Mariene Biologie
Instituut voor Dierkunde
Vakgroep morfologie, systematiek en ecologie
UNIVERSITEIT GENT

UNIVERSITY OF GENT
FACULTY OF SCIENCE,
DEPARTMENT OF BIOLOGY
MARINE BIOLOGY SECTION

Academic Year 1997-1998

BIODIVERSITY OF NEMATODES IN THE WESTERN INDIAN OCEAN (WIO): TAXONOMY AND ASSEMBLAGES

BY

AGNES W. N. MUTHUMBI

PROMOTOR: PROF. DR. M. VINCX

THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF SCIENCE (BIOLOGY)

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Erratum

1) Page 13: 2.6d, should read "Significant test was done using Kruskal-Wallis test in the package of statistica 5.1. Values were considered significantly different at $p < 0.05$".

2) Page 223: 1.5b, line 17-19 should read "The SCOC values were significant different between the five groups ($p=0.006$)".

3) Page 223: 1.5c, line 22-23 should read "The DNA:RNA values in the five groups were significantly different ($p=0.009$)".

4) Page 223: 1.5e, line 28-31 should read "There was a significant difference between the mean oxygen concentration values in the five groups were ($p=0.024$)".

5) Page 225: 1.5f, line 3-4 should read " The mean fine sand proportion in the five groups was not significantly different between the groups".

6) Page 225: 1.5g, line 19-21 should read "The mean nematode density was not significantly different between the five groups".

7) Page 94: paragraph 5, line 9 should read "Furthermore, this species has typical chromadorid supplements. Therefore, we place this species in the genus *Dichromadora* because of having a large dorsal hollow tooth, two longitudinal rows of dots and pre-cloacal supplements and because it lacks a large buccal bulb. Besides, ……".

8) Page 193, line 12 it should "Table 1.5"

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ERRATA:

Please replace the text in the thesis "Biodiversity of nematodes in the Western Indian Ocean ... by Agnes W. N. Muthumbi" with the following corrections (1-8). The errors were made due to the use of wrong statistical method which has now been corrected and some typing errors. Thank you.

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Acknowledgement

Various people and organisations were very instrumental in enabling me to accomplish this doctoral work, without them it would have been impossible to see it to the end.

My memory goes back to 1992, when I rejoined Kenya Marine and Fisheries Research Institute (K.M.F.R.I.) and I met the director, Dr. E. Okemwa, who first made me aware of the existence of the field of benthic studies. My sincere gratitude to him for being firm with me at that time when I was bent on pursuing other areas and for his continued encouragement throughout the years. Around the same time 1992, I met Yvette Vermeulen who patiently introduced me to the work of meiobenthos. Thank you Yvette, for being patient with me. My very sincere gratitude go to my promotor, Prof. Magda Vincx. My first impression of her when I met her in 1992 in Kenya, was that of a loving, kind and easily accessible person. This has been confirmed over the years and has enabled me to tackle a lot of situations with more ease than would have been otherwise, thank you so much for what you have been to me, you have been a real boost to my work.

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I am greatly indebted to the following: to my husband and son, thanks for patiently waiting for me to complete my studies, to my parents, thanks for all you have done for me, to my brothers and sisters, thanks for not keeping me out of your mind for all this time I have been away, to all my nieces and nephews, thanks for making me be alert constantly about everything.

I am very grateful to all my friends in Belgium and Kenya and all my colleagues in K.M.F.R.I., who have continually encouraged and prayed for me. Thanks also to those who have kept me in touch with Kenya.

To the Almighty God, may He be glorified in this work, for "His compassions fail not. They are new every morning: Great is thy faithfulness".

Summary

During the Netherlands Indian Ocean Program (NIOP) 1990-1995, benthic sampling was carried out to assess among other things, meiofauna densities, sediment community oxygen consumption and nematode assemblages.

Four transects were sampled along the Kenyan coast in the Western Indian Ocean (WIO), from north to south: Kiwayu, Tana, Sabaki and Gazi. Samples were taken during two seasons: South East monsoon in June/July and the onset of the North East monsoon in November/December at depths: 20m, 50m, 500m, 1000m and 2000m. The samples were taken using a box core or lander. From each box two sub-samples were taken to a depth of 5 cm using a plastic core 2.6 cm internal diameter. The two sub-samples from each box were mixed and fixed in hot, 4 % formaldehyde. In the laboratory, they were centrifuged in Ludox and nematodes were separated and enumerated. Between 100-200 nematodes were picked and processed using standard methods for slide preparation. They were then identified to genera level.

Genus composition and distribution in the transects, in the two seasons and in depth were studied. Genus diversity was estimated using Hills diversity numbers (N_0, N_1, N_2, H').

From some selected families (Chromadoridae, Comesomatidae, Microlaimidae and *Molgolaimus*), the nematodes were identified to species level and where well represented they were described.

For the selected families (Chromadoridae, Comesomatidae, Microlaimidae and *Molgolaimus*), genera and species composition and distribution were studied in the two periods, four transects and in depth. Species diversity was estimated using Hills diversity numbers and Hierarchical diversity.

Environmental data from the same area (WIO) were obtained from published work or unpublished data analysed in other institutes. This included sediment community oxygen consumption (SCOC), DNA:RNA ratio, oxygen concentration and saturation, organic carbon, C:N ratio and sediment composition.

Species description

From the three families, 42 new species were described and from 13 known species additional information provided. Of the 55 species described an average of 75 % of the nematodes were new. From Chromadoridae, 68 % were new species, *Molgolaimus* had 100 % new species, from Microlaimidae, 89 % were new species and from Comesomatidae, 75 % were new. This means that a lot of nematodes especially from the tropics are still not described both from the sublittoral and deep sea.

Species list for the described species

Chromadoridae

Spilipherinae Filipjev, 1918

Acantholaimus Allgen, 1933

Acantholaimus vermeuleni sp. n.

Acantholaimus verscheldi sp. n.

Acantholaimus heipi sp.n.

Acantholaimus elegans Jensen, 1988

Acantholaimus gathumai sp. n.

Acantholaimus geraerti sp. n.

Acantholaimus invaginatum sp.n.

Chromadorinae Filipjev, 1917

Prochromadorella Micoletzky, 1924

Prochromadorella daroe sp. n.

P. ditlevseni (de Man, 1922) Lorenzen, 1971

Trichromadora Kreis, 1929

Trichromadora longicaudatum Kreis, 1929

Euchromadorinae Gerlach & Riemann, 1973

Actinonema Cobb, 1920

Actinonema longicaudata (Steiner, 1918) Timm, 1961

Actinonema paraceltica sp. n.

Actinonema nicolae sp. n.

Rhips Cobb, 1920

Rhips reginae sp.n.

Trochamus Boucher & Bovée, 1971

Tochamus bulbosa sp. n.

Trochamus complexus Boucher, 1976

Trochamus prosoporus Blome, 1985

Trochamus polki sp. n.

Hypodontolaiminae de Coninck, 1965

Dichromadora Kreis, 1929

Dichromadora longicaudata sp.n.

Dichromadora gathuai sp. n.

Dichromadora loisae sp. n.

Dichromadora cucullata Lorenzen, 1973

Dichromadora quadripapillata sp. n.

Hypodontolaimus de Man, 1886

Hypodontolaimus marleenae sp. n.
Hypodontolaimus aff. angelae Inglis, 1961

Ptycholaimellus Cobb, 1920
Ptycholaimellus macrodentatus Timm, 1961
Ptycholaimellus peninnae sp.n.
Ptycholaimellus ponticus Filipjev, 1922

Desmodoridae Filipjev, 1922

Molgolaiminae Jensen, 1978

Molgolaimus Ditlevsen, 1921
Molgolaimus abyssorum sp.n.
Molgolaimus tyroi sp. n.
Molgolaimus gazii sp.n.
Molgolaimus sabakii sp.n.
Molgolaimus kiwayui sp.n.
Molgolaimus tanai sp.n.

Microlaimidae Micoletzeky, 1922

Aponema Jensen, 1978
Aponema sp. 1 sp.n.
Aponema sp. 2 sp. n.

Bolbolaimus Cobb, 1920
Bolbolaimus sp. 1a sp.n.
Bolbolaimus sp. 2a sp.n.

Calomicrolaimus Lorenzen, 1976
Calomicrolaimus spec. 1 sp.n.

Ixonema Lorenzen, 1976
Ixonema spec. 1 sp. n.

Microlaimus de Man, 1880
Microlaimus texianus Chitwood, 1951
Microlaimus spec. 1a sp. n.
Microlaimus spec. 2a sp. n.

Comesomatidae Filipjev, 1918

Sabatierinae Filipjev, 1934

Cervonema Wieser, 1954
Cervonema tenuicauda Schuurman, 1950
Cervonema minutus sp.n.
Cervonema gourbaulti sp.n.

Sabatieria Rouville, 1903
Sabatieria lucia sp.n.
Sabatieria conicauda Vitiello, 1970
Sabatieria pisinna Vitiello, 1970

Dorylaimopsinae de Coninck, 1965

Dorylaimopsis Ditlevsen, 1918
Dorylaimopsis coomansi sp.n.
Dorylaimopsis gerardi sp.n.
Dorylaimopsis variabilis sp.n.

Hopperia Vitiello, 1969
Hopperia indiana sp.n.

Paramesonchium Hopper, 1967
Paramesonchium mombasi sp.n.

Kenyanema gen. n.
Kenyanema monorchis sp. n.

Nematode density

Nematode densities were highest at the shallowest stations (20m) which recorded 927 and 1350 ind/10cm^2. At 50-2000m depth the density was 112 -669 ind/10 cm^2. The low nematode density compared to the temperate region was associated to low food availability. The general trend in all transects was high nematode density at shallow depth which decreased upto 1000m, then increased slightly or decreased slightly upto 2000m. This trend was similar to the trend in oxygen concentration, and therefore oxygen was thought to be influencing nematode density.

Nematode composition (in Transects and two periods)

A total of 36 families were identified in June/ July and 38 families in Nov/Dec. The most dominant families were Xyalidae, Monhysteridae and Comesomatidae. Some temporal variation in family composition was observed in that Comesomatidae and Linhomoeidae had a higher relative abundance in June/ July compared to Nov/Dec, and Microlaimidae and Chromadoridae had a higher relative abundance in Nov/Dec compared to June/July.

In June/July a total of 199 nematode genera were identified while in Nov/Dec 217 genera were identified. In June/July, 19 genera had at least 1.0 % which contributed to 50 % of the community. In Nov/Dec, 20 genera had at least 1.0 % and this contributed to 50 % of the community. The most dominant genera in both periods were *Monhystera* (7 %, 8 % respectively), *Halalaimus* (6 %, 5%), *Sabatieria* (5 %, 4%), *Daptonema* (4 %, 6 %) and *Acantholaimus* (3 %, 5 %). There was some

temporal variation in genera distribution between the two periods in that during June/July *Terschellingia* had a higher dominance compared to Nov/Dec and in Nov/Dec *Acantholaimus* and *Molgolaimus* had a higher dominance compared to June/July.

In the transects, the most dominant genera were similar, although the relative abundance varied from transect to transect. Some of the most dominant genera common in all transects were *Monhystera* (4-10%) and *Halalaimus* (4-6 %). Some temporal variation was observed in that again *Terschellingia* was the most dominant genus in only Sabaki in June/July and in the Training transect in Nov/Dec, *Microlaimus* was the second most dominant genus.

Species (genus) diversity was estimated using Hills diversity numbers. Average diversity (Hill's N_1) was lower in June/July (24) compared to Nov/Dec (26). In the transects, diversity was lowest in Sabaki in both periods (19 and 20 respectively). In Jule/July, genus diversity was highest in Tana (27) while in Nov/Dec it was highest in Training transect (29).

Ecological groups (Depth)

On the basis of nematode genera composition, TWINSPAN and DCA analysis identified four groups of stations. The four groups were

A- stations at 20m, 50m and 200m depth,

B- stations at 20m and 50m

C- stations at 500m and 1000m and

D- stations at 1000m and 2000m

This shows that depth had a lot of influence on structuring the nematodes composition in the area. Besides depth, nematode composition may have been influenced by sediment composition. Station groups A and B were at nearly the same depths but group A stations had sediment with high sand content and very low silt content.

Further analysis of the nematodes was therefore done with the groups separated on the basis of depth but group A and B were kept separate. Therefore, the following groups were considered for further analysis;

1 -A

2 -B

3 -500m stations

4 -1000m stations

5 -2000m stations

Nematode composition in the ecological groups

In all five ecological groups, the most dominant families were Xyalidae (8-21 %), Monhysteridae (3-32 %), Chromadoridae (6-10 %), Comesomatidae (4-17 %) and

Oxystomatidae (6-9 %). The most notable trend in family distribution in the groups was the increase in relative abundance of Monhysteridae and the decrease of Xyalidae from group 1 to 5. The two shallow station groups had also high relative abundances of Linhomoeidae (12 %) in group 1 and Microlaimidae (13 %) in group 2.

Some of the most dominant genera were common in all the five groups of stations, although their relative abundance differed from group to group. The dominant genera were *Monhystera*, *Sabatieria*, *Halalaimus*, and *Daptonema*. *Acantholaimus* was also dominant but it was completely absent in group 1.

The shallow station groups, 1 and 2, were distinctly different from the deeper stations in some of their dominant genera, while the deeper station groups 3, 4 and 5 had nematode genera composition that shifted gradually with depth from 3 to 5. In group 1, the most dominant genera were *Daptonema* (11 %), *Terschellingia* (9 %), *Dorylaimopsis* (7 %) and *Halalaimus* (4 %). In group 2, the most dominant genera were *Microlaimus* (6 %), *Halalaimus* (6 %), *Daptonema* (5 %) and *Sabatieria* (4 %). *Terschellingia* and *Dorylaimopsis* were typical for group 1 and *Microlaimus* was one of the typical genera for group 2, where they had higher relative abundance than in any other. The deeper station groups were characterised by varying proportions of Sabatieria (6 %, 7 %, 2 % respectively), *Monhystera* (5, 9, and 23 %), *Acantholaimus* (4, 5, 8 %) and *Molgolaimus* (4, 4, 2 %). *Halalaimus* had a high relative abundance in all the five groups (4, 6, 6, 6, 5 %).

Genus diversity in the station groups was compared using Hills diversity numbers. It was highest in group 2 and 3 intermediate in group 1 and 4 and lowest in group 5. All indices indicated a low diversity at group 1, increased to a maximum at group 2 or 3 and then decreased to a minimum in group 5 stations. This trend in diversity followed the same trend as the average sediment sand content in the station groups. It appears like sediment sand content had an influence on nematode diversity. Besides, Spearman Ranked Order correlation (SROC) showed a significant positive correlation between genus diversity and sand and a negative correlation with silt content in the sediment.

Genus diversity was a function of high number of genera combined with low dominance. In group 2 and 3, with the most diverse nematode communities, at least 129 and 121 genera (respectively) had 0.1 % relative abundance, and 50 % of the population was made up by 22 genera in group 2 and 19 genera in group 3. In group 1 and 4, at least 110 genera had relative abundance of 0.1 %, and 50 % of the community was made up by 15 genera in both groups. In group 5, only 94 genera had 0.1 % relative abundance and 50 % of the population was made up by only 10 genera.

Temporal variation was observed in nematode composition and diversity in the deep station groups. In the 500m stations higher genus diversity (using Hills N_1) was observed in June/July (32) compared to Nov/Dec (28). In the 2000m stations, higher genus diversity was observed in Nov/Dec (19) compared to June/July (18).

Trophic composition

Wieser's classification of nematodegenera into, selective deposit feeders (1a), non-selective deposit feeders (1b) epistrate feeders (2a) and predator/omnivore feeders (2b) were analysed in the ecological groups for trophic composition. Ecological groups 1 and 2 had almost similar trophic composition (1a, 1b and 2a: 28-33 %), ecological groups 3 and 4 had almost similar (1a was dominant with 38 %) and group 5 was close to the last two albeit some minor differences (1b was dominant with 41 %). In all the ecological groups, trophic category 2b contributed to less than 10% of the nematode population.

Species distribution

Chromadoridae

19 genera and 81 species were identified. The most dominant genera were *Acantholaimus* (49%) followed by *Dichromadora* (14 %) and *Actinonema* (10 %). Except for *Acantholaimus* that increased in relative abundance with increase in depth, most other genera of the Chromadorids were more dominant at the shelf than on the slope stations.

A high number of morphospecies (species identified on the basis of qualitative morphological characters alone without measurements because sometimes only juveniles were available) of *Acantholaimus* (38) were recorded leading to a high species richness in the slope stations. However, the number of genera was higher in the shelf than the slope stations.

All transects recorded higher diversity in Nov/Dec compared to June/July period. The Northern most transect had higher species diversity compared to the southern one, although a south-north trend was not quite clear. Generally, species diversity seemed to increase with increase in depth while genera diversity showed the opposite trend. This kind of a trend may have been mainly due to the distribution of *Acantholaimus* suggesting that *Acantholaimus* is very important in this area.

Comesomatidae

12 genera and 44 species were identified in the family Comesomatidae. The family was dominated by the genus *Sabatieria* (40%) followed by *Cervonema* (20 %) and *Dorylaimopsis* (15 %). The first two were the most dominant in the deeper station groups while the last one was dominant at the shallow station group 1.

The number of genera was highest in station groups 1 and 3 while the number of species was highest in group 3 and 4 stations. Hills diversity (N_1) index showed that November/ December period had a higher species diversity compared to June/July period. Species diversity was highest in group 3 station and decreased with increase in depth. Among the two shelf stations, group 1 had a higher diversity than group 2. Thus, most Comesomatidae had a preference for fine sand with high silt content rather

than course sand. In November/December higher diversity was observed in Kiwayu compared to Gazi while in June/July, Gazi had a higher diversity compared to Kiwayu.

Microlaimidae + *Molgolaimus*

9 genera and 41 species were identified. The most dominant genera were *Microlaimus* (35 %) and *Molgolaimus* (35 %). *Molgolaimus* had a higher relative abundance during the first campaign (in June/ July) than in the second campaign while *Microlaimus* had a higher relative abundance in November/December compared to June/July period. *Microlaimus* dominated the two shallow station groups 1 and 2 while *Molgolaimus* dominated station groups 3 and 4.

Overall diversity was highest during November /December compared to June/July. In June/July campaign, Kiwayu had the highest diversity index while in November/December, the diversity index increased from North to South. The diversity index N_0 was highest in group 3 stations and decreased with depth while N_1 was highest in group 2 stations and decreased with increase in depth. Among the Microlaimidae, most genera and species appear to prefer coarse sands rather than sand with high silt content.

This work presents the first comprehensive study of free living nematodes of the Indian Ocean.

SAMENVATTING

Tijdens het Nederlandse Indische-Oceaan-Programma (NIOP, 1990-1995) werden bodemstalen verzameld in de Indische Oceaan met het doel om onder meer de activiteiten en samenstelling van het benthos te bepalen. Hiervoor werden o.a. meiofauna densiteiten en respiratie van de bodemgemeenschappen bepaald.
Vier transecten werden bemonsterd langsheen de Kenyaanse kust in het westelijk deel van de Indische Oceaan (WIO); deze transecten zijn van noord naar zuid : Kiwayu, Tana, Sabaki en Gazi. De monsters werden genomen tijdens twee seizoenen : zuidoostelijke monsoon in juni/juli en het begin van de noordoostelijke monsoon in november/december en dit op verschillende dieptes : 20m, 50m, 500m, 1000m en 2000m. De monsters werden genomen door middel van een 'boxcorer' of een 'lander'. Uit elke box werden twee deelstalen genomen tot op een diepte van 5 cm door gebruik te maken van een steekbuis van 2.6 cm binnendiameter. De twee deelstalen uit elke box werden gemengd en gefixeerd met warme, 4% formaldehyde oplossing. In het laboratorium werden de deelstalen gecentrifugeerd met Ludox en de nematoden werden geteld. Tussen 100-200 nematoden werden uitgepikt en verder verwerkt volgens standaardprocedures. Alle nematoden werden geïdentificeerd tot op het genusniveau. De genusdiversiteit werd bestudeerd door middel van de Hill diversiteitsindices.

Van een geselecteerd aantal families (Chromadoridae, Comesomatidae, Microlaimidae en *Molgolaimus*) werden de nematoden tot op soortniveau gedetermineerd en (her)beschreven als ze in voldoende groot aantallen aanwezig waren. Van deze families werden eveneens de soortensamenstelling, de verdeling per transect en per diepte bestudeerd over de twee seizoenen. Diversiteit werd eveneens bestudeerd tot op soortniveau.

Volgende omgevingsvariabelen van het studiegebied (WIO) werden bekomen uit de literatuur (of van NIOZ, Texel en CEMO, Yerseke, niet gepubliceerde data) : zuurstofverbruik van de bodemgemeenschappen (SCOC), DNA:RNA ratio, zuurstofconcentratie en verzadiging, organische koolstof, C:N ratio en sediment samenstelling.

Beschrijving van de soorten

Van de 3 eerder vermelde families werden 42 nieuwe soorten beschreven en van 13 gekende soorten werd aanvullende informatie verschaft. Bij de Chromadoridae waren 68% van de soorten nieuw voor de wetenschap, alle gevonden *Molgolaimus* species waren nog niet eerder beschreven, van de Microlaimidae waren 89% van de soorten nieuw en van de Comesomatidae, 75% van de soorten nieuw. Dit illustreert het grote aantal ongekende nematodensoorten in de diepzee van de Indische Oceaan. Er wordt geschat dat in totaal 75% nieuw is voor de wetenschap.

Soortenlijst van de beschreven soorten

Chromadoridae

Spilipherinae Filipjev, 1918

Acantholaimus Allgen, 1933

Acantholaimus vermeuleni sp. n.
Acantholaimus verscheldi sp. n.
Acantholaimus heipi sp.n.
Acantholaimus elegans Jensen, 1988
Acantholaimus gathumai sp. n.
Acantholaimus geraerti sp. n.
Acantholaimus invaginatum sp.n.

Chromadorinae Filipjev, 1917

Prochromadorella Micoletzky, 1924

Prochromadorella daroe sp. n.
P. ditlevseni (de Man, 1922) Lorenzen, 1971

Trichromadora Kreis, 1929

Trichromadora longicaudatum Kreis, 1929

Euchromadorinae Gerlach & Riemann, 1973

Actinonema Cobb, 1920

Actinonema longicaudata (Steiner, 1918) Timm, 1961
Actinonema paraceltica sp. n.
Actinonema nicolae sp. n.

Rhips Cobb, 1920

Rhips reginae sp.n.

Trochamus Boucher & Bovée, 1971

Tochamus bulbosa sp. n.
Trochamus complexus Boucher, 1976
Trochamus prosoporus Blome, 1985
Trochamus polki sp. n.

Hypodontolaiminae de Coninck, 1965

Dichromadora Kreis, 1929

Dichromadora longicaudata sp.n.
Dichromadora gathuai sp. n.
Dichromadora loisae sp. n.
Dichromadora cucullata Lorenzen, 1973
Dichromadora quadripapillata sp. n.

Hypodontolaimus de Man, 1886
Hypodontolaimus marleenae sp. n.
Hypodontolaimus aff. angelae Inglis, 1961

Ptycholaimellus Cobb, 1920
Ptycholaimellus macrodentatus Timm, 1961
Ptycholaimellus peninnae sp.n.
Ptycholaimellus ponticus Filipjev, 1922

Desmodoridae Filipjev, 1922

Molgolaiminae Jensen, 1978

Molgolaimus Ditlevsen, 1921
Molgolaimus abyssorum sp.n.
Molgolaimus tyroi sp. n.
Molgolaimus gazii sp.n.
Molgolaimus sabakii sp.n.
Molgolaimus kiwayui sp.n.
Molgolaimus tanai sp.n.

Microlaimidae Micoletzeky, 1922

Aponema Jensen, 1978
Aponema sp. 1 sp.n.
Aponema sp. 2 sp. n.

Bolbolaimus Cobb, 1920
Bolbolaimus sp. 1a sp.n.
Bolbolaimus sp. 2a sp.n.

Calomicrolaimus Lorenzen, 1976
Calomicrolaimus spec. 1 sp.n.

Ixonema Lorenzen, 1976
Ixonema spec. 1 sp. n.

Microlaimus de Man, 1880
Microlaimus texianus Chitwood, 1951
Microlaimus spec. 1a sp. n.
Microlaimus spec. 2a sp. n.

Comesomatidae Filipjev, 1918

Sabatierinae Filipjev, 1934

Cervonema Wieser, 1954
Cervonema tenuicauda Schuurman, 1950
Cervonema minutus sp.n.
Cervonema gourbaulti sp.n.

Sabatieria Rouville, 1903
Sabatieria lucia sp.n.
Sabatieria conicauda Vitiello, 1970
Sabatieria pisinna Vitiello, 1970

Dorylaimopsinae de Coninck, 1965

Dorylaimopsis Ditlevsen, 1918
Dorylaimopsis coomansi sp.n.
Dorylaimopsis gerardi sp.n.
Dorylaimopsis variabilis sp.n.

Hopperia Vitiello, 1969
Hopperia indiana sp.n.

Paramesonchium Hopper, 1967
Paramesonchium mombasi sp.n.

Kenyanema gen. n.
Kenyanema monorchis sp. n.

Nematoden densiteiten

De nematoden densiteiten waren het hoogst in de meest ondiepe stations (20m) met aantallen schommelend tussen 927 en 1370 ind./10cm². Bij een diepte tussen 50-2000m schommelt de densiteit tussen 112 en 669 ind./10cm². In vergelijking met gematigde gebieden wordt gedacht dat de densiteit lage gecorreleerd is met lage voedselbeschikbaarheid. De algemene trend in alle transecten was dat de nematoden densiteiten afnemen tot 1000m diep om nadien lichtjes te stijgen naar de 2000m diepte toe. Deze trend is ook teruggevonden in de zuurstofconcentratie.

Nematoden samenstelling (in alle transecten over de twee periodes)

In totaal werden 36 families geïdentificeerd in jun/jul en 38 families in nov/dec. De meest dominante families zijn Xyalidae, Monhysteridae en Comesomatidae. Temporele variatie werd waargenomen in de samenstelling van de families : de Comesomatidae en

de Linhomoeidae hadden een hogere relatieve abundantie in jun/jul in vergelijking met nov/dec en de Microlaimidae en de Chromadoridae waren talrijker in nov/dec.

In jun/jul werden199 nematoden genera onderscheiden terwijl in nov/dec dit aantal 217 bedroeg. In jun/jul hadden 19 genera een minimale abundantie van 1% en maakten samen 50% uit van de gemeenschap. In nov/dec hadden 20 genera een minimale abundantie van 1% die samen 50% van de gemeenschap vormden. De meest abundante genera in beide perioden waren *Monhystera* (7 en 8 % respectievelijk), *Halalaimus* (6 en 5 %), *Sabatieria* (5 en 4%), *Daptonema* (4 en 6%) en *Acantholaimus* (3 en 5%). Er was een temporele variabiliteit in de genusverdeling : *Terschellingia* had een hogere abundantie in jun/jul terwijl *Acantholaimus* en *Molgolaimus* een hogere abundantie hadden in nov/dec.

De vergelijking tussen de transecten leverde geen noemenswaardige verschillen op in de genussamenstelling. *Monhystera* (4-10%) en *Halalaimus* (4-6%) waren dominant in alle transecten. *Terschellingia* was het meest dominante genus in het Sabaki transect in jun/jul (en in nov/dec in de 'training' transect) met *Microlaimus* als tweede meest dominante genus.

De species (genus) diversiteit werd berekend door middel van de Hill diversiteitsgetallen. De gemiddelde diversiteit (N_1) was lager in jun/jul (24) in vergelijking met nov/dec (26). Vergelijking tussen de transecten leverde volgende beeld : het Sabaki transect had de laagste diversiteit in beide periodes (19 en 20 resp.). In jun/jul had het Tana transect de hoogste diversiteit (27) terwijl in nov/dec het 'training' transect de hoogste diversiteit had (29).

Ecologische groepen (gebaseerd op waterdiepte)

Op basis van de samenstelling van de nematoden genera, TWINSPAN en DCA analyse werden 4 stationsgroepen onderscheiden :

A : stations op 20m, 50m and 200 m waterdiepte

B : stations op 20 m en 50 m

C : stations op 500 m en 1000 m

D : stations op 1000 m en 2000 m.

Hieruit blijkt dat de waterdiepte een bepalende factor is voor het bepalen van de samenstelling van de nematodengemeenschap. Naast de diepte is de sedimentsamenstelling eveneens belangrijk. De stationsgroepen A en B zijn ongeveer op dezelfde diepte gelegen maar de stations van groep A hebben een hoog percentage zand en een zeer laag slib gehalte. Verdere analyse van de nematoden toonde aan dat stationsgroepen A en B een duidelijk verschillende nematodensamenstelling hadden.

Daarom worden de volgende vijf ecologische groepen voorgesteld :

1 : A
2 : B
3 : 500 m stations
4 : 1000 m stations
5 : 2000 m stations

De nematodensamenstelling in de vijf ecologische groepen kan als volgt samengevat worden : over de vijf ecologische groepen verspreid zijn de volgende families dominant : Xyalidae (8-21%), Monhysteridae (3-32%), Chromadoridae (6-10%), Comesomatidae (4-17%) en de Oxystomatidae (6-9%). De meest merkwaardige trend in de verdeling over de families was de toename in relatieve abundantie van de Monhysteridae en de afname van de Xyalidae gaande van groep 1 naar groep 5. De twee ondiepe stations groepen hadden ook hoge relatieve abundanties voor de Linhomoeidae (12%) in groep 1 en de Microlaimidae (13%) in groep 2.

Sommige dominante genera werden teruggevonden in alle stationsgroepen : *Monhystera*, *Sabatieria*, *Halalaimus* en *Daptonema*. *Acantholaimus* was eveneens dominant maar echter wel afwezig in groep 1.

De ondiepe stationsgroepen 1 en 2 verschilden duidelijk van de overige groepen in hun generasamenstelling. Groep 1 heeft volgende dominante genera : *Daptonema* (11%), *Terschellingia* (9%), *Dorylaimopsis* (7%) en *Halalaimus* (4%). In groep 2 zijn de meest dominante genera : *Microlaimus* (2%), *Halalaimus* (6%), *Daptonema* (5%) en *Sabatieria* (4%). *Microlaimus* had de hoogste dominantie van het gebied in deze stationsgroep. De diepere stationsgroepen werden gekenmerkt door wisselende aantallen van *Sabatieria* (6, 7 en 2 % respectievelijk), *Monhystera* (5, 9 en 23%), *Acantholaimus* (4, 5, 8%) en *Molgolaimus* (4, 4, 2%). *Halalaimus* had een hoge abundantie in alle stationsgroepen (4, 6, 6, 6, 5%).

De genusdiversiteit (N_1) was het hoogst in stationsgroepen 2 en 3, intermediair in groepen 1 en 4 en het laagst in groep 5. Deze trend was dezelfde als deze van het gehalte aan zand in de sedimenten. Een significante positieve correlatie werd gevonden tussen het percentage zand en de diversiteit en een negatieve correlatie tussen de diversiteit en het slib gehalte.

De genusdiversiteit was het gevolg van een hoog aantal genera in combinatie met een lage dominantie. In stationsgroepen 2 en 3 (met de meest diverse gemeenschappen) werden er 129 en 121 genera gevonden met een minimum abundantie van 0.1 %, en 50% van de gemeenschap bestond uit respectievelijk 22 en 19 genera. In groepen 1 en 4 waren 110 genera met een relatieve abundantie hoger dan 0.1 % en 50% van de gemeenschap bestond uit 15 genera in beide groepen. In groep 5, hadden slechts 94 genera een abundantie van 0.1 % en 50% van de gemeenschap bestond uit slechts 10 genera.

Een opmerkelijke temporele variatie is gevonden in de diepere stationsgroepen. In de stations op 500 m diepte was een hogere genusdiversiteit gevonden in jun/jul (32 genera) in vergelijking met de 28 genera in nov/dec. In de 2000 m stations werd een hogere diversiteit waargenomen in nov/dec (19 genera) in vergelijking met jun/jul (18 genera).

Trofische samenstelling : de classificatie van Wieser (1a : selectieve deposit-eters, 1b : niet-selectieve deposit-eters, 2a epistratum-eters en 2b predatoren/omnivoren) werd berekend over de vijf ecologische groepen. Stationsgroepen 1 en 2 hadden een vrij vergelijkbare trofische samenstelling (1a, 1b en 2a : 28-33%); de groepen 3 en 4 hadden een dominantie van 1a (38%) en groep 5 is vrij vergelijkbaar met groepen 3 en 4 (1b : 41%). De predatoren/omnivoren hadden telkens een abundatie lager dan 10%.

Verdeling van de soorten

Chromadoridae

19 genera en 81 species werden geïdentificeerd. De meest dominante genera waren *Acantholaimus* (49%) gevolgd door *Dichromadora* (14%) en *Actinonema* (10%). Behalve voor *Acantholaimus*, zijn de Chromadoridae het meest abundant in de ondiepe shelf stations.

38 morfospecies (soorten geïdentificeerd op basis van kwalitatieve morfologische kenmerken daar dikwijls slechts juvenielen gevonden werden) van het genus *Acantholaimus* werden onderscheiden.

Alle transecten toonden een hogere diversiteit in nov/dec in vergelijking met jun/jul. Het meeste noordelijke transect had de hoogste soortendiversiteit. In het algemeen lijkt de soortendiversiteit toe te nemen met de diepte terwijl de genusdiversiteit de tegenovergestelde trend vertoonde. Deze trend in grotendeels te wijten aan de grote soortenrijkdom van *Acantholaimus*.

Comesomatidae

12 genera en 44 soorten werden geïdentificeerd. Deze familie werd gedomineerd door *Sabatieria* (40%), gevolgd door *Cervonema* (20%) en *Dorylaimopsis* (15%). De eerste twee genera waren het meest dominant in de diepere stations terwijls *Dorylaimopsis* het dominant genus in stationsgroep 1 was.

Het aantal genera was het hoogst in de stationsgroepen 1 en 3 terwijl het aantal soorten het hoogste was in groepen 3 en 4. De diversiteit was hoger in nov/dec dan in jun/jul. De soortendiversiteit was het hoogste in groep 3 en daalde met toenemende diepte. Bij de ondiepe stations, had groep 1 een hogere diversiteit dan groep 2. Hieruit besluiten we dat de Comesomatidae ook in dit gebied een duidelijke preferentie hebben voor fijn zand met een hoog slib gehalte eerder dan voor grof zand.

Microlaimidae + *Molgolaimus*

9 genera en 41 soorten werden geïdentificeerd. De meeste dominante genera zijn *Microlaimus* (35%) en *Molgolaimus* (35%). *Molgolaimus* had een hogere relatieve abundantie jun/jul terwijl dit voor *Microlaimus* in nov/dec was.
Microlaimus was dominant in groepen 1 en 2 en *Molgolaimus* was dominant in groepen 3 en 4.

De diversiteit was het hoogst in nov/dec. In jun/jul, had het Kiwayu transect de hoogste diversiteit . In nov/dec was er een toename van de diversiteit van noord naar zuid. Het aantal soorten was het hoogst in groep 3 terwijl N1 het hoogst was in groep 2. De Microlaimidae prefereren grofzandige sedimenten eerder dan slibbig zand.

Voorgestelde studie is de eerste die een vrij volledig beeld geeft van de nematodengemeenschappen in de West-Indische Oceaan.

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MATERIALS AND METHODS

1: GENERAL INTRODUCTION AND AIMS

INDIAN OCEAN (Kennett, 1982; Pickering *et al*, 1988 and Meadows & Campbell, 1988).

The Indian Ocean is the third largest ocean (with an area of 74 x 10^6 km^2) after the Atlantic and the Pacific Ocean. Most of this area lies to the Southern Hemisphere. It has an average depth of 3840 m with only a small percentage (9 % of the continental shelves) of continental shelf. The boundary between the Indian Ocean and the Atlantic Ocean lies south of South Africa, while the boundary with the Pacific Ocean follows the Indonesian Islands to the eastern and southern Australia and south of Tasmania to Antarctica. It has few islands and several submarine plateaux and rises. Nearly all river discharges occur in the northern part adjacent to Asia. This Ocean is intermediate between the carbonate-rich Atlantic and the carbonate-poor Pacific Ocean. Carbonate is abundant on topographic highs but occurs in low concentrations in the basins. Dilution of the carbonates by terrigenous debris is conspicuous in the Bay of Bengal and the Arabian Sea adjacent to the Indian sub-continent and on the Mozambique basin off Southeast Africa.

Like in other water bodies, oxygen concentration is vertically stratified from the shelf to the deep levels (Figure 1). The oxygen minimum zone (i.e<0.1-0.5ml/l) occurs at 300-1000 m. In this zone there is accumulation of organic rich sediments as a result of lack of burrowing organisms and hence absence of bioturbation. The sediments here are laminate muds. Below 1000m, the oxygen levels are higher (1ml/l) and the muds are olive grey in colour. At 1500 m and below the sediments are well oxygenated and they are dark brown in colour.

The surface water temperature over the Indian Ocean is one of the highest (25°C). In the southern part, the surface temperature is lower (20°C). In deeper waters about 2000m, it is more uniform at about 3°C. Salinity in the ocean is a function of evaporation, precipitation and ice formation. High precipitation at the equator and ice melting at the polar regions causes salinity to be lower in these areas than at the mid latitudes. In the Indian Ocean salinity is on average 35.0 p.s.u. High surface water temperature and relatively low salinity, means that surface water density becomes low and therefore, does not sink. Thermohaline circulation occurs when the opposite happens and the sinks due to density. This kind of circulation does not exist in the Indian Ocean and the bottom water comes from the cold Antarctic region.

Drastic seasonal changes in wind patterns cause reversals in current directions in the northern Indian Ocean. In this region, the summer monsoon winds blow from the western Indian Ocean into India. Ocean currents (Southwest Monsoonal Drift) thus flow mainly from west to east. In contrast the cold, northern winds blow southward from the Asian continent over the Indian Ocean. Ocean currents (Northeast Monsoonal Drift)

respond by flowing mainly from east to west or to the Southwest. The circulation pattern further south in the Indian ocean away from the Monsoonal influences is similar to the gross features of the South Atlantic and Pacific. The colder, heavier water from the sea sinks at the continental margin causing upwelling. There is seasonal high primary productivity during the months of upwelling and this contributes significantly to the carbon cycle within the area. This area with seasonal current reversals is of interest in terms of effects to the global carbon cycle.

In contrast, strong stratification of the surface waters south of Somalia impose restricted surface circulation by surface winds to only 300-500 m depth. With little fresh water input, thus little terrigenous material to the sea, the contribution of carbon from this coastline to the global carbon cycle is considered minimal.

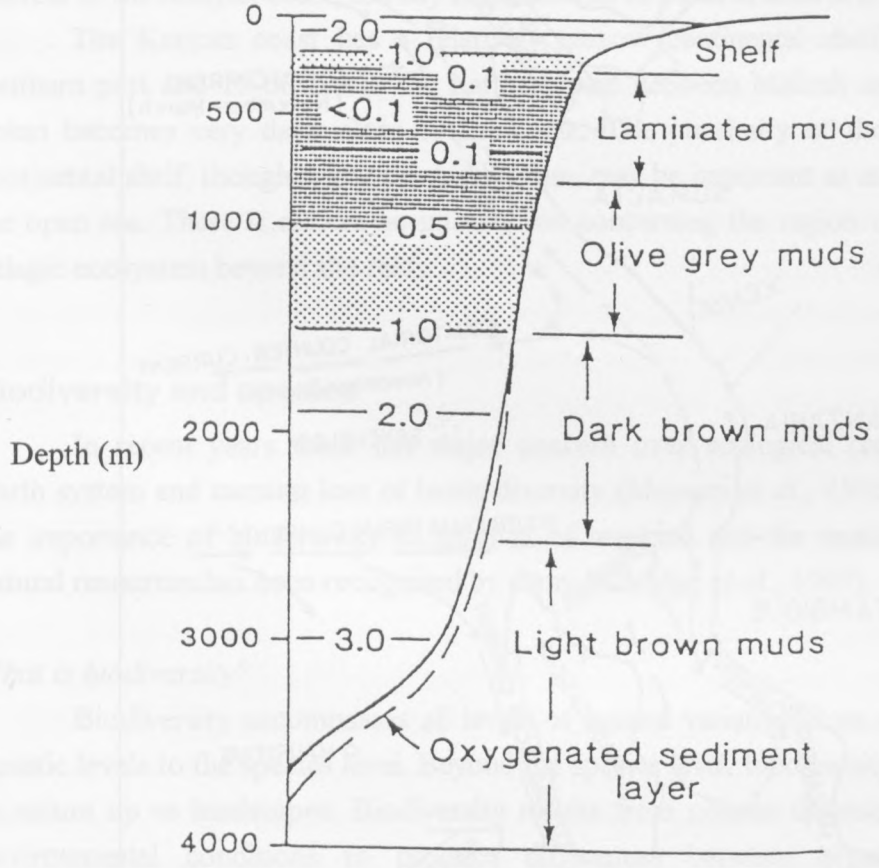


Figure 1: North western Indian Ocean, an open continental slope with an oxygen rich surface layer, well-developed oxygen minimum layer and increasingly aerobic deep-water masses against the slope (from Pickering *et al* 1988).

Kenyan Coast (Heip *et al.*, 1995)

The Western Indian Ocean along the Kenyan Coast extends from approximately 1° S to 4° south of the Equator. The area is influenced by the Southeast Monsoon (April - October), the Northeast monsoon (November -March) with inter-monsoon periods in May and November. The main water currents are the Northward flowing East African Coastal Current (EACC), which flows predominantly to the north, the Somali Current (SC) that flows southwards during the Northeast monsoon in the northern part and the East ward flowing Equatorial Counter Current (ECC) formed as a result of SC meeting with EACC during the Northeast Monsoon (Figure 2).

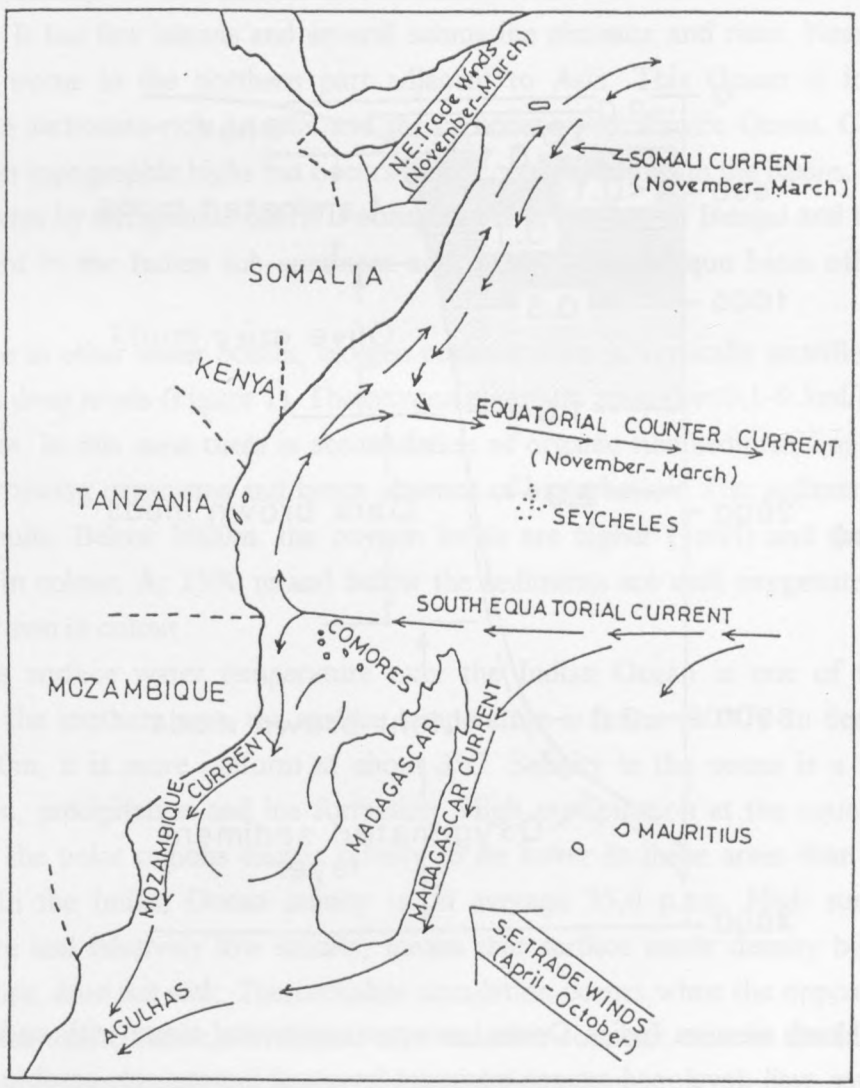


Figure 2: Ocean currents and monsoon winds in the Eastern Africa region (simplified from Richmond, 1997)

The coastal ecosystems in Kenya consist of shallow shelf area, coral reefs (fringing reefs) along the entire coastline, with extensive areas of sea grass beds on the more sheltered parts of the back reefs and in lagoonal areas, mangroves on the shores of the brackish parts of rivers and creeks. The coast is influenced by seasonal and permanent rivers that bring land derived nutrients and silt into the sea. The two rivers in the Northern part, Tana and Sabaki at 2° 40' and 3° 10'S respectively are permanent rivers, which bring in terrigenous sediment discharge (Figure 3). Terrigenous material from the Sabaki river reduces the coral reefs especially at Watamu area (Katwijk *et al.*, 1994). In Mombasa, two of the largest creeks that surround the island are threatened by pollution. In the South, the Gazi bay has two seasonal rivers draining into it, Mkurumuji and Kidogoweni which bring in fresh water and land derived nutrients into the coastal waters especially during the wet season when there is increased water influx. Besides the land derived nutrients, the bay is otherwise relatively pristine (Ohowa *et al.,* 1997). Like the rest of the Kenyan coast, the bay is considered to be an area of low productivity.

The Kenyan coast has a relatively narrow continental shelf, (0-3 km in the southern part and 15-60 km in the northern part between Malindi and Lamu) and the ocean becomes very deep close to the coast. The proximity of the deep sea to the continental shelf, though a low productive one, may be important as an export system to the open sea. There is almost no information concerning the region on the benthic and pelagic ecosystem beyond the reefs.

Biodiversity and species

In recent years there has major concern over ecological changes altering the Earth system and causing loss of biotic diversity (Mooney *et al.*, 1996). This is because the importance of biodiversity to survival of mankind and the sustainable use of our natural resources has been recognised by many (Claridge *et al.*, 1997).

What is biodiversity?

Biodiversity encompasses all levels of natural variation from the molecular and genetic levels to the species level. Beyond the species level, biodiversity includes patterns in nature up to landscapes. Biodiversity results from genetic diversity interacting with environmental conditions to produce differences between organisms. To better understand biodiversity, Huston, (1995), suggest that it is better to divide it into the smallest functional type or guilds that have repeatable pattern and consistent behaviour, such as species, the basic units of biodiversity.

What is a species? or what are species? (Claridge *et al.*, 1997)

Several concepts have been put forward to define species such as biological and phylogenetic species concept. The morphological species concept, though not a concept as such, but was put forward as an empirical solution to a practical problem is most

practical in the prevailing conditions (since material used was dead fixed specimens). In this case morphological diagnosable characters in dead preserved organisms are used in order to distinguish species. This concept although practical due to logistics reasons, has several unresolved difficulties:

How much variability should a single species encompass?

How about character convergence which often perplex taxonomic classification based on morphology?

How about simpartric and allopartric species?

These and many other question are not answered here but are circumvented in order to come up with some 'bio labels', **for who can tell what a species is?**

Nematode Assemblages and species distribution

In most tropical areas, meiofauna studies have concentrated on the sandy beaches and the mangroves swamps (McLachlan *et al.*, 1977; Hodda & Nicholas, 1985; Alongi 1990; Vanhove *et al.*, 1992) and deep-sea work is almost non-existent. The only deep sea work in the tropics is in the Tropical East Atlantic (Soltwedel, 1997). In the Indian Ocean only one study so far has been done in the Arabian sea (Thiel, 1966). And although, quantitative sampling was done, the processing of the samples does not allow for comparison with other studies. Information about deep-sea meiofauna is available, though limited, for the Mediterranean sea (Dinet & Vivier, 1979; Soetaert & Heip,1995), N.E Atlantic (Pfannkuche, 1985; Vanreusel *et al.*, 1992; Vincx *et al.*, 1994; Vanreusel *et al.*, 1995; Vanaverbeke *et al*, 1997a), the Pacific (Shirayama & Kojina, 1994), in the Antarctica (Vanhove *et al.*, 1995), the Arctic (Vanaverbeke *et al.*, 1997).

Distribution of nematode species of the deep sea is limited to few studies in the North Carolina (Tietjen, 1971), Gulf of Gascony (Dinet & Vivier, 1979), Norwegian sea (Jensen, 1988), Venezuela basin (Tietjen, 1984), Hatterras Abyssal plain (Tietjen, 1989), Scotian Rise (Thistle & Sherman, 1985), Bay of Biscay (Vanreusel *et al.*, 1992), Mediterranean Sea (Soetaert *et al.*, 1995), Laptev Sea (Vanaverbeke *et al.*, 1997), Goban Spur (Vanaverbeke et al., 1997a) and the Weddell Sea (Vanhove *et al.*, 1997).

A gap therefore existed in that no comparisons could be made with the Indian Ocean. The Dutch government endeavoured to close this gap through the Netherlands Indian Ocean Programme NIOP (1990-1995).

Netherlands Indian Ocean Programme (NIOP)

NIOP was funded by the Dutch government to carry out an expeditions in the Indian ocean to collect scientific information concerning the Indian Ocean in collaboration with the countries that border the Indian Ocean (Heip *et al.*, 1995). The execution of the program was achieved through co-operation of the Dutch and local scientists from the region through different projects.

Only, little information about the Kenyan Coast south of Somalia exist. The Netherlands Indian Ocean Programme 1990-1995, therefore, organised the Project A, (Monsoons and coastal ecosystems in Kenya) to gather information about productivity from this oligotrophic area. Besides, the northern part of the Kenyan coast experiences the current reversal that induces upwelling. It was of interest to find out if seasonal high productivity also occurred at this part as has been found in the Somali coast.

During the Netherlands Indian Ocean program, various study subjects were followed. Wind and current speed and directions were observed during two periods, the Southeast (June) and the Northeast (November) monsoons. Other pelagic conditions such as salinity, temperature, nutrient and primary productivity were measured. In the sediments, community oxygen consumption, nutrients, chlorophyll levels and other related pigments were also studied. The results of this study showed that during the Southeast monsoon, the surface water formed a homogenous surface layer overlying a main thermocline at 70-120 m while in the Northeast monsoon, the homogenous layer was much shallower (50 m) and the thermocline was higher by 30m. The water temperature was slightly higher in November than in June (Nguli, 1995).

The general picture that emerged from this study is that, primary productivity in the water column decreased from the northern most transect to the southern most and rates of primary production were higher during the second cruise (especially for the Southern transects) compared to the first cruise (Kromkamp *et al.*, 1995). In the sediments, sediment community oxygen demand (SCOD) (Duineveld *et al.*, 1997) decreased with increasing water depth, being highest at 50m in the northern most transect (Kiwayu). There was no temporal variation in SCOD between June/July and November/December.

AIMS and OBJECTIVES

In the present work, benthic samples collected during NIOP were used for analysis of meiofauna. The aim was to identify nematode communities or assemblages that may give an indication of benthic changes equivalent to the changes observed in the water column and in the sediment along the transects and in the two monsoon periods. We also wanted to get an idea about the biodiversity of this area. This work was divided into three parts.

Part I: Description of nematode species from selected families and genera (Chromadoridae, Microlaimidae, *Molgolaimus* and Comesomatidae).

Part II: Nematode assemblages in the Western Indian Ocean (WIO)

In this study, nematode assemblages and diversities were studied in detail to establish if there were any trends in nematodes related to

- depth
- seasonality (South East monsoon and North East monsoon)
- horizontal distribution (transect)

The results of the assemblages and diversities will be compared with results from literature.

Part III: Distribution and diversity of nematode species of the selected families.

No attempt has been made so far to report on the distribution of species for a particular family in terms of horizontal distribution and or bathymetry. In this study, the distribution and diversities of three families, Chromadoridae, Comesomatidae and Microlaimidae (NB: *Molgolaimus* is considered together with the Microlaimidae) were studied in relation to

- water depth (ecological groups)
- seasonality (South East monsoon and North East monsoon)
- horizontal distribution (transects in the Indian Ocean).

II: MATERIALS AND METHODS

2.1 Study Area

The study area is the Western Indian Ocean (WIO) along the Kenyan coast. Four transects at Kiwayu, the northern most, Tana, Sabaki and Gazi the southern most were sampled (**Figure 3).** At every transect at least four stations were sampled from the continental shelf and the slope at depths 50m, 500 m, 1000m and 2000m and an extra station was sampled at 20m in Kiwayu, Tana and Sabaki and at 200m at the Kiwayu transects (**Table 1a & 1b**). Sampling was done in two campaigns: the first was done in June/July (KA1) during the Southeast monsoon and the second in the November/ December (KA2) during the onset of the Northeast monsoon. During the second campaign, the Tana transect was not sampled. Two extra stations were sampled within the vicinity of Gazi during a training programme conducted in the November/December period referred here as Training transect. During KA1, the stations were labelled 1** and in KA2, the equivalent stations have similar label but for 5**.

2.2 Sampling

Sediment samples were taken during the NIOP on the RV Tyro during the cruises A1 and A2. The samples were taken using either a box corer or a lander. Two sub-samples were taken up to a depth of 5 cm with a plastic core of 2.6 cm internal diameter from one box core and pooled together. Also used for benthic fauna analysis were sub-samples taken from the box core that was incubated in order to assess sediment oxygen consumption (Duineveld *et al.*, 1997). During the first campaign in stations 105, 114 and 133 and in the second campaign in station 505 samples were taken using a lander only or as additional samples. The full list of the samples used is given in Appendix Ia and Ib and the sample labels are shown in Table 2. Samples were preserved in 4% buffered formaldehyde. In the laboratory, the samples were sieved over 1 mm and collected on 32 µm screen sieve. The material retained on the 32 µm mesh was then centrifuged twice in Ludox to separate meiofauna from sediments. The supernatant was stained in rose bengal over night.

Higher taxa meiofauna were identified using the pictorial key of Higgins & Thiel 1988 and enumerated using a dissecting microscope at magnification 250 ocular lens. Nematodes were numerically the most dominant taxa followed by harpacticoid copepods (Duineveld *et al.*, 1997). In this study we concentrated on nematodes alone.

Table 1 a: Location and depth of the sampling stations for cruise KA1

Transect	Date	Station (1**)	Latitude S	Longitude E	Depth (m)
Kiwayu	02/7/1992	127	02°.03'.61	41°.17'.80	24
	02/7/1992	128	02°.03'.16	41°.18'.48	55
	04/7/1992	131	02°.00'.27	41°.26'.62	500
	03/7/1992	132	01°.56'.03	41°.31'.54	1000
	03/7/1992	133	02°.01'.49	41°.46'.96	2015
Tana	30/6/1992	120	02°.42'.20	40°.31'.18	21
	30/6/1992	121	02°.43'.07	40°.33'.89	52
	06/7/1992	136	02°.40'.05	41°.10'.17	992
Sabaki	25/6/1992	108	03°.10'.06	40°.10'.06	18
	25/6/1992	111	03°.09'.78	40°.14'.41	53
	27/6/1992	114	03°.10'.27	40°.17'.02	213
	28/6/1992	117	03°.08'.21	40°.41'.80	500
	29/6/1992	118	03°.08'.46	41°.01'.77	1112
	29/6/1992	119	03°.10'.67	41°.14'.20	2007
Gazi	20/6/1992	103	04°.25'.83	39°.33'.58	62
	22/6/1992	105	04°.24'.06	39°.45'.99	511
	23/6/1992	106	04°.20'.35	40°.21'.70	1000
	23/6/1992	107	04°.21'.83	41°.13'.16	2053

Table 1b: Location and depth of the sampling stations for cruise KA2

Transect	Date	Station (5**)	Latitude S	Longitude E	Depth
Kiwayu	23/11/1992	528	02°.04'.76	41°.17'.40	39
	20/11/1992	531	02°.00'.48	41°.37'.56	516
	22/11/1992	532	01°.56'.02	41°.37'.56	904
	21/11/1992	533	02°.00'.86	41°.47'.71	2027
Training	08/12/1992	550	04°.11'.96	39°.37'.94	51
	07/12/1992	552	04°.07'.71	39°.54'.67	500
Sabaki	28/11/1992	511	03°.09'.59	40°.13'.94	57
	25/11/1992	514	03°.10'.27	40°.17'.34	207
	25/11/1992	517	03°.09'.43	40°.41'.25	508
	2611/1992	518	03°.07'..98	40°.59'.96	963
	27/11/1992	519	03°.09'.28	41°.16'.53	2179
Gazi	30/11/1992	503	04°.19'.28	39°.35'.56	47
	03/12/1992	505	04°.25'.33	39°.45'.21	520
	04/12/1992	506	04°.19'.45	40°.21'.80	1020
	02/12/1992	507	04°.21'.31	41°.13'.64	2088

2.3 Environmental data

Environmental data were obtained from already published work resulting from the same expedition (NIOP). Sediment grain size, organic carbon and C:N ratio analysis were carried out at the Netherlands Institute of Ecology at Yerseke and were available only from the second campaign (Appendix IIb).

Sediment community Oxygen Consumption (SCOC), oxygen content in the water column, chlorophyll a and other pigments values, obtained from Duineveld *et al.*, (1997) were available for both campaigns (Appendix IIa and IIb).

2.4 Nematode Identification

At least 150 nematodes were picked at random from each sample. In a few of the samples less than 150 nematodes were obtained, in which case, all nematodes were picked out and dehydrated for permanent slide preparation using the method of Seinhorst (1959); in 4% formaldehyde solution with nematodes, 1% glycerine was added and left overnight in a desiccator with 95% ethanol. They were then left in 95% ethanol and put in an oven set at 35° C, 5% glycerine was added every two hours throughout the day. They were then left in this mixture overnight. By the next day, the nematodes were in pure glycerine. The nematodes were then mounted on slides using the method of Cobb (1918). On a cover slip placed on an aluminium frame, a ring of paraffin was made using a hot copper tube. A drop of glycerine was then added and between one and eleven nematodes were placed on the glycerine drop. A second cover slip was placed on the first one and the slide was then placed on an aluminium bar and heated by a small flame. The paraffin ring was allowed to melt slightly then cooled so that the two cover slips stuck together.

Nematodes were first identified to genus level using the pictorial key by Platt & Warwick (1988) and other published keys. Systematics was based mainly on Lorenzen (1981). Three families, Chromadoridae, Comesomatidae and Microlaimidae and the genus *Molgolaimus* were identified to species level using the 'nematode library' of the Marine Biology section of the University of Gent and other published work.

Table 2: Sample labels

Box 1	Box 2	Incubation 1	Incubation 2	Lander 1	Lander 2	a	b
A	B	C	D	E	F	G	H

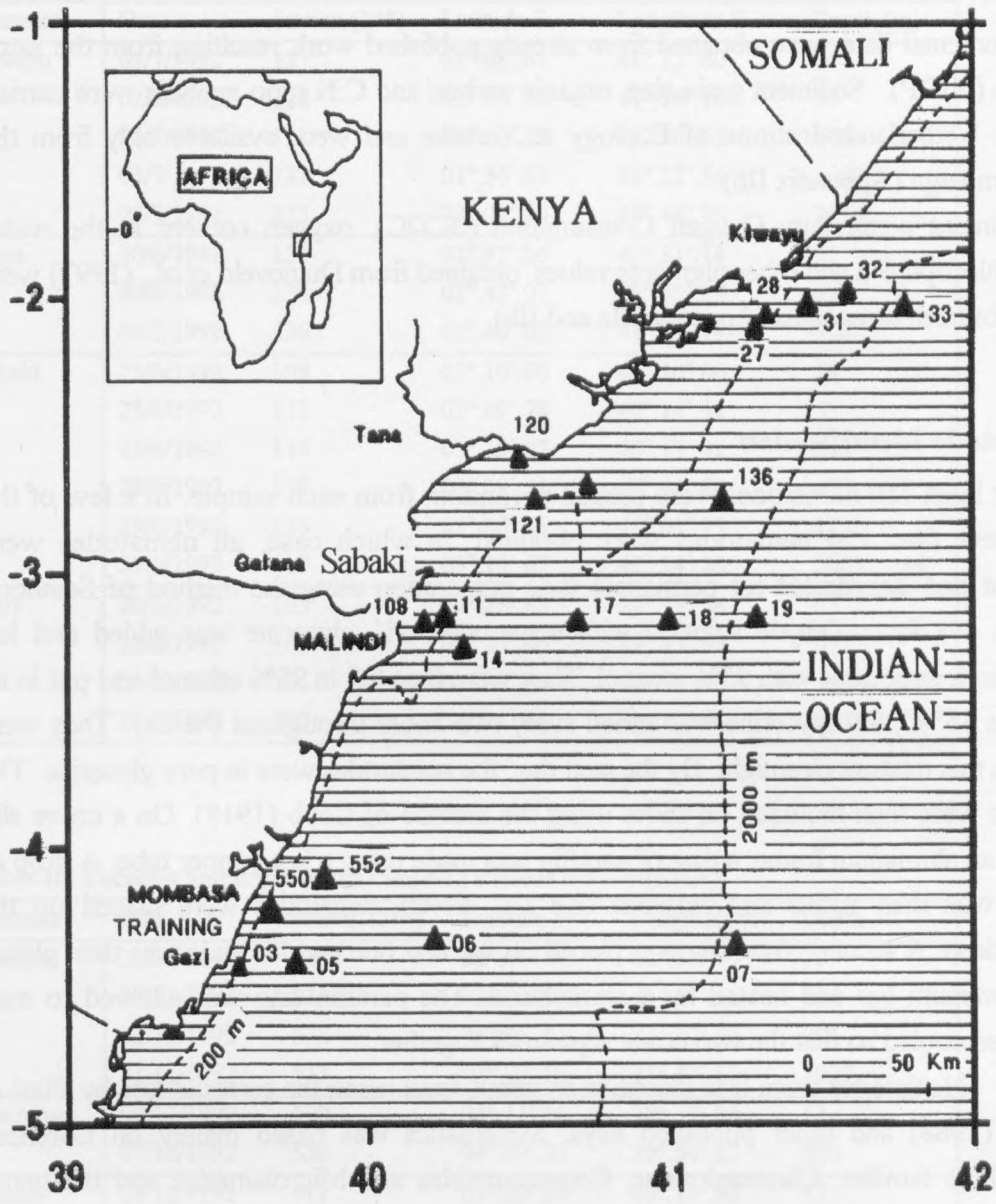


Figure 3 : Map of the Kenyan coast showing the sampling stations

Key

Stations labelled with 1** (e.g. 120) were sampled during the June/July 1992 only, those labelled with 5** (e.g. 550) were sampled during Nov/Dec only and those labelled with 2 figures only ** (e.g. 28) were sampled during both campaigns

2.5 Description of Species

The description of new and some known species were done whenever there were enough material (at least two adult males in good condition). Measurements were taken and drawings for the purpose of description were made using a camera lucida microscope (Wild Heerbrugg) at all appropriate magnifications with a Leitz Diaplan. In a few cases the drawings were complemented with scanning electron pictures. For scanning, materials were prepared using the method described by Verschelde *et al.*, 1998.

Type specimens are deposited in the collection of Koninklijk Belgisch Instituut voor Natuurwetenchappen (KBIN) of Brussels, slide numbers RI493-RI589 and the Marine Biology section of the University of Gent (MBRUG) slide numbers 10285-10529.

The abbreviations used in the text and tables are:
a : body length divided by maximum body diameter, b: body length divided by pharyngeal length, c : body length divided by tail length, c': tail length divided by anal body diameter abd : anal body diameter, amp dist: amphid distance from the anterior, amp wid: amphid width, bulb d: bulb diameter cbd : corresponding body diameter, D: water depth, gub: gubernaculum, hd : head diameter at the level of the cephalic setae, L : total body length, L': body length from the anterior to anus, M: maximum body diameter, spic : spicule length, V: position of vulva as a percentage of total body length, V': position of vulva as a percentage of body length from anterior to anus, v: vulva distance from the anterior

Formula:
distance from the anterior to;

$$\frac{\text{head} \quad \text{end of the pharynx} \quad \text{M (vulva)} \quad \text{anus}}{\text{cbd}} \qquad \text{total body}$$

All measurements (not ratios) are in micrometers and all curved structures are measured along the arc.

2.6 Data Analysis

2.6a Spearman Rank Order correlation

In order to assess the relationship between environmental and biotic variables with depth, the Spearman rank order correlation was used. Only those pairs of variables that were significantly correlated (p-value < 0.05) are tabulated.

2.6b Significant test

Significant test was done using contrast analysis in ANOVA in the package of Statistica. Values were considered to be significantly different when p-value was <0.05.

2.6c Cluster analysis (Jongman *et al.*, 1987)

Genus composition was analysed using multivariate methods. First the data were treated with a **cluster analysis**. Cluster analysis classifies sites, species or variables. The aim of this classification is to

-give information on the concurrence of species (internal data structure),

-to establish community types for descriptive studies

-to detect relations between communities and the environment by analysis of the groups formed by the cluster analysis with respect to the environmental variables. In cluster analysis, two major methods can be distinguished.

One is the agglomerative cluster analysis which combines individual objects into groups. Each group is combined with another group. This combination of the most similar groups occurs until only one group with all the stations is left.

The second kind of cluster analysis is the divisive method. This starts with all objects as a group. The group is first divided into smaller groups, subsequently these are divided into smaller groups until some kind of `stopping rule' is satisfied. The idea of this way of clustering is that large differences should prevail over the less important smaller differences: the global structure of a group should determine the subgroups.

The second kind of cluster analysis, in the form of **Two Way INdicator SPecies ANalysis (TWINSPAN)** in the program by Hill (1979) was used. The program classifies the sites as well by constructing an ordered two-way table from a sites-by-species matrix. (In this case genus distribution matrix)

2.6d Ordination

Ordination is a multivariate technique that arranges sites on the basis of data on species (genera) composition. The aim of the ordination is to arrange points in two or more dimensions, such that points that are close together correspond to sites that are similar in species composition, and sites that are far apart correspond to sites that are dissimilar in species composition. Detrended Correspondence Analysis (DCA) (Hill, 1979a) was used with non-transformed data.

Canonical Correspondence Analysis (CCA), was used in order to try and explain the variations obtained in species distribution in combination with environmental variables. However, no valuable results were obtained probably because a lot of the environmental data were missing.

2.7 Nematode genus diversity

Nematode genus diversities were calculated using Hills diversity numbers of the orders 0, 1, 2 and infinite (Hill, 1973) and Ranked Species Abundance curve RSA (Lambshead *et al.*, 1983). Species diversities were calculated using Hills diversity numbers and Hierarchical diversity (Pielou, 1969).

Hills diversity numbers

Genera diversity was measured using Hills diversity numbers (N_0, N_1, N_2 and N_∞) (Hill, 1973). Hills diversity numbers gives an estimate of diversity by giving more weight to the rare species in N_0 towards stronger emphasis to the most dominant one (N_∞)

N_0 - the total number of species in the sample.

N_1- an estimate of the number of species that yields N_1 if all species contain the same number of individuals

$N_1 = \exp(-\sum p_i \ln(p_i)) = \exp(H')$ where H' is the Shannons entropy $-\sum p_i \ln(p_i)$

N_2- the probability that two individuals sampled from a community at random and without replacement will belong to the same species, (low probability = high diversity)

N_2-the reciprocal of Simpsons index i.e. $1/(P_1^2+P_2^2+.....+Pn^2) = \lambda = \sum p_i^2$

N_∞ - the reciprocal of the proportional abundance of the commonest species.

P_i - the relative abundance of each species (genus)

Hierarchical diversity (Pielou, 1969)

Hierarchical diversity can distinguish the contribution of diversity by the species and the genera, since total diversity (H'T) is equal to between genera diversity (H'g) plus within genus diversity (H'wg) (Heip *et al.*, 1988).

$H'T = H'wg + H'g$

$H'g = -\sum_i q_i \log q_i$ is the between genera diversity, and

$H'wg = \sum_i q_i (-\sum_j r_{ij} \log r_{ij})$ is the average within-genus diversity.

q, the proportional abundance of the group $_i$,

r_{ij}, the proportional abundance of species $_j$ in group $_i$

Ranked Species Abundance (RSA)

-In a RSA curve, species are ranked according to their relative abundance k. The cumulative abundance is plotted against species rank. An assemblage A is considered equal or more dominant than an assemblage B when all possible values of k, the k-dominance values of A are greater than the k-dominance values of B. Since dominance is the reverse of equitability, and has an inverse relationship with diversity, one assemblage is considered more diverse than another if the k-dominance of one is less than the other one.

2.8 Trophic grouping

Nematodes were identified to four trophic groups according to Wieser, (1953)

-selective deposit feeders (1a)

-non selective deposit feeders (1b)

-epistrate feeders (2a)

-predator/ omnivore feeders (2b)

PART I:

TAXONOMY OF NEMATODES

1.1: LIST OF DESCRIBED SPECIES

Chromadoridae

Spilipherinae Filipjev, 1918

Acantholaimus Allgen, 1933
Acantholaimus vermeuleni sp. n.
Acantholaimus verscheldi sp. n.
Acantholaimus heipi sp. n.
Acantholaimus elegans Jensen, 1988
Acantholaimus gathumai sp. n.
Acantholaimus geraerti sp. n.
Acantholaimus invaginatum sp. n.

Chromadorinae Filipjev, 1917

Prochromadorella Micoletzky, 1924
Prochromadorella daroe sp. n.
Prochromadorella ditlevseni (de Man, 1922), Lorenzen, 1971
Trichromadora Kreis, 1929
Trichromadora longicaudata Kreis, 1929

Euchromadorinae Gerlach & Riemann, 1973

Actinonema Cobb, 1920
Actinonema longicaudatum (Steiner, 1918), Timm, 1961
Actinonema paraceltica sp. n.
Actinonema smolae sp. n.

Rhips Cobb, 1920
Rhips reginae sp. n.
Trochamus Boucher & Bovée, 1971
Trochamus bulbosa sp. n.
Trochamus complexus Boucher, 1976
Trochamus prosoporus Boucher & Bovée, 1971
Trochamus polki sp. n.

Hypodontolaiminae de Coninck, 1965

Dichromadora Kreis, 1929
Dichromadora longicaudata sp. n.

Dichromadora gathuai sp. n.
Dichromadora loisae sp. n.
Dichromadora cucullata Lorenzen, 1973
Dichromadora quadripapillata sp. n.

Hypodontolaimus de Man, 1886
Hypodontolaimus marleenae sp. n.
Hypodontolaimus aff. angelae Inglis, 1961

Ptycholaimellus Cobb, 1920
Ptycholaimellus macrodentatus Timm, 1961
Ptycholaimellus penninae sp. n.
Ptycholaimellus ponticus Filipjev, 1922

Desmodoridae Filipjev, 1922

Molgolaiminae Jensen, 1978
Molgolaimus Ditlevsen, 1921
Molgolaimus abyssorum sp. n.
Molgolaimus tyroi sp. n.
Molgolaimus gazii sp.n.
Molgolaimus sabakii sp.n.
Molgolaimus kiwayui sp.n.
Molgolaimus tanai sp.n.

Microlaimidae Micoletzky, 1922

syn. Aponematinae (Jensen, 1978) Lorenzen, 1981
syn. Bolbolaiminae (Jensen, 1978) Lorenzen, 1981

Aponema Jensen, 1978
Aponema sp. 1 sp.n.
Aponema sp. 2 sp. n.

Bolbolaimus Cobb, 1920
Bolbolaimus sp. 1a sp.n.
Bolbolaimus sp. 2a sp.n.

Calomicrolaimus Lorenzen, 1976
Calomicrolaimus sp. 1 sp.n.

Ixonema Lorenzen, 1976
*Ixonema sp. 1*sp. n.

Microlaimus de Man, 1880
Microlaimus texianus Chitwood, 1951
Microlaimus sp. 1a sp. n.
Microlaimus sp. 2a sp. n.

Comesomatidae Filipjev, 1918

Sabatierinae Filipjev, 1934

Cervonema Wieser, 1954
Cervonema tenuicauda Schuurmans Stekhoven, 1950
Cervonema minutus sp.n.
Cervonema gourbaulti sp.n.

Sabatieria Rouville, 1903
Sabatieria lucia sp.n.
Sabatieria conicauda Vitiello, 1970
Sabatieria pisinna Vitiello, 1970

Dorylaimopsinae de Coninck, 1965
Dorylaimopsis Ditlevsen, 1918
Dorylaimopsis coomansi sp.n.
Dorylaimopsis gerardi sp.n.
Dorylaimopsis variabilis sp.n.

Hopperia Vitiello, 1969
Hopperia indiana sp.n.
Paramesonchium Hopper, 1967
Paramesonchium mombasi sp.n.
Kenyanema gen. n.
Kenyanema monorchis sp. n.

All new species have been published or in press or submitted in the following articles

-Muthumbi A. & M. Vincx 1996. Nematodes from the Indian Ocean: description of six new species of the genus Molgolaimus, Ditlevsen 1921 (Nematoda: Desmodoridae). Bulletin van het Koninkijk Belgisch Instituut voor Natuurwetenschappen, Biologie 66: 17-28.

- Muthumbi A. W., Soetaert K. & M. Vincx 1997. Deep-sea nematodes from the Indian Ocean: new and known species from the family Comesomatidae. Hydrobiologia 346: 25-57.

- Muthumbi A. W. & M. Vincx 1997. Acantholaimus (Chromadoridae: Nematoda) from the Indian Ocean: description of seven species. Hydrobiologia 346: 59-76.

- Muthumbi A. W. & M. Vincx (in press). Chromadoridae (Chromadorida: Nematoda) from the Indian Ocean: Difficulties in morphological identification of Actinonema Cobb, 1920 and Rhips Cobb, 1920. Hydrobiologia (in press).

- Muthumbi A.W. & M. Vincx (in press). Chromadoridae (Chromadorida: Nematoda) from the Indian Ocean: description of new and known species. Hydrobiologia (in press).

- Muthumbi A. W. & M. Vincx. (submitted). Microlaimidae (Microlaimoidea: Nematoda) from the Indian Ocean: Description of nine new and known species. Hydrobiologia (submitted).

In the following the species and description are given as in the original articles stated above.

1.2 :DESCRIPTIONS

Chromadoridae

Spilipherinae Filipjev, 1918

Acantholaimus Allgen, 1933

Six new species of the genus *Acantholaimus* are described, and additional description of *A. elegans* Jensen, 1988 is given. The species are *A. vermeuleni* sp. n. , *A. verscheldi* sp. n., *A. heipi* sp. n., *A. elegans* Jensen, 1988, *A. gathumai* sp. n. *A. geraerti* sp. n. and *A. invaginatum* sp. n. The distribution of the species of *Acantholaimus* within the four transects is also discussed.

***Acantholaimus vermeuleni* sp. n. (Figure 1.1 A-H)**

Type material

Fourteen males and three females in slide numbers R1519 (♂$_1$), R1520 (♀$_1$) and RUG-10327-103381

Etymology

Named for Yvette Vermeulen, co-ordinator of the Kenya-Belgian Project for the period 1991-1993.

Type locality

Males from sts. 105 (1), 133 (1), 119 (2), 505 (3 including ♂$_1$), 507 (1), 518 (2), 519 (1), 531 (1), 532 (1) and 533 (1)

Females from sts. 506 (♀$_1$), 517 (1) and 519 (1)

Measurements

♂$_1$	-	82	M	300	
					552
	4	10	10	10	

a: 55.2; b: 6.7; c: 2.2; spic: 13

♀$_1$	-	90	212	327	
					543
	4	10	11	9	

a: 49.4; b: 6.0; c: 2.5; V: 39% : V': 65%

Other ♂♂s L: 336-698; L`:209-423; a:25.9-55.2; b: 4.6-8.9; c: 2.0- 4.9; spic: 11-18;

Other ♀♀s L:370, 674; L`: 406, 316; a: 35.5, ; b: 8.9; c: 2.5; V: 41% V': 67%

Description

Male: Body is cylindrical with tapering anterior end and a long filiform tail (Figure 1.1 H, F). The head region is rather small. Cuticular punctations are very fine. There are four rows of somatic setae in dorso-lateral and ventro-lateral positions. They are more conspicuous at the pharyngeal and tail region than on the rest of the body.

The amphids are a simple spiral, 4-6 µm in diameter (83-100 % cbd) located at 3-5 µm from the anterior end. There are two short post- amphidial setae located on the dorso-lateral side at 14-18 µm from the anterior. Anterior sensilla are located close to the anterior

end; inner labial setae are indistinct, outer labial are half as long as the cephalic sensilla which are 3-6 µm and located at the same level (Figure 1.1B & E).

The stoma is narrow, without distinct teeth. The pharynx is cylindrical (66-90 µm long), with a slightly swollen posterior end to form a bulb. Cardia is distinct (Figure 1.1 F & H).

The reproductive system is monorchic with outstretched testis; there is a short germinal zone and large spermatozoa with large nucleus. The vas deferens is short (Figure 1.1 F & H). Spicules are 1.2-1.5 abd long, flat on the distal end and blunt on the proximal end. There is a pair of pre-cloacal setae at 6-7 µm in front of the cloaca (Figure 1.1 G).

The tail is conical anteriorly (35-45 µm long) and measures 100-349 µm.

Females: They are similar to males (Figure 1.1 A, C and D). The reproductive system is amphidelphic with reflexed ovaries; they have a short germinal zone, developing oocytes, and uterus is partially filled with spermatozoa. The vulva and vagina are simple.

Differential diagnosis

Acantholaimus vermeuleni sp. n. is characterised by a narrow anterior end; short (3-6 µm long) cephalic sensilla located at the same level as the outer labial ones which are half as long as the former; amphids (80-100 % cbd) that are single spiral with a distinct spiral origin and two post-amphidial setae located on the dorso-lateral position at 14-18 µm from the anterior end.

Acantholaimus vermeuleni sp.n. resembles *A. akvavitus* Gerlach *et al*, 1979, *A. gigantisetosus* Vivier, 1985, *A. iubilus* Gerlach et al, 1979, *A. maks* Gerlach *et al*, 1979, *A. megamphis* Vivier, 1985, *A. microdontus* Gourbault, 1985, *A. minutus* Vitiello, 1970, and *A. septimus* Gerlach *et al*, 1979 in having two post amphidial setae on the dorso-lateral position. *A. vermeuleni* however differs from all these nematodes, in that they have one or two extra post-amphidial setae on the ventro-lateral position as well and also in having well developed teeth in the stoma which are lacking in the former. *A. microdontus* differs from *A. vermeuleni* in size (L'= 760-1105 µm and M=33-50 µm in *A. microdontus* compared to L'=200-400 µm and M=9-19 µm in *Acantholaimus vermeuleni* sp.n.).

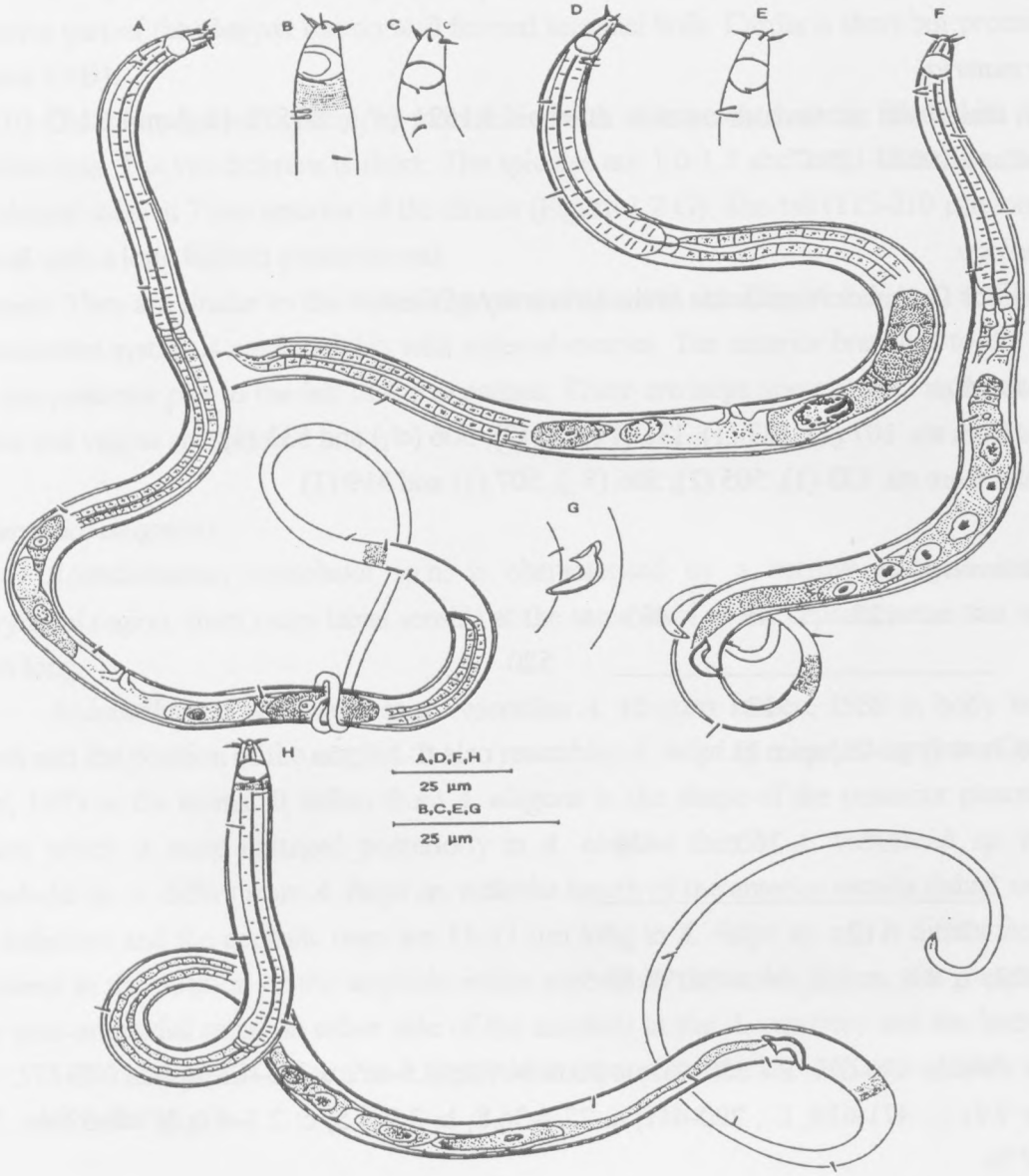


Figure 1.1 *Acantholaimus vermeuleni* sp.n.; A: ♀$_1$ Total view, B: ♂$_1$ head region, C: ♀$_1$ head region, D: ♀$_2$ total view minus tail, E: ♂$_2$ head region, F: ♂$_2$ total view, G: ♂$_1$ spicule, H: ♂$_1$ total view

***Acantholaimus verscheldi* sp.n. (Figure 1.2 A-G)**

Type material

Seven males and six females on slide numbers R1521 (δ_1), R1522 (φ_1) and RUG-10332, 10334 and 10339-10347

Etymology

Named for Dominick Verschelde of the University of Gent

Type locality

Males from sts. 107 (1), 133 (1), 136 (1), 505 (2), 506 (δ_1) and 533 (1)

Females from sts. 133 (1), 505 (2), 506 (φ_1), 507 (1) and 519 (1)

Measurements

δ_1 - 127 M 405

520

7 11 13 11

a: 40; b: 4.1; c: 4.5; spic: 11

φ_1 - 130 260 410

596

7 12 16 9

a: 37.3; b: 4.6; c: 3.2; V: 44% V': 63 %

Other $\delta\delta$s L: 490-621; L`: 280-467; a: 30.0-54.1; b: 3.9-6.5; c: 2.3-4.5; spic: 11-15

Other $\varphi\varphi$s L: 471-618; L`: 290-441; a: 22.4-36.8; b: 3.9-4.5; c: 2.3-4.6; V: 46-52% : V' : 65-67 %

Description

Males: Body is cylindrical, narrow anterior pharyngeal region with a slight increase in width posteriorly, and the tail is filiform (Figure 1.2 E). Cuticular punctations are indistinct. Somatic setae are in four longitudinal rows, that is, two dorso-lateral and two ventro-lateral.

Amphids are 4-7 µm in diameter (71-100% cbd), spiral with a single turn and they are located (at the level of the posterior of the base of the stoma) at 11-15 µm from the anterior end. Inner labial sensilla are inconspicuous, outer labial are short 2-3 µm long and at the same level as the cephalic setae. The cephalic setae are 4-7 µm long and close to the anterior edge. The stoma is long (9-13 µm), and it has three teeth anteriorly and highly sclerotized walls more to the posterior (Figure 1.2C).

The pharynx is cylindrical with some interruptions in the muscular part at the posterior part of the pharynx but no well formed terminal bulb. Cardia is short but prominent (Figure 1.2B).

The reproductive system is monorchic with outstretched testis filled with large spermatozoa. The vas deferens is short. The spicules are 1.0-1.3 abd long. There is a pair of pre-cloacal setae at 7 µm anterior of the cloaca (Figure 1.2 G). The tail (115-210 µm long) is conical with a long filiform posterior end.

Females: They are similar to the males in general shape and size (Figure 1.2 A, D & F). The reproductive system is amphidelphic with reflexed ovaries. The anterior branch is to the right and the posterior one to the left of the intestines. There are large spermatozoa in the uterus. Vulva and vagina are simple.

Differential diagnosis

Acantholaimus verscheldi sp.n. is characterised by a narrow elongate anterior pharyngeal region, short outer labial sensilla at the same level as the cephalic setae that are 4-7 µm long.

Acantholaimus verscheldi sp.n. resembles *A. elegans* Jensen, 1988 in body length, stoma and the position of the amphid. It also resembles *A. heipi* sp.n. and *A. septimus* Gerlach *et al*, 1979 in the stoma. It differs from *A. elegans* in the shape of the posterior pharyngeal region which is more enlarged posteriorly in *A. elegans* than in *A. verscheldi* sp. n.. *A. verscheldi* sp. n. differs from *A. heipi* sp. n. in the length of the anterior sensilla (labial sensilla are indistinct and the cephalic ones are 11-13 µm long in *A. heipi* sp. n.). It differs from *A. septimus* in the position of the amphids which are within the stoma region, the presence of two post-amphidial setae on either side of the amphids in the *A. septimus* and the body size (L'= 575-850 and M= 21-23 µm in *A. septimus* compared to L'= 280-467 µm and M= 12-21 in *A. verscheldi* sp.n.).

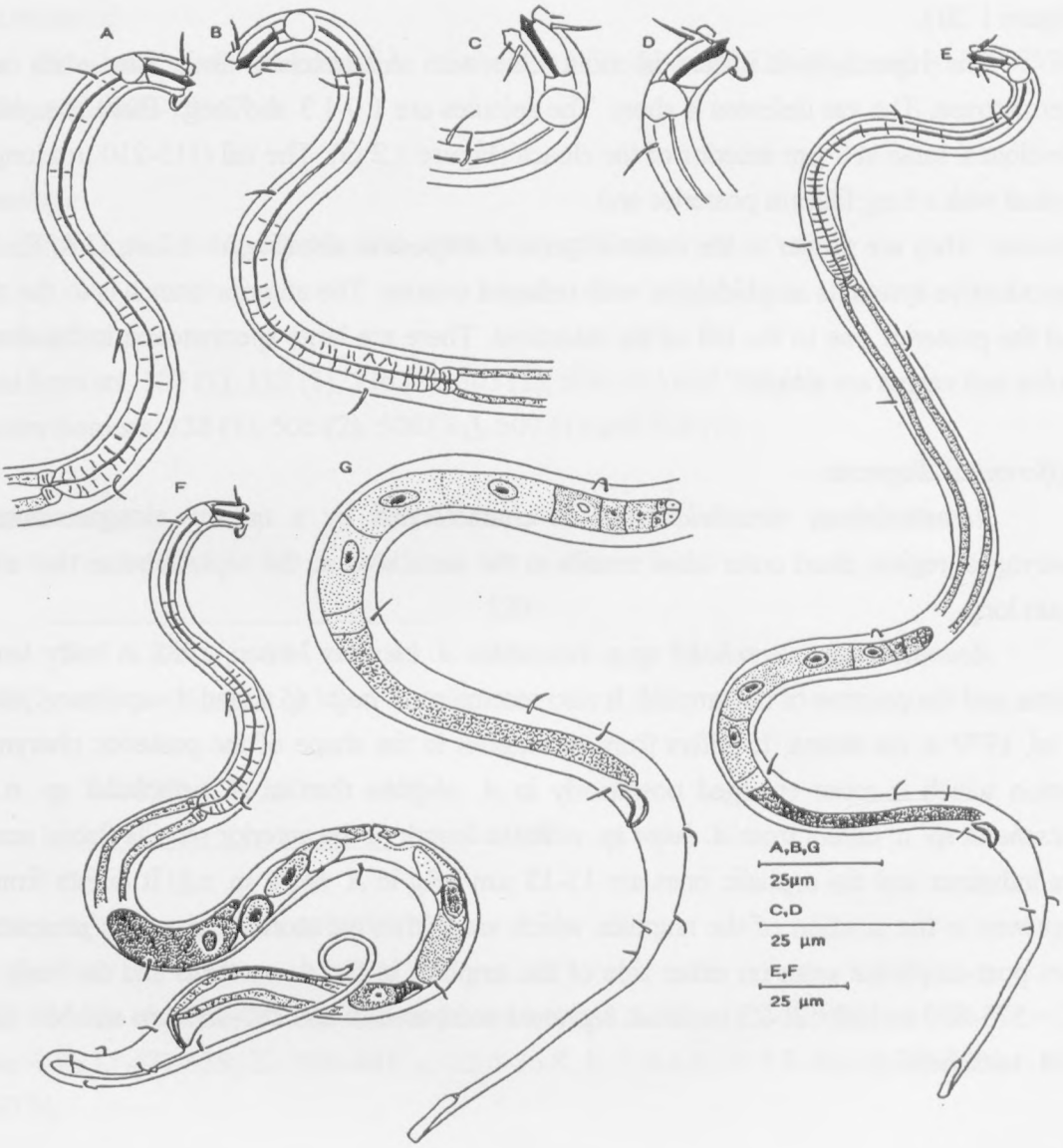


Figure 1.2 *Acantholaimus verscheldi* sp.n.; A: ♀$_1$ pharyngeal region, B: ♂$_1$ pharyngeal region, C: ♂$_1$ head region, D: ♀$_1$ head region, E: ♂$_1$ total view, F: ♀$_1$ total view, G: ♂$_1$ reproductive system

Acantholaimus heipi sp.n. (Figure 1.3 A-I)

Type material

Four males and two females in slide numbers R1523 (σ^1), RUG-10314 (φ_1), RUG- 10348-10350

Etymology

Named for Prof. C. Heip of the University of Gent

Type locality

Males from sts. 133 (σ^1), 517 (1) and 519 (2) and females from sts. 119 (1) and 133 (1)

Measurements

σ^1 - 105 M 326

625

6 14 14 12

a: 44.6; b: 6.0; c: 2.0; spic: 14

φ_1 - 124 242 375

559

7 13 17 12

a: 31.1; b: 4.5; c: 3.0; V: 43% : V' : 66 %

Other ♂ L: 642; L`:343; a:35.7; b:6.1; c:2.1; spic: 14-18 Two males with broken tail L: 421, 457 L`: 263, 271

Other ♀ L:589; L`: 312; a: 36.8; b: 5.7; c: 2.1; V: 36% : V': 68 %

Description

Males: Body is cylindrical and narrow on the first half of the pharyngeal region, with a slight increase in width towards the end of the pharyngeal region and the tail has a short conical anterior part and a long filiform end. Head region (6-7 µm in diameter) is continuous with the rest of the body. Cuticular punctations are indistinct. Somatic setae (3-5 µm long) are in four longitudinal rows: two dorso-lateral and two ventro-lateral rows (Figure 1.3 E).

The amphids are spiral with a single turn and the spiral origin can be seen in some specimens; they are (71-100 % cbd) located at 8-11 µm from the anterior end (anterior most part of the amphids are at the level of the base of the stoma (Figure 1.3 F) or posterior to it (Figure 1.3 B). Inner labial sensilla are indistinct, outer labial short (3µm long) and the

cephalic ones are long (11-13 µm long) and close to the anterior end.

The stoma is long (8-11 µm) and it has three protrusible teeth at the anterior part and sclerotized walls in the posterior part. Pharyngeal muscles surround the stoma. Pharynx (92-124 µm long) is cylindrical with a slight expansion and several interruptions of the muscular part at the base. Cardia short (4 µm) but prominent (Figure 1.3H).

The reproductive system is long with a short germinal zone posterior of which are large spermatozoa filled with a large nuclei. Vas deferens is short. Spicules are 1.2 -1.5 abd and typical Acantholaimid in shape (Figure 1.3 G). A pair of sub-ventral pre-cloacal setae are found at 1-2 µm from the cloaca.

Tail is long (184-299 µm) and slightly swollen at the end and tip is pointed.

Female: They are similar to males (Figure 1.3 A, C & D). The reproductive system is amphidelphic with reflexed ovaries. Anterior branch to the right, posterior one to the left of the intestine (Figure 1.3 I).

Differential diagnosis

Acantholaimus heipi sp.n. is characterised by a narrow pharyngeal region; long (11-13 µm) cephalic setae, long stoma with three teeth, simple spiral amphids located close to the base of the stoma and a long filiform tail.

Acantholaimus heipi sp.n. is similar to *A. elegans* Jensen, 1988 in body length (L:540-720 µm), position of the amphids and the stoma length. However, *A. heipi* sp. n. differs from *A. elegans* in that all three crowns of anterior sensilla are distinct with the cephalic setae being only 7-8 µm long in *A. elegans* and 11-13 µm in *A. heipi* sp. n.; the posterior part of the pharyngeal region is much wider than the anterior part in *A. elegans* and it is also a much wider (M=25-30 µm) species compared to *A. heipi* sp. n. (M= 12-18 µm).

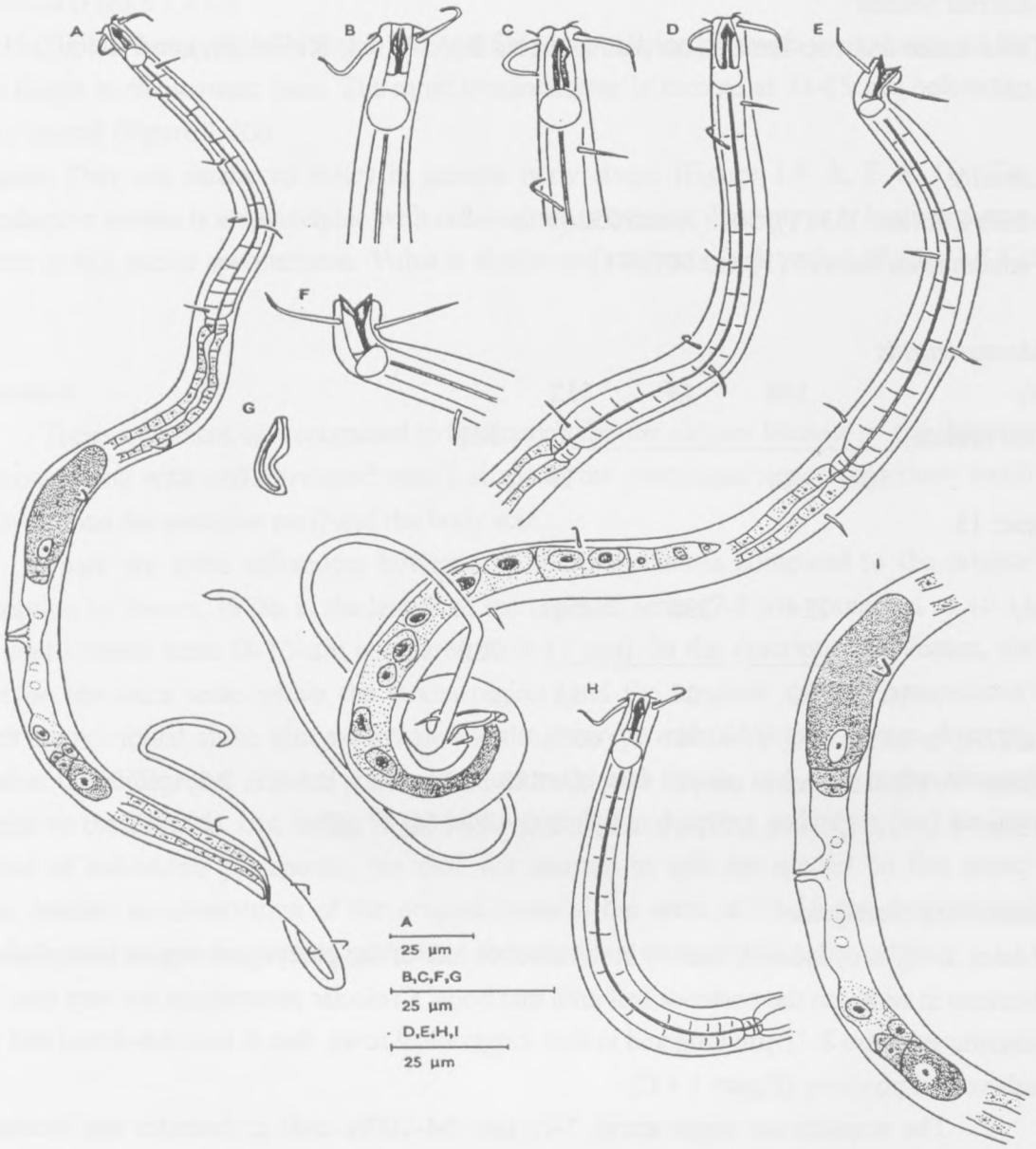


Figure 1.3 *Acantholaimus heipi* sp.n.; A: ♀$_1$ total view, B: ♂$_2$ head region, C: ♀$_1$ head region, D: ♀$_1$ pharyngeal region, E: ♂$_1$ total view, F: ♂$_1$ head region, G: ♂$_1$ spicule, H: ♂$_2$ pharyngeal region, I: ♀$_1$ reproductive system

Acantholaimus elegans Jensen, 1988 (Figure 1.4 A-G)

Material studied

Three males and two females on slide numbers R1524 (♂$_1$), R1525 (♀$_1$) and RUG- 10351-10354

Locality

Males from sts. 133 (1), 506 (1) and 552 (♂1)

Females from sts. 117 (1) and 507 (♀1)

Measurements

♂$_1$	-	148	M	512	
(tail broken)					581
	10	14	17	13	

spic: 15

♀$_1$	-	124	298	454	
					739
	10	22	27	14	

a:27.4; b: 6.0; c: 2.6; V: 40 % : V`: 66 %

Other ♂♂s (tail broken in one) L: 954; L`: 388-525; a: 41.5; b:6.4; c: 2.2; spic: 19

Other ♀ L:739: L`: 454; a:27.4; b: 6.0; c: 2.6; V: 44 %; V`:68%

Additional description

Males: Body is cylindrical, narrow in the anterior half of the pharyngeal region, and gradually increase in width on the posterior half until mid body. Cuticular punctations are very fine. The somatic setae are 8-11 µm long and in four longitudinal rows, that is two sub-dorsal and two sub-ventral positions (Figure 1.4 C).

The amphids are single spiral, 7-11 µm (64-100% cbd) in diameter and located at (partly within the stoma region) 7-12 µm from the anterior end. There maybe four setae before the amphidial and four posterior of it of equal length (9-12 µm) located at sub-dorsal and sub-ventral positions similar to the somatic setae (Figure 1.4 E). Inner labial sensilla are inconspicuous and the outer labial are 5 µm long and at the same level as the cephalic ones which are 10-11 µm long (Figure 1.4 E). The stoma is long (12-18 µm) surrounded by well developed muscles and it has three (four?) teeth anteriorly and highly sclerotized walls posteriorly. The pharynx is 124-159 µm long, cylindrical with a slight swollen terminal end (Figure 1.4 B). Cardia is short (4 µm) but conspicuous.

The reproductive system is monorchic with outstretched testis located to the right of

the intestine. It has a short germinal zone and large sperm cells (five or six spermatozoa in the testis). The spicules are 1.2 abd long. There is a pair of pre-cloacal setae located just before the cloaca (Figure 1.4 D).

The tail has a conical anterior part and filiform posterior part with several setae of the same length as the somatic ones. The most terminal setae is located at 13-15 µm before the end of the tail (Figure 1.4G).

Females: They are similar to males in general body shape (Figure 1.4 A, E & G). The reproductive system is amphidelphic with reflexed short ovaries. The uterus is large and may contain an egg and/or spermatozoa. Vulva is simple and vagina is thick walled (Figure 1.4 F).

Discussion

These specimens are recognised to be *Acantholaimus elegans* because of the shape of the stoma (long with well developed teeth), shape of the pharyngeal region (anteriorly much narrower than the posterior part) and the body size.

There are some differences however, in these specimens compared to the original description by Jensen, 1988a in the length of the cephalic setae (7-8 µm compared to 10-11 µm) and somatic setae (8-10 µm compared to 8-11 µm). In the description of Jensen, the holotype has extra setae within the stoma region (and the amphids are not conspicuous) which are not found in the allotype female and the paratype male. However, Jensen does not mention this difference. In our specimens, one male and female had extra setae situated anterior to the amphids. But owing to the high variability in deep-sea sediments, and the low number of individuals per species, we shall not attempt to split the species on that aspect alone, besides on observation of the original material the setae at 13-15 µm from the tail terminal could be seen in all three specimens, therefore, we recognise it as *A. elegans*.

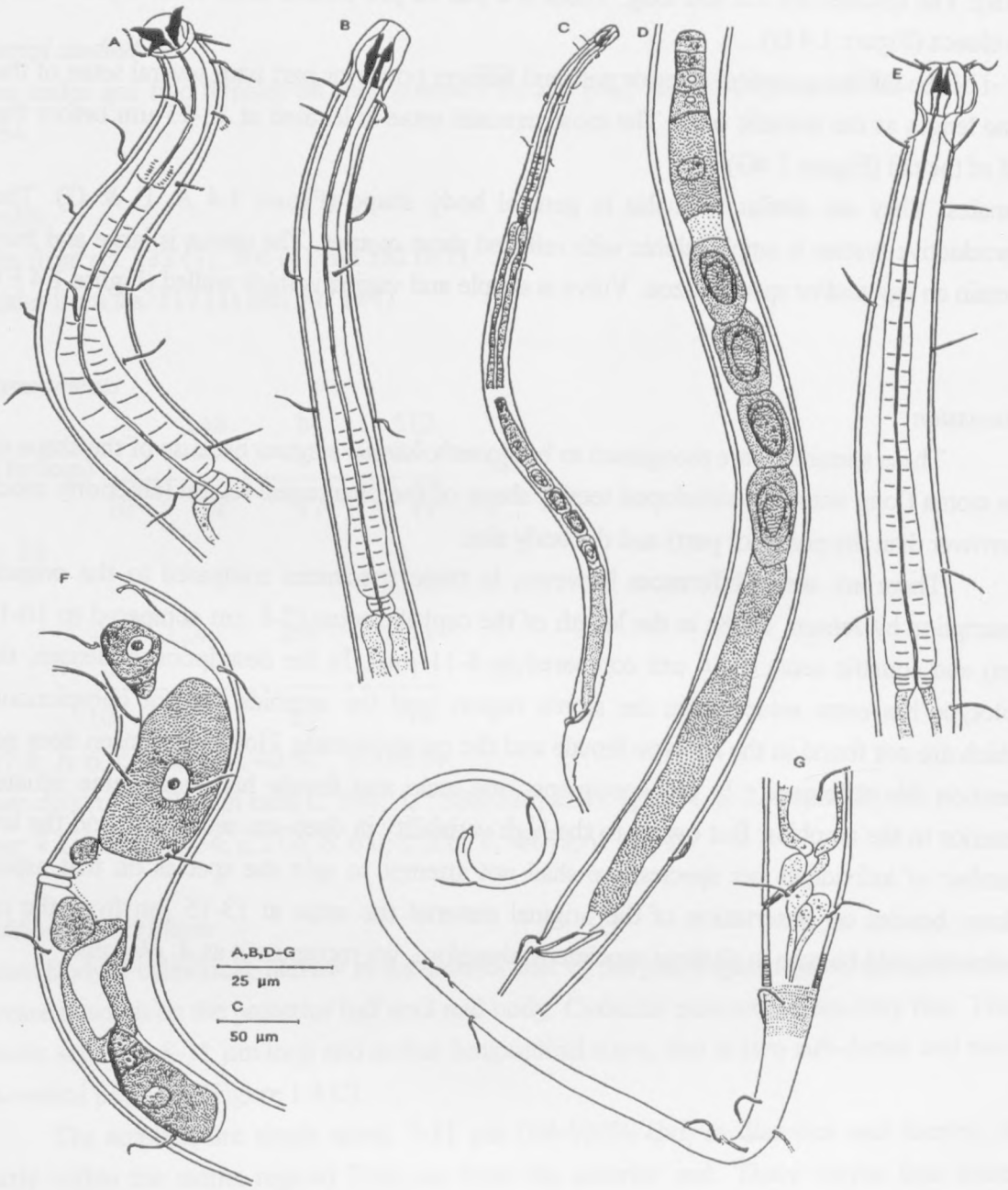


Figure 1.4 *Acantholaimus elegans* Jensen, 1988; A: ♀$_1$ pharyngeal region, B: ♂$_1$ pharyngeal region, C: ♂$_1$ total view minus tail, D: ♂$_1$ reproductive system, E: ♀$_2$ pharyngeal region, F: ♀$_1$ reproductive system, G: ♀$_1$ tail,

***Acantholaimus gathumai* sp.n. (Figure 1.5 A-H)**

Type material

Three males and three females on slide numbers R1526 (♂$_1$), R1527 (♀$_1$) and RUG-10355-10358.

Etymology

Name given for Prof. J. M. Gathuma of the University of Nairobi

Type locality

Males from sts. 505 (♂$_1$), 506 (1), 533 (1)

Females from sts. 119 (1), 505 (♀$_1$), 507 (1)

Measurements

♂$_1$	-	78	M	363	
					581
	7	16	18	14	

a: 32.3; b: 7.4; c: 2.7; spic: 18

♀$_1$	-	77	265	395	
					590
	7	15	17	11	

a: 34.7; b: 7.7; c: 3.0; V: 50 %; V`: 67 %

Other ♂♂s L: 562-608; L`:381-395; a:29.6-40.5; b:6.8-7.5; c:2.9-3.1; spic: 23-24

Other♀♀s L: 556-631; L`:395-423; a:30.9-33.2; b:7.3-7.8; c:3.0-3.7; V:48-50 %; V`: 70-71 %

Description

Males: Body is cylindrical, anteriorly it tapers slightly and posteriorly it ends with a filiform tail. Cuticular punctations starts at the anterior most level of the amphids; the dots are arranged in regular transverse rows. Laterally (5-7 µm diameter), the dots are larger than on the dorsal and ventral sides. There are four longitudinal rows of somatic setae (6-8 µm long) that start immediately posterior of the amphids at dorso-lateral and ventro-lateral positions and borders the lateral differentiation area (Figure 1.5 F).

The amphids are a simple spiral, 5-6 µm in diameter or 45-56 % cbd, located at 8-10 µm from the anterior end. Inner labial sensilla are inconspicuous, the outer are 3 µm long and located at the same level as the cephalic ones which are 10-15 µm (1.5-2.0 hd) long (Figure 1.5 C) (in most specimens the anterior sensilla are broken off).

Stoma is long (7-8 µm), anterior part has teeth and posterior part has sclerotized walls. The pharyngeal muscles surround most of the stoma. The pharynx is cylindrical, 71-87 µm long and swollen at the terminal end to form a bulb which has several interruptions. Cardia is small (Figure 1.5 A).

The reproductive system is monorchic with outstretched testis located to the right of the intestine; a short germinal zone and large spermatozoa fill the rest of the testis; the vas deferens is short (Figure 1.5 E). The spicules are curved on the proximal end and pointed on the distal end. A pair of pre-cloacal setae is present at 4-5 µm from the cloacal (Figure 1.5 H).

The tail is conical with a long filiform end.

Females: They are similar to males in all aspects (Figure 1.5 B & D). The reproductive system is amphidelphic with reflexed ovaries.

Differential diagnosis

Acantholaimus gathumai sp.n. is characterised by punctated cuticle with lateral differentiation (5-7 µm in diameter) of larger dots, long (6-8 µm long) somatic and cephalic (10-15 µm long) setae.

Acantholaimus gathumai sp.n. resembles *A. arminius* Gerlach *et al*, 1979, *A. minutus* Vitiello, 1970, *A. quintus* Gerlach et al, 1979 and *A. geraerti* sp.n. in the shape of the stoma.

It differs from *Acantholaimus arminius* in the position of the amphids which are located within the stoma region and the body size (L'= 1400-1600 µm) in *A. arminius*. It can be distinguished from *A. minutus* in that cephalic setae are only 6 µm long compared to 10-15 µm in the new species and somatic setae are very short in *A. minutus*. *A. gathumai* sp. n. differs from *A. quintus* in that *A. quintus* has at least three teeth in the stoma and several setae at the pharyngeal region. *A. gathumai* sp. n. can be distinguished from *A. geraerti* sp. n. in the lateral differentiation: *A. gathumai* sp. n. has a wider (5-7 µm) lateral differentiation although it is a much thinner species (M= 15-19 µm compared to M= 29-32 µm and lateral differentiation is 4-6 µm and more conspicuous in *A. geraerti* sp. n.

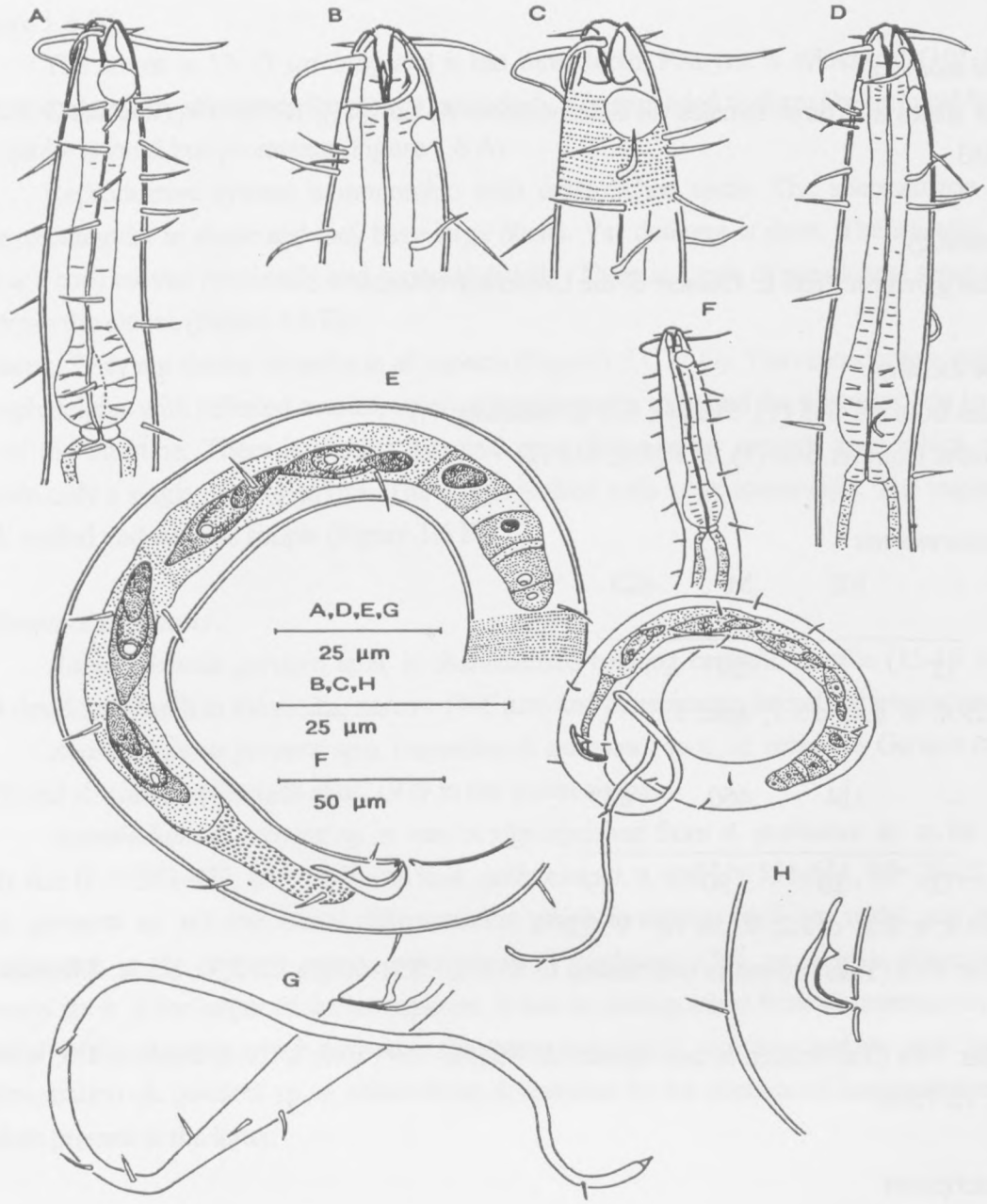


Figure 1.5 *Acantholaimus gathumai* sp.n.; A: ♂$_1$ pharyngeal region,; B: ♀$_1$ head region, C: ♂$_1$ head region, D: ♀$_1$ pharyngeal region, E: ♂$_1$ reproductive system, F: ♂$_1$ total view, G: ♀$_1$ tail, H: ♂$_1$ spicule

Acantholaimus geraerti sp.n. (Figure 1.6 A-G)

Type material

Four males and three females on slide numbers R1528 (♂$_1$), R1529 (♀$_1$) and RUG-10359-10363

Etymology

Name given for Prof. E. Geraert of the University of Gent.

Type locality

Males from sts. 505 (1), 518 (1), 533 (2 including ♂$_1$)

Females from sts. 506 (1), 518 (♀$_1$), 533 (1)

Measurements

♂$_1$	-	102	M	623	
					853
	12	27	29	20	

a: 29.4; b: 8.4; c:3.7; spic: 33

♀$_1$	-	114	460	635	
					925
	12	26	30	19	

a: 30.8; b: 8.1; c: 3.2; V: 50 %; V': 72 %

Other ♂♂s (Tails broken in two males) L: 858 L`: 551-651; a: 26.8; b: 8.5; c: 2.8: spic: 27-35

Other ♀♀s (Tail broken in one female) L: 953; L`: 595-637; a: 29.8; b:8.5; c: 3.0; V: 49%; V`: 72-73%

Description

Male: The body is cylindrical, tapers slightly to the anterior end and a filiform tail end (Figure 1.6 D). Cuticle is punctated with punctations starting from anterior level of the amphids, the punctations are arranged in transverse rows with lateral differentiation having larger and more conspicuous dots than on the rest of the body (Figure 1.6B); the lateral differentiation is 6 µm at the pharyngeal region and 4-6 µm wide at mid body (Figure 1.6 E). Somatic setae are (8-12 µm long) in four longitudinal rows; two in the dorso-lateral and two in the ventro-lateral positions and bordering the lateral differentiation.

The amphids are spiral with a single turn located at 8-12 µm from the anterior; they are 6-8 µm in diameter (40-50 % cbd). The inner labial sensilla are inconspicuous, the outer

labial are 5 µm long and at the same level as the cephalic setae which are 15-19 µm long (Figure 1.6 B).

The stoma is 12-17 µm long and it has three teeth. Pharynx is cylindrical (101-114 µm), and anteriorly surrounds the stoma; posteriorly it is expanded to form the terminal bulb. The cardia is small but prominent (Figure 1.6 A).

Reproductive system is monorchic with outstretched testis. The spermatozoa are large, rectangular in shape and they have large nuclei. Vas deferens is short. The spicules are (1.4-1.7 cbd) curved proximally and rounded distally. There is a pair of pre-cloacal setae at 6 µm from the cloaca (Figure 1.6 E).

Females: They are similar to males in all aspects (Figure1.7 C & G). The reproductive system is amphidelphic with reflexed ovaries, anterior branch to the right and the posterior one to the left of the intestine. There is a short germinal zone followed by growth zone which may contain only a single developed ova. The uterus is filled with large sperm cells. The vagina is thick walled and vulva is simple (Figure 1.6 F).

Differential diagnosis

Acantholaimus geraerti sp.n. is characterised by long cephalic sensilla (15-19 µm), well developed teeth in the stoma, narrow (4-6 µm) and conspicuous lateral differentiation.

Acantholaimus geraerti sp.n. resembles *A. gathumai* sp.n., *A. arminius* Gerlach *et al*, 1979 and *A. calathus* Gerlach *et al*, 1979 in the stoma shape.

Acantholaimus geraerti sp. n. can be distinguished from *A. gathumai* sp. n. by the body size (L`= 363-423, M= 14-19 µm in *A. gathumai* sp. n. and L'= 551-651, M= 29-32 µm in *A. geraerti* sp. n.) and lateral differentiation which is narrow (4-5 µm wide) and more conspicuous in *A. geraerti* sp.n. compared to *A. gathumai* (5-6 µm wide) although *A. geraerti* sp. n. is the larger of the two species. It can be distinguished from *A. arminius* by the position of the amphids which are within the stoma region in *A. arminius* and the wide lateral differentiation. *A. geraerti* sp. n. differs from *A. calathus* by the absence of longitudinal rows of dots present in the latter.

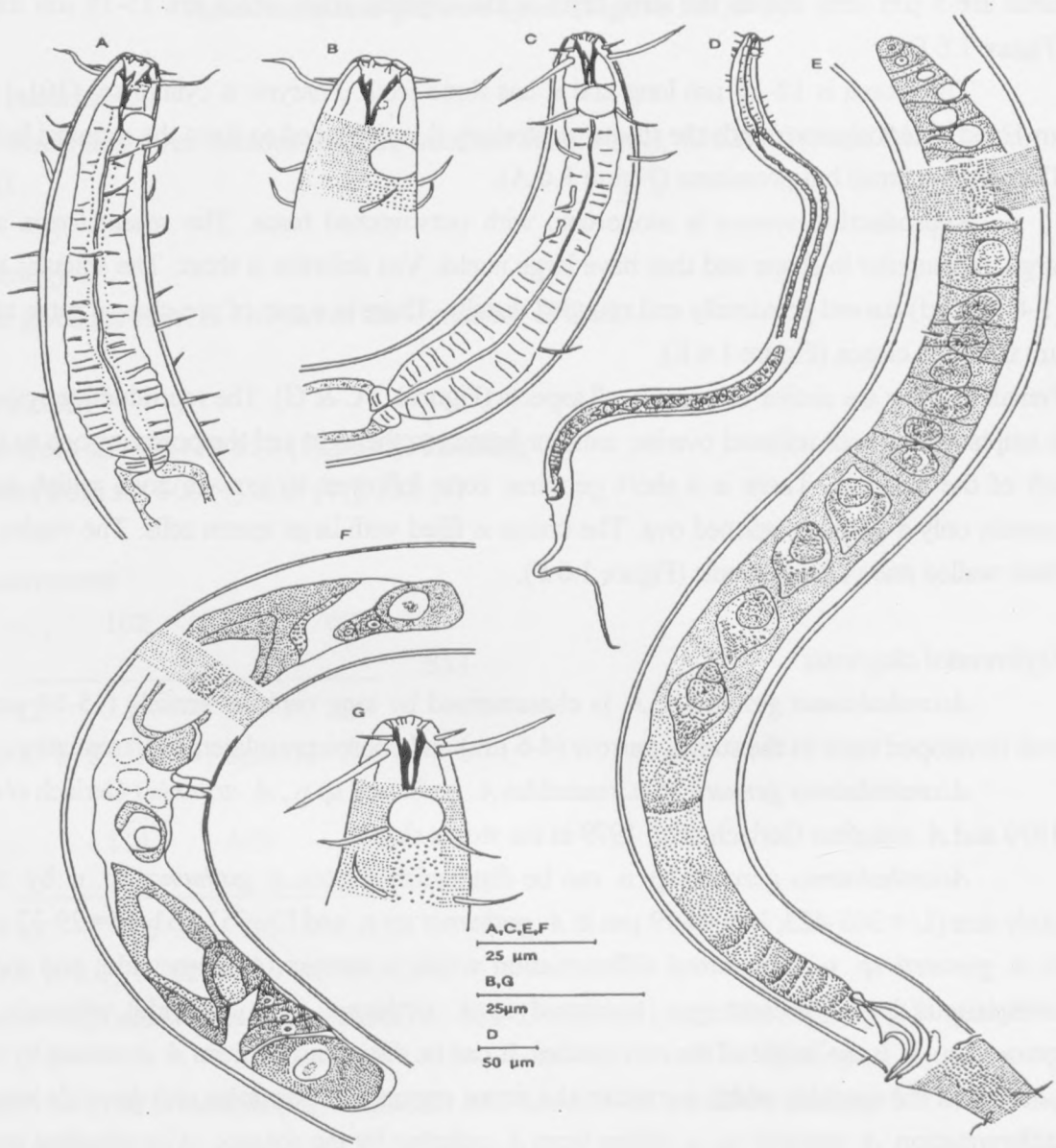


Figure 1.6: *Acantholaimus geraerti* sp.n.; A: ♂$_1$ pharyngeal region, B: ♂$_1$ head region, C: ♀$_1$ pharyngeal region, D: ♂$_1$ total view, E: ♂$_1$ reproductive system, F: ♀$_1$ reproductive system, G: ♀$_1$ head region

***Acantholaimus invaginatum* sp. n. (Figure 1.7 A-H)**

Type material

Six males and seven females on slide numbers R1530 (♂$_1$), R1531 (♀$_1$) and RUG- 10364-10372

Type locality

Males from sts. 105 (1), 107 (1), 133 (1), 505 (♂$_1$), 507 (1) and 519 (1)

Females from sts. 133 (2), 505 (3 including ♀$_1$), 519 (1) and 533 (1)

Measurements

♂$_1$ - 90 M 530

$$\frac{\quad}{12 \quad 24 \quad 29 \quad 19} \quad 782$$

a: 27; b: 8.7; c: 3.1; spic: 32

♀$_1$ - 88 419 558

$$\frac{\quad}{15 \quad 28 \quad 34 \quad 21} \quad 861$$

a: 25.3; b: 9.8; c: 2.8; V: 49 %; V`:75 %

Other ♂♂s L: 733-1019; L`:512-735; a: 27.8-39.2; b: 8.5-9.6; c:3.2-3.5; spic: 24-32

Other ♀♀s L:711-892; L`:512-642; a:24.5-28.9; b:8.5-9.7; c:3.3-3.6; V:49-52 % ; V`:70-75 %

Description

Males: Body is cylindrical, anterior end is blunt and posterior end has a long filiform tail (Figure 1.7 H). Cuticle is punctated from the anterior level of the amphids. Punctations are in regular transverse rows. Laterally, they are larger than on the dorsal and ventral sides. The lateral differentiation region is 10-12 µm on the pharyngeal region (Figure 1.7 A) and mid-body, and 8 µm at the anterior tail region (Figure 1.7 F). Somatic setae [7-12 µm long at pharyngeal (Figure 1.7 E) and 9-13 µm at tail region (Figure 1.7 F)] are in four longitudinal rows: two in dorso-lateral and two in ventro-lateral positions.

Amphids are circular, 5-8 µm (38-66 % cbd) in diameter and located at 3-5 µm from the anterior end (NB the location of the amphids from the anterior maybe more than what is measured here when the stoma is not invaginated). Cephalic setae are long (16-21 µm or 1.3-1.4 hd) (Figure 1.7 B). Stoma (20-22 µm long) has 3 (4?) teeth and often it is invaginated (Figure 1.7 E).

Pharynx is cylindrical (84-106 µm long), anteriorly surrounds the stoma and posteriorly it is swollen to form the terminal bulb (Figure 1.7 E).

The reproductive system is monorchic with an anteriorly outstretched testis located to the right of the intestine. The spermatozoa are large rectangular in shape or elongate. Vas deferens is short. The spicules are curved, 1.2-1.7 x abd long (Figure 1.7 F).

Tail is short conical (35-54 µm long) and long posterior filiform part.

Females: They are similar to the males in most aspects (Figure 1.7 A, D & I). Reproductive system is amphidelphic with reflexed ovaries, anterior to the right, posterior to the left of the intestines. Vulva is simple and vagina is 6-7 µm long and thick walled (Figure 1.7 H).

Differential diagnosis

Acantholaimus invaginatum sp.n. is characterised by cuticle with lateral differentiation of larger dots, long cephalic (16-21 µm) and somatic (7-13 µm) setae. Circular amphids (38-64 % cbd) located close to the anterior end. Long stoma, with three teeth and often invaginated.

Acantholaimus invaginatum sp.n. resembles *A. maks* Gerlach et al, 1979 in the anterior region (invaginated stoma) and the arrangement of the somatic setae at the pharyngeal region; it resembles *A. polydentatus* Gerlach, 1951 and *A. calathus* Gerlach et al, 1979 in the size of the cephalic setae and the arrangement of the somatic setae and *A. quintus* Gerlach et al, 1979 in the arrangement of the somatic setae and the well developed teeth in the stoma.

A. invaginatum sp. n. differs from *A. maks* in the absence of a pair of post amphidial setae on either side of the amphids and the length of the somatic setae which are rather short in *A. maks*. It differs from *A. polydentatus* and *A. calathus* in the absence of two longitudinal rows of larger dots on the lateral sides which are present in these two species, and from *A. quintus* in the length of the cephalic setae: 11 µm or 0.6 x hd sensu Gerlach *et al.*, 1979, 15 µm sensu Gourbault & Vincx 1985 and 8-11 µm or 0.8 x hd sensu Vivier, 1985).

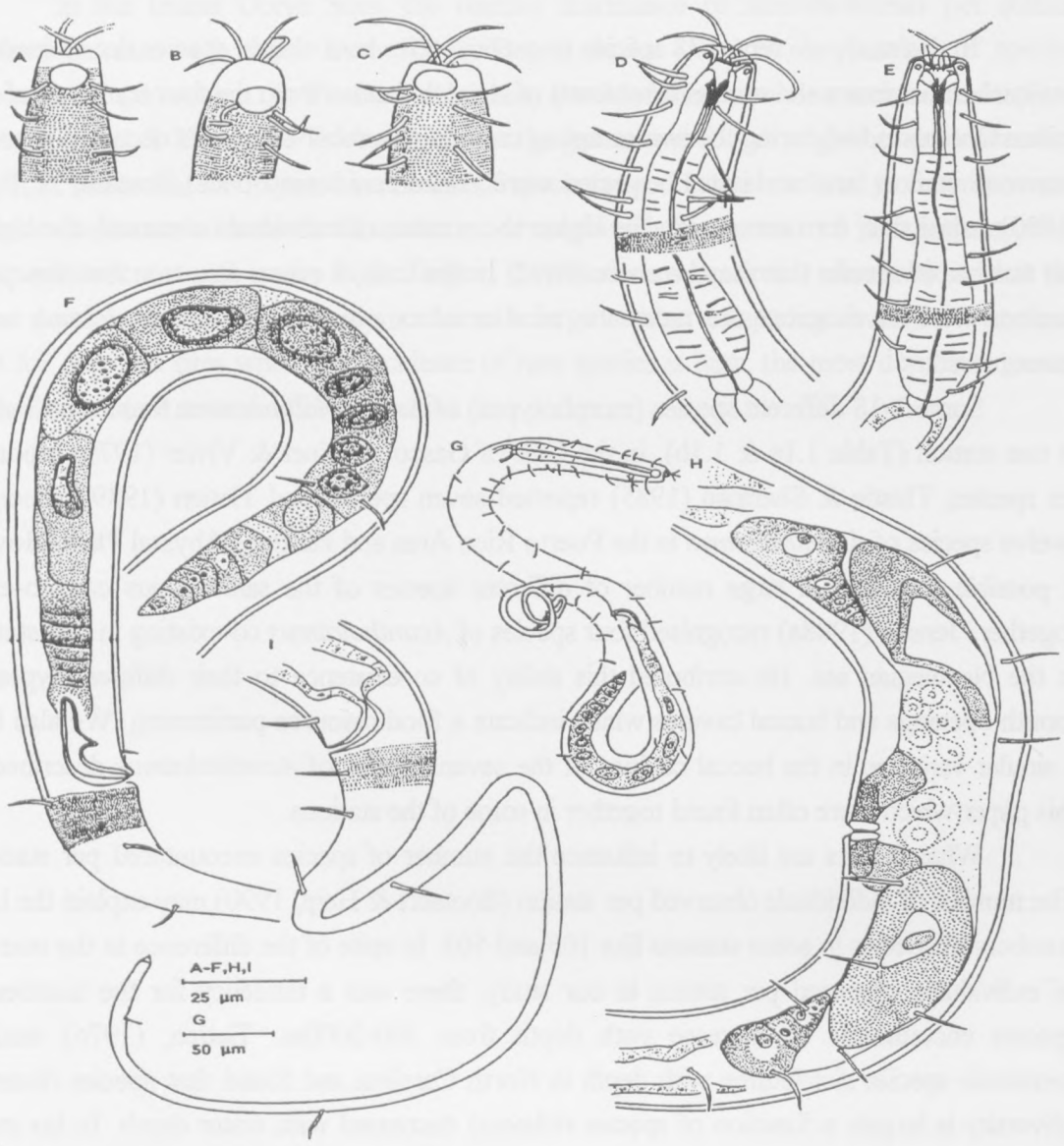


Figure 1.7 *Acantholaimus invaginatum* sp. n.; A: ♂$_1$ head region, B: ♂$_2$ head region, C: ♀$_1$ head region, D: ♀$_1$ pharyngeal region, E: ♂$_1$ pharyngeal region, F: ♂$_1$ reproductive system, G: ♂$_1$ total view, H: ♀$_1$ reproductive system, I: ♀$_1$ tail

Distribution of Acantholaimus species within the four transects of the Indian Ocean

In this study we report 38 species (morphospecies here means: species determined on qualitative characters and no measurements) of *Acantholaimus* from the four transects of the Indian Ocean studied during the two sampling cruises. A number of species occurred in more than one station, and at least 13 species were encountered only once. Soetaert & Heip (1990), argue that, for rare species, the higher the number of individuals observed, the higher the number of species that may be encountered. In this case, it seems also true that the more stations were investigated the more the number of rare species of *Acantholaimus* were encountered.

Some 3-18 different species (morphotypes) of *Acantholaimus* were found co-existing in one station (Table 1.1a & 1.1b). In the Gulf of Gascony, Dinet & Vivier (1979) reported six species, Thistle & Sherman (1985) reported seven species and Tietjen (1989), reported twelve species of *Acantholaimus* in the Puerto Rico Area and Hatteras Abyssal Plain. How is it possible that such a large number of different species of the same genus can co-exist together? Jensen (1988a) recognised four species of *Acantholaimus* co-existing in one station in the Norwegian sea. He attributed this ability of co-existence to their different types of mouth openings and buccal cavities which indicate a food resource partitioning. We also find a similar variation in the buccal cavities of the seven species of *Acantholaimus* described in this paper which were often found together in some of the stations.

What factors are likely to influence the number of species encountered per station? The number of individuals observed per station (Soetaert & Heip, 1990) may explain the high numbers of species in some stations like 105 and 505. In spite of the difference in the number of individuals observed per station in our study, there was a tendency for the number of species encountered to increase with depth from 500-2000m. Tietjen, (1976) studied nematode species distribution with depth in North Carolina and found that species diversity (diversity is largely a function of species richness) decreased with water depth. In his study area, water depth was related to sediment type where shallower stations had sandy sediments and deeper stations had clayey-silt sediments. He argued that sandy sediments provide higher micro-habitats and thereby a higher diversity. Tietjen, (1984) also found species richness and dominance to be related to grain size distribution and organic input in three stations in the Venezuelan Basin. It was possible then, that the increase in species number with depth was in response to sediment type rather than water depth. There is need therefore, to investigate the sediment characteristics of present study stations to see if sediment type has an influence on the number of species of *Acantholaimus* encountered.

In the Indian Ocean sites, the relative dominance of *Acantholaimus* per station showed increase with depth from 500-2000m, a similar trend as the number of species encountered per station. In the North Atlantic, the Mediterranean Sea and most deep-sea sites, Soetaert & Heip, (1995) observed that the genus was found to gain importance with depth. It seems that the increase in number of species encountered is related to the increase in relative dominance with minor variations i.e. where the relative dominance is high the number of species encountered is also high. Tietjen, (1989) also made similar observations that the most dominant genera in his study contained a large number of species. It maybe true then, that for deep-sea sites where the incidence of rare species is high, the most dominant genera will often contain several different species.

Table 1.1a: *Acantholaimus species* identified from the Indian Ocean in Jun/July

(N. observed= total number of individuals observed, A. observed= Acantholaimus individuals observed, z= individuals not identified)

station	105	106	107	117	118	119	133	136
Depth	500	1000	2000	500	1000	2000	2000	1000
N. observed	884	281	269	479	159	358	535	163
A. observed	18	3	10	17	9	26	41	5
A. vermeuleni	2			4	1	5	3	2
A. verscheldi	1	2	2			3	1	
A. heipi		1			1		3	4
A. elegans		3			1		3	2
A. gathumai	2	1		1		4	3	
A. geraerti								
A. invaginatum	2				1		5	
Acanthol. sp.1				1		2		1
2							4	
3								
4	4		1			1	1	
5		1		1	1			
6		1						
7						1	1	
8		1	1		1	2	2	
9								
10						1		1
11				1				3
12			1			1		
13								
14								
15	2		1	2		1	3	
16				1			1	
17								
18			1			1		
19								
20				2				1
21								
22						1		
23								
24					1		3	
25					1			
26								
27				1				
28								
29							4	
30					1			
Z			1		2			
No. of species	9	3	8	11	7	13	14	4

Table 1.1b: *Acantholaimus* species identified from the Indian Ocean from KA2 cruise (Abbreviations are the same as in Table 1.1a)

station	505	506	507	517	518	519	531	532	533	552
Depth	500	1000	2000	500	1000	2000	500	1000	2000	500
N. observed	739	343	302	371	294	323	353	188	337	277
A. observed	45	25	25	12	24	25	6	9	31	19
A. vermeuleni	7	2	2	1	4	3	1	3	3	1
A. verscheldi	5	2	4	2		1	1	1	4	
A. heipi			2			2			1	
A. elegans	5	2	1			1	3	2		2
A. gathumai	5	3	2	1	3	2		2	3	1
A. geraerti	1	1			2				3	1
A. invaginatum	8	2	4		1	2				
Acanthol. sp.1		3								3
2						2			2	
3	2									2
4		1							1	
5			3			2				1
6	1			2	1	2				1
7	3	1		1	3				2	3
8					1	1			1	
9									1	
10		1								
11										
12		1		1					1	1
13		1							1	
14	2									
15	3	3		2	2	1				3
16			1						2	
17		1								
18						2				
19			1							
20					1	1				
21	1		1		1				2	
22										
23			2							
24						2				
25		1							1	
26	2		1					1	1	
27										
28					1				1	
29										
30										
Z		1	1	1	3	1	1		1	
No. of species	13	14	12	8	11	14	3	5	18	11

Chromadorinae Filipjev, 1917

Prochromadorella Micoletzky, 1924

One new species of *Prochromadorella* (*P. daroe*) is described and additional description of *P. ditlevseni* (de Man, 1922) Lorenzen, 1971, is given.

Prochromadorella daroe sp.n. (Figure 1.8 A-H)

Type material

Three males and five females on slides nos. RI544-RI545 and 10408-10413

Etymology

Name given after Prof. N. Daro of V.U.B.

Type locality

Males from sts. 117, 119 (σ^1), 505 and females from sts. 117, 505 (φ_1), 506, 519, and 550

Measurements

σ^1	-	63	104	M	506	
						632
	9	17	17	21	15	

a: 30.1; b: 6.1; c: 5.0; c': 8.4; spic: 22

φ_1	-	54	86	212	361	
						453
	7	13	14	18	9	

a: 25.2; b: 5.3; c: 4.9; c': 10.2; V: 47

Other ♂♂s L: 457-485; a:28.5-32.6; b: 5.5-6.2; c: 5.2-5.3; c': 7.2-7.9; spic: 22-23

Other ♀♀s L: 557-670; a: 29.3-33.5; b: 6.4-6.6; c: 4.7-5.4; c': 8.8-12.2 V: 41-47 %

Description

Males: The body is cylindrical with a blunt anterior end and elongate tail end (Figure 1.8 B). The cuticle is heterogeneous with basket-work pattern of ornamentation from behind the amphids until mid pharyngeal region and longitudinal striations that are one annule width in length from mid pharyngeal region until the tail (Figure 1.8 D & F). No lateral differentiation occurs. Somatic setae are scarce.

Inner and outer labial sensilla are inconspicuous and the cephalic ones are 3-4 µm long. The amphids are loop-shaped but very faint located posterior of the cephalic sensilla. The stoma is small with three solid teeth and it is surrounded by the pharyngeal tissue. The pharynx is cylindrical, 78- 104 µm long, slightly bulbus at the stoma and the terminal end

where it forms the bulb. The bulb is 62-79 % of cbd at its widest diameter and not well developed. The nerve ring surrounds the pharynx at 53-61 % of the pharyngeal length from the anterior. The ventral gland is located posterior of the pharyngo-intestinal junction and the gland opening was not seen (Figure 1.8 A).

The reproductive system is monorchic with outstretched testis located to the right of the intestine. The germinal zone is short and the rest of the testis is filled with small rounded spermatozoa with dense nucleus. The vas deferens is wide at first and then narrows down towards the posterior end (Figure 1.8 B). The spicules are 1.5-2.1 x abd long and curved posteriorly. The gubernaculum is 11-13 µm long and parallel to the spicules. No pre-cloacal supplements (Figure 1.8 G).

The tail is 87-142 µm long, elongate cylindrical, with a pointed tip. The caudal glands are three and arranged in tandem (Figure 1.8 G).

Females: They are similar to males (Figure 1.8 E & H). The reproductive system is amphidelphic with reflexed ovaries, anterior branch located to the right of the intestine, posterior one to the left of it. The uterus and the ovaries are rather short. Vulva and vagina are simple (Figure 1.8 C).

Differential diagnosis

Prochromadorella daroe sp. n. is characterised by short cephalic sensilla (3-4 µm long), heterogeneous cuticle without lateral differentiation, stoma with three solid teeth, cylindrical elongate tail and males without pre-cloacal supplements.

Only three other *Prochromadorella* species are described without pre-cloacal supplements, *P. spinosa* Gerlach, 1957, *P. subterranea* Gerlach, 1953 and *P. tenuicaudata* Gerlach, 1954. *P. daroe* sp.n. differs from all of these species in that these species are longer and thinner (L=929 µm, a= 71 in *P. spinosa*; L= 1264-1325 µm, a= 59-67 in *P. subterranea*; L=1105-1190 µm, a= 44-48 in *P. tenuicaudata*) and they all have a relatively shorter tail compared to *P. daroe* sp.n. (c=9.9, 7.3-9.4, 6.3-7.0 respectively).

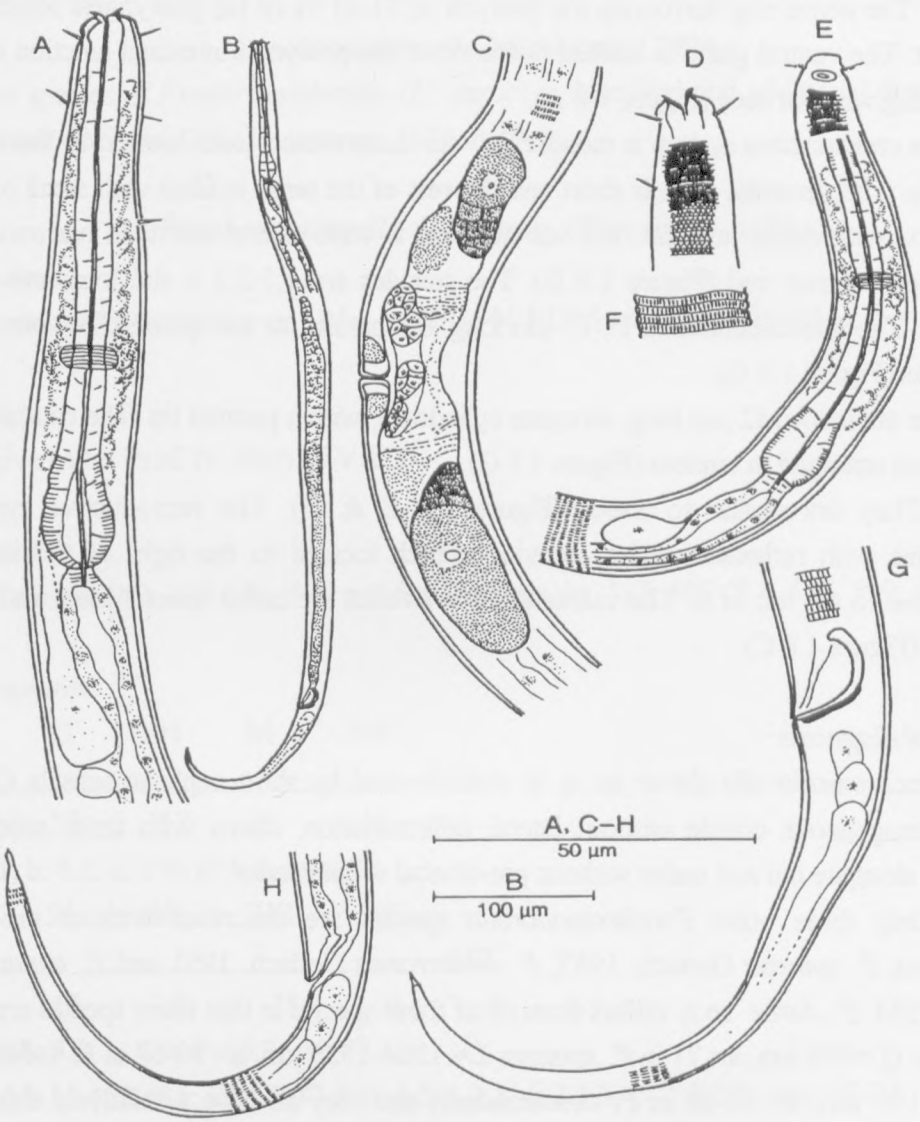


Figure 1.8: *Prochromadorella daroe* sp. n.; A: ♂$_1$ pharyngeal region, B: ♂$_1$ total body, C: ♀$_1$ reproductive system, D: ♂$_1$ head region (superficial), E: ♀$_1$ pharyngeal region; F: ♂$_1$ cuticle (mid-body); G: ♂$_1$ tail; H: ♀$_1$ tail,

***Prochromadorella ditlevseni* (de Man, 1922) Lorenzen, 1971 (Figure 1.9 A-G)**

Material studied

Eight males and one female. Three males and female on slide nos. 10524-10527.

Locality

Males from sts. 114 (3), 511, 514 (2 including ♂1), 550 and female 511 (♀1)

Measurements

♂1	-	61	103	M	588	
						680
	8	15	15	16	15	

a: 42.5; b: 6.6; c: 7.4; c': 6.1; spic: 24

♀1	-	63	107	382	628	
						732
	8	15	16	19	12	

a: 38.5; b: 6.8; c: 7.0; c': 8.7; V: 52 %

Other ♂♂s L: 505-844; a: 38.8-52.8; b:5.9-8.4; c: 6.1-9.8; c': 5.8-8.3; spic: 18-22

Additional description

Males: The body is cylindrical, blunt at the anterior end and a narrow elongate tail with a pointed tip. The cuticle is heterogeneous without lateral differentiation (Figure 1.9 C). Cuticular ornamentations are fine longitudinal striations, one annule width in length covering the whole body, at the pharyngeal region, the striations are more conspicuous and tend to form basket-work pattern (Figure 1.9 C & F).

The amphids are inconspicuous. Anterior sensilla are short, inner and outer labial setae are inconspicuous, and the cephalic ones are 4-5 µm long. The stoma is small, with one large dorsal tooth and two smaller sub-ventral ones. The pharyngeal tissue completely surrounds the stoma. The pharynx is 85-106 µm in length, cylindrical, with a very small expansion anteriorly around the stoma and a slightly larger one at the posterior end that makes the terminal bulb. The bulb is 67-79 % of cbd in diameter at the widest part. The nerve ring surrounds the pharynx at 49-59 % of the pharyngeal length from the anterior. The ventral gland is located posteriorly of the pharyngo-intestinal junction but the gland opening was not seen (Figure 1.9 C).

The reproductive system is monorchic, with outstretched testis, located to the right of the intestine. The spicules are 1.3-1.8 abd, curved and have a poorly developed capitulum. The gubernaculum is 9-13 µm long and parallel to the posterior part of the spicules. There are

five cup-shaped pre-cloacal supplements located at 9-13 µm from the cloaca and spaced at 8-12 µm from each other. A gland opens through each supplement (Figure 1.9 G)

The tail is uniformly cylindrical with a pointed tip. The caudal glands are located close to the anterior end in tandem position.

Female: Similar to males (Figure 1.9 B & E). The reproductive system is amphidelphic with reflexed ovaries, anterior branch to the right of the intestine, posterior to the left of it. The uterus is long, and the ovaries are rather long. Vulva is simple and vagina is thick walled (Figure 1.9 A).

Remarks

Prochromadorella ditlevseni (De Man, 1922) Lorenzen, 1971 was first described from the Zuiderzee (De Man, 1922). Other populations have been described from the German coast (Gerlach, 1951; Lorenzen, 1971). The individuals investigated here are similar to the specimens originally described in measurements and ratios. However, they are slightly shorter than the original specimens in total length (L=505-844 µm present compared to L=828-960 µm respectively).

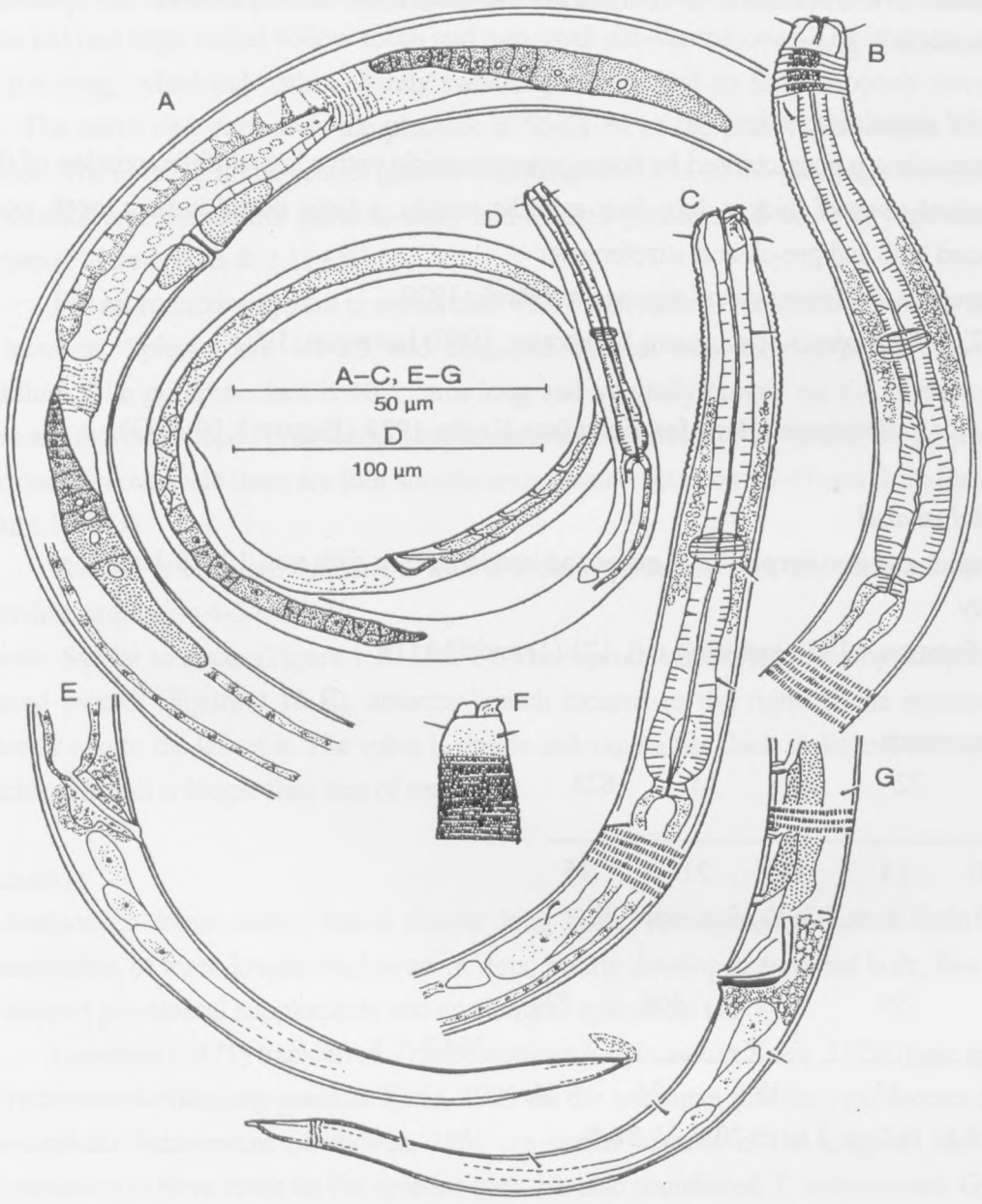


Figure 1.9: *Prochromadorella ditlevseni* (de Man, 1922) Lorenzen, 1971; A: ♀$_1$ reproductive system, B: ♀$_1$ pharyngeal region, C: ♂$_1$ pharyngeal region, D: ♂$_1$ total body, E: ♀$_1$ tail, F: ♂$_1$ head region (superficial), G: ♂$_1$ tail

Trichromadora Kreis, 1929

The genus *Trichromadora* is re-instated and additional description of the species *T. longicaudata* is given.

Emended genus diagnosis

Trichromadora is characterised by homogeneous cuticle with a lateral differentiation of three longitudinal rows of thicker dots, four cephalic sensilla, a large dorsal hollow tooth, poorly developed bulb and pre-cloacal supplements.

Type species: *Trichromadora longicaudata* Kreis, 1929

(syn. *T. ophiocephala* Schuurmans Stekhoven, 1950) Lorenzen, 1971

Trichromadora longicaudata Kreis, 1929 (Figure 1.10 A-G)

Material studied

Four males and one female. Two males and one female on slide nos. 10528-10529.

Locality

Males from sts. 114 (3 including ♂$_1$), 121 (1) and 514 (1)

Measurements

♂$_1$	-	72	119	M	823	1015
	10	14	18	21	15	

a: 48.3; b: 8.5; c: 5.3; c': 12.8; spic: 22

♀$_1$	-	59	105	406	774	1067
	9	15	18	24	14	

a: 44.5; b: 10.2; c: 3.6; c': 20.9; V: 38 %

Other ♂♂s L: 897-1081; a: 47.0-52.2; b: 8.5-10.6; c: 5.1-6.6; c': 9.0-13.5; spic: 17-22

Additional description

Males: The body is very slender, blunt at the anterior end and attenuating at the tail end (Figure 1.10 D). Cuticle is homogeneous with longitudinal striations one annule width in length starting from behind the cephalic sensilla till the tail region. These striations are more pronounced on the pharyngeal region than on the rest of the body. Lateral differentiation is 4 µm wide and consists of three longitudinal rows of thick dots that cover the entire body length from posterior of the head region (Figure 1.10 A & G). Somatic setae are 4-5 µm long and in four longitudinal rows (Figure 1.10 D).

The amphids are faint slit-like located in front of the cephalic setae (Figure 1.10 A). Inner and outer labial sensilla are inconspicuous and the cephalic ones are 4-5 µm long. The stoma has one large dorsal hollow tooth and two small sub-ventral ones. The pharynx is 102-119 µm long, cylindrical with a slightly swollen posterior end to form a poorly developed bulb. The nerve ring surrounds the pharynx at 56-61 % of the pharyngeal length from the anterior. The opening of the ventral gland is located at 45-50 % of the pharyngeal length from the anterior and the ventral gland is small and located posterior of the pharyngo-intestinal junction (Figure 1.10 B & 1.11 D).

The reproductive system is monorchic with outstretched testis located to the right of the intestine. Spicules are 1.1-1.5 abd long and curved, they have a poorly developed capitulum. The gubernaculum is 10-11 µm long and ventrally curved on the posterior end. There are five cup-shaped pre-cloacal supplements located from 17-23 µm to 66-75 µm from the cloaca (in one male there are four supplements located between 16-47 µm from the cloaca (Figure 1.10 G).

The tail is elongate cylindrical with a filiform posterior end, the terminal tip has a finger-like projection 4-5 µm long.

Female: Similar to males (Figure 1.10 C & F). The reproductive system is amphidelphic with reflexed ovaries (Figure 1.10 E), anterior branch located to the right of the intestine and posterior one to the left of it. The vulva is simple and vagina has thick walls and strong radial muscles. The tail is longer than that of males.

Discussion

Trichromadora longicaudata has a slender long body, homogeneous cuticle with lateral differentiation of three longitudinal rows of dots, poorly developed terminal bulb, five (four) cup-shaped pre-cloacal supplements and an elongate cylindrical tail.

Lorenzen (1971) transferred *Trichromadora longicaudata* Kreis, 1929 (type species) to *Prochromadorella longicaudata* Kreis, 1929 on the argument that the two species plus *T. ophiocephala* Schuurmans Stekhoven, 1950 are similar because of the long tail and lateral differentiation in three rows on the anterior part. He also transferred *T. ariminiensis* Gerlach, 1953 and *T. macris* Gerlach, 1956 to the genus *Chromadorella* Filipjev, 1918, because of lateral differentiation which is present throughout the body.

Trichromadora is characterised by an elongate thread-like body, annulated cuticle with three longitudinal rows of lateral punctations (Kreis, 1929). The diagnosis according to Wieser (1954) is: homogenous cuticle, hollow teeth and three lateral longitudinal rows of dots. According to Wieser (1954), *Chromadorella* Filipjev, 1918 and *Prochromadorella* Micoletzky, 1924 are both characterised by a heterogeneous cuticular punctation and solid teeth in the stoma. They are distinguished from each other by the presence of two or four lateral longitudinal rows of thick dots in *Chromadorella* and the absence of the same in

Prochromadorella save traces of it in cervical and adanal regions in some species. Based on the genera (*Prochromadorella*, *Chromadorella* and *Trichromadora*) diagnosis as stated by Wieser (1954), we re-instate the genus *Trichromadora* Kreis, 1929.

The present specimens of *Trichromadora longicaudata* resembles those of Kreis, (1929) (*syn. T. ophiocephala* Schuurmans Stekhoven, 1950), Lorenzen, 1971 in total length, de-Man ratios and lateral differentiation of the cuticle but they differ from those specimens of *Prochromadorella longicaudata* sensu Lorenzen, 1971, in the lateral differentiation of the cuticle (lateral differentiation only found at the anterior pharyngeal region in the latter). On account of having lateral differentiation only at the anterior pharyngeal region we leave those specimens of Lorenzen in the genus *Prochromadorella,* (but they should be given a new name) and transfer *T. longicaudata* (syn. *T. ophiocephala*) to *Trichromadora*.

Other species transferred to the genus *Trichromadora* are *Chromadorella ariminiensis* Gerlach, 1953 because of having three (five?) longitudinal rows of thick dots rather than two or four and *Prochromadorella brachyura* Schuurmans Stekhoven, 1950 because of three longitudinal rows of dots.

Species list

Trichromadorella ariminiensis (Gerlach, 1953) comb. n.

syn. Chromadorella Gerlach, 1953

Trichromadorella brachura (Schuurmans Stekhoven, 1950) comb. n.

syn. Prochromadorella brachura Schuurmans, 1950

Trichromadora longicaudata Kreis, 1929

(syn. *T. ophiocephala* Schuurmans Stekhoven, 1950) Lorenzen, 1971

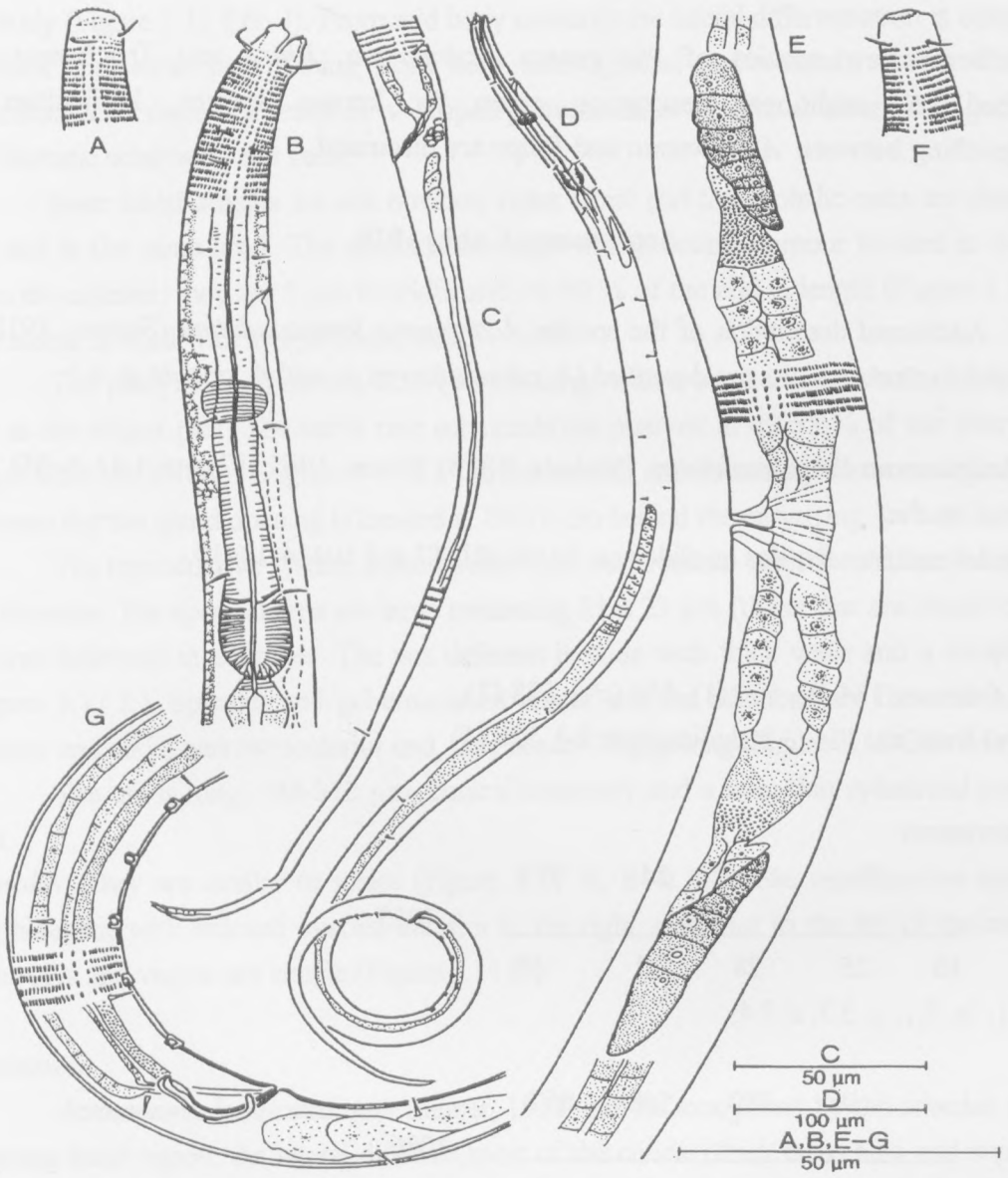


Figure 1.10: *Trichromadora longicaudata* Kreis, 1929; A: ♂$_2$ head region (superficial), B: ♂$_1$ pharyngeal region, C: ♀$_1$ tail, D: ♂$_1$ total body, E: ♀$_1$ reproductive system, F: ♀$_1$ head region (superficial), G: ♂$_1$ tail (spicular and pre-cloacal region)

Euchromadorinae Gerlach & Riemann, 1973

Some new species of the genera *Actinonema*, *Rhips* and *Trochamus* are described and additional description given for known species. Difficulties in distinguishing between *Actinonema* and *Rhips* are discussed.

Actinonema Cobb, 1920

Additional description of the species *Actinonema longicaudatum* (Steiner, 1918) is given and two new species are described (*A. paraceltica* sp. n. and *A. smolae* sp. n.)

Actinonema longicaudatum (Steiner, 1918) Timm, 1961 (Figure 1.11 A-M)

Material studied

Five males and four females on slide nos. RI546-RI547 and 10414-10419

Locality

Males from sts. 114 (1), 506 (1), 514 (♂1), 528 (2),
Females from sts. 114 (3 including type ♀1), 528 (1)

Measurements

	-	78	149	M	873	
♂1						1057
	10	25	28	31	25	

a: 34.1; b: 7.1; c: 5.7; c':7.4;

	-	98	189	548	857	
♀1						1086
	9	27	30	32	23	

a: 33.9; b: 5.7; c: 5.1; c': 9.2; V: 50 %

♂♂s (5) L: 840-1205; a: 27.5-36 b:6.0-6.6; c:4.7-6.0; c': 6.3-9.1

♀♀s (4) L: 902-1251; a: 31.2-33.9; b: 5.7-6.9; c: 5.1-6.5; c': 8.8-10.7; V: 46-50 %

Additional description

Males: The body is cylindrical, tapering slightly anteriorly and the tail is elongate with a thin 2/3 cylindrical end part (Figure 1.11 F). The head region is not set off but it narrows slightly at the very anterior part and twelve rugae surround the stoma. The cuticle is thick, annulated and heterogeneously punctated with basket-work like kind of markings at the pharyngeal region and less conspicuous markings on the rest of the body (Figure 1.11 C & K). The

lateral differentiation begins at the pharyngeal region and here it is simpler than on the rest of the body (Figure 1.11 I & J). From mid body onwards the lateral differentiation is composed of thick transverse bars joining from both sides (dorsal and ventral), above which at superficial level there is a series of `v'-shaped patterns either upright or inverted (Figure 1.11 K). Somatic setae were not seen.

Inner labial sensilla are not obvious, outer labial and the cephalic ones are short 2-3 µm and at the same level. The amphids are large with a double contour located at 4-5 µm from the anterior; they are 3 µm in width and 76-80 % of the cbd in length (Figure 1.11 C). The stoma is small with a large dorsal hollow tooth.

The pharynx is cylindrical, 132-182 µm long, with a small terminal bulb, 54-66 % of cbd at the widest part. The nerve ring surrounds the pharynx at 49-55 % of the pharyngeal length from the anterior (Figure 1.11 E). Cardia is small and flattened. The ventral gland was not seen but the gland opening is located at 10-12 µm behind the nerve ring.

The reproductive system is monorchic with outstretched testis located to the right of the intestine. The spermatozoa are large measuring 21 x 23 µm (those that are about to enter the vas deferens) in diameter. The vas deferens is wide with thick walls and a wide lumen (Figure 1.11 L). Spicules and gubernaculum absent and the telamons are flat with a broad anterior end and a narrow posterior end, they are 24-37 µm long (Figure 1.11 G & H).

The tail is long, 144-212 µm, conical anteriorly and a long thin cylindrical posterior part.

Females: They are similar to males (Figure 1.11 A, B & M). The reproductive system is amphidelphic with reflexed ovaries, anterior to the right, posterior to the left of the intestine. The vulva and vagina are simple (Figure 1.11 D).

Discussion

Actinonema longicaudatum Steiner, 1918, can be recognised by the anterior slightly tapering head region, the lateral differentiation of the cuticle (thick cross bars and superficial `v'-shaped structures), the position of the amphids from the anterior (4-5 µm from the anterior), the shape of the spicules, the large spermatozoa, the thick walled vas deferens with wide open lumen and the long tail.

Actinonema longicaudatum Steiner, 1918 differs from other described species in the shape of the telamons (they are thick, broad on the anterior end and taper on the posterior end) and it lacks any other accessory piece and the long tail. The present specimens are recognised as *A. longicaudatum* because of the shape of the anterior end (head region), the nature of the lateral differentiation and the measurements and ratios. These specimens however differs from other described specimens in that, the tail is shorter in this group (c= 4.5 in *A. longicaudatum* sensu Timm, (1961); c= 4.1 in *A. longicaudatum* sensu Blome, (1985) and c= 3.8 in *A. longicaudatum* Steiner, 1918 while c=4.7-6.5 in the present group).

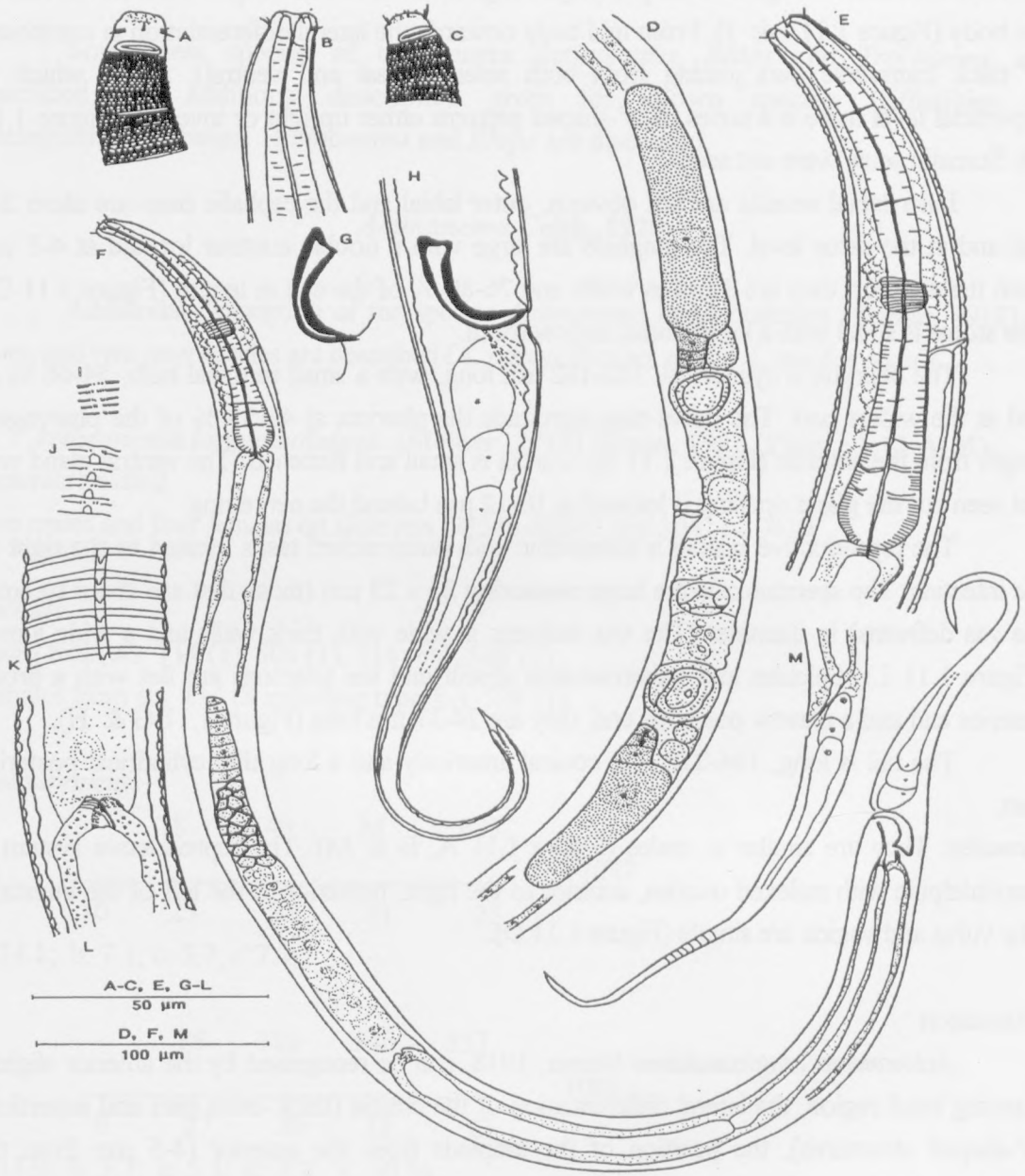


Figure 1.11: *Actinonema longicaudatum* Steiner, 1918; A: ♀$_1$ head (superficial), B: ♀$_1$ stoma, C: ♂$_1$ head (superficial), D: female$_1$ reproductive system, E: ♂$_1$ pharyngeal region, F: ♂$_1$ total body, G: ♂$_1$ spicules, H: ♂$_1$ tail, I: cuticle at bulb region, J: cuticle at posterior of pharyngeal region, K: cuticle at mid-body, L: male$_1$ testis-vas deferens junction, M: ♀$_1$ tail

***Actinonema paraceltica* sp.n. (Figure 1.12 A-N)**

Type material

Five males and four females on slide nos. RI546, RI548-RI549 and 10420-10425

Etymology

Name given because of its close resemblance to *Actinonema celtica*

Type locality

Males from sts. 117 (1), 133 (1), 505 (♂1), 506 (1), and 518 and females from sts. 105 (♀1), 114 (1), 117 (1) and 550 (1)

Measurements

♂1	-	66	143	M	749	
						869
	12	23	23	23	18	

a: 37.9; b: 6.1; c: 7.2; c':6.0

♀1	-	72	156	448	783	
						928
	11	23	24	29	18	

a: 32.0; b: 6.0; c: 6.4; c':8.1; V:48 %

Other ♂♂s L: 693-982; a:33.0-40.9; b: 5.1-6.2; c: 6.5-7.2; c':6.1-6.7

Other ♀♀s L: 638-950; a: 26.6-32.8; b: 5.5-5.8; c:6.1-6.9; c': 7.0-8.1; V: 49

Description

Males: The body is cylindrical with a blunt anterior end and a conico-cylindrical tail; there is no tapering of the head region (Figure 1.12 F). Cuticle heterogeneous with complex patterns at the pharyngeal region (Figure 1.12 C & E) and less conspicuous on the rest of the body. Lateral differentiation begins at the level of the pharyngeal bulb and it is composed of two rows of thick dots on which two longitudinal rows of V-shaped structures are found superficially. At the anterior part of the body the lateral differentiation is less complex (with only longitudinal rows of double dots on either side) than on the rest of the body (Figure 1.12 G & H). Somatic setae were not seen.

The amphids are large (90 % of cbd) with a double contour, located at 6-7 µm from the anterior end. The anterior rugae are pronounced. Inner labial sensilla are not conspicuous, outer labial and the cephalic are 3-4 µm long and located at the same level. The stoma has a

large dorsal hollow tooth and two small sub-ventral ones. The pharynx is 113-175 µm long, cylindrical with a long enlarged terminal part that forms the bulb. The nerve ring is located at 46-53 % of the length of the pharyngeal length from the anterior. The ventral gland is small (probably they are two) located posterior of the pharyngo-intestinal junction (Figure 1.12 D).

The reproductive system is monorchic with outstretched testis located to the right of the intestine. The spermatozoa are small and tend to cluster together as they get close to the vas deferens. The testis-vas deferens junction is clear and the vas deferens is thick walled but without a distinct lumen. The spicules are absent. The telamons are 18-25 µm long, they have thin extensions and a broad mid part and taper on the posterior end. The gubernaculum is short (11-14 µm long) (Figure 1.12 J & M).

The tail is conico-cylindrical with an elongate narrow end. It is pointed and devoid of any annulation from 4-5 µm from the end.

Females: They are similar to the males (Figure 1.12 B, D & L). Reproductive system is amphidelphic with reflexed ovaries, anterior to the right of the intestine, posterior to the left of it (Figure 1.12 K). The vulva and vagina are simple.

Differential diagnosis

Actinonema paraceltica sp. n. is characterised by a blunt head end with conspicuous rugae, lateral differentiation with 'V' markings (two rows of superficial `v-shaped' structures, large amphids (90 % cbd), and a terminal bulb that is not set off from the rest of the pharynx, small spermatozoa that tend to cluster together and telamons with a thin extension from the capitulum.

Actinonema paraceltica sp. n. resembles *A. grafi* Jensen, 1991 in measurements and the shape of the anterior end. However *A. grafi* is a thick nematode, thus the a-values are smaller than they are in *A. paraceltica* sp.n. Besides, the lateral differentiation is different in the two species. *A. paraceltica* sp.n. closely resembles *A. celtica* Boucher, 1976 in most measurements and ratios but differs from it in the nature of ornamentation on the lateral differentiation and the tail length. Although, *A. celtica* is slightly longer (L: 772-1140 µm) compared to *A. paraceltica* sp. n. (L: 638-982 µm), the tail is relatively longer in the latter species (tail= 102-113 in *A. celtica* and 103-145 in *A. paraceltica* sp. n.) and consequently the c-values are larger in the former species (c= 7.3-10.7 in A. celtica and c=6.1-7.2 in *A. paraceltica* sp. n.).

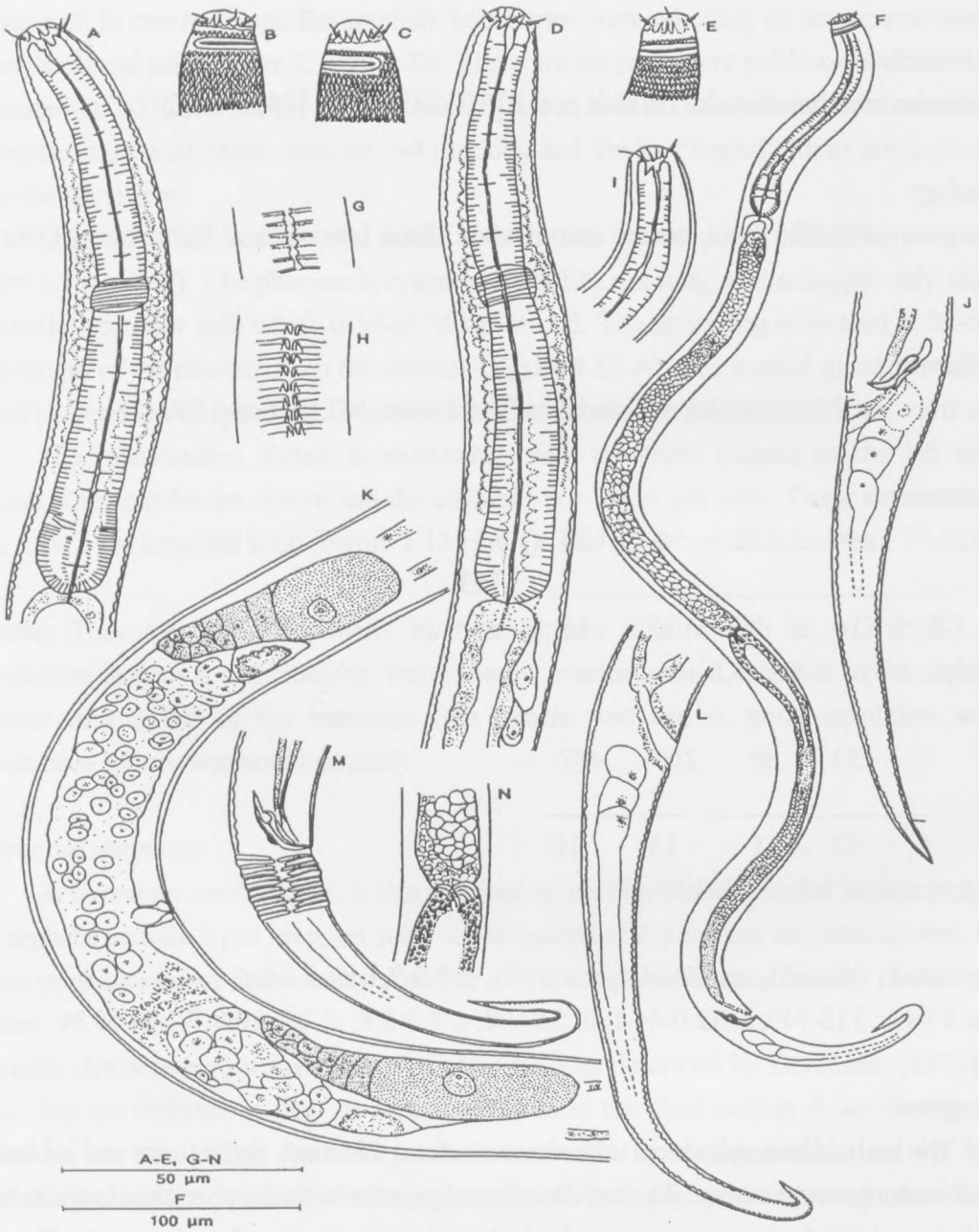


Figure 1.12: *Actinonema paraceltica* sp.n.; A: δ_1 pharyngeal region, B: φ_1 head (superficial), C: δ_1 head (superficial), D: φ_1 pharyngeal region, E: δ_2 head (superficial), F: δ_2 total body, G: lateral differentiation at the bulb region, H: lateral differentiation at mid-body, I: δ_2 stoma, J: δ_1 tail, K: φ_1 reproductive system, L: φ_1 tail, M: δ_2 tail, N: δ_2 testis-vas deferens junction

Actinonema smolae sp.n. (Figure 1.13 A-L)

Type material

Three males and three females on slide nos. RI550-RI551 and 10426-10429

Etymology

Name given after Nic Smol, course co-ordinator of the International Nematology Course in Gent

Type locality

Males from sts. 103 (♂$_1$), 105, 550 and females from sts. 103 (♀$_1$), and 550 (2)

Measurements

♂$_1$	-	66	122	M	634	
	8	16	16	20	15	763

a: 38.1; b: 6.3; c: 5.9; c': 8.6

♀$_1$	-	51	86	260	432	
	8	13	13	14	10	548

a:39.1; b: 6.4; c: 4.7; c': 11.6; V: 47%

Other ♂♂s L: 550-563; a:40.2-34.4; b: 6.1-6.3; c: 5.9-7.1; c': 5.1-8.6

Other ♀♀s L: 512-749; a: 32.0-44.1; b: 5.8-7.8; c: 4.9-5.8; c': 8.9-10.8; V: 48-53 %

Description

Male: The body is long cylindrical with almost uniform thickness, the anterior end is blunt and the tail is elongate cylindrical. The cuticle is heterogeneous with the pharyngeal region having a basket-work kind of ornamentation. At the lateral differentiation there is a gap without any punctation bordered by inverted `2 V' patterns on each annule (Figure 1.13 L). The somatic setae are 5 µm long and in four longitudinal rows, they are more conspicuous on the pharyngeal region than on the rest of the body (Figure 1.13 A).

The amphids are large (90% cbd) with a double contour located at 3-4 µm from the anterior end. In one specimen the amphids' boundaries were touching on the ventral side but not on the dorsal side (Figure 1.13 C & D). There are six prominent solid cones whose bases are located at 2-3 µm from the anterior end (Figure 1.13 E). The six inner labial sensilla are inconspicuous, the six outer ones are 3-4 µm long and the four cephalic ones are 2 µm long and at the same level.

The stoma has small dorsal tooth and the sub ventral ones could not be located (Figure 1.13 A & F). The pharynx is cylindrical, 86-122 µm long, and enlarged only slightly to form the posterior bulb which is 54-69 % of the cbd. The nerve ring is located at 52-57 % of the length of the pharynx from the anterior (Figure 1.13 A). The ventral gland is small and located posterior of the pharyngo-intestinal junction. Cardia not prominent.

The reproductive system is monorchic, with the testis located to the left of the intestine. The spicules are absent and the telamons are 10-14 µm long. The gubernaculum is short, 10-12 µm long and solid (Figure 1.13 H & I). The tail is conical cylindrical, 77-129 µm long.

Females: They are similar to males in most aspects (Figure 1.13 B, G & K). The reproductive system is amphidelphic with reflexed ovaries located, anterior to the right and posterior to the left of the intestines (the female was not in good condition so the reproductive system was not illustrated).

Differential diagnosis

Actinonema smolae sp. n. is characterised by six outer labial sensilla 3-4 µm long and four cephalic sensilla 2 µm long, six solid cones located at 2 µm from the anterior end; large double amphids located immediately posterior of the cones and short accessory pieces but no spicules.

Although, *Actinonema pachydermatum* Cobb, 1920 as described by Lorenzen, (1971), has cones, they are different as they are open compared to the solid ones in *A. smolae* sp. n. *A. smolae* sp. n. also differs from *A. pachydermatum* in the ornamentation on the lateral differentiation and the presence of a large dorsal tooth in *A. pachydermatum*. *A. smolae* sp.n. is about half as long as *A. pachydermatum*.

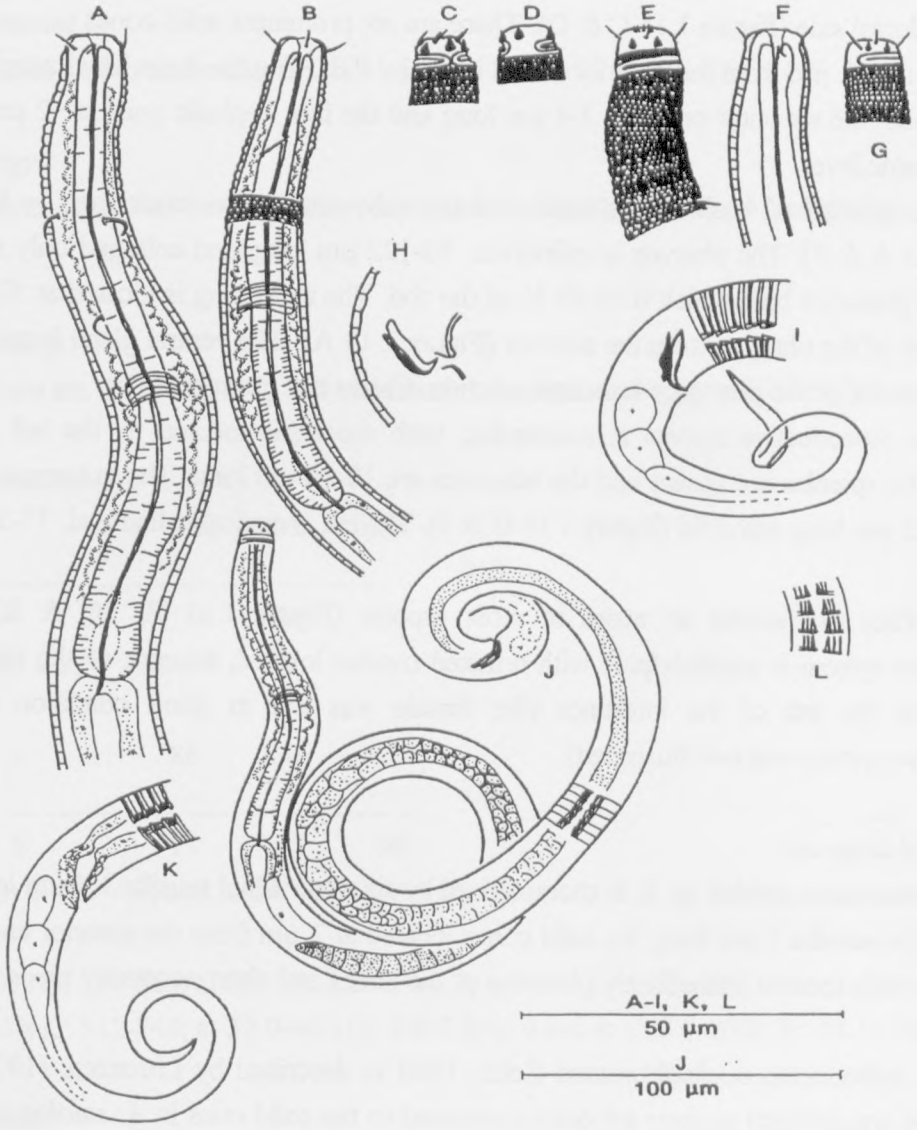


Figure1.1 4: *Actinonema smolae* sp. n.; A: $\sigma^{\prime}_1$ pharyngeal region, B: φ_1 pharyngeal region, C: $\sigma^{\prime}_2$ ventral side of head (superficial), D: $\sigma^{\prime}_2$ dorsal side of head (superficial), E: $\sigma^{\prime}_1$ head (superficial), F: $\sigma^{\prime}_3$ stoma, G: φ_1 head (superficial), H: $\sigma^{\prime}_1$ spicules, I: $\sigma^{\prime}_2$ tail, J: $\sigma^{\prime}_1$ total, K: φ_1 tail, L: lateral differentiation at mid-body

Rhips Cobb, 1920

Rhips reginae sp. n. (Figure 1.14 A-L)

Type material

Three males and four females on slide nos. RI552-RI553 and 10430-10434

Etymology

The name is given after Regine Coolen, secretary of the Marine Biology Section, University of Gent

Type locality

Males from sts. 120 (♂$_1$), 550, 132 and females from sts. 550 (3 including ♀$_1$) and 505

Measurements

♂$_1$	-	70	134	M	849	
						958
	10	18	18	19	17	

(part of the tail broken off) spic: anterior part 17 µm, posterior 25 µm

♀$_1$	-	58	115	300	491	
						590
	10	15	16	16	12	

a: 36.9; b: 5.1; c: 6.0: c': 8.3; V: 51%

Other ♂♂s L: 591-680; a: 42.2-45.3; b: 5.9-6.1; c: 5.9-6.2; c': 7.3-8.2; spic: anterior 14-16 µm, posterior 19-20 µm

Other ♀♀s L: 584-605; a: 30.7-35.6; b: 5.3-6.0; c: 5.2-5.9; c': 7.9-10.2; V: 50-51%

Description

Male: The body is long and thin with uniform thickness and gradually narrowing on the tail end. The tail is cylindrical with a short conical anterior part (Figure 1.14 G). The cuticle is heterogeneous with a basket-work ornamentation at the pharyngeal region (Figure 1.14 B). The lateral differentiation which begins within the pharyngeal region is simple and composed of two fine longitudinal rows of dots and striations on either side. The somatic setae are 4-5 µm long and in four longitudinal rows, they are more conspicuous on the pharyngeal region than on the rest of the body (Figure 1.14D).

The six inner labial sensilla are inconspicuous, the six outer are 4 µm long and the four cephalic ones are 2 µm long and at the same level as the outer labial. There are six solid

cones with their bases located at 4 µm from the anterior end. The amphids are large (90 % cbd), with a double contour and located at 7-9 µm from the anterior end (Figure 1.14B).

The stoma has a large hollow, dorsal tooth, the sub-ventral ones were not seen. The pharynx is cylindrical, 100-134 µm long, with slight enlargement at the terminal to form the bulb, 63-71 % cbd in width. The nerve ring is located at 49-52 % of the length of the pharynx from the anterior (Figure 1.14D). The ventral gland is small located posterior of the pharyngo-intestinal junction (Figure 1.14 G), the gland opening was not seen.

The reproductive system is monorchic with outstretched testis located to the left of the intestine. The testis-vas deferens junction is narrow with longitudinal muscles (Figure 1.14 F). The spicules are double jointed. The anterior part is thin and shorter (40-44 % of the length of the whole spicule) than the posterior part. The posterior part is narrow anteriorly and broad posteriorly. The accessory pieces are four (five?). Two telamons 13 µm long on the anterior, two gubernaculum posterior of the spicules and probably a third highly sclerotized piece located at the base of the gubernaculum (Figure 1.14 I). There are 19-20 pre-cloacal annuli that appear to have supplements.

The tail is 95-115 µm long, slightly conical at the anterior 1/4 part and cylindrical on the posterior part (Figure 1.14 I).

Females: They are similar to males (Figure 1.14 A, C & E). The reproductive system is amphidelphic with reflexed ovaries, located anterior to the right and posterior to the left of the intestine.

Differential diagnosis

Rhips reginae sp. n. is characterised by long (4 µm long) outer labial and short (2 µm long) cephalic sensilla, six solid cones located (base) at 4 µm from the anterior end, large double amphids located at 7-9 µm from the anterior end, double jointed spicules and gubernaculum with several pieces.

Rhips reginae sp. n. differs from other described species in the size (it has L < 1 mm while others have L > 1mm long); amphids that are very wide (90 % cbd) and the lateral differentiation is quite simple compared to the other species.

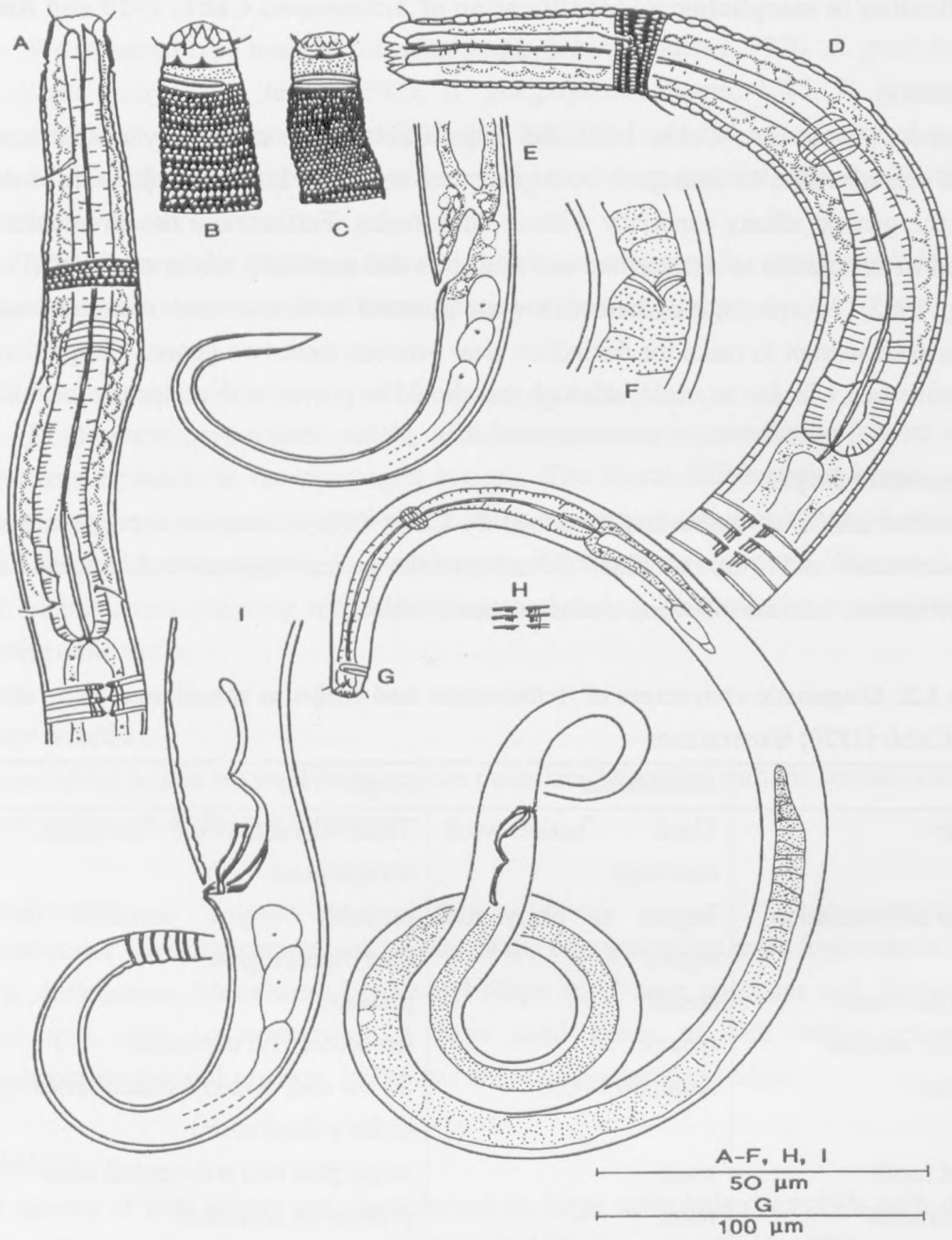


Figure 1.14: *Rhips reginae* sp.n.; A: ♀$_1$ pharyngeal region, B: ♂$_1$ head (superficial), C: ♀$_1$ head (superficial), D: ♂$_1$ pharyngeal region, E: ♀$_1$ tail, F: ♂$_1$ vas deferens-testis junction, G: ♂$_1$ total body, H: lateral differentiation at mid-body, I: ♂$_1$ tail and spicules

Difficulties in morphological identification of *Actinonema* Cobb, 1920 and *Rhips* Cobb, 1920

Introduction

The genera *Actinonema* Cobb, 1920 and *Rhips* Cobb, 1920 are closely related and the generic characteristics to distinguish both genera are not clear. It is hardly possible to decide about the generic affinity especially without adult males. Furthermore the structures often referred to as spicules in *Actinonema* are similar to the accessory pieces of *Rhips* (Platt & Zhang, 1982). Morphological characters were assessed in known and some undescribed species in an attempt to make the distinction clear between these two genera. Suggestions for synonymisation will also be made, although this should be proven with molecular methods.

Actinonema or Rhips?

Actinonema and *Rhips* were first described by Cobb, (1920) with the type species as *A. pachydermatum* and *R. ornata*. Cobb did not give the genera diagnosis but he distinguished the two species with the following characteristics: (Table 1.2)

Table 1.2: Diagnostic characters of *Actinonema* and *Rhips* as mentioned in or derived from Cobb (1920) illustrations

	Actinonema	*Rhips*
Cuticle	Thick basket-work markings	Thick basket-work markings, very conspicuous
Lateral differentiation	Begins at pharyngeal region	probably begins posterior of the pharyngeal region
Cuticular cones	absent	present
Anterior sensilla	minute	ten setiform in one circle
Amphids	large, 80 % cbd	80 % cbd, weakly cuticularised (from Cobb's illustration)
Dorsal tooth	small	large, plus two sub-ventral ones
Supplements	none	present on 25 annuli
Spicules	simple, strong and stout	double jointed
Accessory pieces	frail, slender	five pieces, two in front, two behind and an additional median one behind

Platt & Zhang, (1982) stated that except for the double jointed spicules, the two genera are very closely related since both have similar amphids, cuticle patterns and six triangular cones as is described in *A. pachydermatum* Cobb, 1920 sensu Lorenzen, 1971. According to Kulikov (1993), *Rhips* is characterised by large transversely elongated amphids, jointed spicules from two arcuate parts and the gubernaculum with two L-shaped auxiliary

pieces.

We observed type material (of *Actinonema celtica* Boucher, 1976, *A. grafi* Jensen, 1991, *Rhips anoxybiotica* Jensen, 1985, *R. galapagensis* Blome, 1985, *R. gracicauda* Blome, 1985, and *R. paraornata* Platt & Zhang, 1982) and material of undescribed species collected from different parts of the world as well as our own material from the North Sea and the Indian Ocean.

We compared the following features: cuticle, anterior sensilla, cones, amphids, teeth and the reproductive system in the different species of the two genera.

Cuticle

Both genera have a thick cuticle, with heterogeneous ornamentation (basket work-like patterns especially at the pharyngeal region). The lateral differentiation begins at the pharyngeal region in most of the species of *Actinonema* and posterior of it in most species of *Rhips*. However *R. anoxybiotica*, *R. gracilicauda*, *Rhips reginae* sp. n. and *Rhips* sp. 1 have lateral differentiation beginning within the pharyngeal region. The cuticular ornamentation is otherwise quite similar.

Anterior sensilla

The inner labial sensilla are papilliform and the outer labial together with the cephalic ones are setiform and in one circle in both genera.

Cuticular cones

Six solid cones were observed in both species of the two genera but more frequently in *Rhips* than in *Actinonema*. *Rhips anoxybiotica* and *Rhips sp. 1* have no cones and, *Actinonema smolae* sp.n. and *Actinonema sp.* 1 have solid cones as well while *Actinonema pachydermatum* (sensu Lorenzen, 1971) has cones with sclerotized edges.

Amphids

Most species of both genera are characterised by large cuticularised amphids with double margins. *Rhips ornata*, however, has weakly cuticularised margins (Cobb 1920).

Teeth

According to Cobb (1920), *Actinonema* has a small dorsal tooth and *Rhips* has a large dorsal tooth and two small sub-ventral ones. However, the additional description of *A. pachydermatum* by Lorenzen, (1971) and by Boucher & Bovée, (1971) shows a large dorsal tooth and smaller sub-ventral ones. In nearly all the species of both *Actinonema* and *Rhips* there is a large dorsal tooth and sometimes smaller sub-ventral ones.

Reproductive system

a) Testis-vas deferens junction

A junction exists between the testis and the vas deferens which is a narrow passage with muscular lining. This structure was observed in *Actinonema celtica*, *A. longicaudatum* and *A. paraceltica* sp. n. and in *Rhips reginae* sp. n., *R. galapagensis* and *R. paraornata*. In other individuals the internal structures were either poorly preserved, poorly developed or they had small testis making it difficult to see clearly. We suppose therefore, that this structure is present in species of both genera.

b) Spicules

According to Cobb, *Actinonema* has short spicules and *Rhips* has double spicules. Platt & Zhang (1982), considered the spicules of *Actinonema* to be homologous to the lateral pieces of *Rhips* and that either the cuticularised tubes are vestigial spicules or spicules are totally absent in *Actinonema*. The homology of the two seems reasonable but the tubes cannot be considered vestigial spicules considering that, the spicules in *Rhips* are located in between the two pairs of the accessory pieces (accessory pieces as in Cobb (1920) that is all cuticularised parts surrounding the spicule apart from the spicules themselves) but the tubes in *Actinonema* are actually extensions of the telamon (telamons being accessory pieces in front of the spicules while those behind it are gubernaculum as in Platt & Warwick (1988), and Figure 1.15A and 1.15B below) like in *A. grafi* Jensen, 1991. Thus we consider species of *Actinonema* with such structures to be lacking spicules altogether. There are however, species of *Actinonema* with short structures that are located in between the two pairs of accessory pieces as it is the case in *Rhips* but have only the posterior part, such as *A. pachydermatum* (*sensu* Lorenzen, 1971) and *Actinonema* sp. 1 (Figure 1.15 D). Other species of *Actinonema* have the telamon only *like Actinonema smolae* sp.n. (Figure 1.15E).

c) Accessory pieces

The accessory pieces are homologous in both genera being composed of a pair of telamons and two pieces of the gubernaculum. In some species of *Rhips* however, it is possible that the gubernaculum has an extra median piece.

d) Supplements

Cobb, (1920), observed-what he called-supplements in *Rhips* (arising from 25 pre-cloacal annuli) but none in *Actinonema*. In most species, of *Rhips* such structures have been observed but not in *Rhips anoxybiotica* and *Rhips gracilicauda*. Similar structures were observed in *A. celtica*, *A. grafi*, *Actinonema longicaudatum* Steiner, 1918 and *Actinonema paraceltica* sp.n.. Thus supplements can be present or absent in species of both genera.

Discussion

Most of the characters that were first used to define the two genera by Cobb (1920)

(Table 1.2) have been ignored by most authors as illustrated by the above analysis. There are however, two main characters that are still being considered specific to each genera; that is solid cones in *Rhips* absence of the same in *Actinonema* and double spicules in *Rhips* and simple spicules in *Actinonema*. From the above discussion and Figure 1.15 A-E, it is clear that even these two characters are not stable within a genus and there are all kinds of combinations of characters sometimes making it difficult to assign the genera, *Actinonema* or *Rhips*? If we assume that all species with solid cones are *Rhips* and those without are *Actinonema*, where do species like *R. anoxybiotica* and *Rhips sp. 1* belong and what about *Actinonema smolae*, *Actinonema sp.1* and *A. pachydermatum* sensu Lorenzen, 1971, where are they placed? And if we assume that all species with double spicules are *Rhips* and those without spicules *Actinonema*, how about species with simple spicules like *Actinonema sp. 1* and *A. pachydermatum* sensu Lorenzen (1971) are they *Actinonema* or *Rhips*, or yet another genus? Besides, there are reports of adult *Rhips* loosing their spicules and remaining with the accessory pieces only (Cobb, 1920; Pastor de Ward, 1985). It is possible therefore, to find individuals with double spicules and without spicules and probably with simple spicules as well and all belonging to the same species. The question then is, how important are the double jointed spicules in *Rhips* for the survival and also as a diagnostic character?

Finally, in mixed populations with adult females and juveniles, it is difficult if not impossible to assign the **genera!** Since one of the purposes of nematode identification is to understand the environment, the two genera may not be so different ecologically to be treated separately. We propose therefore that for ecological analysis if males with double spicules, simple spicules and no spicules occur together, they should be treated as one genus, *i.e. Actinonema*, (but add a note to this effect). There may be a higher margin of error when females and juveniles are put in the wrong genera than if all are put in one genus.

For the purpose of systematics on the basis of morphology we leave the two genera as *Rhips* for species with double jointed spicules and *Actinonema* for species without spicules or with half spicules. The problem however, requires urgent attention. The solution may come from analysing the similarities and differences at the molecular level.

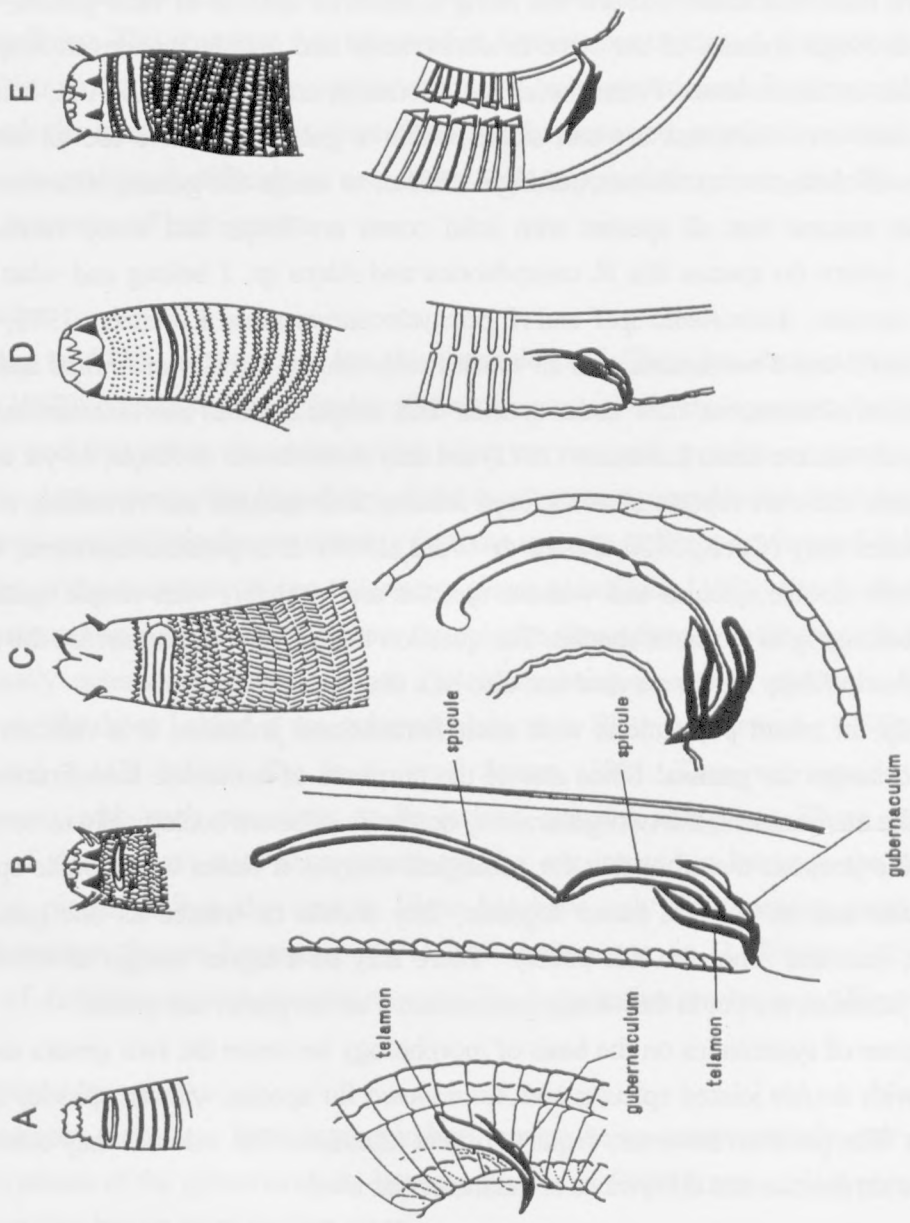


Figure 1.15: Heads and tails of different species of *Actinonema* and *Rhips*; A: *Actinonema pachydermatum* Cobb, 1920 (after Cobb), B: *Rhips ornata* Cobb, 1920 (after Cobb), C: *Rhips sp. 1* (undescribed species from the Indian Ocean), D: *Actinonema sp. 1* (undescribed species from the Indian Ocean), E: *Actinonema smolae* sp. n.

Trochamus Boucher and Bovée, 1971

Trochamus Boucher & Bovée, 1971, is characterised by heterogeneous cuticle with a conspicuous lateral differentiation, slit-like faint amphids, six plus four cephalic setae in one crown, buccal cavity with one dorsal tooth and two smaller sub-ventral ones, simples spicules and absence of pre-cloacal supplements.

Trochamus can be distinguished from *Nygmatonchus* by the nature of the amphids (which are large and conspicuous in the latter), lack of cuticular differentiation at pre- and post anal regions and the simple copulatory apparatus (no telamons).

Trochamus can be distinguished from *Endeolophos* Boucher, 1976 by the nature of the cuticle that is heterogeneous with a complex lateral alae in *Trochamus* while in *Endeolophos*, the cuticle is homogenous and the lateral differentiation is simple.

Here, we describe and give additional description of four species of *Trochamus* which can be distinguished by the size and shape of the body, amphid shape and the copulatory apparatus (Table 1.3).

Table 1.3: Distinguishing characters for the species of *Trochamus* below.

	T. bulbosa sp.n.	*T. complexus*	*T. prosoporus*	*T. polki* sp.n.
Body shape	enlarged at mid-body	enlarged at mid-body	cylindrical	cylindrical
Body length	350-420 µm	550-620 µm	1400-1540 µm	520-620 µm
Amphids	oval in shape	oval in shape	inconspicuous	open loop
Spicules	slender, poorly developed capitulum	slender, rounded capitulum	massive, poorly dev. capitulum	small, notched anterior end

Trochamus bulbosa sp.n. (Figure 1.16 A-G)

Type material

Three males and seven females on slides nos. RI540-RI541 and 10398-10404

Etymology

Name given to the species because of the thick middle part.

Type locality

Males from sts. 111 (2), 511 (δ_1) and females from sts. 111 (1), 511 (5 including φ_1) and 531 (1)

Measurements

δ_1 - 41 69 M 299

$\frac{\qquad\qquad\qquad\qquad\qquad\qquad}{7 \quad 16 \quad 18 \quad 22 \quad 15}$ 367

a: 16.7; b: 5.3; c: 5.4; c': 3.8; spic: 22

φ_1 - 42 73 175 314

$\frac{\qquad\qquad\qquad\qquad\qquad\qquad}{7 \quad 16 \quad 18 \quad 25 \quad 12}$ 378

a: 15.1; b: 5.2; c: 5.9; c': 5.3; V: 46

Other $\delta\delta$'s L: 373; a: 18.7-20.7; b: 4.8; c: 5.3-5.5; c': 4.4-4.5; spic: 19-20

Other $\varphi\varphi$s L: 365-415; a: 13.0-18.9; b: 4.6-5.3; c: 5.4-6.5; c': 4.3-6.0; V: 47-51

Description

Males: The body is small with a plump mid-body and tapers towards the tail end often curved into a 'c-shape' (Figure 1.16 A). The cuticle is annulated and punctated. The punctations are more prominent at the pharyngeal region than on the rest of the body (Figure 1.16 B). The lateral differentiation is a raised alae (Figure 1.16 F) which starts at the level of bulb until the tail region. Somatic setae are scarce.

The amphids are often indistinct or very faint, but probably slit-like. The inner and outer labial sensilla are not distinct, the cephalic ones are very short, 2-3 µm long and at the level of the amphids. Stoma is small and completely surrounded by the pharyngeal tissue, it has a large dorsal tooth and two small sub-ventral ones. The labial rugae around the stoma are very prominent (Figure 1.16 C). The pharynx is cylindrical, 69-85 µm long, with a swollen terminal end to form a bulb which is 61-67 % of the cbd in diameter at the widest

part. The nerve ring surrounds the pharynx at 54-62 % of the pharyngeal length from the anterior. The ventral gland is located posterior of the pharyngo-intestinal junction and the gland opening is at the level of the nerve ring (Figure 1.16 A).

The reproductive system is monorchic with outstretched testis located to the right of the intestine. The spicules are 1.2-1.3 abd long, slender and slightly curved at the posterior end and with a poorly developed round capitulum (Figure 1.16 G). The gubernaculum is simple, 12 µm long, blunt at the posterior tip. No pre-cloacal supplements (Figure 1.16 A).

The tail is conico-cylindrical, 64-72 µm long and tapers gradually at the tip.

Females: Similar to males (Figure 1.16 D, E). The reproductive system is amphidelphic with reflexed ovaries, anterior branch to the right of the intestine and the posterior one to the left of it. The gravid females are greatly enlarged at mid-body. Vulva and vagina are simple.

Differential diagnosis

Trochamus bulbosa sp.n. is characterised by a small plump body, a narrow pharyngeal region and enlarged mid-body, prominent labial rugae, slender spicules with a poorly developed capitulum and a pointed tail tip.

Trochamus bulbosa sp. n. closely resembles *T. carinatus* Boucher & Bovée, 1971, in tail shape and the de Man ratios, but differs from it in size (L=440-525 µm compared to 365-411 µm in the new species), and in the shape of the spicules (*T. carinatus* has spicules with an open capitulum).

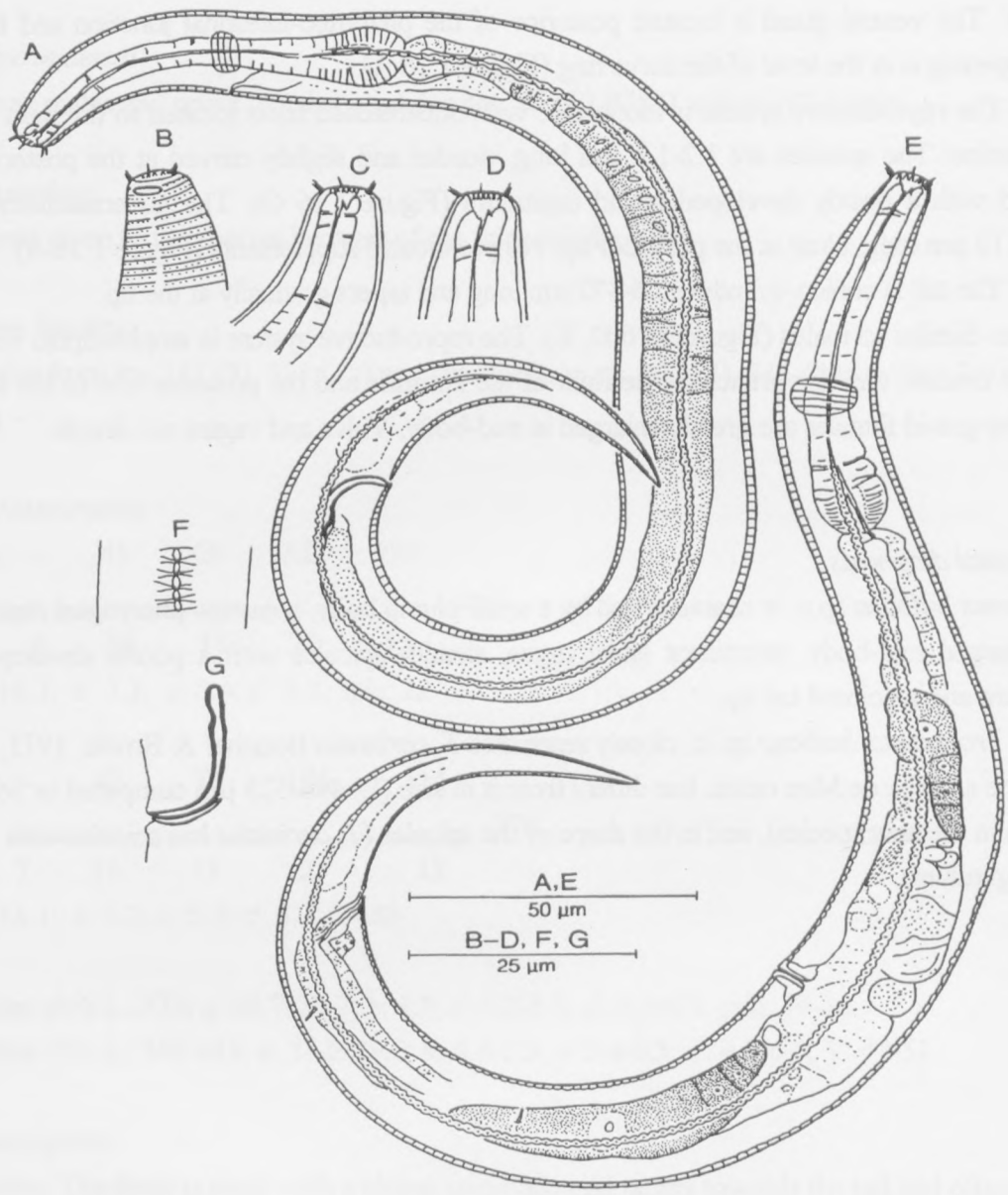


Figure 1.16: *Trochamus bulbosa* sp. N.; A: ♂$_1$ total body, B: ♂$_1$ head region (superficial), C: ♂$_1$ stoma, D: ♀$_1$ stoma, E: ♀$_1$ total body, F: ♂$_1$ lateral differentiation, G: ♂$_1$ spicules.

Trochamus complexus Boucher, 1976 (Figure 1.17 A-H)

Material studied

Two males and five females studied. One male and four females on slide nos. 10520-10522.

Locality

Males from sts. 117 (δ_1), 528 (1) and females from sts. 128 (4 including φ_1) and 117 (1)

Measurements

δ_1	-	54	93	M	491
					600
	9	17	18	27	17

a: 22.2; b: 6.5; c: 5.5; c': 6.4; spic: 37

φ_1	-	55	93	264	462
					582
	8	17	17	39	14

a: 14.9; b: 6.3; c: 4.9; c': 8.6; V: 45

δ_2 L: 548; a: 19.6; b: 5.7; c: 5.5; c': 5.6

Other ♀♀s L: 575-623; a: 13.1-25; b: 6.1-6.5; c: 4.9-6.1; c': 7.0-8.3; V: 47-51

Additional description

Males: The body is cylindrical, swollen at mid-body and slightly tapering at the anterior end and with a cylindrical tail end (Figure 1.17B). The cuticle is annulated and punctated. The punctations are more prominent in the pharyngeal region than on the rest of the body (Figure 1.17 C). Lateral differentiation is composed of a thick and raised longitudinal ridge that begins at the level of the terminal bulb until the anterior part of the tail (Figure E & F for female). Somatic setae are short (3µm long) and in four longitudinal rows (Figure 1.17 E).

The amphids are very faint, loop-shaped and located posterior of the cephalic sensilla (Figure 1.17 A). The inner labial sensilla are not conspicuous and outer labial and the cephalic are short (2 µm long) and located at the same level. The stoma is narrow, often protruded and there is a small dorsal tooth. The pharynx is cylindrical, with a swollen posterior end to form an elongate bulb that is 50-71 % of cbd in diameter. The nerve ring surrounds the pharynx at 54-61 % of the length of the pharynx from the anterior. The ventral gland is small located at 30-34 µm behind the pharyngo-intestinal junction. Opening of the gland is located at 70 % of the pharyngeal length from the anterior (Figure 1.17 C).

The reproductive system is monorchic with outstretched testis located to the right of the intestine. The spicules are long and slender, slightly curved posteriorly and with a well developed rounded capitulum. The gubernaculum is short, 12 μm long and parallel to the spicules (Figure 1.17 B & H).

The tail is elongate cylindrical and tapers slightly towards the end. The caudal glands are three located at the anterior end and arranged in tandem.

Females: They are similar to males (Figure 1.17 A, D, E & G). They are greatly enlarged at mid-body, especially in the gravid ones. The reproductive system is amphidelphic with reflexed ovaries, anterior branch located to the right of the intestine and the posterior one to the left of it. The vulva is simple and vagina has a thick wall (Figure 1.17 F).

Discussion

Trochamus complexus Boucher, 1976, is characterised by an elongate anterior region and enlarged mid-body, lateral differentiation of a thick and raised longitudinal row of dots that starts posterior of the pharyngeal region and long slender spicules with rounded capitulum.

Trochamus complexus was first described from the West Channel (Boucher, 1976). These present individuals are identified as *T. complexus* because of the similarity in the general body shape (anterior end and tail region), the bulb and the spicules with the described population. The specimens investigated here, differs slightly from those of Boucher in: total length (L=548-600 μm compared to 672-728 μm respectively) a-ratio is larger in the first two males (a=36.3 and 38.3) of Boucher's specimens compared to the present individuals, because these were probably immature males as can be seen also from the spicules size of the three males (spic= 22μm, 22μm, 41 μm).

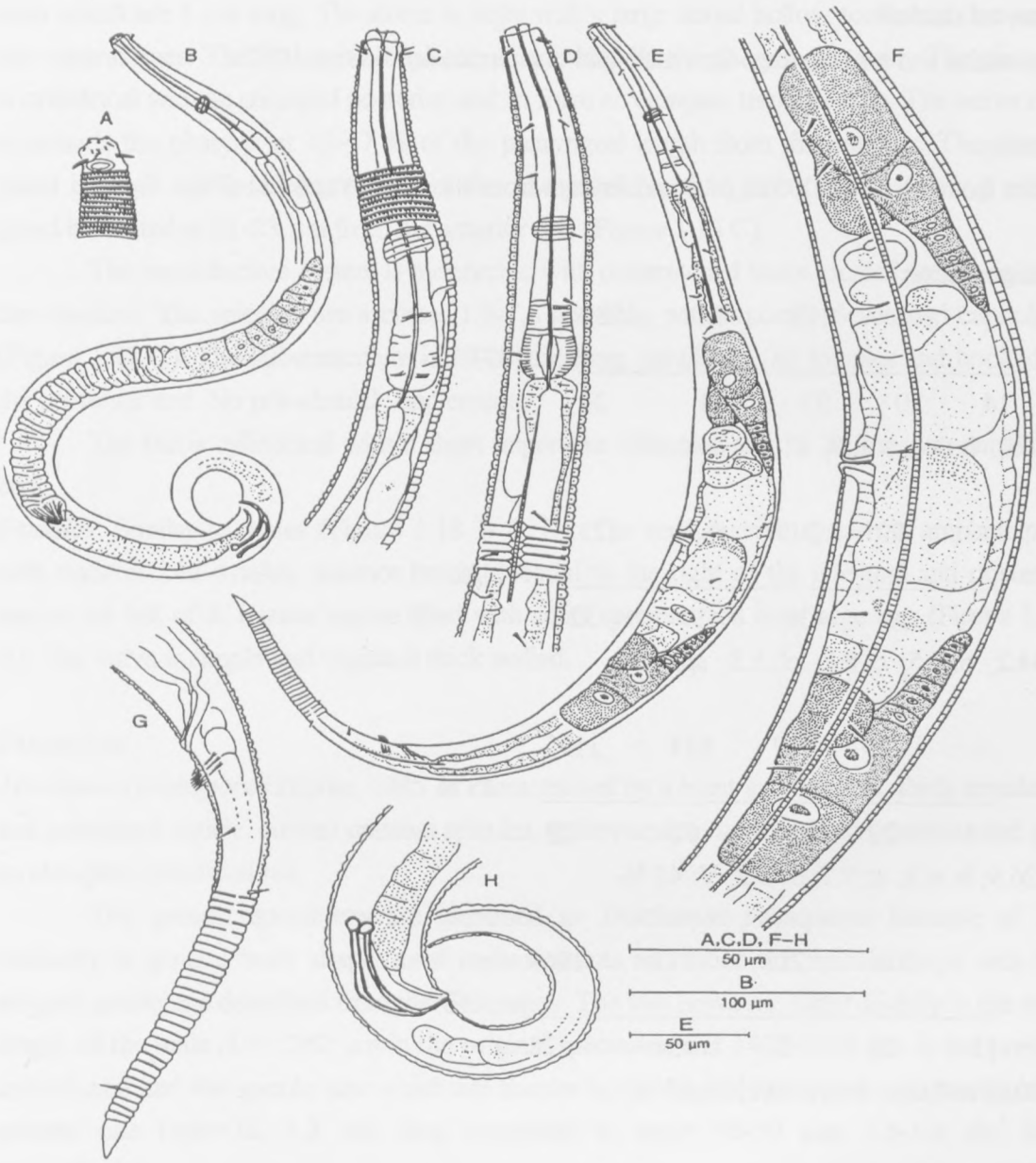


Figure 1.17: *Trochamus complexus* Boucher & Bovée, 1971; A: ♀$_1$ head region (superficial), B: ♂$_1$ total body, C: ♂$_1$ pharyngeal region, D: ♀$_1$ pharyngeal region, E: ♀$_1$ total body, F: ♀$_1$ reproductive system, G: ♀$_1$ tail, H: ♂$_1$ tail

Trochamus prosoporus Blome, 1985 (Figure 1.18 A-D)

Material studied

Two males and two females. One male and one female on slide no.10523.

Locality

Males from sts. 114 (1), 511 (σ^{1}_{1}) and females from sts. 114 (1) and 511 (φ_{1})

Measurements

σ^{1}_{1} - 100 212 M 1289

1473

14 30 33 41 36

a:35.9; b: 7.0; c: 8.0; c': 5.1; spic: 57

σ^{1}_{2} - 99 217 M 1232

1402

14 29 33 41 32

a:34.2; b: 6.5; c: 8.2; c': 5.3; spic: 59

φ_{1} - 98 217 614 1195

1374

14 29 34 51 29

a: 26.9; b: 6.3; c: 7.7; c': 6.2; V: 45 %

φ_{2} - 100 219 717 1369

1539

15 29 37 50 28

a:30.8; b: 7.0; c: 9.1; c': 6.1; V: 47 %

Additional description

Males: The body is truncate and blunt at the anterior end and a cylindrical elongate tail end (Figure 1.18 C). The cuticle is very thick and heterogeneously punctated with punctations that begin posterior of the cephalic setae (Figure 1.18 B). At the pharyngeal region the cuticular pattern is more complex than on the rest of the body. The lateral differentiation is composed of two longitudinal rows of thick dots which are raised, superficially appearing like a single raised line with branching fine annuli (Figure 1.18 C). The somatic setae are long 15-17 µm long and very thin (and most of them are broken off) and they are in four longitudinal rows (Figure 1.18C).

The amphids are fine slit-like located at 7-8 µm from the anterior end. The inner labial sensilla are papilliform, outer labial are short 2-3 µm long and at the same level as the cephalic ones which are 5 µm long. The stoma is large with a large dorsal hollow tooth and two small sub-ventral ones. The stoma is completely surrounded by the pharyngeal tissue. The pharynx is cylindrical with an enlarged posterior end to form an elongate terminal bulb. The nerve ring surrounds the pharynx at 45-47 % of the pharyngeal length from the anterior. The ventral gland is small and located posterior of the pharyngo-intestinal junction, the opening of the gland is located at 21-23 µm from the anterior end (Figure 1.18 C).

The reproductive system is monorchic with outstretched testis located to the right of the intestine. The spicules are arcuate, 1.6-1.8 abd long with a poorly developed capitulum (Figure 1.18 C). The gubernaculum is 20-23 µm long, parallel to the spicules and hooked at the posterior end. No pre-cloacal supplements.

The tail is cylindrical with a short finger-like spinneret and 18-28 µm non-annulated end.

Females: Similar to males (Figure 1.18 B & D). The reproductive system is amphidelphic with outstretched ovaries, anterior branch located to the right of the intestine and posterior one to the left of it. Uterus maybe filled with small spermatozoa or a large egg (Figure 1.18 A). The vulva is simple and vagina is thick walled.

Discussion

Trochamus prosoporus Blome, 1985, is characterised by a blunt anterior end, thick annulated and punctated cuticle, curved massive spicules, gubernaculum with hooked posterior end and an elongate cylindrical tail.

The present specimens are identified as *Trochamus prosoporus* because of the similarity in general body shape, most measurements and ratios and spicule shape with the original specimens described from the Galapagos. The two however, differ slightly in the total length of the male (L= 1262 µm in the original specimens and 1402-1609 µm in the present individuals) and the spicule size which are shorter in the original specimens compared to the present one (spic=38, 1.3 abd long compared to spic= 56-59 µm, 1.6-1.8 abd long respectively).

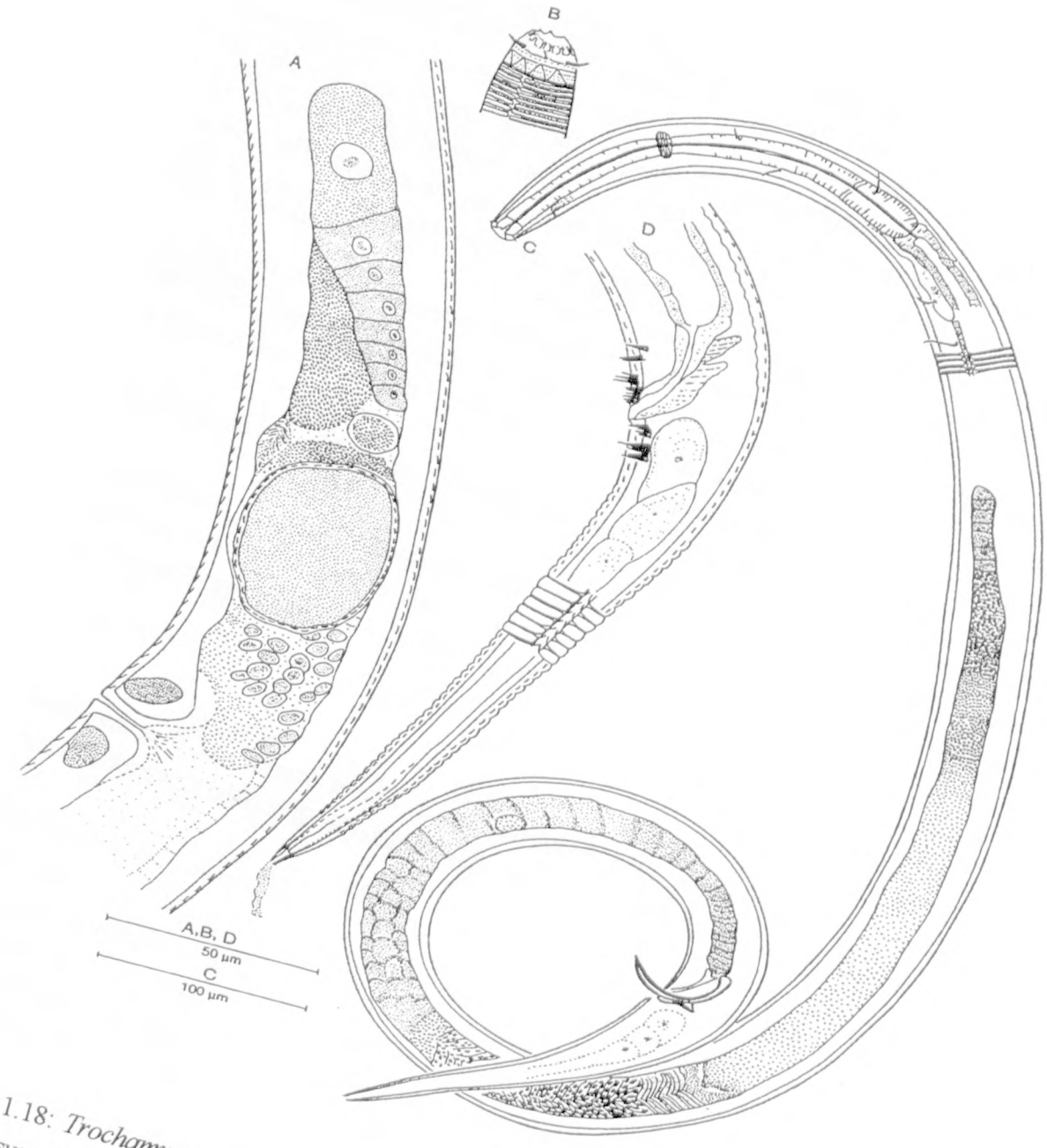


Figure 1.18: *Trochamus prosoporus* Blome, 1985; *A*: ♀1 reproductive system, *B*: ♀1 head region (superficial), C: ♂1 total body, D: ♀1 tail,

***Trochamus polki* sp. n. (Figure 1.19 A-G)**

Type material

One male and four females on slides nos. RI542-RI543 and 10405-10407

Etymology

Name given after Prof. Polk of Free University of Brussels

Type locality

Male from st. 552 and females from sts. 503 (1), 528 (♀$_1$, ♀j), 550 (1)

Measurements

♂$_1$	-	51	85	M	427	
						523
	8	16	16	16	12	

a: 34.9; b: 6.2; c: 5.4; c': 8.0; spic:16

♀$_1$	-	55	103	283	505	
						599
	7	16	18	23	14	

a: 26.0; b: 5.8; c: 6.4; c': 6.7; V: 47%

Other ♀♀s L: 528-621; a: 24.0-26.3; b: 5.8-6.1; c: 6.9; c': 5.4-6.3; V: 47-50%

Description

Male: The body is cylindrical and slender, attenuated both on the anterior and posterior ends which has a cylindrical tail. The cuticle is annulated and punctated, with punctations being more prominent at the pharyngeal region than on the rest of the body. Lateral differentiation is a raised longitudinal row of thick bars one annule width in length (Figure 1.19 C). Somatic setae are scarce.

The amphids are loop-shaped and located within the head region posterior of the anterior sensilla. The inner labial sensilla are inconspicuous while outer labial and the cephalic sensilla are very short, 1.5 µm long and located at the same level (Figure 1.19 B).

The labial rugae are prominent around the stoma (Figure 1.19 B). The stoma is small and surrounded by the pharyngeal tissue, it bears a small dorsal tooth and smaller sub-ventral ones. The pharynx is 85-112 µm long, cylindrical with a slight expansion at the base to form the bulb which is elongate, 53-63 % of the cbd in diameter at the widest part. The nerve ring surrounds the pharynx at 53-60 % of the pharyngeal length from the anterior.

The reproductive system is monorchic with outstretched testis, located to the right of the intestine. The spicules are 1.3 abd long, curved posteriorly and having a poorly developed capitulum. The gubernaculum is 8 µm long and parallel to the spicules (Figure 1.19 A).

Tail is conical elongate and attenuate gradually towards the tip.

Females: Similar to males (Figure 1.19 E, F & G). Reproductive system is amphidelphic with reflexed ovaries, anterior branch located to the right of the intestine and posterior one to the left of it. The vulva is pore-like and the vagina has thick refractive pieces (Figure 1.19 D).

Differential diagnosis

Trochamus polki sp. n. is characterised by having a raised lateral alae which appears as a single row of thick bars superficially, loop-shaped amphids, prominent labial rugae, an elongate terminal bulb and refractive vagina walls.

Trochamus polki sp.n. resembles *T. carinatus* sensu Juario, 1974 in measurements and ratios and in longitudinal alae and spicules in *T. carinatus* sensu Boucher & Boveé, 1971. However *T. polki* sp.n. differs from *T. carinatus* in the shape of the amphids (loop-shaped in the former and simple slit-like in the latter species) and the spicules shape.

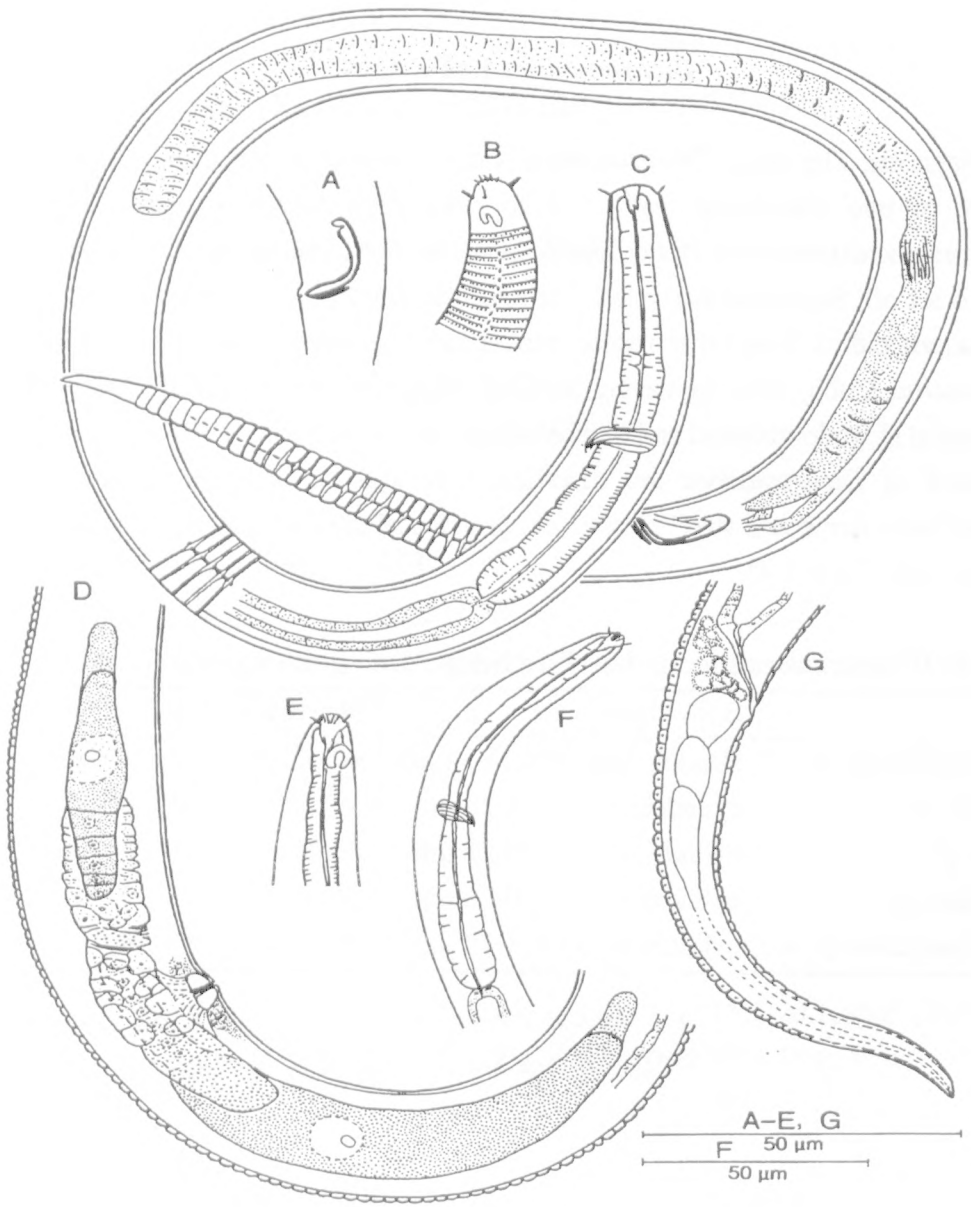


Figure 1.19: *Trochamus polki* sp. n. A: ♂$_1$ spicules, B: ♀$_2$ head region (superficial), C: ♂$_1$ total body, D: ♀$_1$ reproductive system, E: ♀$_1$ stoma, F: ♀$_1$ pharyngeal region, G: ♀$_1$ tail

Hypodontolaiminae de Conick, 1965

Dichromadora Kreis, 1929

Diagnosis. The genus *Dichromadora* is characterised by a triangular hollow dorsal tooth, one or two sub-ventral teeth, oval to ovally-loop shaped amphids, homogenous cuticular ornamentations, two (four) longitudinal rows of punctations and an oesophageal bulb that is set off. Supplements (typical Chromadorid ones) may be present (Wieser, 1954). *Dichromadora* differs from other related genera like *Hypodontolaimus* de Man, 1886 and *Ptycholaimellus* Cobb, 1920 by having an acute triangular dorsal tooth (Kreis, 1929) and lacking typical Hypodontolaimid and Ptycholaimids characters.

Five species of *Dichromadora* are described here and distinguished by the following characters, body shape and size, number of pre-cloacal supplements and the shape of the pharyngeal bulb (Table 1.4).

Table 1.4: *Dichromadora* species described below, distinguishing characters

	Body shape	Pharyngeal bulb	Supplements
D. longicaudata sp. n.	slender, long M=13-14 μm	set off, pyriform	absent
D. gathuai sp. n.	cylindrical, M=25-28 μm	set off, pyriform	absent
D. loisae sp. n.	cylindrical, M=20-21 μm	double	7
D. cucullata sp. n.	cylindrical, M=20-26 μm	pyriform	7
D. quadripapillata sp. n.	cylindrical, M=21-23 μm	pyriform	4

***Dichromadora longicaudata* sp.n. (Figure 1.20 A-F)**

Type material

Five males and four females on slide nos. RI 518-RI531 and 10371-10377

Etymology

Name given because of the species' long tail for the genus

Type locality

Males from sts. 105 (1), 120 (♂$_1$), 131 (1), 532 (2)

Females from sts. 105 (1), 120 (♀$_1$), 132 (1), 550 (1)

Measurements

♂$_1$	-	45	64	M	383	
						548
	5	8	11	14	8	

a:39.1; b: 8.6; c: 3.3; c': 18.3; spic: 19

♀$_1$	-	41	66	208	377	
						538
	5	11	12	13	8	

a: 41.4; b: 8.2; c: 3.6; c': 18.9; V: 39 %

Other ♂♂s L: 486-510; a: 35.4-42.5; b: 7.0-8.6; c: 3.0-3.3; c': 16.1-20.1; spic: 19-24

Other ♀♀s L: 425-590; a: 30.4-44.8; b: 6.7-8.2; c: 2.5-4.0; c': 13.4-18.9; V: 39-43

Description

Males: The body is cylindrical and very thin with an elongate almost filiform tail. Head may be set off by a fine constriction (Figure 1.20 A). The cuticle is annulated and punctated with fine dots on the rest of the body except the lateral sides, which have two longitudinal rows of thick dots starting from the anterior end; the width between the two rows of lateral dots being 2-3 µm. Somatic setae are 5 µm long and in four longitudinal rows.

Four fine cephalic setae, 2-3 µm long; amphids were not seen. Stoma is small and has one hollow dorsal tooth. The pharynx is cylindrical, 63-71 µm long, with a pyriform terminal bulb that is 7-9 µm in diameter at the widest part. The nerve ring surrounds the pharynx at 62-67% of the pharyngeal length from the anterior end (Figure 1.20 C).

The reproductive system is monorchic, with outstretched testis located to the right of the intestine. The spicules are thin and arcuate, 2.3-2.6 x abd long. The gubernaculum is fine,

7 μm long, located parallel to the posterior part of the spicules and serrated on the posterior end. The tail is thin and long (107-212 μm) and has a fine long spinneret (10-16 μm long) (Figure 1.20 E).

Females: Females are similar to males (Figure 1.20 B, D). The reproductive system is amphidelphic, with reflexed ovaries, anterior branch located to the right of the intestine, posterior branch located to the left. The vulva is simple and vagina is surrounded by prominent sphincter muscles (Figure 1.20 F).

Differential diagnosis

Dichromadora longicaudata sp.n. is characterised by a slender body with an elongated tail; cuticle with two longitudinal rows of conspicuous dots; 5 μm long cephalic and somatic setae; arcuate spicules and a thin tail with a very long spinneret.

Dichromadora longicaudata sp. n. can be distinguished from all other described *Dichromadora* species except *D. amphidiscoides* by its body size and shape (small slender body with a long tail). *D. longicaudata* sp. n. closely resembles *D. amphidiscoides* Kito, 1981 in the general body shape, but a-ratio is higher in the new species (a= 30.4-44.8 in *D. longicaudata)* compared to *D. amphidiscoides* (a= 23.8-30.6) and the relative tail length is different between the two species (c-ratio= 13.4-20.1 in *D. longicaudata* sp. n. compared to c-ratio= 7.3-7.9 in *D. amphidiscoides)*. Furthermore, *D. amphidiscoides* has circular or loop-shaped amphids and *D. longicaudata* sp. n. has a long spinneret (10-16 μm long).

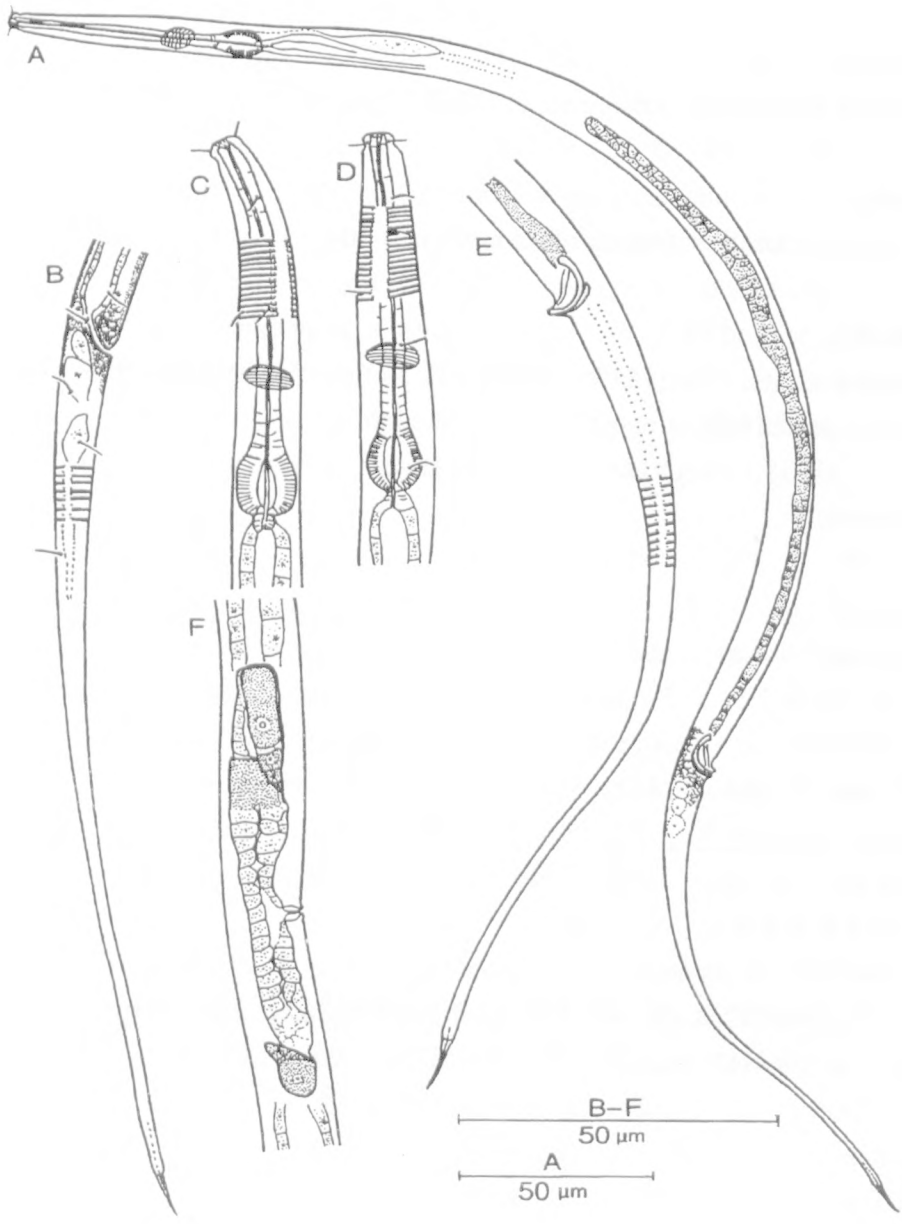


Figure 1.20: *Dichromadora longicaudata* sp.n.; A: ♂$_1$ total body, B: ♀$_1$ tail, C: ♂$_1$ pharyngeal region, D: ♂$_2$ pharyngeal region, E: ♂$_2$ tail, F: ♀$_1$ reproductive system

Dichromadora gathuai sp.n. (Figure 1.21 A-L)

Type material

Six males and six females on slide nos. RI532-RI533 and 10378-10386

Etymology

Name given after Dr. S.N. Gathua of Kenyatta Hospital

Type locality

Males were from sts. 120, 114 (3 including σ^{1}), 514 and 552 and females were from sts. 103 (2), 121 (φ_{1}) and 114 (3)

Measurements

σ^{1}	-	70	117	M	708	
						817
	10	20	20	25	19	

a: 32.7; b: 7.0; c: 7.5; c': 5.7; spic: 33

φ_{1}	-	64	106	312	636	
						703
	8	21	22	28	15	

a: 25.1; b: 6.6; c: 6.4; c': 7.3; V: 44 %

Other ♂♂ L: 509-817; a: 28.1-35.5; b: 5.5-7.5; c: 6.0-7.8; c': 5.7-6.2; spic: 24-27

Other ♀♀s L: 566-817; a: 26.2-31.7; b: 5.7-7.3; c: 5.3-7.0; c': 7.1-8.9; V: 43-47 %

Description

Males: The body is cylindrical with blunt anterior end and pointed tail. Cuticle is annulated and punctated. The lateral differentiation is a narrow and raised alae (Figure 1.21 K and L) which extends from mid-pharyngeal region till mid-tail region. Somatic setae are 5 µm long and in four longitudinal rows (Figure 1.21 A & I). The amphids were not seen. The inner labial setae are inconspicuous, the outer labial are papilliform while the cephalic ones are 3-4 µm long (Figure 1.21 C). The stoma has a large dorsal hollow tooth and two smaller sub-ventral ones (Figure 1.21 E).

Pharynx is cylindrical, 89-119 µm long, with posterior well formed bulb, 13 x 16 µm in dimension. The nerve ring surrounds the pharynx at 57-60 % of the length of the pharynx from the anterior (Figure 1.21 A). The ventral gland is located posterior of the cardia region and the gland opening is not conspicuous.

The reproductive system is monorchic, with outstretched testis located to the right of the intestine. The testis is long and wide followed by a narrower vas deferens with a special junction in between them (Figure 1.21 G). There are strong copulatory muscles extending anteriorly from the cloaca to about one tail length (Figure 1.21 B). The spicules are 1.5-1.7 abd long, curved with poorly developed capitulum. The gubernaculum is one abd long and has a serrated posterior end (Figure 1.21 I). Pre-cloacal supplements are absent.

The tail is 93-109 µm long, conical with a cylindrical end and pointed tip.

Females: They are similar to males in most aspects (Figure 1.21 D, E) but the tail is relatively longer (Figure 1.21 J) (see c- and c'-ratios). The reproductive system is amphidelphic with reflexed ovaries, anterior branch to the right and posterior one to the left of the intestine (Figure 1.21 F). The vulva is circular and vagina has a thick wall (Figure 1.21 H).

Differential diagnosis

Dichromadora gathuai sp.n. is characterised by cylindrical body with a blunt anterior end; cuticle with raised lateral alae; strong curved spicules and a gubernaculum with serrated posterior end and lacks pre-cloacal supplements.

Other *Dichromadora* species described without pre-cloacal supplements are *D. abnormis* Gerlach, 1953, *D. apapillata* Timm, 1961, *D. arcospiculum* Timm, 1961, *D. geophila* (De man, 1876) Gerlach, 1971, *D. islandica* Kreis, 1963, *D. punctata* Schuurmans Stekhoven, 1950, *D. simplex* Timm, 1961, *D. strandi* Allgen, 1940 and *D. tobaensis* Schneider, 1937.

Dichromadora gathuai can be distinguished from *D. geophila*, *D. punctata* and *D. strandi* in that the latter species have a short thick tail. The shape of the gubernaculum (serrated on the posterior end) distinguishes it from *D. arbnomis* and *D. arcospiculum* whose gubernaculum are blunt on the posterior end, *D. islandica*, *D. simplex* and *D. tobaensis* whose gubernacula are short and sharp on the posterior end and *D. apapillata* whose gubernaculum has two teeth on the posterior end. *D. apapillata* also has spicules that are open on the anterior end and the cephalic setae are 50 % hd compared to 30% hd in *D. gathuai* sp.n.

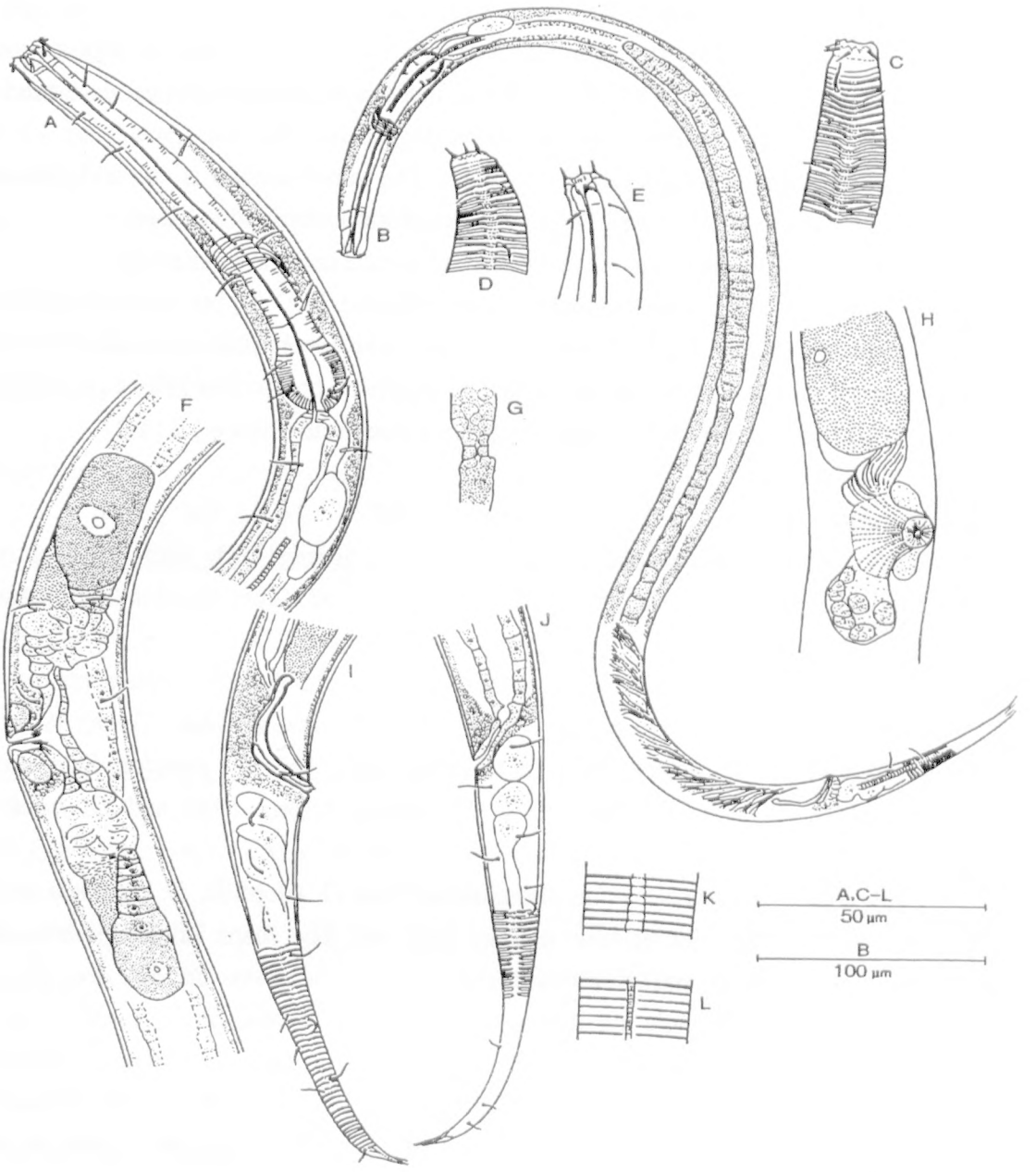


Figure 1.21: *Dichromadora gathuai* sp.n.; A: ♂1 pharyngeal region, B: ♂1 total body, C: ♂1 head region, D: ♀1 head (superficial), E: ♀1 head (section), F: ♀1 reproductive system, G: ♂1 testi-vas deferens junction, H: ♀1 vulva, I: ♂1 tail, J: ♀1 tail, K: cuticle, L: cuticle (more superficial)

Dichromadora loisae sp.n. (Figure 1.22 A-G)

Type material

Four males and five females in slide nos. RI534 and 10386-10388

Etymology

Name given after Miss Loise Kamau of the Kenyan Embassy in Belgium

Type locality

Males from sts. 108 (3 including σ^1) and 127, females from sts. 108 (φ_1) and 127 (4)

Measurements

σ^1 - 48 84 M 517

589

9 16 17 20 14

a: 29.5; b: 7.0; c: 8.2; c': 5.1; spic: 28

φ_1 - 48 84 271 460

546

10 16 17 21 12

a: 26.0; b: 6.5: c: 6.3; c': 7.2; V% : 50

Other $\sigma\sigma$ L: 513-561; a: 29.2-36.6; b: 6.5-7.2; c: 7.2-8.0; c': 5.0-5.5; spic: 27

Other $\varphi\varphi$s L: 508-614; a: 27.0-30.6; b: 6.0-7.3; c: 5.3-6.7; c': 7.4-7.9; V% : 44-51

Description

Males: The body is cylindrical with a rather blunt anterior end with a raised collar that surrounds the labial rugae and a conico-cylindrical tail (Figure 1.22B). The cuticle is punctated from just posterior of the amphids until the tail end leaving a small (4-5 µm) non-punctated end part. At the pharyngeal region the punctations are larger and more conspicuous than on the rest of the body. There are two longitudinal rows of larger dots on the lateral sides.

Inner and outer labial sensilla are inconspicuous and the four cephalic ones are 3 µm long and located at the base of the collar (Figure 1.22C). The somatic setae are in four longitudinal rows, 3-4 µm in length. At the pharyngeal region there are two pairs of conspicuous somatic setae; a dorsal pair located at 12-15 µm and 14-19 µm from the anterior end and a ventral pair located at 16-20 µm and 17-24 µm from the anterior end.

The stoma has a large dorsal tooth and two smaller sub-ventral ones (Figure 1.22A).

The pharynx is 78-86 µm long, cylindrical with a posterior well-developed double bulb that is 12-15 µm at the widest part. The nerve ring surrounds the pharynx at 54-57 % of the length of the pharynx from the anterior end. The ventral gland is small, located (middle of the gland is) at 12 µm from the end of the pharynx (Figure 1.22A). The opening of the gland was not seen.

The reproductive system is long with the vas deferens being half as long.

Spicules are 1.9-2.1 abd long, curved and without a capitulum and appears to have a velum. The gubernaculum is simple 12-14 µm long. There are seven (or eight) cup-shaped pre-cloacal supplements located close to each other from 12-14 µm until 44-54 µm from the cloaca opening (Figure 1.22F).

Females: They are similar to males except for the tail that is relatively longer than in males (see c-ratio and c' values) (Figure 1.22E and G). The reproductive system is amphidelphic with reflexed ovaries; anterior to the right and posterior to the left of the intestine (Figure 1.22D).

Differential diagnosis

Dichromadora loisae sp.n. is characterised by a blunt anterior end with a collar that surrounds the labial rugae, a stoma with a large dorsal tooth, a well-developed double pharyngeal bulb and seven pre-cloacal supplements.

A double pharyngeal bulb and an anterior collar surrounding the rugae are typical characters for the genus *Ptycholaimellus* (Jensen & Nehring, 1992). However, *Ptycholaimellus* has a groove at the base of the collar and lacks typical Chromadorid pre-cloacal supplements. In this new species, the amphids can be seen at the level of the cephalic setae which maybe an indication that there maybe no groove. And although the opening of the ventral gland and the size of the same were not clearly indicated as generic characters for *Ptycholaimellus* (Jensen & Nehring, 1992), most species of *Ptycholaimellus* have the ampulla at the anterior end and the ventral gland is large, which is not the case in this species. Furthermore, this species has typical*Dichromadora* because of having a large dorsal hollow tooth, t

longiarge buccal

bulb. Besides, *D. gracilis* Kreis, 1929, although not illustrated is described as having a double bulb and *Dichromadora sp.* Vitiello, 1970, is illustrated as having one (double bulb), although not well-developed.

Other *Dichromadora* species that possess seven pre-cloacal supplements are *D. cephalata* (Steiner, 1916), Gerlach, 1951 and *D. cucullata* Lorenzen, 1973. However, *D. loisae* sp.n. can be distinguished from these species in having a double bulb and a collar.

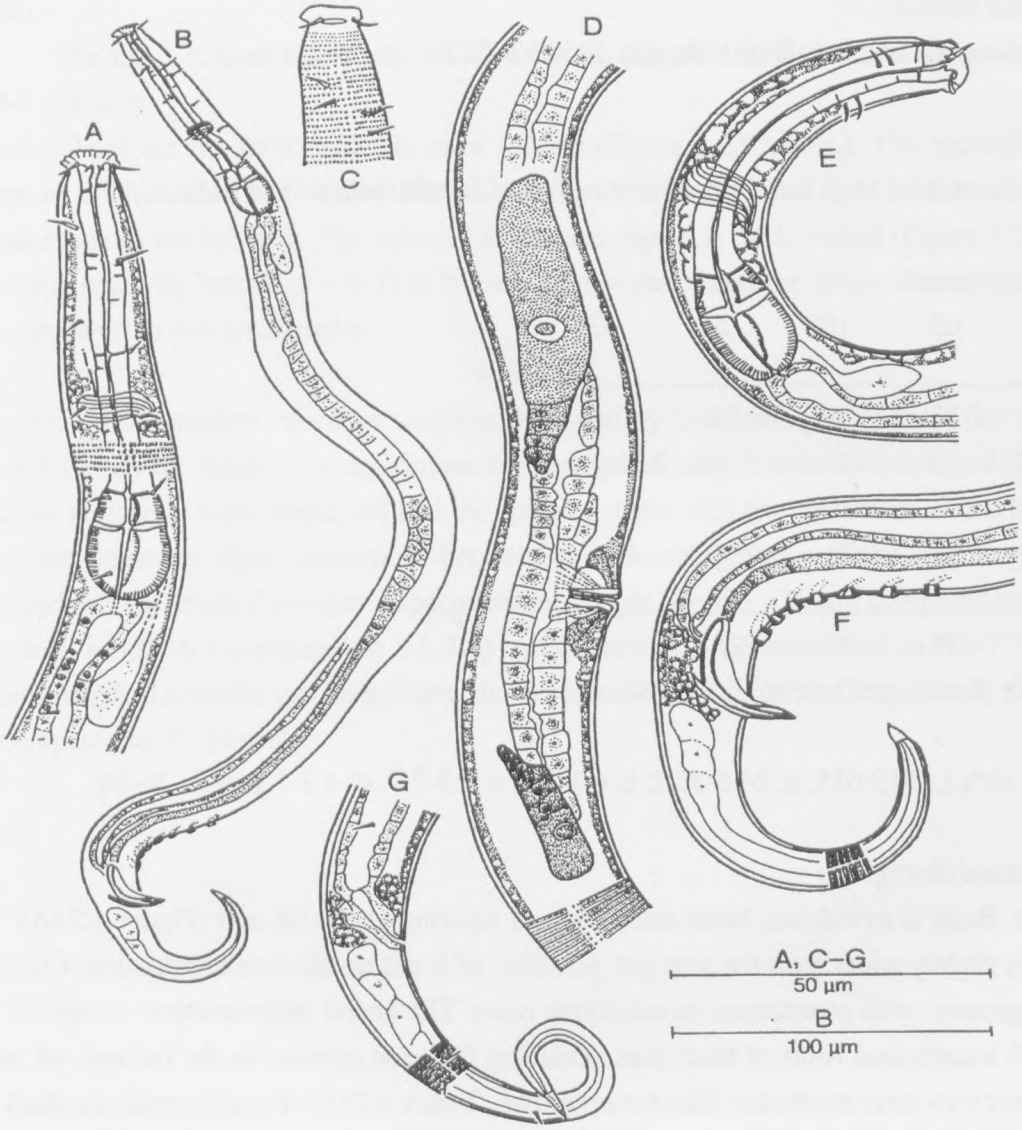


Figure 1.22: *Dichromadora loisae* sp.n.; A: ♂$_1$ pharyngeal region, B: ♂$_1$ total body, C: ♂$_1$ head, D: ♀$_1$ reproductive system, E: ♀$_1$ pharyngeal region, F: ♂$_1$ tail, G: ♀$_1$ tail

Dichromadora cucullata Lorenzen, 1973 (Figure 1.23 A-K)

Material studied

Five males and one female on slide nos. 10509-10512

Locality

Males from sts. 114 (3 including ♂1), 511 (2), and female from st. 114 (♀1)

Measurements

♂1	-	63	101	M	532	
						614
	8	17	18	20	16	

a: 30.7; b: 6.1; c: 7.5; c': 5.1; spic: 24

♀1	-	62	98	274	450	
						538
	8	18	21	26	14	

a: 20.0; b: 5.6; c:5.3; c': 6.7; V% : 46

Other ♂♂s L: 519-635; a: 24.6-30.2; b: 6.1-7.4; c: 7.3-7.7; c': 4.3-5.1; spic: 20-24

Additional description

Males: Body is cylindrical, blunt anteriorly and tapering at the tail end (Figure 1.23A). The head is slightly wider than the area just posterior of it but no obvious constriction. Cuticle is homogenous, with punctations in transverse rows. The lateral differentiation consist of two (four?) longitudinal rows of thick dots extending from the anterior to the tail end, of which the inner two rows are thicker than the outer two (Figure 1.23B). Somatic setae are short and sparse. At the anterior pharyngeal region there are two pairs of setae: a dorsal and a ventral one.

Inner and outer labial sensilla are tiny and the cephalic ones are short 3-4 µm long. The amphids were not seen. The stoma is small with a small dorsal hollow tooth and two sub-ventral ones (Figure 1.23C). The pharynx is 74-101 µm long, cylindrical with a well-developed terminal bulb that is 60-63 % cbd in diameter at the widest part (Figure 1.23E). The nerve ring surrounds the pharynx at 60-67 % of its length from the anterior. The ventral gland is small, 18-26 µm long, located at 20-30 µm (mid point of the gland) posterior of the cardia. The gland opening was not seen. Cardia is small and flattened.

The reproductive system is monorchic with outstretched testis located to the right of the intestine. Spicules are 1.2-1.5 abd long and curved proximally (Figure 1.23J). The

gubernaculum is 11-14 µm long and parallel to the spicules. There are seven cup-shaped pre-cloacal supplements, extending from 11-12 µm upto 45-55 µm in front of the cloaca (Figure 1.23K).

The tail is conical cylindrical, 65-82 µm long (Figure 1.23I). It has a finger-shaped tip, 4-5 µm long.

Females: They are similar to males in most aspects (Figure 1.23D & F,). The reproductive system is amphidelphic, with reflexed ovaries, anterior branch to the right of the intestine, posterior one to the left of it. The vulva is simple and vagina is thick walled (Figure 1.23G). The tail is relatively longer (c' = 6.3) in females than in males and the finger-like tip is 6 µm long compared to 4-5 µm in males.

Remarks: *Dichromadora cucullata* was first described by Lorenzen (1973) from the North Sea and the Kieler Bucht. Our specimens are recognised as *D. cucullata* because of the similarity in general body shape, tail and the spicules shape with the specimens of Lorenzen. There are however, slight differences between the present group and the one originally described in total length [Lorenzen's specimens are longer (L=595-725 µm compared to 519-635 µm)], b- (5.7-6.4 compared to 6.1-7.4) and c-ratios (5.8-6.6 compared to 7.3-7.7) and spicules length [Lorenzen specimens have shorter spicules in spite of the longer body (18-22 µm compared to 20-24 µm)].

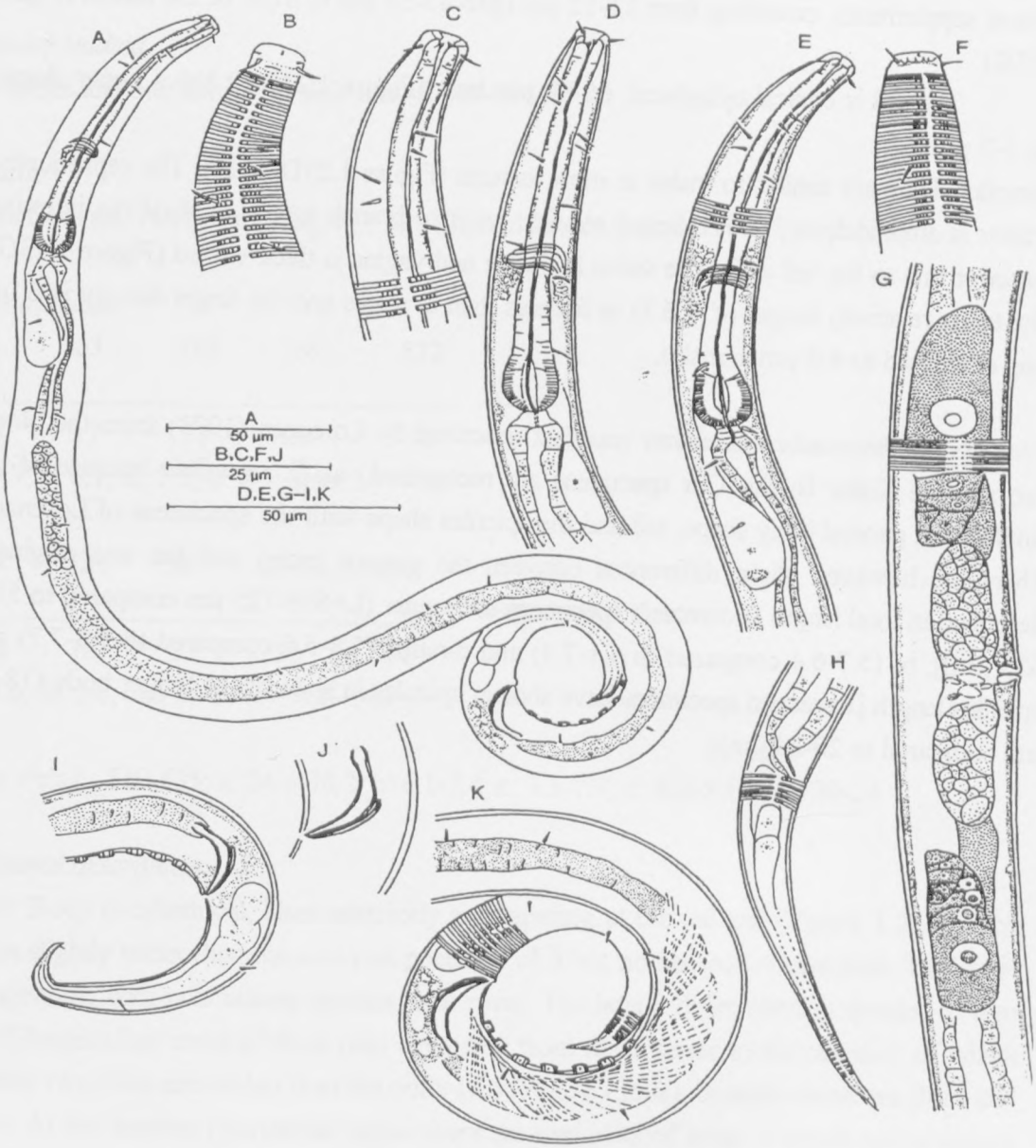


Figure 1.23: *Dichromadora cucullata* Lorenzen, 1973; A: ♂$_1$ total body, B: ♂$_1$ head (superficial), C: ♂$_1$ head (section), D: ♀$_1$ pharyngeal region, E: ♂$_1$ pharyngeal region, F: ♂$_1$ head (section), G: ♀$_1$ reproductive system, H: ♀$_1$ tail, I: ♂$_2$ tail, J: ♂$_1$ spicules, K: ♂$_1$ tail

***Dichromadora quadripapillata* sp.n. (Figure 1.24 A-G)**

Type material

One male and five females on slide nos. RI535-RI536 and 10389-10391

Type locality

All specimens are from st. 511

Etymology

The species name is derived from the number (four) of the pre-cloacal supplements.

Measurements

σ_1 - 84 M 632

727

9 - 23 19

a:31.6; b: 8.7; c: 7.7; c':5.0; spic: 26

φ_1 - 60 100 307 584

699

8 19 21 24 14

a: 29.1; b: 7.0; c: 6.1; c': 8.2; V: 44 %

Other ♀♀s L: 661-717; a: 25.4-27.6; b: 7.2-8.7; c: 5.8-7.7; c': 6.6-7.6; V: 43-46 %

Description

Males: The body is cylindrical, blunt anteriorly and tapering at the tail end. The cuticle is homogeneous with transverse rows of punctations. At the pharyngeal region, the dots are more conspicuous than on the rest of the body. At the lateral sides, there are four longitudinal rows of thick dots that extend from the anterior to the tail end. Somatic setae are sparse and short.

Amphids were not seen. The inner labial setae are inconspicuous, outer labial sensilla are papilliform and the cephalic ones are 4 µm long (Figure 1.24A). The stoma is small and has a dorsal hollow tooth and two small sub-ventral ones. The pharynx is cylindrical, 80-100 µm long, with a well set off terminal bulb which is 62-67 % cbd in diameter. The nerve ring surrounds the pharynx at 60-64 % of its length from the anterior (Figure 1.24B, female). Ventral gland is large 23-26 µm long, located at 28-32 µm (mid-point) from the cardia but the gland opening was not seen.

The reproductive system is monorchic with outstretched testis located to the right of the intestine. The spicules are 1.4 x abd long and curved. The gubernaculum is 18 µm long and parallel to the spicules. There are four (1+3) cup-shaped pre-cloacal supplements located at 23 µm, 41 µm, 51 µm and 61µm in front of the cloacal (Figure 1.24G). The tail is conico-cylindrical, with a clear spinneret (Figure 1.24G).

Females: They are similar to males in most aspects. The reproductive system is amphidelphic, with outstretched ovaries, anterior branch to the right of the intestine, posterior one to the left of it (Figure 1.24B). In one female, there was an egg (21 x41 µm in size) in either side of the uterus, indicating that ovulation takes place simultaneously from both ovaries (Figure 1.24D) in this species.

Tail is cylindrical, with an elongate narrow posterior end. It is relatively longer than in the male.

Differential diagnosis

Dichromadora quadripapillata sp. n. is characterised by four longitudinal rows of dots, short somatic setae with two conspicuous pairs at the anterior pharyngeal region, cephalic sensilla are 40 % of the hd and four (1+3) pre-cloacal supplements in males.

Dichromadora quadripapillata sp.n. differs from other described *Dichromadora* species in the number (four) and arrangement (1+3) of the pre-cloacal supplements.

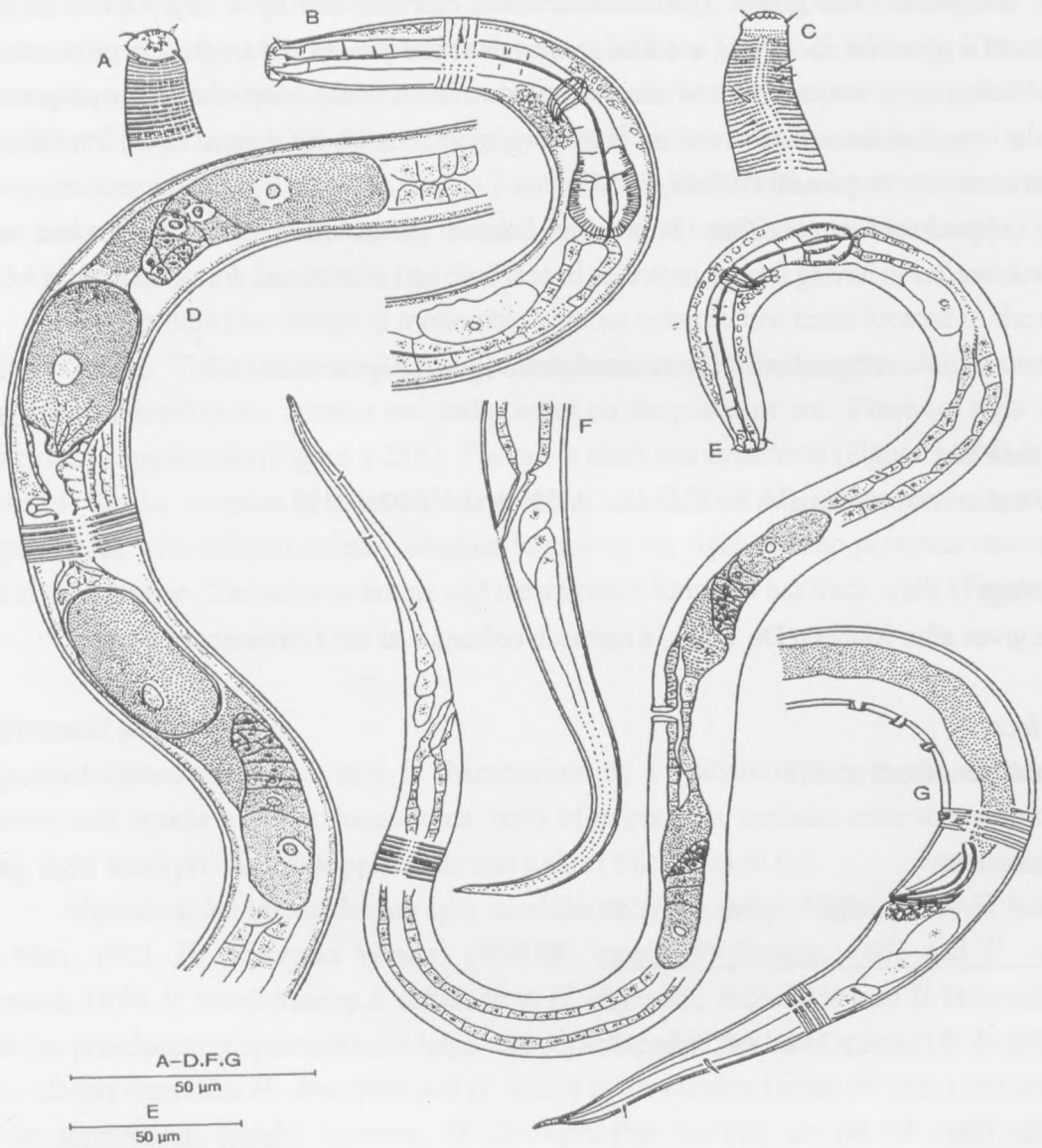


Figure 1.24: *Dichromadora quadripapillata* sp.n.; A: ♂$_1$ head (superficial), B: ♀$_1$ pharyngeal region, C: ♀$_1$ head (section), D: ♀$_1$ reproductive system, E: ♀$_1$ total body, F: ♀$_1$ tail, G: ♂$_1$ tail

Hypodontolaimus de Man, 1886

Diagnosis. The genus *Hypodontolaimus* is characterised by a large dorsal hollow tooth with a posterior apophysis, a dorsal apophysis at the level of the tooth, a large muscular buccal bulb, one or two sub-ventral cusps, amphids oval or ovally loop- shaped, homogenous cuticular ornamentation and two or four longitudinal rows of larger dots. Pre-cloacal supplements may be present (Wieser, 1954).

Hypodontolaimus differs from other related genera such as *Dichromadora* and *Ptycholaimellus* in having a large muscular buccal bulb and sclerotized dorsal apophysis.

Hypodontolaimus marleenae sp.n. (Figure 1.25 A-I)

Type material

Three males and two females on slide nos. RI537 and 10392-10393

Etymology

Name given after Marleen De Troch, a research colleague at the University of Gent

Type locality

All specimens from st. 127

Measurements

♂1	-	48	93	M	593
					651
	16	17	17	20	16

a: 32.6; b: 7.0; c: 11.2; c': 3.6; spic: 33

♀1	-	53	96	347	611
					675
	18	18	20	24	15

a: 28.1; b: 7.0; c: 10.5; c': 4.3; V%: 51

Other ♂♂s L: 708-727; a: 37.3-40.3; b: 7.6-8.3; c: 11.4-11.7; c': 3.8-4.1; spic: 33

♀2 L: 670; a: 27.9; b: 6.9; c: 13.1; c': 3.6; V%: 50

Description:

Males: Body is cylindrical with blunt anterior end and short conical tail (Figure 1.25D). The cuticle is punctated and annulated. The punctations are in transverse rows and there are two

longitudinal rows of larger dots. The somatic setae are sparse, 9-10 µm long and in four longitudinal rows.

The amphids were not seen. The inner labial setae are inconspicuous, the outer labial are short (2 µm long) while the cephalic setae are 17-18 µm (or 1.1 X hd long). The stoma has one large `s'-shaped dorsal tooth and two smaller sub-ventral ones and sclerotized dorsal apophysis. The pharynx is 85-96 µm long, cylindrical with a large buccal bulb and a well-developed terminal one. The nerve ring is located at 52-56 % of the length of the pharynx from the anterior. The ventral gland is small and located posterior of the cardia (Figure 1.25A).

The reproductive system is monorchic with an outstretched testis located to the right of the intestines. The spicules are 2.1-2.2 abd long and curved. The gubernaculum is one abd long and thickened on the anterior end and pointed on the posterior end. There are eight small pre-cloacal supplements (Figure 1.25E). The tail is short and cylindrical (Figure 1.25 E & I).
Females: Similar to males in most aspects (Figure 1.25 B, G & H). Reproductive system is amphidelphic with reflexed ovaries, anterior branch to the right and the posterior one to the left of the intestine. The vulva is simple and the vagina is long and has thick walls (Figure 1.25 C).

Differential diagnosis

Hypodontolaimus marleenae sp.n. is characterised by a cylindrical body that is blunt at the anterior end, cuticle with two longitudinal rows of larger dots, cephalic setae that are one hd long, eight small pre-cloacal supplements and a short thick conical tail.

Hypodontolaimus marleenae sp.n. is similar to *H. abyssalis* Allgen, 1933, *H. balticus* de Man, 1922, *H. dimorpha* Wieser, 1954, *H. inaequalis* Bastian, 1865 and *H. setosa* Butschli, 1874. *H. marleenae* sp.n. differs from *H. abyssalis*, *H. balticus* and *H. inaequalis* in that the pre-cloacal supplements are large and cup-shaped in the latter species. *H. marleenae* sp.n. closely resembles *H. dimorpha* and *H. setosa* in the number (seven or eight) and the size of the supplements (small), however, *H. dimorpha* has short (5 µm *i.e* 1/4 x hd) cephalic setae, thin spicules and a complex gubernaculum and *H. setosa* has long (twice hd) cephalic and somatic setae.

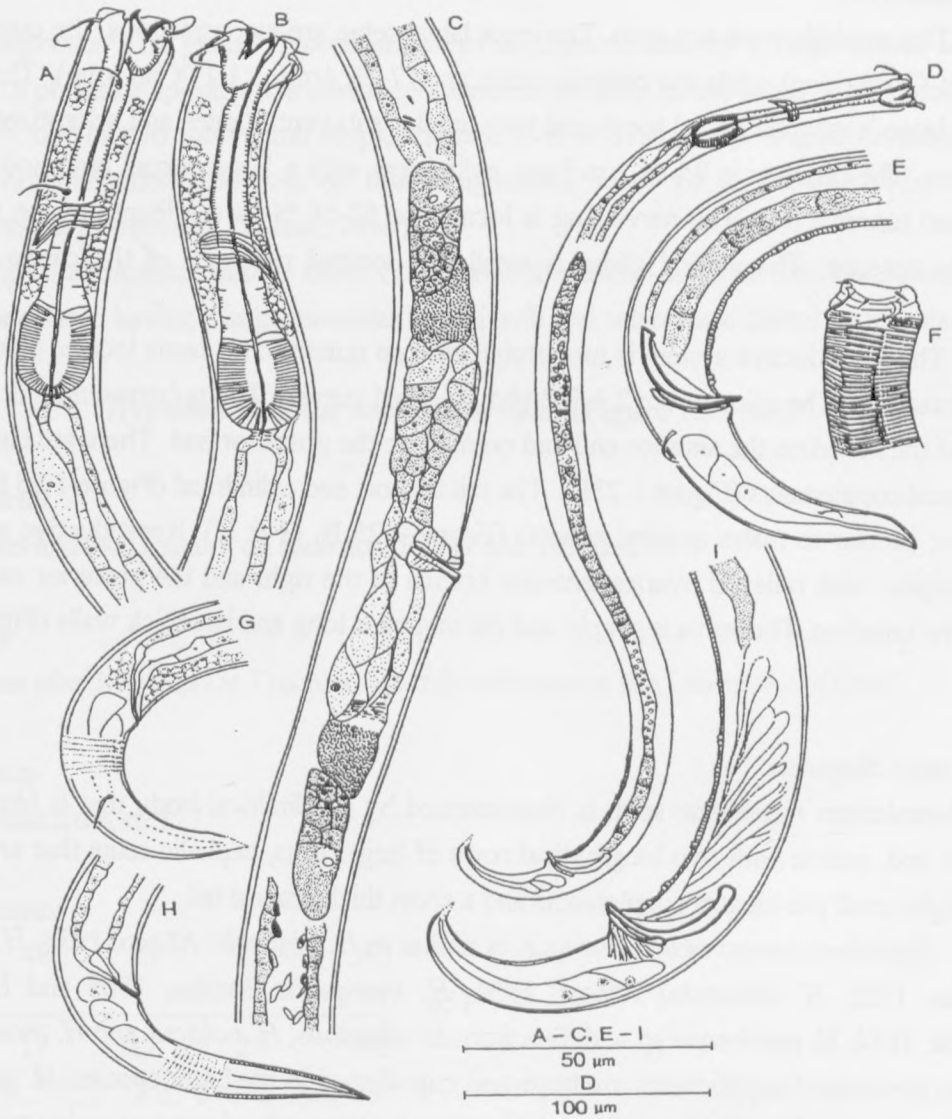


Figure 1.25: *Hypodontolaimus marleenae* sp.n.; A: ♂$_1$ pharyngeal region, B: ♀$_1$ pharyngeal region, C: ♀$_1$ reproductive system, D: ♂$_1$ total body, E: ♂$_2$ tail, F: ♀$_1$ head, G: ♀$_1$ tail, I: ♂$_1$ tail

Hypodontolaimus aff. angelae Inglis, 1961 (Figure 1.26 A-I)

Material studied

Two males and one female on slide no. 10394

Locality

All specimens are from st. 127

Measurements

♂1 -	62	101	M	646	
					736
9	22	22	25	18	

a: 29.4; b: 7.3; c: 8.2; c': 5.0; spic: 29

♂2 -	59	104	M	694	
					783
10	20	22	28	18	

a: 28.0; b: 7.5; c: 8.8; c': 4.9; spic: 32

♀1 -	64	108	373	676	
					779
10	21	22	25	16	

a: 31.2; b: 7.2; c: 7.6; c':6.4; V: 48 %

Additional description

Males: The body is cylindrical; slightly narrowing at the anterior end and a conical cylindrical tail end (Figure 1.26 C). The cuticle is homogeneously punctated with two longitudinal rows of larger dots (Figure 1.26 G). The somatic setae are 4 µm long and in four longitudinal rows (Figure 1.26 F). At the pharyngeal region there are two dorsal and one ventral setae located at 10-12 µm from the anterior (Figure 1.26B) end.

The amphids were not seen. The six inner labial sensilla are inconspicuous, the six outer labial are papilliform and the four cephalic ones are 4 µm long and located close to the anterior end. The stoma has one large dorsal hollow tooth which is curved and two smaller sub-ventral ones (Figure 1.26A) and a sclerotized dorsal apophysis. The pharynx is 101-108 µm long, cylindrical with a well developed posterior bulb that is 15-17 µm in diameter. The nerve ring is located at 58- 61 % of the length of the pharynx from the anterior. The ventral gland is medium sized and located posterior of the cardia (Figure 1.26A) and the gland opening is probably located at the lip region.

The reproductive system is monorchic, composed of a short testis and a long vas deferens and located to the right of the intestine (Figure 1.26C). The spicules are 1.6-1.8 abd long, slightly curved and possess a poorly developed capitulum. The gubernaculum is simple 15-17 µm long (Figure 1.26E). Pre-cloacal supplements are absent.

The tail is long and has a long prominent spinneret

Females: They are similar (Figure 1.26D & F) to males except for the tail that is relatively longer (Figure 1.26H). The reproductive system is amphidelphic (Figure 1.26I). (The female however, was immature, and therefore the details of the reproductive system could not be seen).

Discussion

Hypodontolaimus aff. angelae Inglis, 1961 is characterised by short cephalic setae (40% hd), three setae at the anterior pharyngeal region (*i.e* two on the dorsal and one on the ventral sides), stoma with a large `s'-shaped dorsal tooth and poorly developed dorsal apophysis, a strong well-developed pharyngeal bulb.

The specimens investigated here are comparable with the original group described in the general body shape, the punctation pattern on the lateral differentiation, shape of the spicules and the tail and ratios (a= 28.0-31.2, b= 7.2-7.5, c= 7.6-8.8 compared to a= 22.6-25.9, b= 6.3-8.1, c= 8.1-9.9 respectively) and the cephalic setae which are about 0.5 X hd in length. However, the total length is different (L= 646-779 µm compared to L= 980-1190 µm respectively).

Since the original population of *Hypodontolaimus angelae* is from South Africa, and this population is from East Africa, it is possible that there could be a population with an intermediate length within the region or elsewhere. Also the individuals investigated were immature adults (refer to Figure 1.26C & 1.26I for the reproductive system), so it is possible that mature adults of this region can attain much larger L-values than is the case now.

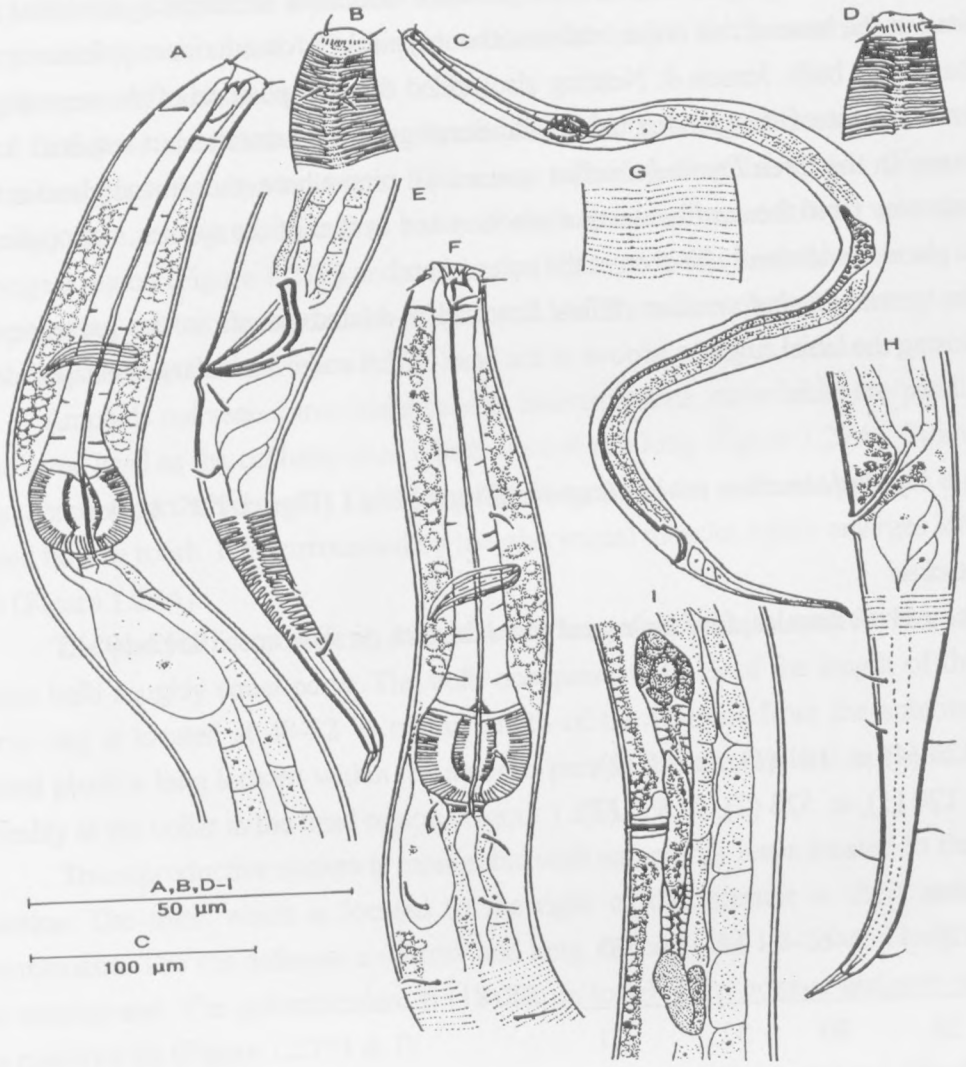


Figure 1.26: *Hypodontolaimus aff. angelae*, Inglis, 1961; A: ♂$_1$ pharyngeal region, B: ♂$_1$ head, C: ♂$_1$ total body, D: ♀$_1$ head, E: ♂$_1$ tail, F: ♀$_1$ pharyngeal region, G: cuticle at mid body, H: ♀$_1$ tail, I: ♀$_1$ reproductive system

Ptycholaimellus Cobb, 1920

Diagnosis. The diagnosis of the genus *Ptycholaimellus* is well discussed by Jensen & Nehring (1992). The main characters are: the presence of a collar surrounding the labial rugae and a groove at the base of this collar, males without typical Chromadorids supplements and a double pharyngeal bulb. Jensen & Nehring also added that the position of the ventral gland opening and the size of the gland could be additional generic characters but required further investigations. In the three *Ptycholaimellus* species we report here, the ventral gland is large and located away from the cardia-intestinal junction and in two of the species, the opening of the ventral gland could clearly be seen at the anterior end.

The genus *Ptycholaimellus* differs from other related genera in the presence of a collar enclosing the labial rugae, a groove at the base of that collar and a large s-shaped dorsal tooth.

Ptycholaimellus macrodentatus Timm, 1961 (Figure 1.27 A-J)

Material studied

Seven males and six females; four males and three females on slide nos. 10513-10515

Locality

Males: st. 120 (4), st. 121 (1), st. 528 (2)

Females st. 120 (1), st. 528 (2), st. 550 (3)

Measurements

♂1	-	70	146	M	753	
						840
	10	26	30	32	21	

a: 26.3; b: 5.8; c: 9.6; c`: 4.1; spic: 40

♀1	-	75	153	425	789	
						883
	12	28	29	35	16	

a: 25.2; b: 5.8; c: 9.4; c`: 5.9; V: 48 %

Other ♂♂s L: 708-991; a: 22.1-29.1; b: 5.7-6.0; c: 8.9-9.7; c`: 4.1-5.2 spic: 35-42

Other ♀♀s L: 732-1053; a: 22.9-28.2; b: 5.4-6.5; c: 8.0-9.9; c`: 5.4-5.9; V: 44-48 %

Additional description

Males: Body is cylindrical with a broad and blunt anterior end and a tapering tail end (Figure 1.27E). The head-region is separated from the rest of the body by a narrow constriction (collar) which is surrounded by a fine membrane 13-16 µm in diameter; the ventral gland probably opens into this collar (Figure 1.27A).

Cuticle is annulated with fine annuli of 1.5-2.0 µm in width and ornamented with punctations along the annule length. There are wide inter-annular spaces (Figure 1.27C). Laterally, there are two longitudinal rows of thick punctations at 3.0-4.5 µm apart at the pharyngeal region (Figure 1.27F) and mid-body (Figure 1.27G). Somatic setae are very short and sparse but the two located at 13-16 µm and 14-19 µm from the anterior end are present in nearly all the specimens (Figure 1.27C).

Amphids not seen. Inner labial sensilla inconspicuous, outer labial are papilliform and at the same level as the cephalic ones which are 6-8 µm long (Figure 1.27A). Stoma has two parts: anterior part which is 8-11 µm long has flanges and the posterior part has a dorsal `s`-shaped hollow tooth. It is surrounded by the pharyngeal muscles which enlarges into a buccal bulb (Figure 1.27A).

The pharynx is cylindrical, 123-164 µm long and it has a well-developed posterior double bulb roughly equal parts. The bulb occupies 30-33 % of the length of the pharynx. Nerve ring is located at 48-52 % of the length of the pharynx from the anterior end. The ventral gland is long located within the anterior part of the intestine and opens to the outside probably at the collar in the head region (Figure 1.27A, E).

The reproductive system is monorchic with an anterior testis located to the left of the intestine. The testis which is located to the right of the intestine is short and filled with spermatozoa. The vas deferens is narrow and long. Spicules are 1.6-2.0 abd long and bent on the anterior end. The gubernaculum is (18-22 µm long) sharp-pointed and sort of hooked at the posterior tip (Figure 1.27 H & J).

The tail is conico-cylindrical 76-109 µm or 4.1-5.2 abd long and often bent to the ventral side. Lateral differentiation stops some 10-15 µm from the tail tip. The tip has a finger-like structure which is 5-7 µm long (Figure 1.27H).

Females : Similar to males (Figure 1.27 B & I). Reproductive system is amphidelphic with reflexed ovaries, anterior branch located to the right and the posterior one to the left of the intestine. Each branch has an ovary with oocytes that are at the same level of development in both ovaries, a thick-walled oviduct and uterus which may be filled with spermatozoa followed by a thick walled common uterus. The vagina is thick walled and surrounded by glandular cells. Vulva is simple (Figure 1.27D). The tail, although similar to that of the males has a higher c` value 5.4-5.9 which could be as a result of the small abd (Figure 1.27I).

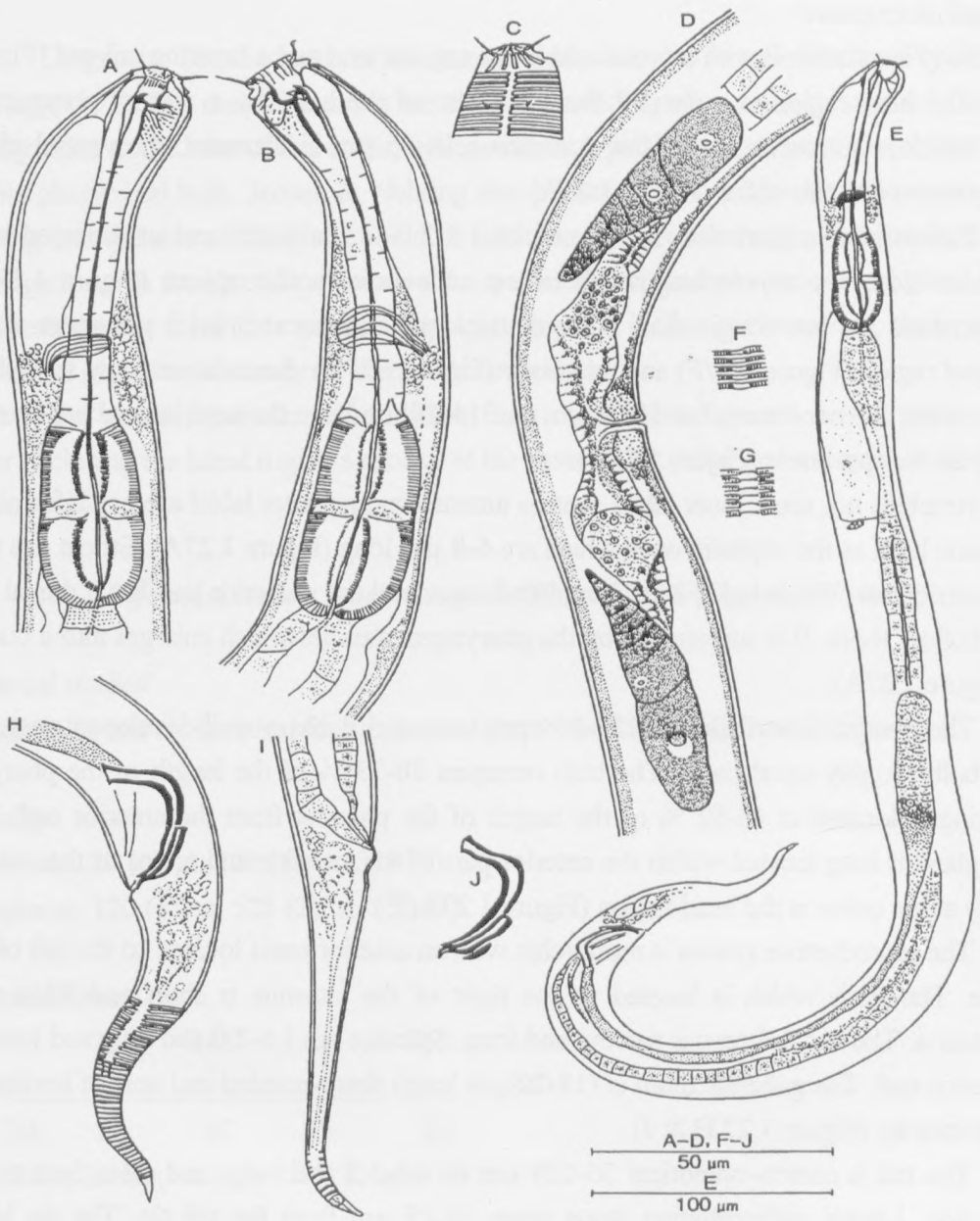


Figure 1.27: *Ptycholaimellus macrodentatus* Timm, 1961; A: ♂$_1$ pharyngeal region, B: ♀$_1$ pharyngeal region, C: ♂$_1$ head (superficial), D: ♀$_1$ reproductive system, E: ♂$_1$ total body, F: cuticle at the mid-pharyngeal region, G: cuticle at the level of the bulb and the rest of the body, H: ♂$_1$ tail, I: ♀$_1$ tail, J: ♂$_1$ spicules

Remarks

Ptycholaimellus macrodentatus was first described from the Bay of Bengal by Timm (1961). This is the second finding of the species from the Indian Ocean.

These specimens have been identified as *P. macrodentatus* Timm, 1961 because of the general body shape, shape and size of the spicules and the gubernaculum. They however, differ from the original population in a number of ways:

- Total length. The original population is slightly shorter than the present (621-670 µm in males and 796-823 µm in females compared to 704-991 µm and 732-1053 µm respectively for the present group) one.
- The knob-like swellings at the base of the tooth could not be observed in the present group.
- The c´ value is smaller for the original specimens compared to the present individuals (3.4-3.6 compared to 4.1-5.9).

***Ptycholaimellus penninae* sp. n. (Figure 1.28A-J)**

Type material

Five males and two females in slide nos. RI538-RI539 and 10395-10397

Etymology

Species named after Penninah Nduhiu of the University of Nairobi

Type locality

All material are from st. 120 except one female from st. 127.

Measurements:

σ^{1} - 69 127 603

684

11 19 21 15

a: 28.5; b: 5.4; c: 8.4; c': 5.4; spic: 22

φ_{1} - 67 127 546

629

9 22 23 15

a: 22.5; b: 5.0; c: 7.6; c' :5.5; V: 49 %

♂♂s L: 581-656; a: 25.4-28.5; b: 4.8-5.2; c: 7.0-8.3; c': 4.7-5.9; spic: 18-21

♀ (juv) L: 453; a: 25.1; b: 5.1; c: 4.7; c': 8.0; V: 47 %

Description:

Male: The body is cylindrical, blunt anteriorly and with tapering tail end (Figure 1.28C). The head region has a membranous structure which is slightly set off from the rest of the body by a fine constriction (Figure 1.28A). The cuticle is annulated and along the annuli there are punctations that are in regular transverse rows (Figure 1.28 G & H). These annuli have large inter-annular spaces. At the anterior pharyngeal region the annuli are devoid of punctations. Laterally, there are two longitudinal rows of dots that are thicker and more widely spaced. Anteriorly, where punctations are not obvious, the lateral differentiation is marked by a discontinuity of the annuli. Somatic setae are completely lacking or they are very short (Figure 1.28E).

Inner and outer labial sensilla are not conspicuous and the cephalic ones are 5 µm long and inserted in the head constriction. The amphids were not seen. The stoma has two parts: the anterior part is wide and deep (5-6 µm long) while the posterior part is narrow and

a large `s'-shaped dorsal hollow tooth attached onto the floor of the first part. The pharyngeal muscle surrounds most of the stoma. The pharynx is cylindrical and swollen into a bulb anteriorly around the stoma and forms a double terminal bulb. The terminal bulb is 25-29 % of the length of the pharynx and 30-32 µm in diameter at the middle. The nerve ring is located at 53-55 % of the length of the pharynx from the anterior. The ventral gland is large and located at the anterior part of the intestine and the gland opening is probably located at the head constriction, 3-4 µm from the anterior end (Figure 1.28A).

The reproductive system is monorchic with an outstretched anterior testis. The testis is half as long as the vas deferens and it is filled with small spermatozoa. The spicules are 1.2-1.5 abd long and curved. The gubernaculum is simple (10-13 µm long) with a broad and serrated posteriorly (Figure 1.28I) end.

The tail is conical with a posterior cylindrical part. The tail tip is a finger-like non-annulated part 5-6 µm long.

Females: They are similar to males (Figure 1.28D, 1.29E & 1.29J). The reproductive system is amphidelphic with reflexed ovaries, anterior branch located to the right of the intestine and the posterior one located to the left. Each ovary has a large ovum and small developing ones. The uterus is filled with spermatozoa. The vulva and vagina are simple (Figure 1.28B).

Differential diagnosis

Ptycholaimellus penninae sp.n. is characterised by short cephalic setae (30% hd), double terminal bulb which is 25-29 % of the length of the pharynx, curved spicules (18-22 µm long) with poorly developed capitulum and a gubernaculum with serrated posterior end.

Ptycholaimellus penninae sp.n. is one of the smallest *Ptycholaimellus* species. It differs from other described species in the shape of the gubernaculum (serrated on the posterior end).

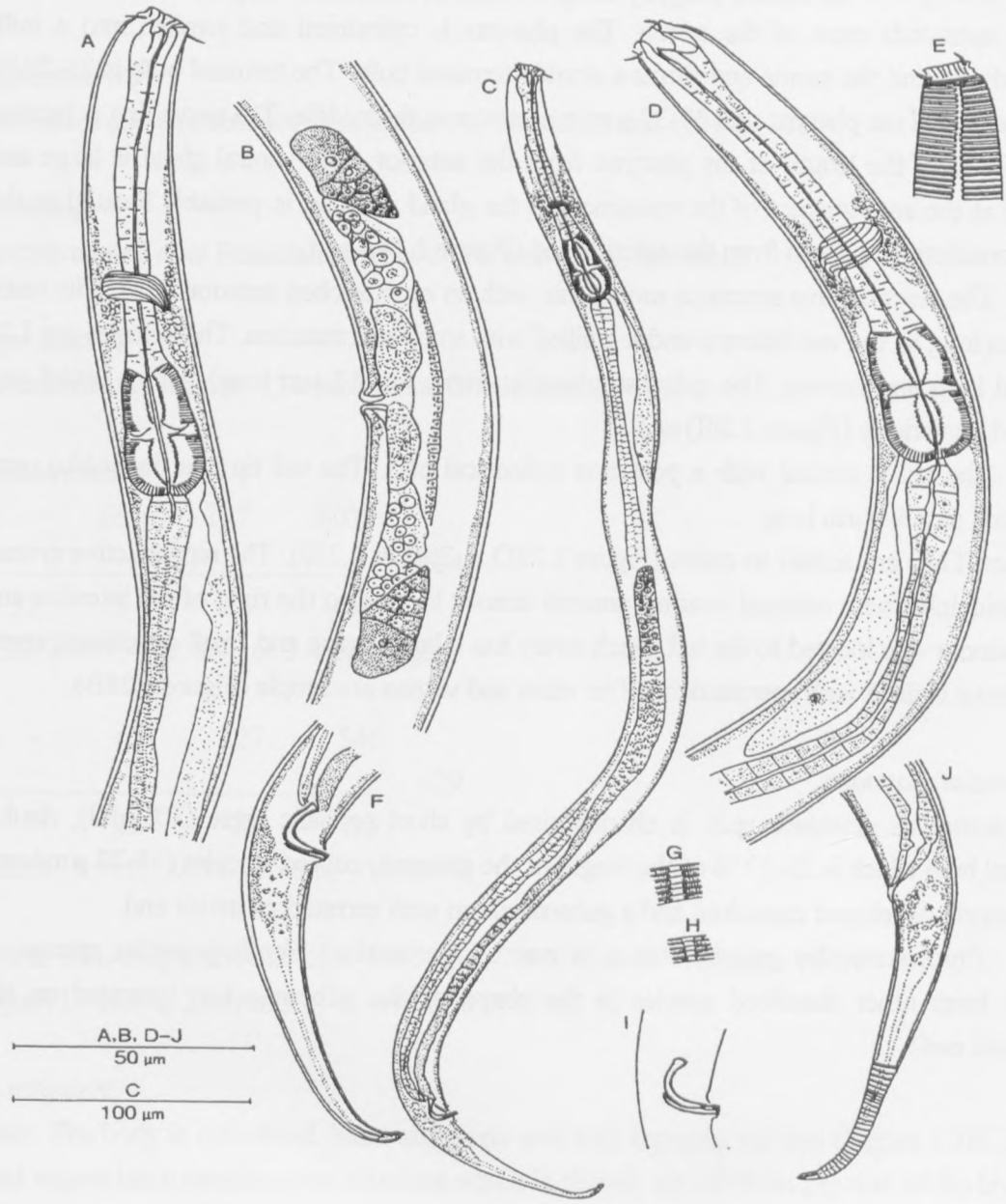


Figure 1.28: *Ptycholaimellus penninae* sp.n.; A: ♂1 pharyngeal region, B: ♀1 reproductive system, C: ♂1 total body, D: ♀1 pharyngeal region, E: ♀1 head (superficial), F: ♂1 tail, G: cuticle at mid-body, H: cuticle at the level of anus and the tail, I: ♂1 spicule (left), J: ♀1 tail

***Ptycholaimellus ponticus* Filipjev, 1922 (Figure 1.29 A-G)**

Material studied

Five males and six females studied; four males and three females on slide nos. 10516-10519

Locality

All specimens are from 0-1 cm sediment depth in the intertidal zone within the *Ceriops* mangrove vegetation in Gazi Bay, Kenya.

Measurements

♂1 -	70	137	M	688	
					769
9	25	27	32	20	

a: 24.0; b: 5.6; c: 9.5; c': 4.1; spic: 28

♀1 -	75	151	448	761	
					873
10	26	31	51	18	

a: 28.2; b: 5.8; c: 7.8; c': 6.2; V: 51 %

Other ♂♂s L: 661-793; a: 25.4-26.5; b: 5.7-6.0; c: 8.7-9.3; c': 4.1-4.6; spic: 25-30

Other ♀♀s L: 746-821; a: 21.9-28.3; b: 5.8-6.1; c: 7.8-8.8; c': 5.1-5.6; V: 46-50 %

Additional description

Males: The body is cylindrical, with a blunt anterior end and a conico-cylindrical tail end (Figure 1.29B). The anterior end has a small collar into which the cephalic setae are inserted. The cuticle is annulated and punctated. There are two longitudinal rows of larger dots which begin from the anterior until the tail end. Somatic setae were not seen.

The inner and outer labial sensilla are inconspicuous and the cephalic ones are 3 µm long. The stoma has a large `s'-shaped dorsal hollow tooth. The pharynx is 61-79 µm long, cylindrical with a large buccal bulb and a well developed posterior double bulb which is 26-30 % of the length of the pharynx (Figure 1.29D).

The reproductive system is monorchic with outstretched testis located to the right of the intestine. The spicules are 1.3-1.5 x abd long and curved. The gubernaculum is 14-17 µm long and simple (Figure 1.29 G).

The tail is 76-87 µm long conical with a cylindrical posterior part and non-punctated tip.

Females: Similar to males in most aspects (Figure 1.29C, E). The tail is however longer than it is in males, 93-112 µm long. The reproductive system is amphidelphic with reflexed ovaries located anterior to the right and the posterior to the left of the intestine. There is spermatheca on either side which is half filled with spermatozoa (Figure 1.29A). The vulva is simple and the vagina has thick walls.

Remarks: Ptycholaimellus ponticus was first described from a single female by Filipjev (1922) as *Hypodontolaimus*. A review of the species was done by Jensen & Nehring (1992). Presently, it is one of the most widely reported *Ptycholaimellus* species, and the described populations show variations in some characters. Yet from our observation of the three *Ptycholaimellus* species described here, we have not observed much variation within a single species in terms of total length, de Mans ratios, spicules size and shape etc. It is therefore doubtful if the population of Gerlach (1951) and Jensen and Nehring (1992) are really *P. ponticus* because of the shape (nearly straight) of the spicules. These populations are different from *P. ponticus* and give them the name *P. jenseni* sp.n. We include also *P. ponticus* population of Schulz, (1932) in the new species, *P. jenseni*, on the basis of the anterior end (well formed raised collar that is separated from the rest of the body).

The present specimens are identified as *P. ponticus* on the basis of de Mans ratios, poorly developed anterior collar and the shape (curved) and size (25-30 µm) of the spicules.

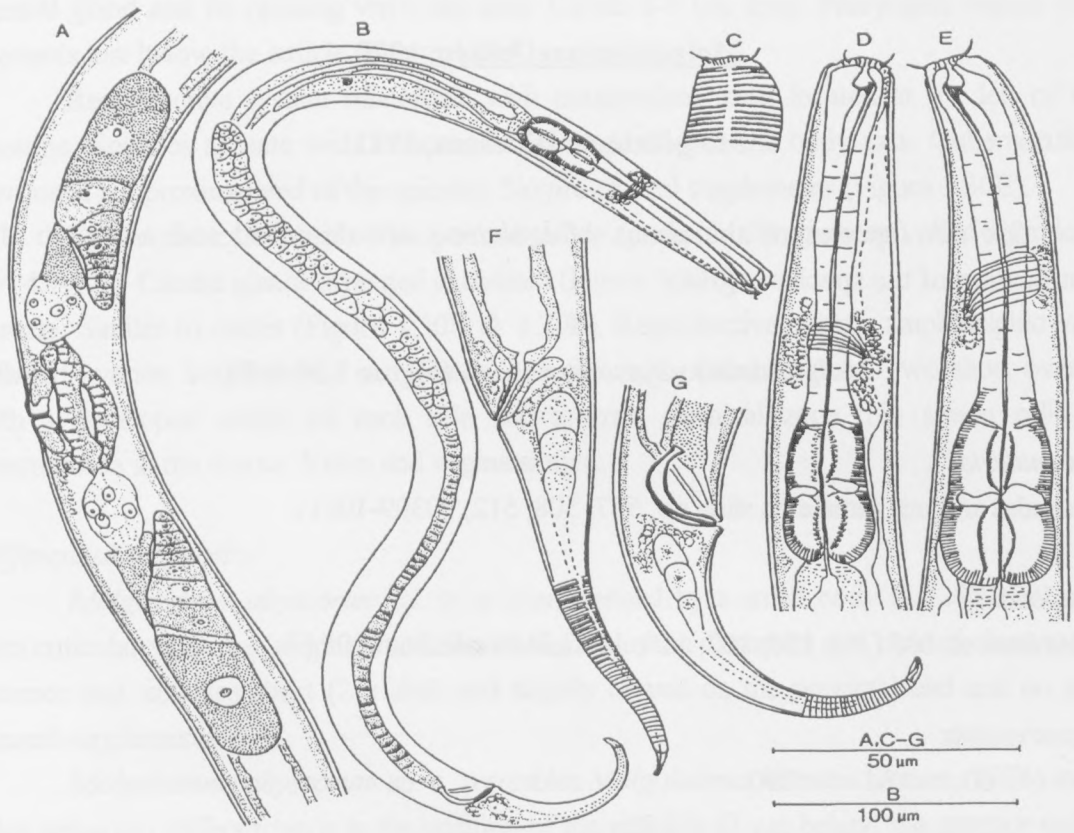


Figure 1.29: *Ptycholaimellus ponticus* Filipjev, 1922; A: ♀$_1$ reproductive system, B: ♂$_1$ total body, C: ♀$_1$ head (superficial), D: ♂$_1$ pharyngeal region, E: ♀$_1$ pharyngeal region, F: ♀$_1$ tail, G: ♂$_1$ tail

Desmodoridae Filipjev, 1922

Molgolaiminae Jensen, 1978

***Molgolaimus* Ditlevsen, 1921**

Six new species of the genus *Molgolaimus* are described and a key to the identification of the species is given.

***Molgolaimus abyssorum* sp. n. (Figure 1.30 A-F)**

Type material

Five males and one female on slide no. 507, 508, 512, 10309-10311

Type locality

Males from st. 105 ($\male_1$), 120, 107, 119, 118 and female from 105 ($\female_1$)

Measurements

$\male_1$ - 60 M 290

342

5 14 14 10

a:24.0 ; b: 5.7; c: 6.6; spic: 20

$\female_1$ - 55 136 245

292

5 14 16 11

a: 18.0; b: 5.3; c: 6.2; V: 46%

♂♂s L: 287-370; a: 20.5-24.0; b: 4.8-5.7; c: 6.1-7.4; spic: 18-23

Description

Males: Body cylindrical, narrower in head region and conical cylindrical tail end (Figure 1.30D).

Cuticle faintly striated, striations bearly visible. Somatic setae not seen. Cephalic setae short (2 µm long) situated 1-2 µm from the anterior end. Amphids circular, small, 2-3 µm (33-50%) in diameter and located immediately posterior of cephalic setae (Figure 1.30C).

Stoma tubular with slightly sclerotized walls and surrounded by pharyngeal muscles on most of the length. Pharynx cylindrical with a well developed terminal bulb with

sclerotized valves. Nerve ring located at 60% of the length of the pharynx from the anterior. Ventral gland and its opening were not seen. Cardia 8-9 µm long. Pharyngeal region with pigments just below the cuticle (Figure 1.30A).

Reproductive system monorchic with outstretched testis located at the left of the intestine. Spicules arcuate with a short distal part parallel to the body axis. Gubernaculum surrounds the proximal end of the spicules. No pre-cloacal supplements (Figure 1.30E).

Tail conico-cylindrical with a pointed tail tip (probably the spinneret), 47-56 µm long (c'= 4.7-5.5). Caudal glands arranged in tandem (Figure 1.30E).

Female: Similar to males (Figure 1.30B & 1.30F). Reproductive system amphidelphic with reflexed ovaries, both anterior and posterior to the right of the intestine. Two short ovaries with a developed ovum on each side and a small germinal zone. No sperm cells or spermatheca in the uterus. Vulva and vagina simple.

Differential diagnosis

Molgolaimus abyssorum sp. n. is characterised by a small body (L=287-370 µm); faint cuticular striations; amphids circular, small (2-3 µm in diameter) and located close to the anterior end; spicules short (2 x abd) and slightly curved on the proximal end and no pre-cloacal supplements.

Molgolaimus abyssorum sp. n. resembles *Molgolaimus minutus* (Jensen, 1978) in de Man ratios but differs from it in the position of the amphids (7 µm behind the anterior end in *M. minutus*), the spicules shape (distal tip is wide and open and curves dorsally in *M. minutus*), the presence of one or two pre-cloacal supplements in *M. minutus* and the shape of the gubernaculum.

Molgolaimus tyroi sp. n. (Figure 1.30 G-L)

Type material

Four males and five females on slide no. 509, 510, 10312-10317

Type locality

Males from st. 106 (3), 105 (1), 117 (1), 119 (1) and females from st. 106 (2), 105 (3)

Etymology

Species is named after R. V. *Tyro*, the Dutch research vessel used for this sampling.

Measurements

- 51 M 200

♂1 _____ 237

4 11 11 10

a: 21.6; b: 4.7; c: 6.4; spic: 29

♀1 - 50 136 250

_____ 280

4 13 15 8

a: 18.7; b: 5.6; c: 9.3; V: 49

Other ♂♂s L: 213-222; a: 17.8-20.1; b: 3.8-4.5; c: 5.8-6.3; spic: 30-32

Other ♀♀s L: 225-290; a: 15.9-19.3; b: 4.0-5.6; c: 7.2-9.0 V: 48-59 %

Description

Males: Body cylindrical, attenuated on both ends but more so at tail end (Figure 1.30L). Cuticular striations and somatic setae not observed. Four cephalic setae located close to the anterior end. Amphids circular, 60% cbd, faint and located at 4 μm behind the anterior end. Stoma narrow with slightly sclerotized walls, surrounded by the pharyngeal muscles on almost the entire length.

Pharynx cylindrical, with a well developed terminal bulb. Nerve ring, ventral gland and its opening not seen. Cardia long (5-6 μm) and prominent (Figure 1.30G).

Reproductive system monorchic with outstretched testis located at the left of the intestine. Spicules thin, long (3 x abd) and curved twice. Single pre-cloacal supplement at 14-19 μm in front of the cloaca, however in some males there is a faint impression of another supplement at 10-11 μm from the cloaca. Gubernaculum very small and faint (Figure 1.30J).

Tail conical with a posterior (10-15 μm) cylindrical part (c`= 3.2-3.7).

Females: Similar to males (Figure 1.30 H, I & K). Reproductive system amphidelphic with reflexed ovaries, anterior ovary to the left and posterior to the right of the intestine. Each ovary has a single mature ovum and a short germinal zone. Vulva and vagina simple.

Differential diagnosis

Molgolaimus tyroi sp.n. is characterised by its small body size (L=225-290 μm); amphids close to the anterior end (4 μm behind anterior); long (3 x abd) thin spicules curved twice and one or two pre-cloacal supplements. *M. tyroi* sp. n. is similar to *M. abyssorum* sp. n. in size (L is about 300 μm) but differs from it in the shape of spicules (double curved).

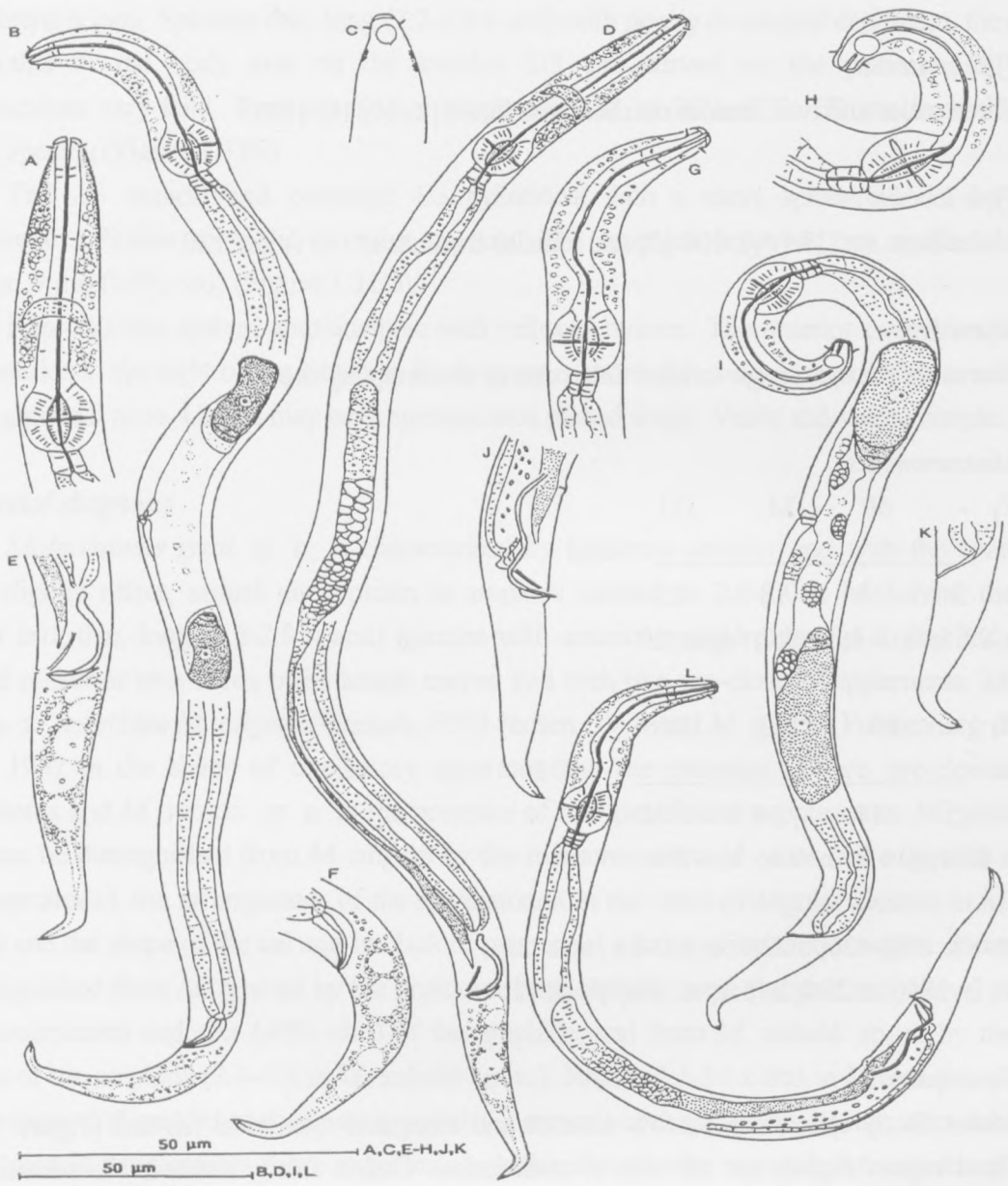


Figure 1.30: *Molgolaimus abyssorum* sp. n. and *Molgolaimus tyroi* sp. n.; A-E *Molgolaimus abyssorum* sp. n.; A: δ_1 pharyngeal region, B: φ_1 total view, C: δ_1 head region (superficial), D: δ_1 total view, E: δ_1 tail, F: φ_1 tail, G-L *Molgolaimus tyroi* sp. n.; G: δ_1 pharyngeal region, H: φ_1 pharyngeal region, I: φ_1 total view, J: δ_1 tail, K: φ_1 tail, L: δ_1 total view

Molgolaimus gazii sp.n. (Figure 1.31 A-E)

Type material

Three males and two females on slide nos. 511-512, 10318, 10319

Type locality

Males from st. 119 ($\male_1$), 106 (2) and females from st. 103 ($\female_1$) and 120

Etymology

Named of the species given after Gazi, one of the sampling sites.

Measurements

$\male_1$ - 69 M 311

385

5 15 18 13

a: 27.5; b: 5.6; c: 6.0; spic: 29

$\female_1$ - 69 173 366

435

5 14 14 10

a: 31.1; b: 6.3; c: 6.3; V: 40%

$\male\male$s L: 382-430; b:23.9; c: 6.0-6.1; spic: 29

$\female_2$ L: 389; a: 25.9; b: 6.1; c: 5.6; V: 42 %

Description

Males: Body cylindrical, narrow anterior and elongated cylindrical tail end (Figure 1.31B). Head region slightly set off with a constriction. Cuticle faintly striated. No somatic setae observed.

Four short cephalic setae, located behind the head constriction (Figure 1.31A). Amphids circular and very faint, 7 µm in diameter (70% cbd), 13-15 µm (2.6-3.0 x hd) behind the anterior end. Stoma narrow with sclerotized walls and surrounded by the pharyngeal muscles on most of the length (Figure 1.31C).

Pharynx cylindrical with a well developed muscular terminal bulb which has sclerotized valves. Nerve ring and the opening of the ventral gland not seen. Ventral gland located at pharyngo-intestinal junction. Cardia short (4-5µm) but prominent (Figure 1.31B).

Reproductive system monorchic with outstretched testis located to the left of the intestine.

The germinal zone is short, posterior of which are spermatozoa arranged in clusters, and the vas deferens is long. Spicules thin, long (2.2-2.9 x abd) with poorly developed capitulum, they are parallel to the body axis on the anterior 1/3 and curved on the posterior 2/3. Gubernaculum very faint. Two pre-cloacal supplements at 18-20 and 30 -32 µm from the cloacal opening (Figure 1.31E).

Tail 2/3 conical and posterior 1/3 cylindrical with a short spinneret (c'= 5.5-7.7).*Females*: Similar to males in most aspects. The amphids however, are smaller in diameter, 5 µm (55% cbd) (Figure 1.31D).

Reproductive system amphidelphic with reflexed ovaries. The anterior ovary to the left, posterior to the right of the intestine. Each ovary is short with a single mature ovum and a short germinal zone. Uterus may have spermatozoa placed singly. Vulva and vagina simple.

Differential diagnosis

Molgolaimus gazii sp. n. is characterised by a narrow anterior end with the head region slightly offset; sexual dimorphism in amphids located at 2.6-3.0 x hd behind the anterior end; thin, long (2.2-2.9 x abd) spicules with anterior one third parallel to the body axis and posterior two thirds of its length curved and with two pre-cloacal supplements. *M. gazii* sp. n. resembles *M. allgeni* (Gerlach,1950) Jensen, 1978 and *M. typicus* Furstenberg & Vincx, 1992 in the shape of copulatory apparatus and the presence of two pre-cloacal supplements and *M. sabakii* sp. n. in the presence of two pre-cloacal supplements. *M. gazii* sp. n. can be distinguished from *M. allgeni* by the measurements and ratios (*M. allgeni* is a larger nematode), the arrangement of the spermatozoa in the testis (triangular clusters in *M. allgeni*) and the shape of the tail and the lack of prominent sclerotization on the vagina. It can be distinguished from *M. typicus* by the position of the cephalic setae (located at the level of head constriction) and size (40% cbd) of the amphids; and from *M. sabakii* sp. n. by the position of the amphids (3.4-4.0 in *M. sabakii* sp. n.), length (3.1-34 x abd in *M. sabakii* sp. n.) and shape (1\2 parallel to the body axis and 1\2 curved) of the spicules and the position of the pre-cloacal supplements (both supplements within the spicular region in *M. sabakii* sp. n.).

***Molgolaimus sabakii* sp. n. (Figure 1.31 F-L)**

Type material

Six males and one female on slide no. 513, 514, 10320-10323

Type locality

Males from st. 105 (4), 106, 136 and female from st. 119

Etymology

Named of the species given after Sabaki, one of the sampling sites.

Measurements

$\frac{♂_1 \quad - \quad 90 \quad M \quad 528}{5 \quad 16 \quad 16 \quad 13}$ 641

a: 40.1; b: 7.1; c: 5.8; spic: 44 µm

$\frac{♀_1 \quad - \quad 90 \quad 229 \quad 469}{5 \quad 18 \quad 16 \quad 12}$ 578

a: 36; b: 6.4; c: 5.3; V: 40 %

♂♂s L:497-611; a:31.1-40.7; b:5.8-7.3; c:4.4-6.0; spic:37-40

Description

Males: Body cylindrical, head region narrower and set off from the rest of the body by a constriction; conico-cylindrical tail (Figure 1.31G).

Cuticle faintly striated and begins at the level of the constriction. No somatic setae observed. Four cephalic setae 4 µm long and situated within the striations. Amphids circular 7-8 µm (70-80% cbd) in diameter and situated at 15-20 µm (3.4-4.0 x hd) from the anterior end (Figure 1.31F) (in two males amphids are 12 µm from the anterior end, however the pharynx appear to be contracted (Figure 1.31J) probably contracting the cuticle as well and thereby pulling the amphids more anteriorly). Stoma narrow.

Pharynx cylindrical with a well developed terminal bulb which has cuticularised valves. The nerve ring surrounds the pharynx at 60% of the length of pharynx from the anterior. Ventral gland opening not seen. Ventral gland located posterior of the pharyngo-intestinal junction (Figure 1.31G).

Cardia 7-8 µm long and conspicuous.

Reproductive system monorchic with outstretched testis located at the left of the

intestine. Short testis, spermatozoa grouped in clusters and long vas deferens. Spicules long (3.1-3.4 x abd) and thin, anterior half is straight (parallel to the body axis) and the posterior half is arcuate. Capitulum poorly developed and partly or completely open at the distal tip. Gubernaculum small and simple. Two pre-cloacal supplements situated at 12-23 and 20-33 µm anterior of the cloaca (Figure 1.31K). Tail is conical with an elongate cylindrical posterior end.

Female: Similar to males in most aspects (Figure 1.31H & F). However, amphids smaller in diameter (6 µm or 55% cbd). Reproductive system amphidelphic with reflexed ovaries, anterior to the left, posterior to the right of the intestine. Ovaries short, with a single mature ovum on each side and a short germinal zone. The uterus may have spermatozoa but there is no spermatheca. Vulva and vagina simple (Figure 1.31L).

Differential diagnosis

Molgolaimus sabakii sp. n. is characterised by narrow anterior end; sexual dimorphism in size of amphids [wide amphids in males (70-80 % cbd), smaller in females (55% cbd)] located at 17-20 µm behind the anterior end; spicules that are thin and long (3.1-3.4 abd) and have the anterior half being straight and the posterior half curved; two ventral pre-cloacal supplements located within the spicule region.

Molgolaimus sabakii sp. n. resembles *M. allgeni* (Gerlach, 1950) Jensen, 1978 in the shape of the spicules and *M. gazii* sp. n. in and the number of pre-cloacal supplements. *M. sabakii* sp. n. differs from *M. allgeni* in the arrangement of the spermatozoa in the testis (triangular clusters in *M. allgeni*), length of the spicules (2.0-2.4 x abd in *M. allgeni*) and the absence of a clearly sclerotized vagina. It differs from *M. gazii* sp. n. in the position of the amphids which are 13-15 µm (2.6-3.0 x hd) behind the anterior end in *M. gazii* sp. n.; in the shape (1\3 anterior part is parallel to the body axis and 2\3 is curved in *M. gazii* sp. n.) and size (2.2-2.4 x abd long in *M. gazii* sp. n.) of the spicules and the position of the pre-cloacal supplements in relation to the spicules (only the posterior supplement is situated within the spicular region in *M. gazii* sp. n.).

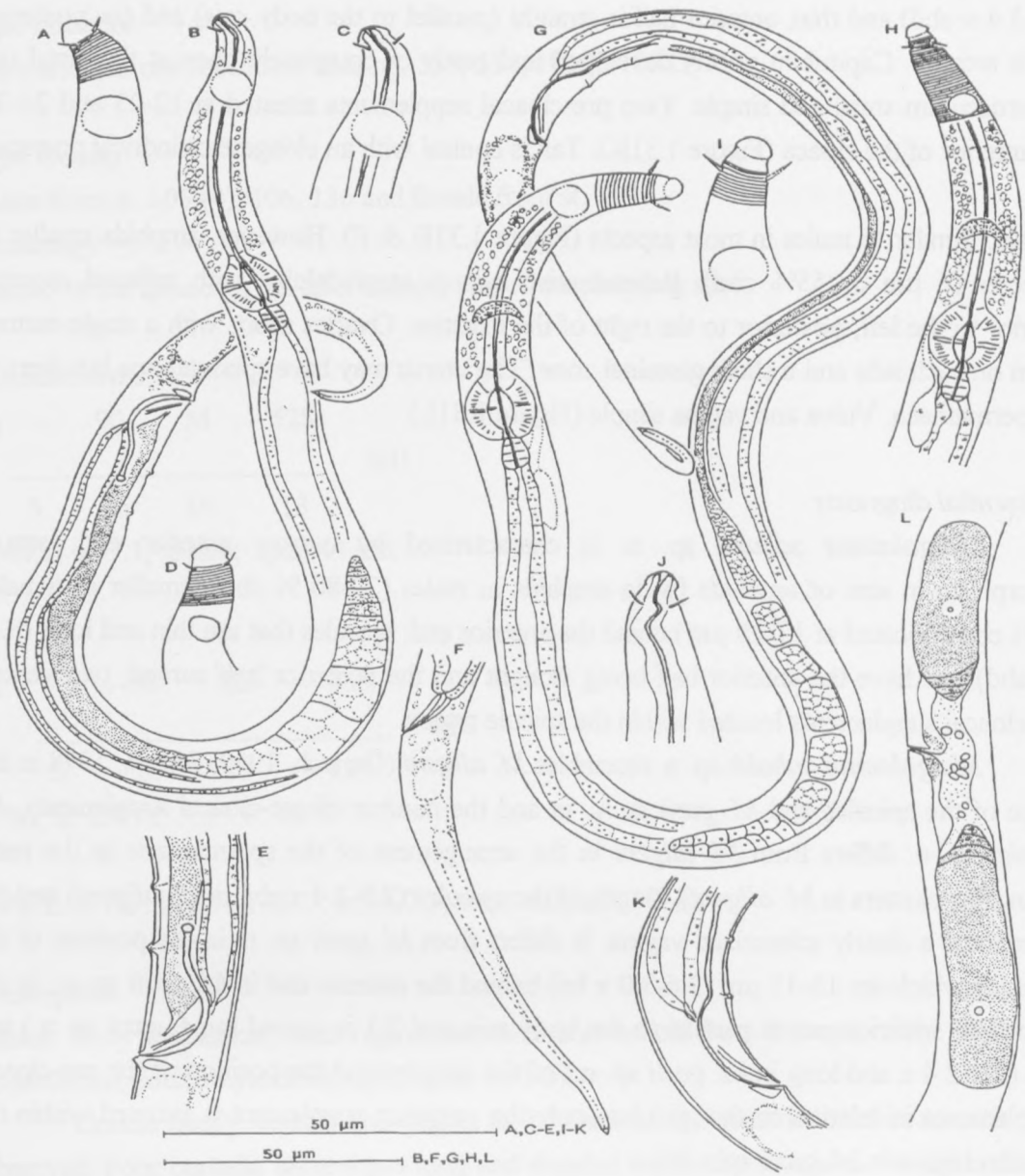


Figure 1.31: *Molgolaimus gazii* sp. n. and *M. sabakii* sp. n.; A-E: *Molgolaimus gazii* sp. n.; A: ♂$_1$ head region, B: ♂$_1$ total view, C: ♂$_1$ head region (section), D: ♀$_1$ head region, E: ♂$_1$ spicule, F-L *Molgolaimus sabakii* sp. n.; F: ♀$_1$ tail, G: ♂$_1$ total view, H: ♀$_1$ pharyngeal region, I: ♂$_1$ head region, J: ♂$_2$ head region (section), K: ♂$_1$ spicules, L: ♀$_1$ reproductive system

***Molgolaimus kiwayui* sp. n. (Figure 1.32 A-F)**

Type material

Two males and one female on slide no. 515, 10324

Type locality

Station 131

Etymology

Named of the species given after Kiwayu, one of the sampling sites.

Measurements

σ^{1} - 69 M 249

289

5 15 16 12

a: 17.0; b: 4.2; c: 5.8; spic: 20

σ^{2} - 66 M 270

321

6 16 16 13

a: 20.1; b: 4.9; c:6.3; spic: 22

φ_{1} - 63 161 267

312

5 17 20 10

a: 15.7; b: 5.0; c: 6.8; V: 51 %

Description

Males: Body cylindrical, blunt anterior end and narrow at the tail end (Figure 1.32A). Head slightly off set by a fine constriction. Cuticular striations very faint. Somatic setae not seen. Four short cephalic sensilla (2 µm long) at the level of the constriction. Amphids 50-63% cbd in diameter, circular and faint, located at 6-8 µm (1-1.5 x hd) from the anterior end (Figure 1.32B). Stoma narrow with a small dorsal tooth and the pharyngeal muscles surround most of its length.

Pharynx cylindrical with a well developed terminal bulb which has sclerotized valves. Nerve ring surrounds the pharynx at 56-59 % of the length of the pharynx from the anterior. Opening of the ventral gland not seen. Ventral gland small at the level of the pharyngo-intestinal junction. Cardia (5 µm long) prominent (Figure 1.32C).

Reproductive system monorchic with outstretched testis located at the left of the intestine. Testis short, spermatozoa grouped in clusters and long vas deferens, (Figure 1.32A). Spicules slightly curved with a capitulum. Gubernaculum simple. One (or two) pre-cloacal supplements at 16-19 µm in front of the cloaca (Figure 1.32F).

Tail conical with a posterior one third cylindrical part (c'=3.9-4.6).

Female: Similar to males (Figure 1.32D and 1.32E). Reproductive system amphidelphic, with reflexed ovaries, anterior branch to the left and the posterior to the right of the intestine. Each ovary has a single mature ovum and a short germinal zone. Vulva and vagina simple.

Differential diagnosis

Molgolaimus kiwayui sp. n. is characterised by head region off set by a constriction, amphids that are 50-63 % cbd in diameter, located at 1.0-1.5 hd behind the anterior end short slightly curved spicules which possess a capitulum; one or two pre-cloacal supplements.

Molgolaimus kiwayui sp. n. resembles *M. turgofrons* (Lorenzen,1972) Jensen, 1978 in the shape of the head region, position of the amphids and the shape of the spicules,; it *M. abyssorum* sp. n. in the body and spicules size and *M. minutus* Jensen, 1978, in the position of the amphids from the anterior. It differs from *M. turgofrons* in measurements (L= 900-930 µm) and ratios (a= 34-40, b= 8.8-9.0, c= 7.8-8.8), longer cephalic sensilla and the gubernaculum has a dorsally directed apophysis in *M. turgofrons*. *M. kiwayui* sp. n. differs from *M. abyssorum* sp. n. in the position of the amphids (6-8 µm or 1-1.5 x hd compared to 2-3 µm or 0.5 x hd respectively) from the anterior end and in the spicules which lacks a capitulum in the latter. *M. kiwayui* sp. n. differs from *M. minutus* in the shape of the anterior end (anterior attenuated in *M. minutus*) and the spicules (spicules open and curved dorsally at the distal end in *M. minutus*).

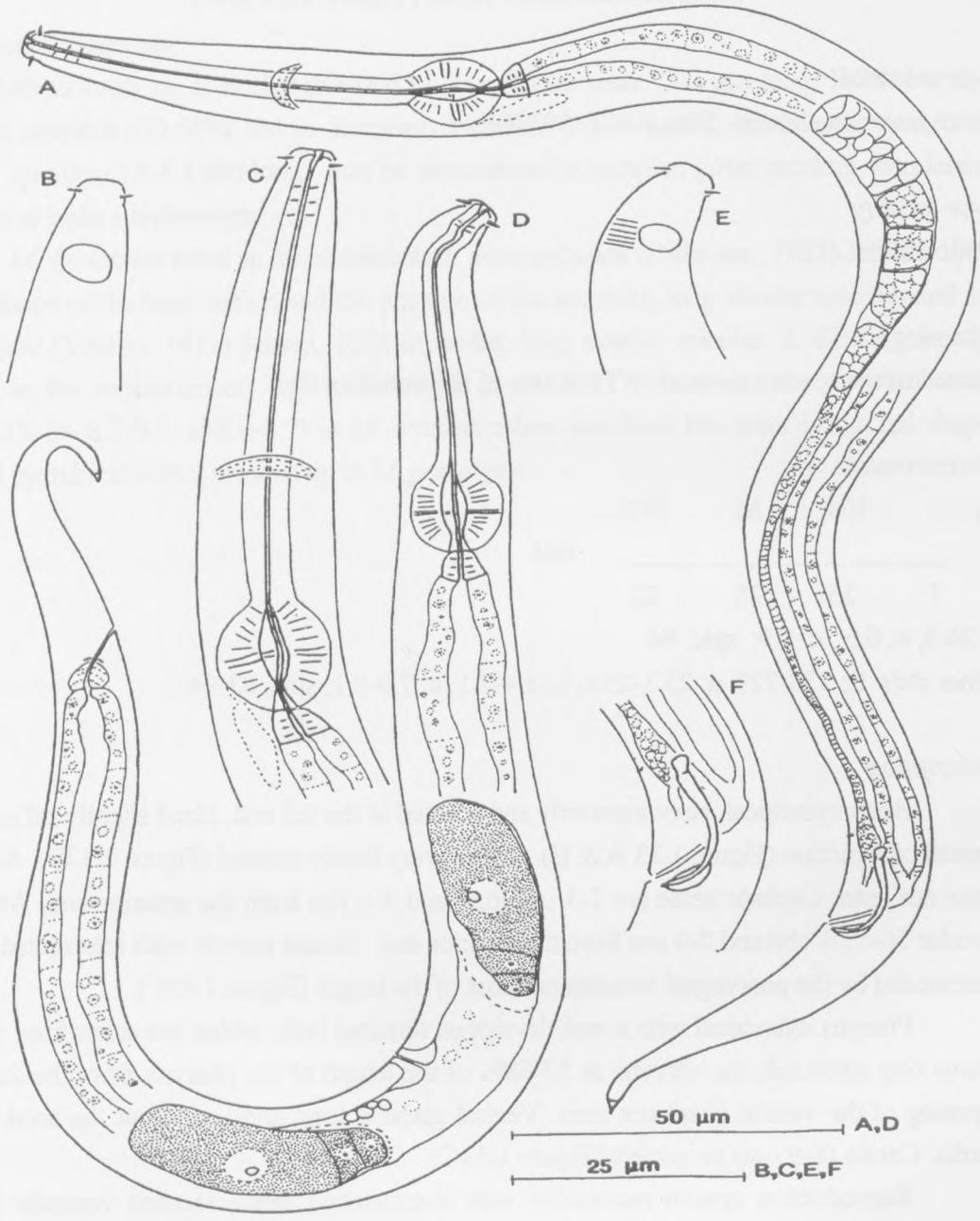


Figure 1.32: *Molgolaimus kiwayui* sp. n.; A: ♂$_1$ total view, B: ♂$_1$ head region, C: ♂$_1$ pharyngeal region, D: ♀$_1$ total view, E: ♀$_1$ head region, F: ♂$_1$ spicules

***Molgolaimus tanai* sp. n. (Figure 1.33 A-D)**

Type material

Three males on slide no. 516, 10325, 10326

Type locality

Station 528

Etymology

Named of the species given after Tana, one of the sampling sites.

Measurements

σ^{1} - 104 M 597

684

7 25 28 22

a: 24.4; b: 6.6; c: 7.9; spic: 84

Other ♂♂s L: 538-721; a: 23.3-25.6; b: 5.4-7.1; c: 7.9-8.1; spic: 83-94

Description

Body cylindrical, blunt anteriorly and pointed at the tail end. Head slightly off set with a small constriction (Figure 1.33 A & E). Cuticle very faintly striated (Figure 1.33B). Somatic setae not seen. Cephalic setae are 2-3 µm long and 4-6 µm from the anterior end. Amphids circular 50-55% cbd and 7-9 µm from the anterior end. Stoma narrow with sclerotized walls, surrounded by the pharyngeal muscles on most of the length (Figure 1.33C).

Pharynx cylindrical with a well developed terminal bulb, which has sclerotized valves. Nerve ring surrounds the pharynx at 57-68% of the length of the pharynx from the anterior. Opening of the ventral gland not seen. Ventral gland is long and located at the level of the cardia. Cardia (8-9 µm) prominent (Figure 1.33C).

Reproductive system monorchic with outstretched testis, located ventrally to the intestine with only a slight overlap. Spicules, thin, long (3.8-5.1 abd long) and straight, but in one specimen, they were sinusoid (Figure 1.33F). Gubernaculum (12-18 µm long) complex with lateral pieces (Figure 1.32D). Tail conical with a short (32-41%) posterior cylindrical part (c'=4.0- 4.8).

Females not found.

Differential diagnosis

Molgolaimus tanai sp. n. is characterised by its cephalic setae (2-3 µm long) located at 5-6 µm and amphids (50-55% cbd in diameter) located 7-9 µm behind the anterior end, long slender spicules, 3.8-5.1 abd long / may be sinusoid and a complex gubernaculum with lateral pieces and lacks supplements.

Molgolaimus tanai sp. n. resembles *M. tenuispiculum* (Ditlevsen, 1921) Jensen, 1978 in the shape of the head region and the position of the amphids, long slender spicules and *M. parallgeni* (Vitiello, 1973) Jensen, 1978 in having long slender spicules. It differs from the former in the measurements e.g. body length (L= 995-1175 µm) and the de Man ratios (a=27-33, b= 8.7-9.7, c=8.0-8.7) in *M. tenuispiculum* and from the latter in the tail shape, conical cylindrical with a swollen tip in *M. parallgeni*.

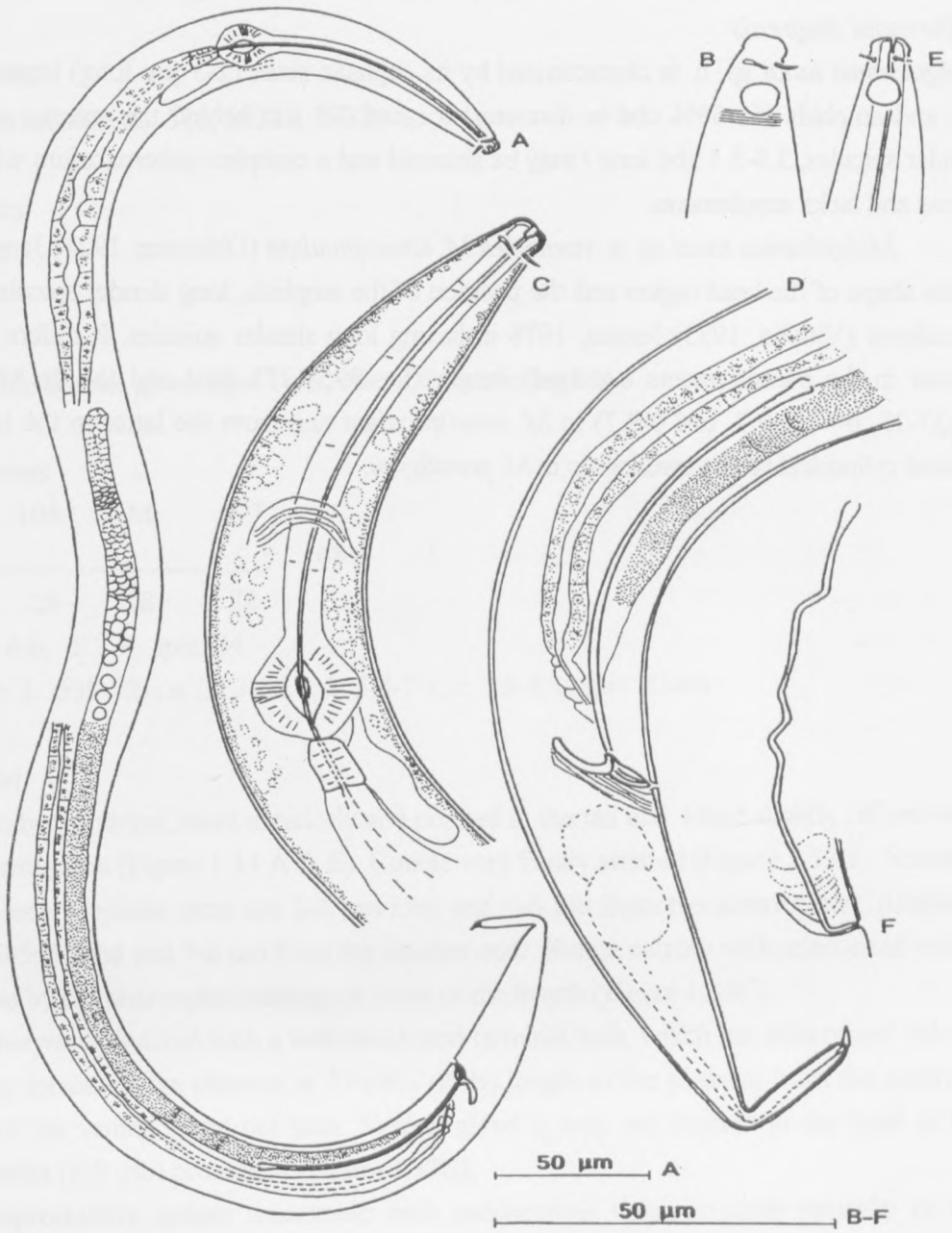


Figure 1.33: *Molgolaimus tanai* sp. n.; A: σ^1 total view, B: σ^1 head region, C: σ^1 pharyngeal region, D: σ^1 tail and spicules, E: σ^2 head region, F: σ^2 spicule.

Key to species of the genus *Molgolaimus*

1.a. Spicules short (< 3 x abd long) 2

b. Spicules long (> 3 x abd long) 9

2.a. One or two pre-cloacal supplements present 3

b. No pre-cloacal supplements 7

3.a. Spicules 1 x abd long 4

b. Spicules > 1 x abd long 5

4.a. Body length < 500 µm, cephalic setae (setiform papillae) inserted at the level of head constriction, amphids located at 1.3 x hd behind the anterior end
M. citrus (Gerlach, 1959), Jensen, 1978

b. Body length > 1000 µm, cephalic setae (4.5-5.0 µm or 0.5 x hd long) inserted behind head constriction, amphids 1.4 x hd behind anterior end *M. cuanensis* (Platt, 1973) Jensen, 1978

c. Body length > 1000µm, cephalic setae (6µm or 0.6 x hd long) inserted at the head constriction, amphids located just posterior of the head constriction *M. parallgeni* (Vitiello, 1973) Jensen, 1978

5.a. Body length < 500 µm 6

b. Body length > 500 µm, cephalic setae (3 µm long) inserted at the head constriction or just behind it, amphids located at 1-1.3 hd behind anterior end, spicules 1.9-2.4 x abd long
M. allgeni (Gerlach, 1950) Jensen, 1978

6.a. Cephalic setae inserted in front of the head constriction, amphids located at 1-1.5 x abd behind anterior end, spicules 1.7 x abd long *M. kiwayui* sp. n.

b. Cephalic setae inserted behind head constriction, amphids located at 2.6-3.0 x hd behind anterior end, spicules 1.7 x abd long *M. gazii* sp. n.

c. Cephalic setae inserted at the head constriction or just posterior

of it, amphids situated at 1.4 x hd behind anterior end, spicules 1.9-2.1 x abd long *M. minutus* Jensen, 1978

d. Cephalic setae inserted at the level of the head constriction, amphids located at 2.5 x hd behind the anterior end, spicules 2.7 x abd long *M. typicus* Furstenberg & Vincx, 1992

7.a. Body length < 400 µm, spicules 2 x abd long *M. abyssorum* sp. n.
b. Body length > 600 µm 8

8.a. Spicules 1.4-1.5 x abd, gubernaculum with a curved apophysis *M. turgofrons* (Lorenzen, 1972) Jensen,1978

b. Spicules 1 x abd, gubernaculum without an apophysis *M. lazonus* (Vitiello, 1971) Jensen, 1978

9.a. One or two pre-cloacal supplements present 10
b. No pre-cloacal supplement present 12

10.a. Body length > 400 µm 11
b. Body length < 300 µm *M. tyroi* sp. n.

11.a. Spicules > 5 x abd long, amphids situated at 1 x hd behind the anterior end *M. tenuispiculum* (Ditlevsen, 1921) Jensen, 1978

b. Spicules 3 x abd long, amphids situated at 3-4 x hd behind anterior end *M. sabakii* sp.n.

12.a. Body length 700 µm, cephalic setae, 3 µm long, close to anterior end, amphids 70 % cbd and located posterior of the stoma, spicules > 8 x abd long, tail (5-7 abd long) conico-cylindrical with a swollen tip *M. longispiculum* (Timm, 1961), Jensen, 1978

b. Body length 500-600 µm, cephalic sensilla located in front of the head constriction, amphids located at 1.7 x hd behind anterior end, spicules 3 x abd long, tail conico-cylindrical with a swollen tip *M. demani* (De Man, 1922) Jensen, 1978

c. Body length 500-700 µm, cephalic sensilla located behind the head constriction, amphids located around 1-1.3 x hd behind the anterior end, spicules 3.8-4.3 x abd long, tail conico-cylindrical with pointed tip *M. tanai* sp.n.

Microlaimidae Micoletzky, 1922

Aponematinae Jensen, 1978 *syn.* Lorenzen, 1981

Bolbolaiminae Jensen, 1978 *syn.* Lorenzen, 1981

***Aponema* Jensen, 1978**

Two new species of *Aponema* are described, *Aponema spec. 1* sp. n. and *Aponema spec 2* sp. n.

***Aponema spec. 1* sp. n. (Figure 1.34 A-H)**

Type material

Eight males and three females on slide numbers RI556-RI557 and 10435-10443

Type locality

Males are from sts. 106, 117, 119, 136, 505, 506 (σ^1_1), 533 (2)

Females are from sts. 105 (φ_1), 119 and 131

Measurements

σ^1_1	-	47	75	M	286	356
	5	12	13	13	10	

a:27.4; b: 5.0; c: 5.1; c': 7.0; spic: 20

φ_1	-	42	68	155	260	323
	6	12	13	16	9	

a: 20.2 b: 4.8; c: 5.1; c': 7.0; V: 48%

Other ♂♂s L: 296-378; a: 24.2-28.6; b: 4.7-5.3; c: 5.1-6.0; c': 4.9-6.7; spic: 17-19

Other ♀♀s L: 259-328; a: 17.3-19.3; b: 4.4-4.6; c: 5.5-6.1; c': 5.2-6.0; V: 47-50 %

Description

Males: Cylindrical body attenuating on both anterior and posterior ends (Figure 1.34A). The head is slightly set off by a fine constriction. The cuticle has fine annuli starting from the level of the constriction (Figure 1.34B). Somatic setae were not seen.

The amphids are simple spiral and the spiral origin is obvious on the ventral side, they are 5-6 µm, 56-66 % of cbd in diameter and located at 12-15 µm from the anterior end. The inner and outer labial sensilla are inconspicuous, while the four cephalic ones are very short (1-2 µm long) setiform. The stoma is rather small with one small dorsal tooth and two sub-

ventral ones (Figure 1.34C & F). The pharynx has a well developed pyriform terminal bulb, which is 80-85 % of cbd in diameter. The nerve ring is located at 60-65 % of the length of the pharynx from the anterior (Figure 1.34C & F). The ventral gland is small and it is located posterior of the cardia but the gland opening is not obvious.

The reproductive system is diorchic with outstretched testes located either the anterior to the right or the left and posterior on the opposite side of the intestine. The sperm cells are large, slightly elongate and pointed on two sides (Figure 1.34A). The spicules are 1.5-2.0 abd long, slightly curved and with a poorly developed capitulum. The gubernaculum is sclerotized and has a dorsal-caudal apophysis 5-7 µm long (Figure 1.34G) which is dorsally curved.

The tail is 51-71 µm long, conical and cylindrical on the posterior half and has a pointed tip (Figure 1.34G).

Females: They are similar to males (Figure 1.34D, E & H) in most aspects. The amphids are however, smaller (4 µm or 44-50 % cbd in diameter) than in males. The reproductive system is amphidelphic with outstretched ovaries, located either anterior to the right or the left and posterior on the other side of the intestine. The ovaries are short and both sides may have ova at the same level of development. In the uterus occur a few sperm cells that are not in clusters. Vulva and vagina are simple.

Differential diagnosis

Aponema spec. 1 sp.n. is characterised by a finely annulated cuticle, sexual dimorphism of the amphids (males have larger amphids), spicules with a poorly developed capitulum and tail with a pointed tip.

So far only the type species *Aponema torosus* (Lorenzen, 1973), Jensen, 1978 is described. *A. spec. 1* sp.n. can be distinguished from *A. torosus* in the size (L= 259-378 µm in the former compared to L=600-700 µm in the latter), sexual dimorphism in the size of the amphids exhibited by *A. spec. 1* sp.n. and the shape of the tail. *A. spec. 1* sp.n. can be distinguished from *A. spec. 2* sp.n. in the sexual dimorphism in the amphids and the shape of the tail (short with a blunt tip in *A. spec. 2* sp.n.).

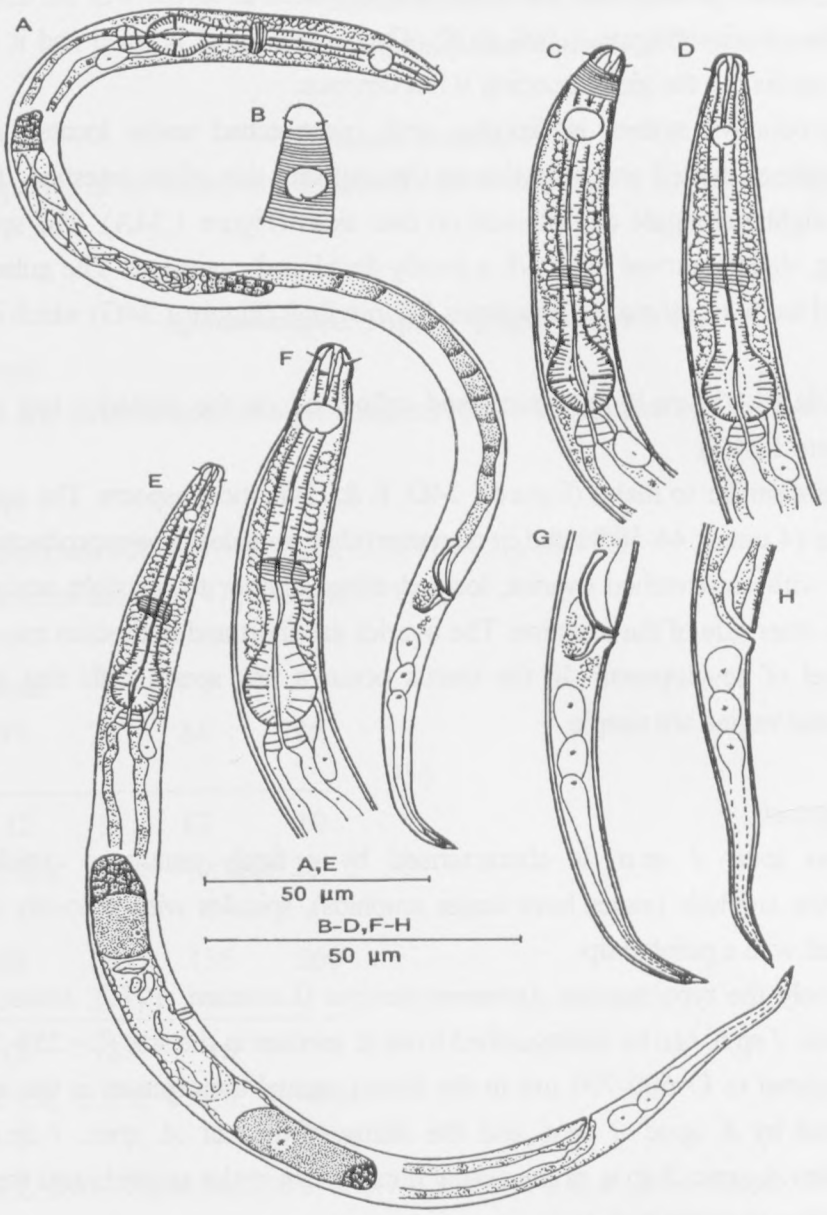


Figure 1.34: *Aponema spec. 1* sp. n.; A: ♂$_1$ total body, B: ♂$_2$ head (superficial), C: ♂$_1$ pharyngeal region, D: ♀$_1$ pharyngeal region, E: ♀$_1$ total body, F: ♂$_2$ pharyngeal region, G: ♂$_1$ tail, H: ♀$_1$ tail

Aponema spec. 2 sp.n. (Figure 1.35 A-G)

Type material

Three males and eight females on slide numbers RI558-RI559 and 10444-10450

Type locality

Males are from sts. 111 (2 including ♂$_1$) and 511 and females from sts. 111 and 511 (7 including ♀$_1$).

Measurements

♂$_1$	-	42	69	M	271
					308
	5	12	13	14	11

a: 22.0; b: 4.5; c: 8.3; c': 3.4; spic: 19

♀$_1$	-	45	73	160	281
					311
	5	12	13	17	9

a:19.5; b: 4.5; c: 6.6; c': 5.6; V: 48 %

Other ♂♂s L:279-328; a: 21.5-27.3; b: 4.5-4.7; c: 7.5-8.6; c': 3.1-3.2; spic: 19-21

Other ♀♀s L: 253-297; a: 17.0-20.9; b:4.0-4.7; c: 6.6-7.5; c': 4.2-5.6; V: 48-52 %

Description

Males: Cylindrical body often curved (Figure 1.35F). The head is set off from the rest of the body by a fine constriction. The cuticle is finely annulated (Figure 1.35C). Somatic setae are very short and were only seen at the tail region (Figure 1.35D).

The amphids are a simple spiral, (4 µm) 44-55 % cbd in diameter and located at 10-15 µm from the anterior end (Figure 1.35C). The inner and outer labial sensilla were not seen but the four cephalic ones are 1-2 µm long and inserted at the head constriction. The stoma is small with a small dorsal and two sub-ventral teeth (Figure 1.35B). Pharynx with a well developed terminal bulb which is 75-85 % of cbd in diameter. The nerve ring is located at 60-65 % of the length of the pharynx from the anterior (Figure 1.35F). Ventral gland is small and located posterior of the cardia but the gland opening was not seen. The cardia is 4-5 µm long and prominent.

The reproductive system is diorchic with outstretched testes located anterior either to the right or the left and the posterior on the opposite side of the intestine. The sperms cells are

elongate or rounded. The spicules are 1.6-1.8 the abd long and almost straight except for the anterior one fourth that is dorsally or ventrally bent, and the anterior tip is pointed (Figure 1.35D). The gubernaculum has sclerotized dorsal caudal apophysis which is 6-7 μm long. There is one pre-cloacal supplement located at 10-11 μm in front of the cloaca (Figure 1.35F).

The tail is short, conical cylindrical with a blunt terminal tip.

Females: They are similar to males (Figure 1.35A &G). The reproductive system is amphidelphic with outstretched ovaries located, anterior either on the left or right of the intestine and posterior on the other side. The uterus is often filled with spermatozoa. Vulva is simple and vagina is long and heavily sclerotized..

Differential diagnosis

Aponema spec. 2 sp.n. has a head that is set off from the rest of the body by a fine constriction, spicules that are almost straight and dorsally bent at the anterior tip and one pre-cloacal supplement and a short cylindrical tail with a blunt tip.

Aponema spec. 2 sp.n. can be distinguished from the other two, *A. torosus* (Lorenzen 1973) Jensen 1978 and *A. spec. 1* sp.n., by the set off head, spicules with a pointed anterior tip, pre-cloacal supplement and the short tail with a blunt tip in *A. spec. 2* sp.n.. Besides, *A. torosus* is much longer (L=600-700 μm long) and *A. spec. 1* sp. n. has sexual dimorphism in the size of the amphids.

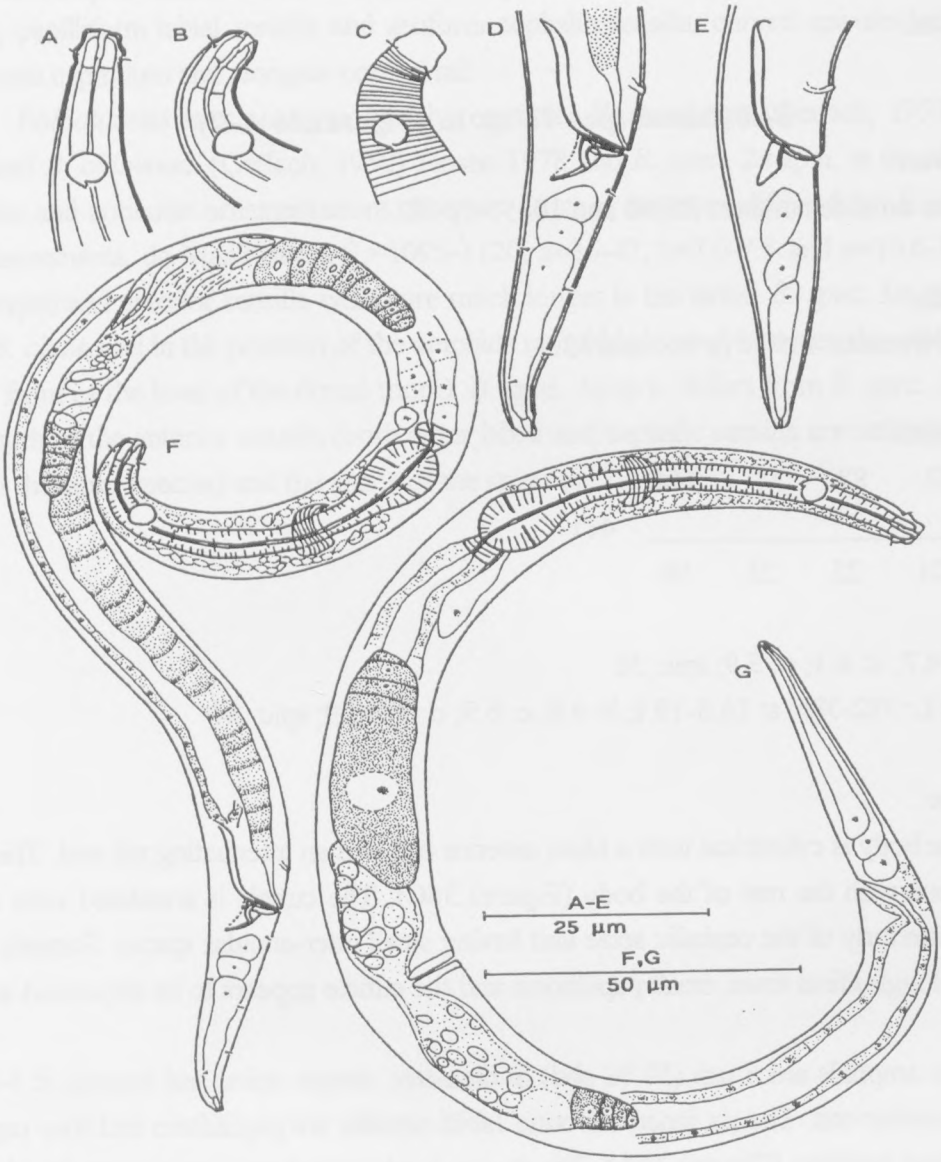


Figure 1.35 : *Aponema spec. 2* sp.n.; A: ♀$_1$ stoma, B: ♂$_1$ stoma, C: ♀$_2$ head (superficial), D: ♂$_1$ tail, E: ♂$_2$ tail, F: ♂$_1$ total body, G: ♀$_1$ total body

Bolbolaimus Cobb, 1920

Two species of *Bolbolaimus*, *Bolbolaimus spec. 1a* sp. n. and *Bolbolaimus spec. 2a* sp. n. are described.

Bolbolaimus spec. 1a sp. n. (Figure1.36 A-D)

Type material

Three males on slide numbers RI560 and 10451-10452

Type locality

Specimens from sts. 119 (σ^1_1), 506 and 533.

Measurements

σ^1_1	-	53	88	M	344	
						411
	9	21	22	23	18	

a: 16.0; b: 4.7; c: 6.1; c': 3.9; spic: 35

Other ♂♂s L: 382-386; a: 16.8-19.1; b: 4.8; c: 6.9; c': 3.3-3.9; spic: 34

Description

The body is cylindrical with a blunt anterior end and an attenuating tail end. The head is continuous with the rest of the body (Figure1.36C). The cuticle is annulated with annuli starting posteriorly of the cephalic setae and having small inter-annular spaces. Somatic setae are in four longitudinal rows, small papilliform and the cuticle appears to be depressed around them.

The amphids are 6 µm (50 % cbd) in diameter, simple spiral and located at 4-6 µm from the anterior end. The six inner, six outer labial sensilla are papilliform and four cephalic ones are short setiform (Figure1.36A). The stoma is sclerotized and has a large dorsal tooth and two pairs of smaller sub-ventral ones. The pharynx is 80-88 µm long and cylindrical with a well developed posterior bulb which is 65-75 % cbd. The nerve ring is located at 55-60 % of the length of the pharynx from the anterior (Figure1.36B). The ventral gland is small and located posterior of the cardia and the gland opening is at the level of the nerve ring.

The reproductive system is diorchic with outstretched testes located, anterior to the left and posterior to the right of the intestine (Figure1.36C). The spicules are 1.9-2.0 abd in length arcuate and with a poorly developed capitulum (Figure1.36D). The gubernaculum is 13-14 µm long with a dorso-anteriad pointing tip.

The tail is conical, 55-67 µm long with a pointed tip.

Differential diagnosis

Bolbolaimus spec. 1a sp.n. is characterised by cuticular annuli with fine inter-annular spaces, papilliform labial sensilla and setiform cephalic sensilla, curved spicules with poorly developed capitulum and elongate conical tail.

Bolbolaimus spec. 1a sp.n. closely resembles *B. crassiceps* (Gerlach, 1953) Jensen, 1978 and *B. chitwoodi* (Gerlach, 1950) Jensen 1978 and *B. spec. 2a* sp.n. in the absence of denticles and cuticular ornamentations. *B. spec. 1a* sp.n. however differs from *B. crassiceps* in measurements, de Man's ratios (L=1095-1120, a=35-47, b=7.0-7.5 and c=10.6-12.2 in *B. crassiceps*) and anterior sensilla which are much longer in the latter. *B. spec. 1a* sp.n. differs from *B. chitwoodi* in the position of the amphids (amphids located between the cephalic setae and in front of the level of the dorsal tooth). *B. spec. 1a* sp.n. differs from *B. spec. 2a* sp.n. in the length of the anterior sensilla (both outer labial and cephalic sensilla are setiform, 2-3 µm long in the latter species) and the shape of the spicules.

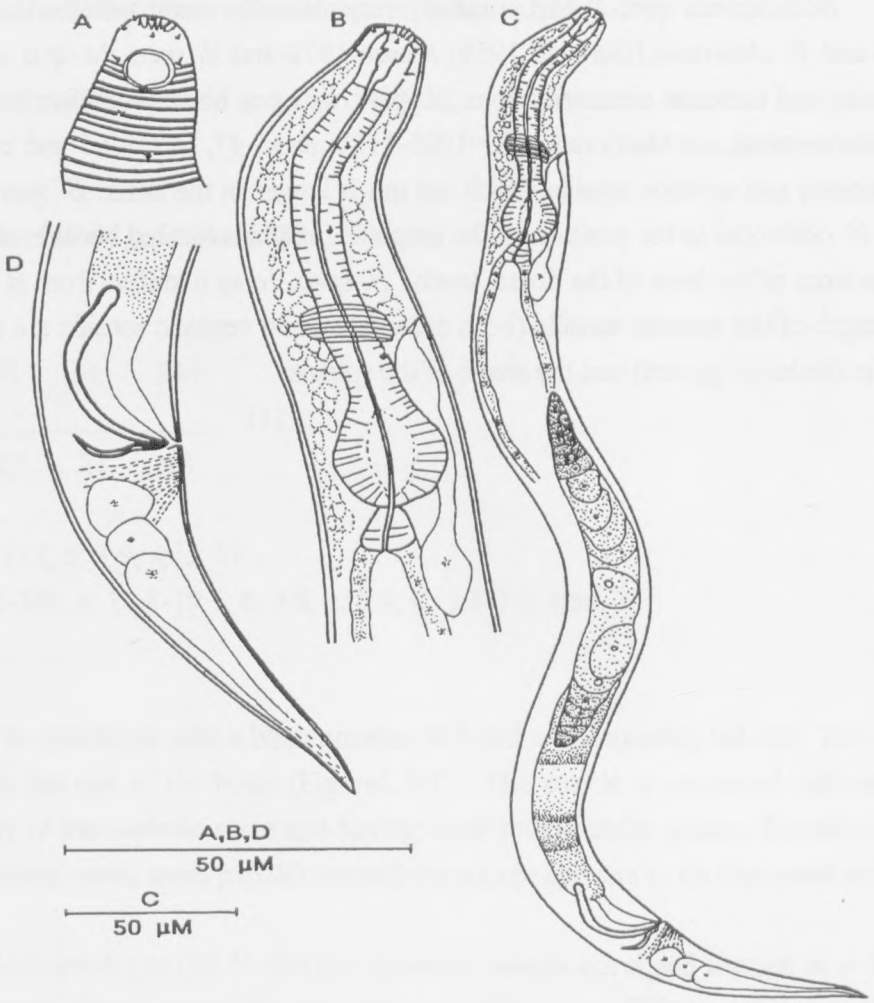


Figure1.36: *Bolbolaimus spec. 1a* sp.n.; A: δ_1 head (superficial), B: δ_1 pharyngeal region, C: δ_1 total body, D: δ_1 tail

***Bolbolaimus spec. 2a* sp.n. (Figure1.37 A-H)**

Type material

Five males and two females on slide numbers RI561-RI562 and 10453-10458

Type locality

Males are form sts. 505 (3 including σ^{1}), 507 (2) and females are from sts. 119 (φ_{1}) and 505.

Measurements

σ^{1} - 49 92 M 427

488

8 17 16 18 16

a: 27.1; b: 5.3; c: 8.0; c': 3.8; spic: 29

φ_{1} - 39 73 246 356

411

7 13 14 14 10

a: 29.4; b: 5.6; c: 7.5; c': 5.5; V: 60%

Other $\sigma\sigma$s L: 387-493; a: 25.8-35.2; b: 5.6-6.3; c: 7.3-7.9; c': 4.1-5.7; spic: 24-29

Other $\varphi\varphi$s L: 527; a: 27.2; b: 6.2; c: 7.6; c':5.3; V: 59 %

Description

Males: The body is cylindrical with a blunt anterior end and an attenuating posterior end (Figure1.37D). The cuticle is annulated with annuli starting from posterior of the cephalic setae (Figure1.37B). The somatic setae were not seen.

Amphids are large, simple spiral, (4-6 µm) 50-60 % cbd in diameter and located at 4-6 µm from the anterior end (Figure1.37B). The inner labial sensilla are not conspicuous while the six outer labial and the four cephalic ones are setiform, 2-3 µm long. The stoma is highly sclerotized and has one large dorsal tooth and two pairs of smaller sub-ventral ones. The pharynx is 61-92 µm long, with a terminal pyriform bulb which is 80-93 % of cbd in diameter (Figure1.37A). The nerve ring surrounds the pharynx at 50-55 % of the pharyngeal length from the anterior end. The ventral gland is small and located posterior of the cardia, gland opening not obvious. The cardia is long and conspicuous.

The reproductive system is diorchic with outstretched testes located anterior to the left and posterior to the right or the left (rare) of the intestine. The spicules are 2.0-2.3 abd in length and curved, they have well-developed beak-shaped capitulum. The gubernaculum is 10-12 µm long, curved with a sharp pointed dorsal anterior tip (Figure1.37G).

The tail is conical with a short (49-69 µm long) cylindrical posterior part.

Females: They are similar to males (Figure1.37C, E & H). The reproductive system is amphidelphic with outstretched ovaries located like in the males, anterior to the left and posterior to the right or the left of the intestine. The uterus is long and may contain sperm cells that are in clusters. The vulva is simple and the vagina is long (Figure1.37F).

Differential diagnosis

Bolbolaimus spec. 2a sp.n. is characterised by setiform labial and cephalic sensilla, amphids located posterior of the cephalic setae and spicules with a well developed beak-shaped capitulum.

Bolbolaimus spec. 2a sp.n. resembles *B. chitwoodi (Gerlach, 1950)* Jensen, 1978, *B. crassiceps* (Gerlach, 1953) Jensen, 1978 and *Bolbolaimus spec. 1a* sp.n. in the absence of denticles in the stoma, the lack of cuticular ornamentation and the level of annulation in the head region. *B. spec. 2a* sp. n. differs from *B crassiceps* in measurements and de Man's ratios (L=1095-1120, a=35-47, b=7.0-7.5 and c=10.6-12.2 in *B. crassiceps*) and it differs from *B. chitwoodi* in the position of the amphids (amphids located between the cephalic setae and infront of the level of the dorsal tooth). *B. spec. 2a* sp. n. differs from *B. spec. 1a* sp.n. in the length of the anterior sensilla (labial sensilla are papilliform and cephalic are short setiform in *B. spec. 1a* sp.n.) and the shape of the spicules (spicules have a well-developed beak-shaped capitulum in *B. spec. 2a sp.n.*).

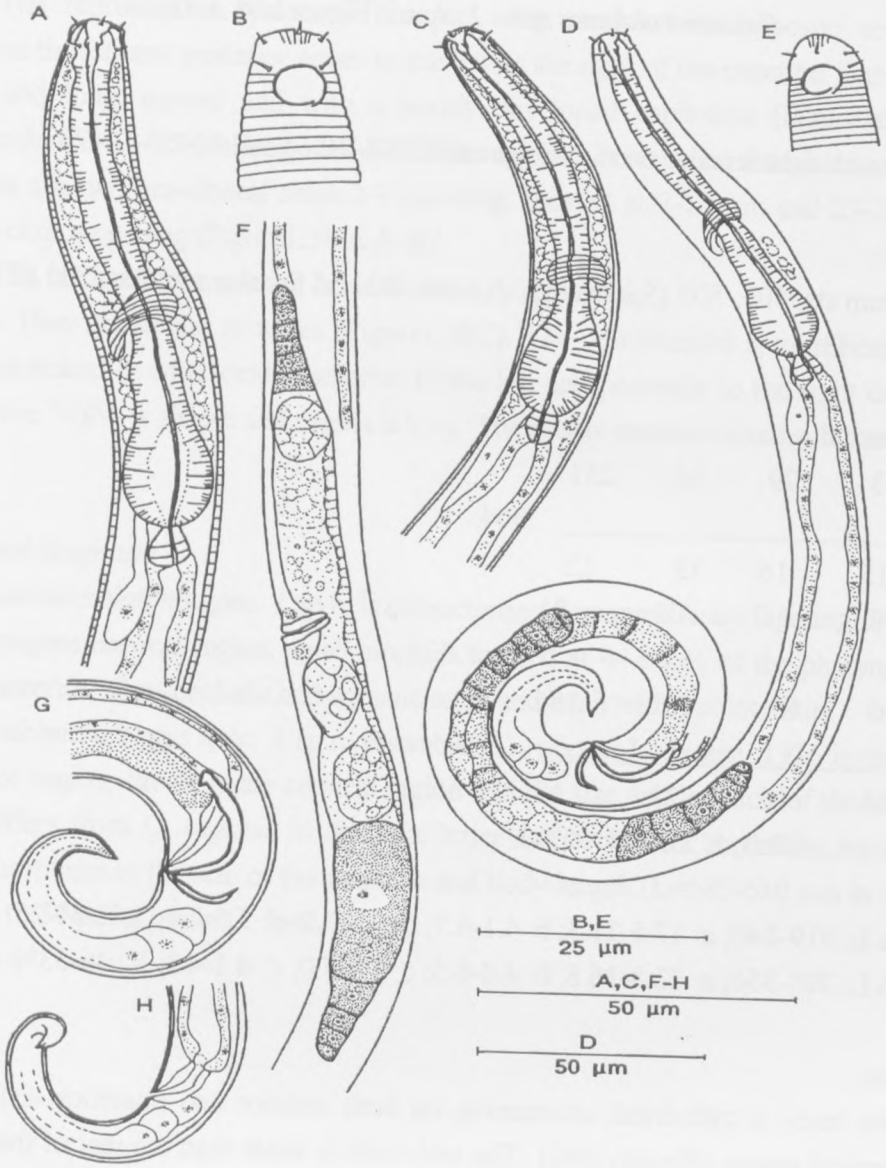


Figure1.37: *Bolbolaimus spec. 2a* sp.n.; A: ♂$_1$ pharyngeal region, B: ♂$_1$ head (superficial), C: ♀$_1$ pharyngeal region, D: ♂$_1$ total body, E: ♀$_1$ head (superficial), F: ♀$_1$ reproductive system, G: ♂$_1$ tail, H: ♀$_1$ tail

Calomicrolaimus Lorenzen, 1976

Calomicrolaimus spec. 1 sp.n. (Figure1.38 A-D)

Type material

Seven males and eight females on slide numbers RI563-RI564 and 10459-10470

Type locality

Males are from sts. 503, 505 (5 including ♂$_1$) and 533 and females are from 505 (6 including ♀$_1$) 518 and 533

Measurements

♂$_1$ -	53	79	M	251	
					304
6	15	16	19	12	

a: 16.0; b: 3.9; c: 5.7; c': 4.4; spic: 21

♀$_1$ -	56	81	167	266	
					304
6	15	16	22	12	

a: 13.8; b: 3.8; c: 8.0; c': 3.2; V: 55%

Other ♂♂s L: 319-340; a: 17.5-21.3; b: 4.1-4.7; c: 6.1-7.2; c': 3.5-4.4; spic:21-25

Other ♀♀s L: 301-356; a: 12.8-16.8; b: 4.0-6.5; c: 6.4-7.0; c': 4.1-4.8; V: 46-53%

Description

Males: The body is cylindrical, attenuating on both anterior and posterior end and has a narrow cervical region (Figure1.38C). The mid-body is wider than the rest of the body. The cuticle is finely striated starting from posterior of the cephalic setae. Somatic setae are 3-4 µm long and in four longitudinal rows.

The amphids are small (2-3 µm wide) and located at 44-54 % of the length of the pharyngeal region from the anterior and they have corpus gelatum which is longer in the males observed than in the females (Figure1.38 D). The inner labial sensilla are inconspicuous, the six outer labial are papilliform while the four cephalic ones are 3-4 µm long. The stoma is sclerotized and has a large dorsal tooth and two sub-ventral ones. The pharynx is (60-81 µm long) cylindrical with a pyriform terminal bulb which is 70-85 % of the cbd in diameter. The nerve ring is located at 65-69 % of the length of the pharyngeal region from the anterior. The

ventral gland is small and located posterior of the cardia but the gland opening is not obvious. Cardia is prominent.

The reproductive system is diorchic with outstretched, opposed testes located anterior to the left and posterior either to the left or the right of the intestine. The spicules are 1.8-1.9 abd long, curved and with a poorly developed capitulum (Figure1.38 B) .The gubernaculum is 12-15 µm long, parallel to the spicules but curved anteriorly on the dorsal tip. There are two pre-cloacal setae 2-3 µm long, located at 7-10 µm and 23-29 µm away from the cloaca opening (Figure1.38 A & B).

The tail is 45-52 µm long, conical with a cylindrical tip.

Females: They are similar to males (Figure1.38C). The reproductive system is amphidelphic with outstretched ovaries located anterior to the left and posterior to the right or the left of the intestine. Vulva is simple and vagina is long. The uterus contains sperms that are dispersed singly.

Differential diagnosis

Calomicrolaimus spec. 1 sp.n. is characterised by a small body tapering on both ends and an elongate cervical region, small amphids located at 44-54 % of the pharyngeal length from the anterior, short cephalic and somatic setae and a tail with a pointed tip.

Calomicrolaimus spec. 1 sp.n. resembles *C. rugatus* Lorenzen, 1976 in the shape of the anterior region, the elongate cervical region and the size and location of the amphids. *C. spec. 1* differs from *C. rugatus* in that, the latter has prominent thorn-like cervical setae, sexual dimorphism in the size of the amphids and body length (L=585-630 µm in *C. rugatus* compared to 304-356 µm in *C. spec. 1* sp.n.).

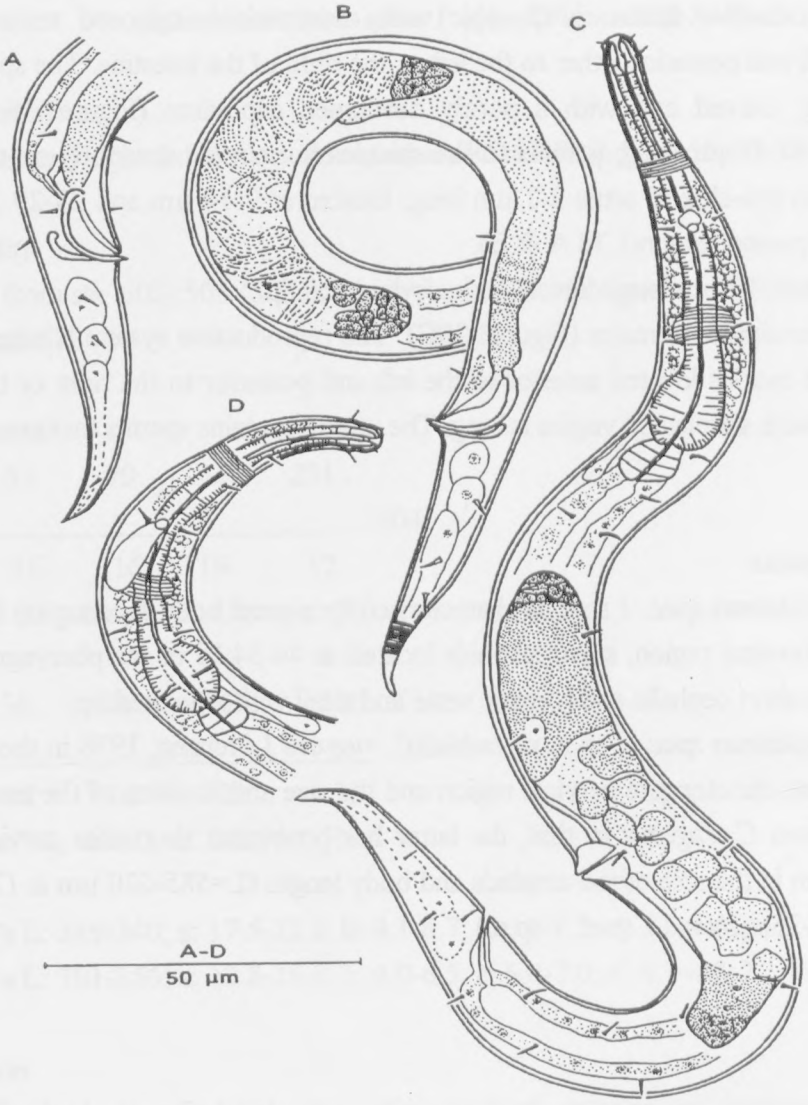


Figure1.38: *Calomicrolaimus spec. 1* sp.n.; A: δ_1 tail, B: δ_2 reproductive system and tail region, C: φ_1 total body, D: δ_1 pharyngeal region

Ixonema spec. 1 sp.n. (Figure 1.39 A-F and 1.40A-G)

Type material

Eight males and eight females in slide numbers RI565-RI566 and 10471-10479

Type locality

Males are from sts. 117, 120, 503, 506, 511 (2) and 550 (2 including $\male_1$) and females are from sts. 119, 503 (2), 505, 511 (2 including $\female_1$), 514 and 550, station depth is 20-2000 m.

Measurements

$\male_1$	-	47	75	M	286
					321
	7	16	17	21	14

a: 15.3; b: 4.3; c: 9.2; c': 2.5; spic: 27

$\female_1$	-	57	85	177	319
					367
	7	14	15	26	11

a: 14.1; b:4.3; c: 7.7; c': 4.4; V:48 %

Other ♂♂s L: 250-405; a: 14.7-22.5; b: 4.0-4.9; c: 7.9-9.1; c': 2.5-3.8; spic: 22-27

Other ♀♀s L: 245-385; a: 12.3-15.1; b: 3.6-4.7; c: 7.3-8.6; c': 2.6-4.5; V: 48-52%

Description

Males: The body is cylindrical, short and plump, attenuating on both ends and thick in the middle (Figure1.39C). The cuticle is very finely striated (Figure1.40D) only seen by SEM. Somatic setae (5-6 µm long) are thick and in four longitudinal rows (Figure1.39C).

The amphids are circular (Figure1.40C), 1-2 µm in diameter and located at 30-45 % of the length of the pharyngeal region from the anterior and has a long rod-like corpus gelatum (Figure1.39E). The inner and outer labial sensilla are papilliform (Figure1.40A) and the four cephalic ones are setiform, 4-5 µm long. The stoma is sclerotized and has a big dorsal tooth and two sub-ventral ones. The pharynx has a well developed terminal bulb which is 70-85 % of the cbd in width. The nerve ring surrounds the pharynx at 60-70 % of the length of the pharyngeal region from the anterior (Figure1.39F). The ventral gland and its outlet were not seen. Cardia is prominent, (5-6 µm long).

The reproductive system is diorchic with outstretched testes located (most) anterior to the left and posterior to the right of the intestine or (rare) both anterior and posterior testes to the right or the left of the intestine (Figure1.39C). The spicules are 1.7-2.3 abd long,

massive and curved (Figure1.39D). There is a single ventral pre-cloacal setae located at 7 µm from the cloaca opening.

The tail is short (36-46 µm long), cylindrical with a blunt tip (Figure1.39D & Figure1.40E) where the three caudal glands open through separate outlets (Figure1.40F).

Females: They are similar to males (Figure1.39A, B, E & Figure1.40G). The reproductive system is amphidelphic with outstretched ovaries located anterior to the left and posterior to the right of the intestine or both anterior and posterior to the right or the left of the intestine. Vulva is simple and vagina is long.

Differential diagnosis

Ixonema spec. 1 sp.n. is characterised by short (< 400 µm long) stout body with a narrow elongate cervical region, small (1-2 µm) circular amphids located at 30-45 % of the pharyngeal length from the anterior, strong spicules with a poorly developed capitulum.

Two other *Ixonema* species described are; *I. powelli* Jensen, 1985 and *I. sordidum* Lorenzen, 1971. *Ixonema spec. 1* sp.n. can be distinguished from them in the body size (<400 µm long) and the shape of the spicules. It also differs from *I. powelli* in the shape of the amphids (circular in *Ixonema spec. 1* sp. n. and pocket-shaped in *I. powelli*).

Remarks

Smooth cuticle is used as a generic character for *Ixonema*, (Lorenzen, 1971), however scanning pictures reveal that the cuticle actually has fine annuli or striations.

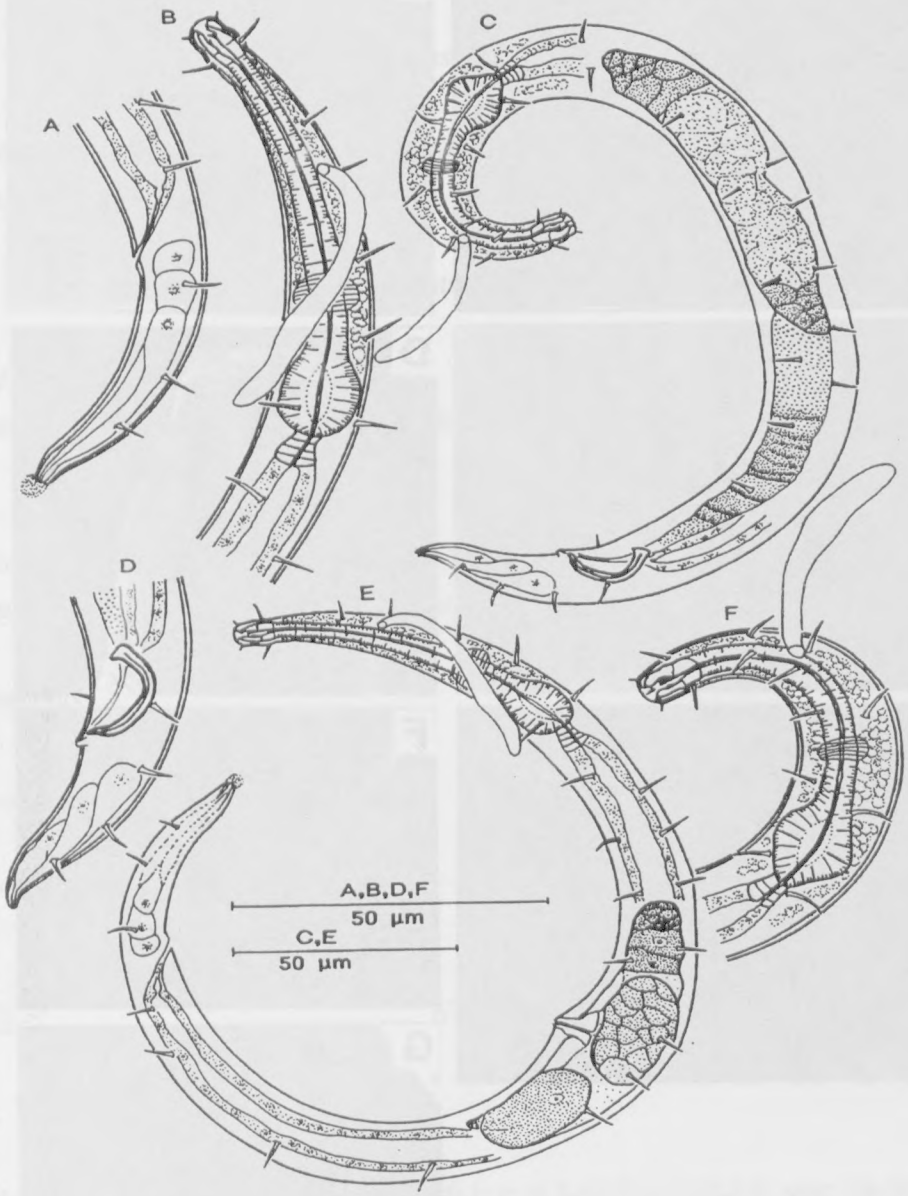


Figure1.39: *Ixonema spec. 1* sp.n.; A: ♀$_1$ tail, B: ♀$_1$ pharyngeal region, C: ♂$_1$ tail, D: ♂$_1$ tail, E: ♀$_1$ total body, F: ♂$_1$ pharyngeal region,

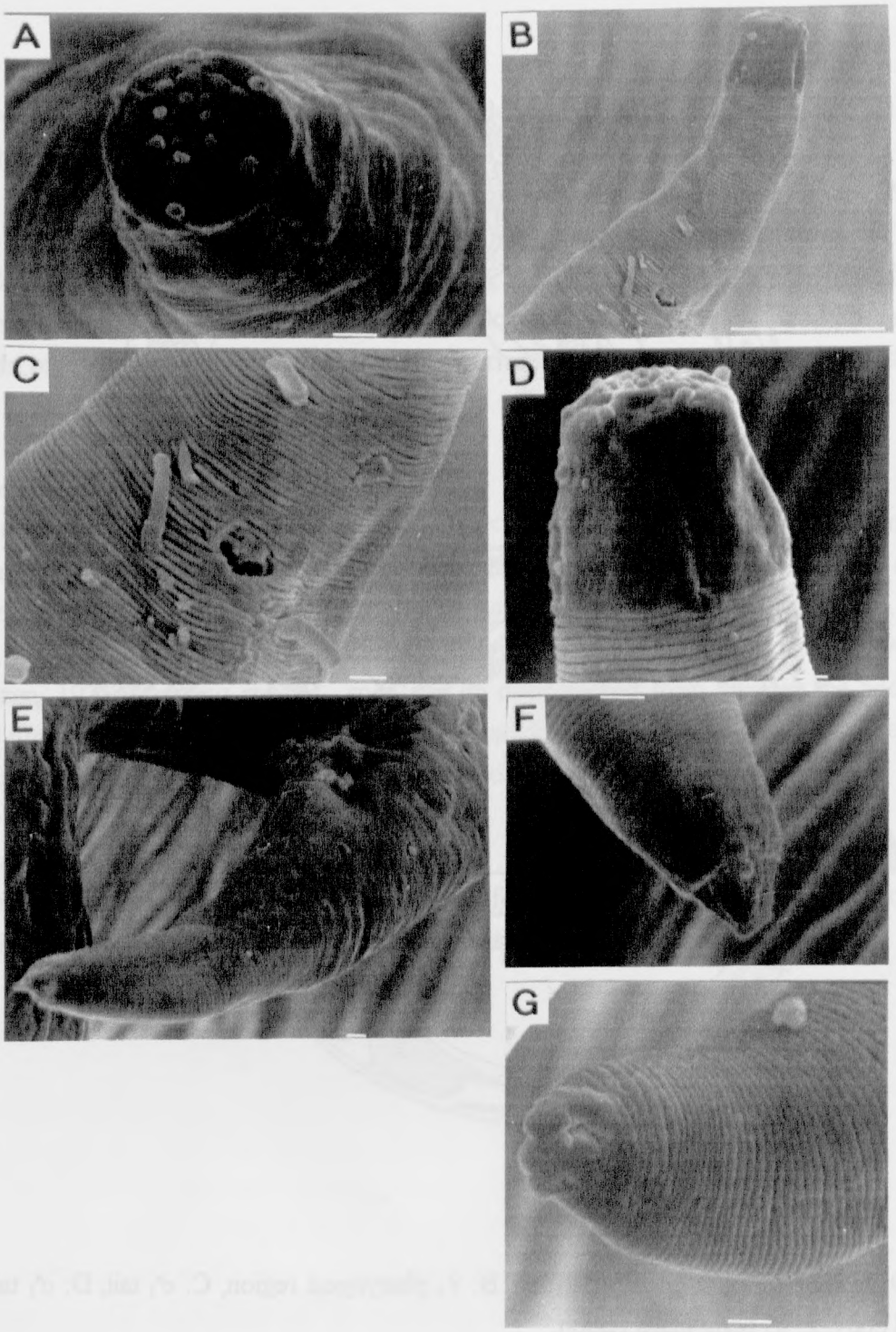


Figure1.40: *Ixonema spec. 1* sp.n.; A: ♂2 anterior view, B: ♂2 cervical region showing position of amphids, C: ♂2 amphids, D: ♂2 head region (lateral), E: ♂2 tail region, F: ♂2 tail tip, G: ♀2 tail tip, (Scale bars = 1 µm in A, C-G and 10 µm in B)

Microlaimus de Man, 1880

Additional description of *Microlaimus texianus* Chitwood, 1951 is given and two new species, *Microlaimus spec.1a* sp. n. and *Microlaimus spec. 2a* sp. n. are described.

Microlaimus texianus Chitwood, 1951 (Figure1.41 A-H)

Material studied

Ten males and six females on slide numbers RI567-RI568 and 10480-10492

Locality

Males form sts. 108 (3 including σ^1), 111, 114, 514 (4) and 528, females from sts. 108 (2 including φ_1), 506, 514, 528 and 550, the station depth is 20-1000 m

Measurements

σ^1 - 48 78 M 560

619

7 15 15 19 17

a: 32.6; b: 7.9; c: 10.9; c': 3.4; spic: 25

φ_1 - 43 76 321 605

675

7 15 18 23 12

a: 29.3; b: 8.9; c: 9.6; c': 5.8; V: 48 %

Other $\sigma\sigma$'s L: 559-736; a: 31.0-39.4; b: 7.2-9.1; c: 9.7-12.7; c': 3.2-3.9; spic: 24-30

Other $\varphi\varphi$'s L: 491-675; a: 27.3-34.9; b: 7.7-8.5; c: 8.5-9.9; c': 5.1-6.3; V: 47-51%

Additional description

Males: The body is cylindrical, attenuating more at the posterior end than at the anterior end (Figure1.41F). There is a slight constriction posterior of the head, thereby giving the impression of a slightly set off head. Cuticle is annulated with annuli beginning at the constriction. Each annule is ornamented with a fine striation at the middle (Figure1.41B). Somatic setae were not seen except at the tail where there are two rows on each sub-lateral side of the body. Hypodermal glands were not seen.

The amphids are simple spiral with the spiral origin obvious on the ventral side; they are 60-75 % of the cbd in diameter and located at 8-11 μm from the anterior end. In some individuals there is corpus gelatum from the amphids (Figure1.41C). The labial sensilla are

inconspicuous. The four cephalic ones are 3-4 µm long and located at the level of the constriction. The stoma is small with a dorsal tooth and two smaller sub-ventral ones (Figure1.41B). The pharynx (75-89 µm long) has a well-developed terminal bulb which is 71-76 % of the cbd. The nerve ring is located at 47-50 % of the length of the pharynx from the anterior. The ventral gland is large, and located posterior of the cardia and the gland opening is at the level of the nerve ring. Cardia is prominent (Figure1.41D).

The reproductive system is monorchic with an outstretched anterior testis located to the right or left of the intestine (Figure1.41F). The sperm cells are large, elongate and striated. The spicules are 1.5-1.7 abd in length, curved and they have a poorly developed capitulum (Figure1.41E). The gubernaculum is 11-13 µm long and curved ventrally on the anterior end. There are five pre-cloacal supplements located between 7-13 µm and 44-81 µm from the cloaca opening.

Tail is conical with an elongate cylindrical end. The three caudal glands are arranged in tandem (Figure1.41F).

Females: They are similar to males in most aspects (Figure1.41A & H). The amphids are however, smaller, 44-55 % of cbd and located at 8-12 µm from the anterior end (Figure1.41A). The reproductive system is amphidelphic with outstretched ovaries located anterior one either to the right (often) or left of the intestine and the posterior one on the opposite side. There are large eggs (39 X 17 µm in dimensions) on each side of the uterus suggesting that ovulation takes place simultaneously from both ovaries. Vulva and vagina are simple (Figure1.41H). The tail is also longer (Figure1.41G) (see c' and c-ratio values).

Discussion

Microlaimus texianus was first described by Chitwood, 1951 with only females. Wieser, 1954 described another population with males. The present population has been identified as *M. texianus* because of the general body shape, measurements and ratios which are similar to the original population. There are however slight differences between the present population and that of Wieser:

-There is no sexual dimorphism in the amphids size in the population of Wieser

-The size of the gubernaculum differs markedly (22- 24 µm compared to 11-13 µm in the present population).

-Although Wieser depicts presence of pre-cloacal supplements in males (Figure 133b), he does not mention the number in total and we can only assume that they are five like in our population.

-Finally, our population has males that possess only an anterior testis and since there is no mention of the reproductive system in Wieser's population, so we cannot know the condition in that population.

So far this is the only *Microlaimus* species described with only one testis. Single anterior

testis is a character found in *Molgolaimus* (and partly in *Aponema*) Jensen, 1978. However this species has outstretched ovaries while in *Molgolaimus* the females have reflexed ovaries. Lorenzen (1980) argues that it is more likely that the posterior testis is lost independently (in the case of *Aponema*) than that the ovaries have become reflexed independently. And *Aponema* is characterised mainly by the highly sclerotized copulatory apparatus especially the gubernaculum which possesses a dorso-caudal apophysis (Jensen, 1978) which is not the case in this species.

In conclusion, therefore, we shall leave this population as *Microlaimus texianus* because it resembles the original population morphologically.

Although, *Microlaimus texianus* and *M. cyatholaimoides* de Man, 1922 resemble closely, we agree with Hopper and Meyer, 1967, to keep the two species separately since there are no hypodermal glands in *M. texianus*.

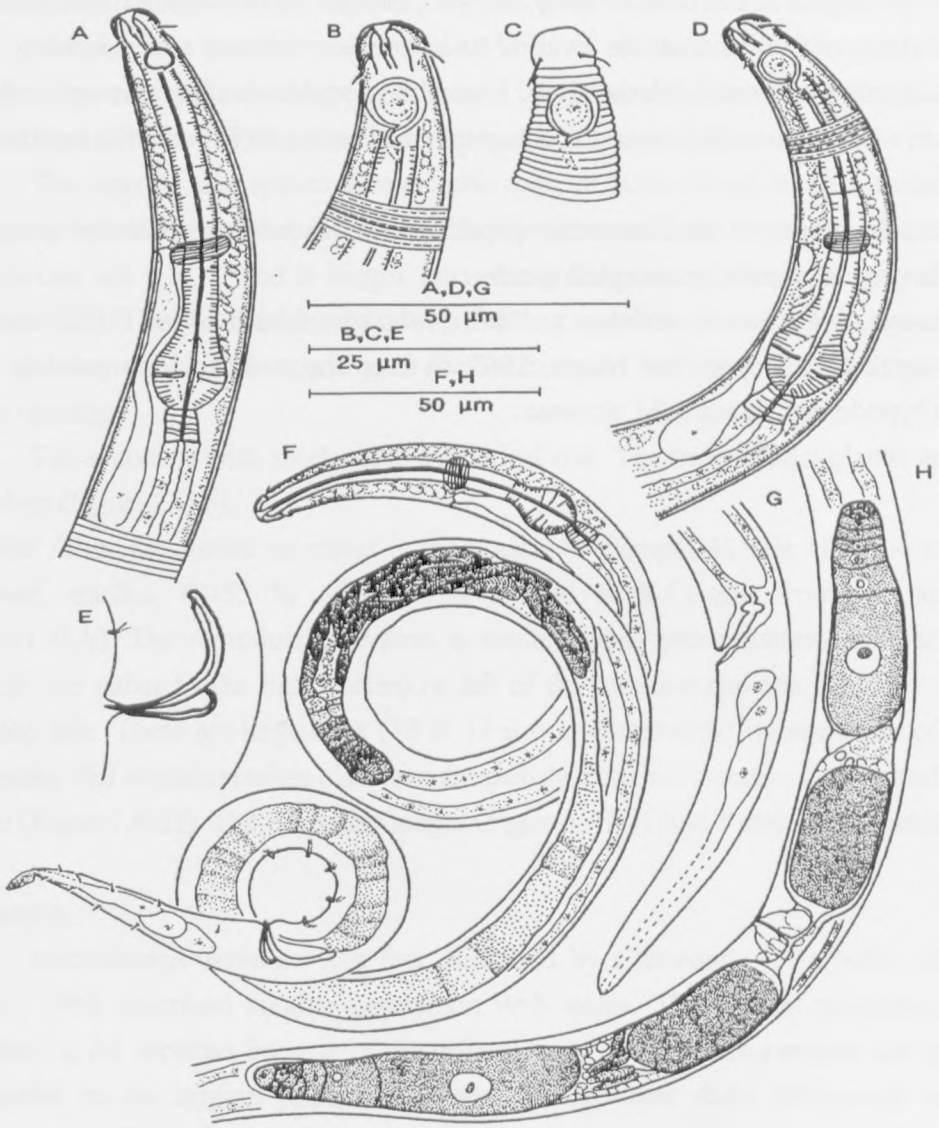


Figure1.41: *Microlaimus texianus* Chitwood, 1951; A: ♀$_1$ pharyngeal region, B: ♂$_1$ stoma, C: ♂$_1$ head (superficial), D: ♂$_1$ pharyngeal region, E: ♂$_1$ spicules, F: ♂$_1$ total body, G: ♀$_1$ tail, H: ♀$_1$ reproductive system

***Microlaimus spec. 1a* sp.n. (Figure1.42 A-F)**

Type material

Six males and nine females on slide numbers RI569-RI570 and 10493-10503

Type locality

Males from sts. 133 (3 including ♂$_1$), 503, 505 and 518, Females from sts. 133 (5), 105, 531 (♀$_1$) and 550 (2)

Measurements

♂$_1$	-	69	M	244	
					294
	6	13	15	12	

a: 19.6; b: 4.3; c: 5.7; c': 4.3; spic: 12

♀$_1$	-	49	103	163	
					202
	5	12	12	8	

a: 16.8; b: 4.1; c: 5.2; c': 4.9; V: 51 %

Other ♂♂s L: 211-296; a: 18.9-20.7; b: 4.3-4.8; c: 4.9-7.0; c': 3.5-4.7; spic: 12-15

Other ♀♀s L: 217-291; a: 13.6-17.7; b: 3.8-4.3; c: 5.2-7.2; c': 3.0-6.0; V: 47-52 %

Description

Males: The body is cylindrical and narrows on both ends. Head is not set off (Figure1.42F). The cuticle is annulated with annuli starting posterior of the cephalic setae (Figure1.42A). Somatic setae were not seen.

The amphids are (4-5 µm) 56-62 % of cbd in diameter, simple spiral, with the spiral origin sometimes being obvious on the ventral side. They are located at 11-15 µm from the anterior end (Figure1.42A). The inner and outer labial sensilla are inconspicuous and the four cephalic ones are very short and located just anterior of the first annule. The pharynx is cylindrical (46-69 µm long) with a well developed, pyriform bulb, which is 80-85 % of cbd in diameter (Figure1.42A). The nerve ring is located at 58-65 % of the length of the pharynx from the anterior. The ventral gland is small and located posterior of the cardia, but the gland opening was not seen.

The reproductive system is diorchic with outstretched testes often located to the left of the intestine. The sperms are oval to rounded clusters, which encloses several sperms. The spicules are 1.0-1.7 abd long, slightly curved and with a poorly developed capitulum (Figure1.42D). The gubernaculum is simple, 5-6 µm long.

The tail is 43-52 µm long, conical cylindrical in shape. The caudal glands are arranged in tandem.

Females: They are similar to males (Figure1.42B, C & E). The reproductive system is amphidelphic with outstretched ovaries, located like in the males to the left of the intestine. The uterus may contain one or two clusters of sperms. The vulva is simple and the vagina is long.

Differential diagnosis

Microlaimus spec. 1a sp. n. is characterised by a small (<300 µm long) body that is often curved or coiled; an elongate cervical region, amphids located at 11-15 µm from the anterior end sperms that are in oval to round clusters and short simple spicules.

Microlaimus spec. 1a sp. n. resembles *M. copulatus* Jensen, 1988 in general body shape and de Mans ratios. The two species however, differs in the shape and the size of the spicules (in *M. copulatus* the spicules have a peculiar shape and they are twice abd), gubernaculum which has a highly sclerotized piece infront of the cloaca and the presence of a single pre-cloacal supplement in *M. copulatus*; besides, *M. spec. 1a* sp. n. is shorter (L=211-296 in males and 202-291 in females) than *M. copulatus* (L=320-330 µm in males 340-350 in females).

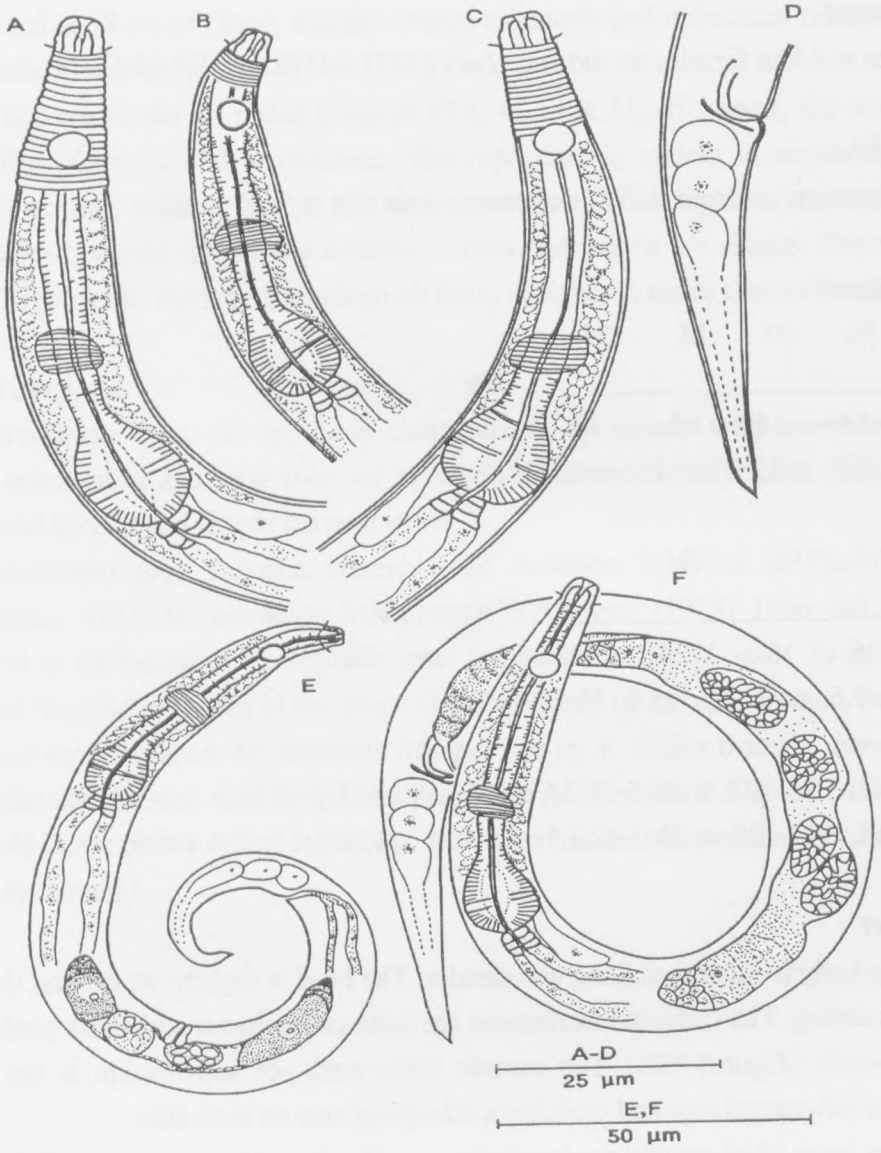


Figure1.42: *Microlaimus spec. 1a* sp.n.; A: ♂$_1$ pharyngeal region, B: ♀$_1$ pharyngeal region, C: ♀$_2$ pharyngeal region, D: ♂$_1$ tail, E: ♀$_1$ total body, F: ♂$_1$ total body

***Microlaimus spec. 2a* sp. n. (Figure1.43 A-H)**

Type material

Four males and four females on slide numbers RI571-RI572 and 10504-10508

Type locality

All the specimens are from st. 503 except one male that is from st. 550.

Measurements

♂1	-	56	93	M	735	
						799
	9	14	14	15	14	

a: 53.3; b: 8.6; c: 12.5; c': 4.6; spic: 22

♀1	-	56	95	391	640	
						710
	10	16	16	20	13	

a: 35.5; b: 7.5; c: 10.1; c': 5.4; V: 55%

Other ♂♂s L: 735-792; a: 45.5-50.3; b: 8.3-8.9; c: 11.7-13.0; c': 4.1-5.3; spic: 21-24
Other ♀♀s L: 719-759; a: 38.0-42.3; b: 7.5-8.4; c: 10.0-10.1; c': 5.1-5.9; V: 52-55 %

Description

Males: The body is cylindrical, long and slender. The head is slightly set off and the posterior end is attenuating. The cuticular annulations are quite conspicuous and starts posterior of the cephalic sensilla (Figure1.43B). The somatic setae were not seen except at the tail region which has a sub-ventral row and probably a sub-dorsal one on each side.

The inner labial sensilla are inconspicuous, the six outer ones are papilliform and the four cephalics are 7-9 µm long (Figure1.43B). The amphids are 50-55 % of cbd (5-6 µm) in diameter simple spiral, with the spiral origin being obvious and located at 11-13 µm away from the anterior end. The stoma is sclerotized and has one dorsal and two sub-ventral teeth. The pharynx is 89-93 µm long, cylindrical with a poorly developed pyriform bulb, which is 75-80 % of cbd in diameter (Figure1.43E). The nerve ring is located at 59-60 % of the length of the pharynx from the anterior. The ventral gland is located posterior of the cardia and the gland opening was not seen. Cardia is 6-7 µm long and prominent.

The reproductive system is diorchic with opposed and outstretched testes located anterior either to the left or the right and posterior to the opposite side of the intestine. The sperms are elongate sausage-shaped and striated (Figure1.43 F). The spicules are 1.6-1.8 abd

in length slightly curved and with a poorly developed capitulum. The gubernaculum is simple, 10-12 µm long, and parallel to the spicules (Figure1.43 D).

The tail is 58-64 µm long, slightly conical anteriorly and cylindrical on the posterior end. The caudal glands are in tandem.

Females: They are similar to males (Figure1.43A, C, G & H). However, the amphids are slightly smaller 42-50 % cbd in diameter. The reproductive system is amphidelphic with outstretched ovaries, located like in the males, anterior to the right or the left and the posterior to the opposite side of the intestine. Vulva and vagina are simple. The tail is also longer (70-76 µm long) than in males although the L is higher in males than in females.

Differential diagnosis

Microlaimus spec. 2a sp. n. is characterised by cuticle with prominent annuli, papilliform outer labial and long (one hd in length) setiform cephalic ones, long sausage-shaped striated sperms and simple curve spicules.

Microlaimus spec. 2a sp.n. resembles *M. acinaces* Warwick & Platt, 1973, *M. borealis* Steiner, 1916, *M. ostracion* Schuurmans Stekhoven, (1964) 1966 and *M. sensus* Wieser, 1954 in the length of the cephalic setae in relation to hd. *M. spec. 1a* sp. n. can be distinguished from *M. acinaces* in the shape (sickle-shaped) of the spicules and the presence of pre-cloacal supplements in *M. acinaces*. *M. spec. 2a* sp. n. differs from *M. borealis* in the large dorsal tooth and long slender spicules present in *M. borealis*. *M. spec. 2a* differs from the other two in the nature of the cuticle (*M. ostracion* has cuticular ornamentation while *M. sensus* has fine annuli).

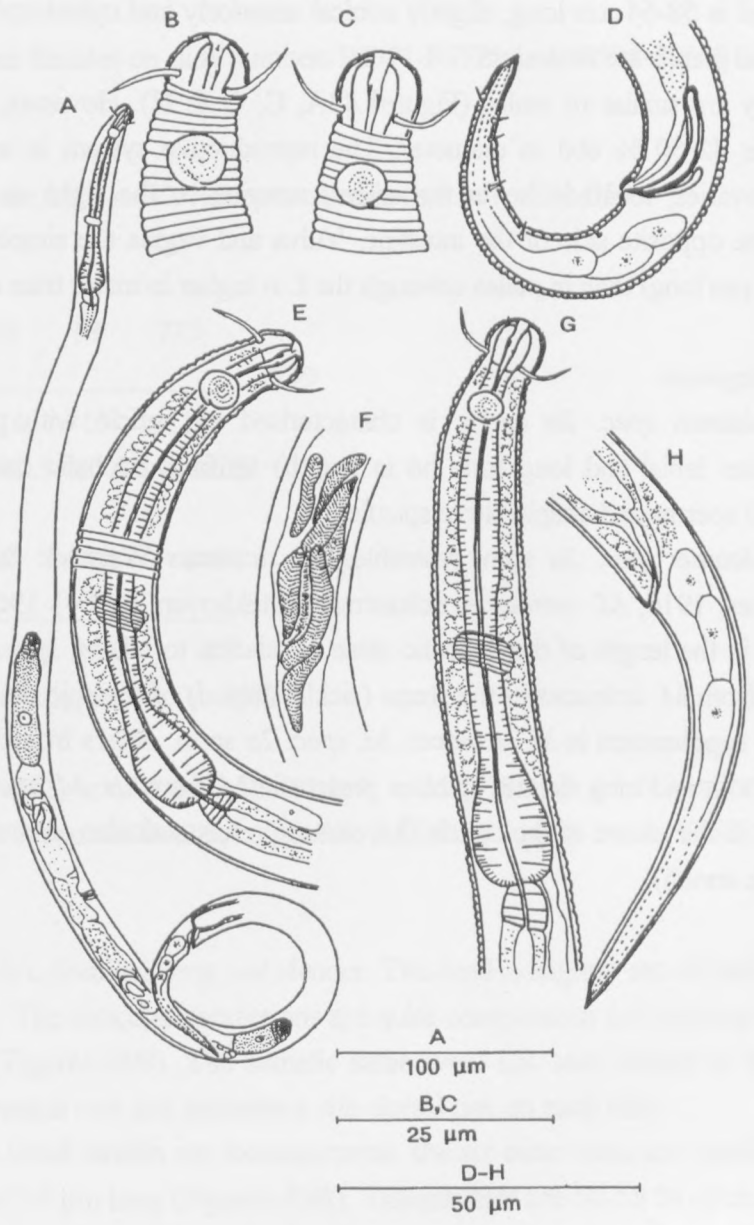


Figure1.43: *Microlaimus spec. 2a* sp.n.; A: ♀$_1$ total body, B: ♂$_1$ head (superficial), C: ♀$_1$ head (superficial), D: ♂$_1$ total body (left side), E: ♂$_1$ pharyngeal region (right side), F: ♂$_1$ spermatozoa, G: ♀$_1$ pharyngeal region, H: ♀$_1$ tail

Comesomatidae Filipjev, 1918

New and known species of the genera *Cervonema*, *Sabatieria*, *Dorylaimopsis*, *Hopperia* and *Paramesonchium* and one new genus, *Kenyanema*, are described.

Sabatierinae Filipjev, 1934

Cervonema Wieser, 1954

Additional description of *Cervonema tenuicauda* Schuurmans Stekhoven, 1950 is given and two new species *C. minutus* sp. n. and *C. gourbaulti* sp. n. are described

Cervonema tenuicauda Schuurmans Stekhoven, 1950 (Figure1.44 A-H)

Material studied

Nine males and four females

Locality

All specimens were collected from station 105.

Measurements

♂1 - 158 M 696

803 µm

7 22 24 20

a: 33.5; b: 5.1; c: 7.5; spic: 18 µm

♀1 - 172 417 661

784 µm

8 25 27 22

a: 29; b: 4.6; c: 6.4; V: 53%

Other ♂♂s L: 671-833; a: 27.3-34.3; b: 4.6-5.6; c: 6.6-8.9; spic: 17-21

Other ♀♀s L: 735-811; a: 29.0-30.5: b: 4.5-5.7; c: 6.4-6.8; V: 50-55 %

Additional description

Male: The body is cylindrical and tapering at both ends (Figure1.44F). The head measures 7-8 µm in diameter.

The cuticle is faintly striated with striations beginning at the anterior border of the amphid. No lateral differentiation. Somatic setae are short and scattered.

The anterior sensilla are in two circles; inner labial sensilla are indistinct, the outer labial and the cephalic sensilla are equal in length, 3 µm long (38-50% cbd). The amphids are

spiral with three to four turns, 6-9 µm in diameter (54-67% cbd) and they are located 9-11 µm from the anterior end (Figure1.44C).

The stoma is long (6-8 µm) and narrow and it is surrounded by the pharyngeal tissue on the posterior part. The pharynx is cylindrical, 137-158 µm long and it is expanded posterioly to form an elongate bulb (30-33% of the pharyngeal length). The nerve ring is located at 44-49% of the pharyngeal length from the anterior. The opening of the ventral gland is situated posterior of the nerve ring at 51-56% of the length of the pharynx. The ventral gland is small and located posterior of the pharyngeal-intestinal junction. The cardia is 8-9 µm long and pear shaped (Figure1.44A).

The reproductive system is diorchic, with opposed and outstretched testes (Figure1.44F). Anterior branch is to the left and the posterior one is to the right of the intestine. The spermatozoa are large elongate to oval shaped and appear striated (Figure1.44G). The spicules are simple, slightly curved (17-21 µm long) and equal to the abd (Figure1.44H). Gubernaculum is absent. There are 6-7 very fine pre-cloacal supplements.

The tail is conical with a filiform posterior part (95-110 µm long); the conical part is 35-45 % of the tail length (c'=5.1-6.5). There are three short setae at the tail tip (Figure1.44H).

Females: They are similar to males in body shape, anterior sensilla (Figure1.44E), amphids, pharyngeal region and tail. The reproductive system is amphidelphic with outstretched ovaries (Figure1.44B). The anterior branch is to the left and the posterior one to the right of the intestine. Each branch has a short ovary and either a large spermatheca filled with sperm cells or small one. The vulva and vagina are simple located at 50-55% of the body length from the anterior.

Discussion

Cervonema temicauda was first described by Schuurmans Stekhoven in 1950 from a single female. The present specimens are in many ways similar to *C. temicauda* Schuurmans Stekhoven, 1950. There are however a few variations such as the amphidial turns (5.5 turns in the original description compared to 4 turns in the present specimens) and width relative to the cbd (77% in the original description compared to 55-72% in the present specimens). We however consider these to be minor variations and not enough to describe it as a different species.

The description of *C. temicauda* by Vitiello in 1970 is of specimens that show somehow morphological difference between each other as shown in his illustrations; for instance in Fig. 1b, the amphid distance from the anterior is different in all the four drawings, the spicules and gubernaculum shape in Figure 2.35d are also different and in one case the gubernaculum is lacking. Therefore, Vitiello accepted a rather large intra-specific variability for the species.

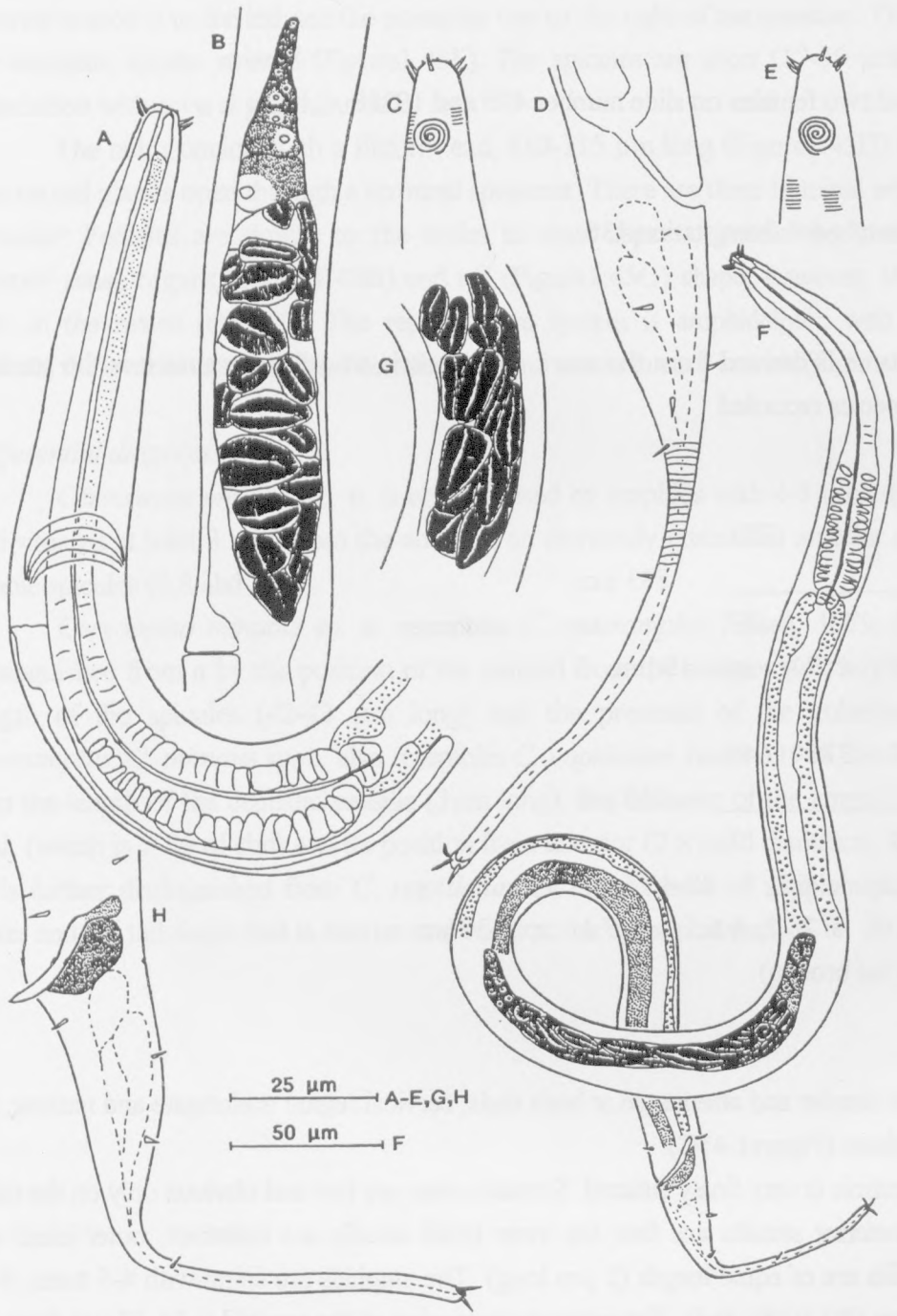


Figure1.44: *Cervonema temicauda* Schuurmans Stekhoven, 1950; A: ♂$_1$ pharyngeal region, B: ♀$_2$ reproductive system, C: ♂$_1$ head region, D: ♀$_1$ tail, E: ♀$_1$ head region, F: ♂$_2$ total view, G: ♂$_1$ mid body (spermatozoa), H: ♂$_1$ tail

***Cervonema minutus* sp. n. (Figure 1.45 A-H)**

Type Material

Two males and two females on slide number 495 and 10288

Type locality

All the specimens were from station 136

Etymology

The species name is derived from the word *minute*. It is so called because it is the smallest *Cervonema* species recorded.

Measurements

$\sigma^{\prime}_1$ - 141 M 721

5 23 31 23 833 µm

a: 26.9; b: 5.9; c: 7.4; spic: 19 µm

φ_1 - 130 370 649

5 23 23 17 750 µm

a: 32.6; b: 5.8; c: 6.8; V: 48-49%

Other $\sigma^{\prime}$ L: 818 a: 28.2, b:6.1, c: 7.1, spic: 17 µm

Other φ_2 L: (tail broken)

Description:

Male: Body is slender and attenuated at both ends; cervical region is elongate and narrow; the tail is long filiform (Figure1.45C).

The cuticle is very finely striated. Somatic setae are few and obvious only on the tail.

The anterior sensilla are fine; the inner labial sensilla are indistinct, outer labial and cephalic sensilla are of equal length (2 µm long). The amphids are spiral with 4-5 turns, 8-10 µm in diameter (80-100% cbd). The anterior most edge of the amphid is 16-17 µm from the anterior (at least three head diameters) (Fig.46D).

The stoma is very narrow. The pharynx is cylindrical 130-141 µm long, with a slightly expanded terminal bulb, 19-24 µm wide (Figure1.45E). The nerve ring is located at 57-59% of the pharyngeal length from the anterior. The ampulla of the ventral gland opens posterior of the nerve ring at 65-68% of the length of the pharynx from the anterior. Ventral gland is small. Cardia is small.

The reproductive system is diorchic, with opposed and outstretched testes. The anterior branch is to the left and the posterior one to the right of the intestine. The sperm cells are elongate, appear striated (Figure1.45F). The spicules are short (17-19 µm), flat and in association with several glandular cells.

The tail is conical with a filiform end, 110-115 µm long (Figure1.45H) (c'= 4.9-5.2). The caudal glands open through a terminal spinneret. There are three terminal setae.

Females: Females are similar to the males in most aspects; general body shape, cuticle, anterior sense organs (Figure1.45B) and tail (Figure1.45G) shape, however, the c' is larger than in the males (c'= 6.5). The reproductive system is amphidelphic with outstretched ovaries; the ovaries are short and contain a mature ovum in each branch (Figure1.45A).

Differential diagnosis

Cervonema minutus sp. n. is characterised by amphids with 4-5 turns (80-90% cbd) and situated at least 3 x hd from the anterior; an extremely attenuated anterior end and short simple spicules (0.8 abd long).

Cervonema minutus sp. n. resembles *C. macramphis* Jensen, 1979, but it can be distinguished from it by the position of the amphid from the anterior (2 x hd), the shape and length of the spicules (42-43 µm long) and the presence of the gubernaculum in *C. macramphis*. *C. minutus* sp. n. also resembles *C. papillatum* Jensen, 1988, but it differs from it in the length of the cephalic sensilla (3µm long), the diameter of the amphid in relation to cbd (which is 70% of cbd) and its position from anterior (2 x head diameter). *C. minutus* sp. n. is further distinguished from *C. papillatum* by the presence of supplements (6-7) in the latter and the tail shape that is shorter and wider at the cylindrical part.

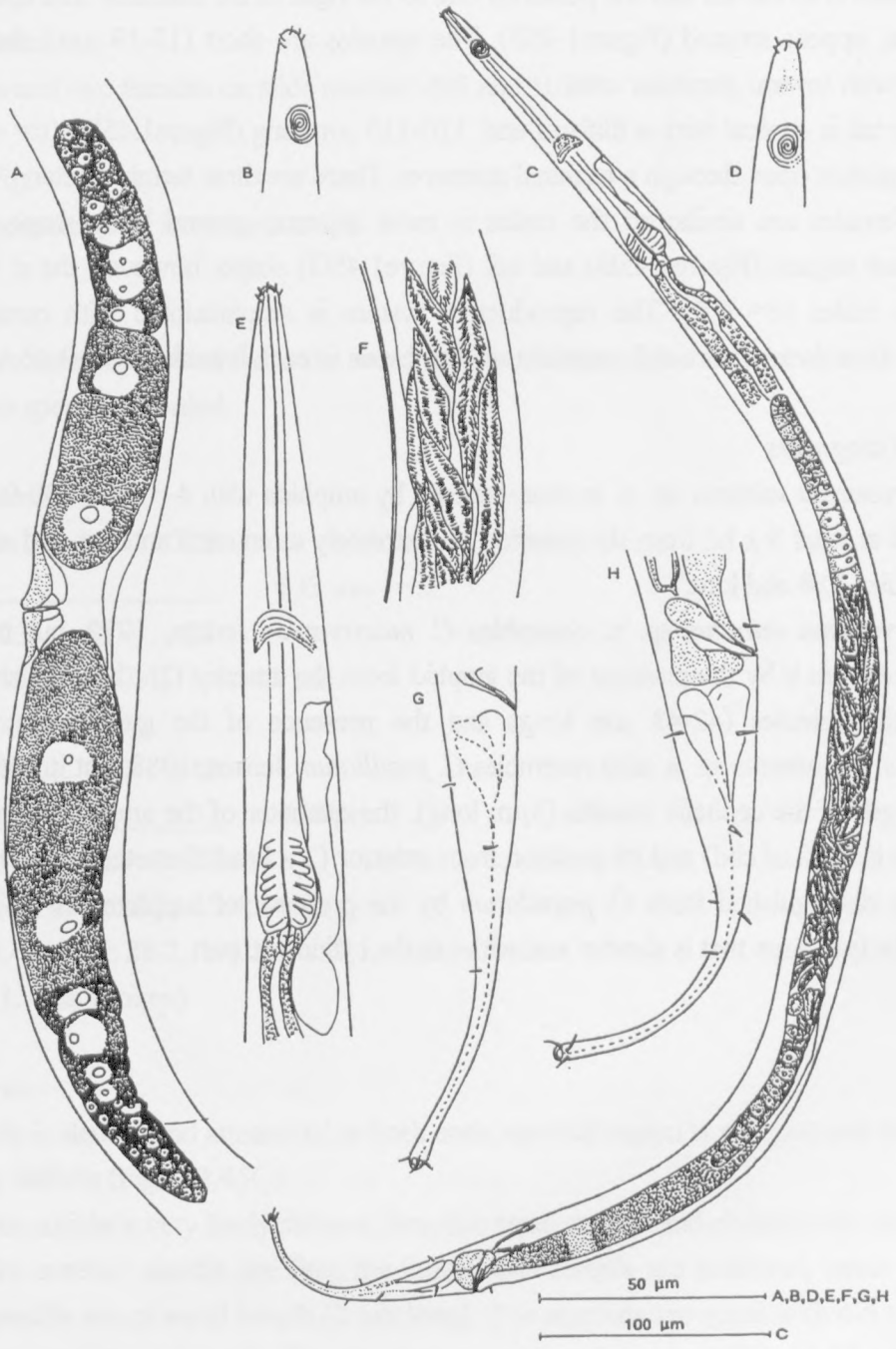


Figure 1.45: *Cervonema minutus* sp.n.; A: ♀$_1$ reproductive system, B: ♂$_1$ head region, C: ♂$_1$ habitus, D: ♀$_1$ head region, E: ♂$_1$ pharyngeal region, F: ♂$_1$ mid body (spermatozoa), G: ♀$_1$ tail region, H: ♂$_1$ tail region

***Cervonema gourbaulti* sp. n. (Figure1.46 A-G and Figure1.47 A-C)**

Type material

Four males and three females on slide numbers 496, 10289, 10290, 10291, 10297.

Type locality

Males from st. 105 (3 including ♂$_1$), 117 and females from st. 105 (2 including ♀$_1$), 131

Etymology

The species name is given in honour of Dr. Nicole Gourbault of the Muséum National d`Histoire naturelle de Paris, France.

Measurements

♂$_1$	-	234	M	1132	
					1470 µm
	10	36	41	31	

a: 35.9; b: 6.3; c: 4.4; spic: 30 µm

♀$_1$	-	214	710	1182	
					1642 µm
	9	40	45	28	

a: 35.7; b: 7.7; c: 3.4; V: 43 %

Other ♂♂s L: 1225-1470; a: 34.0-38.9; b: 6.0-6.8; c: 4.1-6.3; spic:27-32 µm
Other ♀♀s L: 1264-1642; a: 26.3-35.7; b: 6.3-7.7; c: 3.4-5.4 V: 43-51 %

Description

Male: Body is cylindrical and tapers at both ends. The cervical region is narrow and elongate and the tail is conical with a posterior filiform end (Figure1.46 A).

The cuticle has fine striations which start immediately posterior of the cephalic setae. The somatic setae are short, few and scattered.

The six inner labial sensilla are indistinct. The six outer labial and four cephalic sensilla are equal (4-5 µm long) in length. The amphids are spiral with 5 turns; and they have a diameter of 13-15 µm (73-88% cbd); the anterior border of the amphids is 17-24 µm from the anterior (at least two x hd from the anterior) (Figure1.46 B).

The stoma is narrow, unarmed and surrounded by the pharyngeal muscle. Pharynx is cylindrical, 187-240 µm long and slightly expanded at the terminal end to form an elongate crenated bulb, 61-79 µm long by 22-27 µm wide (Figure1.46 E). The dorsal pharyngeal gland

opening is at the base of the stoma. The maximum body width at the pharyngeal region is 34-36 µm. The nerve ring is located at 43-48% of the pharyngeal length from the anterior. The opening of the ventral gland is located posterior of the nerve ring at 52-56% of the pharyngeal length from the anterior. The ventral gland is small. Cardia is 8-12µm long.

There are brownish particles enclosed in the intestinal cells which give the intestine a brownish to dark colour appearance (Figure1.47 C). In one female specimen such particles were seen in the lumen of the intestine and the rectum giving the evidence that these particles could be passed from the intestinal cells and excreted to the outside (Figure1.47 A and B).

The reproductive system is diorchic, with opposed and outstretched testes. Each branch has a short germinal zone and the testes are filled with large elongate sperm cells (14 - 31 µm long) (Figure1.46 D). The anterior branch is to the left and the posterior one to the right of the intestine. The spicules are simple with the ventral part being slightly longer than the dorsal part. There are several glandular cells located around the spicules in addition to another 5-6 pairs of copulatory ones.

The tail is conical (one fifth of the length) and the posterior part is filiform; and measures 206-338 µm long (c`=7.4-11.3). There are numerous setae at the conical part and fewer on the rest of the tail and two terminal ones (Figure1.46 F).

Females: They are similar to males in general body shape, cuticle, and anterior sensilla (Figure1.46 C). They are however thicker than the males; the maximum diameter at the pharynx is 40-41 µm and the mbd is 39-47 µm. They have smaller (12-13 µm or 60- 80% cbd) amphids than males. The reproductive system is amphidelphic with outstretched ovaries. Each branch has a short ovary and a large spermatheca filled with sperms (Figure1.46 G). The anterior branch is to the right and the posterior to the left of the intestine. Tail is similar to that of the males (234-460 µm long); and the c`=7.6-16.

Differential diagnosis

Cervonema gourbaulti sp. n. is characterised by long outer labial and cephalic sensilla that are equal in length (4-5 µm); multispiral amphids with five to six turns; an elongate crenate terminal pharyngeal bulb; a tail with a rather long cylindrical part (3/4 the total length of the tail).

Cervonema gourbaulti sp. n. resembles *C. jenseni* Gourbault, 1980 but can be differentiated from it in the size of the spermatozoa in the testes, which are larger in *C. gourbaulti* compared to *C. jenseni* [in three specimens from the type population of *C. jenseni* that we measured, the spermatozoa length was on the average 7.0-14 µm compared to 14-31 µm in *C. gourbaulti* sp. n.]; *C. jenseni* has a gubernaculum and its tail is one third conical and two thirds cylindrical (filiform) and relatively shorter in length (c=7.5-10.2 compared to c=3.4-6.3 in *C. gourbaulti* sp. n.).

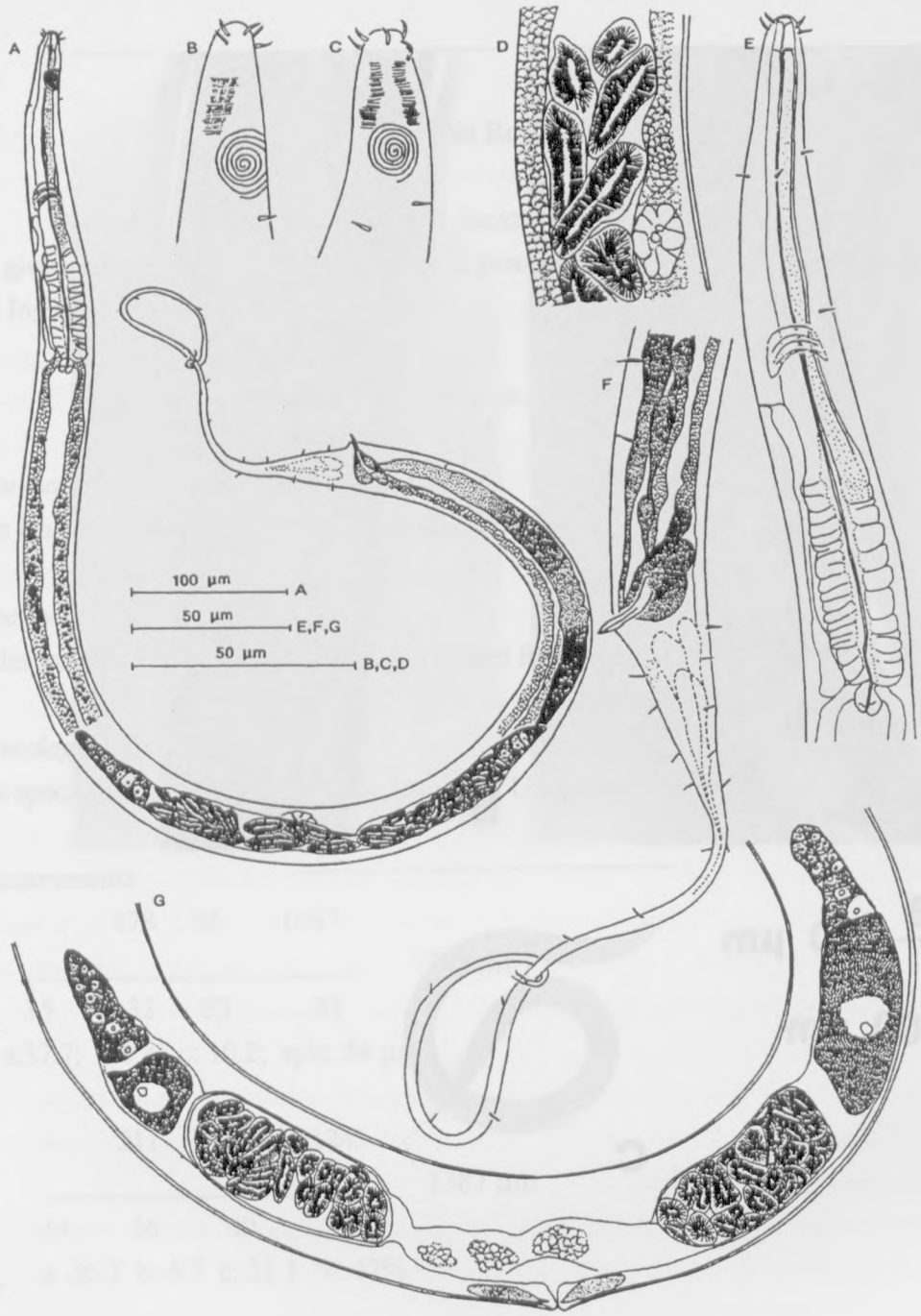


Figure 1.46: *Cervonema gourbaulti* sp. n.; A: ♂$_1$ habitus, B: ♀$_1$ head region, C: ♂$_1$ head region, D: ♂$_1$ mid body (spermatozoa), E: ♂$_1$ pharyngeal region, F: ♂$_1$ tail region, G: ♀$_1$ reproductive system

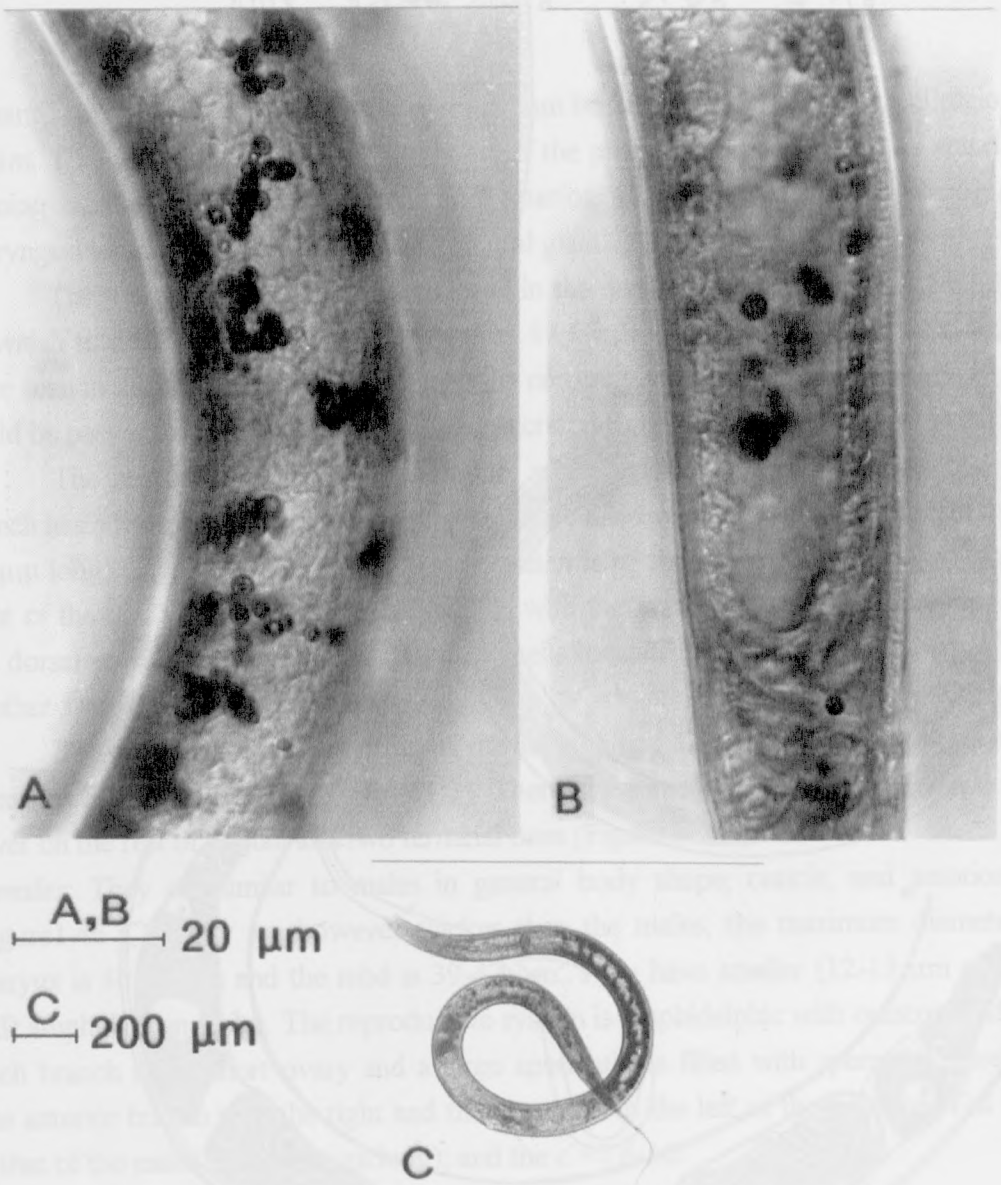


Figure 1.47: *Cervonema gourbaulti* sp. n.; A: ♀$_2$ mid body region showing the particles in the cells of the intestine as well as in the lumen, B: ♀$_2$ brown particles in the lumen of the posterior part of the intestine and the rectum, C: ♀$_2$ habitus showing the brown particles in the intestinal cells

Sabatieria Rouville, 1903

One new species of *Sabatieria*, *S. lucia* is described and *S. conicauda* and *S. pisinna* are given with additional description. In *S. pisinna*, population from the Mediterannean sea and Indian Ocean are compared.

Sabatieria lucia sp. n. (Figure1.48 A-H)

Type material

Five males and one female on slide number 493, 494, 10285, 10286 and 10287

Type locality

Males from st. 133 (σ^1), 105 (2), 118, 117 and female from st. 105 (φ_1)

Etymology

The species is named after Dr. Lucy Irungu of University of Nairobi.

Measurements

σ^1 - 178 M 1087

1205 µm

15 33 33 31

a:37.7; b:6.8; c: 10.2; spic: 54 µm

φ_1 - 211 652 1245

1387 µm

14 36 40 28

a: 36.7 b: 6.7 c: 11.1 V: 47%

Other $\sigma^1\sigma^1$s L: 1367-1527; a: 34-38.2; b: 6.7-7.8; c: 10.3-11.4; spic: 52-57

Description

Males: Body is cylindrical, broad and rounded anteriorly and conical with a cylindrical tail end. The head is slightly offset and it measures 14-16 µm in diameter.

The cuticle is punctated and annulated. Punctations begin from the anterior edge of the amphids, just posterior of the cephalic setae. Laterally, the punctations are larger and more widely spaced, on the rest of the body, they are smaller and arranged in transverse rows. Annulations are conspicuous at the tail region (Figure1.48E).

There are eight longitudinal rows of somatic setae; these are longer at the pharyngeal

and the tail region than at the rest of the body where they become inconspicuous.

Anterior sensilla are in three separate crowns with inner and outer labial sensilla short but setiform (2 µm) and the four cephalic sensilla are 4-5 µm long (30 -33% hd). The amphids are spiral with 2.75 turns; they are 9-13 µm wide (73-80% cbd) and located immediately posterior of the cephalic setae (Figure1.48C).

The stoma has a cup shaped anterior part and a conical posterior part; the pharyngeal muscles surround the posterior part of the stoma. The pharynx is cylindrical, 178-211 µm long, and slightly swollen to form a bulb (Figure1.48A). The marginal tubes start from the base of the stoma until the bulb and they are lined with thick cuticle. The canal of the dorsal pharyngeal gland opens at the base of the stoma.

The ventral gland is located posterior of the pharyngeal-intestinal junction and it opens through an ampulla at 50-61% of the pharyngeal length from the anterior. The nerve ring is located at 44-51 % of the pharynx from the anterior. Cardia is short but prominent.

The reproductive system is diorchic, with opposed and outstretched testes. The anterior branch is to the left and posterior to the right of the intestine. The sperm cells are large, elongate to oval shaped and have a clear nucleus and a dark nucleolus (Figure1.48D). The spicules are slightly curved, without capitulum; they are 1.5-1.8 abd long (Figure1.48H). There are three to four pairs of copulatory glands located anterior of the spicules (Figure1.48B) and other glandular cells without clear nucleus at the vicinity of the spicules. The gubernaculum is short with a long caudal apophysis (that may vary in length from one specimen to the other). One ventral pre-cloacal seta and 12 tubular supplements (Figure1.48 E).

The tail is conical with posterior half cylindrical and a swollen tip, 118-136 µm long (c`=3.5-3.9). Three setae at the tail tip. The three caudal glands open through a prominent spinneret at the tail tip (Figure1.48B).

Females: The females are similar to the males in general body shape, anterior sensilla and cuticle. The ventral gland is located at the pharyngeal-intestinal junction. The ovaries and the uterus could not be seen clearly; vulva (Figure1.48G) is located at 47% from the anterior. The tail (Fig.1F) is similar to that of the males but it is slightly longer (142 µm) and the abd smaller (28 µm).

Differential diagnosis

Sabatieria lucia sp. n. is characterised by short but distinct inner labial, setiform outer labial (2 µm long) and cephalic sensilla (4-5 µm long or 30-33 % cbd); amphideal fovea are 2.75 turns or 73-80% cbd and slightly curved spicules that have a poorly developed capitulum (52-57 µm long).

Sabatieria lucia sp. n. resembles *S. paradoxa* Wieser and Hopper, 1967, *S. paracupida* Wieser and Hopper, 1967, *S. preadatrix* Schuurmans Stekhoven, 1950 and *S.*

stekhoveni Vitiello, 1970 because of the shape of the head and tail and the cuticular punctations.

Sabatieria lucia sp.n. can be distinguished from these species by the length of the outer labial sensilla, which are distinct but very short in all these species, and cephalic sensilla which are longer in these species than they are in *S. lucia* sp. n.; cephalic setae are 6-7 µm in *S. paradoxa*, 10 µm in *S. paracupida*, 5-6 or 50-57 % cbd in *S. stekhoveni* and 54% cbd in *S. preadatrix*. *S. lucia* sp. n. can also be distinguished from these species by the length of the spicules; they are 60-63 µm in *S. paradoxa*, 60-68 µm in *S. paracupida*, 63-69 µm in *S. preadatrix* and 44-47 µm in *S. stekhoveni* although *S. stekhoveni* is longer (L=1400-1817 µm) than *S. lucia* sp. n.

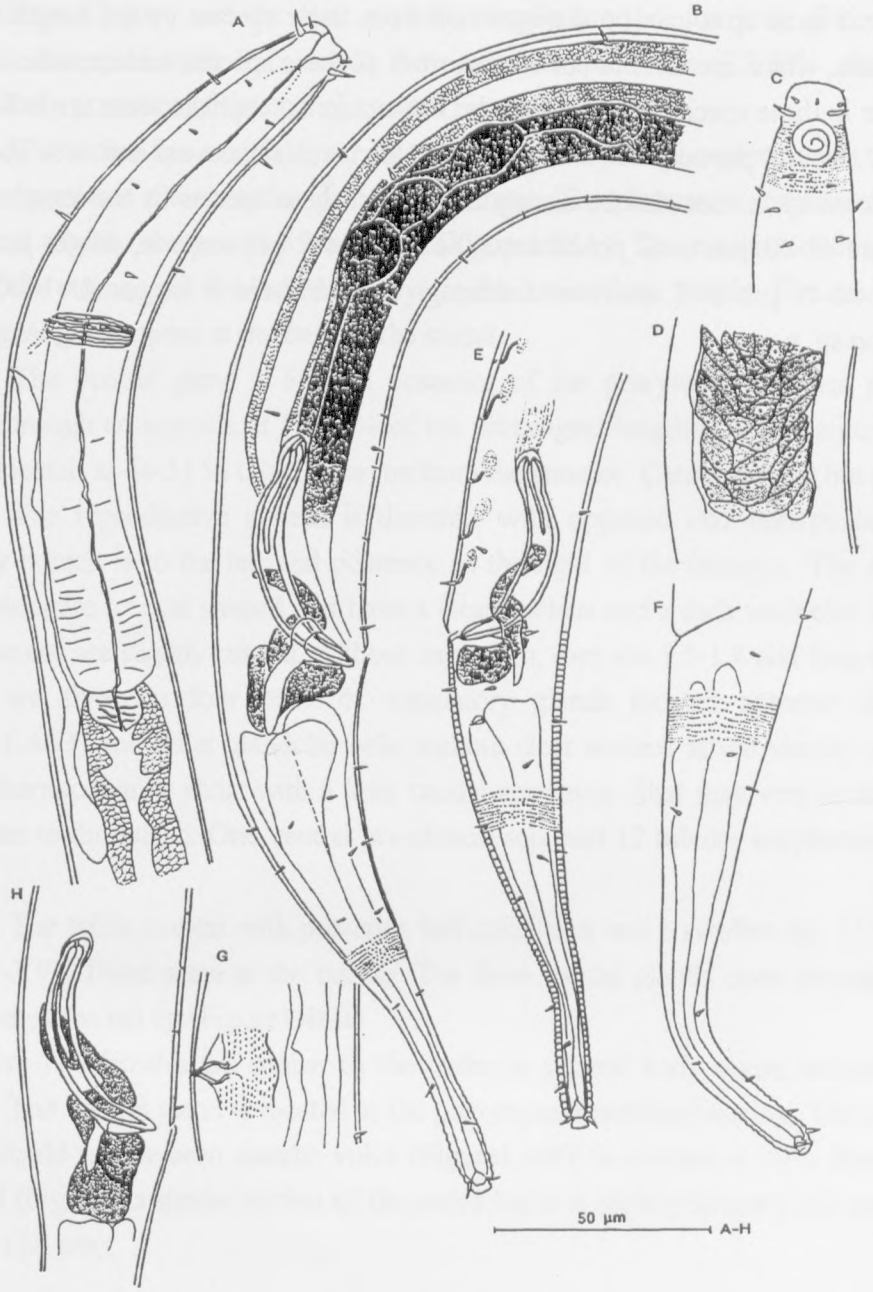


Figure 1.48: *Sabatieria lucia* sp. n.; A: ♂1 Pharyngeal region, B: ♂2 tail region and copulatory glands, C: ♂1 head region, D: ♂2 mid body (spermatozoa arrangement), E: ♂1 tail region and supplements, F: ♀1 tail region, G: ♀1 vulva, H: ♂3 spicule

***Sabatieria conicauda* Vitiello, 1970 (Figure1.49 A-J)**

Material studied

Seven males and thirteen females

Locality

Males from st. 136 (four including ♂$_1$), 105 (3), 117 and females from st. 105 (5 including ♀$_1$), 117 (2), 106 (3), 132 (1), 133 (2)

Measurements

♂$_1$ - 147 M 1097

1168 µm

12 28 33 28

a: 35.4; b: 7.1; c: 16.5; spic : 36 µm

♀$_1$ - 164 631 1239

1298 µm

12 29 32 29

a: 40.6; b: 7.5; c: 22 V: 49%

Other ♂♂s L: 883-1182; a: 32.0-43.0; b: 6.3-8.0; c: 14.5-16.5; spic: 31-37 µm

Other ♀♀s L: 970-1386; a: 29.4-51.3; b: 6.4-7.0; c: 15.7-22.0; V: 46-53%

Additional description

Males: Body is cylindrical; anterior end broad and tail is short conico-cylindrical (Figure1.49A). The head measures 10-12 µm in diameter and it is slightly set off from the rest of the body.

The cuticle is punctated; laterally, the dots are larger and irregular and more widely placed. There are eight rows of somatic setae; these are longer (3 µm) at the pharyngeal and the tail region than on the rest of the body (1.5 µm).

The outer and inner labial sensilla are short; the cephalic ones are setiform 3-4 µm long (25-40%). The amphids are multispiral with three turns, 7-9 µm in diameter (62-64% cbd) and they are located posterior of the cephalic setae (Figure1.49B).

The stoma is cup-shaped in the anterior part and narrow tubular in the posterior part which is surrounded by the pharyngeal muscles.

The pharynx is cylindrical, 139-163 µm (Figure1.49E) and has a swollen posterior end that forms an elongate terminal bulb, 17-24 µm wide. The cbd at that level of the bulb is 23-31 µm. The nerve ring surrounds the pharynx at 74-87 µm from the anterior. The opening

of the ventral gland is found posterior of the nerve ring at 95-105 µm from the anterior. The ventral gland is located at the pharyngo-intestinal junction. The cardia is short and pear-shaped.

The reproductive system is diorchic, with opposed and outstretched testes. The anterior branch is to the left and the posterior to the right of the intestine. The sperms are oval to elongate and appear striated (Figure1.49F). The spicules are 1.3-1.5 abd long, slightly curved and without a capitulum (Figure1.49H). The gubernaculum is short with a straight dorso-caudal apophysis 8-12 µm long. There are nine fine ventral pre-cloacal supplements extending anteriorly from the cloaca to about 119 µm.

The tail is conico-cylindrical, 54-76 µm long (c'=2.5-2.8). There are two terminal setae. The caudal glands open through a spinneret (Figure1.49H) at the terminal end.

Females: Females are similar to the males in general body shape, anterior sensilla (Figure1.49 C) and cuticular punctations. The reproductive system is amphidelphic with outstretched ovaries (Figure1.49 D). There is a spermatheca on each branch that may be filled with sperm cells. The vulva is simple and the vagina is short.

The tail shape is similar to that of the males for most females (Figure1.49 J); it is 52-75 µm long (c'=2.0-3.1); in some females a more conical tail is present (Figure1.49G and I).

Discussion

The present specimens of *Sabatieria conicauda* resemble those described by Vitiello (1970) in general appearance, however, they are thinner (a=32-40.8 in males, a=33.8-45.5 in females compared to those of Vitiello a=30-35 in males, a= 26.2 in females). The variation in tail shapes was not observed in the original description.

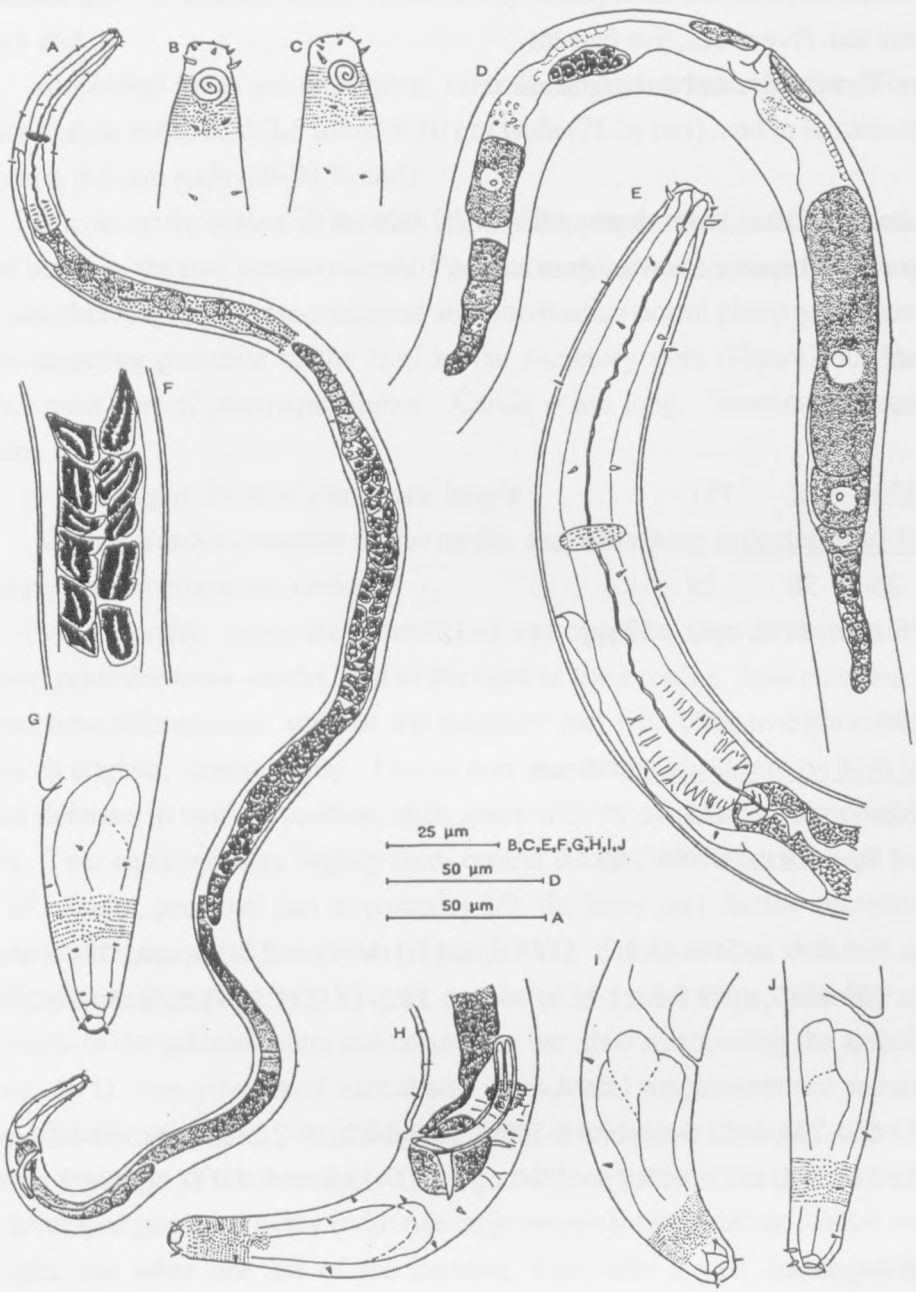


Figure 1.49: *Sabatieria conicauda* Vitiello, 1970; A: ♂$_1$ total view, B: ♂$_1$ head region, C: ♀$_1$ head region, D: ♀$_2$ reproductive system, E: ♂$_1$ pharyngeal region, F: ♂$_1$ mid body (spermatozoa), G: ♀$_4$ tail region, H: ♂$_1$ tail region, I: ♀$_3$ tail region, J: ♀$_1$ tail region

***Sabatieria pisinna* Vitiello, 1970. (Figure1.50 A-I)**

Material studied:

Mediterranean sea: Five males, five females

Indian ocean: Three males and three females.

Locality

Mediterranean site: 530 m water depth; 42E.38.5'N 8E39.6' S

Indian ocean site: All specimens were from station 105

Measurements:

Mediterranean sea:

σ^{1}: 4 131 M 733

10 26 30 25 805 µm

a: 26.8; b: 6.1; c: 11.2; spic: 37 µm.

φ_{1}: 4 201 586 1097

13 30 35 25 1180 µm

a: 33.7; b: 5.9; c: 14.2; V: 49.7 %

Other ♂♂s L: 720-945; a: 24.0-33.2; b: 5.0-5.6; c: 11.1-13.0; c': 2.4-3.4; spic: 35-38 µm

Other ♀♀s L: 920-1080; a: 23.8-31.2; b: 5.3-5.9; c: 13.5-15.9; c': 2.5-3.5; V: 50.0-52.7

Indian ocean:

Other ♂♂s L: 670-794; a: 23.9-28; b: 5.3-5.6; c: 10.6-14.2; c': 2.2-2.9; spic: 35-38 µm

Other ♀♀s L: 833-902; a: 23.1-28.2; b: 5.7-7.1; c: 12.7-13.7; c': 2.5-3.0; V: 49-52

Additional description

Cylindrical nematodes, attenuated towards the anterior (30-40 % of maximal body width), tail with short cylindrical end part.

Cuticle transversely punctated from level posterior to the cephalic setae to the tail tip, lateral differentiation consists of rows of larger dots, each row corresponding with one row of smaller and more closely spaced dots dorsally and ventrally.

Somatic setae are very short and in eight rows, epidermal glands associated with these setae are visible as oval, bright spots (Figure1.50 E).

Internal and external labial sensilla are short and in two separate rows, a third crown of cephalic setae (3 µm, i.e. 25-30 % of corresponding head diameter) is at 4-5 µm from the anterior end.

Amphideal fovea are multispiral, ventrally wound, anterior border 5-6 µm from the anterior end, in males 3.25-3.5 turns, 9-10 µm wide (75 % cbd), and in females they are 2.75-3.25 turns, 8-9 µm wide (60-70 % cbd).

Buccal cavity conical in anterior, narrow in posterior part, small projections are at the border between the two compartments. Pharynx is cylindrical, posteriorly enlarged, marginal tubes are obvious; two ventro-sublateral and one median-dorsal pharyngeal gland distinct, the former emptying posterior to the level of the excretory pore (Figure1.50 A), the latter in anterior most part of pharyngeal lumen. Cardia 4 µm long. Intestinal cells with refractive granules.

Nerve ring at 55 % of pharyngeal length.

Ventral gland is posterior to the cardia, excretory pore is posterior to the nerve ring, accessory gland in males not obvious.

Male diorchic, testes are outstretched and opposite, anterior testis to the left of the intestine, posterior testis smaller, and to the right of the intestine. Spermatozoa are globular. Vas deferens differentiated: anterior and posterior part with refractive granules, small central part much brighter, almost empty. Two to four ejaculatory glands are on both lateral sides of the vas deferens in tandem position, each gland with its own outlet, emptying in the cloacal region. Two equal spicules, slightly bent, central lamella in two parts: distal part in anterior third of spicules, proximal part in posterior 2/3, the latter part distally sometimes connected with the ventral margin of the spicule (Figure1.50H). Gubernaculum with two curved, dorso-caudally directed apophyses (8-10 µm), cuneus with curved shape, ventrally are two lateral expansions of the gubernaculum and an anterior bar, thus surrounding the spicules completely (Figure1.50 I). One pre-cloacal ventral seta. Pre-cloacal supplements not seen.

Female: didelphic, amphidelphic, with ovaries outstretched, anterior ovary left, posterior one right of the intestine. Two spermatheca present. In one female, apart from a well developed posterior ovary (with one large oocyte), two anterior ovaries were observed, one right, the other one left of the intestine, both with a well developed but somewhat flattened oocyte, only in the branch on the left of the intestine is a spermatheca present (Figure1.50 B).

Tail conical in anterior 2/3, posterior third cylindrical, three sub-terminal setae, three caudal glands entirely in tail region.

Discussion

Some differences exist with the original description of Vitiello (1970), e.g. no lateral differentiation observed in the type specimens (can be overlooked in small animals), the

number of turns in the amphideal fovea somewhat smaller: 2.75 in females, 3 in males (internal part sometimes difficult to observe). However, the general body shape and the shape of the spicules is similar and as such, the above described specimens are co-specific with *S. pisinna*.

The population from the Indian ocean is similar to that from the Mediterannean sea in all aspects. It is however, apparent that these nematodes are slightly smaller in size than those from the Mediterannean sites.

Due to the curved gubernaculum, it is more probable that *S. pisinna* belongs to the *celtica* group instead of the *pulchra* group as proposed by Platt (1985). The absence of pre-cloacal supplements is confirmed by the above described specimens, this is an exception for the genus.

The presence of two anterior ovaries in one female has never been observed before. A clear patch in the vas deferens has been used by Platt (1982) to relate following genera belonging to the Ethmolaimidae: *Neotonchoides* Platt, 1982, *Gomphionchus* Platt, 1982, *Neotonchus* Cobb, 1933, *Filitonchus* Platt, 1982 and *Nannolaimus* Cobb, 1920. A similar clear patch is also present in *S. pisinna*, therefore, it could be that too much emphasis has been given to this feature in the Ethmolaimidae.

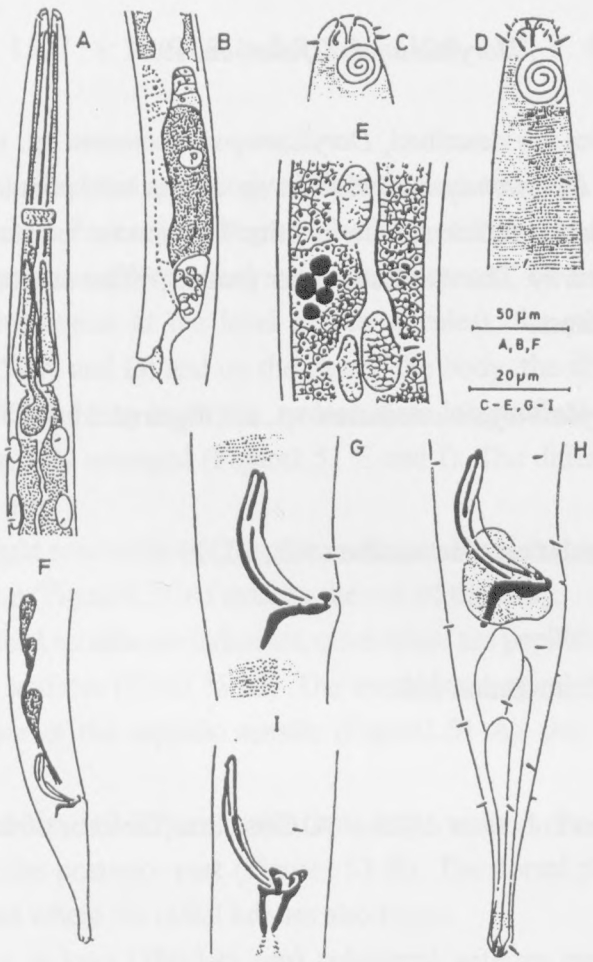


Figure 1.50: *Sabatieria pisinna* Vitiello, 1970, A: ♀$_1$ pharyngeal region, B: ♀$_1$ reproductive system (anterior branch), C: ♀$_1$ head region, D: ♂$_1$ head region, E: ♀$_1$ pharyngeal granules and epidermal glands, F: ♂$_1$ tail and copulatory glands, G: ♂$_1$ spicular apparatus, H: ♂$_2$ tail, I: ♂$_3$ spicular apparatus ventral view

Dorylaimopsinae de Coninck, 1965

Species from three known genera of the subfamily Dorylaimopsinae are described and one species from a new genus, *Kenyanema monorchis* gen. & sp. n.

Dorylaimopsis Ditlevsen, 1918

Three new species are described, *Dorylaimopsis coomansi* sp. n., *D. gerardi* sp. n. and *D. variabilis* sp. n. *Dorylaimopsis variabilis* sp. n. has two populations with different body lengths and occurring at different water depths. This species has anterior testis different in length and level of maturity. The two testis either produce different sizes of spermatozoa or they mature at different times.

Dorylaimopsis coomansi sp. n. (Figure1.51 A-I)

Type material

Two males and three females on slide numbers 502, 10299.

Type locality

All the specimens came from station 108

Etymology

The species name is given in honour of Prof. A. Coomans (Director of the Zoology Institute, University of Gent)

Measurements

σ^1 - 180 M 1315

1445 µm

11 38 48 38

a: 30.1; b: 8.0; c: 11.1; spic: 63 µm

σ^2 - 184 M 1467

1602 µm

12 39 46 42

a: 34.8; b: 8.7; c: 11.9; spic: 58 µm

♀$_1$	-	194	872	1633
				1790 µm
	13	44	51	38

a: 35; b: 9.2; c: 11.4 V: 49 %

Other ♀♀s L: 1697, 1597 ; a: 28, 27.9; b: 8.7, 8.3; c: 10.9, 11.2; V: 46 %

Description

Males: The body is cylindrical, anteriorly with blunt end and with a conico-cylindrical tail. The cuticle is punctated. Punctations begin at the level of the anterior border of the amphids. Laterally, the punctations are larger and more widely spaced, on the pharyngeal and the tail region (including the region at the level of the spicules), the punctations are irregularly arranged (Figure 1.51 A and D) and on the rest of the body, the differentiated part is raised (Figure1.51 D and E) and may have one, two or three longitudinal rows of dots which may be regularly or irregularly arranged (Figure1.51 E and I). The differentiated lateral region at the mid body is 4-6 µm.

There are eight rows of long (7 µm) somatic setae which may be more conspicuous at the pharyngeal region (Figure1.51 A) than on the rest of the body.

The inner labial sensilla are indistinct, outer labial are papilliform and the cephalic ones are long (8-10 µm) setiform (67-81 % hd). The amphids are spiral with 2.5 turns and located immediately posterior of the cephalic sensilla (Figure1.51 A), they are 8-9 µm in diameter (53-64 % cbd).

Stoma is tubular (19-20 µm) with three large teeth in the anterior part and highly sclerotized walls in the posterior part (Figure1.51 B). The dorsal pharyngeal gland opens at the base of the stoma where the radial tubules also begin.

The pharynx is long (180-195 µm) cylindrical with an expanded base to form the terminal bulb, 22-34 µm at the widest diameter (cbd is 38-47 µm). The nerve ring is located at 46-53 % of the pharyngeal length from the anterior. The opening of the ventral gland is located posterior of the nerve ring at 54-57% of the pharyngeal length from the anterior (cbd is 31-39) (Figure1.51 B).

The cardia is small. The intestinal wall has glandular cells, more numerous close to the cardia and less so more posteriorly.

The reproductive system is diorchic, with opposed and outstretched testes. The anterior branched is to the right and the posterior branch is to the left of the intestine. The spermatozoa are small and tightly packed in the testes (Figure1.51 I). The spicules are 1.4 and 1.7 abd long and curved (Figure1.51 H), they have a capitulum and their proximal tip is sharp and hooked. There are 16 fine pre-cloacal supplements extending upto 166 µm anterior of the cloaca. Close to the cloaca, the supplements are close together (a 47 µm section has nine

supplements), further away from the cloaca the supplements are 12 - 20 µm apart. The gubernaculum has a long (26 and 34 µm) dorso-caudal apophysis which is blunt and rounded at the tip.

The tail is long (130 and 135 µm), conico-cylindrical with numerous setae at the ventral and sub-ventral region (c'= 3.2 and 3.4). There are three long terminal setae. The caudal glands open through a prominent spinneret (Figure1.51 H).

Females: The females are similar to the males in general body shape, anterior sensilla and cuticle (Figure1.51 C). The reproductive system is amphidelphic, with outstretched ovaries. There is however, one female which has its anterior ovary reflexed at the tip (Figure1.51 F). Each branch has a short uterus, a small spermatheca and a long ovary. The vulva is simple and vagina has thick walls.

The tail is similar to that of the male but it is slightly longer 142-157 µm (c'=3.6-4.1) and lacks the numerous setae (Figure1.51 G).

Differential diagnosis

Dorylaimopsis coomansi sp. n. is characterised by long (8-10 µm) cephalic setae, cuticular punctation which has lateral differentiation of irregularly arranged dots at the pharyngeal and tail regions and 1-3 longitudinal rows of dots on the rest of the body. The spicules have a capitulum and they are hooked at the proximal end, the gubernaculum apophysis has a blunt tip.

Dorylaimopsis coomansi sp. n. differs from all other described species in the spicule and gubernaculum shape. The cuticular punctation is similar to that of *D. turneri* Zhang, 1992 but in *D. turneri* there are five longitudinal rows of dots posterior of the pharyngeal region.

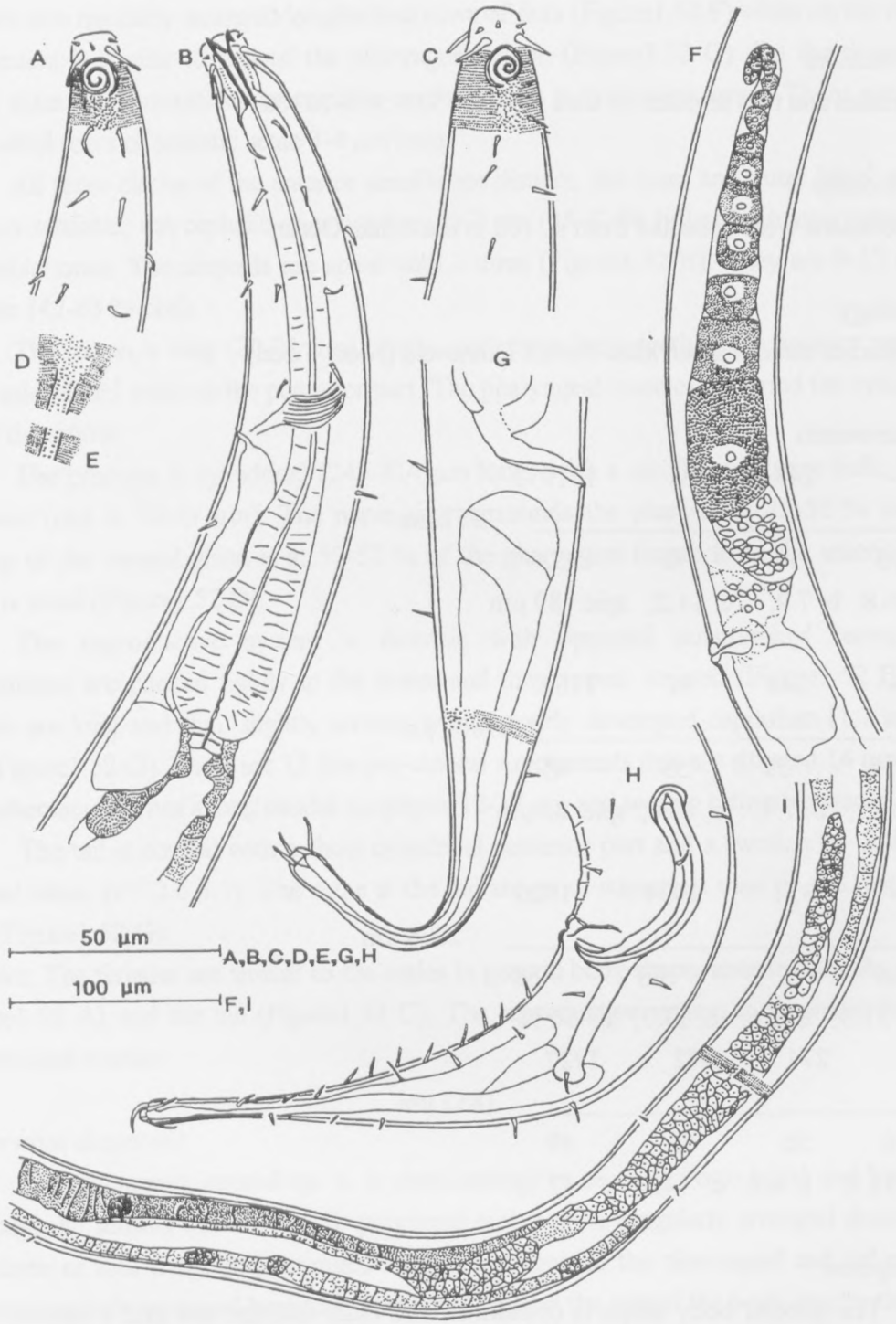


Figure 1.51: *Dorylaimopsis coomansi* sp. n.; A: $\male_1$ head region, B: $\male_1$ pharyngeal region, C: $\female_1$ head region, D: $\male_1$ lateral differentiation (end of the pharynx), E: $\male_1$ lateral differentiation (mid body), F: $\female_1$ reproductive system (anterior branch), G: $\female_1$ tail region, H: $\male_1$ tail region, I: $\male_1$ reproductive system

Dorylaimopsis gerardi sp. n. (Figure1.52 A-G)

Type material

Two males and two females on slide numbers 503, 504, 10300.

Type locality

All specimens were collected from st. 105 in the Indian Ocean

Etymology

This species name is given after Gerard Duineveld (Nioz, Texel)

Measurements

♂1	-	248	M	1819	1957 µm
	16	59	73	52	
a: 26.8; b: 7.9; c: 14.2; spic: 89 µm					
♂2	-	243	M	1764	1805 µm
	18	59	53	45	
a: 34.1; b: 7.4; c: 12.8; spic: 85 µm					
♀1	-	314	1034	1926	2078 µm
	16	57	66	53	
a: 31.5; b: 6.6; c: 13.7; V: 50 %					
♀2	-	274	872	1727	1852 µm
	16	56	58	49	
a: 31.9; b: 6.8: c: 14.8; V: 47 %					

Description

Male: The general body shape is cylindrical with blunt anterior end and a narrow conico-cylindrical posterior end. The head region is slightly constricted thereby appearing to be offset.

The cuticle is punctated with punctations starting at the anterior border of the amphids. Laterally, the punctations are larger, more widely spaced and irregularly arranged close to the amphids and in three or four irregularly arranged longitudinal rows on the rest of

the pharyngeal region (Figure1.52 D) and upto 40-115 µm behind it. On the rest of the body, there are two regularly arranged longitudinal rows of dots (Figure1.52 F) while on the tail the arrangement is similar to that of the pharyngeal region (Figure1.52 G). On the dorsal and ventral sides the punctations are smaller and arranged in transverse rows. There are eight longitudinal rows of somatic setae 3-4 µm long.

All three circles of the anterior sensilla are distinct, the inner and outer labial sensilla are short setiform, the cephalic ones are long, 6-7 µm (38-43 % hd) and situated behind the outer labial ones. The amphids are spiral with 3 turns (Figure1.52 B). They are 9-12 µm in diameter (47-63 % cbd).

The stoma is long (20-21 µm) tubular with three large teeth in the anterior part and highly sclerotized walls on the posterior part. The pharyngeal muscles surround the cylindrical part of the stoma.

The pharynx is cylindrical (243-314 µm long) with a swollen posterior bulb, 32-42 µm wide (cbd is 50-59 µm). The nerve ring surrounds the pharynx at 42-50 % and the opening of the ventral gland is at 52-57 % of the pharyngeal length from the anterior. The cardia is small (Figure1.52 D).

The reproductive system is diorchic with opposed outstretched testes. The spermatozoa are packed tightly in the testes and they appear striated (Figure1.52 E). The spicules are long and thin, slightly arcuate with a poorly developed capitulum (1.7 and 1.9 abd) (Figure1.52 G). There are 13 fine pre-cloacal supplements that are situated 14 µm apart. The gubernaculum has a long caudal apophysis 12-17 µm and weakly refractive pieces.

The tail is conical with a short cylindrical posterior part and a swollen tip with three terminal setae, (c'= 2.6-3.1). The setae at the tail are more numerous than on the rest of the body (Figure1.52 G).

Females: The females are similar to the males in general body shape, anterior sensilla, cuticle (Figure1.52 A) and the tail (Figure1.52 C). The reproductive system is amphidelphic with outstretched ovaries.

Differential diagnosis

Dorylaimopsis gerardi sp. n. is characterised by short setiform labial and long (6-7 µm) cephalic sensilla (38-43 % hd), punctated cuticle with irregularly arranged dots at first then three or four irregularly arranged longitudinal rows at the pharyngeal and tail regions, and two regularly arranged longitudinal rows of dots on the rest of the body length, the tail is conico-cylindrical with a distinctly swollen tip.

Dorylaimopsis gerardi sp. n. resembles *D. rabalaisi* Zhang, 1992 in the pattern of cuticular punctations but it can be distinguished from it by the length of the cephalic sensilla (54-83 % hd in *D. rabalaisi*), the diameter of the amphideal fovea (57-79 %) and the shape of the spicules.

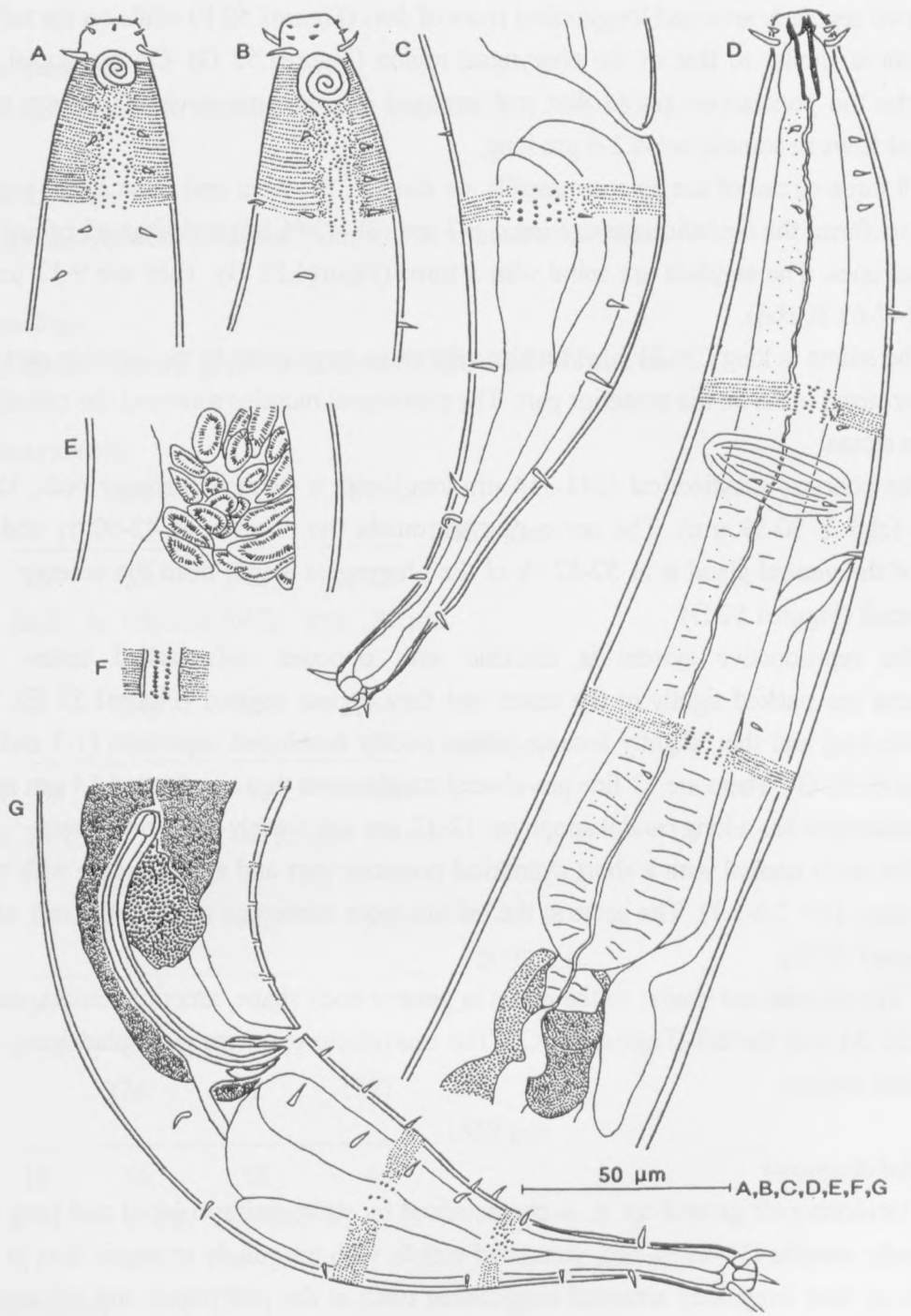


Figure 1.52: *Dorylaimopsis gerardi* sp. n.; A: ♀$_1$ head region, B: ♂$_1$ head region, C: ♂$_1$ tail region, D: ♂$_1$ pharyngeal region, E: ♂$_1$ spermatozoa (mid body), F: ♂$_1$ lateral differentiation (mid body), G: ♂$_1$ tail region

***Dorylaimopsis variabilis* sp. n. (Figure1.53A-M, Figure1.54A-F and Figure1.55A-I)**

Two different populations of *Dorylaimopsis variabilis* sp. n. were identified. Population (pop) 1 inhabited stations at 200m depth, population (pop) 2 inhabited stations at 20-50 m depth. Pop 1 had body length longer than 1780 µm (Table 1.6) and pop 2 had body less than 1473 µm. Morphologically the two populations are similar.

Type material: (pop 1)

Ten males and eight females on slide numbers RI505-RI506, 10301-10306.

Type locality: station 114

Etymology

The species name is derived from the word *variable*. It is so called because it occurs in two different forms.

Measurements: (also in Table 1.6)

σ^1 - 254 M 1972

2148 µm

18 65 72 56

a: 29.8; b: 8.5; c: 12.2; spic: 124 µm

φ_1 - 299 1328 2479

2710 µm

19 63 83 52

a: 32.7; b: 9.1; c: 11.7; V: 49 %

Type material: pop 2

Four males and four females 506, 10308, 10309.

Locality : Stations 111 and 128

Measurements: (also in Table 1.6)

σ^2 - 156 M 1098

1209 µm

11 39 54 37

a: 22.4; b: 7.8; c: 10.9; spic: 77 µm

φ_2 - 176 631 1201

1324 µm

14 40 58 32

a: 22.4; b: 7.5; c: 10.8; V: 48 %

Description

Males: The body is cylindrical with a blunt anterior end and a conical cylindrical tail end (Figure1.53 C and 1.54 F). Head end is set off from the rest of the body by a constriction at the level of the cephalic sensilla.

The cuticle is punctated on the median layer (Figure1.55E). Punctations begin at the level of the anterior border of the amphids (Figure1.53 E, 1.54 B). Laterally, the cuticle is raised (Figure1.55 D and E) and the punctations here are larger (Figure1.55 D), more widely spaced and arranged in longitudinal rows. From the anterior end until 26-53 µm in front of the pharyngo-intestinal junction in pop. 1 there are three longitudinal rows of dots (in pop 2, the three rows extend from the anterior until 0-100 µm posterior of the pharyngo-intestinal junction), the rest of the body until the level of the spicule has two longitudinal rows (Figure1.53 F, G). The remaining posterior part (i.e. spicule region and the tail) (Figure1.53 I and 1.54 E) has three rows of punctations similar to the pharyngeal region. On the dorsal and ventral sides, the punctations are smaller and arranged in transverse rows. Eight rows of somatic setae that appear to be inserted into grooves in the cuticle.

Anterior sensilla are all distinct, inner and outer labial sensilla are tiny and the cephalic ones are long setiform, 33-50% hd (Figure1.53E and 1.54B).

The amphids are spiral with 2.75-3.0 turns 47-75 % cbd wide and situated immediately posterior of the cephalic setae (Figure1.53E, 1.54 B and 1.55 A).

The stoma has an anterior conical part with three teeth and a posterior tubular part with highly sclerotized walls (Figure1.53K, 1.54C and 1.55B). The dorsal pharyngeal gland opening is at the base of the stoma.

The pharynx is cylindrical, slightly expanded at the base. (Figure1.53B). The nerve ring is located at 41-64% of the length of the pharynx from the anterior. The opening of the ventral gland cell is located at 48-75 % of the length of the pharynx from the anterior and the ventral gland is at the pharyngo-intestinal junction. Cardia is small but distinct. The intestinal wall cells appear granular especially close to the cardia.

The reproductive system is diorchic with opposed and outstretched testes (Figure1.53 D). The anterior testis is to the left and the posterior one is to the right of the intestine. The anterior testis is longer and has larger spermatozoa (Figure1.53 D) which may be widely spaced (Figure1.53 M), the posterior testis is shorter (Figure1.53 D) and has smaller spermatozoa (Figure1.53 L). In some specimens, the spermatozoa may be widely spaced and vacuolated in the anterior testes but always closely packed in the posterior testis. It is possible that the two testes have spermatozoa at different developmental stages and hence the difference in their sizes. However, both small and large spermatozoa were observed in the female uterus, this may suggest that no change in size occurs either in the male or the female reproductive tract. It is therefore, possible that there are two types of spermatozoa, a larger

type in the anterior testis and a smaller one in the posterior testis.

The spicules are long (1.8-2.4 abd), arcuate and have a capitulum (Figure1.53 I and 1.54 E). The gubernaculum has a long caudal apophysis. There are 12-26 pre-cloacal supplements with very fine ducts.

The tail is conico-cylindrical with a swollen tip (c'=2.9-3.9) (Figure1.53 I, 2.55 E and 2.56 F and I). There are numerous setae on the conical part of the tail and three (7-10 µm long) at the tip. The caudal glands open through three separate outlets at the terminal (Fig. 1.55 G).

Females: They are similar to males in general body shape, cuticle, anterior sensilla (Figure1.53 J and 1.54 A) and the tail (Figure1.53 H and 1.54 D). The reproductive system is amphidelphic with outstretched ovaries (Figure1.53 A), the anterior branch to the left and the posterior one to the right of the intestine. Each branch has a long germinal zone and a growth zone that may or may not have a mature ovum and a uterus which may be partly filled with spermatozoa.

Differential diagnosis

Dorylaimopsis variabilis sp. n. is characterised by short labial sensilla, setiform cephalic sensilla (33-58 % hd), multispiral amphids with 2.75-3.0 turns, cuticular punctations with lateral differentiation of three longitudinal rows at the pharyngeal and tail regions and two longitudinal rows at the rest of the body, spicules that are long and arcuate.

Dorylaimopsis variabilis sp. n. resembles *D. mediterraneus* Grimaldi de Zio, 1968 in the cuticular punctations, de mans ratios, and general body shape. They can be distinguished from each

other by the number of amphideal turns (3.5 turns in *D. mediterraneus*), and although *D. mediterraneus* is the size of the larger form of *D. variabilis* sp. n., *D. mediterraneus* has much longer (187-225 µm) spicules that have a typical double curve and striations at the middle.

Discussion

Riemann (1986) described *Nicascolaimus punctatus* in which the anterior testes is longer and produces larger spermatozoa and the posterior testes is shorter and has smaller spermatozoa. From this observation he concluded that there exists sperm dimorphism in nematodes. Riemann also discussed other nematodes in which such a phenomenon has been observed. Since two types of testis and spermatozoa are also observed in *Dorylaimopsis variabilis* sp. n. the situation is comparable with that of *N. punctatus* therefore, we suppose that sperm dimorphism exists in this species as well.

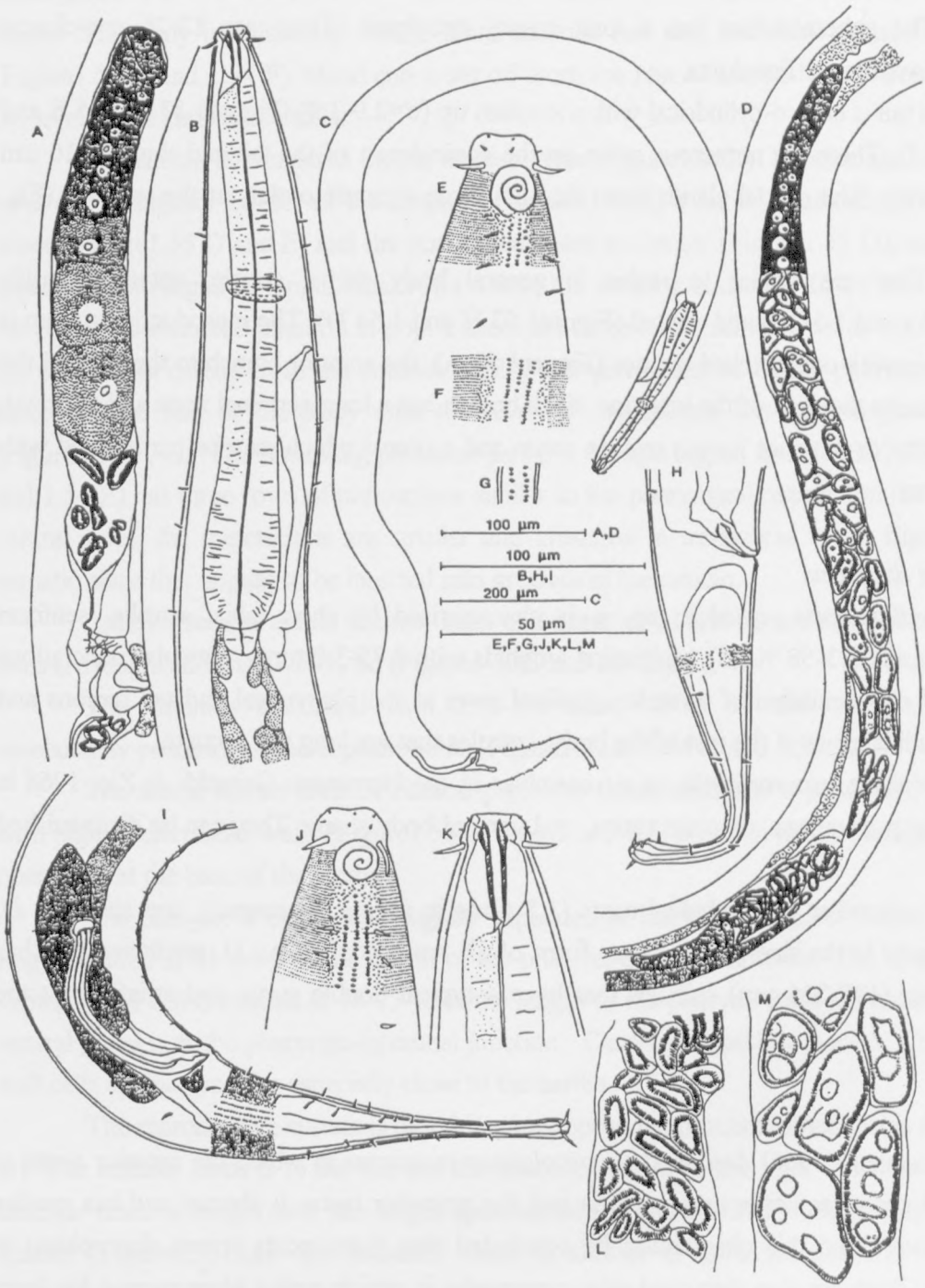


Figure 1.53: *Dorylaimopsis variabilis* sp. n. (pop 1): A: ♀$_1$ reproductive system, B: ♂$_1$ pharyngeal region, C: ♂$_2$ habitus, D: ♂$_1$ head region, E: ♂$_1$ reproductive system, F: ♂$_1$ lateral differentiation (pharyngeal region), G: ♂$_1$ lateral differentiation (mid body), H: ♀$_1$ tail, I: ♂$_1$ tail, J: ♀$_1$ head region, K: ♂$_1$ stoma, L: ♂$_1$ spermatozoa (posterior testes), M: ♂$_1$ spermatozoa (anterior testes)

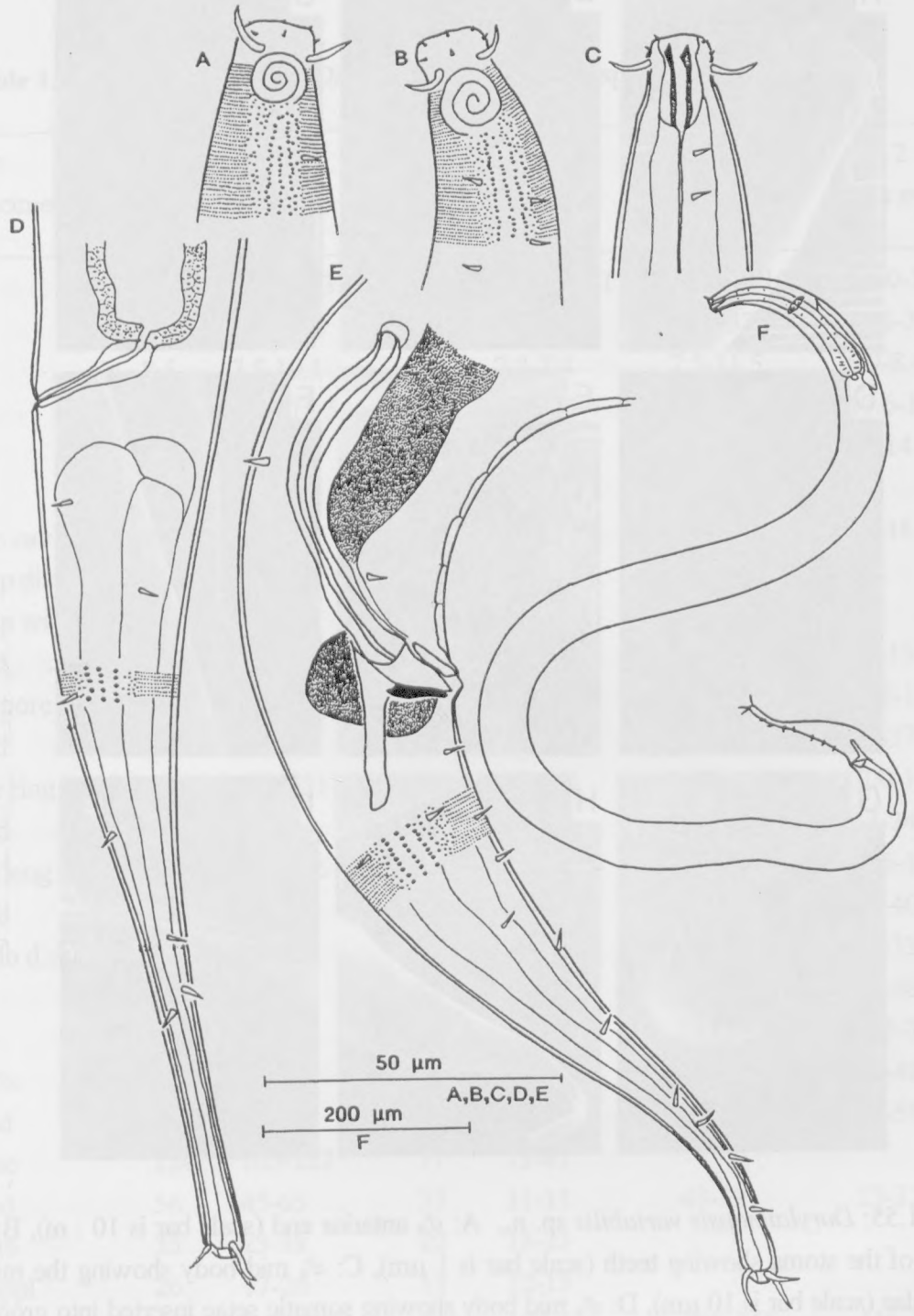


Figure 1.54: *Dorylaimopsis variabilis* sp. n. (pop 2), A: ♀$_1$ head region, B: ♂$_1$ head region, C: ♂$_1$ stoma, D: ♀$_1$ tail, E: ♂$_1$ tail, F: ♂$_1$ habitus

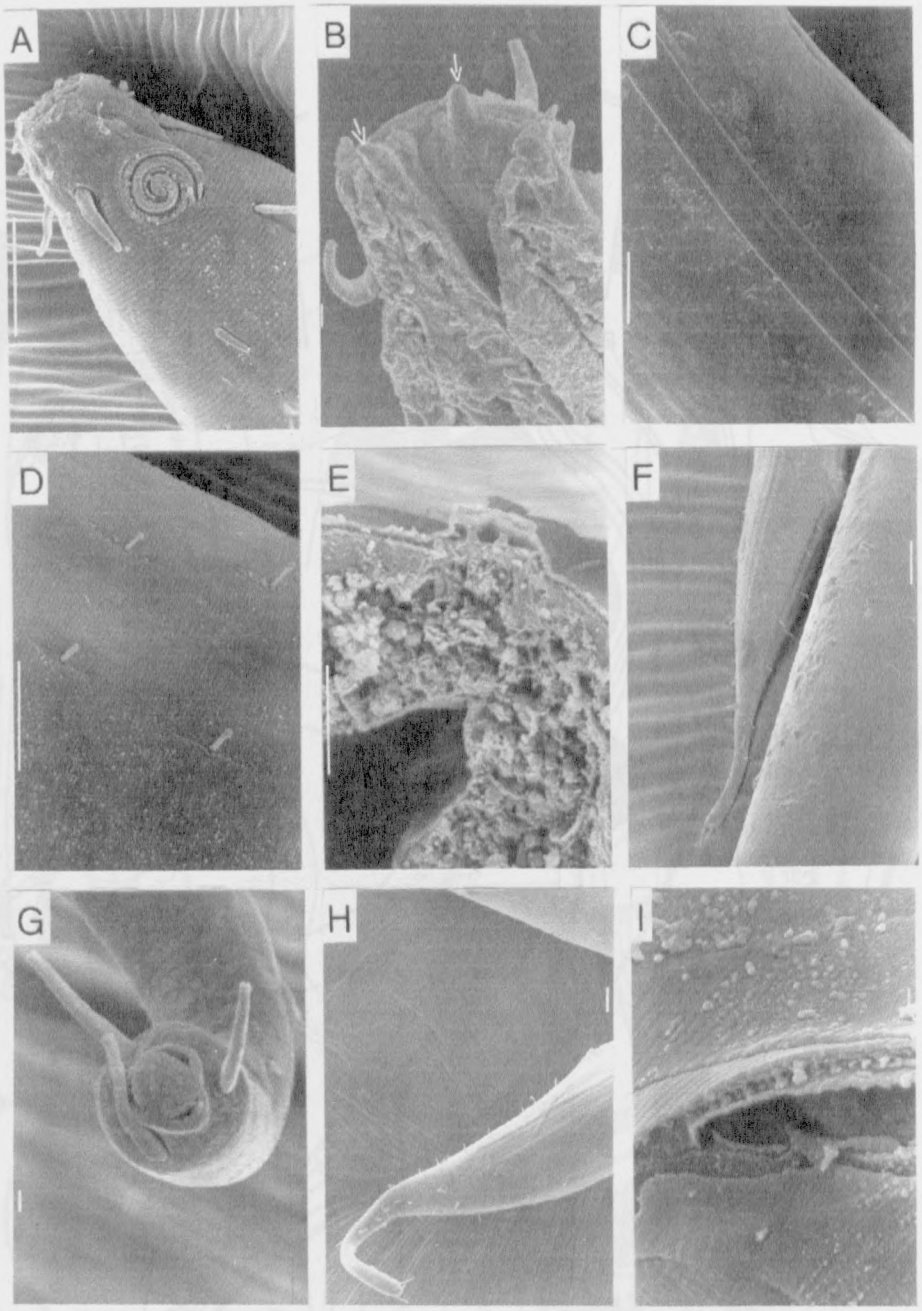


Figure 1.55: *Dorylaimopsis variabilis* sp. n., A: ♂6 anterior end (scale bar is 10 : m), B: ♂7 section of the stoma showing teeth (scale bar is 1 μm), C: ♂6 mid body showing the raised lateral alae (scale bar is 10 μm), D: ♂6 mid body showing somatic setae inserted into grooves (scale bar is 10 μm), E: ♂7 cross section at mid body showing the raised cuticle and punctations (as large perforations) at the differentiated lateral part (scale bar is 10 μm), F: ♂3 tail region of the (pop.2) (scale bar is 10 : m), G: ♂6 tail tip showing the three separate outlets of the caudal glands (scale bar is 1 μm), H: ♂6 tail region (pop. 1) (scale bar is 10 μm), I: ♂7 section of the cuticle showing punctations as perforations on the median layer (scale bar is 1 μm).

Table 1.5: Measurements for *Dorylaimopsis variabilis* sp. n.

pop	population 1		population 2		pop 1	pop 2
specimens	♂$_1$	♂♂s n=9	♂$_2$	♂♂s n=3	♀♀s n=8	♀♀s n=4
L	2148	1780-2533	1209	1119-1271	1932-2710	1300-1473
a	29.8	27.4-35	22.4	26.5-32.9	24.5-33	22.8-35.9
b	8.5	7.5-10.1	7.8	7.2-7.4	7.5-11.5	6.9-8.4
c	12.2	10.1-15.5	10.9	10.5-11.4	10.5-13.9	10.6-12.8
hd	18	15-18	11	12-14	16-19	12-14
cs	8	6-9	5	5-6	6-9	7-8
buc cav	27	22-34	18	14-18	23-29	14-18
amp dist	7	8-10	7	5-7	5-9	6-7
amp wid	11	9-13	9	8-9	9-12	9
cbd	22	19-22	14	12-14	18-22	14-15
ex pore	159	146-163	117	104-126	137-181	118-135
cbd	57	49-60	34	32-36	53-62	34-37
ner ring	135	118-151	96	88-104	112-145	100-113
cbd	55	47-59	33	31-35	51-61	33-34
ph leng	254	226-296	156	156-172	221-323	176-193
cbd	65	54-70	39	35-40	60-74	37-40
bulb d	37	35-42	24	21-26	40-49	27-32
M	72	60-87	54	35-48	72-82	41-58
v					1131-1420	603-702
V%					45-49	46-48
cbd					75-83	41-58
spic	124	105-127	77	73-85		
abd	56	45-65	37	31-35	48-52	23-32
gub	35	23-38	20	15-23		
suppl	26	17-26	13	12-13		
tail	176	148-214	111	107-115	160-248	115-123
s term	8	7-10	6	7-9	7-9	8-10
c'	3.1	2.9-3.9	3.0	3.2-3.5	3.3-4.8	3.8-4.4
spic/abd	2.2	1.8-2.3	2.1	2.1-2.4		
L/spic	17.3	17-21	15.7	14.8-15.7		

Hopperia Vitiello, 1969

Hopperia indiana sp. n. (Figure1.56 A-G)

Type material

One male and six females on slide number RI500-RI501, 10296-10298.

Type locality

Male from st. 131 ($\male_1$) and females from st. 131 (2), 106 (3 including $\female_1$), 105

Etymology

The species name is given with the reference to the Indian Ocean.

Measurements

$\male_1$ - 272 M 2183

17 57 60 45 2440 µm

a: 40.7 ; b: 9.0; c: 9.5; spic: 69 µm

$\female_1$ - 255 1419 2515

17 53 54 38 2785 µm

a: 51.6; b: 10.9; c: 10.3; V: 51 %

$\female_2$, $\female_3$: L: 2695; a: 51.6, 51.8; b: 9.5; c: 10.3, 9.6; V: 49, 52 %

$\female_4$-$\female_6$ L: 2072-2301; a: 37-40.4; b: 7.7-8.3; c: 7.9-8.2; V: 47-49 %

Description

Male: Body cylindrical, anteriorly blunt and truncate with a filiform tail end. Head diameter is 14-17 µm.

The cuticle is clearly punctated and appear faintly annulated especially in the head region. Punctations begin immediately posterior of the cephalic sensilla, laterally they are larger and more widely spaced. On the rest of the body, the punctations are smaller and arranged in transverse rows. Eight longitudinal rows of somatic setae, more numerous on the pharyngeal and tail region than on the rest of the body.

Three crowns of anterior sensilla, the inner and outer labial sensilla are very short but distinct, the cephalic sensilla are 3-4 µm long (17-24 % hd).

The amphids are spiral with 2.5 turns and located posterior of the cephalic sensilla, they are 9-11 µm in diameter (47-55 % cbd) (Figure1.56 C).

The stoma is tubular 28-33 µm long and 6-7 µm wide, the anterior part has three large teeth and the posterior part has highly sclerotized walls. The pharyngeal muscles surround part of the stoma (Figure1.56 B).

The pharynx is long cylindrical and expanded at the base to form a terminal bulb which is 29-42 µm at the widest part. The radial tubules are distinct and start at the base of the stoma (Figure1.56 A). The nerve ring is located at 44-48 % of the pharyngeal length from the anterior. The opening of the ventral gland is located posterior of the nerve ring at 50-55% (cbd is 37-50 µm) of the pharyngeal length from the anterior. The ventral gland is small (Figure1.56 A). Cardia is small. The intestinal wall has numerous glandular cells especially close to the cardia.

The reproductive system (testes and vas deferens) was not clearly observed. There are seven pairs of copulatory glands (in tandem) and they open at the cloaca. Pre-anally, there is a row of short sub-ventral setae, a single ventral setae and 20-21 ventral supplements with very fine ducts (Figure1.56 E). The spicules are massive (1.5 abd long) with a `velum'. The gubernaculum has a long (19 µm) caudal apophysis (Figure1.56 E).

The tail is conical (one third) anteriorly and filiform posteriorly, it is 257 µm long (c'= 5.7). There are numerous setae along the whole length of tail but no terminal setae (Figure1.56 G). The caudal glands open at the tip.

Females: Females are similar to males in general body shape, anterior sensilla (Figure1.56 D), cuticle and stoma. However, females ($\&_1$, $\&_2$ and $\&_3$) from the deeper stations (1000m) were much longer and thinner, and consequently had a higher a-ratio (a= 51.6-65.7) than those ($\&_4$-$\&_6$) from the shallower stations (500m) (a= 37-40.4). The reproductive system is amphidelphic with outstretched ovaries, it was however, poorly preserved in all the females and therefore no drawings were made. Uterus is long, thick walled and filled with spermatozoa. The vulva is simple and vagina is thick walled,

The tail is slightly longer in the females than in the male (252-281 µm) and the abd is smaller (33-41 µm) and consequently c' (c'= 6.4-8.5) is larger in the females than in male (Figure1.56 F).

Differential diagnosis

Hopperia indiana sp. n. is characterised by short conical anterior sensilla, cuticle punctated with lateral differentiation of larger dots, spicules which possess a `velum' and a gubernaculum with long and sharp pointed apophysis.

Hopperia indiana sp. n. resembles *H. massiliensis* Vitiello, 1969 in the general body shape and the tail but it can be distinguished from it by the length of the cephalic sensilla relative to the hd, 18-24 % hd in *H. indiana* sp. n. and 12-15 % hd in *H. massiliensis*, length of the spicules (69 µm long i.e. 1.5 abd) and presence of a `velum' in *H. indiana* sp. n. while they are 52-54 µm long (1.3 abd) and without a `velum' in *H. massiliensis* , *H. indiana* sp. n. has 20-21 ventral pre-cloacal supplements while *H. massiliensis* has 13-16 supplements.

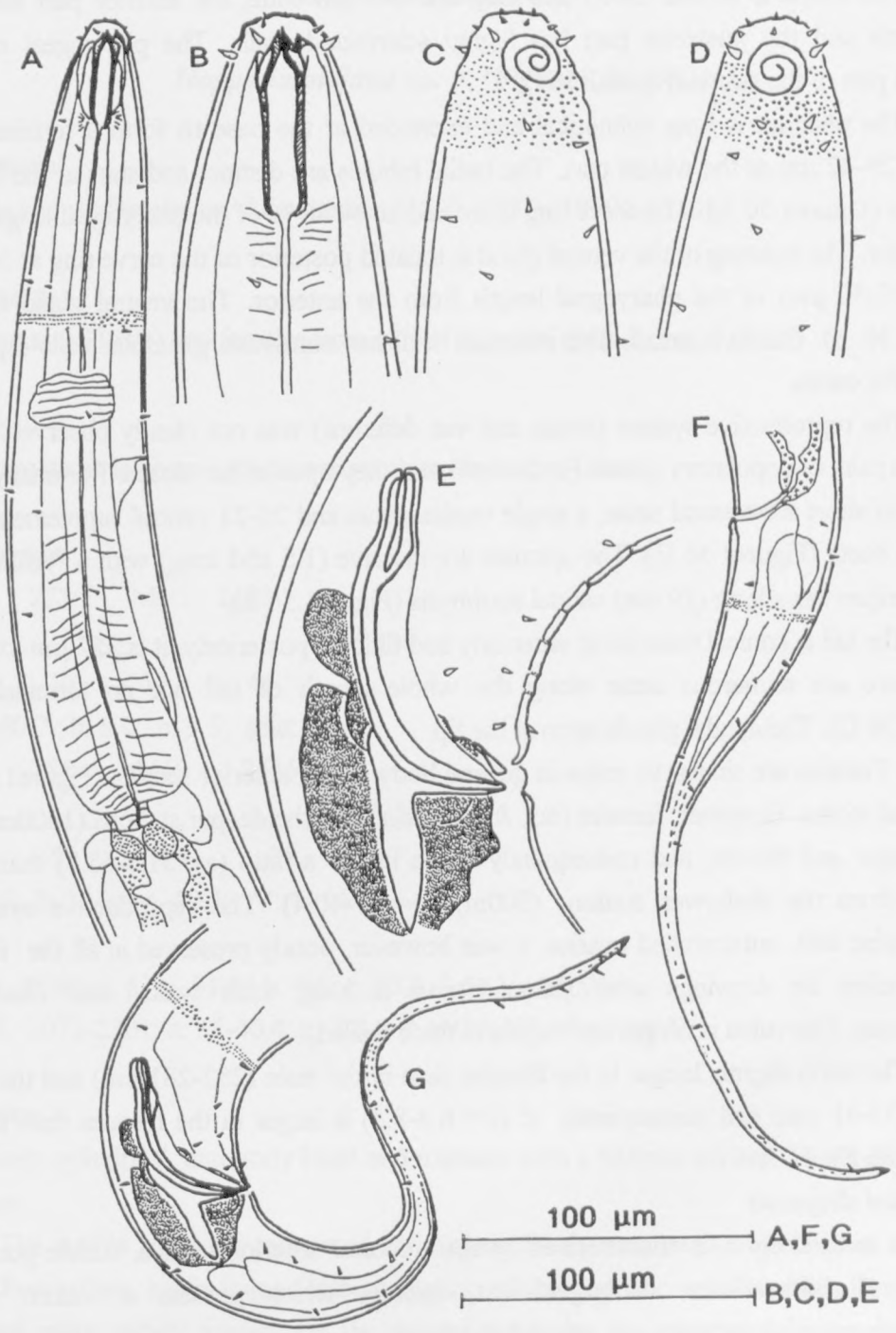


Figure 1.56: *Hopperia indiana* sp. n.: A: ♂$_1$ pharyngeal region, B: ♂$_1$ stoma, C: ♂$_1$ head region, D: ♀$_1$ head region, E: ♂$_1$ spicules, F: ♀$_1$ tail, G: ♂$_1$ tail

Paramesonchium Hopper, 1967

Paramesonchium mombasi sp. n. (Figure1.57 A-F)

Material studied

Two males on slide number 497

Type locality

Both males were collected from station 127

Etymology

The species is named after the town of Mombasa in Kenya

Measurements

$\sigma^{\prime}_1$ - 165 M 2186

2276 µm

9 15 15 14

a:142.3; b:14.1; c:25.3; spic:17 µm

$\sigma^{\prime}_2$ - 162 M 2122

2212 µm

9 16 16 16

a:138.3; b:13.4; c:27.7 spic:17 µm

Description

Male: Body is cylindrical and slender, with a blunt head end. The head region shows a kind of a constriction just behind the cephalic setae (Figure1.57 A and D).

The cuticle is annulated and punctated. The punctations are arranged in transverse rows throughout the body. Laterally, there are three longitudinal rows of larger dots that extend from 64 µm away from the anterior until the conical part of the tail (Figure1.57 C). Annuli are more pronounced at the pharyngeal and tail regions. Somatic setae were observed only at the cylindrical part of the tail.

The anterior sense organs are long, the inner labial sensilla are indistinct, the outer labial sensilla are 5 µm and cephalic sensilla are 21 µm long (Figure1.57 A and D). There are also four prominent cervical setae (14 µm long) 23 µm from the anterior (Figure1.57D). The amphids are spiral with 2.75 turns, 9-11 µm in diameter (90% hd). They are located immediately posterior of the cephalic setae (Figure1.57 A).

Stoma is large (Figure1.57 B), cup-shaped, 7-9 µm long with sclerotized walls. Pharyngeal muscles surround part of the stoma. The pharynx is cylindrical, 162-165 µm long and slightly expanded at the terminal end to form the bulb (Figure1.57 C) 10 µm wide. The nerve ring surrounds the pharynx at 80-82 µm from the anterior, and the opening of the ventral gland is located posterior of it (103-177 µm from anterior). The ventral gland is located at 46 µm posterior of the pharyngo-intestinal junction.

Cardia is long and pear-shaped.

The reproductive system is diorchic, with opposed and outstretched testes. Spicules are arcuate (Figure1.57 F), 17 µm long (1.1 and 1.2 abd). The gubernaculum is short with a dorso-caudally curved gubernacular apophysis 12 µm long. There are six to seven ventral pre-cloacal supplements located close to each other. Posterior of the cloacal, there are three sub-ventral setae at the conical part of the tail.

The tail is conico-cylindrical, 90 µm long (c'=5.6 and 6.4), with a slightly swollen tip (Figure1.57 E). There are two long setae at the tip.

Differential diagnosis

Paramesonchium mombasi sp. n. is characterised by long labial (5 µm) and cephalic (21 µm) setae that are close to each other, cuticle punctated with transversely arranged rows of dots and lateral differentiation of three longitudinal rows of larger dots, amphids are wide (80-90% cbd).

Paramesonchium mombasi sp. n. resembles *P. belgicum* Jensen, 1976 but they can be distinguished from each other by the length of the anterior sensilla, in *P. belgicum*, cephalic sensilla are longer, 36 µm and labial sensilla are 4 µm long, it is a much thicker nematode (a=52-79 compared to a= 138.4-142.3 in *P. mombasi* sp. n.), *P. belgicum* lacks lateral differentiation of longitudinal rows of dots and it has five pre-cloacal supplements which begin far in front of the cloaca.

Paramesonchium mombasi sp. n. also resembles *P. serialis* Wieser, 1954 but it can be distinguished from it by the shape of the head with the labial sensilla inserted into raised parts of the lips in *P. serialis*, the length of the anterior sensilla (6 µm for the labial and 32 µm for the cephalic setae), the diameter of the amphid is smaller (13 µm, 70% cbd) and the stoma has teeth. *P. serialis* also has several shorter setae at the pharyngeal region compared to *P. mombasi* sp. n.

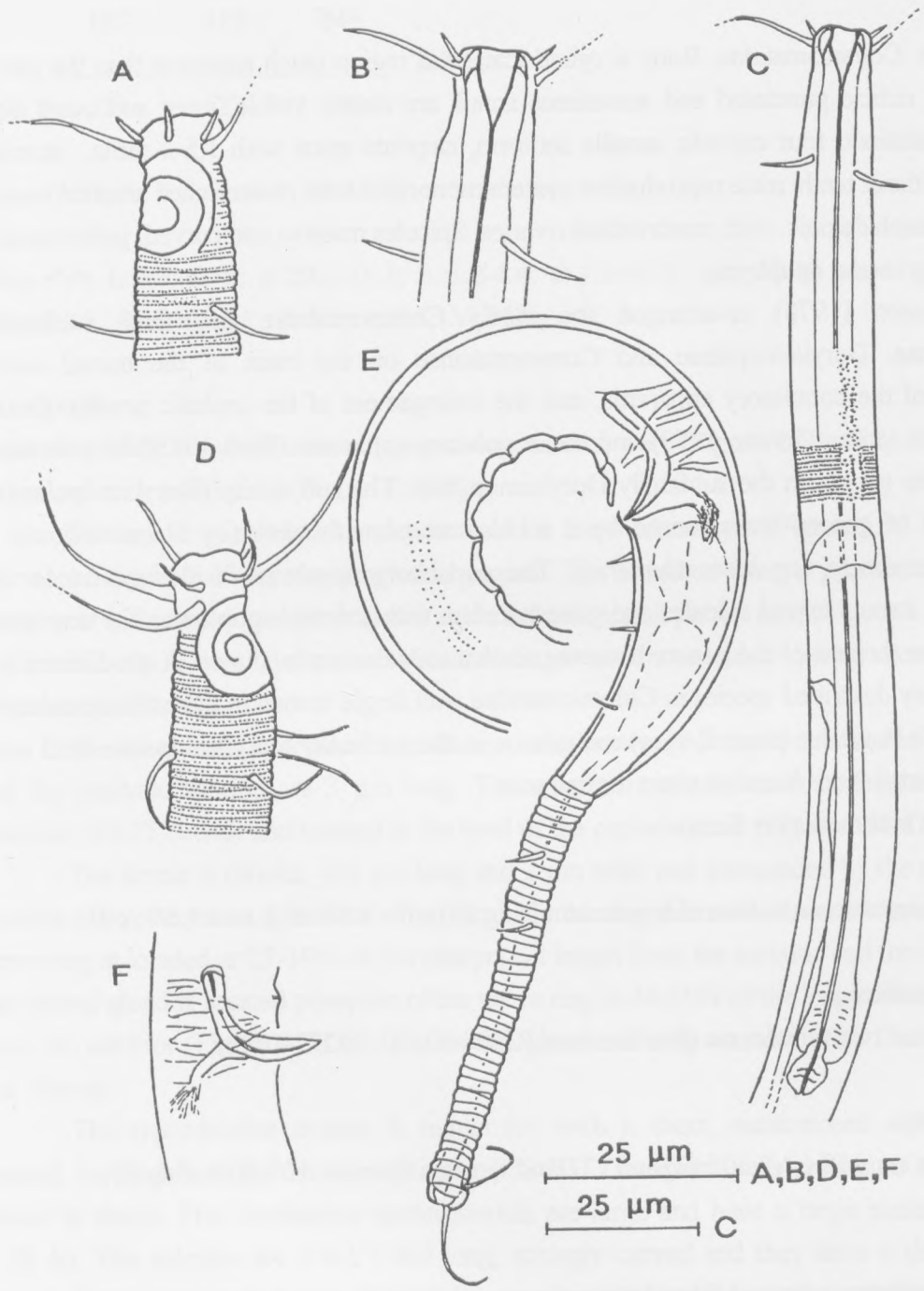


Figure1.57: *Paramesonchium mombasi* sp. n.
A: ♂$_1$ head region; B: ♂$_1$ stoma; C: ♂$_1$ pharyngeal region; D: ♂$_2$ head region; E: ♂$_1$ tail region
F: ♂$_2$ spicule

Kenyanema gen. n.

Diagnosis: Comesomatidae. Body is cylindrical, head region much narrower than the rest of the body, cuticle punctated and sometimes annuli are clearly visible, inner and outer labial sensilla indistinct, four cephalic sensilla setiform, amphids spiral with 1.5-2 turns, stoma is tubular without teeth, male reproductive system monorchic with outstretched anterior branch. Females amphidelphic with outstretched ovaries. Spicules massive and curved, gubernaculum with a long caudal apophysis.

Jensen (1978) re-arranged the family Comesomatidae into three subfamilies Sabatieriinae, Dorylaimopsinae and Comesomatinae on the basis of the buccal cavity, structure of the copulatory apparatus, and the arrangement of the cephalic sensilla. On the basis of the stoma (Jensen 1979) and the copulatory apparatus (Platt 1985) *Kenyanema* is close to the genera in the subfamily Dorylaimopsinae. The sub family (Dorylaimopsinae) is composed of genera characterised by a tubular stoma with teeth (*eg Dorylaimopsis*) or without armament (*eg Metasabatieria*). The copulatory apparatus is also typical for the subfamily, strong curved spicules and gubernaculum with a dorsal apophysis. The new genus differs from the rest of the genera however, in that only the cephalic sensilla are distinct, it is also the only described species in Comesomatidae with single branch in the male reproductive system. We however, place *Kenyanema* gen. n. in the subfamily Dorylaimopsinae until more material (details) are found to place it otherwise.

This genus is named after Kenya.

Kenyanema monorchis gen. et sp. n. (Figure 1.58 A-J and 1.59 A-D)

Material studied

Six males and two females on slide numbers RI498-RI499, 10292-10295.

Type locality

Males from sts. 118 (σ^1_1), 105 (2) and 131 and females from sts. 105 (including φ_1).

Etymology

The species name is derived from the word monorchic which means single testis.

Measurements

σ^1_1	-	220	M	895
				990 µm
7		25	28	23

a: 35.4; b: 4.5; c: 10.4; spic: 35 µm

φ_1 - 187 418 646

727 µm

7 25 27 21

a: 26.9; b: 3.9; c: 8.9; V: 58 %

Other ♂♂s L: 613-975; a: 29.2-36.1; b: 3.2-4.4; c: 7.3-10.3; spic: 32-38 µm
Other φ_2 L: 727; a: 30.1; b: 5.1; c: 9.8; V: 55%

Description

Male: The body is cylindrical, with narrowing anterior part (Figure 1.59 A) (5-7 µm) and conical tail with swollen tip (Figure 1.58 B).

The cuticle is annulated and punctated on the median layer (Figure 1.59 B and C). The annuli begin halfway the amphideal region. The annuli are more pronounced at the pharyngeal (nine annuli per 10 µm) and at the tail (six annuli per 10 µm) (Figure 1.58 J) than at the mid body. Laterally, the punctations are larger and more widely spaced. Somatic setae are scarce and short.

The inner and outer labial sensilla are indistinct (only being visible under the SEM) and the cephalic sensilla are 3 µm long. The amphids are spiral with two turns, 4-6 µm diameter (63-75% cbd) and located at the level of the cephalic setae (Figure 1.58 C).

The stoma is tubular, 6-8 µm long and 2 µm wide and surrounded by the pharyngeal muscles. The pharynx is cylindrical. The marginal tubes begin from the base of the stoma. The nerve ring is located at 27-39% of the pharyngeal length from the anterior and the opening of the ventral gland is located posterior of the nerve ring at 44-55% of the length of the pharynx from the anterior (Figure 1.58 G). The ventral gland cell body was not seen. Cardia is small but distinct.

The reproductive system is monorchic with a short, outstretched anterior testis located to the left of the intestine (Figure 1.58 B). The sperm cells are large, elongate to round in shape. The developing spermatozoids are large and have a large nucleus (Figure 1.58 A). The spicules are 1.4-1.7 abd long, strongly curved and they have a short central lamina. They are surrounded by glandular tissue especially at the posterior end (Figure 1.58 I, J). The gubernaculum is strong and it has a long (12-17 µm) caudal apophysis.

Tail is conical (81-100 µm long and c`=3.1-4.5) with a short (1/3 tail length) cylindrical part and a swollen tip with three terminal setae (Figure 1.58 I, J and Figure 1.59 D). The caudal glands open through three separate outlets (Figure 1.59 B).

Females: Females are similar to males in general body shape, anterior sensilla, cuticle and the stoma (Figure 1.58 F, G). The reproductive system is amphidelphic with outstretched

branches. The anterior branch is to the left and the posterior branch is to the right of the intestine. The ovary is short and the mature ovum may occupy upto one third of the length (Figure 1.58E).

Diagnosis

Kenyanema monorchis gen. *et* sp. n. is the only Comesomatid so far described with a single testis. It has a head region that is narrower than the rest of the body, labial sensilla not distinct, four cephalic sensilla obvious but short (3 µm), amphids with 2 turns and located at the level of the cephalic setae, distinct pharyngeal tubules, males have large elongate sperm cells, spicules are massive and ventrally curved and they have a short central lamina. The gubernaculum has a long, thin caudal apophysis with a sharp posterior tip, the tail is short conico-cylindrical, swollen tip with two terminal setae.

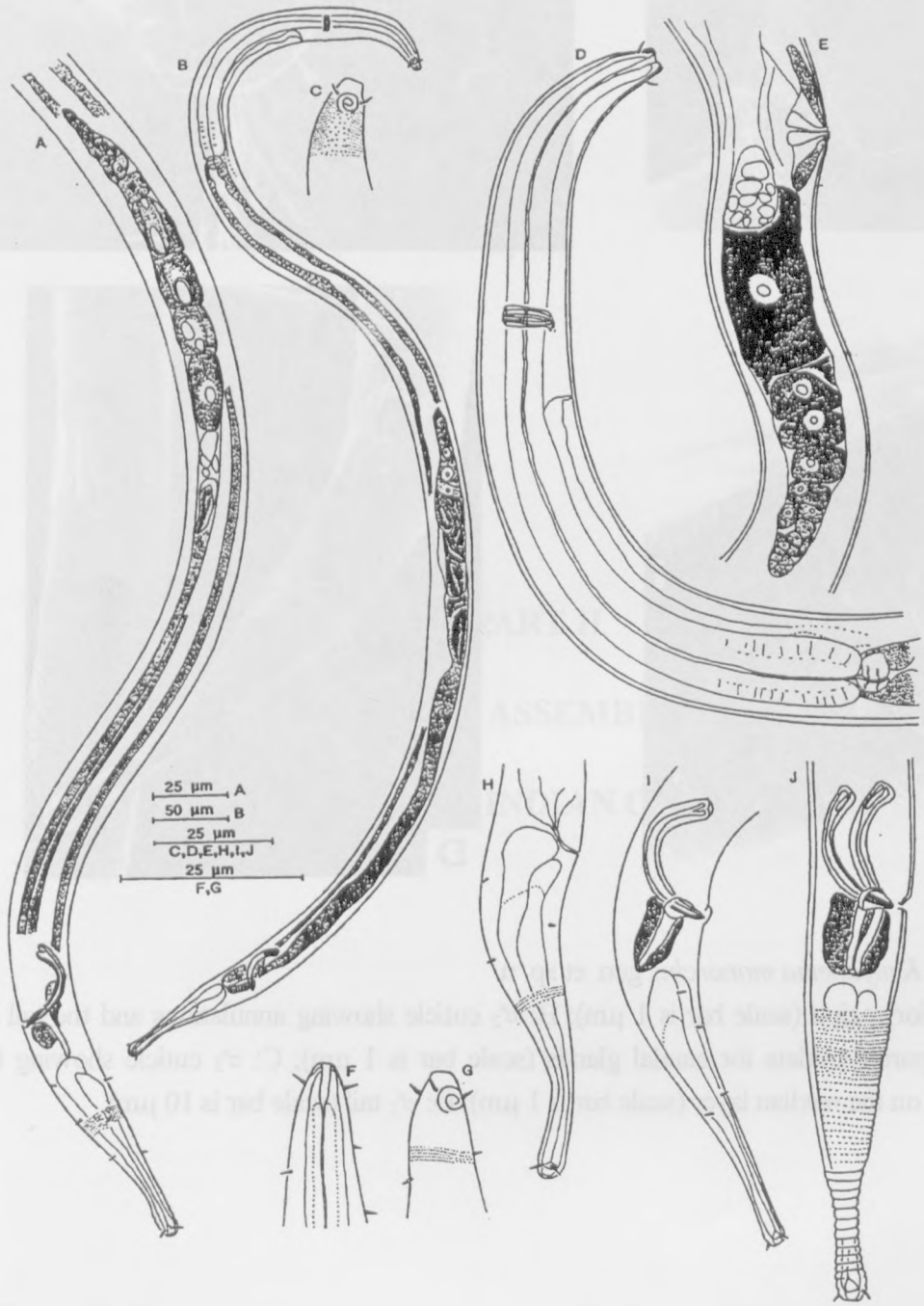


Figure 1.58: *Kenyanema monorchis* gen. et sp. n.

A: ♂$_6$ reproductive system (immature ♂); B: ♂$_1$ habitus; C: ♂$_1$ head region; D: ♂$_1$ pharyngeal region; E: ♀$_1$ reproductive system; F: ♀$_1$ stoma; G: ♀$_1$ head region; H: ♀$_1$ tail region; I: ♂$_2$ tail region; J: ♂$_1$ tail region

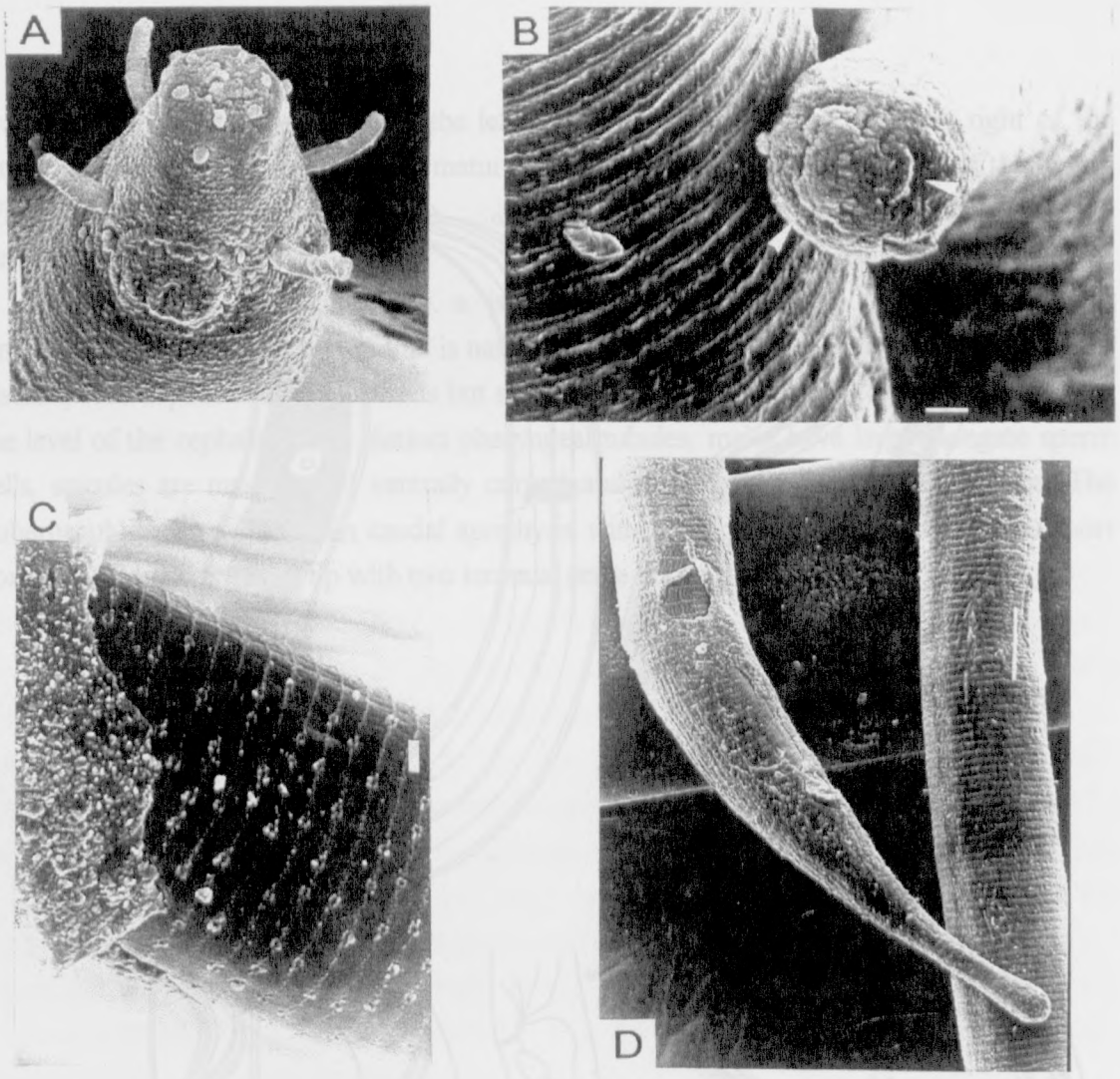


Figure 1.59 *Kenyanema monorchis* gen. et sp. n.
A: ♂$_2$ anterior region (scale bar is 1 μm); B: ♂$_2$ cuticle showing annulations and the tail tip with the separate outlets for caudal glands (scale bar is 1 μm); C: ♂$_3$ cuticle showing the punctations on the median layer (scale bar is 1 μm); D: ♂$_2$ tail (scale bar is 10 μm).

PART II

NEMATODE ASSEMBLAGES IN

THE WESTERN INDIAN OCEAN (WIO)

1. RESULTS

1.1 Environmental factors

Environmental variables are given Appendix IIa and IIb. A complete table for all environmental variables could not be obtained for both periods due to technical problems. Sediment Community Oxygen Consumption (SCOC), DNA:RNA ratio in the sediment, oxygen concentration and saturation in the water column were available for the two campaigns (Duineveld *et al.*, 1997). Sediment analysis *i.e.* sand and silt content, organic carbon and C:N ratio in the sediment were available for November/ December only. Of the four environmental variables available for both periods, only oxygen concentration (µM) and saturation (%) showed differences between the two periods. June/July had higher values of oxygen concentration and saturation compared to November/ December. The other two SCOC and DNA:RNA ratios were not very different between the two periods.

Spearman Rank Order Correlation (SROC) was used to test whether these environmental variables had a relationship with depth. The results show that SCOC, DNA:RNA, oxygen concentration and saturation, sand and silt content were significantly correlated with depth. SCOC, DNA:RNA ratio, oxygen content and fine sand had a negative correlation with depth, while sediment silt proportion correlated positively with increasing water depth (Table 2.1 and Figure 2.1 a-f). Organic carbon, C:N ratio and medium sand and very fine sand grain were not at all correlated with depth.

Table 2.1: SROC of depth vs environmental variables

Depth Vs	Varied N	Spearman R	t (N-2)	p-level
SCOC	29	-.82	-7.40	0.000
DNA:RNA	24	-.55	-3.11	0.005
Oxygen(µM)	23	-.61	-3.51	0.002
Sfines %	14	-.61	-2.69	0.19
Ssilt 16 %	14	0.67	3.13	0.009
Ssilt 50 %	14	0.67	3.11	0.009
Ssilt 63 %	14	0.67	3.12	0.009

(see abbreviations for sediment in Appendix IIb)

Figure 2.1: Distribution of abiotic variables with depth

(1: June/July; 2: Nov/Dec period)

Fig. 2.1a: SCOC (mmol/m2/d)

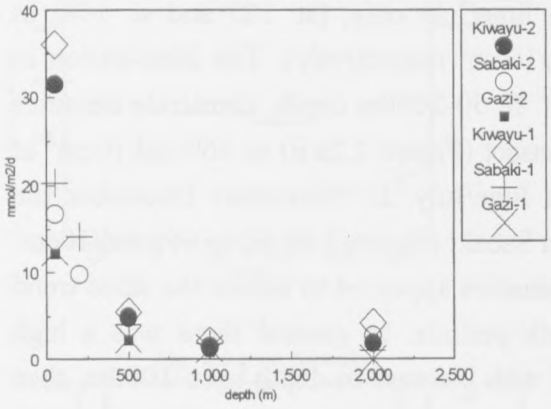


Fig. 2.1b: DNA:RNA ratio

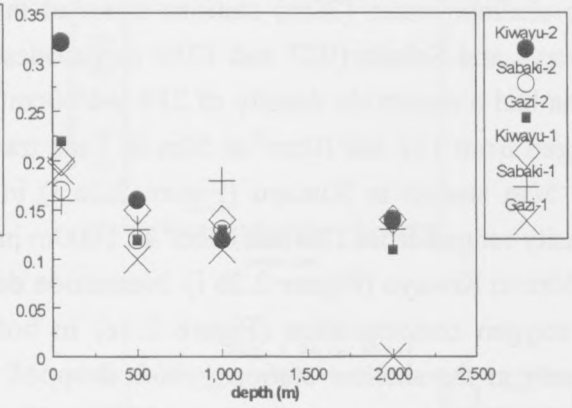


Fig. 2.1c: Oxygen concentration (µM)

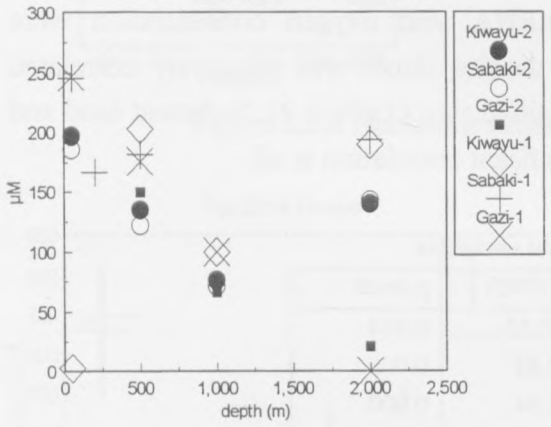


Fig. 2.1d: Sediment fine sand (%)

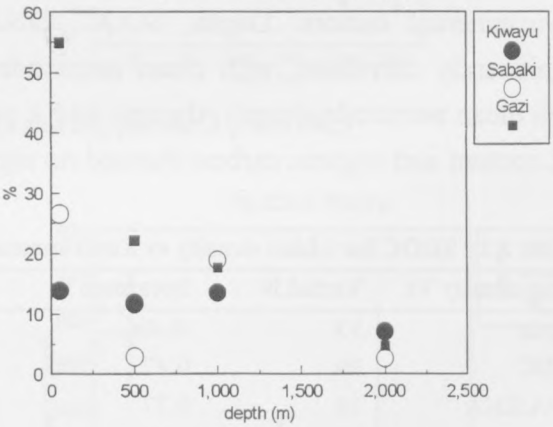


Fig. 2.1e: Sediment silt 16 %

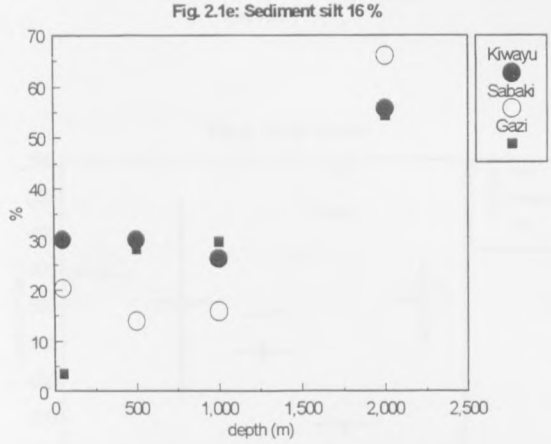
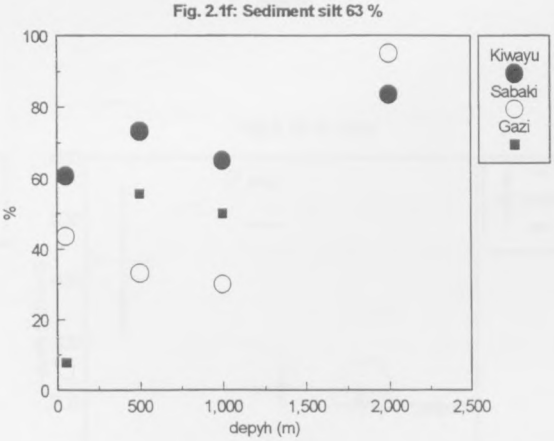


Fig. 2.1f: Sediment silt 63 %



1.2 Nematode Density

Mean nematode density per station is shown in Appendix IIa and IIb and in Figure 2.2a i-iv and Figure 2.2b i-iv. Highest nematode densities were observed in the two shallow water (20m) stations sampled in June/July only, (st. 127 and st. 108) in Kiwayu and Sabaki (927 and 1350 nematodes/10cm^2 respectively). The 20m station in Tana had a nematode density of 239 ind/10cm^2. In 50-2000m depth, nematode densities ranged from 112 ind/10cm^2 at 50m in Tana transect (Figure 2.2a ii) to 669 ind/10cm^2 at the 50m station in Kiwayu (Figure 2.2a i) in June/July. In November/ December the density ranged from 189 ind/10cm^2 at 1000m in Sabaki (Figure 2.2b iii) to 661 ind/10cm^2 at 50m in Kiwayu (Figure 2.2b i). Nematode densities appeared to follow the same trend as oxygen concentration (Figure 2.1c) in both periods. In general there was a high density at the shallow stations which dropped with increase in depth upto 1000m, then increased or decreased slightly at 2000m. The only exception was Sabaki in June/July where nematode density was higher at 1000m than at 500m while oxygen concentration behaved reversely.

SROC was performed to assess if mean nematode density correlated with environmental factors. Depth, SCOC, DNA:RNA, and oxygen concentration were significantly correlated with mean nematode density, depth was negatively correlated with mean nematode density, the rest had a positive sign (Table 2.2). Sediment sand and silt content and organic carbon showed no significant correlation at all.

Table 2.2: SROC for Mean density vs Environmental variables

Mean density Vs	Varied N	Spearman R	t (N-2)	p-level
Depth	33	-0.49	-3.15	0.004
SCOC	29	0.47	2.81	0.009
DNA:RNA	24	0.77	5.64	0.000
Oxygen (µm/l)	23	0.66	4.01	0.000

Figure 2. 2a: Nematode density during period 1 (June/July)

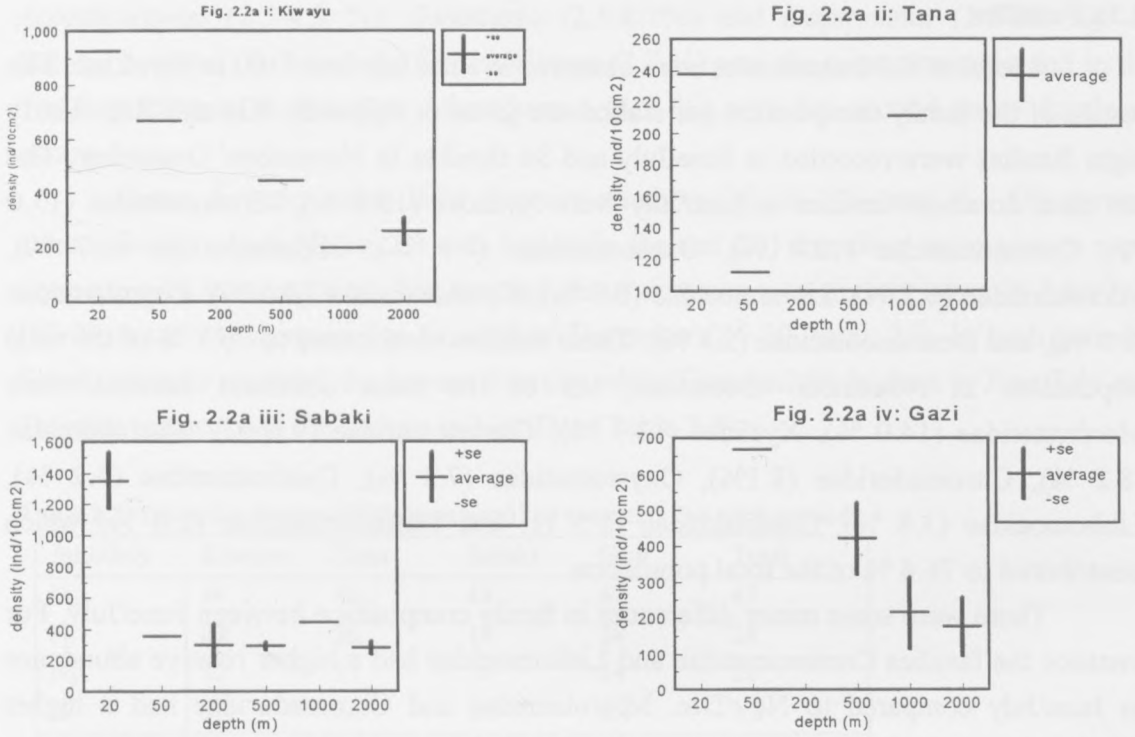
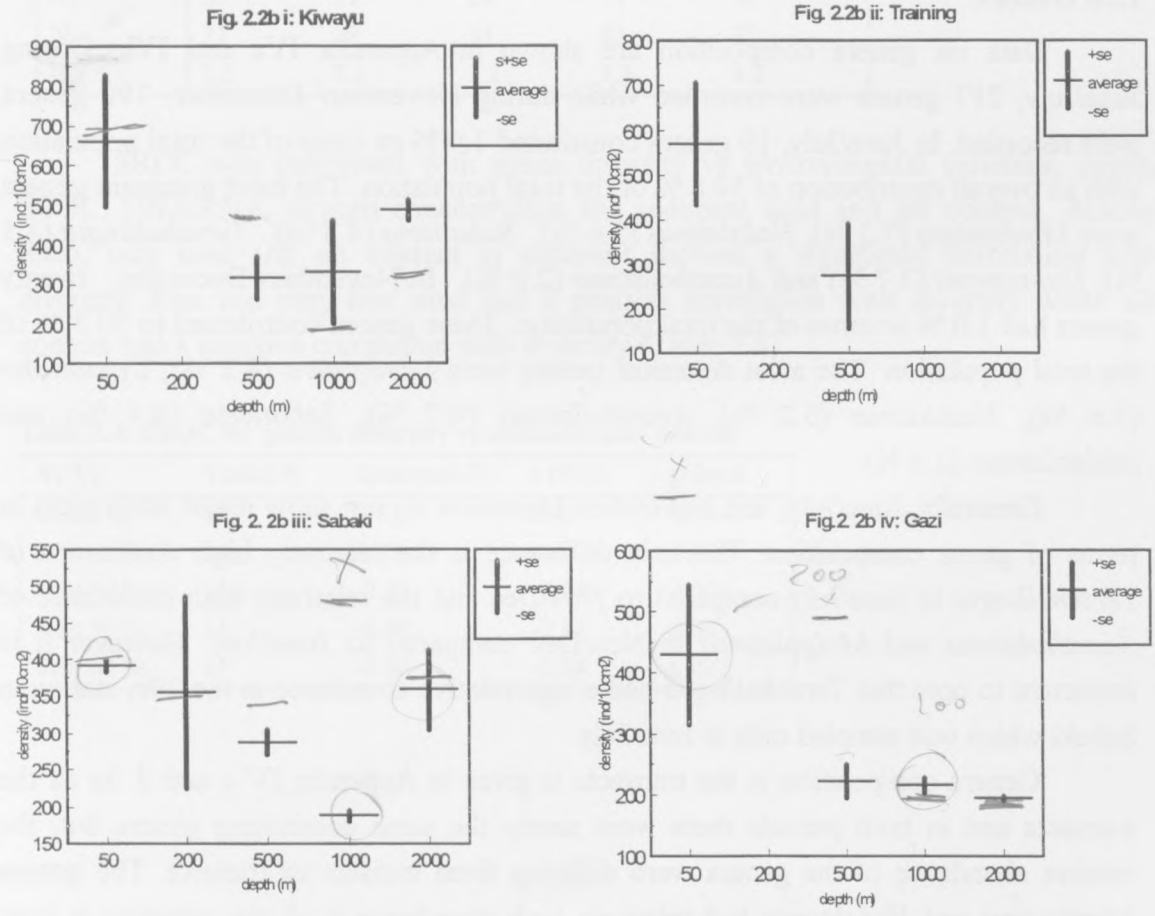


Figure 2.2b: Nematode density during period 2 (Nov/Dec)



1.3 Nematode composition

1.3a Families

A total of 5030 nematodes were observed in June/July and 5100 in Nov/Dec. The results of the family composition per station are given in Appendix IIIa and IIIb. Thirty eight families were recorded in June/July and 36 families in November/ December. The ten most dominant families in June/July were Xyalidae (13.5 %), Monhysteridae (13.0 %), Comesomatidae (12.0 %), Oxystomatidae (7.9 %), Chromadoridae (6.7 %), Microlaimidae (6.2 %), Linhomoeidae (5.9 %), Cyatholaimidae (4.6 %), Leptolaimidae (3.9 %), and Desmoscolecidae (2.4 %). These families contributed to 76.1 % of the total population. In November/ December, ten of the most dominant families were Monhysteridae (14.0 %), Xyalidae (13.9 %), Comesomatidae (9.6 %), Microlaimidae (8.2 %), Chromadoridae (8.1%), Oxystomatidae (7.3 %), Cyatholaimidae (5.2 %), Linhomoeidae (3.8 %), Leptolaimidae (3.5 %) and Desmoscolecidae (2.8 %) which contributed to 76.4 % of the total population.

There were some minor differences in family composition between June/July. For instance the families Comesomatidae and Linhomoeidae had a higher relative abundance in June/July compared to Nov/Dec. Microlaimidae and Chromadoridae had a higher relative abundance in Nov/Dec compared to June/July.

1.3b Genera

Data on genera composition are shown in Appendix IVa and IVb. During June/July, 217 genera were recorded while during November/ December, 199 genera were recorded. In June/July, 19 genera constituted 1.0 % or more of the total population with an overall contribution of 50.8 % of the total population. The most dominant genera were *Monhystera* (7.2 %), *Halalaimus* (5.6 %), *Sabatieria* (4.5 %), *Terschellingia* (4.5 %), *Daptonema* (3.7 %) and *Acantholaimus* (2.6 %). In November/ December, twenty genera had 1.0 % or more of the total population. These genera contributed to 50.3 % of the total population. The most dominant genera were *Monhystera* (8.2 %), *Daptonema* (5.6 %), *Halalaimus* (5.2 %), *Acantholaimus* (4.7 %), *Sabatieria* (4.4 %) and *Molgolaimus* (2.9 %).

Generally, June/July, and November/ December do not show major differences in terms of genus composition. The only difference is the relatively high dominance of *Terschellingia* in June/July compared to Nov/Dec and the relatively high dominance of *Acantholaimus* and *Molgolaimus* in Nov/Dec compared to June/July. However it is important to note that *Terschellingia* had a high relative abundance in the 20m station in Sabaki which was sampled only in June/July.

Genera composition in the transects is given in Appendix IV c and d. In all the transects and in both periods there were nearly the same dominating genera but, the relative abundance of the genera were differing from transect to transect. The genera *Monhystera* and *Halalaimus* had relatively high abundance in all the transects in both

periods (being 4.3-10.1% and 4.2- 5.8 % respectively) and they were among the four most dominant genera. The other dominant genera common in the transects were *Acantholaimus* (2.5-4.9 %), *Sabatieria* (2.5-8.1%) and *Daptonema* (1.5-12 %). In Sabaki, however, in June/July, *Terschellingia* (7.7 %) was the most dominant and in the Training transect in Nov/Dec *Microlaimus* (4.5 %) was the second most dominant genus.

Genus diversity using Hills diversity numbers (N_0, N_1, N_2 and N_{inf}, H) showed almost similar trends (Table 2.3 and Appendix IIa and IIb) therefore comparisons were done using N_1 in most cases. The average genus diversity was slightly lower in June/July (19-26, total: 24) compared to November/ December (24-29, total: 26). In both periods, Sabaki transect recorded the lowest diversity while Tana had the highest in June/July and Training transect had the highest in Nov/Dec (Table 2.3).

Table 2.3: Diversity indices (Hills numbers) for transects for each period

June/July	Kiwayu	Tana	Sabaki	Gazi	Total
N_0	46	46	43	47	47
N_1	23	26	19	24	24
N_2	22	27	19	24	22
H'	3.1	3.3	2.9	3.1	3.1
Nov/Dec	Kiwayu	Training	Sabaki	Gazi	Total
N_0	52	50	48	51	51
N_1	25	29	24	27	26
N_2	21	28	21	23	23
H'	3.2	3.3	3.2	3.2	3.2

SROC was performed with genus diversity vs environmental variables, depth, SCOC, DNA:RNA, oxygen concentration and sediment sand and silt content. Among them, only sand and silt content in sediment showed a significant correlation with diversity. Fine and very fine sand had a positive correlation with diversity while silt content had a negative correlation with diversity (Table 2.4).

Table 2.4: SROC for genera diversity vs sediment sand and silt

N1 Vs	Varied N	Spearman R	t (N-2)	p-level
Sfines %	14	0.71	3.49	0.004
Svfines %	14	0.77	4.14	0.001
Ssilt 16 %	14	-0.59	-2.54	0.026
Ssilt 50 %	14	-0.55	-2.23	0.04
Ssilt 63 %	14	-0.56	-2.34	0.037

1.4 Clustering Analysis to identify Ecological groups (Depth)

In an attempt to understand the communities that could possibly be identified in the area of study, cluster analysis on the genera was performed with all the samples treated as replicates.

1.4a Two Way INdicator SPecies ANalysis (TWINSPAN)

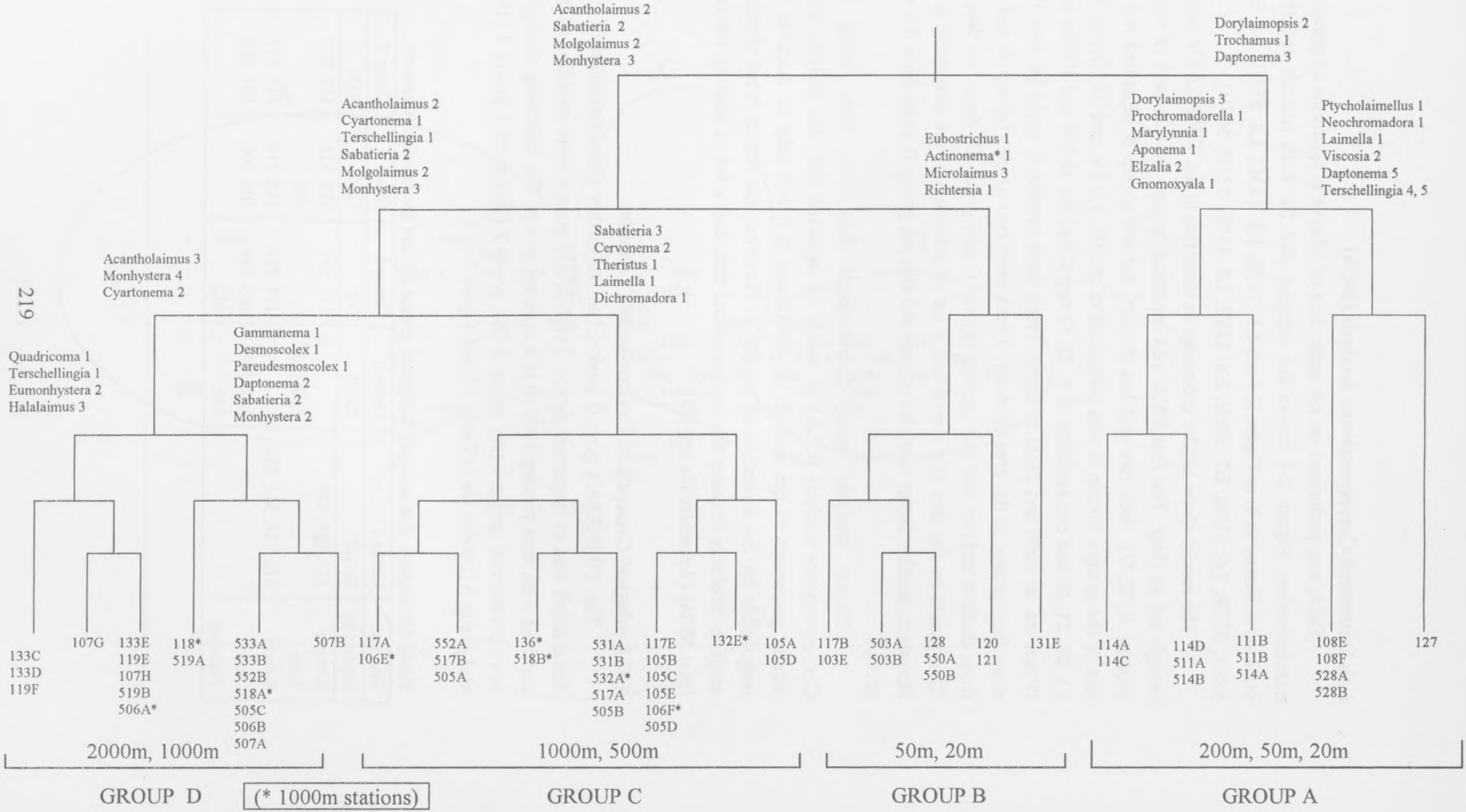
Figure 2.3 shows the divisions of the TWINSPAN and Appendix V gives the table of classification. The results show four main groups separated mainly on depth differences. The first division separated stations 08, 11, 14, 27 and 28 from other stations. The indicator genera for this group (group A) were *Dorylaimopsis* (at cut level 2), *Trochamus* (1) and *Daptonema* (3). These were stations at water depth 20m, 50 m and 200m deep. The indicator genera for the large group were *Acantholaimus* (2), *Sabatieria* (2), *Molgolaimus* (2) and *Monhystera* (3).

The second division separated stations 03 (50 m depth), st. 20 (20 m), st. 21 (50 m) st. 50 (50 m) and two sts. 17 and 31 (500 m) from the rest of the stations. The indicator genera for this group (group B) were *Microlaimus* (3), *Eubostrichus* (1) *Richtersia* (1) and *Actinonema** (1). The indicator genera for the remainder of the stations were *Acantholaimus* (2), *Cyartonema* (1), *Terschellingia* (1), *Sabatieria* (2), *Molgolaimus* (2) and *Monhystera* (3).

The third division divided the remaining stations into two groups: the first of these groups was composed of stations at 500 m depth (sts. 05, 17, 32 and 52) and station at 1000 m depth (sts. 06, 18, 31 and 36). The indicator genera for this group (group C) of stations were *Sabatieria* (3), *Cervonema* (2), *Theristus* (1) and *Laimella* (1).

The fourth group (group D) was composed mainly of stations at 2000 m (sts. 07, 19 and 33) depth and 1000 m (sts. 06, 18) and two replicates from 500 m sts. (52B and 05 C). The indicator genera for this group were *Acantholaimus* (3), *Monhystera* (4) and *Cyartonema* (2).

Figure 2.3: TWINSPAN grouping based on all replicates from both periods



1.4b Detrended Correspondence Analysis (DCA)

DCA was performed on the same data of relative proportions of genera without transformation. Figure 2.4 shows the samples plot for both periods together. (**NB**: Stations indicated as **L** in Figure 2.4 are **L1**: 117E; **L2**: 133C; **L3**: 552B; **L4**: 505B; **L5**: 552A, 517B; **L6**: 518B; **L7**: 506B; **L8**: 133E; **L9**: 119E, 533B, 507B).

The results show similar groupings as identified in the TWINSPAN analysis even though not as clear. The first DCA axis separated groups on the basis of depth (three groups, A, C, D). Axis two was less distinct, but still group B separated out from the rest of the groups. Group A was composed of sts. 08, 11, 14, and 28. Group B had sts. 03, 20, 21, 50 and one replicate of st. 28. Group C had sts. at 500 and 1000m and Group D had sts. at 1000 and 2000 m depth. From these results, it could be seen that, there were four groups in the area of study. These were two groups (group A and group B) from shallow stations and two groups (group C and group D) from the deep stations. This points to the fact that depth had a lot of influence in the nematode structuring. However, another factor was also at play and this put group B away from the rest of the groups.

Cluster analysis using environmental data was done using Canonical Correspondence analysis (CCA). It would be expected that this analysis would show similar groupings of the stations as the former two and help to discover the factor responsible for the formation of cluster B. However, no results were obtained in this analysis, probably because the environmental data had a lot of missing information (at least 50 %) (Appendix IIa and IIb).

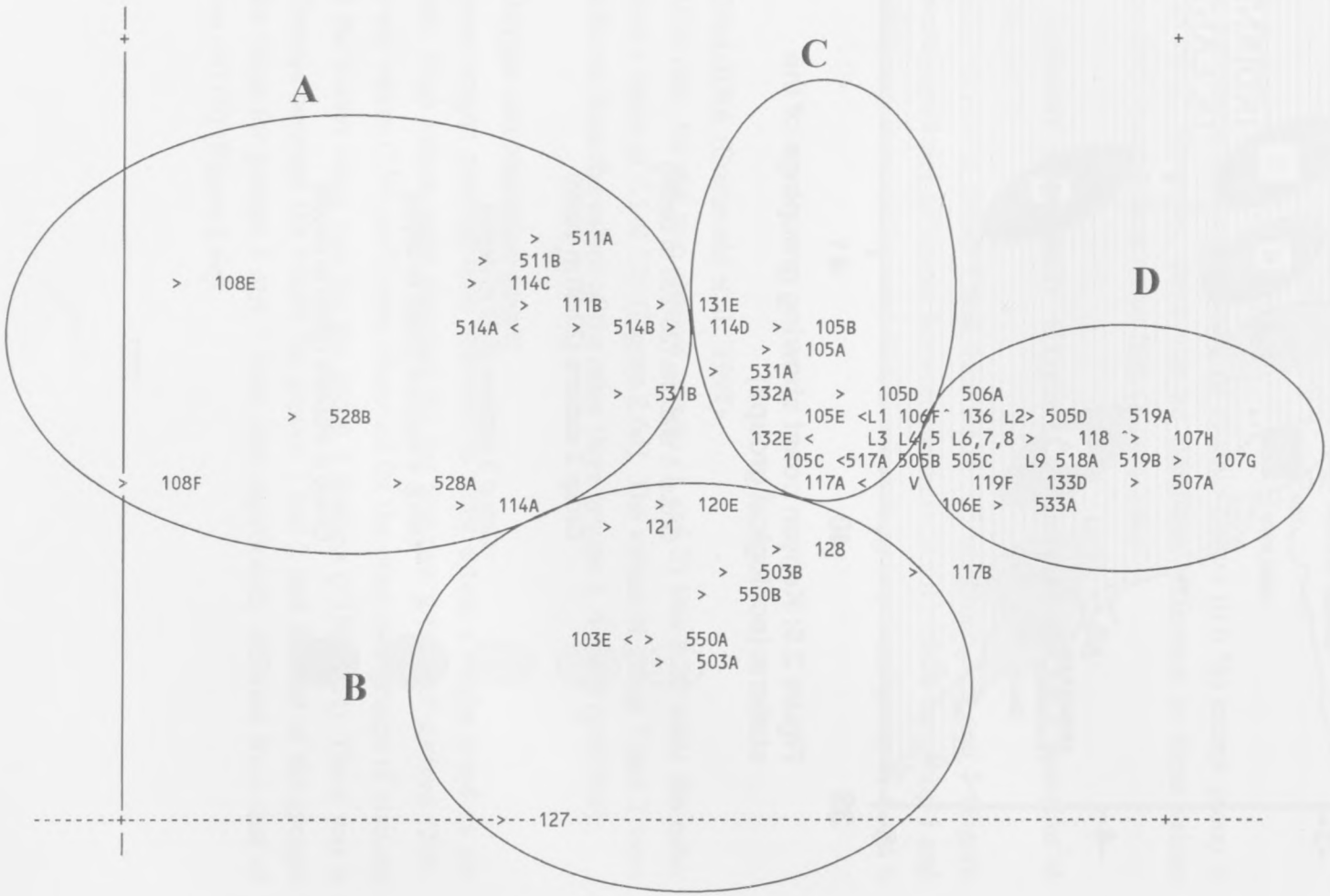
1.5 Ecological Groups and Environmental variables

The TWINSPAN groups were taken for further characterisation of the groups. Since depth was an important factor, TWINSPAN groups were modified to incorporate depth as well, thus putting 1000 m in a separate group. The following ecological groups were considered: group 1 (A), group 2 (B), group 3 (500 m sts.), group 4 (1000 m sts.) and group 5 (2000m sts.) (Table 2.5 and Figure 2.5).

Table 2.5: Stations that make up Ecological groups 1-5 and the location (transect)

Transect	Group 1	Group 2	Group 3	Group 4	Group 5
Depth (m)	20-200	20-50	500	1000	2000
Kiwayu	127, 128, 528		131, 531	132, 532	133, 533
Tana		120, 121		136	
Sabaki	111, 114, 511, 514		117, 517	118, 518	119, 519
Gazi		103, 503	105, 505	106, 506	107, 507
Training		550,	552		

Figure 2.4: Sample plot for the DCA Analysis



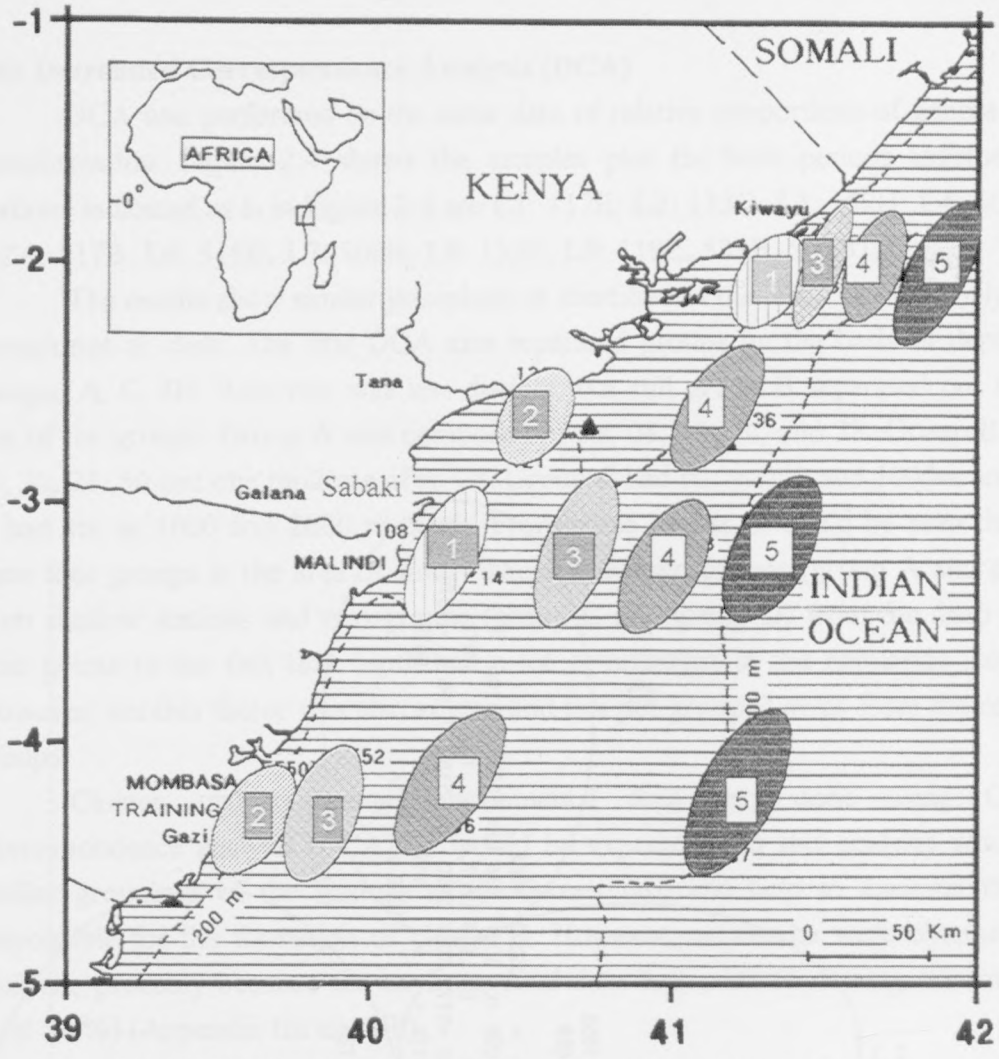


Figure 2.5: Kenyan coast showing groupings of the stations (ecological groups)

Group 1 stations (20-200 m depth)

Group 2 stations (20-50 m depth)

Group 3 stations (500 m depth)

Group 4 stations (1000 m depth)

Group 5 stations (2000 m depth)

To know how the various environmental variables behaved within each ecological group, the means of the environmental variables per group of stations was plotted for each ecological group. Figure 2.6 shows the mean depth, organic carbon, SCOC, DNA:RNA ratio and oxygen concentration. In Figure 2.7 sand, silt concentration, diversity and density per group are shown.

1.5a: Depth

Group 1 and group 2 were stations at mean depth 80m, group 3 stations were at 500m, group 4 stations were at 1000 m and group 5 stations were at 2000 m (Figure 2.6a).

1.5b: Organic carbon

All the groups had nearly the same amount of organic carbon (0.6 %) except group 2 which had 0.25 % C. However, there was no significant difference in these values because the standard deviation was rather high (Figure 2.6b).

1.5c: Mean Sediment Community Oxygen Consumption (SCOC) mmol/m^2/d (Duineveld et al., 1997)

The mean SCOC was 22 in group 1 and declined to < 5 in group 3, 4 and 5 (Figure 2.6c). There was a significant difference between the mean SCOC values for group 1 and group 2 ($p=0.059$) and between the mean SCOC values for group 2 and group 3, 4 and 5 ($p=0.0047$).

1.5d: Mean DNA:RNA (Duineveld et al., 1997)

Mean DNA:RNA ratio for the two shallow groups (1 and 2) was 0.20 while the other three groups had a value of 0.1-0.125 (Figure 2.6d). The values of group 1 and 2 were significantly different from the values of the other three groups 3, 4 and 5 ($p=0.004$).

1.5e: Mean Oxygen concentration (µm/l)

The mean oxygen concentration followed to some extent a similar trend as the DNA:RNA ratio. High values were observed for the first two groups of stations (200-225 µm/l). Lower values (150 µm/l) were observed for the other two groups of stations (3 and 5) and the lowest value was for the group 4 stations (<100 µm/l). There was a significant difference between the values for groups 1 and 2 and the rest of the groups ($P<0.005$). The value for groups 3 and 5 were also significantly different from that of group 4 stations (<0.05) (Figure 2.6e).

Figure 2.6: Mean depth(m), organic C, SCOC (mmol/ m2/d), DNA:RNA, and Oxygen conc. (µm) per group

Fig. .2.6a:Mean depth of stations per group

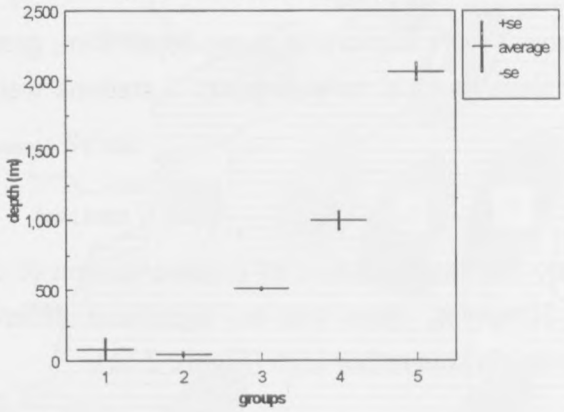


Fig. 2.6b: Mean organic carbon per group

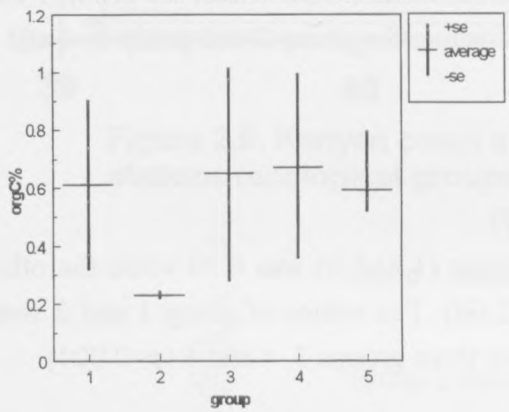


Fig. 2.6c: Mean SCOC (deck incubation)

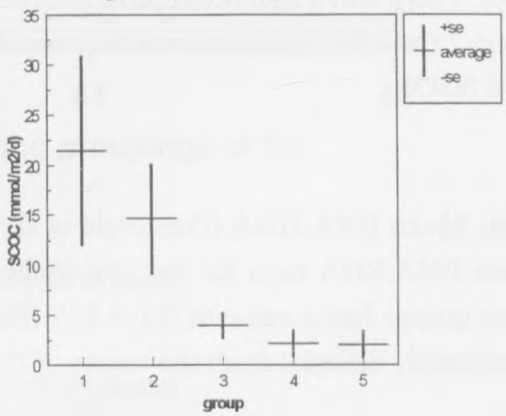


Fig. 2.6d: Mean DNA:RNA valus per group

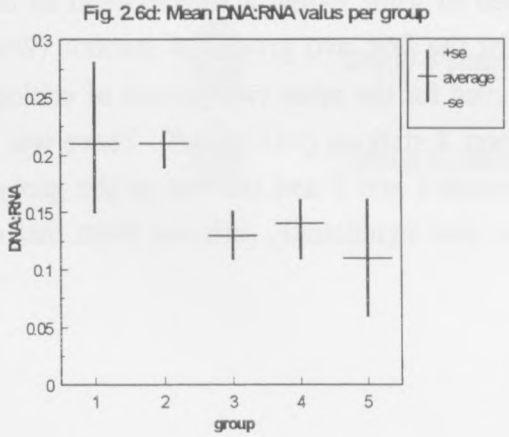
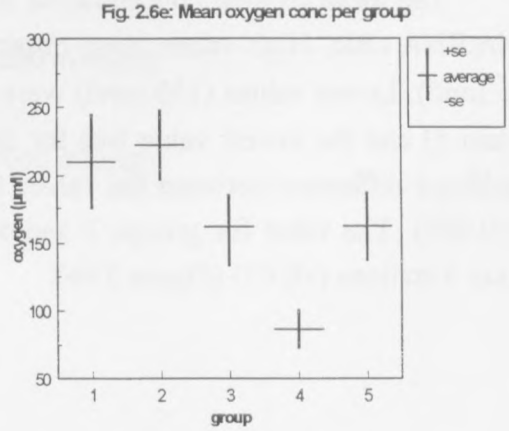


Fig. 2.6e: Mean oxygen conc per group



1.5f: Mean sand and silt composition

The mean sand concentration for each group was 15-20 % for groups 1, 3 and 4, 5 % in group 5 and 55 % in group 2. Mean sand concentration in groups 1, 3, 4 and 5 was significantly different from the value for group 2 ($p<0.005$) (Figure 2.7a). The mean value for the very fine sand component followed a similar trend as the sand. There was however, no significant difference in fine sand content between all five groups (Figure 2.7b).

The mean silt 63 % showed that (Figure 2.7c) the three groups of stations (group 1, 3 and 4) had nearly equal silt content of 40-45 %, one group (2) with a lower percentage (10 %) and one group (5) with the highest percentage (80 %) compared to the rest of the groups. Mean percentage of silt 16 followed a similar trend as that of silt 63.

The two groups (1 and 2) of shallow stations were at approximately the same depth (above 200m), they however, had different values of sand and silt content. Group 2 had high sand and low silt content, while groups 1, 3 and 4 had average amount of sand and silt content. Group 5 on the other hand had the lowest sand content and the highest silt content.

1.5g: Mean nematode density

The mean nematode density was 640 ind/10 cm^2 in group 1, 400 ind/10cm^2 in group 2 and 250 ind/10cm^2 in group 3, 4 and 5 (Figure 2.7e). There was a significant difference in the mean nematode density between group 1 and the rest while the rest of the groups were not significantly different from each other. Mean nematode density followed the same trend as mean SCOC (Figure 2.6c).

Figure 27: Mean sand, silt (%) and density (ind/10cm2) per group

Fig.2.7a: Mean fine sand values per group

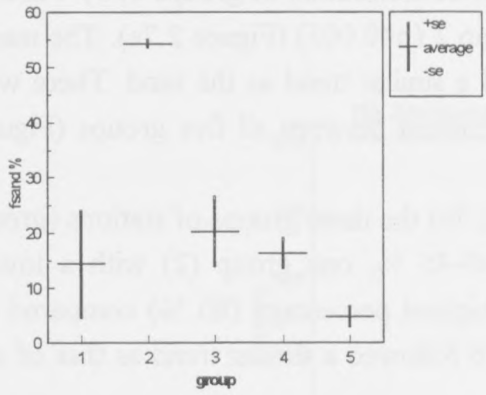


Fig.2.7b: Mean very fine sand (%) per group

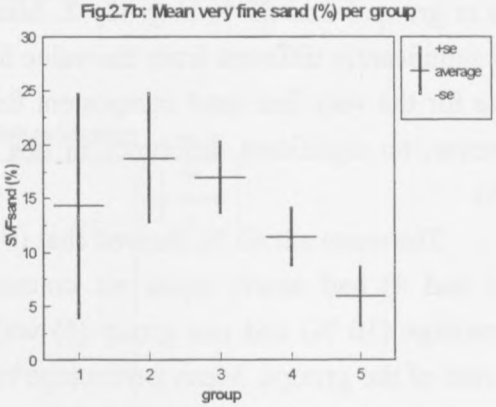


Fig. 2.7c: Mean silt 63 concent (%) per group

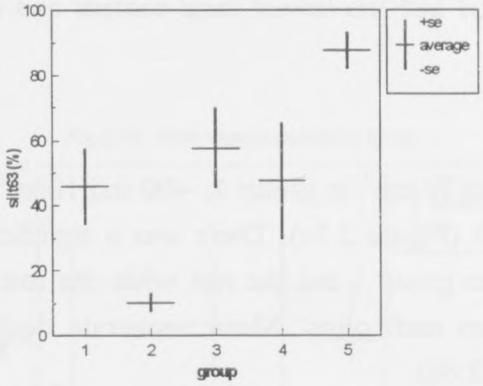


Fig. 2.7d: Mean silt 16 (%) per group

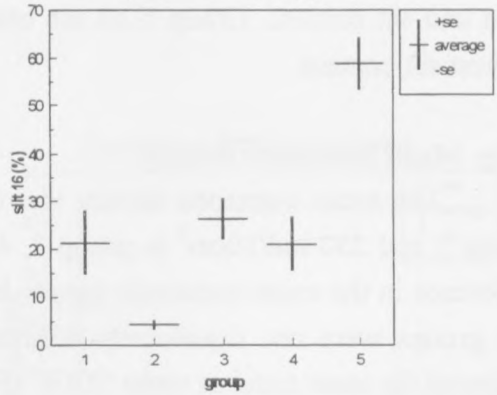
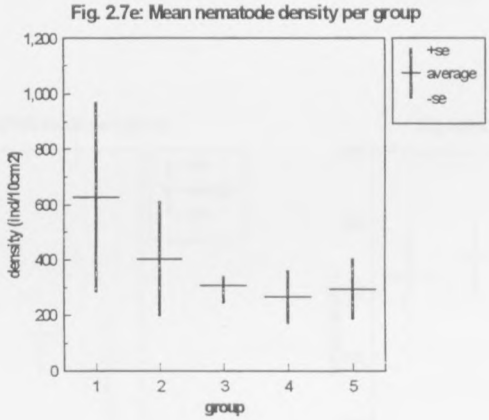


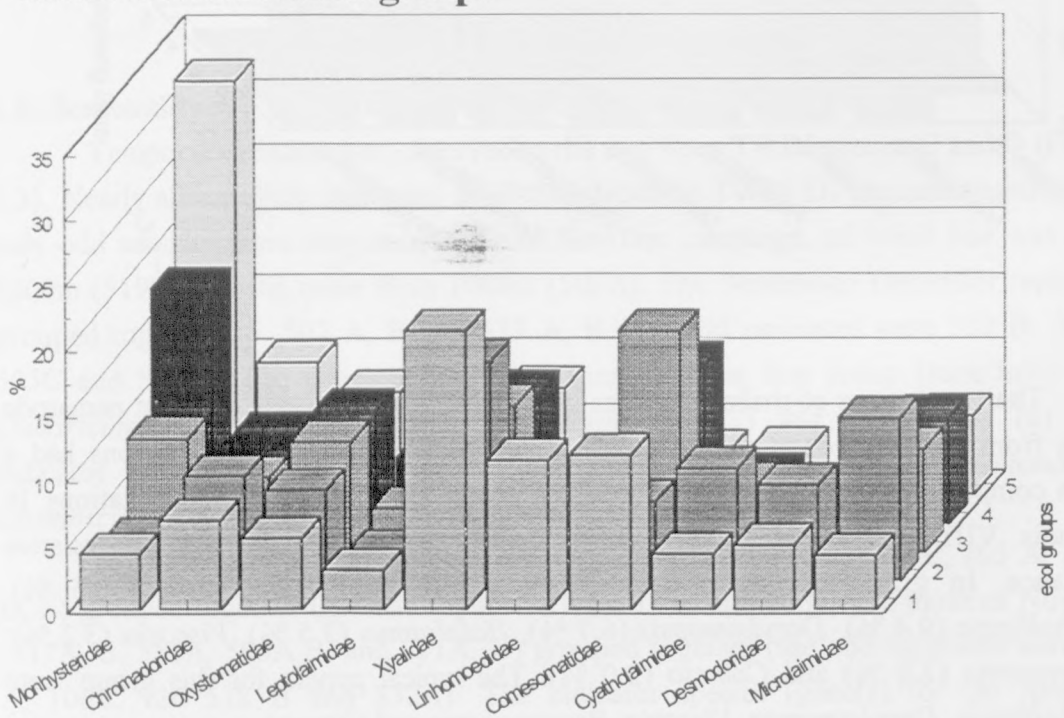
Fig. 2.7e: Mean nematode density per group



1.6: Family Composition per group

Family composition per group is shown in Appendix VI, and Figure 2.8 shows the distribution of the most dominant families. The number of families per ecological group ranged from 30 families in group 2 to 36 families in group 3. Xyalidae (8-21 %), Monhysteridae (3.3-31.8 %), Chromadoridae (5.8-10.2 %), Comesomatidae (3.5-16.9 %) and Oxystomatidae (5.5-8.8 %) were some of the families that occurred in high proportion in all five groups. Some families increased in proportion from group 1 to group 5 such as Monhysteridae, Leptolaimidae, Aegialoalaimidae, Desmoscolecidae, Diplopeltidae and Ironidae. Some declined in proportion from group 1 to group 5 such as Xyalidae while other families declined from group 2 to group 5 such as Microlaimidae, Cyatholaimidae, Ceramonematidae, Desmodoridae among others (Appendix VI). The families Chromadoridae, Comesomatidae and Oxystomatidae although well represented in all five groups, did not portray any particular trend. This may probably be as a result of having at least two or more abundant genera, of which one genus had high relative abundance in the shallow stations while the second genus had a high relative abundance in deeper stations. For instance Chromadoridae had most genera occurring in shallow stations while *Acantholaimus* was highly dominant and prevalent in deep stations.

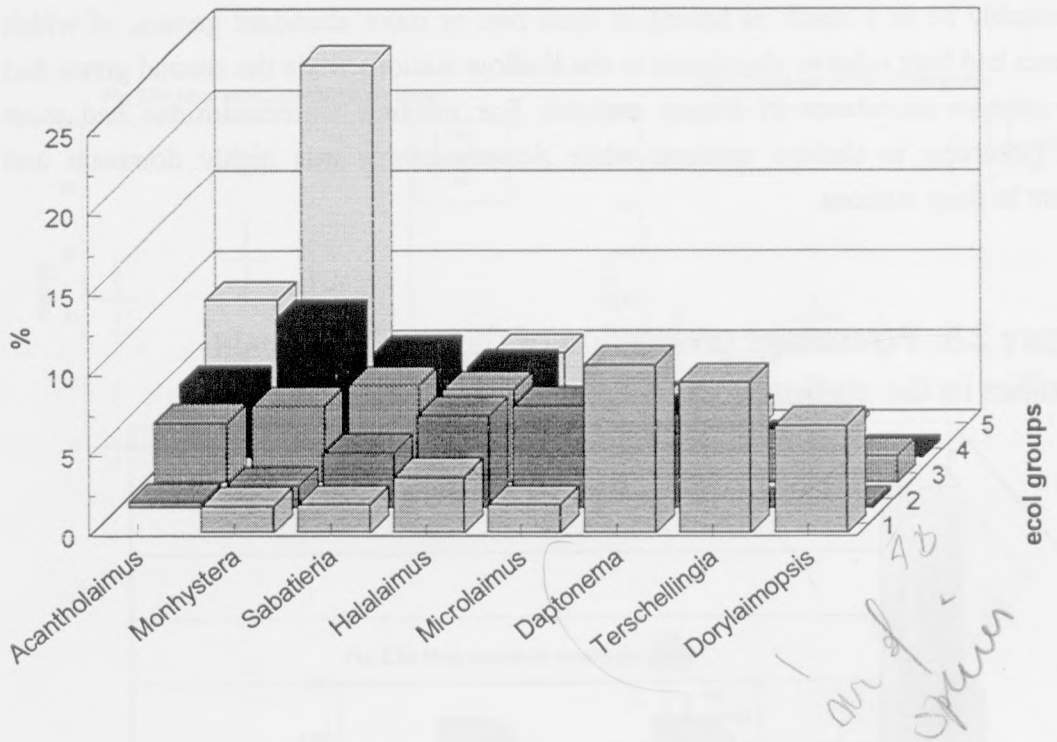
Figure 2.8: Percentage proportion of the most dominant families in the station groups



1.7: Genera composition per group

The Genera composition per ecological group is given in Appendix VII, and Figure 2.9 shows the distribution of the most dominant genera in the five ecological groups. Some genera portrayed a trend from group 1 to 5 in the relative abundance while some were not consistent. Some genera demonstrated increasing dominance from group 1 to 5, some genera decreased in relative abundance while others showed no trend at all. For instance the genera *Acantholaimus* and *Monhystera* showed an increase relative abundance with depth (1 to 5), while the genus *Daptonema* had the opposite trend. To some extent *Microlaimus* decreased in relative abundance with depth while *Molgolaimus* showed the opposite trend.

Figure 2.9: Distribution of the most dominant genera among the station groups



The two groups of shallow stations harboured some distinctly different nematode genera from the three deep station groups. The three groups of deep stations had a genera composition that gradually shifted from group 3 through to group 5 stations. In Appendix VIII, genera are listed in order of importance on the basis of relative abundance. In group 1, the most dominant genera were *Daptonema* (10.5 %), *Terschellingia* (9.4 %), *Dorylaimopsis* (6.7 %), *Halalaimus* (3.5 %), *Viscosia* (3.2 %), *Psammonema* (2.8 %) and *Comesa* (2.0 %). The typical genera for this group were *Terschellingia*, *Dorylaimopsis*, *Viscosia*, *Psammonema* and *Comesa*.

In group 2, the most dominant genera were *Microlaimus* (6.4 %), *Halalaimus* (5.8 %), *Daptonema* (4.7 %), *Sabatieria* (3.5 %), *Paramonhystera* (3.1 %), *Desmodora* (2.5 %), *Rhynchonema* (2.3 %), *Ptycholaimellus* (2.2 %), *Actinonema** (2.0 %) and *Dichromadora* (2.0 %). The typical genera for this group were *Microlaimus, Paramonhystera, Desmodora, Rhynchonema, Ptycholaimellus, Actinonema** and *Dichromadora.*

Only few genera had a high relative abundance in group 3 alone, and even then, their relative abundance was low. Most highly dominant genera in group 3 were also highly dominant in group 4 and 5 as well. Nematode genera dominant in group 3 were *Sabatieria* (6.1 %), *Halalaimus* (5.8 %), *Monhystera* (4.7 %), *Molgolaimus* (4.0 %), *Cervonema* (4.0 %), *Acantholaimus* (3.8 %), *Daptonema* (3.2 %), *Amphimonhystrella* (2.5 %), *Terschellingia* (2.2 %) and *Pselionema* (2.0 %). The genera dominant in group 4 were *Monhystera* (8.7 %), *Sabatieria* (6.5 %), *Halalaimus* (6.0 %), *Acantholaimus* (4.6 %), *Molgolaimus* (4.2 %), *Leptolaimus* (2.9 %), *Daptonema* (2.8 %), and *Cervonema* (2.8 %). Genera common to group 3 and 4 therefore, were *Cervonema, Sabatieria,* and *Daptonema.* Nematode genera dominant in group 5 were *Monhystera* (23 %), *Acantholaimus* (8.4 %), *Halalaimus* (5.0 %), *Eumonhystera* (3.2 %), *Leptolaimus* (2.2 %), *Cyartonema* (2.2 %), *Molgolaimus* (2.0 %), and *Microlaimus* (2.0 %). Genera common to group 4 and 5 were *Leptolaimus* and *Cyartonema.* Other genera had high relative abundance in all three deep station groups, such as *Acantholaimus, Monhystera* and *Molgolaimus.* No genera seemed to occur in high abundance exclusively in group 5 stations. *Halalaimus,* on the other hand occurred in almost equal relative abundances (4, 6, 6, 6 and 5 %) in all five groups.

1.8: Seasonality

Temporal variation was observed in the two deep TWIN groups C and D (Figure 2.3). Nearly all June/July replicates of 2000m depth (in TWIN D) grouped together, the only odd samples were two samples from Nov/Dec campaign, of which one was from 2000m (519B) and the other from 1000m (506A). The November/ December replicates grouped together *i.e.* 507 A, B and 533 A, B (the odd replicates were 552 B, 518A, 505C and 506B). The indicator species (genera) for the first group (June/July) were *Quadricoma* (1), *Terschellingia* (1) *Eumonhystera* (2) and *Halalaimus* (3). The indicator species (genera) for the second group (Nov/Dec) were *Gammanema* (1), *Desmoscolex* (1), *Daptonema* (2), *Sabatieria* (2) and *Monhystera* (2).

In TWIN group C, the 500m depth replicates of June/July (117E, 105 A, B, C, D, E) grouped together (the odd replicates were 132E and 106F) and those of Nov/Dec (517A, B, 552A, 505A,B, and 531A, B) grouped together (the odd replicates were 117 A, 106E, 136 518 B and 532A). The indicator species (genera) for the June/July campaign were *Cheironchus* (1), *Spirinia* (1), *Camacolaimus* (1) *Aegialoalaimus* (1)

and *Paramicrolaimus* (1). The indicator species for Nov/Dec campaign were *Gamarinema* (1), *Aponema* (1), *Acantholaimus* (2) and *Daptonema* (2).

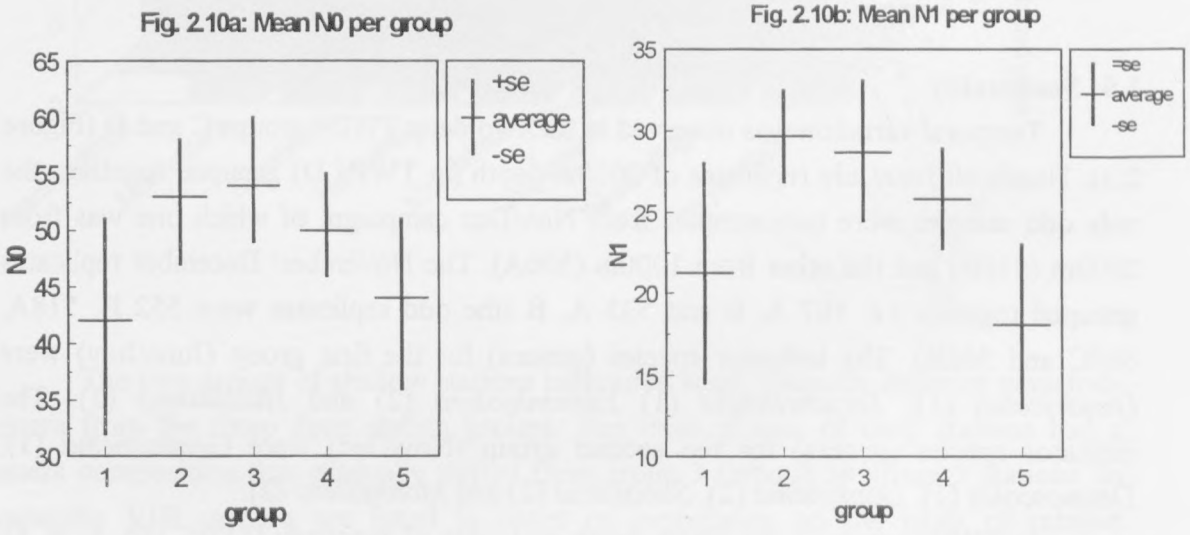
1.9: Mean genus diversity and K-Dominance curves

Mean genus diversity using Hills numbers N_0 and N_1 is shown in Table 2.6 and Figure 2.10. The maximum mean number of genera was recorded in group 3 and the minimum was in group 1. Genus diversity using N_1 had nearly a similar trend as N_0, although in this case the highest value was observed in group 2 stations and the lowest value was in group 5. This trend follows to some extent, the trend observed in sand content in the station groups (Figure 2.7b) . It appears like sediment sand and silt content had an influence on nematode structuring and genus diversity.

Table 2.6: Diversity indices for the ecological groups (Hills numbers)

	Group 1	Group 2	Group 3	Group 4	Group 5
N_0	42	53	54	50	44
N_1	21	31	29	26	18
N_2	17	30	29	28	14
H'	3.0	3.4	3.3	3.2	2.8

Figure 2.10: Mean diversity indices per group



It seems that the high genus diversity observed in group 2 and 3 was due to a high number of genera combined with low dominance. In Appendix VIII, genera are listed in order of importance on the basis of relative proportion. In group 1, there were 110 genera that had at least 0.1 % relative abundance, in group 2, 129 genera, in group

3, 121 genera, in group 4, 110 genera and in group 5, 94 genera. In group 1, fifty percent of the proportion was made up by 14-15 genera. In group 2, fifty percent of the proportion was made up by 21-22 genera. In group 3, fifty percent of the population was made up by 18-19 genera. In group 4, fifty percent of the population was made up of 14-15 genera. In group 5, fifty percent of the population was made up by 9-10 genera. Group 5 with the lowest diversity index had only a few genera making up 50 % of the population.

The K-dominance curves in Figure 2.11 shows the trend in genera diversity for the five groups. In group 1 stations (Figure 2.11a), the curves for the stations spread out with station 108 clearly having lower diversity than all the other stations. In group 2 stations, k-dominance for individual stations were stuck together and all stations had the highest percentage proportion being less than 20 %. Groups 3 and 4 have a similar trends as group 2 with individual genera proportion being less than 20%. In group 5 stations three out of six stations had genera with proportions of more than 25 % indicating high dominance of some genera.

In Figure 2.11f the mean values per group are plotted. Group 5 had the lowest diversity, groups 2 and 3 had the highest diversity and groups 1 and 4 had intermediate values.

Figure 2.11: K-Dominance Curves

Fig.2.11a: Group 1 stations

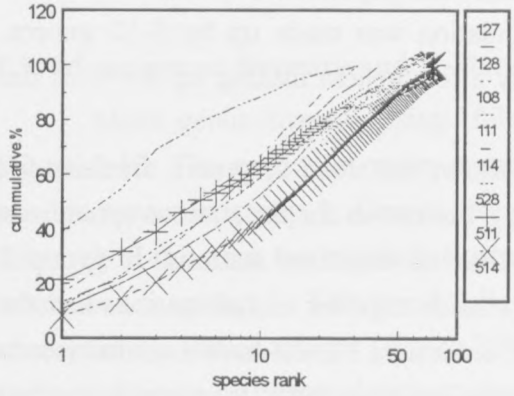


Fig. 2.11b: Group 2 stations

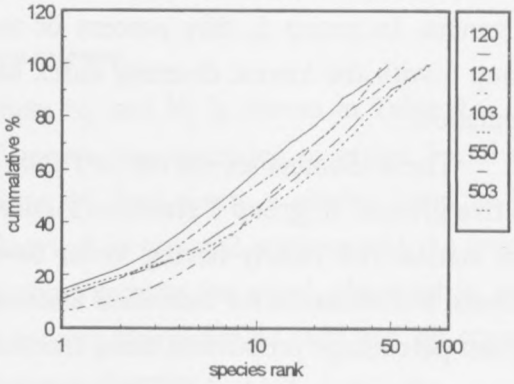


Fig. 2.11c: Group 3 stations

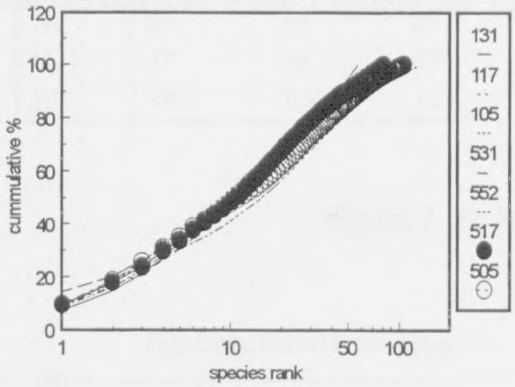


Fig. 2.11d: Group 4 stations

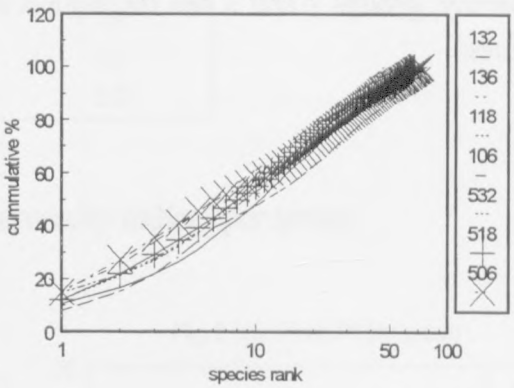


Fig. 2.11e: Group 5 stations

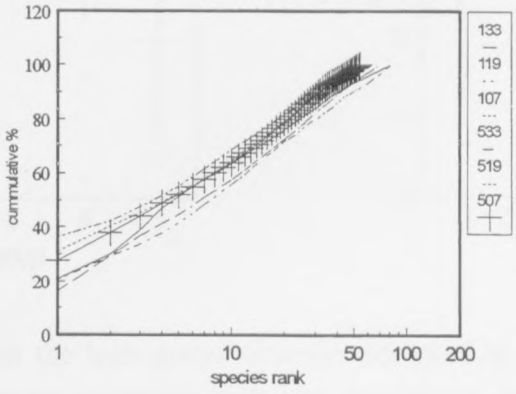
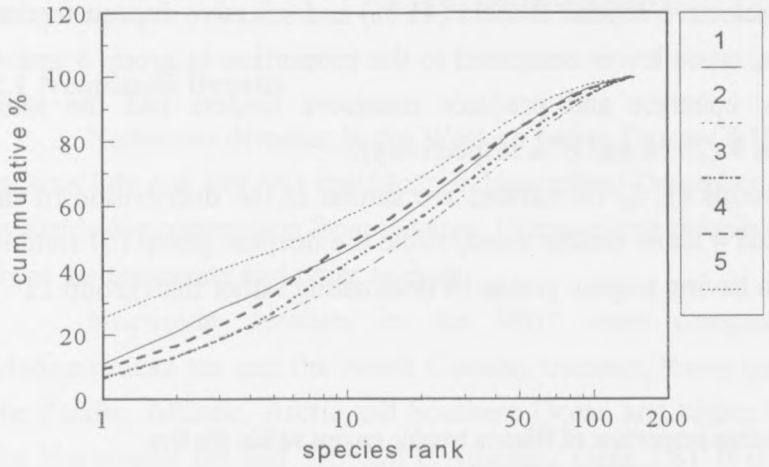


Fig. 2.11f: Mean values per group



Temporal variation in genus diversity was observed in the deep groups of stations. The two TWINSPAN groups C and D (Figure 2.3), had slightly different genus diversity between June/July and November/ December (Table 2.7). In group C (500m), genus diversity was slightly higher in June/July compared to November/ December, while in group D (2000m), the genus diversity was slightly higher in Nov/Dec compared to June/July.

Table 2.7: Hill's diversity values for 500m and 2000m for June/July and Nov/Dec

Depth	500m (selection for C)		2000m (selection for D)	
Period	Jun/Jul	Nov/Dec	Jun/Jul	Nov/Dec
N_0	60	55	43	45
N_1	32	28	18	19
N_2	30	30	14	14
H	3.5	3.3	2.8	2.9

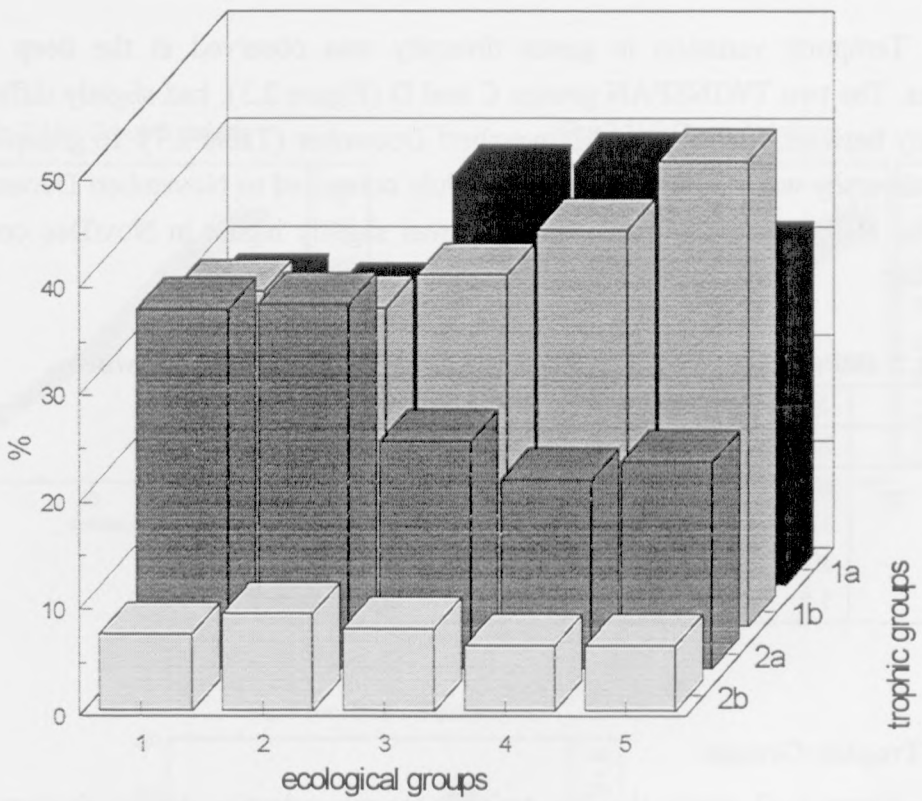
1.10: Trophic Groups

Figure 2.12 shows the four trophic groups, selective deposit feeders (1a), non-selective deposit feeders (1b), epistrate feeders (2a) and predator/omnivore feeders (2b) according to the classification of Wieser (1953), in the five ecological groups. In Appendix IX, the full list of the genera arranged in order of trophic groups is presented. In ecological group 1 and 2, the trophic groups 1a, 1b and 2a were almost equally represented with about 28-33 % of the population in each of the three trophic groups and the trophic group 2b had only 8-9 % of the population (Figure 2.12). Ecological groups 3 and 4 show similar trends in the proportion of all the trophic groups. The most dominant trophic group being 1a with 38 %, trophic group 1b contributed 32-37 %, group 2a had 18-22 % and trophic group 2b had 6-8 %. Ecological group 5, was a little

bit different from the other two groups of slope stations in that, the most dominant trophic group was the non-selective deposit feeders (41 %) and selective deposit feeders had 31 % of the population, much lower compared to the proportion in group 3 and 4. The other trophic groups, epistrate and predator omnivore feeders had the same proportion as in group 3 and 4 (20 % and 8 % respectively).

The two shallow groups (1, 2) of stations are similar in the distribution of the trophic groups. Groups 3 and 4 show similar trend, while the deepest group (5) stations differs from the latter two in having trophic group 1b dominating rather than group 1a.

Figure 2.12: Percentage proportion of Wiesers trophic groups within the five ecological groups



2: DISCUSSION

2.1 Nematode Density

Nematode densities in the Western Indian Ocean (WIO) were 112-669 ind/10cm^2 in June/July and 189-661 ind/10cm^2 in November/ December. There is no information available for comparison from the area. Comparisons therefore, were done with studies from the temperate and polar regions.

Nematode densities in the WIO were comparable to those from the Mediterranean sea and the North Carolina transect, lower than the densities observed in the Pacific, Atlantic, Arctic and Southern Ocean and higher than the values observed in the Norwegian sea and Tropical E Atlantic (Table 2.8). It is however important to note that for the Norwegian samples (Jensen, 1988) only the first 3 cm into the sediment were considered, which maybe the cause for the lower density. Latitudinal trends have been observed in nematode density (Vincx *et al.*, 1994); there are lower densities in the Western Atlantic, Mediterranean and the Eastern Pacific than in the NE Atlantic. Vincx *et al.*, (1994) observed that nematode densities are linked to surface primary production (and potential water temperature). Water temperature influences the rate of organic degradation and hence the amount of available food reaching the sea floor. Low nutrient concentration in the water column and uptake rates by phytoplankton indicate that the Kenyan coast is an oligotrophic area (Semeneh *et al.*, 1995). This may explain the lower densities compared to the more productive temperate regions.

Table 2.8: Nematode densities in other deep-sea sites

Ocean	place	Depth (m)	Density (ind/10cm^2)	Reference
E Atlantic	North Carolina	50-2500	33-1026	Tietjen, 1976
NE Atlantic	Porcupine Sea Bight	1000, 2000	702-2385	Pfannkuche, (1985)
	Bay of Biscay	190, 325	840, 779	Vanreusel *et al.*, (1992)
	Norwegian Sea	970-2133	107-204	Jensen, 1988
Mediterranean Sea		160-1220	336-637	Soetaert *et al.*, 1991a
NE Atlantic	W Europe & NW Africa	70-5250	5-2382	Vincx *et al.*, 1994
Pacific Ocean	NE Japan	200-2000	473-1619	Shirayama & Kojima, 1994
Antarctic	Weddell Sea	211-2080	815-5122	Vanhove, 1995
NE Atlantic	Goban Spur	206-2760	15600-89850	Soetaert *et al.*, 1997
Tropical E Atlantic	W. Africa	27-4601	13-888	Soltwedel, 1997
Arctic	Laptev Sea	65-3237	418-2683	Vanaverbeke *et al.*, 1997
Indian Ocean	**WIO**	**20-2000**	**112-1350**	**Present**

Although, the general trend of nematodes is to decrease in density with increase in depth, this is not always the case (Vincx et at, 1994). Nematode densities may be influenced by predation pressure and current activities which may cause erosion and prevent organic matter from reaching sea floor (Thiel, 1983). In the WIO nematode density decreased with increase in depth upto 1000m, then increased slightly. Shirayama & Kojima (1994) observed a linear reduction of nematode density with depth until 1503 m, after which it remained constant. In the Porcupine Sea Bight (500-4850m), Pfannkuche observed a decline in meiofauna density with depth. Limited food resource and/or poor quality has been cited as the most important factor causing this trend (Jensen, 1988). In the WIO no trends were observed in C:N ratio that could suggest differential food availability with depth. Nutrient levels in WIO were generally low but they increased slightly with increase in depth away from the shallow stations suggesting that these nutrients were largely of oceanic origin (Nguli, 1995). Another factor may have been responsible therefore, for the trends observed in nematode densities. We suspect oxygen content in the water column may have influenced this trend as nematode density values were positively correlated with oxygen content in the water. Slightly higher nematode densities were observed in 2000m compared with 1000m stations in most transects in both periods, and this trend was similar to oxygen levels. Thiel, (1966) in a study in a deep transect in the North Western Indian Ocean, observed low nematode counts at 1045-1050m deep, which coincided with the oxygen minimum zone. Deeper down at 1700m, oxygen content increased, but this did not influence the nematode density anymore. During the present study, oxygen minimum zone was observed at 600-1000m deep in both periods (Heip & de Bie, 1995) which coincided with minimum nematode density in most transects. Levin *et al.*, (1991) in a study in Tropical east Pacific observed that at low oxygen concentration, abundance, composition and diversity of macrofauna was affected. In their study however, oxygen did not seem to have a direct effect on meiofauna abundance.

2.2 Nematode composition

2.2.1 Families

The number of families recorded from the Indian Ocean were 36 and 38. Table 2.9 shows the number of families identified from other regions at similar depths.

Table 2.9: Total number of families from different areas

	Total no. families	No. cores	No.per $10cm^2$	
Arctic	32	-	15-28	Vanaverbeke *et al.*, 1997
W Atlantic	25	21	-	Tietjen, 1976
Antarctic	40	41	19-28	Vanhove, 1997
WIO	**37**	**32**	**13-27**	**Present**

A comparison of the WIO and other deep sea transects, (Table 2.9) shows no difference in the total number of families observed in the different regions. Number of families per core (max. of 27), in WIO was nearly the same as from other regions. 20-21 families from two shelf break stations in the NE Atlantic is also comparable to the rest of the regions (Vanreusel *et al*, 1992). There is therefore, no apparent latitudinal trend in total number of families at comparable depths.

The distribution of the number of families with depth showed no consistent trend. There were 34 families in group 1, 30 in group 2, 36 in group 3, 33 in group 4 and 34 in group 5. The number of families was maximum at 500 m and minimum at 20-50m. In the Laptev transect, Vanaverbeke *et al.*, 1997 observed a decreasing number of families with depth and then a slight increase at 3200.

The nematode families found in the Indian Ocean are typical marine nematode families, dominated by Xyalidae, Monhysteridae, Comesomatidae, Microlaimidae, Chromadoridae and Oxystomatidae. In the North Carolina transect (Tietjen, 1976), the most dominant families were Comesomatidae, Monhysteridae, Microlaimidae, Desmodoridae, Oxystomatidae and Cyatholaimidae (though Xyalidae is not recorded here, it is possible that a number of Xyalids were included in Monhysteridae because the genera list shows high proportions of *Xyala* and *Theristus*). In the Bay of Biscay (Vanreusel *et al.*, 1992), the most dominant families were Comesomatidae, Chromadoridae, Xyalidae, Cyatholaimidae, Selachinematidae and Microlaimidae among others. In Antarctica, (Vanhove *et al.*, 1997), Chromadoridae were the most dominant, followed by Comesomatidae, Desmodoridae, Microlaimidae, Monhysteridae and Xyalidae. In the Laptev transect Xyalidae, Chromadoridae, Leptolaimidae and Comesomatidae were the most dominant (Vanaverbeke *et al.*, 1997). Remarkably, although the order of dominance may differ, the same families are almost always dominating in different geographical areas at similar depth. Notably, in the WIO and other regions like the Laptev Sea (Vanaverbeke *et al.*, 1997), Monhysteridae increased their relative importance with depth. Xyalidae were dominant at shallow depths, and Comesomatidae were more dominant at mid depths 500-1000m in WIO but this was not the case for the Laptev Sea.

2.2.2 : Genera

The most dominant genera (*Monhystera*, *Daptonema*, *Microlaimus*, *Sabatieria* and *Acantholaimus*) in WIO were also similar to other areas at similar depths. In North Carolina, Tietjen (1976) found *Sabatieria*, *Monhystera*, *Microlaimus* and *Xyala* most dominant. In two shelf-break stations (depth 190 and 325m) from the Bay of Biscay, some of the most dominant genera were *Sabatieria*, *Daptonema*, *Minolaimus*, *Richtersia* and *Halalaimus* (Vanreusel *et al.*, 1992). In the slope stations from the NE Atlantic, the most dominant genera were *Sabatieria*, Monhysteridae, *Daptonema*, *Comesa*, *Acantholaimus* among others (Soetaert & Heip, 1995). Along the Mediterranean, shelf

and slope the most dominant genera were *Sabatieria*, *Acantholaimus*, Monhysteridae and *Halalaimus* (Soetaert *et al.*, 1995). In the Arctic, dominant genera were *Microlaimus*, *Chromadora*, *Leptolaimus*, *Daptonema* and *Monhystera* (Vanaverbeke et al., 1997). In the Antarctic (Weddell Sea), the dominant genera were *Sabatieria*, *Molgolaimus*, *Microlaimus*, *Dichromadora* and *Monhystera* (Vanhove et al., 1997). Similar genera are dominant in different geographical regions.

Both TWINSPAN and DCA gave four faunal groups (ecological groups separated mainly on the basis of depth), *i.e.* two groups of continental shelf stations and two groups of slope stations. Although, an attempt was made to separate the slope stations into three groups on the basis of the depth, (500m, 1000m and 2000m), there was a gentle transition from one group to the next in terms of environmental factors, nematode composition and diversity. On the other hand, the two groups of shelf stations behaved differently in terms of environmental factors, nematode composition and diversity in spite of their occurrence within the same bathymetric depth.

The two shelf stations were different in terms of the dominant genera composition, being *Daptonema*, *Terschellingia* and *Dorylaimopsis* in group 1 against *Microlaimus*, *Daptonema* and *Halalaimus* and several Chromadorids in group 2. Group 1 stations had relatively high amount of silt and group 2, on the other hand had high sand content in sediments. Tietjen (1976) found *Terschellingia* restricted to clayey-silts while most genera of Chromadoridae and Microlaimidae were more dominant in the sandy sites. In the Long Island Sound one species of *Terschellingia* and *Dorylaimopsis* were restricted to or well represented in muddy sands (Tietjen, 1977). Tietjen, 1984, observed that the two groups 'interstitial species' and 'burrowing species' (Wieser, 1959) were adapted to these environments by their body size and hence their mode of locomotion. We suppose that sediment composition in the shallow stations influenced the nematode genera composition. High silt levels arrive at Sabaki transect (most of group 1 stations) especially during the wet season, April- October (Katwijk *et al.*, 1994). This may explain the high abundance of *Terschellingia* and *Dorylaimopsis* in Sabaki transect (and group 1 stations) especially in June/July. In the southern transects, Gazi and Training (most of group 2 stations), only seasonal rivers are found (Ohowa *et al.*, 1995) which may not influence the sea much especially in terms of silt deposition. This may explain the high sand content in those stations and hence the high abundance of *Microlaimus* in the Training transect (and group 2 stations) in Nov/Dec compared to June/July. In the Laptev Sea, high abundance of *Microlaimus* in the shallow station was associated with high oxygenation of the sediments (Vanaverbeke *et al.*, 1997).

The genera composition at slope stations in WIO were similar to sites in the NE and W Atlantic especially in the typical deep-sea genera but differed to some extent with the Polar region. The typical deep-sea nematode genera, *Monhystera* and *Acantholaimus* (Soetaert & Heip 1995) increased in relative abundance with increase in depth in the WIO and in most other studies similar trends have been found (Soetaert & Heip 1995; Vanaverbeke *et al.* 1997; Vanaverbeke *et al.* 1997a). Other genera highly abundant at

the slope stations in the WIO were *Sabatieria, Halalaimus* and *Molgolaimus.* In the NE Atlantic Soetaert & Heip (1995), found *Sabatieria*, *Amphimonhystrella* and *Halalaimus* also being dominant. In the Goban Spur, Vanaverbeke *et al.* (1997a) found *Sabatieria*, *Microlaimus* and *Daptonema* also dominant. In the Antarctic slope stations, most abundant genera were *Microlaimus*, *Molgolaimus* and *Sabatieria* (Vanhove *et al.* 1997). WIO differed with the Polar in that, in the Laptev Sea, the sub-dominant genera were *Leptolaimus*, *Metalinhomoeus*, *Daptonema* and *Microlaimus* (Vanaverbeke *et al.* 1997) and with the Antarctica in that *Monhystera* was less dominant and *Acantholaimus* was not one the five most dominant genera at the slope (Vanhove *et al.*, 1997).

In WIO, *Sabatieria* was highly abundant at mid-depths (500-1000), and this coincided with the oxygen minimum zone (OMZ). Soetaert & Heip (1995) observed that *Sabatieria* typically inhabits anoxic or sub-oxic regions.

Halalaimus numbers were relatively high all throughout the five groups, but with a gentle shift in proportions from the shelf to the slope stations in WIO. This was similar to the distribution in the NE Atlantic (Soetaert & Heip 1995; Vanaverbeke et al. 1997a), the W Atlantic (Tietjen 1976) while in the Arctic and Antarctic, the relative abundances were rather low (Vanaverbeke *et al.* 1997; Vanhove *et al.*, 1997).

2.2.3: Diversity

Genus diversity was highest at group 2 and 3, lower in group 1 and 4 and lowest in group 5. This means that if we consider the shelf to be group 2 stations alone, genus diversity (N_1) would be highest at the shelf (20-50m) and decrease with increase in depth upto 2000m. On the other hand, by taking the average for the two shelf stations, genus diversity shows a parabolic trend, being highest at 500m depth. Such diversity trend has already been observed in nematodes and other marine organisms (Etter & Grassle 1992; Boucher & Lambshead 1995; Rex & Etter 1997). Highest nematode diversity has been observed at the bathyal depth (Boucher & Lambshead 1995) while for macrofauna and fish megafauna, the highest diversity was observed at 2000-3000m and decreased in the hadal depths (Rex *et al.* 1997). In the Laptev Sea, genus diversity decreased with increase in depth (Vanaverbeke *et al.*, 1997) while in the Goban Spur (Vanaverbeke *et al.*, 1997a) and the Antarctic (Vanhove 1997) there was no trend in genus diversity with depth.

The two shelf station groups although at the same depth had different genus diversity indices. Genus diversity showed high positive correlation with sand and a negative correlation with silt content in sediment. High genus diversity in group 2, therefore may be explained by high amount of sand and low silt compared to group 1. Heip and Decraemer (1974) observed that high silt environment had lower spatial heterogeneity rendering such environments to have fewer niches and thus support fewer species. Similarly, Tietjen (1976; 1984) found high species diversity in sediments with high sand content.

Although group 1 and 2 stations were at the continental shelf, they were differently affected by river deposition which adversely affected the nematode composition and diversity especially at group 1. This observation supports in a way the suggestion by Gray (1997), that coastal areas may have higher diversity than deep sea areas but low diversities are often reported because the coast is prone to human and other external influences much more than the deep sea.

Latitudinal trends in diversity have long been proposed by Sanders & Hessler (1969) and more recently by (Rex *et al.* 1997). Gray, (1997), however argues that although this may be true for some groups, Sanders data was not representative, the number of species recorded for some regions was rather low and his method (rarefaction) has errors. Rex *et al.*, (1997) presented data for deep-sea Bivalves, Gastropods and Isopods from the Atlantic which show a decline from the Tropics to the Arctic but the cline in the southern hemisphere is not clear. Deep-sea nematode genus diversity from the Arctic, NE Atlantic, Mediterranean and the Antarctic was compared using various diversity indices (Vanhove *et al.* 1997). Highest diversity was observed from Antarctica and NE Atlantic and both the Laptev Sea and the Mediterranean Sea had low diversity. Comparing diversity (using Hills diversity numbers N_0 and N_1) from WIO and the other four sites shows that WIO has lower diversity than the NE Atlantic and the Antarctic and higher diversity than the Arctic and the Mediterranean. No latitudinal trend can be discerned. However, if local diversity is directly related to regional diversity (Rex *et al.* 1997; Caley & Schluter, 1997), then it is necessary to generate more data sets before making a conclusively comparison of different regions or compare areas that are as similar as possible especially in terms of environmental factors that directly influence diversity. For instance, primary productivity could have positive or negative effects on diversity of various marine organisms (Huston, 1995; Taylor, 1997). It is important, therefore to note that the Mediterranean (Vincx *et al.*, 1994), the Laptev Sea (Vanaverbeke *et al.* 1997) and the WIO (Semeneh *et al.*, 1995) are all oligotrophic regions compared to the highly productive NE Atlantic (Vincx *et al.* 1994) and Antarctic Ocean (Vanhove *et al.*, 1997). This may be the reason for the higher diversity in the former three sites compared to the latter.

2.2.4 Seasonality

In the East African waters seasonality results from the Inter-Tropical Convergence Zone (ITCZ), which creates two seasons, Northeast and Southeast monsoons (McClanahan, 1988). This seasonality has been observed to influence diversity and productivity of various marine organisms. For instance, species of the brown and red algae make their greatest contribution to the flora diversity and biomass during the Southeast monsoon (McClanahan, 1988). Seasonality in the nematode genera composition was observed in the two deeper station groups. During the two seasons genera diversity was highest in June/July at 500m depth and in November/ December at 2000m depth. It was however, difficult to determine the environmental factor that may

have been responsible for the variation in genera composition. Oxygen concentration was suspected to have been the factor responsible to some extent because oxygen concentration was much higher and the mixed layer much deeper (OMZ was deeper) in June/July compared to Nov/Dec period. Therefore the, higher nematode diversity at 500m depth in June/July may have been associated with high oxygen content. The lower diversity recorded at this depth during Nov/Dec could have been due to oxygen stress since oxygen concentration was lower and OMZ was rather high. Sanders (1968) suggested that the modest nematode diversity he observed in the Western Indian coast was due to severe stress caused by low oxygen content in the water from the western Indian Ocean driven to the Indian coast during Southeast monsoon period. In the Tropical Pacific, Levin *et al.*, (1991) observed that low oxygen concentration reduced the diversity of the macrofauna.

2.2.5 Trophic composition

Like in nematode composition, trophic groups demonstrated a clear difference between shelf and slope fauna. In the shelf stations there was nearly an equal distribution of the three trophic groups selective deposit (1a), non-selective deposit (1b) and epistrate (2a). In the upper slope stations, both groups of deposit feeders were quite high while epistrate group was moderately represented. In the slope stations, non-selective deposit group was the highest, the selective deposit group was moderately high and epistrutum feeders low. The results of the continental shelf in the Great Barrier Reef, (Tietjen, 1991), compares well with the two continental shelf groups in that epistrate and non selective deposit feeders were equal in relative proportions. In the shelf break of the Bay of Biscay, trophic group 1b was more dominant while 2a and 1a were about equal (Vanreusel *et al.*, 1992).

In the slope stations, non-selective deposit feeders increased in relative abundance with increase in depth and the selective deposit feeders were more abundant while the epistrutum feeders were less abundant than at the shelf. The Arctic Laptev Sea, was similar to the WIO in that, non selective deposit increased in relative abundance with increase in depth and epistrate feeders were less abundant (Vanaverbeke *et al.*, 1997). In the Mediterranean slope station (Soetaert & Heip, 1995), non-selective deposit feeders were the most abundant trophic group and this was similar to the 2000m station in WIO.

In most deep-sea areas, the trophic composition is characterised by a high abundance of selective and non-selective deposit feeders especially in the deeper stations, a decreasing proportion of epistrate feeders with increase in depth and a generally low abundance of predator/omnivore trophic group.

PART III

SPECIES DISTRIBUTION

I: RESULTS AND DISCUSSION

I: RESULTS

A: Chromadoridae

1.1: Genera distribution

In total 308 chromadorids were identified from June/July campaign and 390 from Nov/Dec campaign. Nineteen genera were encountered in the family Chromadoridae (Appendix Xa and Xb). *Acantholaimus* was the most dominant genus accounting for 49 % of all the chromadorids (Table 3.1 column 9). *Dichromadora* (14 %) and *Actinonema* (10.8 %) were the only other genera with at least 10 % of the total density. Nearly 50% of the genera had less than 1 % relative proportion.

Overall, there were a few minor differences in the relative abundances of the different genera between the two periods, June/July and Nov/Dec (Table 3.1 column 7 and 8). In June/July, *Dichromadora*, *Hypodontolaimus* and *Prochromadorella* had higher relative abundances than in Nov/Dec. In Nov/Dec, *Acantholaimus*, *Ptycholaimellus* and *Trochamus* had higher relative abundances than in June/July. Most other genera occurred only during one period or they had very low percentage proportions, that there was no difference in their relative abundance in the two periods.

The distribution of these genera within the ecological groups (discussed in Part II) is shown in Figure 3.1 and Table 3.1. *Acantholaimus,* the most dominant genera increased in relative abundance with increase in water depth. Its abundance in group 2 stations was minimal and it was completely absent in group1 stations.

Actinonema on the other hand, had its highest relative abundance in group 2 stations and decreased in abundance with increase in depth. Its relative abundance in group 1 stations was about the same as the abundance in group 4 stations. *Dichromadora* had the highest relative abundance in the shallowest group of stations and declined with increase in water depth. *Trochamus* which had 7.8 % of the total relative abundance also decreased in proportions with increase in depth like *Dichromadora*, while *Ptycholaimellus, Trichromadora, Parachromadorita* and *Neochromadora* occurred at the shelf (group 1 and 2 stations) only.

In general the chromadorids displayed one of the two trends;

1) **increasing of relative abundance with increase in water depth, shown by *Acantholaimus;***
2) **decreasing of the relative abundance with increase in water depth, shown by the rest of the chromadorids. In the second category, some genera such as *Actinonema* and *Ptycholaimellus* had their maximum relative abundance in group 2 stations, while others such as *Dichromadora*, *Prochromadorella* and *Trochamus*, had their maximum relative abundance in group 1 stations**

showing a preference for either high sand content in the sediment (group 2) or sediment with high silt content (group 1) in addition to shallow depth.

Figure 3.1: Distribution of the genera of the family Chromadoridae

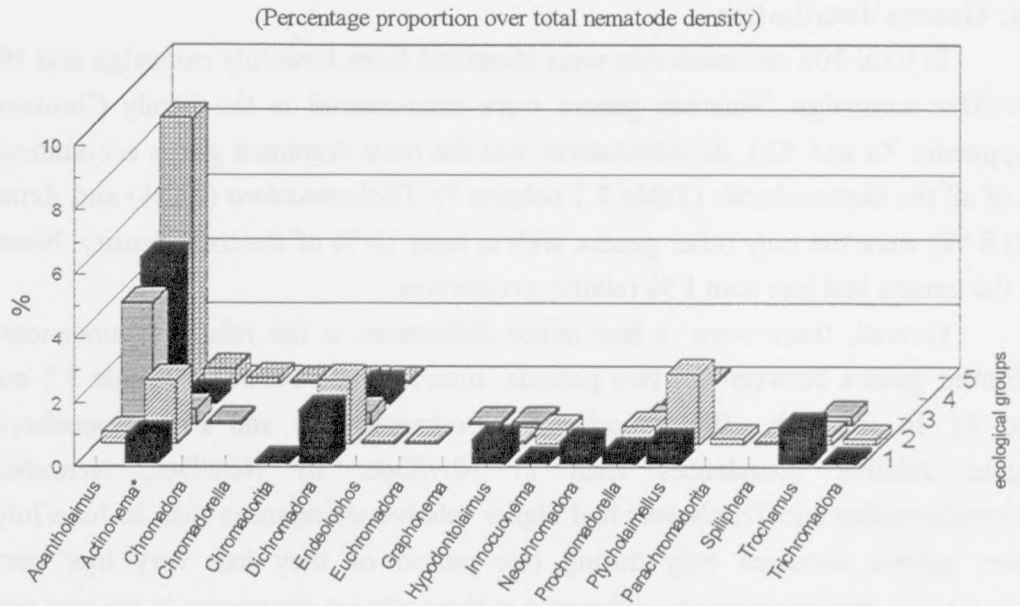


Table 3.1: Percentage proportion of the genera of Chromadoridae in the ecological groups

Group	1	2	3	4	5	Jun/Jul	Nov/Dec	Global
Acantholaimus	0.00	2.84	64.63	72.92	85.03	42.93	55.12	49.02
Actinonema	8.54	25.65	12.29	5.33	7.12	11.03	10.50	10.77
Chromadora	0.00	0.00	0.44	0.00	1.98	0.41	0.68	0.54
Chromadorella	0.00	0.00	1.75	0.00	0.00	1.04	0.00	0.52
Chromadorita	2.30	0.00	0.41	1.33	1.95	1.12	1.38	1.25
Denticulella	0.00	0.00	0.00	0.00	0.39	0.16	0.00	0.08
Dichromadora	30.19	16.32	9.12	15.64	2.03	21.72	6.38	14.05
Endeolophos	0.00	0.53	0.00	0.00	0.00	0.12	0.00	0.06
Euchromadora	0.00	0.84	0.00	0.00	0.00	0.00	0.19	0.10
Graphonema	0.00	0.00	0.66	0.00	0.00	0.00	0.40	0.20
Hypodontolaimus	3.30	2.38	1.75	0.00	0.00	2.48	0.54	1.51
Innocuonema	2.21	4.21	0.00	0.00	0.00	1.26	0.65	0.96
Neochromadora	9.14	0.00	0.77	0.00	0.00	2.92	1.58	2.25
Parachromadorita	2.38	5.47	0.00	0.00	0.00	0.39	1.91	1.15
Prochromadorella	6.18	4.11	3.67	1.44	1.14	3.79	3.00	3.39
Ptycholaimellus	7.76	17.43	0.00	0.00	0.00	1.39	6.00	3.70
Rhips	0.82	6.59	0.88	3.33	0.00	1.91	1.50	1.71
Trichromadora	3.64	1.59	0.00	0.00	0.00	0.90	1.08	0.99
Trochamus	23.54	12.05	3.65	0.00	0.37	6.44	9.09	7.76

(Note: In comparisons of distribution in the transects for both periods, **Tana and Training** transect may be ignored).

The distribution of the chromadorids in the four transects is shown in Table 3.2. The proportion of the genus *Acantholaimus* increased from the northern transect (Kiwayu) to the southern one (Gazi). This trend was the same in both periods. On the other hand, *Actinonema* decreased in relative proportion from the northern to the southern transect in June/July and although the trend was not obvious in Nov/ Dec, Kiwayu had the highest proportion. The genus *Dichromadora* was more or less the same in all the transects in June/July, while in Nov/ Dec, Sabaki had a much higher proportion than the rest of the transects. Other genera did not show any regular trend. *Prochromadorella*, *Trochamus* and *Trichromadora* had the highest relative abundance in the Sabaki transect in both periods.

Table 3.2: Percentage proportion of the genera of Chromadoridae per transect

	June/July				Nov/Dec			
	Kiwayu	Tana	Sabaki	Gazi	Kiwayu	Training	Sabaki	Gazi
Acantholaimus	29.90	35.80	36.76	61.58	42.69	42.08	56.54	67.62
Actinonema	19.47	14.81	8.66	6.83	20.32	6.68	4.00	11.66
Chromadora	0.68	0.00	0.00	0.83	0.62	0.00	0.00	1.67
Chromadorella	0.00	0.00	0.00	3.33	0.00	0.00	0.00	0.00
Chromadorita	0.00	0.00	1.59	1.67	2.43	0.00	0.48	2.10
Denticulella	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dichromadora	17.72	22.22	24.53	21.00	5.35	3.14	12.50	2.29
Endeolophos	0.00	1.23	0.00	0.00	0.00	0.00	0.00	0.00
Euchromadora	0.00	0.00	0.00	0.00	0.00	1.47	0.00	0.00
Graphonema	0.00	0.00	0.00	0.00	0.00	3.13	0.00	0.00
Hypodontolaimus	11.36	0.00	0.00	0.00	0.00	0.00	0.00	1.67
Innocuonema	0.00	3.70	1.39	1.25	0.00	1.47	1.43	0.00
Neochromadora	3.96	0.00	5.48	0.00	4.76	0.00	0.95	0.63
Parachromadorita	0.00	0.00	0.00	1.25	0.00	2.27	3.33	1.67
Prochromadorella	0.00	3.70	8.35	1.00	1.69	4.41	4.42	1.92
Ptycholaimellus	0.55	13.58	0.00	0.00	14.29	20.32	0.48	0.00
Rhips	6.41	1.23	0.00	1.25	0.00	7.49	0.00	1.67
Trichromadora	0.00	3.70	1.47	0.00	0.00	0.00	3.33	0.00
Trochamus	9.25	0.00	11.78	0.00	7.86	7.54	12.54	7.12

1.2: Species distribution

The species distribution for all the stations is shown in Appendix XI. 81 species of Chromadoridae were identified.

Generally, dominance of the species was low. The most dominant species were *Acantholaimus verscheldi* and *A. gathumai,* both of which had 4 % relative abundance (Table 3.3 column 9). Only one eighth (13 species) of the species had 3 % or more relative proportion while more than half of the species had less than 1 % relative abundance.

At the species level, the difference in relative proportion of the species in the two periods was minimal, at most 2-3 % difference (Table 3.3 column 7 and 8). Two species of *Acantholaimus*, *A. verscheldi* and *Acantholaimus sp. 1* and one *Actinonema, A. paraceltica*, had higher relative abundance in Nov/Dec compared to June/July. Four *Dichromadora* species, *D. cucullata*, *D. gathuai*, *D. loisae, D. longicaudata* and one species of *Trochamus, T. complexus* had a higher relative proportion in June/July compared to Nov/Dec. Most other species displayed very little difference between June/July and Nov/Dec or they occurred only during one period.

The distribution of the species in the five ecological groups is shown in Table 3.3. Nearly all species of the genus *Acantholaimus* occurred in groups 3, 4 and 5 stations. The rest of the species of Chromadoridae were concentrated at stations groups 1, 2 and 3. At the species level, there was no clear trend of the relative proportions from deep to shallow stations or vice versa, probably because few individuals were identified per species. However, some species had a slightly higher relative abundance in certain station groups compared to other groups. Most *Acantholaimus* such as *A. vermeuleni*, *A. verscheldi*, *A. gathumai, A. invaginatum* etc, had their maximum relative abundance in either group 5 or group 4 stations. In *Actinonema*, one species had its highest relative abundance in group 5, *Actinonema* sp. 1 and another in group 3, *Actinonema* sp. 2 while *A. smolae* and *A. paraceltica* had their maximum relative abundance in group 2 stations. In *Dichromadora*, two species had their maximum relative abundance in group 4: *D. cucullata* and *D. longicaudata*, while *D. gathuai* and *Dichromadora sp. 1* had their maximum relative abundance in group 2 stations. Most other species of *Prochromadorella*, *Trochamus* and *Ptycholaimellus macrodentatus*, *Hypodontolaimus marleeneae* all had their maximum relative abundance in group 1 and 2 stations.

Table 3.3: Percentage proportion of the species Chromadoridae in the ecological groups

Group	1	2	3	4	5	Jun/Jul	Nov/Dec	Global
Acantholaimus vermeuleni	0.00	0.00	3.22	9.97	5.93	3.77	3.79	3.78
A. heipi	0.00	0.00	1.00	0.00	3.85	1.56	0.62	1.09
A. elegans	0.00	0.00	8.10	2.87	3.11	3.22	3.87	3.55
A. verscheldi	0.00	0.00	5.67	4.44	7.84	2.66	5.46	4.06
A. gathumai	0.00	0.00	3.82	10.87	7.31	3.89	4.90	4.39
A. geraerti	0.00	0.00	0.66	2.17	1.00	0.00	1.52	0.76
A. invaginatum	0.00	0.00	3.57	3.11	8.09	2.80	3.70	3.25
Acantholaimus sp. 1	0.00	0.00	6.48	7.11	2.48	2.77	4.45	3.61
Acantholaimus sp. 2	0.00	0.00	0.00	0.00	3.31	0.63	0.74	0.68
Acantholaimus sp. 3	0.00	0.00	1.44	0.00	0.00	0.00	0.88	0.44
Acantholaimus sp. 4	0.00	0.00	6.58	0.67	2.67	4.77	0.45	2.61
Acantholaimus sp. 5	0.00	0.00	3.06	0.00	4.71	2.28	1.50	1.89
Acantholaimus sp. 6	0.00	0.53	3.45	0.83	0.59	0.43	2.31	1.37
Acantholaimus sp. 7	0.00	0.00	3.46	3.94	1.22	0.57	3.32	1.94
Acantholaimus sp. 8	0.00	0.00	0.00	3.61	3.94	2.09	0.66	1.38
Acantholaimus sp. 9	0.00	0.00	0.00	0.00	0.33	0.00	0.14	0.07
Acantholaimus sp. 10	0.00	0.00	0.00	0.00	0.88	0.22	0.14	0.18
Acantholaimus sp. 11	0.00	0.00	0.00	0.00	2.05	0.83	0.00	0.42
Acantholaimus sp. 12	0.00	0.00	1.23	0.67	2.17	0.74	1.11	0.93
Acantholaimus sp. 13	0.00	0.00	0.00	0.67	0.33	0.00	0.36	0.18
Acantholaimus sp. 14	0.00	0.00	0.88	0.00	0.00	0.00	0.54	0.27
Acantholaimus sp. 15	0.00	0.53	6.32	3.50	3.58	2.78	3.75	3.26
Acantholaimus sp. 16	0.00	0.00	0.00	0.00	1.51	0.16	0.47	0.31
Acantholaimus sp. 17	0.00	0.00	0.00	0.67	0.00	0.00	0.22	0.11
Acantholaimus sp. 18	0.00	0.00	0.00	0.00	2.97	0.74	0.48	0.61
Acantholaimus sp. 19	0.00	0.00	0.66	0.00	0.00	0.00	0.40	0.20
Acantholaimus sp. 20	0.00	0.00	1.61	2.50	0.59	1.35	0.65	1.00
Acantholaimus sp. 21	0.00	0.00	0.24	0.67	1.31	0.00	0.91	0.46
Acantholaimus sp. 22	0.00	0.00	0.00	0.00	0.45	0.18	0.00	0.09
Acantholaimus sp. 23	0.00	0.00	0.00	0.00	1.28	0.00	0.54	0.27
Acantholaimus sp. 24	0.00	1.79	0.00	1.11	2.25	1.21	0.46	0.83
Acantholaimus sp. 25	0.00	0.00	0.00	1.78	0.00	0.35	0.22	0.28
Acantholaimus sp. 26	0.00	0.00	1.21	0.77	1.12	0.00	1.46	0.73
Acantholaimus sp. 27	0.00	0.00	0.44	0.00	0.00	0.26	0.00	0.13
Acantholaimus sp. 28	0.00	0.00	0.00	1.50	0.33	0.00	0.62	0.31
Acantholaimus sp. 29	0.00	0.00	0.00	0.00	1.47	0.60	0.00	0.30
Acantholaimus sp. 30	0.00	0.00	0.00	1.11	0.00	0.35	0.00	0.17
Acantholaimus uniden	0.00	0.00	1.54	8.39	6.34	1.74	4.51	3.12
Actinonema longicaudatum	7.57	0.00	0.00	1.33	0.33	1.36	2.59	1.97
Actinonema sp. 1	0.00	0.00	0.44	3.33	4.54	3.01	0.14	1.57
Actinonema sp. 2	0.00	4.76	5.50	0.00	0.45	2.93	1.61	2.27
A. smolae	0.27	11.31	0.24	0.00	0.00	0.90	1.89	1.40
A. paraceltica	0.69	9.57	6.11	0.67	1.80	2.83	4.27	3.55
Chromadora sp.	0.00	0.00	0.44	0.00	1.98	0.41	0.68	0.54

Table 3.3 continued...

Group	1	2	3	4	5	Jun/Jul	Nov/Dec	Global
Chromadorella sp.	0.00	0.00	1.75	0.00	0.00	1.04	0.00	0.52
Chromadorita sp. 1	1.58	0.00	0.00	1.33	1.28	0.80	0.85	0.83
Chromadorita sp. 2	0.00	0.00	0.40	0.00	0.67	0.00	0.53	0.26
Chromadorita sp. 3	0.71	0.00	0.00	0.00	0.00	0.31	0.00	0.16
Denticulella sp.	0.00	0.00	0.00	0.00	0.38	0.16	0.00	0.08
Dichromadora cucullata	3.87	0.00	0.44	6.67	0.00	3.74	0.31	2.02
Dichromadora sp. 1	0.00	3.17	0.00	1.67	0.00	1.22	0.00	0.61
Dichromadora sp. 2	1.19	0.00	0.00	0.00	0.00	0.52	0.00	0.26
Dichromadora sp. 3	0.00	0.00	3.49	0.77	0.00	1.56	0.77	1.17
Dichromadora sp. 4	0.00	0.00	0.00	0.00	0.93	0.00	0.39	0.19
D. gathuai	8.55	8.60	1.54	1.67	0.00	4.89	2.23	3.56
D. loisae	10.90	0.00	0.58	0.00	0.00	5.11	0.00	2.56
D. longicaudata	3.64	4.54	2.63	4.87	1.10	4.41	1.76	3.09
D.quadripapillata	2.04	0.00	0.44	0.00	0.00	0.26	0.92	0.59
Endeolophos sp.	0.00	0.53	0.00	0.00	0.00	0.12	0.00	0.06
Euchromadora sp.	0.00	0.84	0.00	0.00	0.00	0.00	0.19	0.09
Graphonema sp.	0.00	0.00	0.66	0.00	0.00	0.00	0.40	0.20
Hypodontol. marleenae	2.75	2.38	0.00	0.00	0.00	1.20	0.54	0.87
Hypodontolaimus angelae	0.55	0.00	1.75	0.00	0.00	1.28	0.00	0.64
Innocuonema sp.	2.21	4.21	0.00	0.00	0.00	1.26	0.65	0.95
Neochromadora sp.	9.14	0.00	0.77	0.00	0.00	2.92	1.58	2.25
Parachromadorita sp. 1	2.38	5.47	0.00	0.00	0.00	0.39	1.91	1.15
Prochromadorella daroe	0.00	1.06	2.06	0.67	1.14	1.29	0.87	1.08
Prochromadorella sp. 1	0.00	0.84	0.00	0.00	0.00	0.00	0.19	0.09
Prochromadorella sp. 2	0.65	0.00	0.44	0.77	0.00	0.54	0.25	0.40
Prochromadorella sp. 3	0.00	0.00	0.58	0.00	0.00	0.35	0.00	0.17
Prochromadorella sp. 4	0.64	0.00	0.00	0.00	0.00	0.00	0.29	0.14
Prochromadorella sp. 5	0.00	0.53	0.00	0.00	0.00	0.12	0.00	0.06
P. ditlevseni	4.89	1.68	0.58	0.00	0.00	1.50	1.40	1.45
Ptycho. macrodentatus	7.76	14.26	0.00	0.00	0.00	0.70	6.00	3.35
P. penninae	0.00	3.17	0.00	0.00	0.00	0.69	0.00	0.35
Rhips reginae	0.00	6.59	0.88	3.33	0.00	1.55	1.50	1.53
Rhips sp. 1	0.82	0.00	0.00	0.00	0.00	0.36	0.00	0.18
Trichromad. longicaudata	3.64	1.59	0.00	0.00	0.00	0.90	1.08	0.99
Trochamus bulbosa	15.08	0.00	1.29	0.00	0.37	3.27	4.38	3.82
T. complexus	5.60	0.00	1.17	0.00	0.00	2.57	0.60	1.58
T. polki	1.49	12.04	0.66	0.00	0.00	0.00	3.80	1.90
T. prosoporus	1.36	0.00	0.53	0.00	0.00	0.60	0.32	0.46

Species distribution in the transects for the two sampling periods is shown in Table 3.4. The species do not seem to show a preference for any particular transect over the others, again probably, because of the low number of individuals observed. Some species however, had high relative abundance in the same transect during both periods. These were *Acantholaimus verscheldi*, *A. gathumai* and *Acantholaimus sp. 5*, all of which had their maximum relative abundance in the Gazi transect. *Actinonema sp. 2* and *A. paraceltica* had their maximum relative abundance in the Kiwayu transect. *Dichromadora cucullata*, *D. gathuai*, *Prochromadorella ditlevseni* and *Trochamus bulbosa* all had their maximum relative abundance in the Sabaki transect in both periods. It is however possible that it was by coincidence that these species had maximum relative abundance in the same transect during both periods. It was difficult to establish what environmental changes influenced these distributions since environmental data was available for only one period.

Table 3.4: Percentage proportion of the species of the Chromadoridae per transect

Period	Jun/Jul				Nov/Dec			
Transect	Kiwayu	Tana	Sabaki	Gazi	Kiwayu	Training	Sabaki	Gazi
Acantholaimus vermeuleni	0.68	16.67	4.65	1.00	6.59	5.00	2.10	3.04
A. heipi	2.72	0.00	1.74	1.00	0.62	0.00	1.48	0.00
A. elegans	1.39	0.00	2.23	6.67	6.48	4.79	0.71	4.82
A. verscheldi	2.11	0.00	1.68	5.00	5.63	0.00	4.71	8.26
A. gathumai	1.36	0.00	4.01	6.67	4.68	1.67	5.07	6.18
A. geraerti	0.00	0.00	0.00	0.00	1.86	3.13	1.50	0.67
A. invaginatum	6.19	0.00	0.93	3.50	0.62	0.00	2.15	8.87
Acantholaimus sp. 1	0.68	8.33	4.07	1.00	0.62	1.67	4.60	8.09
Acantholaimus sp. 2	2.86	0.00	0.00	0.00	1.24	0.00	1.43	0.00
Acantholaimus sp. 3	0.00	0.00	0.00	0.00	0.00	3.33	0.00	1.39
Acantholaimus sp. 4	0.71	0.00	0.49	14.17	0.00	0.00	0.71	0.67
Acantholaimus sp. 5	0.68	0.00	1.52	5.00	0.62	1.67	1.54	2.01
Acantholaimus sp. 6	0.00	1.23	0.00	1.00	0.00	3.13	4.52	1.39
Acantholaimus sp. 7	0.00	0.00	1.52	0.00	1.24	7.92	3.42	2.83
Acantholaimus sp. 8	1.36	0.00	2.01	3.33	0.62	0.00	1.60	0.00
Acantholaimus sp. 9	0.00	0.00	0.00	0.00	0.62	0.00	0.00	0.00
Acantholaimus sp. 10	0.00	0.00	0.60	0.00	0.62	0.00	0.00	0.00
Acantholaimus sp. 11	1.43	0.00	0.00	1.67	0.00	0.00	0.00	0.00
Acantholaimus sp. 12	0.00	0.00	0.60	1.67	0.62	1.67	1.67	0.67
Acantholaimus sp. 13	0.00	0.00	0.00	0.00	0.62	0.00	0.00	0.67
Acantholaimus sp. 14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67
Acantholaimus sp. 15	2.14	1.23	2.80	3.67	0.00	6.46	5.19	3.85
Acantholaimus sp. 16	0.71	0.00	0.00	0.00	1.24	0.00	0.00	0.59
Acantholaimus sp. 17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67
Acantholaimus sp. 18	0.00	0.00	0.60	1.67	0.00	0.00	1.48	0.00
Acantholaimus sp. 19	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.00
Acantholaimus sp. 20	0.00	8.33	1.52	0.00	0.00	0.00	2.02	0.00
Acantholaimus sp. 21	0.00	0.00	0.00	0.00	1.24	0.00	0.67	1.29
Acantholaimus sp. 22	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67
Acantholaimus sp. 24	2.14	0.00	0.93	1.25	0.00	0.00	1.43	0.00
Acantholaimus sp. 25	0.00	0.00	0.93	0.00	0.00	0.00	0.00	0.67
Acantholaimus sp. 26	0.00	0.00	0.00	0.00	2.34	0.00	0.00	2.88
Acantholaimus sp. 27	0.00	0.00	0.69	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 28	0.00	0.00	0.00	0.00	0.62	0.00	1.50	0.00
Acantholaimus sp. 29	2.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 30	0.00	0.00	0.93	0.00	0.00	0.00	0.00	0.00
Acantholaimus uniden	0.00	0.00	1.85	3.33	3.91	1.67	5.80	4.78
Actinonema longicaudata	0.00	0.00	3.63	0.00	4.79	0.00	3.33	1.33
Actinonema sp. 1	10.88	0.00	1.67	0.00	0.62	0.00	0.00	0.00
Actinonema sp. 2	4.76	11.11	1.42	1.00	7.14	0.00	0.00	0.00
A. smolae	0.55	0.00	0.00	2.50	0.00	5.21	0.00	3.79
A. paraceltica	3.27	3.70	1.94	3.33	7.76	1.47	0.67	6.54

Table 3.4: continued

Transect	Kiwayu	Tana	Sabaki	Gazi	Kiwayu	Training	Sabaki	Gazi
Chromadora sp.	0.68	0.00	0.00	0.83	0.62	0.00	0.00	1.67
Chromadorella sp.	0.00	0.00	0.00	3.33	0.00	0.00	0.00	0.00
Chromadorita sp. 1	0.00	0.00	0.76	1.67	1.19	0.00	0.48	1.33
Chromadorita sp. 2	0.00	0.00	0.00	0.00	1.24	0.00	0.00	0.77
Chromadorita sp. 3	0.00	0.00	0.83	0.00	0.00	0.00	0.00	0.00
Denticulella sp.	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dichromadora cucullata	0.55	0.00	4.10	6.67	0.00	0.00	0.95	0.00
Dichromadora sp. 1	0.00	7.41	0.00	1.67	0.00	0.00	0.00	0.00
Dichromadora sp. 2	0.00	0.00	1.39	0.00	0.00	0.00	0.00	0.00
Dichromadora sp. 3	0.00	0.00	0.00	5.00	2.53	0.00	0.00	0.63
Dichromadora sp. 4	0.00	0.00	0.00	0.00	0.62	0.00	0.77	0.00
D. gathuai	2.86	6.17	5.53	5.17	0.00	1.67	4.58	1.67
D. loisae	2.75	0.00	12.04	0.00	0.00	0.00	0.00	0.00
D. longicaudata	11.56	8.64	1.47	1.67	2.20	1.47	3.33	0.00
D.quadripapillata	0.00	0.00	0.00	0.83	0.00	0.00	2.86	0.00
Endeolophos sp.	0.00	1.23	0.00	0.00	0.00	0.00	0.00	0.00
Euchromadora sp.	0.00	0.00	0.00	0.00	0.00	1.47	0.00	0.00
Graphonema sp.	0.00	0.00	0.00	0.00	0.00	3.13	0.00	0.00
Hypodont. marleenae	5.49	0.00	0.00	0.00	0.00	0.00	0.00	1.67
H. angelae	5.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Innocuonema sp.	0.00	3.70	1.39	1.25	0.00	1.47	1.43	0.00
Neochromadora sp.	3.96	0.00	5.48	0.00	4.76	0.00	0.95	0.63
Parachromadorita sp. 1	0.00	0.00	0.00	1.25	0.00	2.27	3.33	1.67
Prochromadorella daroe	0.00	2.47	1.98	1.00	0.00	0.00	0.77	1.92
Prochromadorella sp. 1	0.00	0.00	0.00	0.00	0.00	1.47	0.00	0.00
Prochromadorella sp. 2	0.00	0.00	1.45	0.00	1.10	0.00	0.00	0.00
Prochromadorella sp. 3	0.00	0.00	0.93	0.00	0.00	0.00	0.00	0.00
Prochromadorella sp. 4	0.00	0.00	0.00	0.00	0.60	0.00	0.48	0.00
Prochromadorella sp. 5	0.00	1.23	0.00	0.00	0.00	0.00	0.00	0.00
Proch. ditlevseni	0.00	0.00	3.99	0.00	0.00	2.94	3.17	0.00
Ptycholaim. macrodentatus	0.55	6.17	0.00	0.00	14.29	20.32	0.48	0.00
Ptycholaimellus. penninae	0.00	7.41	0.00	0.00	0.00	0.00	0.00	0.00
Rhips reginae	4.76	1.23	0.00	1.25	0.00	7.49	0.00	1.67
Rhips sp. 1	1.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trichroma. longicaudata	0.00	3.70	1.47	0.00	0.00	0.00	3.33	0.00
Trochamus bulbosa	0.68	0.00	8.33	0.00	2.86	0.00	11.11	0.45
T. complexus	8.57	0.00	1.85	0.00	0.60	0.00	1.43	0.00
T. polki	0.00	0.00	0.00	0.00	2.98	7.54	0.00	6.67
T. prosoporus	0.00	0.00	1.59	0.00	1.43	0.00	0.00	0.00
Total	100	100	100	100	100	100	100	100

1. 3: Diversity

The number of species per genus and number of species in each ecological group is shown in Table 3.5.

Table 3.5: Distribution of the genera of Chromadoridae (ecological groups)

	species no.	No. of species in each ecological group				
	.	1	2	3	4	5
Acantholaimus	37	0	3	21	22	30
Actinonema	6	3	3	4	3	4
Chromadora	1	0	0	1	0	1
Chromadorella	1	0	0	1	0	0
Chromadorita	3	2	0	1	1	2
Denticullela	1	0	0	0	0	1
Dichromadora	9	6	3	6	5	2
Endeolophos	1	0	1	0	0	0
Euchromadora	1	0	1	0	0	0
Graphonema	1	0	0	1	0	0
Hypodontolaimus	2	2	1	1	0	0
Innocuonema	1	1	1	0	0	0
Neochromadora	1	1	0	1	0	0
Prochromadorella	8	4	5	4	2	1
Ptycholaimellus	2	1	2	0	0	0
Rhips	2	1	1	1	1	0
Trichromadora	1	1	1	0	0	0
Trochamus	4	4	1	4	0	1
Total no of species	82	26	23	46	34	42
Total no of genera	18	11	12	12	5	8

Acantholaimus had the highest number of species (37 species) of all the Chromadoridae. All the other genera had less than 10 species each. *Dichromadora,* the next most diverse in terms of number of species, had 9 species, *Prochromadorella* 8, *Actinonema* 6, *Trochamus* 4 species and *Chromadorita* 3 species. *Hypodontolaimus*, *Ptycholaimellus* and *Rhips* had two species each and the remaining ten genera had only one species each.

The distribution of the genera in the ecological group shows that group 2 and 3 had the highest number of genera (12 genera each) and group 1, 5 and 4 follow in that order with 11, 8 and 5 genera respectively. The species distribution on the other hand show that group 3 and 5 had the most number of species (46 and 42 respectively). The station group next highest in the number of species was group 4, 1 and 2 in that order.

Species diversity indices show no difference between June/July and Nov/Dec (Table 3.6 column 7 and 8). Within the ecological group, all diversity indices increased with increasing water depth from group 1 to group 5 (Table 3.6). This may indicate that although group 4 and 5 had very few genera, these were genera with a high number of species compared with the genera occupying the shallow stations.

Table 3.6: Species diversity for the Chromadoridae within the ecological groups (Hills numbers)

Hills	ecological groups					period	
nos	1	2	3	4	5	Jun/Jul	Nov/Dec
N_0	4.57	6.29	6.58	6.80	9.77	5.68	5.79
N_1	3.94	5.48	6.17	6.07	8.69	5.12	5.18
N_2	3.44	4.92	5.73	5.46	7.74	4.66	4.66
N_{inf}	2.41	3.39	4.08	3.69	4.87	3.36	3.25
H	1.20	1.58	1.66	1.63	2.09	1.47	1.47

In each period species diversity within the transects did not vary much (Table 3.7). However, overall, there was higher species diversity during Nov/Dec compared to June/July for all the transects. In June/July, the Tana transect had the highest species diversity and Gazi had the lowest diversity. In Nov/Dec, Kiwayu had the highest diversity and Sabaki had the lowest, although the difference was minimal.

Table 3.7: Species diversity for the Chromadoridae in the transects (Hills numbers).

	Jun/Jul				Nov/Dec			
Transect	Kiwayu	Tana	Sabaki	Gazi	Kiwayu	Training	Sabaki	Gazi
N_0	6.43	6.67	6.50	4.60	8.29	8.00	7.30	7.80
N_1	5.44	5.64	5.99	4.56	7.13	7.14	6.96	6.88
N_2	4.74	4.93	5.48	4.42	6.21	6.46	6.54	611
N_{inf}	3.26	3.17	3.78	3.60	3.67	4.06	4.65	3.96
H	1.55	1.63	1.62	1.34	1.75	1.86	1.74	1.84

Hierarchical diversity (Pielou, 1977) was calculated per replicate and the mean per station group estimated by averaging the replicate values.

June/July had a lower within genus diversity and a higher between genera diversity compared to Nov/Dec, However, the total diversity was higher in Nov/Dec compared to June/July (Table 3.8 column 7 and 8).

Within genus diversity increased with depth (i.e. from group 1 to group 5) while between genera diversity showed the opposite trend. Generally, total diversity increased with depth except for group 2 stations, which had higher diversity than both groups 3 and 4. This means that although group 5 stations had mainly the genus *Acantholaimus*, it still had the highest overall diversity. This may indicate that *Acantholaimus* is rather an important genus within the chromadorids in that area, with strong speciation capacity in the deep-sea.

Table 3.8 Hierarchical diversity for the Chromadoridae in the ecological groups

	Ecological groups					Periods	
	1	2	3	4	5	June/July	Nov/Dec
H'wg	0.05	0.12	0.33	0.47	0.76	0.31	0.47
H'g	0.52	0.70	0.33	0.31	0.15	0.36	0.27
H'T	0.57	0.81	0.66	0.77	0.91	0.70	0.74

Table 3.9 shows hierarchical diversity of chromadorids in the transects. In June/July, all the transects except Sabaki had lower within genus diversity compared to between genera diversity. In Nov/Dec, within genus diversity was higher than between genera diversity for all the transects except the training transect. The total diversity was slightly higher in November for Kiwayu and Gazi but not for Sabaki.

Table 3.9: Diversity of Chromadoridae in the transects and in the two periods (Hierarchical)

	June/July				Nov/Dec			
	Kiwayu	Tana	Sabaki	Gazi	Kiwayu	Training	Sabaki	Gazi
H'wg	0.15	0.33	0.38	0.31	0.44	0.21	0.45	0.49
H'g	0.58	0.48	0.31	0.41	0.32	0.43	0.23	0.27
H'T	0.73	0.81	0.69	0.72	0.75	0.64	0.68	0.76

2: Discussion

Acantholaimus is one of the genera considered as a typical deep-sea genus (Soetaert & Heip, 1995) and it has been often found along the whole depth tansect but with higher relative proportion in deeper stations (Soetaert *et al.* 1995; Vanaverbeke *et al.* 1997; Vanaverbeke *et al.* 1997a). Many authors have indicated that most nematodes that show trends related to water depth are often in response to other environmental factors related to water depth other than depth as such. Tietjen (1971, 1976) has shown that the factor that influences most nematode distribution is sediment composition. Group 1 stations had the same silt content as group 3 and nearly the same as group 4, yet the proportion of *Acantholaimus* was different in these three groups (it increased from group 2 to 5). However, the amount of fine and very fine sand decreased with depth from group 2 to group 5. It seems that the decrease in sand content resulted in fewer other nematode genera being present in those sediments, consequently the relative abundance of *Acantholaimus* increased.

Most of the other genera of Chromadoridae (*Endeolophos*, *Euchromadora*, *Hypodontolaimus* and *Ptycholaimellus*) were inhabiting shallow water stations although a few were represented at all depths. Tietjen, (1976) observed that several genera of Chromadoridae such as *Dichromadora*, *Rhips* and *Spilophorella* were restricted to the sandy sediments. In the Laptev transects, Vanaverbeke *et al*, (1997), found seven genera (*Acantholaimus*, *Chromadora*, *Chromadorella*, *Chromadorita*, *Endeolophos*, *Neochromadora* and *Prochromadorella*) out of nine chromadorids in station 1 (65m) and seven (*Acantholaimus*, *Chromadora*, *Chromadorella*, *Chromadorita*, *Neochromadora*, *Prochromadorella* and *Spiliphera*) in station 2 (230m) and only two genera (*Acantholaimus* and *Prochromadorella*) in station 5 (3237m). In the WIO, *Dichromadora*, *Prochromadorella*, *Rhips* and *Trochamus* were present at nearly all depths. In the Goban Spur, apart from *Acantholaimus*, the only chromadorid present at nearly all depths was *Chromadora* (Vanaverbeke *et al.* 1997a). In Antarctica, *Dichromadora* was the most dominant chromadorid and it was at all depths (Vanhove *et al.* 1997). One common feature among the genera that appeared to be eurybenthic at the WIO, is that they had several species. Most of these species had only a short range of occurrence, the eurybenthic nature of the genus was due to having multi-species and these species behaved differently. Only a few species could be considered eurybenthic such as *Acantholaimus sp. 6*, *Acantholaimus sp. 15*, *Actinonema paraceltica*, and *Dichromadora longicaudata*.

Thistle & Sherman, (1985) described functional groups of nematodes in terms of tail type. They proposed that the hemisessile form of the nematode had a long tail, which anchors the nematode in deeper, firmer sediment and that could be retracted to enable the nematode to retreat rapidly. It is possible that occurrence at the slope has something to do with tail length at least in chromadorids because the only other eurybenthic species

in addition to *Acantholaimus, Actinonema paraceltica* and *Dichromadora longicaudata* have a long tail. The ability to survive in slope stations where few other chromadorids are found, thus little competition, has made *Acantholaimus* to be relatively abundant in these sediments than elsewhere.

Diversity of the Chromadoridae increased with increase in water depth (using Hills diversity numbers). Using hierarchical diversity, within genus diversity values also showed increase with increase in depth while between genera diversity was highest in group 2 stations. Diversity of soft sediment benthic organisms has been found to change parabolically with increase in water depth (Rex *et al.* 1997) and earlier Sanders (1968) had observed a linear increase with depth. Depth related increase in diversity of Chromadoridae in the WIO was as a result of the high number of species of *Acantholaimus* (see also Part I) (Muthumbi & Vincx, 1997). It seems that *Acantholaimus* has a high speciation rate and an ability to co-exist especially in deep sea. Two questions can be asked, one how can there be such a high number of species and two; how can they survive together especially that they are of the same genus. Jensen (1988), found four species of *Acantholaimus* co-existing and he attributed this ability to food partition as a result of different mouth opening. Soetaert *et al.*, (1995) proposed that the coexistence of several species of the genus *Sabatieria* was due to vertical segregation. It is possible that the same factor is responsible to the co-existence of species of *Acantholaimus* in addition to food partitioning.

Constancy of physical conditions and long past history of physical stability in the deep sea has helped yield high diversity in deep-sea environments (Sanders & Hessler 1969). Although Grassle, (1991) points out that no single theory can explain the high diversity in the deep-sea, however, he agrees that physical constancy of the environment plays a major role in enhancing high diversity. Recently, Rex et al. (1997) pointed out that diversity in the deep sea is a result of integration of ecological and evolutionary processes operating at different levels. This high diversity is maintained by habitat heterogeneity and disturbance acting together (Gage 1997). Through constant but small disturbances, the population is kept low, thereby does not attain competitive sizes (Gage, 1997).

Although this may be a good explanation for the high diversity in the deep sea, the question still remains; why only one genus (*Acantholaimus*) is so diversified among the Chromadoridae.

B: COMESOMATIDAE

1.1: Genera distribution

In the June/July campaign, 589 comesomatids were identified and in the Nov/Dec campaign 485 were identified. Twelve genera of the family Comesomatidae were identified (Appendix XIIa and XIIb). The most dominant genus was *Sabatieria* consisting of 40 % of the total (Table 3.10 column 9). *Cervonema* was the next most dominant genus comprising of 22 % and *Dorylaimopsis* had 14 % of the total. The fourth and fifth most dominant genera were *Laimella* and *Paracomesoma* with 8% and 4% respectively. The rest of the genera had less than 2 % relative abundance.

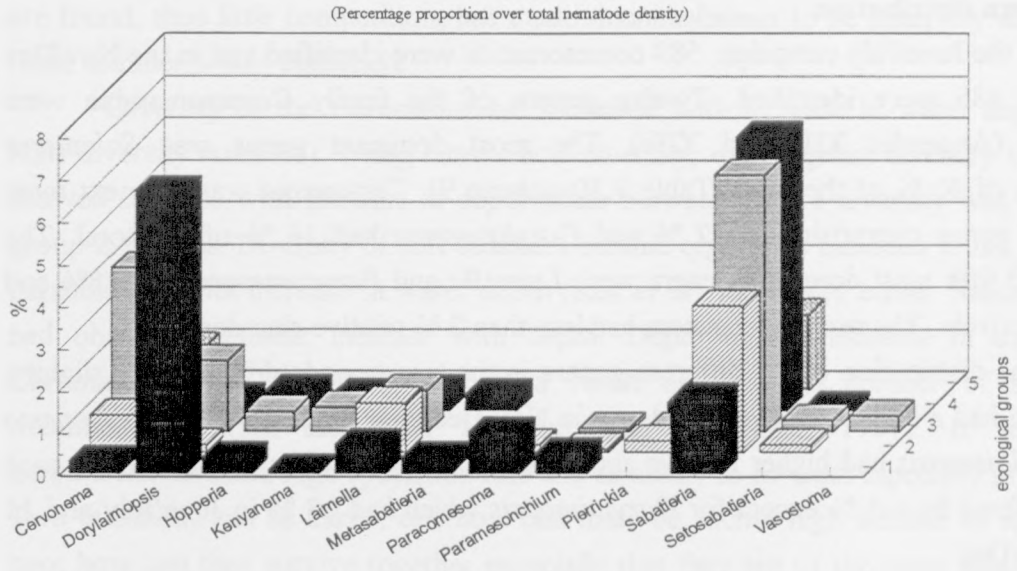
The distribution of the different genera in the two periods differed only slightly; *Sabatieria* had a higher relative abundance in Nov/Dec than June/July while *Cervonema* and *Dorylaimopsis* had higher relative abundance in June/July. The proportions in each genus differed by 1-3 % except for *Dorylaimopsis* which had 18 % in June/July and 11 % in Nov/Dec.

Depth distribution, indicated by groups 1-5, is shown in Table 3.10 column 2-6 and Figure 3.2. The two most dominant genera *Sabatieria* and *Cervonema* increased in relative abundance, more or less with increase in depth. For *Sabatieria*, the maximum relative abundance was observed in group 4 stations while in *Cervonema*, group 4 stations had slightly lower proportion than group 3 stations. *Dorylaimopsis* dominated in group 1 stations with 52 % and *Paramesonchium* had its highest relative abundance in group 1 stations as well. *Laimella* and *Paracomesoma* had their highest relative abundance in group 2 stations as well.

Table 3.10: Percentage proportion of genera of Comesomatidae (ecological groups)

Group	1	2	3	4	5	Jun/Jul	Nov/Dec	global
Sabatieria	14.8	30.9	48.9	56.6	50.0	37.6	41.9	39.7
Setosabatieria	1.6	1.5	1.2	0.7	0.0	0.8	1.2	1.0
Cervonema	3.0	3.0	26.6	24.0	36.5	21.6	19.0	20.3
Laimella	7.4	29.7	6.0	3.7	2.6	6.3	10.6	8.4
Pierrickia	0.0	0.0	0.3	3.1	5.9	2.7	0.9	1.8
Paracomesoma	12.6	15.3	0.1	0.0	0.0	4.9	4.8	4.8
Dorylaimopsis	52.5	1.5	8.0	2.3	0.0	18.3	10.7	14.6
Hopperia	1.7	0.0	2.8	4.0	0.0	2.7	1.0	1.9
Vasostoma	1.4	0.0	0.0	0.0	0.0	0.5	0.1	0.3
Kenyanema	1.0	0.0	4.6	3.5	0.5	2.9	1.6	2.3
Paramesonchium	4.1	1.4	1.0	0.0	0.0	1.7	1.1	1.4
Metasabatieria	0.0	0.0	0.5	2.2	0.0	0.3	0.7	0.5

Figure 3.2: Distribution of the genera in Comesomatidae within the groups



The distribution of the genera within the transects is shown in Table 3.11. *Sabatieria* and *Cervonema* had high relative abundance in all the transects. *Laimella* and *Kenyanema* were also present in all the transects although their relative abundance was low. Some genera had high relative abundnance in the same transect in both periods such as *Setosabatieria* and *Paracomesoma* had their highest relative abundance in Kiwayu. *Sabatieria* and *Dorylaimopsis* had their highest relative abundance in Sabaki. *Cervonema*, *Laimella* and *Pierrickia* had their highest relative abundance in the Gazi transect.

Table 3.11: Percentage proportion of genera of Comesomatidae (transects)

Period	June/July				Nov/Dec			
Transect	Kiwayu	Tana	Sabaki	Gazi	Kiwayu	Training	Sabaki	Gazi
Sabatieria	32.81	60.61	37.01	34.62	36.02	45.42	45.84	40.54
Setosabatieria	2.26	3.03	0.00	0.00	4.64	0.00	0.45	0.00
Cervonema	18.29	16.67	13.50	34.96	21.66	8.06	18.43	22.01
Laimella	6.63	13.64	1.36	9.73	13.43	6.25	4.58	16.52
Pierrickia	3.06	0.00	2.38	3.51	0.62	0.00	1.17	1.25
Paracomesoma	7.14	0.00	5.82	3.56	7.30	12.50	0.48	4.17
Dorylaimopsis	16.72	3.03	35.07	3.96	10.65	0.00	23.81	1.95
Hopperia	3.98	1.52	0.60	3.96	10.65	0.00	23.81	1.95
Vasostoma	2.29	0.00	0.00	0.00	0.00	0.00	0.33	0.00
Kenyanema	1.46	1.52	3.21	3.89	1.24	2.78	1.72	1.25
Paramesonchium	5.36	0.00	1.04	0.28	0.62	0.00	2.00	0.83
Metasabatieria	0.00	0.00	0.00	0.94	3.11	0.00	0.00	0.00

1.2: Species distribution

44 species of Comesomatidae were identified (Appendix XIIIa and XIIIb). Most of the species were poorly represented and only 5 species had a relative abundance of at least 5 % (Table 3.12 column 9). The most dominant species were *Sabatieria conicauda* (18 %), *Dorylaimopsis variabilis* (11.5 %). *Cervonema tenuicauda* (9.8 %), *Sabatieria lucia* (6.8 %) and *Paracomesoma* sp. 1 (4.6 %). 35 species had relative abundance of 2 % or less.

Difference between the two periods (June/July and Nov/Dec) were small with only a few species showing preference for one or the other period (Table 3.12 column 7 and 8). *Sabatieria conicauda* and *Laimella sp2* had higher relative abundance in Nov/Dec while *Sabatieria aff. furcillata*, *Dorylaimopsis variabilis* and *Hopperia indiana* had higher relative abundance in June/July, compared to Nov/Dec.

Species distribution in the ecological group (depth) is shown in Table 3.12. Most species were confined either to shallow or deep water stations, and few species were found both in shallow and deep water stations. *Sabatieria conicauda* and *Sabatieria sp. 1* for instance were found in group 3 to group 5 stations, *S. conicauda* showing a peak in group 4 stations. *Cervonema tenuicauda* increased in relative abundance with increase in water depth and most of the other species of *Cervonema* were confined to deep water. *Laimella aff. minuta* was confined more to deeper water stations while two species, *Laimella sp. 1* and *Laimella sp. 2* both had high relative abundances in shallow water stations particularly group 2 stations. All species of *Pierrickia* were found in group 3, 4 and 5 stations. *Dorylaimopsis variabilis* and *Paramesonchium mombasi* had their peaks in group 1 stations. A few species occurred in four out of the five depth ranges and only *Sabatieria* sp.2 and *Cervonema tenuicauda* occurred at all depths.

Table 3.12: Percentage proportion of the species of Comesomatidae in the ecological groups

Group	1	2	3	4	5	June/July	Nov/Dec	global
Sabatieria conicauda	0.0	0.0	26.7	46.0	11.5	14.05	22.58	18.32
S. lucia	0.0	4.2	10.7	3.5	12.8	7.55	6.08	6.82
S. pissina	0.0	0.0	9.6	0.9	0.0	2.84	3.48	3.16
S. aff. Furcillata	3.7	13.6	0.0	0.0	0.0	2.68	1.67	2.17
S. aff. Americana	5.7	0.8	0.4	1.3	0.0	2.92	0.41	1.66
Sabatieria sp. 1	0.0	0.0	0.7	0.4	17.0	3.27	4.07	3.67
Sabatieria sp. 2	3.3	10.9	0.6	0.4	1.7	2.00	2.87	2.44
Sabatieria sp. 3	0.0	0.0	0.0	3.9	5.9	1.96	1.61	1.78
Sabatieria sp. 4	2.1	1.5	0.0	0.0	0.0	0.28	1.02	0.65
Sabatieria sp. 5	0.0	0.0	0.0	0.0	2.1	0.00	0.86	0.43
Sabatieria sp. 6	0.0	0.0	0.2	0.0	0.0	0.00	0.10	0.05
Setosabatieria sp.	1.6	1.5	1.2	0.7	0.0	0.78	1.28	1.03
Cervonema tenuicauda	1.4	3.0	10.7	10.6	21.0	10.46	9.10	9.78
C. minutus	0.0	0.0	4.4	6.7	5.2	3.51	3.46	3.48
C. gourbaulti	1.4	0.0	6.3	2.8	1.2	3.01	2.87	2.94
C. aff. jenseni	0.0	0.0	0.2	2.1	11.1	3.79	1.25	2.52
Cervonema sp. 1	0.2	0.0	0.0	0.0	0.0	0.10	0.00	0.05
Cervonema sp. 2	0.0	0.0	1.6	0.0	1.0	0.13	1.32	0.72
Cervonema sp. 3	0.0	0.0	0.0	1.2	0.0	0.38	0.00	0.19
Cervonema sp. 4	0.0	0.0	3.5	0.6	0.0	0.17	2.28	1.23
Laimella aff. vera	0.0	0.0	1.0	0.4	0.0	0.07	0.71	0.39
L. aff. filicaudata	0.0	0.0	0.0	0.4	0.0	0.00	0.15	0.07
Laimella aff. minuta	0.2	0.0	1.8	1.9	2.8	1.69	1.23	1.46
Laimella sp. 1	4.7	19.6	0.4	0.0	0.0	2.77	3.52	3.15
Laimella sp. 2	2.1	18.2	0.9	0.4	0.0	0.82	4.61	2.72
Laimella sp. 3	0.3	3.0	1.3	0.5	0.0	0.71	0.99	0.85
Laimella sp. 4	0.0	0.0	0.6	0.0	0.0	0.22	0.16	0.19
Pierrickia sp. 1	0.0	0.0	0.0	1.2	2.8	1.26	0.15	0.71
Pierrickia sp. 2	0.0	0.0	0.0	0.0	1.2	0.45	0.00	0.22
Pierrickia sp. 3	0.0	0.0	0.0	0.0	1.2	0.45	0.00	0.22
Pierrickia sp. 4	0.0	0.0	0.0	0.0	1.2	0.45	0.00	0.22
Pierrickia sp. 5	0.0	0.0	0.1	0.7	0.0	0.05	0.25	0.15
Pierrickia sp. 6	0.0	0.0	0.2	1.3	0.0	0.00	0.59	0.29
Paracomesoma sp. 1	11.0	20.8	0.0	0.0	0.0	4.40	4.75	4.57
Paracomesoma sp. 2	1.6	0.0	0.1	0.0	0.0	0.46	0.34	0.40
Dorylaimopsis variabilis	48.7	0.0	1.4	0.0	0.0	13.67	9.34	11.51
D. coomansi	3.8	1.5	1.3	2.3	0.0	2.72	0.80	1.76
D. gerardi	0.0	0.0	5.3	0.0	0.0	1.94	1.31	1.62
Hopperia indiana	0.6	0.0	2.8	3.6	0.0	2.20	0.92	1.56
Hopperia sp. 1	1.1	0.0	0.0	0.5	0.0	0.46	0.17	0.32
Vasostoma sp	1.4	0.0	0.0	0.0	0.0	0.50	0.11	0.31
Kenyanema monorchis	1.0	0.0	4.6	3.5	0.5	2.88	1.71	2.29
Paramesonchium mombasi	4.1	1.4	1.0	0.0	0.0	1.65	1.13	1.39
Metasabatieria sp	0.0	0.0	0.5	2.2	0.0	0.29	0.75	0.52

Distribution in the transects is shown in Table 3.13. Although most species were rather rare occurring only once or twice, a few species showed preference for certain transects in both periods. *Sabatieria conicauda* had its highest relative abundance in Gazi on both periods while *S. lucia* had a preference for the Sabaki transect. *Cervonema tenuicauda* although present in all the transects it had a higher relative abundance in Gazi. *Dorylaimopsis variabilis* had its highest relative abundance in Sabaki while the other *Dorylaimopsis* species *D. coomansi* and *D. gerardi* were more dominant in the Gazi transect.

If difference in relative abundance between June/July and Nov/Dec can be used to assess seasonality, then it was clear in some species. *Sabatieria conicauda* for instance had high relative abundance in Gazi in Nov/Dec compared to June/July.

Sabatieria lucia had a high relative abundance in Sabaki June/July compared to Sabaki Nov/December. *Cervonema tenuicauda* and *Cervonema aff. jensen* both had their high relative abundance in Gazi in June/July compared to Nov/Dec. All *Dorylaimopsis* species had their highest relative abundance in Kiwayu in June/July compared to Nov/Dec.

Table 3.13: Percentage proportion of the species of the Comesomatidae in the transects

Period	June/July				Nov/Dec			
Transect	Kiwayu	Tana	Sabaki	Gazi	Kiwayu	Training	Sabaki	Gazi
Sabatieria conicauda	14.53	16.67	9.45	18.46	15.16	34.07	11.42	36.92
S. lucia	2.04	1.52	16.09	2.98	0.62	11.11	8.43	6.02
S. pissina	0.00	0.00	2.84	5.69	0.00	7.04	6.91	1.18
S. aff. Furcillata	0.57	27.27	0.00	0.00	0.00	0.00	4.83	0.00
S. aff. Americana	0.00	1.52	7.40	0.00	1.04	0.00	0.45	0.00
Sabatieria sp. 1	5.40	0.00	0.00	6.67	5.43	0.00	8.00	0.00
Sabatieria sp. 2	2.63	10.61	0.47	0.82	6.49	8.33	0.45	0.93
Sabatieria sp. 3	7.64	0.00	0.76	0.00	3.28	0.00	2.38	0.00
Sabatieria sp. 4	0.00	3.03	0.00	0.00	0.00	0.00	2.95	0.00
Sabatieria sp. 5	0.00	0.00	0.00	0.00	3.57	0.00	0.00	0.00
Sabatieria sp. 6	0.00	0.00	0.00	0.00	0.42	0.00	0.00	0.00
Setosabatieria	2.26	3.03	0.00	0.00	4.64	0.00	0.45	0.00
Cervonema tenuicauda	5.32	10.61	8.62	16.21	9.50	0.00	9.51	11.36
C. minutus	9.29	6.06	0.29	2.56	6.61	3.33	3.66	0.83
C. gourbaulti	3.68	0.00	4.32	1.88	1.66	0.00	5.25	2.12
C. aff. jenseni	0.00	0.00	0.00	12.13	0.00	0.00	0.00	4.03
Cervonema sp. 1	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00
Cervonema sp. 2	0.00	0.00	0.00	0.42	1.79	0.00	0.00	2.85
Cervonema sp. 3	0.00	0.00	0.00	1.20	0.00	0.00	0.00	0.00
Cervonema sp. 4	0.00	0.00	0.00	0.56	2.10	7.41	0.00	3.25
Laimella aff. vera	0.00	0.00	0.00	0.22	0.62	0.00	0.00	1.80
L. aff. filicaudata	0.00	0.00	0.00	0.00	0.62	0.00	0.00	0.00
Laimella aff. minuta	4.76	0.00	0.29	1.73	0.00	0.00	0.79	3.09
Laimella sp. 1	0.00	3.03	1.08	6.67	5.02	8.33	2.54	1.85
Laimella sp. 2	1.86	3.03	0.00	0.42	3.64	0.00	0.83	11.11
Laimella sp. 3	0.00	7.58	0.00	0.00	3.53	0.00	0.42	0.00
Laimella sp. 4	0.00	0.00	0.00	0.69	0.00	0.00	0.00	0.51
Pierrickia sp. 1	1.02	0.00	0.00	3.33	0.62	0.00	0.00	0.00
Pierrickia sp. 2	2.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pierrickia sp. 3	0.00	0.00	1.19	0.00	0.00	0.00	0.00	0.00
Pierrickia sp. 4	0.00	0.00	1.19	0.00	0.00	0.00	0.00	0.00
Pierrickia sp. 5	0.00	0.00	0.00	0.18	0.00	0.00	0.71	0.00
Pierrickia sp. 6	0.00	0.00	0.00	0.00	0.00	0.00	0.45	1.39
Paracomesoma sp. 1	5.36	0.00	5.82	3.33	6.59	16.67	0.00	4.63
Paracomesoma sp. 2	1.79	0.00	0.00	0.22	0.71	0.00	0.48	0.00
Dorylaimopsis variabilis	9.71	0.00	30.79	0.00	7.65	0.00	21.74	0.00
D. coomansi	4.53	3.03	3.87	0.00	2.38	0.00	0.67	0.00
D. gerardi	2.48	0.00	0.42	3.96	0.62	0.00	1.41	2.17
Hopperia indiana	2.83	0.00	0.42	4.56	0.00	0.00	1.19	1.65
Hopperia sp. 1	1.14	1.52	0.18	0.00	0.71	0.00	0.00	0.00
Vasostoma sp	2.29	0.00	0.00	0.00	0.00	0.00	0.33	0.00
Kenyanema monorchis	1.46	1.52	3.21	3.89	1.24	3.70	1.72	1.39
Paramesonchium mombasi	5.36	0.00	1.04	0.28	0.62	0.00	2.00	0.93
Metasabatieria sp	0.00	0.00	0.00	0.94	3.11	0.00	0.00	0.00

1.3: Diversity

The number of species per genus varied from 1 in genus like *Setosabatieria*, *Metasabatieria* etc to 11 species in *Sabatieria*. Table 3.14 shows the number of species per genus and their distribution in the ecological groups. Generally, station groups 3 and 4 had higher number of species compared to station groups 1 and 2.

Table 3.14: Distribution of the genera and species of Comesomatidae in the ecological groups.

		Number of species in each ecological group				
	Species no.	1	2	3	4	5
Sabatieria	11	4	4	7	7	6
Setosabatieria	1	1	1	1	1	0
Cervonema	8	3	1	6	6	5
Laimella	7	4	3	6	5	1
Pierrickia	6	0	0	2	3	4
Paracomesoma	2	2	1	1	0	0
Dorylaimopsis	3	2	1	3	1	0
Hopperia	2	2	0	1	2	0
Vasostoma	1	1	0	0	0	0
Kenyanema	1	1	1	1	1	1
Paramesonchium	1	1	1	1	0	0
Metasabatieria	1	0	0	1	0	0
Total no. genera	12	10	8	11	8	5
Total no. species	44	21	13	30	26	17

Hills diversity numbers are shown in Table 3.15. In June/July the diversity of Comesomatidae was slightly higher than in Nov/Dec, although the difference was small. Diversity was highest in group 3 stations and decreased with increase in water depth in group 4 and 5. Of the two shallow water station groups, group 2 had a lower diversity than group 1.

Table 3.15: Diversity of the Comesomatidae in the Ecological groups (Hills numbers)

Groups	1	2	3	4	5	Jun/Jul	Nov/Dec	global
N_0	5.29	4.00	8.26	5.20	3.29	5.47	5.77	5.62
N_1	3.74	3.07	6.01	4.14	3.09	4.14	4.46	4.30
N_2	3.03	2.43	4.84	3.46	2.75	3.45	3.64	3.55
$N_{inf.}$	2.01	1.83	3.00	2.29	2.17	2.38	2.42	2.40
H	1.10	0.88	1.70	1.36	0.96	1.22	1.33	1.28

Diversity in the transects is shown in Table 3.16. In June/July, the Gazi transect had the highest diversity while in Nov/Dec, Kiwayu had the highest diversity. Both Kiwayu and Sabaki had higher diversity in Nov/Dec compared to June/July while Gazi had higher diversity in June/July compared to Nov/Dec.

Table 3.16: Diversity of the Comesomatidae in the transects (Hills numbers)

Periods	June/July				Nov/Dec			
Transects	Kiwayu	Tana	Sabaki	Gazi	Kiwayu	Training	Sabaki	Gazi
N_0	5.57	6.00	4.00	7.00	8.71	2.75	5.80	4.90
N_1	4.51	4.58	2.86	5.28	7.25	2.58	4.33	3.40
N_2	3.95	3.93	2.38	4.26	6.23	2.11	3.51	2.58
N_{inf}	2.92	2.91	1.72	2.63	3.98	1.56	2.36	1.74
H	1.43	1.36	0.87	1.46	1.93	0.80	1.40	1.06

In hierarchical diversity, the overall within genus diversity was higher than between genera diversity (Table 3.17 column 9). In both June/July and Nov/Dec, again within genus diversity was higher than between genera diversity, however total diversity was the same in both periods. The high between genera diversity in group 3 stations means that several more genera co-existed in these stations. And the low value in group 5 stations means that only few genera could venture in these stations. The total diversity was highest in group 3 and lowest in group 5 stations.

Table 3.17: Hierarchical diversity of the Comesomatidae in the ecological groups

Groups	1	2	3	4	5	Jun/Jul	Nov/Dec	Global
H'g	0.38	0.30	0.51	0.45	0.21	0.38	0.40	0.39
H'wg	1.95	1.84	2.23	1.88	1.75	1.96	1.84	1.95
H'T	2.33	2.14	2.74	2.33	1.96	2.34	2.34	2.34

Hierarchical diversity showed that in June/July, both between genera and within genus diversity and consequently, the total diversity were highest in the Gazi transect, while in Nov/Dec, total diversity was highest in the Sabaki transect (Table 3.18). The lowest diversity was observed in Tana in June/July and in Gazi in Nov/Dec.

Table 3.18: Hierarchical diversity of the Comesomatidae in the transects

	June/July				Nov/Dec			
	Kiwayu	Tana	Sabaki	Gazi	Kiwayu	Training	Sabaki	Gazi
H'g	0.44	0.37	0.29	0.46	0.57	0.24	0.40	0.32
H'wg	1.51	1.24	1.88	2.59	2.20	2.26	2.41	1.29
H'T	1.95	1.62	2.16	3.05	2.76	2.50	2.81	1.61

2: Discussion

The two most dominant genera of Comesomatidae (*Sabatieria* and *Cervonema*) in the WIO transects have been found at other deep-sea sites also. In the WIO *Sabatieria* was dominant at mid-depths (500-1000m). In North Carolina, Tietjen (1976) found *Sabatieria* dominant at mid-depths (600-1000m) and those were sites with sandy silt sediments. *Sabatieria* was the most dominant genus in the shelf and slope stations in the NE Atlantic and Mediterranean and the Mediterranean canyon (Soetaert & Heip, 1995). In the Laptev transect, Vanaverbeke *et al.*, (1997), found *Sabatieria* in nearly all depth. In Goban Spur, Vanaverbeke *et al.*, (1997a), found *Sabatieria* dominant upto 1425 m depth. In the Antarctica, *Sabatieria* was present at all depths except the down slope stations (2000m). The distribution of *Sabatieria* along the depth transects in different regions confirms the observation by Soetaert & Heip (1995) that *Sabatieria* becomes less dominant with increasing water depth. They proposed that this kind of trend was due to the diminishing amount of organic matter that enter the sub-oxic and anoxic regions with increasing water depth.

Most species of *Sabatieria* such as *S.conicauda, S. pissina* and *S. sp. 1* were only present in group 3 to 5 stations. Only few species were confined to group 1 and 2 and these had low abundances. *S. aff. Americana* and *S. sp 2* displayed a eurybenthic distribution.

In the Western Indian Ocean transects, *Cervonema* was found along the whole depth but was more abundant at deeper stations. In the Mediterranean Sea, *Cervonema* was present along the whole transect (Soetaert *et al.*, 1995) and in the Canyon site (Soetaert & Heip, 1995) as well. In the Laptev transect, Vanaverbeke *et al.*, (1997), found *Cervonema* was present only in the two shallowest stations. In Goban Spur, Vanaverbeke *et al.*, (1997a), *Cervonema* was present only at 2182 m station. In the Antarctica, *Cervonema* was present at the shelf of Halley Bay only (Vanhove *et al.*, 1997). The distribution of *Cervonema* in different regions shows a wide range of depths. This may be due to having several species that behave differently or having eurybenthic species. Tietjen (1984) found *Cervonema* with a high affinity of the pelagic and hemipelagic sites in the Venezuelan basin while in the Hatterras plain (Tietjen, 1989) *Cervonema* was present in silt clay sediments. In Long Island Sound, Tietjen (1977) found *Cervonema tenuicauda* in all kinds of sediment, though in low frequencies. In the WIO, *C. tenuicauda* was present at all depths while the other dominant species such as *C. minutus, C. gourbaulti and C. aff. Jensen)* were present in the deeper stations 500-1000m) only. A few less dominant species were found at group 1 and 2 stations only.

In Long Island Sound, Tietjen, (1977), found *Dorylaimopsis* in high relatively abundance in muddy sands and fine sands. In the present study, the most dominant species of *Dorylaimopsis, D. variabilis* was dominant in group 1 stations which had high silt content. The other two species had different distribution, *D. coomansi* showed a more or less eurybenthic distribution while *D. gerardi* was only present at 500m stations.

There are only few records of *Dorylaimopsis* especially in deep sea, so it is not possible to make comparisons of its distribution with other regions.

Most genera of the Comesomatidae had a large number of species but most of them were poorly represented. *Sabatieria* had the most number of species (11 species), *Cervonema* had 8, *Laimella* had 7 and *Pierrickia* 6 species. The highest diversity of the Comesomatidae was in group 3 stations and decreased with increase in depth. This was in contrast with the observation in the Chromadoridae that showed an increase in diversity with increase in depth. It seems that the diversity of Comesomatidae was influenced by the distribution of *Sabatieria* which had the highest number of species Between the two shallow stations, the highest diversity was observed in group 1 stations, seemingly most Comesomatidae were attracted to the more silty sites rather than the sandy sites as was the case with Chromadoridae.

There was slightly higher diversity in Kiwayu than in the other transects probably in response to higher productivity since slightly higher nutrient values were recorded in this transect than the other transects.

C: Microlaimidae

1.1 Genera distribution

In June/July 309 microlaimids were identified and in Nov/Dec 411 individuals were identified. Genera distribution of the Microlaimidae is shown in Appendix XIVa and XIVb. Nine genera of the Microlaimidae were identified. The most dominant genera were *Microlaimus* and *Molgolaimus*, and together they made up 70 % of the total microlaimids (Table 3.18 column 9). The rest of the genera had less than 10 % relative abundance. Three genera had less than 1 % relative abundance. The difference between the two periods was observed in the dominant genera only. *Microlaimus* had higher relative abundance in June/July (42 %) compared to Nov/Dec (28.6 %). *Molgolaimus* had higher relative abundance in Nov/Dec (38.5 %) compared to June/July (31 %). *Ixonema* also had a difference in relative abundance between June/July (1.7 %) and Nov/Dec (8.0 %).

Distribution in the ecological groups is shown in Table 3. 19 (column 2-6) and Figure 3.3. *Microlaimus* was highly dominant in group 1 and 2 stations, accounting for 55-60 % of the microlaimids. In the deeper station groups, *Microlaimus* was accounting for 22-25 %. *Molgolaimus* on the other hand was more dominant in the deeper station groups 3-5 where it accounted for 47 % and 52 % in groups 3 and 4 and for 36 % in group 5 stations. *Aponema* was found in all groups but it was rather low in group 2 stations and it was most dominant in group 1 stations. *Bolbolaimus* was absent in group 1 stations and more or less increased in relative abundance with increase in depth. *Calomicrolaimus* and *Ixonema* were both present in all the station groups, but *Calomicrolaimus* was most abundant in group 5 stations while *Ixonema* was most abundant in group 2 stations.

Table 3.19: Percentage proportion of the genera of Microlaimidae in the ecological groups

Groups	1	2	3	4	5	Jun/Jul	Nov/Dec	global
Aponema	14.68	0.89	4.19	5.54	5.71	6.07	7.32	6.69
Bolbolaimus	0.00	8.01	11.99	7.67	15.44	8.99	8.82	8.91
Calomicrolaimus	5.65	4.43	9.11	2.85	10.93	7.50	6.89	7.20
Cinctonema	0.00	4.55	1.56	0.00	0.00	1.14	0.81	0.97
Crassonema	0.00	0.00	0.00	2.16	0.00	0.48	0.20	0.34
Ixonema	6.03	10.67	2.05	3.30	5.59	1.73	8.01	4.87
Microlaimus	59.66	55.43	22.16	25.70	25.62	42.10	28.62	35.36
Spirobolbolaimus	0.00	2.12	1.08	0.00	0.64	0.57	0.82	0.70
Molgolaimus	13.98	13.90	47.85	52.77	36.08	31.42	38.50	34.96

Distribution of the genera of the microlaimids in the transects is shown in Table 3.20. In all the transects *Microlaimus* had a higher relative abundance in June/July compared to Nov/Dec. *Molgolaimus* on the other hand, had a higher relative abundance in Kiwayu and Sabaki in Nov/Dec compared to June/July and in Gazi, relative abundance for June/July was higher than for Nov/Dec. The other genera did not show preference for any transect in both campaigns.

Figure 3.3: Distribution of the genera of Microlaimidae in the ecological groups

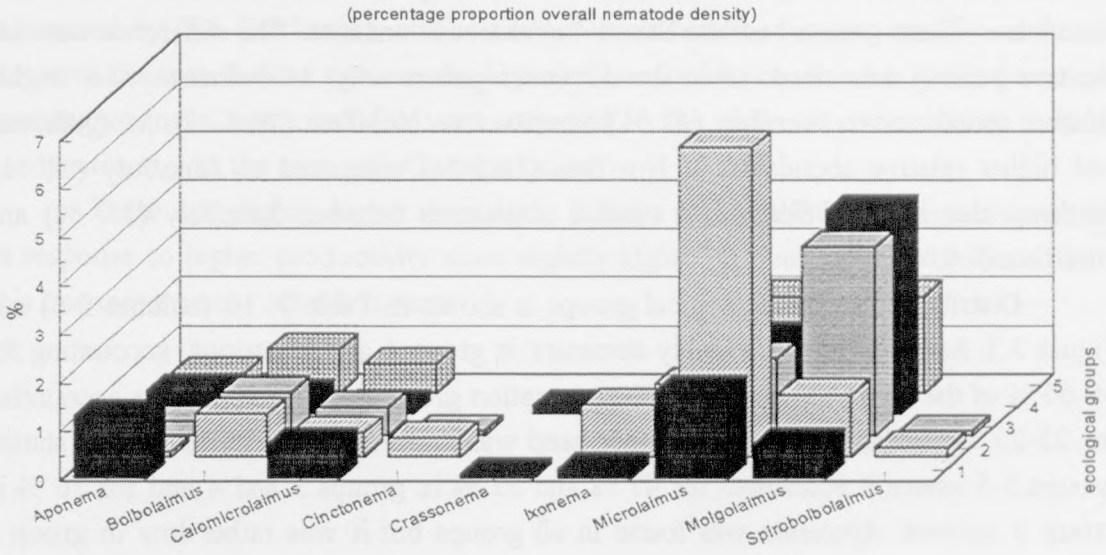


Table 3.20: Percentage proportion of the genera of Microlaimidae along the transects

Period	June/July				Nov/Dec			
Transect	Kiwayu	Tana	Sabaki	Gazi	Kiwayu	Training	Sabaki	Gazi
Aponema	3.96	5.13	9.56	3.63	5.43	0.00	13.96	4.93
Bolbolaimus	5.71	8.47	10.93	9.12	8.62	1.32	8.64	12.15
Calomicrolaimus	12.88	0.00	4.22	9.94	7.23	4.63	1.62	12.83
Cinctonema	0.00	7.41	0.00	1.43	0.00	1.32	0.00	1.97
Crassonema	0.00	0.00	0.00	1.54	0.00	0.00	0.00	0.63
Ixonema	0.89	12.17	1.04	0.00	0.00	11.19	15.15	5.20
Microlaimus	41.38	28.94	59.96	25.11	30.17	35.97	28.82	24.40
Spirobolbolaimus	0.00	0.00	1.53	0.00	0.00	2.63	0.43	1.06
Molgolaimus	35.17	37.89	12.76	49.24	48.55	42.95	31.37	36.83

1. 2: Species distribution

41 species of the Microlaimidae were identified (Appendix XVa and XVb). Dominance was low since all species had a relative abundance of less than 10 % (Table 3.21 column 9). The most dominant species were *Microlaimus texianus* and *Microlaimus sp.1a* with a relative abundance of 9 % each. The next most dominant species were *Molgolaimus abyssorum* (8 %) and *M. tyroi* (6.5 %). At least half of the species had less than 2 % relative abundance.

The difference in relative abundance of the species between June/July and Nov/Dec was minimum; *Microlaimus texianus*, *M. Sp. 1a*, *M. sp.1*, *M. sp.6* and *Molgolaimus abyssorum* had a higher abundance in June/July compared to Nov/Dec. Only *Ixonema sp. 1* had a higher relative abundance in Nov/Dec compared to June/July. The rest of the species had very small differences between the two campaigns.

The distribution in the five ecological groups (Table 3.21) does not show any depth-related trends. Some species had a high relative abundance in shallow water stations such as *Aponema sp. 2*, *Calomicrolaimus aff. conspicuus*, *Microlaimus texianus*, *Microlaimus sp. 5*, *Microlaimus sp. 6* and *Molgolaimus tanai*. Other species such as *Calomicrolaimus sp. 1*, species of *Bolbolaimus* and *Molgolaimus* had their highest relative abundance in deep water stations. *Ixonema sp. 1, Microlaimus sp. 1a, Microlaimus sp. 1, M. sp. 4, M. sp. 6, M. globiceps, Molgolaimus sabakii* and *M. sp. 4* showed a eurybenthic distribution.

Table 3.21: Percentage proportion of the species of Microlaimidae in the ecological group.

Group	1	2	3	4	5	Jun/Jul	Nov/Dec	Global
Aponema sp. 2	14.85	0.00	0.23	0.00	1.10	2.86	4.27	3.57
Aponema sp. 1	0.00	0.89	3.96	5.54	4.62	3.20	3.05	3.12
Bolbolaimus sp. 1a	0.00	2.04	2.55	0.59	6.40	3.31	1.48	2.40
Bolbolaimus sp. 2a	0.00	4.59	6.35	0.59	7.54	2.68	5.52	4.10
Bolbolaimus sp. 1	0.00	0.75	2.76	6.50	1.50	3.01	1.48	2.24
Bolbolaimus sp. 2	0.00	0.00	0.33	0.00	0.00	0.00	0.20	0.10
Bolbolaimus sp. 3	0.00	0.62	0.00	0.00	0.00	0.00	0.14	0.07
Calomicrolaimus sp. 1	0.00	0.00	8.92	2.09	10.93	5.31	5.24	5.28
C. aff. conspicuus	6.60	4.43	0.19	0.77	0.00	2.19	1.65	1.92
Cinctonema sp.	0.00	4.55	1.56	0.00	0.00	1.14	0.81	0.97
Crassonema sp.	0.00	0.00	0.00	2.16	0.00	0.48	0.20	0.34
Ixonema sp. 1	8.88	10.67	2.05	3.30	5.59	1.73	8.01	4.87
Microlaimus texianus	31.65	1.14	2.61	0.63	0.00	11.35	6.79	9.07
Microlaimus sp. 1a	1.97	10.96	3.94	13.78	16.92	10.56	7.23	8.89
Microlaimus sp. 2a	0.00	7.59	0.00	0.00	0.85	0.16	1.90	1.03
Microlaimus sp.1	6.35	1.32	1.54	1.62	0.73	3.68	0.73	2.21
Microlaimus sp. 2	0.00	0.00	1.93	0.00	1.09	0.70	0.91	0.81
Microlaimus sp. 3	0.00	0.00	0.00	1.00	0.00	0.00	0.32	0.16
Microlaimus sp. 4	2.27	5.98	1.42	2.59	0.90	1.44	2.83	2.14
Microlaimus sp. 5	0.00	7.60	0.94	1.00	1.34	0.73	2.42	1.58
Microlaimus sp. 6	10.42	0.00	1.06	2.73	0.70	4.48	1.23	2.86
Microlaimus sp. 7	0.76	1.07	0.38	0.00	0.00	0.00	0.76	0.38
Microlaimus sp.	1.67	2.08	2.06	0.59	0.00	1.46	1.06	1.26
M. globiceps	0.52	5.40	5.37	1.77	2.22	4.76	1.30	3.03
M. aff. cochleatus	0.00	1.50	0.38	0.00	0.00	0.22	0.34	0.28
M. aff. zosterae	0.00	10.78	0.00	0.00	0.00	2.23	0.42	1.33
M. aff. macrocirculus	0.00	0.00	0.53	0.00	0.85	0.31	0.36	0.34
Spirobolbolaimus sp.	0.00	2.12	1.08	0.00	0.64	0.57	0.82	0.70
Molgolaimus tyroi	0.93	0.00	12.34	9.78	5.66	5.57	7.34	6.46
M. abyssorum	0.00	4.05	8.78	9.56	16.86	9.06	7.09	8.08
M. gazii	0.00	1.50	5.25	5.44	3.23	2.21	4.38	3.30
M. sabakii	2.78	1.37	4.97	8.23	2.44	2.93	4.00	3.47
M. kiwayui	0.00	0.00	3.65	4.13	2.55	2.21	2.36	2.28
M. tanai	6.65	0.00	0.99	0.00	0.00	2.12	3.25	2.68
Molgolaimus sp. 1	1.39	0.00	3.00	4.77	0.00	1.18	2.69	1.94
Molgolaimus sp. 2	0.64	0.00	3.38	2.67	0.00	0.72	2.84	1.78
Molgolaimus sp. 3	0.93	0.00	1.04	2.93	0.00	0.57	1.00	0.78
Molgolaimus sp. 4	0.76	6.53	4.23	4.36	3.14	4.66	2.27	3.47
Molgolaimus sp. 5	0.00	0.00	0.00	0.00	1.74	0.00	0.73	0.36
Molgolaimus sp. 6	0.00	0.00	0.23	0.00	0.00	0.00	0.14	0.07
Molgolaimus sp. 7	0.00	0.45	0.00	0.91	0.00	0.00	0.39	0.20
Molgolaimus sp.	0.00	0.00	0.00	0.00	0.45	0.18	0.00	0.09

The distribution in the transects is shown in Table 3.22. Some species had consistently high relative abundances in the same transect in both periods. *Aponema sp. 2*, *Ixonema sp. 1* and *Microlaimus sp. 1* had high abundance in the Sabaki transect in both periods. *Aponema sp. 1*, *Bolbolaimus sp. 1a*, *Calomicrolaimus aff. conspicuus*, *Microlaimus sp. 1a*, *Molgolaimus kiwayui*, *M. tanai*, *Molgolaimus sp.1* and *Molgolaimus sp.2* all had their highest relative abundance in the Kiwayu transect. Other species had their highest abundance in the Gazi transect such as *Calomicrolaimus sp. 1* and three *Molgolaimus* sp., *M. tyroi*, *M. abyssorum* and *M. gazii*. Most of the other species did not show any consistent trend.

Table 3.22: Percentage proportion of the species of Microlaimidae along the transects

	June/July				Nov/Dec			
Transect	Kiwayu	Tana	Sabaki	Gazi	Kiwayu	Training	Sabaki	Gazi
Aponema sp. 2	0.00	0.00	7.64	0.00	0.00	0.00	13.24	0.00
Aponema sp. 1	3.96	5.13	1.92	3.63	5.43	0.00	0.71	4.93
Bolbolaimus sp. 1 a	5.71	4.76	4.30	0.00	5.73	0.00	0.00	0.59
Bolbolaimus sp. 2a	0.00	3.70	3.51	3.25	1.30	1.32	7.73	7.93
Bolbolaimus sp. 1	0.00	0.00	3.13	5.87	1.59	0.00	0.91	2.57
Bolbolaimus sp. 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63
Bolbolaimus sp. 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43
Calomicrolaimus sp. 1	3.96	0.00	4.22	9.17	4.85	0.00	1.62	11.23
C. aff. Conspicuus	8.93	0.00	0.00	0.77	2.38	4.63	0.00	1.61
Cinctonema sp.	0.00	7.41	0.00	1.43	0.00	1.32	0.00	1.97
Crassonema sp.	0.00	0.00	0.00	1.54	0.00	0.00	0.00	0.63
Ixonema sp. 1	0.89	12.17	1.04	0.00	0.00	11.19	15.15	5.20
Microlaimus texianus	3.75	0.00	28.08	0.00	12.50	4.78	9.77	0.63
Microlaimus sp. 1a	16.38	2.56	13.50	5.35	12.08	10.09	5.05	4.85
Microlaimus sp. 2a	0.00	0.00	0.00	0.53	0.00	2.32	0.00	4.97
Microlaimus sp.1	3.75	0.00	4.96	3.21	0.00	2.32	1.34	0.00
Microlaimus sp. 2	0.84	0.00	0.00	1.67	2.86	0.00	0.00	0.83
Microlaimus sp. 3	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
Microlaimus sp. 4	4.28	2.56	0.69	0.00	1.43	3.00	3.60	2.99
Microlaimus sp. 5	1.30	0.00	0.00	1.43	0.00	1.32	1.00	5.99
Microlaimus sp. 6	5.19	0.00	8.93	0.00	0.00	0.00	3.80	0.00
Microlaimus sp. 7	0.00	0.00	0.00	0.00	0.00	0.00	0.91	1.46
Microlaimus sp.	2.86	0.00	1.18	1.24	0.00	5.89	0.00	0.95
M. globiceps	3.03	0.00	1.79	10.97	1.30	2.63	1.43	0.63
M. aff. Cochleatus	0.00	0.00	0.00	0.71	0.00	2.63	0.00	0.00
M. aff. Zosterae	0.00	23.81	0.00	0.00	0.00	1.00	0.91	0.00
M. aff. Macrocirculus	0.00	0.00	0.83	0.00	0.00	0.00	0.00	1.11
Spirobolbolaimus sp.	0.00	0.00	1.53	0.00	0.00	2.63	0.43	1.06
Molgolaimus tyroi	0.00	2.56	2.03	14.62	4.68	13.49	6.01	8.07
M. abyssorum	5.64	3.70	5.26	17.63	4.68	4.32	6.08	10.92
M. gazii	2.52	7.69	0.40	2.54	2.34	3.57	2.58	7.93
M. sabakii	1.30	5.13	1.74	4.86	1.30	13.22	5.16	1.06
M. kiwayui	6.53	0.00	0.83	1.48	5.48	3.57	0.00	2.05
M. tanai	6.81	0.00	1.67	0.00	11.11	0.00	2.31	0.00
Molgolaimus sp. 1	1.10	0.00	0.00	3.02	8.41	0.00	0.00	2.46
Molgolaimus sp. 2	3.30	0.00	0.00	0.00	7.66	0.00	1.68	1.76
Molgolaimus sp. 3	2.60	0.00	0.00	0.00	1.59	2.78	0.87	0.00
Molgolaimus sp. 4	4.54	18.80	0.83	5.10	1.30	2.00	3.92	1.42
Molgolaimus sp. 5	0.00	0.00	0.00	0.00	0.00	0.00	1.43	0.83
Molgolaimus sp. 6	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.00
Molgolaimus sp. 7	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.31
Molgolaimus sp.	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00

1.3: Diversity

The number of genera and species per ecological group is shown in Table 3.23. *Microlaimus* had the highest number of species (15) followed by *Molgolaimus* (14). The ecological groups 2 and 3 stations had the highest number of genera. The highest number of species was recorded in group 3 stations.

Table 3.23: Distribution of genera and species of Microlaimidae in the ecological groups

	number of species	Ecological groups				
		1	2	3	4	5
Aponema	2	1	1	2	1	2
Bolbolaimus	5	0	4	4	3	3
Calomicrolaimus	2	1	1	2	2	1
Cinctonema	1	0	1	1	0	0
Crassonema	1	0	0	0	1	0
Ixonema	1	1	1	1	1	1
Microlaimus	15	8	11	12	9	9
Spirobolbolaimus	1	0	1	1	0	1
Molgolaimus	14	7	5	11	10	8
Total no. genera	9	5	8	8	7	7
Total no. species	52	18	25	35	27	25

Species diversity using Hill's diversity numbers gave an average of 6.11 (Table 3.24). Nov/Dec had a higher diversity compared to June/July. Group 2 stations had the highest diversity and group 1 stations had the lowest diversity. Group 3 and 4 had nearly equal diversity.

Table 3.24: Diversity of the species of Microlaimidae in the ecological groups (Hills numbers)

Groups	1	2	3	4	5	June/July	Nov/Dec	Global
N_0	2.64	9.00	7.05	7.80	5.62	5.03	7.23	6.11
N_1	2.41	7.71	6.12	7.08	4.80	4.44	6.30	5.35
N_2	2.08	6.79	5.44	6.44	4.19	3.90	5.62	4.74
N_{inf}	1.68	4.35	3.62	4.23	2.99	2.63	3.86	3.24
H	0.74	1.92	1.75	1.92	1.41	1.27	1.75	1.50

The diversity in the transects is shown in Table 3.25. All the transects had higher diversity in Nov/Dec compared to June/July. In June/July, Kiwayu had the highest diversity of all transects and in Nov/Dec, Gazi had the highest diversity of all transects beside the Training transect. In Nov/Dec, the diversity increased from the northern to the southern transect, (Training transect was in the vicinity of Gazi).

Table 3.25: Diversity of Microlaimidae in the transects (using Hills numbers)

Periods	June/July				Nov/Dec			
Transect	Kiwayu	Tana	Sabaki	Gazi	Kiwayu	Training	Sabaki	Gazi
N_0	5.71	5.00	4.15	5.40	5.71	9.00	6.10	8.70
N_1	4.63	4.38	3.81	4.89	5.22	8.05	5.38	7.27
N_2	3.98	3.97	3.30	4.41	4.82	7.22	4.86	6.29
N_{inf}	2.61	2.91	2.23	3.01	3.54	4.75	3.56	4.04
H	1.47	1.39	0.97	1.42	1.60	1.99	1.54	1.95

Hierarchical diversity in the ecological groups and in the two periods is shown in Table 3.26. Overall, between genera diversity was lower than the within genus diversity. Nov/Dec had higher both between genera and within genus diversities compared to June/July. Group 2 stations again had the highest between genera and within genus diversity. Group 1 stations had the lowest diversity of both hierarchical levels.

Table 3.26: Hierarchical diversity of the Microlaimidae in the ecological group

Group	1	2	3	4	5	June/July	Nov/Dec	Global
H'g	0.23	0.47	0.45	0.43	0.42	0.33	0.46	0.40
H'wg	0.43	2.35	1.46	1.87	1.10	1.12	1.52	1.32
H'T	0.66	2.82	1.91	2.30	1.52	1.46	1.98	1.72

The hierarchical diversity in the transects is shown in Table 3.27. In all the transects between genera diversity was lower than within genus diversity. In June/July, Kiwayu had the highest diversity while in Nov/Dec, Gazi had the highest diversity next to the Training transect. All the transects had higher between genera diversities in Nov/ Dec compared to June/July.

Table 3.27: Hierarchical diversity of Microlaimidae in the transects

Periods	June/July				Nov/Dec			
Transects	Kiwayu	Tana	Sabaki	Gazi	Kiwayu	Training	Sabaki	Gazi
H'g	0.29	0.42	0.30	0.36	0.45	0.45	0.42	0.52
H'wg	1.99	0.73	0.56	1.31	0.99	2.65	1.14	1.82
H'T	2.29	1.15	0.87	1.67	1.45	3.09	1.55	2.34

2 : Discussion

The most dominant genera in the family Microlaimidae were *Microlaimus* and *Molgolaimus*. Both genera were present at all depths but *Microlaimus* was more dominant in the shallow station groups 1 and 2 and *Molgolaimus* was more dominant at mid-depth. In the North Carolina transect, *Microlaimus* was present at all depths but had higher relative abundance at 230-500m and at 1250-1500m (Tietjen, 1976). In the NE Atlantic, *Microlaimus* was present at all depths and this was also the case with the Mediterranean Canyon (Soetaert & Heip, 1995). In the Mediterranean Sea, it was present upto a depth of 530m with a peak at 280m (Soetaert *et al.*, 1995). In the Laptev transect, (Vanaverbeke *et al.*, 1997) it was present at 65m and 2000m while at the Goban Spur, NE Atlantic, (Vanaverbeke *et al.* 1997a) *Microlaimus* was present at all depth. In the Antarctic, *Microlaimus* was present at all depths except the at shelf-break, where it was not even among the sub-dominant genera (Vanhove *et al.*, 1997). It appears that, *Microlaimus* occurs at all depths but with peaks at different depths in different sites.

In the Long Island Sound, *Microlaimus* was mainly present in the sandy sites (Tietjen, 1977). *Microlaimus* was found in sandy sites in the Venezuelan basin (Tietjen, 1984), the Hatterras plain and in Puerto Rico (Tietjen, 1989) as well. In the Laptev Sea, high abundance of *Microlaimus* at the shelf stations was associated with high oxygenation of the sediments. In this study, *Microlaimus* was dominant in shallow stations (group 2) which had a high sand content. Only a few species had their highest abundance in silty deep sites; *M. sp. 1a* had a high relative abundance in group 4 and 5 station and *M. globiceps* had its highest abundance in group 3 but it was well represented in group 2 stations as well.

Molgolaimus on the other hand was dominant in deeper stations in this study. *Molgolaimus* was present at all depths but it was more dominant in the shallow depths in the Mediterranean transect however (Soetaert *et al.*, 1995). In the Laptev transect, it was present only in the two shallow stations (Vanaverbeke *et al.*, 1997). In the Puerto Rico trench, it was present in station 5 (2200m) only which had the highest sand fraction (Tietjen, 1989). In the Great Barrier Reef, *Molgolaimus* was present in four stations and absent in one station showing had the highest mud content (Tietjen, 1991). In the present study, *Molgolaimus* was found more dominant at 500-1000m depths, coinciding with OMZ. In the Fiji Basin, Vanreusel *et al.*, (1997) found *Molgolaimus* in high abundance near the edges of the hydrothermal vents. Vanhove *et al.*, (1997) observed that *Molgolaimus* was the dominant genus in the nematode assemblage adapted to living in ice-berg disturbed areas. It seems that *Molgolaimus* occurs in areas with severe conditions beng a highly adaptable genus.

Most other genera of Microlaimidae are less reported probably because they are found in low abundances or they are absent altogether. In this study, *Aponema* was present in all the transects except the course sandy stations of group 2. *Aponema sp. 2* had a high relative abundance in group 1 while *Aponema sp. 1* was present in all groups. In this study, *Ixonema* was present in all the transects while *Bolbolaimus* had higher

relative abundance in deeper stations. In the Mediterranean transect, distribution of *Ixonema* was similar to this study but *Bolbolaimus* was more dominant in the shallower stations upto 500m.

Diversity of the microlaimids was highest in group 2 and 4 but the average number of species (N_0) was highest in group 2. In group 2, within genus diversity was quite high, seemingly due to a high number of species of *Microlaimus*. In group 4 stations, the next most diverse group, the within genus diversity was again quite high, probably because of the high number of species of *Molgolaimus*.

Summary

Acantholaimus was the most dominant genus of the Chromadoridae especially in the three deep groups of stations. It also had a high number of species. This contributed to the high total diversity especially in the deeper station groups rendering diversity in Chromadoridae to increase with increasing depth. Thus, species diversity of Chromadoridae was very much influenced by *Acantholaimus*. In group 2, the second most diverse group, the highest between genera diversity was observed and this decreased with increasing depth. The more sandy sediment in group 2 stations provided a high diversity of micro- habitats for more genera to co-exist (this may also be indicative of a preference for sandy sediments by most Chromadoridae genera). Temporal variation was observed between the two seasons. High diversity was observed in Nov/Dec compared to June/July. In both period, diversity was higher in the northern transects compared to the southern transects.

The most dominant genera of Comesomatidae were *Sabatieria* and *Cervonema* and they were most abundant at mid-depths (group 3 and 4). The between genera diversity was highest in group 3 and 4 stations. The total diversity was highest in group 3 and lowest in group 2 and 5. It seems that diversity of the Comesomatidae was influenced by the distribution of *Sabatieria* which had the highest number of species. Generally, most genera of Comesomatidae appeared to avoid sites with course sandy (group 2) sediment. They had an affinity for group 4 stations, probably because of the relatively lower oxygen concentration. Temporal variation in diversity was not very clear. However, the two northern transects, Kiwayu and Sabaki had a lower diversity in June/July than the Gazi transect. In Nov/Dec, diversity increased from south to north.

The most dominant genera of the Microlaimidae were *Microlaimus* and *Molgolaimus*. *Microlaimus* was more dominant at shallow stations with a sandy sediments while *Molgolaimus* was dominant at mid-depths which were at OMZ. The diversity of the Microlaimidae was lowest in group 1 and highest in group 2 and 4 stations. Temporal variation was observed in the total diversity; there was a higher diversity in Nov/Dec compared to June/July. In June/July, diversity was higher in the northern transect while it was higher in the Gazi transect during Nov/Dec.

GENERAL CONCLUSION

Nematode taxonomy

Taxonomy was done for three nematode families (Chromadoridae, Comesomatidae, Microlaimidae + *Molgolaimus*). From these families, 55 species of nematodes were described out of which 75 % were new to science. This suggests that a lot of new species remain to be described from the deep sea.

Nematode assemblages

Nematode structure was influenced by

- depth; Three groups of nematodes were recognised
  - group A and B at 20-200m
  - group C at 500-1000m and
  - group D at 1000-2000m
- sediment composition; Groups A and B which were at similar depth are distinguished by;
  - group A having sandy sediments with high proportion of silt
  - group B having course sandy sediments
- seasonality

A temporal variation was observed especially in 500-2000m stations. This variation is attributed to a difference in oxygen content in the water column. In June/July oxygen content was much higher with a much deeper oxygen minimum zone than in Nov/Dec.

Species distribution and diversity

- Most genera and species had a higher relative abundance at shallower stations compared to the deeper ones, except *Acantholaimus* and *Monhystera* which increased in relative abundance with increasing depth.
- Genus diversity showed a parabolic trend being highest at 500m depth.

In Chromadoridae however, species diversity increased with increasing depth due to a high number of species in the genus *Acantholaimus*. In Microlaimidae, the highest diversity was observed in group 2 (50-200m) stations while in Comesomatidae the highest diversity was observed at mid-depths (500m) and decreased with increasing depth.

- Diversity was generally higher during Nov/Dec campaign compared to June/July.
- Spatial variation in diversity was observed with the northern transect having a higher diversity compared to the southern transects in most cases.
- Temporal variation in diversity was also observed; at 500m depth, genus diversity was higher in June/July campaign compared to Nov/Dec probably as a response to a higher oxygen content of the water as a result of deeper mixing of the water during Southeast monsoon period.

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APPENDICES

LIST OF APPENDICES

PART I

PART II

APPENDIX I to IX
FOR PART II

Appendix Ia: Samples used from first campaign (June/July) x-sample, () water depth, labels as used for TWINSPAN

June/July Transect↓	Labels→ Stations↓	unreplicated	A Box 1	B Box 2	C Incubation 1	D Incubation 2	E Lander 1	F Lander 2	G a	H b
Kiwayu	127 (20m)	x								
	128 (50m)	x								
	131 (500m)	x								
	132 (1000)	x								
	133(2000m)				x		x	x		
Tana	120 (20m)	x								
	121 (50m)	x								
	136 (1000)	x								
Sabaki	108 (20m)				x	x				
	111 (50m)			x						
	114 (200m)		x				x	x		
	117 (500m)		x	x	x					
	118(1000m)	x								
	119(2000m)				x	x				
Gazi	103 (50m)				x					
	105 (500m)		x	x	x		x	x		
	106(1000m)				x	x				
	107(2000m)								x	x

Appendix Ib: Samples used from second campaign (Nov/Dec) x-sample, () water depth, labels as used for TWINSPAN

Nov/Dec Transect ↓	Labels → Stations ↓	A Box 1	B Box 2	E Lander 1	F Lander 2
Kiwayu	528 (50m)	x	x		
	531 (500m)	x	x		
	532 (1000m)	x	x		
	533 (2000m)	x	x		
Sabaki	511 (50m)	x	x		
	514 (200m)	x	x		
	517 (500m)	x	x		
	518 (1000m)	x	x		
	519 (2000m)	x	x		
Gazi	503 (50m)	x	x		
	505 (500m)	x	x	x	x
	506 (1000m)	x	x		
	507 (2000m)	x	x		
Training	550 (50m)	x	x		
	552 (500m)	x	x		

Appendix IIa: Mean depth, nematode diversity and density and sediment composition per station for June/July

Stations	127	128	131	132	133	120	121	136	108	111	114	117	118	119	103	105	106	107
Depth	24	55	500	1000	2015	21	52	992	18	53	213	500	1112	2007	62	511	1000	2053
Mean density	927	669	445	200	260	238	112	211	1350	358	299	295	443	284	667	309	215	176
SCOC (deck)		36.00	5.50	2.20	4.20	23.90	10.00	5.00		20.30	14.20	4.10	1.90	1.10	12.50	2.40	1.30	0.00
DNA:RNA		0.20	0.15	0.14	0.14					0.16		0.13	0.18	0.13	0.19	0.10	0.11	0.00
Oxygen (µM)		254.00	203.00	100.00	190.00					246.00	167.00	182.00		194	247	176	100	
Oxygen (%)		124.00	71.00	34.00	56.00					120.00	66.00	66.00		57	121	61	33	
No	52	31	57	56	42	48	45	46	24	40	40	48	48	55	59	63	53	34
H	3.42	2.91	3.43	3.27	2.85	3.22	3.45	3.12	1.98	3.01	2.96	3.07	3.16	3.20	3.34	3.56	3.44	2.46
N1	30.49	18.42	30.76	26.29	17.37	25.02	31.59	22.56	7.27	20.33	19.52	21.62	23.64	24.61	28.30	35.39	31.52	11.82
N2	25.62	14.26	32.24	38.75	14.17	22.55	37.19	20.50	4.47	22.42	15.88	28.48	28.10	18.24	29.99	29.59	28.95	8.58
Ninf	0.0010	0.0006	0.0015	0.0011	0.0005	0.0008	0.0018	0.0007	0.0003	0.0008	0.0006	0.0009	0.0008	0.0005	0.0010	0.0011	0.0013	0.0003

Appendix IIb: Mean depth, nematode diversity and density and sediment composition per station for Nov/ Dec

Stations	528	531	532	533	550	552	511	514	517	518	519	503	505	506	507
Depth	39	516	904	2027	51	500	57	207	508	963	2179	47	520	1020	2088
Mean density	661	317	332	488	570	274	392	355	288	189	360	430	222	215	194
OrgC%	1.01	1.15	0.99	0.67	0.22	0.48	0.49	0.34		0.36	0.59	0.24	0.31	0.50	0.51
C:N (mol)	10.39	9.39	9.09	8.71	6.82	8.38	8.30	8.88	12.87	8.33	8.64	7.62	9.39	8.27	8.25
SCOC (deck)	31.50	4.90	1.40	1.90			16.70	9.80	4.90	1.50	2.80	12.20	2.30	0.90	2.40
DNA:RNA	0.32	0.16	0.12	0.14			0.17		0.12	0.13	0.14	0.22	0.12	0.13	0.11
Oxygen (µM)	197.00	135.00	76.00	140.00			186.00		122.00	71.00	143.00	197.00	150.00	66.00	144.00
Oxygen (%)	94.00	47.00	25.00	41.00			89.00		42.00	23.00	42.00	96.00	52.00	21.00	43.00
SD50MUc	32.57	25.84	32.79	13.61	147.01	78.36	77.53	340.00		196.67	10.46	188.20	46.26	62.70	13.87
Smedium%	10.70	0.67	6.51	0.22	8.22	6.77	2.00	47.42		34.74	0.00	24.01	6.54	13.40	3.92
Sfines%	13.76	11.66	13.52	7.06	53.63	26.61	26.45	2.86		18.89	2.60	54.92	22.17	17.65	4.81
Svfines%	12.27	14.46	14.08	9.05	24.69	21.59	27.86	2.71		8.81	2.46	12.79	14.79	16.52	6.19
Ssilt16	29.66	29.89	26.34	55.74	5.06	20.76	20.31	14.01		15.80	66.04	3.51	28.20	29.62	54.54
Ssilt50	56.68	68.02	59.31	76.68	9.46	9.46	38.29	31.27		27.01	89.23	6.24	50.90	44.51	77.69
SSilt63	60.67	73.20	65.00	83.66	12.58	44.05	43.50	33.11		29.92	94.97	7.69	55.57	49.92	84.22
SSkew	-0.07	-0.01	-0.04	-0.09	0.36	0.37	0.47	0.78		0.55	-0.02	0.30	0.16	0.24	-0.11
No	49	56	55	52	55	45	51	47	57	44	43	57	56	52	37
H	3.04	3.31	3.31	3.18	3.49	3.19	3.37	3.17	3.37	3.16	2.70	3.42	3.40	3.24	2.72
N1	21.14	28.27	27.40	24.15	32.90	24.50	29.00	24.16	29.44	23.56	14.95	30.59	30.64	25.89	15.38
N2	11.96	28.83	27.20	17.52	29.08	27.89	22.60	19.31	30.37	23.39	10.95	30.00	26.34	19.21	14.03
Ninf	0.0005	0.0010	0.0009	0.0007	0.0010	0.0012	0.0008	0.0007	0.0011	0.0009	0.0004	0.0008	0.0010	0.0007	0.0005

Abbreviations for sediment

SD50Muc Sediment Median grain size D50 calculated in mu
Smedium % Sediment Medium sand fraction PHI 1-2
Sfines % Sediment fine sand %
Ssilt16 % Sediment silt %< 16 mu
Ssilt 50% Sediment silt %< 50 mu
Ssilt 63% Sediment silt %< 63 mu

Appendix IIIa: Percentage proportion of nematode families identified during June/July

	127	128	131E	132E	133C	133D	133E	120E	121	136	108E	108F	111B	114A	114C	114D	117A	117B	117E	118	119E	119F	103E	105A	105B	105C	105D	105E	106E	106F	107G	107H
Chromadoridae	13.98	4.67	2.45	5.16	6.13	13.73	12.30	16.17	11.24	2.58	2.99	3.17	1.88	11.46	8.99	6.82	7.34	8.87	6.25	6.04	8.00	10.53	4.81	1.72	2.33	7.19	1.17	6.96	7.14	1.21	8.86	3.45
Comesomatidae	11.83	19.63	16.56	9.68	4.91	2.61	8.56	14.37	13.48	14.84	15.92	3.70	13.13	1.04	25.40	9.09	12.43	7.26	19.38	8.05	1.14	4.09	2.14	26.44	31.98	14.37	21.64	15.19	15.31	15.15	3.80	0.57
Ethmolaimidae	0.54	0.93	1.84	0.00	0.61	0.00	0.00	0.00	5.62	0.65	6.97	3.70	4.38	7.29	1.06	0.00	1.13	0.00	0.63	0.00	0.00	1.17	0.53	1.72	0.00	0.60	1.75	0.00	1.02	0.00	0.00	0.00
Cyatholaimidae	6.45	1.87	2.45	3.23	2.45	9.80	3.21	7.19	4.49	3.23	0.50	0.53	2.50	7.29	3.17	10.80	2.82	11.29	1.25	4.03	1.71	5.26	6.42	5.75	5.23	8.98	5.26	3.16	7.14	6.06	0.00	2.87
Selachinematidae	0.54	0.93	1.23	0.00	0.00	0.65	1.60	0.60	2.25	1.29	0.00	0.00	6.25	2.08	1.06	0.57	5.65	3.23	3.75	4.03	0.00	0.00	3.74	6.32	4.65	5.99	1.17	3.80	1.02	1.82	1.27	1.15
Desmodoridae	5.91	14.02	1.23	3.23	0.00	0.00	0.53	5.99	14.61	0.00	0.00	0.00	7.50	8.33	0.00	2.27	1.69	4.84	4.38	2.68	1.14	1.75	5.88	2.30	1.16	1.20	2.92	4.43	2.04	1.21	1.27	0.00
Microlaimidae	9.68	4.67	7.98	7.10	3.07	7.19	9.09	5.39	7.87	8.39	1.00	1.59	7.50	1.04	1.06	2.84	13.56	8.06	9.38	2.68	12.00	7.02	10.16	4.02	2.91	8.98	7.02	3.80	13.27	8.48	1.27	1.15
Leptolaimidae	3.23	3.74	4.29	9.68	8.59	1.31	4.81	4.79	1.12	7.74	2.49	1.06	5.00	2.08	3.17	2.27	0.56	2.42	3.13	6.71	3.43	2.92	2.67	2.87	4.65	3.59	1.75	8.23	2.04	4.24	3.80	6.32
Haliplectidae	0.00	0.00	0.61	0.00	0.00	0.65	1.07	1.20	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	1.15	0.58	0.60	0.58	0.00	1.02	0.61	1.27	0.00
Tarvaiidae	1.08	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.63	0.00	0.00	0.58	1.07	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.00	0.00
Aeglaloalaimidae	1.08	1.87	1.84	6.45	1.84	1.31	4.28	0.60	0.00	3.87	0.00	0.00	1.88	0.00	0.53	0.57	2.26	0.81	1.25	3.36	8.57	5.26	2.67	2.30	2.91	4.19	4.68	4.43	1.02	2.42	0.00	2.87
Tubolaimidae	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ceramonematidae	6.45	0.00	1.23	2.58	0.00	0.65	0.53	0.60	2.25	1.94	0.00	0.00	1.25	2.08	0.00	0.00	3.39	11.29	0.63	2.01	1.71	2.34	2.67	1.72	1.16	1.80	0.58	2.53	4.08	0.61	0.00	0.57
Paramicrolaimidae	0.00	0.00	0.00	1.29	0.00	0.00	0.53	0.00	1.12	0.00	0.00	0.00	0.00	3.13	0.00	0.57	0.00	0.81	1.25	0.00	0.57	0.00	0.00	0.57	1.16	0.60	0.00	1.27	2.04	0.00	0.00	0.00
Meyliidae	0.54	0.00	0.00	0.00	0.00	1.31	0.53	0.00	0.00	0.00	0.50	0.00	1.25	0.00	0.00	0.00	0.56	0.00	1.88	0.00	0.00	0.00	0.00	1.72	0.58	0.00	0.00	0.00	0.00	1.21	0.00	0.00
Desmoscolecidae	0.54	0.00	1.84	2.58	1.84	2.61	3.21	1.20	1.12	0.65	0.50	0.00	5.00	1.04	1.06	1.70	2.82	1.61	3.75	4.03	2.29	3.51	9.09	0.57	0.58	1.20	1.17	6.33	10.20	1.82	1.27	2.30
Monhysteridae	1.61	8.41	3.07	13.55	39.88	35.95	15.51	5.39	5.62	18.06	0.50	1.59	8.13	7.29	4.23	7.95	13.56	4.84	11.25	22.82	27.43	24.56	2.14	1.15	2.33	2.40	7.60	6.33	13.27	15.76	36.71	48.28
Xyalidae	26.88	13.08	15.34	12.26	4.29	1.96	6.95	15.57	14.61	6.45	6.47	21.69	10.63	22.92	23.28	26.14	6.78	14.52	10.63	10.07	11.43	8.77	33.69	14.94	15.70	15.57	11.70	12.03	9.18	12.12	10.13	5.17
Sphaerolaimidae	0.54	0.00	1.84	0.65	0.61	0.65	3.74	1.20	0.00	1.29	0.00	0.00	1.88	4.17	2.12	2.84	0.00	0.00	1.25	2.01	2.29	1.75	0.53	1.15	0.58	1.20	1.17	0.00	0.00	1.21	0.00	6.32
Siphonolaimidae	0.00	0.00	7.36	1.29	0.00	0.00	0.00	0.00	3.37	0.00	0.00	0.00	0.63	1.04	0.53	0.00	0.00	0.00	0.63	0.00	0.57	0.00	1.07	0.57	0.58	0.60	0.00	0.00	0.00	0.61	0.00	0.00
Linhomoeidae	1.08	12.15	9.82	5.16	3.68	1.31	1.60	0.00	2.25	3.23	48.76	28.04	10.00	3.13	6.35	1.14	1.69	1.61	1.88	4.70	2.29	3.51	0.53	6.32	5.81	4.19	1.17	6.33	1.02	4.24	3.80	2.87
Axonolaimidae	0.54	2.80	1.23	0.00	0.61	0.00	1.60	0.00	0.00	0.00	1.49	1.06	0.00	3.13	3.70	0.00	2.26	0.81	0.00	0.00	0.00	0.00	0.00	3.45	0.00	0.60	2.92	0.00	0.00	0.00	0.00	0.00
Diplopeltidae	0.54	0.93	4.91	1.29	1.84	2.61	3.21	1.80	1.12	1.94	1.00	0.00	0.63	1.04	2.12	2.84	1.13	3.23	0.63	3.36	3.43	1.75	0.53	0.00	2.91	1.20	1.75	1.90	1.02	3.03	0.00	3.45
Coninckiidae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thoracostomopsidae	0.54	0.00	0.00	0.00	1.23	0.00	0.53	4.19	0.00	0.00	0.50	0.00	0.00	0.00	0.53	1.14	0.00	0.00	0.00	0.00	1.14	0.58	0.53	0.00	0.00	0.60	1.17	0.00	0.00	0.00	0.00	0.00
Anoplostomatidae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00
Phanodermatidae	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00
Anticomidae	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ironidae	0.00	0.00	0.00	0.65	3.68	1.31	2.14	1.20	0.00	3.23	0.00	0.00	0.63	0.00	0.00	0.00	3.95	1.61	2.50	1.34	1.71	0.58	0.00	0.57	1.16	1.20	2.34	1.27	1.02	2.42	7.59	0.00
Oxystomatidae	2.69	4.67	6.75	8.39	12.27	10.46	6.95	7.19	2.25	14.19	1.99	3.70	2.50	5.21	9.52	18.18	12.43	4.03	11.25	6.04	5.71	6.43	4.28	8.05	8.72	8.38	14.62	9.49	5.10	11.52	12.66	7.47
Oncholaimidae	2.69	1.87	1.23	2.58	0.00	0.00	1.60	1.80	0.00	0.65	3.98	26.46	2.50	4.17	0.00	0.57	0.00	0.00	0.63	2.01	1.71	0.58	1.07	0.00	0.58	0.60	0.00	0.63	0.00	1.82	1.27	1.15
Enchelidiidae	0.00	1.87	0.61	0.65	0.61	0.00	0.00	0.60	1.12	0.00	2.49	3.70	0.63	0.00	1.59	0.57	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	1.20	0.00	0.00	0.00	0.00	0.00	0.57
Tripyloididae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.00	0.00
Pandolaimidae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trefusidae	0.00	0.00	2.45	0.00	0.61	1.31	0.00	0.00	0.00	0.65	0.00	0.00	0.63	0.00	0.00	0.00	0.00	4.03	1.25	2.68	0.00	1.75	0.00	1.15	1.74	0.60	3.51	0.63	2.04	1.21	2.53	1.15
Lauratonematidae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rhabdolaimidae	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.58	0.00	1.15	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00
Rhabdonemaniidae	0.54	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57
Tylenchid	0.00	0.00	0.00	0.00	1.23	0.00	1.07	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	1.15
Others	0.54	0.93	1.84	1.94	0.00	1.31	3.74	2.99	3.37	3.87	1.99	0.00	2.50	0.00	0.53	0.00	2.26	3.23	0.63	1.34	0.57	4.09	2.67	1.15	0.00	1.80	1.75	0.00	0.00	0.00	2.53	0.57
Total Identified	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Appendix IIIb: Percentage proportion of nematode families identified during November/December

	528A	528B	531A	531B	532A	533A	533B	550A	550B	552A	552B	511A	511B	514A	514B	517A	517B	518A	518B	519A	519B	503A	503B	505A	505B	505C	505D	506A	506B	507A	507B
Chromadoridae	14.04	6.67	5.88	1.18	8.24	14.12	14.77	9.09	10.69	9.94	10.00	12.14	3.76	1.67	4.59	4.21	4.05	10.07	9.56	11.84	8.33	3.45	1.32	9.94	5.78	13.17	4.83	9.55	9.04	11.89	8.05
Comesomatidae	5.26	12.78	15.29	20.71	12.64	5.08	5.37	2.60	0.00	6.21	10.00	5.78	13.44	18.89	10.71	11.58	12.14	10.07	9.56	3.95	2.56	6.90	3.29	17.68	10.22	13.17	23.45	10.83	16.87	2.10	0.00
Ethmolaimidae	7.02	8.89	2.94	1.78	1.65	0.00	0.00	0.65	1.89	0.00	0.00	0.00	5.91	5.56	1.02	1.58	1.16	0.67	0.00	0.00	0.00	1.15	5.26	0.00	0.89	0.60	0.00	0.00	0.00	0.00	0.00
Cyatholaimidae	1.17	1.11	3.53	4.73	2.20	2.82	4.70	15.58	7.55	5.59	9.00	5.20	3.23	7.22	8.67	4.74	8.67	2.01	2.21	3.95	4.49	11.49	7.89	7.73	4.44	4.79	2.76	5.10	3.01	0.70	4.70
Selachinematidae	1.17	2.22	2.94	1.18	1.65	2.82	0.67	4.55	3.77	4.97	2.00	0.58	4.30	1.67	0.00	0.00	5.20	1.34	5.15	2.63	0.00	2.87	9.87	1.66	4.44	4.79	2.76	1.91	0.60	1.40	0.67
Desmodoridae	16.96	5.56	1.76	1.18	0.00	0.56	0.67	5.19	3.77	1.24	0.00	2.31	4.30	1.67	1.53	5.26	0.58	2.01	0.74	0.66	0.64	7.47	8.55	4.97	2.22	1.20	0.00	2.55	0.00	0.70	2.68
Microlaimidae	3.51	4.44	5.88	5.92	4.95	10.73	7.38	12.99	16.98	5.59	9.00	6.94	6.99	2.22	5.61	12.11	8.09	7.38	9.56	1.32	4.49	18.97	15.13	8.84	12.44	7.78	4.83	10.83	9.64	6.99	8.05
Leptolaimidae	1.17	0.56	3.53	0.59	8.79	3.39	9.40	1.30	3.77	3.73	3.00	5.78	3.23	6.67	2.04	2.63	5.20	3.36	2.94	1.97	5.13	0.57	1.97	2.76	2.22	3.59	2.76	3.18	2.41	2.80	6.71
Haliplectidae	0.00	0.00	0.00	0.59	0.00	0.56	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.53	0.00	0.67	0.00	1.32	0.64	0.00	0.00	0.00	1.33	0.00	1.38	1.27	1.20	0.00	0.00
Tarvalidae	0.00	0.00	1.18	0.00	0.00	0.56	0.00	1.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.44	1.20	0.00	0.00	0.00	0.00	0.00
Aeglaloalaimidae	0.00	1.67	2.94	1.78	4.95	1.69	2.01	0.00	0.00	2.48	4.00	0.00	0.54	0.56	0.51	1.05	1.16	4.03	1.47	1.97	5.13	0.00	1.32	2.21	2.67	4.79	2.07	1.91	2.41	6.99	7.38
Tubolaimidae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ceramonematidae	0.00	1.11	3.53	4.14	1.10	1.13	0.00	7.14	3.77	1.24	1.00	0.58	2.69	1.11	0.00	2.11	4.62	1.34	2.94	1.97	0.64	8.62	4.61	1.66	2.67	5.39	1.38	1.91	3.61	0.70	0.67
Paramicrolaimidae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	1.26	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	1.72	0.00	0.00	0.44	0.00	0.69	0.00	0.00	0.00	0.00
Meylidae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.00	0.00	0.00	0.00
Desmoscolecidae	3.51	0.56	1.76	0.59	2.20	4.52	4.03	0.65	3.77	0.62	2.00	1.73	1.08	2.22	4.08	1.05	2.31	6.04	5.15	3.29	5.13	1.15	0.66	5.52	5.33	4.79	2.76	2.55	2.41	0.70	4.03
Monhysteridae	2.34	2.22	7.06	6.51	14.29	22.60	19.46	1.95	3.14	16.15	11.00	3.47	5.91	2.78	4.08	12.11	10.40	21.48	16.18	38.16	34.62	0.57	3.95	9.39	12.89	11.98	23.45	17.83	26.51	41.26	28.86
Xyalidae	32.16	22.78	17.65	28.40	18.68	11.30	7.38	12.99	14.47	11.18	14.00	9.83	28.49	24.44	29.08	14.74	6.36	6.04	10.29	11.18	12.18	16.67	9.87	5.52	11.11	6.59	6.21	6.37	9.64	6.99	8.72
Sphaerolaimidae	0.58	0.00	1.18	2.96	0.00	0.56	1.34	0.65	0.00	0.62	0.00	1.16	2.15	1.11	4.08	0.53	4.05	0.00	0.74	0.66	0.00	0.57	0.00	0.00	0.44	1.80	1.38	1.27	1.20	0.00	0.67
Siphonolaimidae	0.00	0.56	0.00	2.37	0.00	0.00	0.00	0.00	0.00	0.62	0.00	12.14	0.00	1.11	0.00	0.00	0.00	0.67	0.74	0.00	0.00	1.15	0.00	0.00	0.44	0.00	0.69	0.00	0.00	0.00	0.00
Linhomoedidae	1.17	23.89	7.06	4.14	8.24	2.26	1.34	1.30	1.89	4.97	6.00	3.47	5.38	11.11	5.61	3.16	1.73	0.00	2.21	0.66	0.64	1.72	4.61	1.10	1.33	1.20	2.76	5.10	1.81	0.00	0.67
Axonolaimidae	0.58	1.11	2.35	1.78	0.00	0.00	0.00	0.00	0.00	0.62	1.00	19.08	0.54	1.11	2.04	1.58	1.16	0.00	0.00	1.32	0.00	3.45	0.66	1.10	0.44	0.00	0.69	0.00	0.00	0.00	2.01
Diplopeltidae	2.34	1.11	4.12	2.37	2.75	2.26	3.36	0.65	0.00	3.11	5.00	2.89	1.61	2.22	2.04	3.16	5.20	4.70	2.21	3.29	1.92	2.30	3.95	3.87	1.78	4.79	4.14	0.64	1.81	2.80	4.70
Coninckidae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	2.52	0.00	0.00	0.00	0.00	0.00	0.00	1.05	0.58	0.00	0.00	0.00	0.00	1.15	0.66	0.55	0.00	0.00	0.69	0.00	0.00	0.00	0.00
Thoracostomopsidae	0.58	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.58	0.54	0.56	0.00	1.58	0.00	0.67	0.74	0.00	0.00	0.57	0.00	0.55	0.44	0.00	0.69	0.64	0.00	0.70	0.00
Anoplostomatidae	0.00	0.00	0.00	1.18	0.00	0.00	0.00	1.95	0.00	0.00	0.00	0.00	0.54	0.00	0.00	2.11	0.00	0.00	1.47	0.00	0.00	0.00	0.00	0.55	0.00	0.00	0.00	1.27	0.00	0.00	0.67
Phanodermatidae	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Anticomatidae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	1.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ironidae	0.00	0.00	0.00	0.00	0.00	1.13	2.68	0.00	0.63	4.97	2.00	0.00	0.00	0.00	0.00	1.58	4.05	1.34	3.68	1.97	0.64	0.57	0.66	1.10	0.00	1.80	1.38	1.27	1.20	0.00	2.01
Oxystomatidae	4.68	1.11	7.06	5.33	6.04	6.78	11.41	11.69	10.69	12.42	11.00	4.62	2.69	1.67	13.78	7.89	6.94	10.74	10.29	5.92	5.77	4.60	8.55	11.60	10.67	3.59	3.45	10.19	4.82	6.99	4.03
Oncholaimidae	1.17	1.11	1.18	0.00	0.00	1.13	0.67	2.60	0.63	0.62	0.00	0.58	0.00	0.00	0.00	1.05	0.58	0.00	0.00	0.00	0.00	1.72	0.00	0.00	0.00	1.20	0.69	1.27	0.00	0.00	0.00
Enchelidiidae	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.65	0.00	0.00	0.00	0.00	1.61	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tripyloididae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pandolaimidae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trefusidae	0.00	0.00	0.00	0.00	0.55	1.69	2.01	2.60	6.29	1.24	0.00	0.00	0.00	0.00	0.00	2.11	1.16	1.34	0.74	0.00	0.00	0.57	1.97	0.55	1.78	1.80	2.76	0.64	1.20	4.90	2.01
Lauratonematidae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rhabdolaimidae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	1.47	0.00	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.67
Rhabdonemaniidae	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	1.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tylenchid	0.00	0.00	0.00	0.59	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00
Others	0.58	0.56	0.00	0.00	0.55	1.69	0.00	0.65	2.52	0.00	0.00	1.16	1.08	3.33	0.00	0.00	4.62	2.01	0.00	1.32	5.77	0.00	4.61	0.55	3.11	0.00	0.69	1.27	0.00	1.40	2.01
Total Identified	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Appendix IVa: Relative proportion (%) of nematode genera in June/July

	127	128	131E	132E	133C	133D	133E	120E	121	136	108E	108F	111B	114A	114C	144D	117A	117B	117E	118	119E	119F	103E	105A	105B	105C	105D	105E	106E	106F	107G	107H
Acantholaimus	0.00	0.00	0.00	0.00	1.23	11.76	10.16	1.20	0.00	2.58	0.00	0.00	0.00	0.00	0.00	0.00	2.82	8.06	1.88	6.04	7.43	8.19	0.53	0.57	0.58	4.79	0.58	4.43	3.06	0.61	6.33	3.45
Actinonema	1.08	0.00	0.61	0.65	2.45	0.65	0.00	0.00	4.49	0.00	0.00	0.00	0.00	2.08	2.65	0.00	1.13	0.81	0.63	0.00	0.00	1.75	1.07	0.00	0.58	0.00	0.00	0.63	0.00	0.00	0.00	0.00
Chromadora	0.00	0.00	0.61	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00
Denticulella	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromadorella	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromadorita	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27	0.00
Dichromadora	3.23	0.93	0.61	0.65	0.61	0.00	0.00	3.59	4.49	0.00	1.99	2.65	0.00	5.21	2.65	2.84	0.56	0.00	0.63	0.00	0.00	0.00	1.07	0.57	0.00	1.80	0.00	0.63	3.06	0.61	0.00	0.00
Endeolophos	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euchromadora	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graphonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hypodontolaimus	6.45	0.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Innocuonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Neochromadora	1.08	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.53	0.00	1.04	0.53	1.14	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prochromadorella	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80	0.00	0.00	0.00	0.00	0.00	1.04	1.59	1.14	1.69	0.00	1.25	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00
Parapinanema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ptycholaimellus	0.54	0.00	0.00	0.00	0.00	0.00	0.00	6.59	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Parachromadorita	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rhips	1.61	0.00	0.00	0.65	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spilliphera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trochamus	0.00	2.80	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	1.88	1.04	0.00	0.57	0.00	0.00	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trichromadora	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12	0.00	0.00	0.00	0.00	0.00	1.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cervonema	0.00	0.00	4.29	0.65	2.45	0.65	0.00	0.00	2.25	4.52	0.50	0.00	0.00	0.00	0.53	1.14	3.39	1.61	2.50	1.34	0.00	2.34	0.00	10.92	4.07	4.19	9.36	5.70	6.12	6.67	0.00	0.57
Dorylaimopsis	0.00	15.89	4.91	1.29	0.00	0.00	0.00	0.00	1.12	0.00	3.48	0.53	11.88	1.04	21.69	7.95	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.57	6.40	1.20	1.17	0.63	0.00	0.00	0.00	0.00
Hopperia	0.00	2.80	1.23	0.65	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.53	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.23	0.60	0.58	0.63	1.02	1.82	0.00	0.00
Kenyanema	0.00	0.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	1.06	0.00	0.00	0.81	0.63	1.34	0.00	0.00	0.00	1.15	1.74	1.80	1.75	1.27	0.00	0.00	0.00	0.00
Laimella	0.00	0.00	1.84	0.00	0.00	0.65	0.00	0.00	4.49	0.65	1.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	1.07	2.87	0.58	0.60	0.58	0.63	1.02	0.00	0.00	0.00
Metacomesoma	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00
Metasabatieria	3.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00
Paracomesoma	4.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	2.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paramesonchium	3.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00
Pierrickia	0.00	0.00	0.00	0.65	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00	1.27	0.00
Sabatieria	1.08	0.93	0.00	5.16	1.23	0.65	8.56	13.17	3.37	7.74	8.96	0.53	0.63	0.00	0.53	0.00	6.21	3.23	14.38	4.70	0.57	0.58	0.00	9.77	12.79	5.99	7.02	5.70	7.14	6.67	2.53	0.00
Setosabatieria	0.00	0.00	1.23	0.65	0.00	0.00	0.00	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vasostoma	0.00	0.00	2.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Comesa	0.00	0.93	1.23	0.00	0.61	0.00	0.00	0.00	0.00	0.00	5.97	3.70	0.63	6.25	1.06	0.00	1.13	0.00	0.63	0.00	0.00	1.17	0.00	1.15	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00
Filitonchus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gophionchus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02	0.00	0.00	0.00
Nannolaimus	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.25	0.00	0.00	0.00	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00
Neotonchus	0.00	0.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.57	0.00	0.00	1.17	0.00	0.00	0.00	0.00	0.00
Acanthonchus	0.00	1.87	0.00	0.00	0.61	0.00	0.00	0.60	0.00	0.65	0.00	0.00	0.00	4.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.07	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.00	0.00
Cyatholaimus	0.00	0.00	0.00	0.00	0.61	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kraspedonema	0.00	0.00	1.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Longicyatholaimus	0.54	0.00	0.00	0.65	0.00	1.31	1.07	1.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.63	0.00	0.00	1.17	0.00	2.30	1.16	0.60	1.75	1.27	1.02	1.82	0.00	1.15
Marylynnia	0.54	0.00	0.00	0.00	0.00	3.27	0.00	1.20	0.00	0.00	0.00	0.00	1.88	3.13	1.06	6.82	0.00	1.61	0.00	0.00	0.00	0.00	1.07	0.00	0.58	0.60	0.00	0.00	0.00	0.61	0.00	0.00
Metacyatholaimus	0.00	0.00	0.00	0.00	0.00	3.92	1.07	0.00	0.00	1.29	0.00	0.00	0.00	0.00	2.12	0.00	0.56	0.81	0.00	1.34	0.00	2.34	1.07	0.00	2.33	5.99	0.00	0.00	0.00	0.00	0.00	0.00
Minolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00
Nannolaimoides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paracanthonchus	1.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	2.04	0.00	0.00	0.00
Paracyatholaimoides	0.00	0.00	0.00	1.29	0.61	0.00	0.53	2.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.57	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00
Paracyatholaimus	0.00	0.00	0.00	0.00	0.61	0.00	0.00	0.00	2.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.63	0.00	1.21	0.00	0.00
Paralongicyatholaimus	1.08	0.00	1.23	0.00	0.00	1.31	0.00	0.60	2.25	0.00	0.50	0.53	0.00	0.00	0.00	0.00	0.00	5.65	0.00	1.34	0.57	0.58	1.07	2.30	0.58	1.20	2.34	1.27	0.00	1.21	0.00	0.57
Pomponema	1.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Praeacanthonchus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.60	0.00	0.00	1.02	0.00	0.00	0.00
Cheironchus	0.00	0.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.00	0.00	0.00	0.53	0.57	1.16	1.20	0.58	0.63	0.00	0.61	0.00	0.00
Choanolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Demonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

App. IV continued ..	127	128	131E	132E	133C	133D	133E	120E	121	136	108E	108F	111B	114A	114C	144D	117A	117B	117E	118	119E	119F	103E	105A	105B	105C	105D	105E	106E	106F	107G	107H
Gammanema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.29	0.00	0.00	0.00	0.00	0.00	0.00	2.26	0.81	0.63	1.34	0.00	0.00	0.00	3.45	0.58	0.00	0.00	0.00	1.02	0.00	0.00	0.00
Halichoanolaimus	0.00	0.93	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	1.69	0.00	0.63	2.01	0.00	0.00	0.53	2.30	0.58	2.40	0.00	2.53	0.00	0.61	1.27	0.57
Latronema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.56	0.00	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00
Richtersia	0.54	0.00	0.61	0.00	0.00	0.00	0.00	0.00	1.12	0.00	0.00	0.00	6.25	1.04	0.00	0.00	0.00	0.81	0.63	0.67	0.00	0.00	2.67	0.00	1.16	1.20	0.00	0.63	0.00	0.61	0.00	0.00
Synonchiella	0.00	0.00	0.00	0.00	0.00	0.65	1.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.56	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.57
Synonchium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.60	0.00	0.00	0.00	0.00	0.00	0.00
Catanema	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12	0.00	0.00	0.00	0.63	2.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00
Chromaspirina	1.08	0.00	0.61	0.00	0.00	0.00	0.00	0.00	4.49	0.00	0.00	0.00	0.63	6.25	0.00	2.27	0.00	0.81	0.00	0.67	0.00	0.00	2.14	1.15	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Desmodora	0.00	0.00	0.00	2.58	0.00	0.00	0.00	3.59	2.25	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.63	0.67	0.57	0.58	0.53	0.00	0.00	0.00	0.58	0.00	0.00	0.61	1.27	0.00
Desmodorella	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.63	0.67	0.00	0.58	1.07	0.00	0.58	0.00	1.17	0.63	1.02	0.00	0.00	0.00
Draconema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Epsilonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00
Eubostrichus	2.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.37	0.00	0.00	0.00	1.25	0.00	0.00	0.00	0.00	1.61	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Leptolaimella	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Notochaetosoma	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02	0.00	0.00	0.00
Metepsilonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00
Onyx	1.61	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paradraconema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Parallelocoilas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Polysigma	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Psammonema	0.00	14.02	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pseudonchus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sigmophoranema	0.54	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spirinia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.69	0.00	0.63	0.67	0.00	0.58	0.53	1.15	0.00	1.20	0.58	1.90	0.00	0.61	0.00	0.00
Aponema	0.00	0.00	0.61	0.00	0.61	0.00	0.00	0.00	0.00	1.29	0.00	0.00	6.88	0.00	0.00	0.00	0.00	0.81	0.00	0.00	0.57	0.58	0.00	0.57	0.00	0.00	0.00	0.00	1.02	1.21	0.00	0.00
Bolbolaimus	0.00	0.00	0.00	0.00	1.23	0.00	0.00	0.60	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.39	2.42	1.88	0.67	0.57	1.17	2.14	0.00	0.00	1.20	0.00	1.27	2.04	0.61	0.00	0.00
Calomicrolaimus	5.38	0.00	0.61	0.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.82	0.00	0.00	0.00	0.57	1.75	0.00	0.00	0.00	0.00	0.58	1.27	1.02	0.00	0.00	0.57
Cinctonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crassonema	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.04	0.00	0.00	0.00
Ixonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Microlaimus	2.69	2.80	0.00	3.23	0.00	7.19	4.81	0.00	5.62	1.29	1.00	1.59	0.63	1.04	1.06	2.27	4.52	2.42	3.13	1.34	6.86	0.58	6.95	2.30	0.00	2.99	4.09	0.63	1.02	0.61	0.00	0.00
Molgolaimus	0.00	1.87	6.75	3.87	0.61	0.00	4.28	2.40	0.00	5.81	0.00	0.00	0.00	0.00	0.00	0.57	2.26	1.61	3.75	0.00	3.43	1.75	1.07	0.57	2.91	4.19	2.34	0.63	6.12	6.06	1.27	0.57
Spirobolbolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimicron	0.00	0.00	0.61	1.29	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.34	0.00	0.00	0.00	0.00	0.00	0.58	0.60	0.58	1.27	0.00	0.61	0.00	0.00
Camacolaimus	0.00	0.93	0.00	0.65	1.84	0.00	1.60	0.60	0.00	1.94	0.00	0.00	0.63	0.00	0.00	0.57	0.00	0.00	0.63	0.67	0.00	0.58	0.00	0.57	0.58	0.00	0.58	0.00	0.00	0.00	0.00	0.00
Cricolaimus	0.00	0.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57
Dagda	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Deontolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diodotolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Halaphanolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Leptolaimoides	0.00	0.93	0.61	2.58	0.61	0.00	2.14	3.59	0.00	1.94	0.00	0.00	0.00	1.04	0.00	1.70	0.56	0.00	0.00	0.00	0.57	0.00	0.00	1.72	1.74	0.60	0.00	1.90	1.02	1.21	0.00	1.15
Leptolaimus	2.15	1.87	0.61	3.87	6.13	1.31	0.00	0.60	1.12	4.52	1.49	1.06	2.50	1.04	1.06	0.00	0.00	1.61	2.50	4.03	2.29	1.17	1.07	0.57	0.00	1.20	0.58	3.80	1.02	1.82	2.53	2.87
Onchium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Procamacolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	1.15
Setoplectus	0.00	0.00	0.61	0.00	0.00	0.65	1.07	1.20	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	1.15	0.58	0.60	0.58	0.00	1.02	0.61	1.27	0.00
Tarvaia	1.08	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.00	0.00	0.58	1.07	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.00	0.00
Aegialoalaimus	0.00	0.00	0.61	1.94	0.00	0.65	1.07	0.00	0.00	1.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.57	1.17	0.53	1.15	0.58	0.00	1.17	0.00	0.00	1.21	0.00	0.00
Cyartonema	1.08	1.87	0.61	1.94	0.61	0.65	2.67	0.60	0.00	1.29	0.00	0.00	0.00	0.00	0.53	0.00	0.56	0.00	1.25	2.68	3.43	2.92	0.00	0.00	1.74	3.59	0.58	3.80	1.02	1.21	0.00	1.15
Diplopeltoides	0.00	0.00	0.61	2.58	1.23	0.00	0.53	0.00	0.00	0.65	0.00	0.00	1.88	0.00	0.00	0.00	1.69	0.81	0.00	0.00	4.00	0.58	1.07	1.15	0.58	0.60	1.75	0.63	0.00	0.00	0.00	1.72
Southernia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chitwoodia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tubolaimoides	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ceramonema	2.69	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.81	0.00	0.00	0.00	0.00	1.07	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00
Dasynemoides	0.54	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metadasynemella	1.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pselionema	2.15	0.00	1.23	1.94	0.00	0.00	0.53	0.60	2.25	1.94	0.00	0.00	1.25	0.00	0.00	0.00	2.26	9.68	0.63	2.01	1.71	2.34	1.60	1.15	0.58	1.20	0.58	1.90	4.08	0.00	0.00	0.00
Pterygonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.63	0.00	0.61	0.00	0.57

App. IV continued...	127	128	131E	132E	133C	133D	133E	120E	121	136	108E	108F	111B	114A	114C	144D	117A	117B	117E	118	119E	119F	103E	105A	105B	105C	105D	105E	106E	106F	107G	107H
Paramicrolaimus	0.00	0.00	0.00	1.29	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	3.13	0.00	0.00	0.00	0.81	1.25	0.00	0.57	0.00	0.00	0.57	1.16	0.60	0.00	1.27	2.04	0.00	0.00	0.00
Calligyrus	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00
Desmogerlachia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Desmorolenzenia	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	1.17	1.60	0.00	0.00	0.60	0.00	1.27	1.02	0.61	0.00	1.15
Desmoscolex	0.54	0.00	0.61	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.01	0.57	0.00	0.00	0.00	0.58	0.00	0.00	1.90	8.16	0.61	0.00	0.00
Domorganus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00
Greeffiella	0.00	0.00	0.00	0.00	0.00	0.00	1.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.58	0.00	0.00	0.00	0.60	0.00	0.00	1.02	0.00	0.00	0.00
Hapalomus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57
Pareudesmoscolex	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.81	0.63	2.01	0.57	0.00	0.53	0.00	0.00	0.00	0.00	1.90	0.00	0.61	0.00	0.00
Quadricoma	0.00	0.00	0.61	0.65	1.84	2.61	0.53	1.20	1.12	0.65	0.00	0.00	3.75	1.04	1.06	0.00	1.13	0.00	1.25	0.00	1.14	1.75	2.14	0.57	0.00	0.00	0.58	0.63	0.00	0.00	1.27	0.57
Tricoma	0.00	0.00	0.61	1.29	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	4.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gerlachius	0.54	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.50	0.00	1.25	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	1.72	0.58	0.00	0.00	0.00	0.00	1.21	0.00	0.00
Meylia	0.00	0.00	0.00	0.00	0.00	1.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diplolaimella	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.00	2.30
Diplolaimelloides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	2.53	0.57
Eumonhystera	0.00	2.80	0.00	1.29	15.95	7.19	1.60	2.99	1.12	0.65	0.50	0.00	0.63	0.00	2.12	0.00	10.17	0.00	0.00	0.00	2.29	4.68	0.53	0.57	0.00	0.00	3.51	1.27	1.02	1.82	2.53	4.60
Monhysteridae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.75	0.00	0.58	0.00	0.00	2.33	1.20	0.00	0.63	0.00	4.24	0.00	1.15
Monhystrella	0.00	4.67	0.00	0.65	0.00	1.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.13	0.00	2.50	0.00	0.57	0.00	0.00	0.00	0.00	0.00	1.75	0.63	1.02	0.00	0.00	1.72
Monhystera	1.08	0.00	2.45	9.03	22.70	22.22	13.37	0.60	3.37	14.19	0.00	0.00	4.38	7.29	1.06	6.82	0.00	4.84	4.38	2.68	23.43	15.20	1.60	0.00	0.00	1.80	1.75	0.63	8.16	6.67	30.38	32.76
Ammotheristus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.60	1.17	0.00	0.00	0.61	0.00	0.00
Amphimonhystera	0.54	0.00	0.00	0.00	1.23	0.65	0.00	0.60	1.12	1.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.58	0.00	0.58	1.90	0.00	1.21	2.53	0.00
Amphimonhystrella	0.00	0.00	5.52	3.87	0.00	0.00	1.07	0.00	0.00	0.00	0.00	0.00	0.00	1.04	2.12	8.52	0.00	0.00	2.50	0.67	5.14	1.75	0.00	6.32	6.98	2.40	4.09	6.33	1.02	1.21	0.00	0.57
Cobbia	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.60	0.00	0.58	1.80	0.58	0.00	0.00	3.03	0.00	0.00
Daptonema	9.14	4.67	1.84	1.29	0.61	0.00	1.07	7.78	4.49	0.00	5.97	21.69	5.63	17.71	12.17	3.98	1.13	0.00	0.00	0.00	0.57	1.17	5.35	1.15	1.74	0.60	2.92	0.00	3.06	0.00	0.00	0.57
Echinotheristus	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.00	0.00
Elzalia	0.00	0.00	1.23	0.00	1.84	0.00	0.00	0.00	1.12	0.00	0.00	0.00	1.25	2.08	1.06	4.55	0.56	0.00	1.88	0.00	0.00	0.58	1.60	1.15	0.58	0.00	0.00	0.00	1.02	0.61	0.00	0.00
Gnomoxyala	0.00	2.80	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.06	2.27	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	1.16	0.00	0.00	0.00	0.00	0.61	0.00	0.57
Linhystera	0.00	3.74	0.00	0.65	0.00	0.00	0.53	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.71	0.00	0.00	1.15	0.00	0.00	0.00	0.00	1.02	0.00	0.00	0.00
Manganonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.67	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61	3.80	0.57
Metadesmolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paramonhystera	0.00	0.00	1.23	0.65	0.00	0.00	0.00	0.00	3.37	0.65	0.50	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17	10.16	1.15	1.16	7.19	0.00	0.00	0.00	0.61	0.00	0.57
Promonhystera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prorhynchonema	2.15	0.00	0.00	1.29	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Retrotheristus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rhinema	0.00	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rhynchonema	2.69	0.00	0.61	0.65	0.00	0.00	0.00	5.39	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.71	1.75	4.81	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.57
Scaptrella	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stylotheristus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00
Theristus	1.61	0.00	3.68	0.00	0.00	0.00	0.00	1.20	1.12	0.65	0.00	0.00	0.00	1.04	3.17	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	1.15	1.16	0.60	0.58	0.63	0.00	1.21	1.27	0.00
Valvalaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20	0.58	0.00	0.00	0.00	0.00	0.00
Xenolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xyala	10.22	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.59	0.00	1.13	2.42	0.00	0.00	0.00	0.00	5.88	0.00	0.00	0.00	0.00	0.63	1.02	0.00	0.00	0.00
Xyalidae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12	1.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.84	1.88	5.37	0.00	1.17	0.00	0.00	0.58	0.60	0.58	0.00	0.00	0.61	0.00	0.57
Doliolaimus	0.00	0.00	1.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	1.25	2.01	2.29	1.17	0.00	0.57	0.00	0.00	1.17	0.00	0.00	1.21	0.00	5.75
Metasphaerolaimus	0.54	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20	0.00	0.00	0.00	0.00	0.00	0.00
Parasphaerolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sphaerolaimus	0.00	0.00	0.00	0.65	0.61	0.65	2.67	1.20	0.00	1.29	0.00	0.00	1.88	4.17	1.59	2.27	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.57	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Subsphaerolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Astomonema	0.00	0.00	6.75	1.29	0.00	0.00	0.00	0.00	3.37	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.58	0.60	0.00	0.00	0.00	0.00	0.00	0.00
Siphonolaimus	0.00	0.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Desmolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00
Didelta	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Disconema	0.00	0.00	1.23	0.65	0.00	0.00	1.07	0.00	0.00	1.94	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.63	2.68	1.71	0.00	0.00	2.30	1.16	0.00	0.00	1.90	0.00	0.61	1.27	0.00
Eleutherolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.16	0.60	0.58	0.00	0.00	0.00	0.00	1.15
Eumorpholaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Linhomoeus	0.00	0.00	0.00	0.00	1.84	0.65	0.00	0.00	1.12	0.65	0.00	0.00	0.00	2.08	0.53	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	1.02	0.00	0.00	0.00
Megadesmolaimus	0.54	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	1.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

App. IV continued..	127	128	131E	132E	133C	133D	133E	120E	121	136	108E	108F	111B	114A	114C	144D	117A	117B	117E	118	119E	119F	103E	105A	105B	105C	105D	105E	106E	106F	107G	107H
Metalinhomoeus	0.00	0.93	1.23	0.65	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.53	1.25	0.00	0.00	0.57	0.00	0.81	0.00	1.34	0.00	0.00	0.53	0.00	1.16	0.60	0.00	0.00	0.00	1.21	0.00	0.00
Paralinhomoeus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00	1.15	0.00	0.60	0.00	0.00	0.00	0.61	0.00	0.00
Terschellingia	0.54	10.28	6.13	2.58	1.84	0.65	0.53	0.00	0.00	0.00	48.76	27.51	8.13	0.00	4.76	1.14	0.00	0.00	0.63	0.00	0.57	0.58	0.00	1.72	1.74	1.80	0.58	4.43	0.00	1.82	0.00	0.00
Axonolaimus	0.00	0.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Odontophora	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paradontophora	0.00	2.80	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.49	1.06	0.00	1.04	3.70	0.00	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00
Parareolaimus	0.00	0.00	0.00	0.00	0.61	0.00	1.60	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00	0.00	0.00	0.81	0.00	0.00	0.00	0.00	0.00	3.45	0.00	0.60	2.34	0.00	0.00	0.00	0.00	0.00
Areolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00
Campylaimus	0.00	0.93	2.45	0.65	1.23	0.00	1.60	0.00	1.12	0.65	0.50	0.00	0.00	0.00	1.06	2.27	0.00	1.61	0.63	1.34	1.14	0.00	0.53	0.00	0.58	0.00	0.00	1.27	1.02	0.61	0.00	2.30
Diplopeltula	0.54	0.00	1.84	0.65	0.00	1.96	1.60	0.60	0.00	1.29	0.50	0.00	0.00	0.00	1.06	0.57	0.56	0.81	0.00	1.34	1.71	1.75	0.00	0.00	1.74	0.00	1.17	0.00	0.00	2.42	0.00	1.15
Southerniella	0.00	0.00	0.61	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.63	1.04	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.58	0.60	0.00	0.63	0.00	0.00	0.00	0.00
Coninckia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Enoplaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00
Enoploides	0.00	0.00	0.00	0.00	1.23	0.00	0.00	1.20	0.00	0.00	0.50	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Epacanthion	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mesacanthion	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mesachantholdes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oxynchulus	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paramesacanthion	0.54	0.00	0.00	0.00	0.00	0.00	0.00	1.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.58	0.00	0.00	0.00	0.00	0.00
Anoplostoma	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chaetonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00
Crenopharynx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Micoletzkyia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phanoderma	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00
Anticoma	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dolicholaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.60	0.58	0.00	0.00	1.21	6.33	0.00
Parironus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00
Sylingolaimus	0.00	0.00	0.00	0.65	2.45	0.65	2.14	0.00	0.00	3.23	0.00	0.00	0.00	0.00	0.00	0.00	3.95	0.00	2.50	1.34	1.14	0.58	0.00	0.00	1.16	0.60	1.17	0.63	1.02	1.21	1.27	0.00
Thalassironus	0.00	0.00	0.00	0.00	1.23	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00
Trissonchulus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Halalaimus	2.15	2.80	5.52	4.52	9.82	9.15	5.35	5.99	2.25	9.03	1.49	0.53	1.25	4.17	8.99	14.77	9.04	3.23	6.25	3.36	2.86	5.26	4.28	5.17	4.65	5.39	11.11	5.70	4.08	7.27	6.33	4.02
Litinium	0.00	0.00	0.00	0.65	0.00	0.65	0.53	0.00	0.00	2.58	0.00	0.53	0.00	0.00	0.00	0.00	1.13	0.00	4.38	0.67	1.14	0.00	0.00	0.00	0.00	0.60	1.75	2.53	0.00	2.42	0.00	0.00
Oxystomina	0.00	1.87	0.00	1.29	0.61	0.00	0.53	0.00	0.00	1.94	0.50	2.12	1.25	1.04	0.53	1.70	0.56	0.81	0.63	1.34	1.71	1.17	0.00	1.72	3.49	0.60	1.17	0.63	0.00	1.82	1.27	1.15
Paroxystomina	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02	0.00	0.00	0.00
Thalassoalaimus	0.54	0.00	0.00	0.65	1.84	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80	0.58	1.27	1.02	0.00	3.80	0.00
Wieseria	0.00	0.00	0.61	0.65	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.15	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.57
Viscosia	2.69	1.87	0.61	2.58	0.00	0.00	1.07	1.80	0.00	0.65	3.98	26.46	2.50	4.17	0.00	0.57	0.00	0.00	0.63	2.01	1.71	0.58	1.07	0.00	0.58	0.60	0.00	0.00	0.00	1.82	1.27	1.15
Filoncholaimus	0.00	0.00	0.60	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00
Oncholaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	1.07	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00
Bathyeurystomina	0.00	0.00	0.00	0.00	0.61	0.00	0.00	0.00	1.12	0.00	1.49	2.65	0.00	0.00	1.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.57
Belbolla	0.00	1.87	0.61	0.65	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eurystomina	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00
Pareurystomina	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Polygastrophora	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bathylaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.00	0.00
Tripyloides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pandolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Halanonchus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rhabdocoma	0.00	0.00	2.45	0.00	0.61	1.31	0.00	0.00	0.00	0.65	0.00	0.00	0.63	0.00	0.00	0.00	0.00	4.03	1.25	1.34	0.00	1.17	0.00	0.57	1.74	0.00	0.58	0.63	2.04	2.42	2.53	1.15
Trefusialaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02	0.00	0.00	0.00
Trefusia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.57	0.00	0.60	2.92	0.00	0.00	0.00	0.00	0.00
Lauratonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rhabdolaimus	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.58	0.00	1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rhabdonemania	0.54	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57
Tylenchid	0.00	0.00	0.00	0.00	1.23	0.00	1.07	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	1.15
Others	4.30	3.74	7.98	14.84	4.91	7.19	11.23	7.19	6.74	8.39	3.48	2.65	10.00	2.08	5.82	12.50	13.56	16.94	14.38	12.75	4.57	9.94	10.16	6.32	4.07	4.19	4.68	5.70	7.14	4.24	12.66	12.64
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Appendix IVb: Relative proportion (%) of nematode genera identified in November/December

	528A	528B	531A	531B	532A	533A	533B	550A	550B	552A	552B	511A	511B	514A	514B	517A	517B	518A	518B	519A	519B	503A	503B	505A	505B	505C	505D	506A	506B	507A	507B	Total
Acantholaimus	0.00	0.00	3.53	1.18	4.95	12.43	12.08	0.00	0.00	8.70	6.00	0.00	0.00	0.00	0.00	3.68	3.47	9.40	8.82	9.21	7.05	0.00	0.66	6.63	4.44	11.98	3.45	7.64	7.83	11.89	6.71	4.72
Actinonema	4.09	0.00	0.00	0.00	0.00	0.56	1.34	2.60	1.89	0.00	0.00	0.00	0.00	0.00	1.53	0.00	0.00	0.67	0.00	0.00	0.00	1.15	0.00	0.00	0.89	0.60	0.00	0.00	1.20	0.00	0.00	0.55
Chromadora	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.34	0.06	
Denticulella	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromadorella	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Chromadorita	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	1.27	0.00	0.00	0.00	0.10
Dichromadora	0.00	0.00	0.59	0.00	1.65	0.56	0.00	0.65	0.63	0.62	0.00	4.62	0.00	0.56	1.53	0.53	0.00	0.00	0.00	0.00	0.64	0.57	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47
Endeolophos	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euchromadora	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Graphonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Hypodontolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Innocuonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	1.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
Neochromadora	2.34	1.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18
Prochromadorella	0.58	0.00	0.00	0.00	0.55	0.00	0.00	0.65	1.89	0.00	0.00	1.73	0.00	0.00	1.02	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	1.10	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.29
Parapinanema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ptycholaimellus	4.68	4.44	0.00	0.00	0.00	0.00	0.00	4.55	1.89	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53
Parachromadorita	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
Rhips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.26	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.00	0.00	0.00	0.00	0.10
Spiliphera	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
Trochamus	2.34	0.56	1.76	0.00	0.00	0.00	0.00	0.00	1.89	0.00	1.00	1.73	3.76	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.66	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.51
Trichromadora	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Cervonema	0.00	0.56	4.12	7.10	1.65	1.69	1.34	0.00	0.00	0.62	2.00	0.00	0.00	0.00	2.04	2.63	1.16	3.36	3.68	1.32	0.64	2.87	1.97	2.21	1.33	4.79	11.03	0.64	1.81	2.10	0.00	1.98
Dorylaimopsis	1.17	1.11	1.76	4.14	1.10	0.00	0.00	0.00	0.00	0.00	0.00	3.47	7.53	8.89	5.61	1.05	0.58	0.00	0.00	0.00	0.00	0.00	0.00	1.10	0.89	0.60	0.00	0.00	0.00	0.00	0.00	1.39
Hopperia	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20	0.69	0.00	0.60	0.00	0.00	0.14
Kenyanema	0.00	0.00	0.59	0.00	0.55	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.02	0.00	0.00	0.00	0.74	0.00	0.00	0.00	0.00	2.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
Laimella	1.75	2.22	2.94	1.18	2.20	0.00	0.00	0.65	0.00	0.00	0.00	0.00	4.30	0.56	0.00	1.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.66	1.33	1.80	0.00	0.00	0.60	0.00	0.00	0.78
Metacomesoma	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metasabatieria	0.00	0.00	0.00	0.00	2.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
Paracomesoma	0.58	4.44	0.00	0.00	0.00	0.00	0.00	1.30	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
Paramesonchium	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
Pierrickia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.67	0.00	0.00	0.00	2.87	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.16
Sabatieria	1.75	2.22	2.94	6.51	4.40	2.26	4.03	0.65	0.00	5.59	6.00	1.16	1.08	6.67	1.02	5.79	9.83	4.70	5.15	2.63	1.92	0.57	0.66	10.50	6.67	4.79	11.72	10.19	13.25	0.00	0.00	4.37
Setosabatieria	0.00	0.00	0.59	1.18	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
Vasostoma	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Comesa	5.26	8.33	2.94	1.18	0.55	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.00	1.02	1.58	1.16	0.00	0.00	0.00	0.00	0.00	4.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.92
Filitonchus	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Gophionchus	0.58	0.00	0.00	0.00	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
Nannolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.06
Neotonchus	0.58	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.91	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.47
Acanthonchus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.60	0.00	0.00	0.00	1.16	0.00	0.00	0.00	0.53	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16
Cyatholaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Kraspedonema	0.00	0.00	0.59	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Longicyatholaimus	0.00	0.00	0.00	0.59	1.10	1.13	0.67	0.00	0.00	0.00	3.00	0.00	0.00	2.78	0.00	1.05	0.00	0.00	0.74	1.97	0.64	0.00	1.32	0.55	0.44	0.60	0.00	1.27	0.60	0.70	2.01	0.65
Marylynnia	0.00	0.56	0.00	0.59	0.00	1.13	0.00	1.95	0.63	1.24	3.00	0.58	0.54	1.11	6.12	0.00	3.47	0.00	0.00	0.00	0.64	1.15	0.66	1.10	0.00	1.20	0.00	1.91	0.00	0.00	0.00	0.90
Metacyatholaimus	0.00	0.00	0.00	0.00	0.00	0.00	2.01	2.60	1.26	0.62	1.00	0.00	0.00	0.00	0.00	0.00	1.73	0.67	0.00	0.00	0.64	0.00	0.00	0.55	1.78	1.20	2.07	0.00	0.00	0.00	0.00	0.51
Minolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.58	0.00	0.00	0.00	0.00	1.15	0.00	2.76	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.20
Nannolaimoides	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Paracanthonchus	0.58	0.00	0.59	1.18	0.00	0.56	1.34	2.60	4.40	0.62	1.00	0.00	0.00	1.67	1.02	0.00	0.00	0.00	0.00	0.66	0.00	3.45	1.32	0.00	0.00	0.60	0.00	1.91	0.60	0.00	0.00	0.76
Paracyatholaimoides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.26	0.00	0.00	0.58	1.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
Paracyatholaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
Paralongicyatholaimus	0.58	0.00	0.59	1.18	0.55	0.00	0.67	1.95	0.00	0.00	0.00	0.00	1.08	1.67	0.00	2.11	2.31	0.00	1.47	0.66	2.56	1.15	3.95	1.10	0.44	1.20	0.69	0.00	1.20	0.00	1.34	0.92
Pomponema	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.72	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.12
Praeacanthonchus	0.00	0.00	0.00	1.18	0.00	0.00	0.00	0.65	0.00	0.00	0.00	2.31	0.00	0.00	1.02	0.53	0.00	0.00	0.00	0.00	0.00	2.30	0.66	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.67	0.33
Cheironchus	0.00	0.56	0.00	0.00	0.00	0.00	0.00	1.30	0.63	0.00	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	1.32	0.00	1.33	2.40	0.69	0.00	0.00	0.00	0.67	0.33
Choanolaimus	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Demonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

App. IVb continued..	528A	528B	531A	531B	532A	533A	533B	550A	550B	552A	552B	511A	511B	514A	514B	517A	517B	518A	518B	519A	519B	503A	503B	505A	505B	505C	505D	506A	506B	507A	507B	
Gammanema	0.00	0.56	0.59	0.59	0.55	1.13	0.00	0.00	0.63	0.62	1.00	0.00	0.00	0.00	0.00	0.00	4.62	0.67	5.15	0.00	0.00	0.57	1.97	0.55	0.89	1.20	1.38	0.00	0.60	0.70	0.00	0.74
Halichoanolaimus	0.00	0.00	0.00	0.59	0.55	1.69	0.67	0.00	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	2.63	0.00	0.00	1.32	0.55	0.89	1.20	0.69	0.64	0.00	0.00	0.00	0.41
Latronema	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.57	0.66	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
Richtersia	0.58	1.11	1.18	0.00	0.55	0.00	0.00	2.60	2.52	2.48	0.00	0.00	3.76	1.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.89	0.00	0.00	1.27	0.00	0.70	0.00	0.67
Synonchiella	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Synonchium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.15	3.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
Catanema	1.75	1.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.15	1.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18
Chromaspirina	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.15	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
Desmodora	1.17	0.00	0.59	0.59	0.00	0.56	0.67	2.60	1.89	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.67	0.00	0.00	0.64	4.02	3.29	0.55	2.22	0.00	0.00	0.00	0.00	0.70	2.68	0.76
Desmodorella	1.17	0.00	0.00	0.59	0.00	0.00	0.00	0.65	1.26	1.24	0.00	0.00	1.61	0.56	0.51	4.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.42	0.00	1.20	0.00	1.27	0.00	0.00	0.00	0.65
Draconema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Epsilonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.04
Eubostrichus	0.58	1.11	0.00	0.00	0.00	0.00	0.00	1.30	0.63	0.00	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
Leptolaimella	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Notochaetosoma	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Metepsilonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Onyx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paradraconema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Parallelocollas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Polysigma	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Psammonema	11.11	2.78	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.61	1.11	0.51	0.53	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.69
Pseudonchus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sigmophoranema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spirinia	0.58	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.16	0.54	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
Aponema	0.00	0.00	1.18	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	0.00	4.30	0.56	1.53	0.53	0.58	0.00	0.00	0.00	0.64	1.15	0.00	0.55	0.00	0.60	0.00	1.27	0.60	0.70	0.00	0.55
Bolbolaimus	0.00	0.00	0.59	0.59	0.00	2.26	1.34	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.58	1.16	0.00	0.74	0.66	0.00	0.00	0.66	1.10	1.78	0.00	1.38	1.27	0.00	2.10	1.34	0.63
Calomicrolaimus	0.58	0.00	0.00	0.00	0.00	1.69	1.34	1.30	1.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.74	0.00	0.00	2.30	0.00	3.31	3.56	1.20	0.69	1.27	0.00	0.00	0.67	0.70
Cinctonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	1.20	0.00	0.00	0.00	0.00	0.00	0.08
Crassonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.02
Ixonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30	1.89	0.00	2.00	2.89	0.54	0.56	0.00	0.00	0.00	0.00	0.74	0.66	0.64	2.87	0.00	1.10	0.00	0.00	0.00	1.91	0.60	0.00	0.00	0.55
Microlaimus	1.75	1.67	1.18	2.37	1.10	2.26	1.34	5.84	9.43	0.62	2.00	2.89	0.00	1.11	4.08	3.68	0.58	3.36	1.47	0.00	0.64	12.07	11.84	0.00	2.22	0.00	0.00	1.27	1.20	2.80	1.34	2.58
Molgolaimus	1.17	2.78	2.35	2.96	3.85	2.82	3.36	1.30	3.14	3.73	5.00	0.58	2.15	0.00	0.00	5.79	5.20	4.03	4.41	0.00	2.56	0.57	1.32	2.21	4.89	4.79	2.76	3.82	6.63	0.70	4.70	2.88
Spirobolbolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
Antimicron	0.00	0.00	1.18	0.00	0.55	0.00	0.00	0.00	0.00	0.62	1.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00	1.20	0.00	0.00	0.00	0.00	0.00	0.18
Camacolaimus	0.00	0.00	0.00	0.00	0.55	0.00	0.67	0.00	0.63	0.00	0.00	0.58	0.00	0.56	0.00	0.00	0.58	0.00	0.00	0.66	0.00	0.00	0.00	0.55	0.00	0.00	1.38	0.00	0.00	0.70	1.34	0.25
Cricolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.02
Dagda	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Deontolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diodotolaimus	0.00	0.00	1.18	0.00	0.55	0.00	0.67	0.00	0.00	0.00	0.00	0.58	0.54	0.00	0.00	0.53	0.00	0.67	0.74	1.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22
Halaphanolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Leptolaimoides	0.00	0.00	0.59	0.59	2.20	0.56	1.34	0.00	1.26	1.24	1.00	0.00	0.00	0.56	0.51	1.58	2.31	0.67	0.74	0.00	1.28	0.00	0.00	0.55	0.89	0.60	0.00	0.64	0.60	0.00	2.68	0.72
Leptolaimus	0.58	0.56	0.00	0.00	4.40	1.69	4.70	0.65	1.26	1.86	1.00	1.73	2.69	3.89	1.53	0.53	1.73	1.34	0.00	0.00	3.85	0.00	1.97	1.66	1.33	1.20	1.38	1.91	0.60	0.70	2.01	1.53
Onchium	0.58	0.00	0.00	0.00	0.55	1.13	1.34	0.00	0.63	0.00	0.00	1.73	0.00	1.67	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.60	1.40	0.00	0.35
Procamacolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Setoplectus	0.00	0.00	0.00	0.59	0.00	0.56	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.53	0.00	0.67	0.00	1.32	0.64	0.00	0.00	0.00	1.33	0.00	1.38	1.27	1.20	0.00	0.00	0.35
Tarvaia	0.00	0.00	1.18	0.00	0.00	0.56	0.00	1.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.44	1.20	0.00	0.00	0.00	0.00	0.00	0.18
Aegialoalaimus	0.00	0.00	0.00	0.00	0.00	0.56	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.51	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.00	2.07	0.00	0.00	0.70	0.00	0.18
Cyartonema	0.00	0.56	1.18	0.59	1.65	0.00	0.67	0.00	0.00	0.62	2.00	0.00	0.54	0.00	0.00	0.53	0.58	2.01	0.74	1.97	2.56	0.00	0.00	1.10	0.89	2.99	0.00	0.00	1.81	4.90	6.04	1.04
Diplopeltoides	0.00	1.11	0.59	0.00	2.75	0.00	0.00	0.00	0.00	0.62	2.00	0.00	0.00	0.00	0.00	0.00	0.58	2.01	0.00	0.00	1.28	0.00	0.00	1.10	0.44	1.80	0.00	1.91	0.60	1.40	1.34	0.61
Southernia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Chitwoodia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Tubolaimoides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ceramonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.74	0.00	0.00	0.00	1.97	0.55	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.14
Dasynemoides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.25	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	2.87	1.97	0.00	0.44	2.40	0.00	0.00	0.00	0.70	0.00	0.41
Metadasynemella	0.00	0.00	1.76	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	1.08	1.11	0.00	0.00	0.00	0.00	2.21	0.66	0.64	0.00	0.00	0.00	1.78	0.00	0.00	0.64	0.60	0.00	0.00	0.37
Pselionema	0.00	1.11	1.76	3.55	1.10	0.56	0.00	1.95	0.63	1.24	1.00	0.58	0.54	0.00	0.00	2.11	2.89	0.67	0.00	1.32	0.00	2.87	0.66	1.10	0.44	2.40	1.38	1.27	2.41	0.00	0.67	1.12
Pterygonema	0.00	0.00	0.00	0.59	0.00	0.56	0.00	1.30	2.52	0.00	0.00	0.00	1.08	0.00	0.00	0.00	0.58	0.67	0.00	0.00	0.00	2.87	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.35

App. IVb continued..	528A	528B	531A	531B	532A	533A	533B	550A	550B	552A	552B	511A	511B	514A	514B	517A	517B	518A	518B	519A	519B	503A	503B	505A	505B	505C	505D	506A	506B	507A	507B	
Paramicrolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	1.26	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	1.72	0.00	0.00	0.44	0.00	0.69	0.00	0.00	0.00	0.00	0.18
Calligyrus	0.00	0.00	0.00	0.59	0.00	0.56	0.67	0.00	0.00	0.00	1.00	0.00	0.00	0.56	2.04	0.00	0.00	4.70	0.00	0.00	1.28	0.57	0.00	0.55	3.56	3.59	0.69	0.64	1.20	0.00	1.34	0.78
Desmogerlachia	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Desmorolenzenia	0.00	0.00	0.59	0.00	0.00	0.56	1.34	0.65	0.00	0.00	0.00	0.00	0.00	0.00	2.04	0.00	0.58	0.00	0.00	0.66	0.64	0.57	0.66	0.00	0.00	0.60	0.00	0.00	0.00	0.00	2.01	0.35
Desmoscolex	0.00	0.00	0.59	0.00	0.55	1.69	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.34	0.74	0.66	0.00	0.00	0.00	2.21	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.29
Domorganus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Greeffiella	0.00	0.00	0.00	0.00	0.55	0.00	0.00	0.00	1.26	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.12
Hapalomus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pareudesmoscolex	0.58	0.00	0.00	0.00	0.00	1.13	0.00	0.00	1.89	0.62	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.28	0.00	0.00	0.55	0.00	0.00	1.38	0.00	0.00	0.70	0.67	0.29
Quadricoma	1.17	0.56	0.59	0.00	1.10	0.56	0.00	0.00	0.00	0.00	0.00	0.58	0.00	1.67	0.00	0.53	1.16	0.00	4.41	1.97	0.64	0.00	0.00	2.21	1.78	0.00	0.69	1.27	0.00	0.00	0.00	0.69
Tricoma	1.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	1.16	1.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
Gerlachius	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.00	0.00	0.00	0.00	0.02
Meylia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diplolaimella	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diplolaimelloides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eumonhystera	0.00	0.00	0.59	0.00	0.55	0.56	0.00	1.30	0.00	0.00	1.00	1.16	2.15	0.00	0.00	0.00	0.58	1.34	0.00	1.97	1.92	0.00	0.00	0.00	0.00	0.00	0.00	2.55	1.20	1.40	1.34	0.61
Monhysteridae	0.58	0.00	2.94	0.59	8.24	0.56	1.34	0.00	0.00	4.35	0.00	0.58	0.00	0.00	0.00	2.11	0.58	2.01	5.15	6.58	1.92	0.00	0.00	1.10	4.44	0.60	2.07	3.18	1.81	0.00	0.00	1.66
Monhystrella	0.58	0.00	0.00	0.59	0.55	1.69	6.71	0.00	2.52	0.00	0.00	0.58	1.08	2.22	4.08	0.00	0.00	3.36	0.00	0.66	0.00	0.00	2.63	0.00	0.00	5.39	0.00	0.00	1.81	3.50	5.37	1.37
Monhystera	0.58	1.67	2.35	0.59	2.20	19.21	11.41	0.65	0.63	8.07	8.00	1.16	2.15	0.56	0.00	8.42	8.67	14.09	8.09	24.34	30.13	0.00	1.32	6.63	6.22	4.79	18.62	10.83	17.47	32.17	16.78	8.24
Ammotheristus	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	1.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
Amphimonhystera	0.00	0.00	0.00	1.78	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.00	0.00	0.00	0.74	0.66	0.64	0.57	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.20
Amphimonhystrella	2.34	0.00	5.29	0.00	1.10	0.56	0.67	0.65	0.63	1.24	0.00	0.00	1.08	0.56	2.04	1.05	0.58	2.01	0.74	1.97	1.92	1.15	0.66	2.76	3.56	1.20	0.69	1.91	0.60	0.70	0.00	1.27
Cobbia	1.17	0.56	1.76	0.59	1.65	0.56	0.00	5.19	1.89	1.24	6.00	0.00	0.00	0.56	0.51	0.00	0.00	0.67	2.94	0.66	0.00	0.57	1.97	0.00	0.44	1.20	0.00	0.00	1.20	0.00	2.01	0.98
Daptonema	21.64	20.00	2.94	23.08	10.99	4.52	0.00	3.25	5.03	0.00	2.00	1.16	10.75	15.56	9.69	4.21	2.89	0.00	3.68	0.00	0.64	2.87	0.66	0.55	3.56	0.60	0.69	1.27	6.02	2.80	2.68	5.58
Echinotheristus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Elzalia	1.75	0.00	1.76	0.59	0.55	0.00	0.00	0.00	0.00	1.24	1.00	0.00	5.91	0.56	5.10	0.00	0.00	0.00	0.00	0.00	0.00	1.15	0.66	1.10	0.44	0.00	0.00	0.64	0.00	0.00	0.00	0.78
Gnomoxyala	1.75	0.00	0.00	1.18	0.55	0.00	0.67	0.65	0.63	0.00	0.00	0.58	1.61	0.00	7.14	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.80	0.69	0.00	0.60	0.00	0.00	0.65
Linhystera	0.00	1.11	0.00	0.00	0.55	0.00	0.00	0.00	0.00	0.00	2.00	0.00	3.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23
Manganonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	1.28	0.00	0.00	0.00	0.00	0.60	1.38	0.00	0.00	0.00	0.00	0.12
Metadesmolaimus	0.00	0.00	1.18	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.74	0.00	0.64	0.00	0.00	0.00	0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.14
Paramonhystera	0.00	0.56	0.59	0.00	0.00	0.56	0.00	1.95	0.00	0.00	0.00	1.73	1.61	2.22	3.57	0.00	0.00	0.00	0.00	0.66	0.00	0.57	1.32	0.00	0.00	0.60	0.00	0.00	0.00	1.40	0.00	0.59
Promonhystera	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.05	1.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.22
Prorhynchonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.89	0.00	0.00	0.00	1.08	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.16
Retrotheristus	0.00	0.00	0.59	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	1.08	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
Rhinema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rhynchonema	0.58	0.00	0.59	0.00	0.55	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	1.15	1.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
Scaptrella	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.04
Stylotheristus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.24	0.00	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
Theristus	0.58	0.00	1.18	0.00	0.00	0.00	0.00	1.30	1.89	0.62	0.00	0.00	0.00	0.56	0.00	1.58	0.00	0.00	1.47	0.00	0.00	0.57	0.00	0.00	0.89	0.00	0.00	0.00	0.00	0.00	0.67	0.37
Valvalaimus	1.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
Xenolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xyala	0.58	0.00	0.00	0.00	0.00	1.69	0.67	0.00	0.00	1.86	0.00	0.00	0.00	0.00	0.00	1.05	0.00	0.67	0.00	0.66	0.64	4.02	0.66	0.00	0.00	0.00	0.69	0.00	0.00	0.70	0.00	0.45
Xyalidae	0.00	0.00	0.00	0.00	0.00	0.00	1.34	0.00	0.00	0.62	0.00	0.00	0.00	0.00	0.00	2.63	0.58	0.67	0.00	1.32	5.13	0.00	0.00	0.00	0.89	0.60	0.00	1.27	0.00	1.40	0.00	0.53
Doliolaimus	0.00	0.00	0.59	1.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	1.73	0.00	0.00	0.66	0.00	0.00	0.00	0.00	0.00	0.60	0.69	1.27	1.20	0.00	0.67	0.31
Metasphaerolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.53	0.00	1.16	0.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.00	0.00	0.00	0.00	0.14
Parasphaerolaimus	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.16	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
Sphaerolaimus	0.00	0.00	0.00	1.18	0.00	0.00	1.34	0.00	0.00	0.62	0.00	0.00	1.61	0.56	2.55	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	1.20	0.00	0.00	0.00	0.00	0.00	0.35
Subsphaerolaimus	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
Astomonema	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.56	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.00	0.00	0.00	0.00	0.45
Siphonolaimus	0.00	0.56	0.00	1.78	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.74	0.00	0.00	1.15	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.20
Desmolaimus	0.00	0.56	0.00	0.00	0.55	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
Didelta	0.00	0.00	0.00	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.69	0.00	0.00	0.00	0.00	0.10
Disconema	0.00	0.56	2.35	0.59	1.65	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.00	1.02	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.00	0.69	1.27	0.00	0.00	0.67	0.37
Eleutherolaimus	0.00	0.00	0.00	0.00	0.55	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Eumorpholaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27	0.00	0.00	0.00	0.04
Linhomoeus	0.00	1.11	0.00	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	1.33	0.00	0.00	1.27	0.60	0.00	0.00	0.23
Megadesmolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.58	1.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08

App. IVb continued..	528A	528B	531A	531B	532A	533A	533B	550A	550B	552A	552B	511A	511B	514A	514B	517A	517B	518A	518B	519A	519B	503A	503B	505A	505B	505C	505D	506A	506B	507A	507B	
Metalinhomoeus	0.58	1.11	0.59	0.59	1.10	0.56	0.67	0.00	0.63	1.24	1.00	2.31	0.00	1.67	3.57	0.00	0.58	0.00	0.00	0.00	0.00	1.15	3.29	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.70
Paralinhomoeus	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.24	0.00	0.00	1.08	0.00	0.00	0.00	0.00	0.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
Terschellingia	0.00	20.00	3.53	1.78	2.75	0.00	0.00	0.65	0.00	1.86	4.00	0.58	2.69	7.78	1.02	1.58	0.00	0.00	1.47	0.00	0.00	0.00	0.00	0.55	0.00	0.00	1.38	1.27	1.20	0.00	0.00	1.80
Axonolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
Odontophora	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
Paradontophora	0.58	1.11	1.18	0.59	0.00	0.00	0.00	0.00	0.00	0.62	0.00	2.31	0.54	1.11	1.53	0.00	0.58	0.00	0.00	0.00	0.00	1.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41
Parareolaimus	0.00	0.00	1.18	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.61	0.00	0.00	0.51	1.58	0.58	0.00	0.00	1.32	0.00	0.00	0.66	1.10	0.44	0.00	0.69	0.00	0.00	0.00	2.01	0.90
Areolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Campylaimus	0.00	0.00	2.94	1.18	1.10	0.56	0.00	0.00	0.00	2.48	0.00	1.73	0.54	2.22	1.53	1.05	1.73	0.00	0.00	0.00	0.64	1.15	1.32	2.21	0.00	0.60	0.00	0.00	0.60	0.00	2.68	0.88
Diplopeltula	1.17	1.11	1.18	0.59	1.10	0.56	1.34	0.65	0.00	0.00	3.00	0.58	1.08	0.00	0.51	2.11	1.73	2.01	1.47	1.97	1.28	0.57	0.66	0.55	0.89	2.99	2.07	0.64	0.60	0.70	0.67	1.06
Southerniella	1.17	0.00	0.00	0.00	0.55	1.13	1.34	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	1.16	2.01	0.00	0.66	0.00	0.57	1.97	1.10	0.44	1.20	2.07	0.00	0.60	2.10	0.00	0.61
Coninckia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	2.52	0.00	0.00	0.00	0.00	0.00	0.00	1.05	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	0.00	0.69	0.00	0.00	0.00	0.00	0.00
Enoplolaimus	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.56	0.00	1.05	0.00	0.00	0.74	0.00	0.00	0.00	0.00	0.55	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.16
Enoploides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Epacanthion	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mesacanthion	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mesachanthoides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Oxynchulus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Paramesacanthion	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.44	0.00	0.69	0.00	0.00	0.70	0.00	0.08
Anoplostoma	0.00	0.00	0.00	1.18	0.00	0.00	0.00	1.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.05	0.00	0.00	1.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.67	0.22
Chaetonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.06
Crenopharynx	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
Micoletzkyia	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phanoderma	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Anticoma	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	1.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
Dolicholaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Parironus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sylingolaimus	0.00	0.00	0.00	0.00	0.00	1.13	2.68	0.00	0.63	4.97	2.00	0.00	0.00	0.00	0.00	1.05	4.05	1.34	3.68	0.00	0.64	0.57	0.66	1.10	0.00	1.80	1.38	1.27	1.20	0.00	2.01	0.98
Thalassironus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Trissonchulus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Halalaimus	4.68	0.56	6.47	4.14	5.49	3.39	10.07	11.69	8.81	8.70	7.00	2.89	1.61	1.11	12.76	6.84	4.05	7.38	5.88	4.61	2.56	4.60	7.89	4.42	6.67	1.80	2.76	7.01	1.81	2.80	2.01	5.23
Litinium	0.00	0.00	0.00	0.00	0.00	1.13	0.00	0.00	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.67	1.47	0.00	0.00	0.00	0.00	3.87	0.00	0.60	0.00	0.00	0.00	0.00	0.67	0.31
Oxystomina	0.00	0.56	0.59	1.18	0.55	2.26	0.67	0.00	1.89	1.86	3.00	1.16	1.08	0.00	1.02	0.53	1.73	2.01	1.47	0.00	1.28	0.00	0.00	2.21	0.89	0.60	0.69	1.91	1.81	1.40	1.34	1.06
Paroxystomina	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Thalassoalaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.62	1.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.55	0.44	0.00	0.00	0.64	0.60	0.70	0.00	0.20
Wieseria	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	1.47	0.66	0.64	0.00	0.00	0.00	0.44	0.60	0.00	0.00	0.00	1.40	0.00	0.18
Viscosia	1.17	1.11	1.18	0.00	0.00	1.13	0.67	2.60	0.63	0.62	0.00	0.58	0.00	0.00	0.00	1.05	0.58	0.00	0.00	0.00	0.00	1.15	0.00	0.00	0.00	1.20	0.69	0.64	0.00	0.00	0.00	0.49
Filoncholaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00
Oncholaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Bathyeurystomina	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.08	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
Belbolla	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eurystomina	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Pareurystomina	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Polygastrophora	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bathylaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tripyloides	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pandolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Halanonchus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Rhabdocoma	0.00	0.00	0.00	0.00	0.55	1.69	1.34	1.30	6.29	0.62	0.00	0.00	0.00	0.00	0.00	2.11	1.16	0.67	0.74	0.00	0.00	0.00	0.66	0.55	1.78	1.20	0.69	0.64	1.20	2.80	0.67	0.86
Trefusialaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trefusia	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.65	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.67	0.00	0.00	0.00	0.00	1.32	0.00	0.00	0.60	0.69	0.00	0.00	1.40	0.67	0.23
Lauratonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rhabdolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	1.47	0.00	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.67	0.14
Rhabdonemania	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	1.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
Tylenchid	0.00	0.00	0.00	0.59	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.06
Others	2.92	3.33	9.41	7.69	8.79	4.52	8.72	5.19	5.66	13.66	6.00	5.20	3.76	11.11	0.00	6.32	10.98	9.40	6.62	15.13	9.62	7.47	9.87	4.97	9.33	1.80	7.59	4.46	6.02	7.69	14.09	7.26
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Appendix IV c: Relative proportion of Nematode genera in the transects in June/July (in order)

Kiwayu	%	Tana	%	Sabaki	%	Gazi	%
Monhystera	10.1	Sabatieria	8.1	Terschellingia	7.7	Monhystera	8.4
Halalaimus	5.6	Monhystera	6.1	Monhystera	5.8	Halalaimus	5.8
Eumonhystera	4.1	Halalaimus	5.8	Daptonema	5.8	Sabatieria	5.8
Acantholaimus	3.3	Daptonema	4.1	Halalaimus	5.1	Cervonema	4.8
Terschellingia	3.2	Molgolaimus	2.7	Dorylaimopsis	4.0	Amphimonhystrella	2.9
Dorylaimopsis	3.2	Dichromadora	2.7	Viscosia	3.6	Molgolaimus	2.6
Microlaimus	3.0	Ptycholaimellus	2.6	Sabatieria	3.4	Acantholaimus	2.5
Daptonema	2.7	Microlaimus	2.3	Acantholaimus	2.9	Paramonhystera	2.1
Sabatieria	2.5	Cervonema	2.3	Microlaimus	2.2	Microlaimus	1.9
Molgolaimus	2.5	Leptolaimus	2.1	Amphimonhystrella	1.8	Eumonhystera	1.6
Leptolaimus	2.3	Rhynchonema	2.0	Comesa	1.7	Leptolaimus	1.5
Psammonema	2.1	Desmodora	1.9	Eumonhystera	1.7	Daptonema	1.5
Xyala	1.6	Leptolaimoides	1.8	Pselionema	1.7	Cyartonema	1.3
Amphimonhystrella	1.5	Laimella	1.7	Leptolaimus	1.6	Terschellingia	1.2
Cyartonema	1.3	Pselionema	1.6	Dichromadora	1.4	Oxystomina	1.2
Viscosia	1.3	Eumonhystera	1.6	Marylynnia	1.2	Rhabdocoma	1.2
Cervonema	1.1	Actinonema	1.5	Molgolaimus	1.1	Desmoscolex	1.1
Astomonema	1.1	Chromaspirina	1.5	Oxystomina	1.1	Pselionema	1.1
Monhystrella	1.0	Paramonhystera	1.3	Cervonema	1.1	Longicyatholaimus	1.1
Hypodontolaimus	1.0	Acantholaimus	1.3	Monhysteridae	1.1	Halichoanolaimus	1.1
Leptolaimoides	1.0	Eubostrichus	1.1	Xyalidae	1.1	Paralongicyatholaimus	1.1
Campylaimus	1.0	Astomonema	1.1	Elzalia	1.0	Dorylaimopsis	1.0
Calomicrolaimus	0.9	Filitonchus	1.1	Cyartonema	0.9	Hopperia	1.0
Diplopeltula	0.9	Sylingolaimus	1.1	Quadricoma	0.9	Monhysteridae	1.0
Quadricoma	0.9	Amphimonhystera	1.0	Chromaspirina	0.9	Metacyatholaimus	0.9
Dichromadora	0.9	Paracyatholaimoides	1.0	Sphaerolaimus	0.9	Leptolaimoides	0.9
Sylingolaimus	0.8	Theristus	1.0	Bolbolaimus	0.8	Dolicholaimus	0.9
Pselionema	0.8	Quadricoma	1.0	Sylingolaimus	0.8	Doliolaimus	0.9
Actinonema	0.8	Paralongicyatholaimus	0.9	Richtersia	0.8	Thalassoalaimus	0.8
Theristus	0.8	Litinium	0.9	Paralongicyatholaimus	0.8	Dichromadora	0.8
Camacolaimus	0.7	Camacolaimus	0.8	Actinonema	0.8	Kenyanema	0.8
Metacyatholaimus	0.7	Sphaerolaimus	0.8	Diplopeltoides	0.7	Cobbia	0.8
Diplopeltoides	0.7	Viscosia	0.8	Aponema	0.7	Xyala	0.8
Linhystera	0.7	Xyalidae	0.8	Campylaimus	0.7	Diplopeltoides	0.8
Hopperia	0.7	Setoplectus	0.8	Paradontophora	0.7	Amphimonhystera	0.7

Appendix IV c continued...

Kiwayu	%	Tana	%	Sabaki	%	Gazi	%
Sphaerolaimus	0.7	Ixonema	0.8	Rhabdocoma	0.7	Laimella	0.7
Rhabdocoma	0.6	Paracyatholaimus	0.7	Diplopeltula	0.7	Litinium	0.7
Oxystomina	0.6	Nannolaimus	0.7	Litinium	0.7	Bolbolaimus	0.7
Paracomesoma	0.6	Aegialoalaimus	0.6	Desmodora	0.6	Disconema	0.7
Aegialoalaimus	0.6	Disconema	0.6	Doliolaimus	0.6	Sylingolaimus	0.7
Rhynchonema	0.6	Oxystomina	0.6	Prochromadorella	0.6	Theristus	0.7
Marylynnia	0.5	Cyartonema	0.6	Metacyatholaimus	0.6	Diplopeltula	0.6
Thalassoalaimus	0.5	Diplopeltula	0.6	Paramicrolaimus	0.5	Viscosia	0.6
Paralongicyatholaimus	0.5	Innocuonema	0.6	Bathyeurystomina	0.5	Parareolaimus	0.6
Longicyatholaimus	0.5	Paramesacanthion	0.6	Disconema	0.5	Campylaimus	0.6
Trochamus	0.5	Prochromadorella	0.6	Calomicrolaimus	0.4	Richtersia	0.6
Gnomoxyala	0.5	Stylotheristus	0.6	Xyala	0.4	Desmorolenzenia	0.6
Prorhynchonema	0.5	Campylaimus	0.6	Gammanema	0.4	Rhynchonema	0.6
Paradontophora	0.5	Linhomoeus	0.6	Halichoanolaimus	0.4	Spirinia	0.6
Ceramonema	0.5	Choanolaimus	0.6	Theristus	0.4	Setoplectus	0.6
Paramesonchium	0.5	Bolbolaimus	0.6	Trochamus	0.4	Quadricoma	0.6
Metasabatieria	0.5	Gammanema	0.4	Pareudesmoscolex	0.4	Paramicrolaimus	0.6
Belbolla	0.4	Metacyatholaimus	0.4	Metalinhomoeus	0.4	Cheironchus	0.5
Elzalia	0.4	Aponema	0.4	Neochromadora	0.4	Monhystrella	0.5
Disconema	0.4	Acanthonchus	0.4	Monhystrella	0.4	Gammanema	0.5
Metalinhomoeus	0.4	Pseudonchus	0.4	Acanthonchus	0.3	Manganonema	0.5
Comesa	0.4	Areolaimus	0.4	Gnomoxyala	0.3	Elzalia	0.5
Desmodora	0.4	Cinctonema	0.4	Leptolaimoides	0.3	Aegialoalaimus	0.5
Linhomoeus	0.4	Longicyatholaimus	0.4	Kenyanema	0.3	Desmodorella	0.4
Laimella	0.4	Trissonchulus	0.4	Neotonchus	0.3	Tricoma	0.4
Acanthonchus	0.4	Marylynnia	0.4	Spirinia	0.3	Trefusia	0.4
Vasostoma	0.4	Enoploides	0.4	Rhynchonema	0.3	Chromaspirina	0.4
Paracyatholaimoides	0.3	Bathyeurystomina	0.4	Linhomoeus	0.3	Diplolaimelloides	0.4
Amphimonhystera	0.3	Leptolaimella	0.4	Camacolaimus	0.3	Antimicron	0.4
Setoplectus	0.3	Dorylaimopsis	0.4	Eubostrichus	0.2	Gerlachius	0.4
Tylenchid	0.3	Trichromadora	0.4	Catanema	0.2	Metalinhomoeus	0.4
Rhips	0.3	Cobbia	0.4	Desmodorella	0.2	Eleutherolaimus	0.3
Parareolaimus	0.3	Draconema	0.4	Laimella	0.2	Calomicrolaimus	0.3
Eubostrichus	0.3	Desmodorella	0.4	Paracomesoma	0.2	Pareudesmoscolex	0.3

Appendix IV c continued...

Kiwayu	%	Tana	%	Sabaki	%	Gazi	%
Neochromadora	0.3	Elzalia	0.4	Desmoscolex	0.2	Desmodora	0.3
Tarvaia	0.3	Richtersia	0.4	Aegialoalaimus	0.2	Xyalidae	0.3
Antimicron	0.3	Setosabatieria	0.4	Rhabdolaimus	0.2	Diplolaimella	0.3
Tricoma	0.3	Catanema	0.4	Desmorolenzenia	0.2	Marylynnia	0.3
Thalassironus	0.3	Desmolaimus	0.4	Longicyatholaimus	0.2	Aponema	0.3
Setosabatieria	0.3	Wieseria	0.2	Latronema	0.2	Paracyatholaimus	0.2
Paramonhystera	0.3	Diplopeltoides	0.2	Southerniella	0.2	Pterygonema	0.2
Doliolaimus	0.3	Rhabdocoma	0.2	Gerlachius	0.2	Ammotheristus	0.2
Litinium	0.3	Linhystera	0.2	Paramonhystera	0.2	Paralinhomoeus	0.2
Paramicrolaimus	0.3	Metalinhomoeus	0.2	Tricoma	0.2	Gnomoxyala	0.2
Synonchiella	0.2	Tylenchid	0.2	Metadasynemella	0.2	Wieseria	0.2
Chromaspirina	0.2	Hopperia	0.2	Synonchiella	0.2	Actinonema	0.2
Desmoscolex	0.2	Minolaimus	0.2	Meylia	0.2	Neotonchus	0.2
Paracanthonchus	0.2	Kenyanema	0.2	Halaphanolaimus	0.2	Linhystera	0.2
Onyx	0.2	Nannolaimoides	0.2	Manganonema	0.2	Paracanthonchus	0.2
Pomponema	0.2	Crenopharynx	0.2	Parareolaimus	0.2	Crassonema	0.2
Greeffiella	0.2	Endeolophos	0.2	Antimicron	0.2	Pierrickia	0.2
Halichoanolaimus	0.2	Prorhynchonema	0.2	Linhystera	0.1	Southerniella	0.2
Meylia	0.2	Rhips	0.2	Megadesmolaimus	0.1	Valvalaimus	0.2
Southerniella	0.2	Mesachanthoides	0.2	Eumorpholaimus	0.1	Procamacolaimus	0.2
Chromadora	0.2	Cyatholaimus	0.2	Siphonolaimus	0.1	Tylenchid	0.2
Pierrickia	0.2	Polygastrophora	0.2	Draconema	0.1	Bathyeurystomina	0.2
Wieseria	0.2	Mesacanthion	0.2	Chromadorita	0.1	Camacolaimus	0.2
Aponema	0.2	Onyx	0.2	Trichromadora	0.1	Comesa	0.2
Kraspedonema	0.2	Polysigma	0.2	Spirobolbolaimus	0.1	Astomonema	0.2
Enoploides	0.2			Tarvaia	0.1	Oncholaimus	0.2
Bolbolaimus	0.2			Tylenchid	0.1	Tarvaia	0.2
Rhabdonemania	0.2			Desmogerlachia	0.1	Acanthonchus	0.2
Dasynemoides	0.2			Ceramonema	0.1	Ceramonema	0.2
Sigmophoranema	0.2			Psammonema	0.1	Greeffiella	0.2
Megadesmolaimus	0.2			Parallelocoilas	0.1	Praeacanthonchus	0.2
Richtersia	0.2			Promonhystera	0.1	Linhomoeus	0.2
Filoncholaimus	0.2			Greeffiella	0.1	Chromadorita	0.1
Metadasynemella	0.2			Dolicholaimus	0.1	Metasphaerolaimus	0.1

Appendix IV c continued...

Kiwayu	% Tana
Metasphaerolaimus	0.2
Gerlachius	0.2
Rhinema	0.1
Rhabdolaimus	0.1
Tubolaimoides	0.1
Cobbia	0.1
Calligyrus	0.1
Kenyanema	0.1
Cyatholaimus	0.1
Neotonchus	0.1
Siphonolaimus	0.1
Cricolaimus	0.1
Bathyeurystomina	0.1
Paracyatholaimus	0.1
Axonolaimus	0.1
Cheironchus	0.1
Crassonema	0.1
Odontophora	0.1
Paramesacanthion	0.1
Nannolaimus	0.1
Echinotheristus	0.1
Catanema	0.1
Ptycholaimellus	0.1
Denticulella	0.1
Deontolaimus	0.1
Phanoderma	0.1
Oxynchulus	0.1
Subsphaerolaimus	0.1
Anticoma	0.1
Metadesmolaimus	0.1
Desmorolenzenia	0.1

% Sabaki	% Gazi	%
Ammotheristus	0.1 Paramesacanthion	0.1
Pierrickia	0.1 Synonchium	0.1
Paracyatholaimoides	0.1 Parironus	0.1
Ixonema	0.1 Paracyatholaimoides	0.1
Paracanthonchus	0.1 Sphaerolaimus	0.1
Enoplaimus	0.1 Synonchiella	0.1
Diplolaimelloides	0.1 Rhabdolaimus	0.1
Axonolaimus	0.1 Metacomesoma	0.1
Diplolaimella	0.1 Hapalomus	0.1
Metadesmolaimus	0.1 Paracomesoma	0.1
Hopperia	0.1 Trefusialaimus	0.1
Cricolaimus	0.1 Gophionchus	0.1
Pareurystomina	0.1 Notochaetosoma	0.1
Nannolaimus	0.1 Paroxystomina	0.1
Odontophora	0.1 Thalassironus	0.1
Crenopharynx	0.1 Domorganus	0.1
Enoploides	0.1 Epsilonema	0.1
Belbolla	0.1 Metepsilonema	0.1
Paramesonchium	0.1 Prochromadorella	0.1
Cheironchus	0.1 Metasabatieria	0.1
Pomponema	0.1 Bathylaimus	0.1
Pterygonema	0.1 Echinotheristus	0.1
Thalassironus	0.1 Filoncholaimus	0.1
Didelta	0.1 Chromadora	0.1
Stylotheristus	0.1 Desmolaimus	0.1
Cyatholaimus	0.1 Chaetonema	0.1
Onchium	0.1 Eurystomina	0.1
Paroxystomina	0.1 Stylotheristus	0.1
Trefusialaimus	0.1 Nannolaimus	0.1
Trefusia	0.1 Paradontophora	0.1
Paracyatholaimus	0.1 Calligyrus	0.1
Paralinhomoeus	0.1 Areolaimus	0.1
Astomonema	0.1 Minolaimus	0.1
	Enoplaimus	0.1

Appendix V: TWINSPAN Classification table using percentage proportion of genera per replicate

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                 23 2356253345566612445153334512223 5 221255 44   111441441133
                562171230028930812379296015678795680944783452018934564735612341

 81 Monh yst1  --1---1124311-211----211-321322-21122----------------1------1--  00000
  1 Acan tho1  1433432333344334343223232321222112212-1131-1---1---------------  000010
 92 Mang anon  ---2-111-11----1---------------1---11-------------------------  000010
125 Syli ngol  211121-111-122111-22122122---1-2111111-1--11--1----------------  000010
101 Xyal id12  --1---13131-1-11-1---11-1----21111-1---12-------1--------------  000011
 37 Hali choa  ---11-1-12211-11---1-1-1---11-1112211-2--1-1--------1----------  000100
133 Tref usi2  ---------1--1-11-11--1-------1---1--1-12---1-1----------------  000100
 36 Gamm anem  ---------1-1-11111-2112113111-111---1-2-1-11--1--------------1-  000101
 49 Bolb olai  1-1--1--11121----2122-11-111-111-1111---22-1-1-11-------------  000110
132 Rhab doco  1112--1-11-11-11121-211111--12111-121-112--1-13--2-----1-------  000110
128 Thal asso  11-2---11---11--11--11-1-----11--11--1-1----------------------1  001000
 25 Long icya  -11-1-111-1112-111211--1-1-111111111-121---1---1---------2----1  001001
 53 Molg olai  1-1122122--223223122323232222322221322121111-122-3--11--2---12-  001001
 61 Seto plec  -1111--11-111-1-1---1------1-11-11-11-11-------111----1--------  001001
 64 Cyar tone  112-2212-21-122212311111111111111221-1-1-------1-1-1----1----11  001001
 65 Dipl ope1  1-1-12111----2211111-1111-1-2-1-111--21111-------1-----1-----1-  001001
 74 Desm osco  ----11---2111-11----3--2-11-1---1-11-------------1------------1  001001
 83 Monh yst3  5545455542544342454-333343212332-11343-121-1-111223131-221--111  001001
 85 Amph imo1  11-2---11-11------------11-1----1-11--11--1----11-----1-------1  001001
102 Doli olai  --1--23-121----11-1---1---11-1-1---11-11---------1--1----------  001001
 58 Lept ola1  1---21111--111111-2111211111211-1111-21-------12-11-1-1--1-----  001010
 63 Aegi oloa  -11-11-1-1-11----1------1-------1--12111-1-------1----1--1-----  001010
129 Wies eria  ------11--1----1-1------11----1-1----11---------1-------1-----  001010
 11 Cerv onem  212---111111122212-2311222231212223341431-21----22-11-2---1--1-  001011
 55 Anti micr  ---------1---1-1-----11--11-1---1111-1-1---------1--------1----  001011
 43 Desm odo1  --11-1-1-1-11-1--12----1--11-121---1-2-1-122-2122------3----1--  00110
 62 Tarv aia1  --1--------1---1----------1---1----1----11-1-1----------------1  00110
 67 Dasy nemo  --------------2-1-1--1-------1------1----21-21---------------1  00110
 70 Pter ygon  ------1----1--1-1-----1----1----1-11----1-2-112---------1------  00110
 35 Chei ronc  --------------2--1----------1-11111-111111-11--1------1----1-  00111
 27 Meta cyat  -22-1--1-1--2111---1-1111-----1-23--2---11---21----2----------  010
 69 Psel ione  --2-11--1211-1122-1221211-121211111-11113121-11121---1-11----12  010
 71 Para micr  ----11--------------2--------111111-111-1-1--11---2-----------  010
 77 Pare udes  -----1-1-2-1-1---11--1-1-------1--111---11----1--------1----1--  010
108 Disc onem  ---111-112-1------11----1-211--11-11112----------1----1-1----1-  01100
121 Enop laim  --1---1-1--------------1111--1-111-1---1--------1-------11-----  01100
 13 Hopp eria  --------------111--11---1-------311111-1---------1-1--1------1-  01101
 14 Keny anem  ---------1---1---------2111-1--1111---111--------1-1--1--------  01101
 32 Para long  -11--112-11-1--11-1---21-111121-11111-223112-1-121------11111-1  011100
 50 Calo micr  1-1--11-1--11--1--121-12-1----2---1-1--1--2--11--1----------1-3  011100
 87 Cobb ia12  ----------11-3111-2--1---2111-1-11-2-1-1-111-31-1-----1--1--11-  011100
 15 Laim ella  -1-------------11---1--11-212111111---21-1---1--21------211-12-  011101
 19 Saba tier  111231-1422223224--3333433232334433343332-11-1-42--1-1111331121  011101
 44 Desm odo2  --1-----11-----1----11-2---1-2-11-1----111---11-1-----1-11--1--  011101
 56 Cama cola  1-1-1----11-1----11---111---1--11---1111------11----11-1-1-----  011101
 59 Lept ola2  3112-22212-12111112-11112---2112-121121111-1-1111111-1122211112  011101
 73 Desm orol  --1-1-11--111--1--2-1-1---1------111-----111-1------1-21-------  011101
 78 Quad rico  121111111-11-------1--12121-1111--1-1111-2-----11111-1-2-1--11-  011101
 86 Amph imo2  --1-131111111-2111--1112-13-112232311232--11-11--3123-2-11--2--  011101
 91 Linh ster  ----11-------2------1---1---1--------11----------------2----1-  011101
117 Camp ylai  1---1121-1-1---11-2-12121-2111-11-11-1--1111----12-1211-121----  011101
118 Dipl ope2  -11-1111111112221111--111111121-1--221-11-11-1-1-1-1111-1-1-111  011101
126 Hala laim  3333322322243311223232233323333233323422323433232342411111212  011101
127 Oxys tomi  1-11111111-212211111-11211111111211111111-----1---1111111-12-1-  011101
137 Othe rs12  233442432442333133443442333333342232343244 33-333332343-42422222  011101
 72 Call igyr  -------11--111221-1----1---1--2-----11-1--1---------1-2--1-----  011110
 80 Eumo nhys  432212212-11-11-11141-1-1-1-1-----11-112-1---1-21--2-1-12-1----  011110
 82 Monh yst2  -1---11---113-2312311------11--2--1--1-1---2--2------12-12--1--  011110
119 Sou  ther  -1-------111122112----11----1-1-111-2-----11-----11----1----1--  011110
 60 Onch ium1  ---------1-11-1111----------1----------------1------1---1--1--  011111
 97 Rhyn chon  --1--11----1-----------1-1-11----1--1---211---3-1----------1-2  100000
 29 Para cant  --1-----1-1111-11--121----11-------------21-22-------1--1--1-1  100001
100 Xyal a123  -1-----1--111-1--1-111-------1----1-1---2321-------1--------1-4  100001
 34 Prae acan  -----1----------1-1-1------1-1---1--------21-1-------21--------  10001
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Appendix V: TWINSPAN Classification table using percentage proportion of genera per replicate continued....

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 51 Ixon emal  --1----11-1--2--1--1---1-1---------------2--1111----2--11-----  10001
 52 Micr olai  -31-23-111-2122-1212111-11121222-211-2222344-33-3-112221-111112  10001
 66 Cera mone  -1------------1---1--11-1-------1------11-1-----------------2  1001
 99 Ther istu  ---1-------------11-1--111--11-1111--11--1--1111212-----1--1-1  1001
  2 Acti non*  211--------112111--1----------111-1-11--111--2212122--1-----2-2  1010
 39 Rich ters  --------11-------1---2----1-1-111111----12-1-22-111----321--111  1010
 94 Para monh  --1---1---11---1-1------1-1-----13-1-11--411-1--21---121121--1-  1010
 24 Acan tho2  1---------------------1-1----1-----1-----1---2-1--2--1--------  1011
110 Linh moeu  11------1-------1--11--11---1-1-------1---------1-21-----1---1-  110010
116 Para reol  1---1-----1-------2---11--11-11--1--1-221--1------1--41--------  110010
 48 Apon emal  1-1--1-11--1---111--1-111-1--1-----1--1-1-1------1----1321-----  110011
 68 Meta dasy  -------11-1-----1--------21---1-------1------1----2-----11----1  1101
104 Spha erol  111-2-------1--1-----11-1--1--1-1----11--------1--212-2111-----  1101
 21 Come come  1-1---------------1--1---2111-1------11---2--1--131--11--3233-  111000
 47 Spir inia  --1------1---------1-----------1-111--11-1-----------11-1---11-  111000
114 Ters chel  111-11--1----2--1----1-1-12121-111211211-----1---3-211132355-51  111000
 12 Dory laim  ---------------1---1--11--12111-311--111--------12153234332111-  111001
115 Para dont  ------------------1-11---11----------1--1------112-21-111111-  111001
 10 Troc hamu  -1-----------1-1----------1----1----------11--1---1-11112---21-  111010
 88 Dapt nema  1-1-11111--2-2-132212-21-225422-11--1112-321-233214421334435553  111010
112 Meta linh  ---------1-111-1-----11-1-111---11-1-1--1112--1--1--1221-1-111-  111010
130 Visc osia  --11111-12-11--1-----11-1-1--1-111-112---11--211-12-11-2--25112  111010
  5 Dich roma  1------1---1-------121-1--1-11-1-111-11--11--1122132221--112--2  111011
  8 Proc hrom  -----1-11----------1---1----1--1--1----------111--11111-----1--  111011
 26 Mary lynn  -2-----11--1-2-1-----121---1----11-1----1111-111--21313111---11  111011
 30 Para cya1  1-1-1-----------------1-------------111------12----11--1------  111011
 89 Elza lia1  1-1-----1----1-----111-1--111-111--1--1--111----11212-3131--1--  111011
 90 Gnom oxya  --1---1-----1--11----------111--1--111-------11----1213-1---1--  111011
105 Asto mone  -------------------------1----11--11---1------23---4-1-1-----  111011
  7 Neoc hrom  -------------------1---1-------------------------1111----11211  111100
 16 Para com1  ------------------------------------1--1---1--------1---12122  111100
 46 Psam mone  ----1---1-----1-----------1--1-1----------------------1-11--42-  111100
 23 Neot onch  --------------1----------------------11-1-1-----1-----233--11-  111101
 42 Chro masp  ---------1----------------------1-----1-1211----213-21-1----1-1  111110
  9 Ptyc hola  ---------------------------------------2131----1------221  111111
 45 Eubo stri  ------------------------------------11-2-11-2------11---112  111111

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Appendix VI: Mean Percentage proportion of nematode families per ecological group

	1	2	3	4	5	Mean
Chromadoridae	6.92	8.11	5.75	6.86	10.15	7.56
Comesomatidae	11.90	6.11	16.90	12.30	3.44	10.13
Ethmolaimidae	3.80	2.16	0.79	0.40	0.14	1.46
Cyatholaimidae	4.27	8.66	5.29	3.82	3.59	5.13
Selachinematidae	1.53	3.95	3.64	1.88	0.99	2.40
Desmodoridae	5.03	7.35	2.56	1.45	0.82	3.44
Microlaimidae	4.22	12.50	7.99	8.23	6.13	7.81
Leptolaimidae	3.03	2.32	3.38	5.11	4.66	3.70
Haliplectidae	0.04	0.33	0.45	0.48	0.52	0.36
Tarvaiidae	0.14	0.43	0.20	0.06	0.09	0.19
Aegialoalaimidae	0.66	0.66	2.57	3.19	3.79	2.17
Tubolaimidae	0.00	0.08	0.04	0.06	0.00	0.04
Ceramonematidae	1.09	4.24	2.81	2.21	0.84	2.24
Paramicrolaimidae	0.26	0.68	0.49	0.33	0.09	0.37
Meylidae	0.16	0.00	0.36	0.12	0.14	0.16
Desmoscolecidae	1.64	2.52	2.78	3.76	2.98	2.74
Monhysteridae	4.32	3.25	8.85	17.97	31.79	13.24
Xyalidae	21.28	16.84	11.18	10.11	8.19	13.52
Sphaerolaimidae	1.47	0.42	1.03	0.84	1.43	1.04
Siphonolaimidae	1.14	0.80	0.73	0.33	0.04	0.61
Linhomoedidae	11.52	1.76	3.34	3.57	1.89	4.42
Axonolaimidae	2.66	0.59	1.08	0.00	0.43	0.95
Diplopeltidae	1.52	1.48	2.71	2.27	2.66	2.13
Coninckidae	0.00	0.71	0.19	0.00	0.00	0.18
Thoracostomopsidae	0.35	0.76	0.34	0.20	0.32	0.39
Anoplostomatidae	0.04	0.28	0.25	0.34	0.05	0.19
Phanodermatidae	0.07	0.00	0.04	0.00	0.14	0.05
Anticomatidae	0.00	0.00	0.04	0.00	0.14	0.04
Ironidae	0.04	0.44	1.63	1.62	1.96	1.14
Oxystomatidae	5.50	7.03	8.52	8.73	7.91	7.54
Oncholaimidae	3.22	1.12	0.48	0.83	0.62	1.25
Enchelidiidae	0.93	0.34	0.20	0.06	0.14	0.33
Tripyloididae	0.04	0.00	0.00	0.06	0.00	0.02
Pandolaimidae	0.04	0.00	0.00	0.00	0.00	0.01
Trefusidae	0.04	1.63	1.70	1.11	1.38	1.17
Lauratonematidae	0.00	0.00	0.08	0.00	0.00	0.02
Rhabdolaimidae	0.09	0.00	0.12	0.27	0.24	0.14
Rhabdonemaniidae	0.08	0.00	0.00	0.13	0.14	0.07
Tylenchid	0.00	0.00	0.10	0.18	0.31	0.12
Others	0.94	2.40	1.44	1.10	1.92	1.56
Total Identified	100.0	100.0	100.0	100.0	100.0	100.0
Number of families	34	30	36	33	34	39

Appendix VII: Mean genera proportion (%) per group

	1	2	3	4	5	Mean
Acantholaimus	0.00	0.41	3.76	4.61	8.35	**3.43**
Actinonema*	0.88	2.03	0.46	0.32	0.48	**0.83**
Chromadora	0.00	0.00	0.10	0.00	0.20	**0.06**
Denticulella	0.00	0.00	0.00	0.00	0.03	**0.01**
Chromadorella	0.00	0.00	0.02	0.00	0.06	**0.01**
Chromadorita	0.14	0.00	0.02	0.09	0.11	**0.07**
Dichromadora	1.67	2.02	0.37	0.59	0.13	**0.96**
Endeolophos	0.00	0.12	0.00	0.00	0.00	**0.02**
Euchromadora	0.00	0.06	0.00	0.00	0.00	**0.01**
Graphonema	0.00	0.00	0.07	0.00	0.00	**0.01**
Hypodontolaimus	0.81	0.06	0.09	0.00	0.00	**0.19**
Innocuonema	0.14	0.53	0.00	0.00	0.00	**0.13**
Neochromadora	0.72	0.00	0.05	0.00	0.00	**0.15**
Prochromadorella	0.37	0.61	0.20	0.12	0.10	**0.28**
Parapinanema	0.02	0.00	0.00	0.00	0.00	**0.00**
Ptycholaimellus	0.67	2.19	0.00	0.00	0.00	**0.57**
Parachromadorita	0.03	0.23	0.00	0.00	0.00	**0.05**
Spiliphera	0.00	0.11	0.04	0.00	0.05	**0.04**
Trochamus	1.21	0.31	0.28	0.00	0.04	**0.37**
Trichromadora	0.10	0.22	0.00	0.00	0.00	**0.07**
Cervonema	0.26	0.93	3.90	2.75	1.01	**1.77**
Dorylaimopsis	6.74	0.22	1.67	0.34	0.00	**1.79**
Hopperia	0.44	0.00	0.47	0.48	0.00	**0.28**
Kenyanema	0.11	0.00	0.57	0.41	0.00	**0.22**
Laimella	0.68	1.18	0.98	0.52	0.04	**0.68**
Metacomesoma	0.00	0.11	0.02	0.00	0.00	**0.02**
Metasabatieria	0.40	0.00	0.02	0.39	0.00	**0.16**
Paracomesoma	1.05	0.24	0.02	0.00	0.00	**0.26**
Paramesonchium	0.48	0.06	0.10	0.00	0.00	**0.13**
Pierrickia	0.00	0.29	0.05	0.18	0.24	**0.15**
Sabatieria	1.81	3.50	6.13	6.51	1.79	**3.95**
Setosabatieria	0.00	0.22	0.34	0.09	0.05	**0.14**
Vasostoma	0.03	0.00	0.35	0.00	0.00	**0.08**
Comesa	2.02	0.52	0.80	0.08	0.13	**0.71**
Filitonchus	0.04	0.67	0.00	0.00	0.00	**0.14**
Gophionchus	0.04	0.06	0.00	0.23	0.00	**0.06**
Nannolaimus	0.11	0.58	0.03	0.00	0.00	**0.14**
Neotonchus	1.22	0.17	0.16	0.00	0.00	**0.31**
Acanthonchus	0.48	0.59	0.08	0.14	0.03	**0.26**
Cyatholaimus	0.07	0.23	0.00	0.10	0.03	**0.09**
Kraspedonema	0.00	0.00	0.22	0.08	0.00	**0.06**
Longicyatholaimus	0.24	0.37	0.65	0.64	0.92	**0.56**
Marylynnia	1.32	0.89	0.79	0.18	0.33	**0.70**
Metacyatholaimus	0.09	0.60	0.74	0.42	0.69	**0.51**
Minolaimus	0.00	0.11	0.21	0.09	0.05	**0.09**
Nannolaimoides	0.03	0.00	0.00	0.09	0.00	**0.03**
Paracanthonchus	0.41	1.18	0.29	0.33	0.26	**0.49**
Paracyatholaimoides	0.13	0.72	0.05	0.18	0.11	**0.24**
Paracyatholaimus	0.03	0.58	0.03	0.18	0.09	**0.18**
Paralongicyatholaimus	0.41	1.49	1.23	0.55	0.65	**0.86**
Pomponema	0.20	0.24	0.10	0.00	0.00	**0.11**
Praeacanthonchus	0.21	0.36	0.14	0.12	0.10	**0.19**
Cheironchus	0.07	0.49	0.40	0.04	0.06	**0.21**
Choanolaimus	0.00	0.34	0.11	0.00	0.00	**0.09**
Demonema	0.00	0.07	0.00	0.00	0.00	**0.01**

App. VII cont..	1	2	3	4	5	Mean
Gammanema	0.03	0.32	0.96	0.99	0.15	**0.49**
Halichoanolaimus	0.14	0.24	0.54	0.50	0.60	**0.40**
Latronema	0.06	0.12	0.25	0.00	0.00	**0.09**
Richtersia	1.34	1.34	0.53	0.31	0.06	**0.72**
Synonchiella	0.02	0.06	0.10	0.00	0.14	**0.07**
Synonchium	0.00	0.44	0.03	0.00	0.00	**0.10**
Catanema	0.41	0.47	0.02	0.00	0.00	**0.18**
Chromaspirina	0.68	1.51	0.18	0.10	0.00	**0.49**
Desmodora	0.70	2.45	0.27	0.56	0.64	**0.92**
Desmodorella	0.24	0.63	0.77	0.26	0.05	**0.39**
Draconema	0.00	0.40	0.08	0.00	0.05	**0.11**
Epsilonema	0.00	0.00	0.02	0.09	0.00	**0.02**
Eubostrichus	0.56	1.30	0.08	0.00	0.00	**0.39**
Leptolaimella	0.00	0.22	0.00	0.00	0.00	**0.04**
Notochaetosoma	0.00	0.11	0.00	0.07	0.00	**0.04**
Metepsilonema	0.00	0.00	0.06	0.05	0.00	**0.02**
Onyx	0.20	0.12	0.00	0.00	0.00	**0.06**
Paradraconema	0.00	0.00	0.00	0.00	0.05	**0.01**
Parallelocoilas	0.00	0.00	0.06	0.00	0.00	**0.01**
Polysigma	0.00	0.12	0.00	0.00	0.00	**0.02**
Psammonema	2.82	0.00	0.18	0.09	0.03	**0.63**
Pseudonchus	0.00	0.35	0.00	0.00	0.00	**0.07**
Sigmophoranema	0.07	0.00	0.00	0.09	0.00	**0.03**
Spirinia	0.21	0.11	0.25	0.14	0.05	**0.15**
Aponema	1.26	0.11	0.35	0.48	0.38	**0.52**
Bolbolaimus	0.00	0.90	0.87	0.43	0.85	**0.61**
Calomicrolaimus	0.71	0.49	0.63	0.22	0.58	**0.52**
Cinctonema	0.00	0.37	0.06	0.00	0.00	**0.09**
Crassonema	0.07	0.00	0.00	0.19	0.00	**0.05**
Ixonema	0.25	1.07	0.21	0.23	0.16	**0.38**
Microlaimus	1.83	6.43	1.59	1.63	1.99	**2.69**
Molgolaimus	0.67	1.33	3.94	4.15	2.04	**2.43**
Spirobolbolaimus	0.00	0.20	0.14	0.00	0.05	**0.08**
Antimicron	0.03	0.00	0.46	0.55	0.00	**0.21**
Camacolaimus	0.29	0.18	0.19	0.54	0.52	**0.35**
Cricolaimus	0.03	0.00	0.09	0.04	0.10	**0.05**
Dagda	0.00	0.00	0.02	0.05	0.00	**0.01**
Deontolaimus	0.00	0.00	0.00	0.00	0.03	**0.01**
Diodotolaimus	0.09	0.00	0.12	0.18	0.17	**0.11**
Halaphanolaimus	0.23	0.00	0.00	0.00	0.00	**0.05**
Leptolaimoides	0.30	0.84	0.88	1.31	0.79	**0.82**
Leptolaimus	1.75	0.95	1.02	2.88	2.23	**1.77**
Onchium	0.25	0.06	0.02	0.27	0.32	**0.18**
Procamacolaimus	0.00	0.00	0.02	0.00	0.14	**0.03**
Setoplectus	0.03	0.46	0.35	0.34	0.52	**0.34**
Tarvaia	0.25	0.41	0.18	0.04	0.10	**0.20**
Aegialoalaimus	0.07	0.11	0.24	0.74	0.46	**0.32**
Cyartonema	0.46	0.12	1.02	1.56	2.19	**1.07**
Diplopeltoides	0.30	0.21	0.73	1.18	0.96	**0.68**
Southernia	0.00	0.00	0.03	0.00	0.00	**0.01**
Chitwoodia	0.00	0.11	0.02	0.00	0.00	**0.03**
Tubolaimoides	0.00	0.00	0.00	0.09	0.00	**0.02**
Ceramonema	0.34	0.41	0.16	0.05	0.04	**0.20**
Dasynemoides	0.07	0.87	0.17	0.09	0.06	**0.25**
Metadasynemella	0.36	0.06	0.21	0.25	0.11	**0.20**
Pselionema	0.56	1.50	2.01	1.60	0.58	**1.25**
Pterygonema	0.07	0.67	0.16	0.13	0.09	**0.22**

App. VII cont..	1	2	3	4	5	Mean
Paramicrolaimus	0.13	0.36	0.28	0.33	0.08	**0.24**
Calligyrus	0.19	0.06	0.43	0.56	0.32	**0.31**
Desmogerlachia	0.06	0.00	0.08	0.00	0.00	**0.03**
Desmorolenzenia	0.23	0.51	0.16	0.12	0.66	**0.33**
Desmoscolex	0.07	0.00	0.30	1.14	0.33	**0.37**
Domorganus	0.00	0.00	0.02	0.00	0.00	**0.00**
Greeffiella	0.00	0.13	0.08	0.19	0.19	**0.12**
Hapalomus	0.00	0.11	0.00	0.00	0.05	**0.03**
Pareudesmoscolex	0.11	0.30	0.31	0.33	0.36	**0.28**
Quadricoma	0.80	0.89	0.58	0.75	0.94	**0.79**
Tricoma	0.24	0.92	0.17	0.18	0.00	**0.30**
Gerlachius	0.25	0.00	0.12	0.09	0.03	**0.10**
Meylia	0.00	0.00	0.09	0.00	0.07	**0.03**
Diplolaimella	0.02	0.00	0.00	0.04	0.24	**0.06**
Diplolaimelloides	0.02	0.00	0.04	0.00	0.26	**0.07**
Eumonhystera	0.75	1.06	0.79	0.92	3.15	**1.34**
Monhysteridae	0.07	0.00	1.17	4.17	1.01	**1.28**
Monhystrella	1.12	0.51	0.48	0.61	1.79	**0.90**
Monhystera	1.70	1.37	4.78	8.68	22.89	**7.88**
Ammotheristus	0.06	0.19	0.08	0.04	0.05	**0.08**
Amphimonhystera	0.10	0.40	0.23	0.37	0.47	**0.31**
Amphimonhystrella	0.86	0.31	2.53	1.34	1.17	**1.24**
Cobbia	0.17	1.51	0.83	0.89	0.27	**0.73**
Daptonema	10.49	4.71	3.20	2.76	1.17	**4.47**
Echinotheristus	0.07	0.00	0.04	0.04	0.00	**0.03**
Elzalia	1.31	0.73	0.72	0.24	0.15	**0.63**
Gnomoxyala	1.18	0.13	0.24	0.26	0.15	**0.39**
Linhystera	0.77	0.00	0.18	0.34	0.17	**0.29**
Manganonema	0.00	0.00	0.10	0.14	0.57	**0.16**
Metadesmolaimus	0.05	0.00	0.16	0.05	0.08	**0.07**
Paramonhystera	0.72	3.09	0.51	0.23	0.36	**0.98**
Promonhystera	0.40	0.00	0.06	0.00	0.05	**0.10**
Prorhynchonema	0.37	0.47	0.00	0.23	0.05	**0.22**
Retrotheristus	0.12	0.00	0.04	0.00	0.05	**0.04**
Rhinema	0.12	0.00	0.00	0.00	0.00	**0.02**
Rhynchonema	0.37	2.29	0.19	0.26	0.43	**0.71**
Scaptrella	0.00	0.06	0.00	0.04	0.00	**0.02**
Stylotheristus	0.07	0.22	0.11	0.19	0.00	**0.12**
Theristus	0.45	0.84	0.94	0.28	0.16	**0.54**
Valvalaimus	0.07	0.00	0.12	0.00	0.00	**0.04**
Xenolaimus	0.00	0.11	0.00	0.00	0.00	**0.02**
Xyala	1.38	1.64	0.42	0.12	0.40	**0.79**
Xyalidae	0.00	0.22	0.70	1.13	0.91	**0.59**
Doliolaimus	0.02	0.00	0.75	0.55	0.88	**0.44**
Metasphaerolaimus	0.16	0.00	0.14	0.05	0.03	**0.08**
Parasphaerolaimus	0.09	0.11	0.08	0.00	0.00	**0.06**
Sphaerolaimus	0.86	0.24	0.26	0.28	0.38	**0.40**
Subsphaerolaimus	0.03	0.06	0.00	0.00	0.08	**0.04**
Astomonema	0.84	0.78	1.06	0.18	0.00	**0.57**
Siphonolaimus	0.11	0.11	0.29	0.05	0.05	**0.12**
Desmolaimus	0.03	0.29	0.02	0.08	0.05	**0.09**
Didelta	0.00	0.07	0.15	0.10	0.00	**0.06**
Disconema	0.13	0.00	0.62	1.12	0.51	**0.48**
Eleutherolaimus	0.02	0.00	0.07	0.08	0.14	**0.06**
Eumorpholaimus	0.12	0.00	0.00	0.09	0.00	**0.04**
Linhomoeus	0.25	0.22	0.11	0.38	0.14	**0.22**
Megadesmolaimus	0.19	0.06	0.00	0.09	0.10	**0.09**

App. VII cont..	1	2	3	4	5	Mean
Metalinhomoeus	0.91	0.61	0.57	0.62	0.10	**0.56**
Paralinhomoeus	0.10	0.00	0.17	0.10	0.00	**0.07**
Terschellingia	9.38	0.06	2.18	1.17	0.26	**2.61**
Axonolaimus	0.00	0.11	0.21	0.00	0.00	**0.07**
Odontophora	0.18	0.06	0.00	0.00	0.00	**0.05**
Paradontophora	1.16	0.17	0.37	0.00	0.00	**0.34**
Parareolaimus	1.05	0.07	0.62	0.00	0.40	**0.43**
Areolaimus	0.04	0.24	0.03	0.00	0.00	**0.06**
Campylaimus	0.66	0.58	1.28	0.69	0.77	**0.80**
Diplopeltula	0.44	0.31	1.26	1.14	1.13	**0.85**
Southerniella	0.19	0.25	0.54	0.36	0.47	**0.36**
Coninckia	0.00	0.32	0.16	0.00	0.00	**0.10**
Enoplaimus	0.09	0.00	0.15	0.10	0.05	**0.08**
Enoploides	0.05	0.24	0.00	0.05	0.07	**0.08**
Epacanthion	0.04	0.00	0.00	0.00	0.00	**0.01**
Mesacanthion	0.00	0.23	0.00	0.00	0.05	**0.06**
Mesachanthoides	0.00	0.12	0.00	0.00	0.05	**0.03**
Oxynchulus	0.00	0.00	0.08	0.00	0.03	**0.02**
Paramesacanthion	0.07	0.42	0.07	0.00	0.06	**0.12**
Anoplostoma	0.00	0.19	0.19	0.15	0.06	**0.12**
Chaetonema	0.00	0.00	0.07	0.05	0.00	**0.02**
Crenopharynx	0.04	0.00	0.00	0.10	0.11	**0.03**
Micoletzkyia	0.00	0.00	0.13	0.00	0.00	**0.03**
Phanoderma	0.00	0.00	0.02	0.00	0.03	**0.01**
Anticoma	0.00	0.00	0.04	0.00	0.14	**0.04**
Dolicholaimus	0.08	0.00	0.03	0.09	0.58	**0.15**
Parironus	0.00	0.00	0.03	0.00	0.00	**0.01**
Syringolaimus	0.00	0.19	1.42	1.44	1.08	**0.83**
Thalassironus	0.00	0.00	0.06	0.00	0.16	**0.04**
Trissonchulus	0.00	0.24	0.00	0.00	0.00	**0.05**
Halalaimus	3.54	5.80	5.80	5.59	5.01	**5.15**
Litinium	0.03	0.00	0.65	0.88	0.31	**0.37**
Oxystomina	0.93	0.19	1.10	1.38	1.08	**0.94**
Paroxystoma	0.00	0.00	0.00	0.17	0.00	**0.03**
Thalassoalaimus	0.07	0.00	0.29	0.25	0.62	**0.25**
Wieseria	0.03	0.00	0.17	0.29	0.27	**0.15**
Viscosia	3.16	1.01	0.46	0.92	0.60	**1.23**
Filoncholaimus	0.00	0.00	0.10	0.00	0.03	**0.01**
Oncholaimus	0.00	0.27	0.02	0.00	0.05	**0.07**
Bathyeurystomina	0.43	0.22	0.03	0.00	0.08	**0.15**
Belbolla	0.30	0.00	0.09	0.09	0.00	**0.10**
Eurystomina	0.03	0.00	0.04	0.00	0.00	**0.02**
Pareurystomina	0.07	0.06	0.00	0.00	0.00	**0.03**
Polygastrophora	0.00	0.12	0.00	0.00	0.00	**0.02**
Bathylaimus	0.00	0.00	0.00	0.04	0.00	**0.01**
Tripyloides	0.02	0.00	0.00	0.00	0.00	**0.00**
Pandolaimus	0.02	0.00	0.00	0.00	0.00	**0.00**
Halanonchus	0.00	0.06	0.00	0.00	0.05	**0.02**
Rhabdocoma	0.08	0.82	1.13	0.91	1.05	**0.80**
Trefusialaimus	0.00	0.00	0.00	0.17	0.00	**0.03**
Trefusia	0.00	0.20	0.25	0.14	0.23	**0.16**
Lauratonema	0.00	0.00	0.04	0.00	0.00	**0.01**
Rhabdolaimus	0.16	0.00	0.10	0.20	0.24	**0.14**
Rhabdonemania	0.10	0.00	0.00	0.10	0.13	**0.07**
Tylenchid	0.00	0.00	0.10	0.22	0.27	**0.12**
Others	5.13	7.64	8.70	9.10	9.60	**8.03**
Total	100.0	100.0	100.0	100.0	100.0	**100.0**
Total number of genera	157	147	175	161	141	**224**

Appendix VIII: Mean genera proportion (%) per group arranged in order of decreasing proportion

	1		2		3		4		5
Daptonema	10.49	Microlaimus	6.43	Sabatieria	6.13	Monhystera	8.68	Monhystera	22.89
Terschellingia	9.38	Halalaimus	5.80	Halalaimus	5.80	Sabatieria	6.51	Acantholaimus	8.35
Dorylaimopsis	6.74	Daptonema	4.71	Monhystera	4.78	Halalaimus	5.59	Halalaimus	5.01
Halalaimus	3.54	Sabatieria	3.50	Molgolaimus	3.94	Acantholaimus	4.61	Eumonhystera	3.15
Viscosia	3.16	Paramonhystera	3.09	Cervonema	3.90	Monhysterid	4.17	Leptolaimus	2.23
Psammonema	2.82	Desmodora	2.45	Acantholaimus	3.76	Molgolaimus	4.15	Cyartonema	2.19
Comesa	2.02	Rhynchonema	2.29	Daptonema	3.20	Leptolaimus	2.88	Molgolaimus	2.04
Microlaimus	1.83	Ptycholaimellus	2.19	Amphimonhystrella	2.53	Daptonema	2.76	Microlaimus	1.99
Sabatieria	1.81	Actinonema*	2.03	Terschellingia	2.18	Cervonema	2.75	Monhystrella	1.79
Leptolaimus	1.75	Dichromadora	2.02	Pselionema	2.01	Microlaimus	1.63	Sabatieria	1.79
Monhystera	1.70	Xyala	1.64	Dorylaimopsis	1.67	Pselionema	1.60	Daptonema	1.17
Dichromadora	1.67	Cobbia	1.51	Microlaimus	1.59	Cyartonema	1.56	Amphimonhystrella	1.17
Xyala	1.38	Chromaspirina	1.51	Sylingolaimus	1.42	Sylingolaimus	1.44	Diplopeltula	1.13
Richtersia	1.34	Pselionema	1.50	Campylaimus	1.28	Oxystomina	1.38	Oxystomina	1.08
Marylynnia	1.32	Paralongicyatholaimus	1.49	Diplopeltula	1.26	Amphimonhystrella	1.34	Sylingolaimus	1.08
Elzalia	1.31	Monhystera	1.37	Paralongicyatholaimus	1.23	Leptolaimoides	1.31	Rhabdocoma	1.05
Aponema	1.26	Richtersia	1.34	Monhysterid	1.17	Diplopeltoides	1.18	Monhysterid	1.01
Neotonchus	1.22	Molgolaimus	1.33	Rhabdocoma	1.13	Terschellingia	1.17	Cervonema	1.01
Trochamus	1.21	Eubostrichus	1.30	Oxystomina	1.10	Desmoscolex	1.14	Diplopeltoides	0.96
Gnomoxyala	1.18	Laimella	1.18	Astomonema	1.06	Diplopeltula	1.14	Quadricoma	0.94
Paradontophora	1.16	Paracanthonchus	1.18	Leptolaimus	1.02	Xyalid	1.13	Longicyatholaimus	0.92
Monhystrella	1.12	Ixonema	1.07	Cyartonema	1.02	Disconema	1.12	Xyalid	0.91
Parareolaimus	1.05	Eumonhystera	1.06	Laimella	0.98	Gammanema	0.99	Doliolaimus	0.88
Paracomesoma	1.05	Viscosia	1.01	Gammanema	0.96	Viscosia	0.92	Bolbolaimus	0.85
Oxystomina	0.93	Leptolaimus	0.95	Theristus	0.94	Eumonhystera	0.92	Leptolaimoides	0.79
Metalinhomoeus	0.91	Cervonema	0.93	Leptolaimoides	0.88	Rhabdocoma	0.91	Campylaimus	0.77
Actinonema*	0.88	Tricoma	0.92	Bolbolaimus	0.87	Cobbia	0.89	Metacyatholaimus	0.69
Sphaerolaimus	0.86	Bolbolaimus	0.90	Cobbia	0.83	Litinium	0.88	Desmorolenzenia	0.66
Amphimonhystrella	0.86	Quadricoma	0.89	Comesa	0.80	Quadricoma	0.75	Paralongicyatholaimus	0.65
Astomonema	0.84	Marylynnia	0.89	Eumonhystera	0.79	Aegioloalaimus	0.74	Desmodora	0.64
Hypodontolaimus	0.81	Dasynemoides	0.87	Marylynnia	0.79	Campylaimus	0.69	Thalassoalaimus	0.62
Quadricoma	0.80	Leptolaimoides	0.84	Desmodorella	0.77	Longicyatholaimus	0.64	Viscosia	0.60
Linhystera	0.77	Theristus	0.84	Doliolaimus	0.75	Metalinhomoeus	0.62	Halichoanolaimus	0.60
Eumonhystera	0.75	Rhabdocoma	0.82	Metacyatholaimus	0.74	Monhystrella	0.61	Calomicrolaimus	0.58
Neochromadora	0.72	Astomonema	0.78	Diplopeltoides	0.73	Dichromadora	0.59	Pselionema	0.58

App. VIII cont...	1		2		3		4		5
Paramonhystera	0.72	Elzalia	0.73	Elzalia	0.72	Calligyrus	0.56	Dolicholaimus	0.58
Calomicrolaimus	0.71	Paracyatholaimoides	0.72	Xyalid	0.70	Desmodora	0.56	Manganonema	0.57
Desmodora	0.70	Filitonchus	0.67	Longicyatholaimus	0.65	Doliolaimus	0.55	Camacolaimus	0.52
Laimella	0.68	Pterygonema	0.67	Litinium	0.65	Antimicron	0.55	Setoplectus	0.52
Chromaspirina	0.68	Desmodorella	0.63	Calomicrolaimus	0.63	Paralongicyatholaimus	0.55	Disconema	0.51
Molgolaimus	0.67	Metalinhomoeus	0.61	Parareolaimus	0.62	Camacolaimus	0.54	Actinonema*	0.48
Ptycholaimellus	0.67	Prochromadorella	0.61	Disconema	0.62	Laimella	0.52	Southerniella	0.47
Campylaimus	0.66	Metacyatholaimus	0.60	Quadricoma	0.58	Halichoanolaimus	0.50	Amphimonhystera	0.47
Eubostrichus	0.56	Acanthonchus	0.59	Metalinhomoeus	0.57	Hopperia	0.48	Aegioloalaimus	0.46
Pselionema	0.56	Paracyatholaimus	0.58	Kenyanema	0.57	Aponema	0.48	Rhynchonema	0.43
Acanthonchus	0.48	Campylaimus	0.58	Halichoanolaimus	0.54	Bolbolaimus	0.43	Parareolaimus	0.40
Paramesonchium	0.48	Nannolaimus	0.58	Southerniella	0.54	Metacyatholaimus	0.42	Xyala	0.40
Cyartonema	0.46	Innocuonema	0.53	Richtersia	0.53	Kenyanema	0.41	Aponema	0.38
Theristus	0.45	Comesa	0.52	Paramonhystera	0.51	Metasabatieria	0.39	Sphaerolaimus	0.38
Diplopeltula	0.44	Monhystrella	0.51	Monhystrella	0.48	Linhomoeus	0.38	Paramonhystera	0.36
Hopperia	0.44	Desmorolenzenia	0.51	Hopperia	0.47	Amphimonhystera	0.37	Pareudesmoscolex	0.36
Bathyeurystomina	0.43	Cheironchus	0.49	Actinonema*	0.46	Southerniella	0.36	Desmoscolex	0.33
Catanema	0.41	Calomicrolaimus	0.49	Viscosia	0.46	Dorylaimopsis	0.34	Marylynnia	0.33
Paralongicyatholaimus	0.41	Prorhynchonema	0.47	Antimicron	0.46	Setoplectus	0.34	Onchium	0.32
Paracanthonchus	0.41	Catanema	0.47	Calligyrus	0.43	Linhystera	0.34	Calligyrus	0.32
Metasabatieria	0.40	Setoplectus	0.46	Xyala	0.42	Pareudesmoscolex	0.33	Litinium	0.31
Promonhystera	0.40	Synonchium	0.44	Cheironchus	0.40	Paramicrolaimus	0.33	Wieseria	0.27
Rhynchonema	0.37	Paramesacanthion	0.42	Dichromadora	0.37	Paracanthonchus	0.33	Tylenchid	0.27
Prorhynchonema	0.37	Acantholaimus	0.41	Paradontophora	0.37	Actinonema*	0.32	Cobbia	0.27
Prochromadorella	0.37	Ceramonema	0.41	Vasostoma	0.35	Richtersia	0.31	Terschellingia	0.26
Metadasynemella	0.36	Tarvaia	0.41	Setoplectus	0.35	Wieseria	0.29	Paracanthonchus	0.26
Ceramonema	0.34	Amphimonhystera	0.40	Aponema	0.35	Theristus	0.28	Diplolaimelloides	0.26
Diplopeltoides	0.30	Draconema	0.40	Setosabatieria	0.34	Sphaerolaimus	0.28	Rhabdolaimus	0.24
Leptolaimoides	0.30	Longicyatholaimus	0.37	Pareudesmoscolex	0.31	Onchium	0.27	Diplolaimella	0.24
Belbolla	0.30	Cinctonema	0.37	Desmoscolex	0.30	Rhynchonema	0.26	Pierrickia	0.24
Camacolaimus	0.29	Paramicrolaimus	0.36	Thalassoalaimus	0.29	Desmodorella	0.26	Trefusia	0.23
Cervonema	0.26	Praeacanthonchus	0.36	Siphonolaimus	0.29	Gnomoxyala	0.26	Chromadora	0.20
Gerlachius	0.25	Pseudonchus	0.35	Paracanthonchus	0.29	Thalassoalaimus	0.25	Greeffiella	0.19
Tarvaia	0.25	Choanolaimus	0.34	Paramicrolaimus	0.28	Metadasynemella	0.25	Linhystera	0.17
Onchium	0.25	Gammanema	0.32	Trochamus	0.28	Elzalia	0.24	Diodotolaimus	0.17
Ixonema	0.25	Coninckia	0.32	Desmodora	0.27	Ixonema	0.23	Theristus	0.16

App. VIII cont...	1	2	3	4	5
Linhomoeus	0.25 Trochamus	0.31 Sphaerolaimus	0.26 Gophionchus	0.23 Thalassironus	0.16
Tricoma	0.24 Amphimonhystrella	0.31 Latronema	0.25 Prorhynchonema	0.23 Ixonema	0.16
Longicyatholaimus	0.24 Diplopeltula	0.31 Spirinia	0.25 Paramonhystera	0.23 Gnomoxyala	0.15
Desmodorella	0.24 Pareudesmoscolex	0.30 Trefusia	0.25 Calomicrolaimus	0.22 Gammanema	0.15
Halaphanolaimus	0.23 Desmolaimus	0.29 Aegioloalaimus	0.24 Tylenchid	0.22 Elzalia	0.15
Desmorolenzenia	0.23 Pierrickia	0.29 Gnomoxyala	0.24 Rhabdolaimus	0.20 procamacolaimus	0.14
Spirinia	0.21 Oncholaimus	0.27 Amphimonhystera	0.23 Greeffiella	0.19 Synonchiella	0.14
Praeacanthonchus	0.21 Southerniella	0.25 Kraspedonema	0.22 Crassonema	0.19 Eleutherolaimus	0.14
Pomponema	0.20 Sphaerolaimus	0.24 Axonolaimus	0.21 Stylotheristus	0.19 Anticoma	0.14
Onyx	0.20 Trissonchulus	0.24 Minolaimus	0.21 Astomonema	0.18 Linhomoeus	0.14
Southerniella	0.19 Enoploides	0.24 Ixonema	0.21 Paracyatholaimoides	0.18 Dichromadora	0.13
Megadesmolaimus	0.19 Areolaimus	0.24 Metadasynemella	0.21 Tricoma	0.18 Comesa	0.13
Calligyrus	0.19 Halichoanolaimus	0.24 Prochromadorella	0.20 Pierrickia	0.18 Rhabdonema	0.13
Odontophora	0.18 Pomponema	0.24 Camacolaimus	0.19 Paracyatholaimus	0.18 Paracyatholaimoides	0.11
Cobbia	0.17 Paracomesoma	0.24 Anoplostoma	0.19 Marylynnia	0.18 Metadasynemella	0.11
Metasphaerolaimus	0.16 Parachromadorita	0.23 Rhynchonema	0.19 Diodotolaimus	0.18 Crenopharynx	0.11
Rhabdolaimus	0.16 Cyatholaimus	0.23 Psammonema	0.18 Trefusialaimus	0.17 Chromadorita	0.11
Halichoanolaimus	0.14 Mesacanthion	0.23 Tarvaia	0.18 Paroxystoma	0.17 Praeacanthonchus	0.10
Innocuonema	0.14 Xyalid	0.22 Linhystera	0.18 Anoplostoma	0.15 Metalinhomoeus	0.10
Chromadorita	0.14 Stylotheristus	0.22 Chromaspirina	0.18 Trefusia	0.14 Prochromadorella	0.10
Disconema	0.13 Bathyeurystomina	0.22 Wieseria	0.17 Manganonema	0.14 Megadesmolaimus	0.10
Paramicrolaimus	0.13 Setosabatieria	0.22 Dasynemoides	0.17 Spirinia	0.14 Cricolaimus	0.10
Paracyatholaimoides	0.13 Leptolaimella	0.22 Paralinhomoeus	0.17 Acanthonchus	0.14 Tarvaia	0.10
Retrotheristus	0.12 Dorylaimopsis	0.22 Tricoma	0.17 Pterygonema	0.13 Pterygonema	0.09
Eumorpholaimus	0.12 Trichromadora	0.22 Ceramonema	0.16 Prochromadorella	0.12 Paracyatholaimus	0.09
Rhinema	0.12 Linhomoeus	0.22 Coninckia	0.16 Xyala	0.12 Metadesmolaimus	0.08
Pareudesmoscolex	0.11 Diplopeltoides	0.21 Neotonchus	0.16 Desmorolenzenia	0.12 Bathyeurystomina	0.08
Siphonolaimus	0.11 Trefusia	0.20 Metadesmolaimus	0.16 Praeacanthonchus	0.12 Paramicrolaimus	0.08
Nannolaimus	0.11 Spirobolbolaimus	0.20 Desmorolenzenia	0.16 Enoplaimus	0.10 Subsphaerolaimus	0.08
Kenyanema	0.11 Anoplostoma	0.19 Pterygonema	0.16 Rhabdonema	0.10 Meylia	0.07
Rhabdonema	0.10 Ammotheristus	0.19 Enoplaimus	0.15 Didelta	0.10 Enoploides	0.07
Paralinhomoeus	0.10 Oxystomina	0.19 Didelta	0.15 Cyatholaimus	0.10 Dasynemoides	0.06
Trichromadora	0.10 Sylingolaimus	0.19 Metasphaerolaimus	0.14 Chromaspirina	0.10 Paramesacanthion	0.06
Amphimonhystera	0.10 Camacolaimus	0.18 Spirobolbolaimus	0.14 Paralinhomoeus	0.10 Richtersia	0.06
Parasphaerolaimus	0.09 Neotonchus	0.17 Praeacanthonchus	0.14 Psammonema	0.09 Cheironchus	0.06
Enoplaimus	0.09 Paradontophora	0.17 Micoletzkyia	0.13 Epsilonema	0.09 Anoplostoma	0.06

App. VIII cont...	1	2	3	4	5
Diodotolaimus	0.09 Gnomoxyala	0.13 Valvalaimus	0.12 Belbolla	0.09 Chromadorella	0.06
Metacyatholaimus	0.09 Greeffiella	0.13 Diodotolaimus	0.12 Capsula	0.09 Draconema	0.05
Rhabdocoma	0.08 Latronema	0.12 Gerlachius	0.12 Minolaimus	0.09 Halanonchus	0.05
Dolicholaimus	0.08 Cyartonema	0.12 Choanolaimus	0.11 Setosabatieria	0.09 Mesacanthion	0.05
Valvalaimus	0.07 Mesachanthoides	0.12 Linhomoeus	0.11 Nannolaimoides	0.09 Spirinia	0.05
Monhysterid	0.07 Polysigma	0.12 Stylotheristus	0.11 Sigmophoranema	0.09 Spirobolbolaimus	0.05
Stylotheristus	0.07 Endeolophos	0.12 Filoncholaimus	0.11 Tubolaimoides	0.09 Desmodorella	0.05
Cyatholaimus	0.07 Polygastrophora	0.12 Chromadora	0.10 Dasynemoides	0.09 Promonhystera	0.05
Cheironchus	0.07 Onyx	0.12 Rhabdolaimus	0.10 Megadesmolaimus	0.09 Oncholaimus	0.05
Echinotheristus	0.07 Siphonolaimus	0.11 Manganonema	0.10 Eumorpholaimus	0.09 Desmolaimus	0.05
Paramesacanthion	0.07 Aponema	0.11 Tylenchid	0.10 Chromadorita	0.09 Hapalomus	0.05
Pterygonema	0.07 Minolaimus	0.11 Synonchiella	0.10 Gerlachius	0.09 Minolaimus	0.05
Sigmophoranema	0.07 Axonolaimus	0.11 Paramesonchium	0.10 Dolicholaimus	0.09 Mesachanthoides	0.05
Crassonema	0.07 Notochaetosoma	0.11 Pomponema	0.10 Desmolaimus	0.08 Siphonolaimus	0.05
Dasynemoides	0.07 Parasphaerolaimus	0.11 Meylia	0.09 Kraspedonema	0.08 Enoplaimus	0.05
Desmoscolex	0.07 Spirinia	0.11 Belbolla	0.09 Eleutherolaimus	0.08 Paradraconema	0.05
Thalassoalaimus	0.07 Metacomesoma	0.11 Cricolaimus	0.09 Comesa	0.08 Prorhynchonema	0.05
Aegioloalaimus	0.07 Chitwoodia	0.11 Hypodontolaimus	0.09 Notochaetosoma	0.07 Setosabatieria	0.05
Pareurystomina	0.07 Spiliphera	0.11 Greeffiella	0.08 Siphonolaimus	0.05 Spiliphera	0.05
Desmogerlachia	0.06 Xenolaimus	0.11 Parasphaerolaimus	0.08 Metadesmolaimus	0.05 Retrotheristus	0.05
Ammotheristus	0.06 Aegioloalaimus	0.11 Oxynchulus	0.08 Metepsilonema	0.05 Ammotheristus	0.05
Latronema	0.06 Hapalomus	0.11 Ammotheristus	0.08 Dagda	0.05 Ceramonema	0.04
Enoploides	0.05 Demonema	0.07 Desmogerlachia	0.08 Ceramonema	0.05 Trochamus	0.04
Metadesmolaimus	0.05 Didelta	0.07 Acanthonchus	0.08 Metasphaerolaimus	0.05 Laimella	0.04
Crenopharynx	0.04 Parareolaimus	0.07 Eubostrichus	0.08 Enoploides	0.05 Cyatholaimus	0.03
Filitonchus	0.04 Metadasynemella	0.06 Draconema	0.08 Chaetosoma	0.05 Acanthonchus	0.03
Epicanthion	0.04 Subsphaerolaimus	0.06 Chaetosoma	0.07 Filoncholaimus	0.05 Phanoderma	0.03
Gophionchus	0.04 Pareurystomina	0.06 Paramesacanthion	0.07 Cheironchus	0.04 Denticulella	0.03
Areolaimus	0.04 Synonchiella	0.06 Graphonema	0.07 Tarvaia	0.04 Metasphaerolaimus	0.03
Vasostoma	0.03 Terschellingia	0.06 Eleutherolaimus	0.07 Ammotheristus	0.04 Filoncholaimus	0.03
Wieseria	0.03 Onchium	0.06 Parallelocoides	0.06 Echinotheristus	0.04 Psammonema	0.03
Gammanema	0.03 Euchromadora	0.06 Metepsilonema	0.06 Bathylaimus	0.04 Gerlachius	0.03
Desmolaimus	0.03 Megadesmolaimus	0.06 Cinctonema	0.06 Diplolaimella	0.04 Deontolaimus	0.03
Subsphaerolaimus	0.03 Scaptrella	0.06 Promonhystera	0.06 Scaptrella	0.04 Oxynchulus	0.03
Parachromadorita	0.03 Paramesonchium	0.06 Thalassironus	0.06 Cricolaimus	0.04	
Nannolaimoides	0.03 Calligyrus	0.06 Pierrickia	0.05		

App. VIII cont...	1	2		3	
Eurystomina	0.03	Odontophora	0.06	Paracyatholaimoides	0.05
Litinium	0.03	Gophionchus	0.06	Neochromadora	0.05
Paracyatholaimus	0.03	Hypodontolaimus	0.06	Diplolaimelloides	0.04
Setoplectus	0.03	Halanonchus	0.06	Echinotheristus	0.04
Cricolaimus	0.03			Eurystomina	0.04
Antimicron	0.03			Lauratonema	0.04
Doliolaimus	0.02			Retrotheristus	0.04
Parapinanema	0.02			Spiliphera	0.04
Pandolaimus	0.02			Anticoma	0.04
Tripyloides	0.02			Paracyatholaimus	0.03
Diplolaimelloides	0.02			Dolicholaimus	0.03
Diplolaimella	0.02			Synonchium	0.03
Eleutherolaimus	0.02			Bathyeurystomina	0.03
Synonchiella	0.02			Parironus	0.03
				Nannolaimus	0.03
				Areolaimus	0.03
				Southernia	0.03
				Onchium	0.02
				Chitwoodia	0.02
				Oncholaimus	0.02
				Metasabatieria	0.02
				procamacolaimus	0.02
				Epsilonema	0.02
				Domorganus	0.02
				Desmolaimus	0.02
				Phanoderma	0.02
				Catanema	0.02
				Metacomesoma	0.02
				Chromadorella	0.02
				Dagda	0.02
				Paracomesoma	0.02
				Chromadorita	0.02

Appendix IX: Percentage proportion of trophic groups in the five ecological groups

1			2			3			4			5	
Genera	% group		Genera	% group		Genera	% group		Genera	% group		Genera	
Terschellingia	9.47	1a	Halalaimus	5.8	1a	Halalaimus	5.9	1a	Halalaimus	5.6	1a	Halalaimus	
Halalaimus	3.57	1a	Others	2.7	1a	Molgolaimus	4.0	1a	Molgolaimus	4.2	1a	Others	
Leptolaimus	1.76	1a	Pselionema	1.5	1a	Cervonema	3.9	1a	Leptolaimus	2.9	1a	Leptolaimus	
Others	1.72	1a	Molgolaimus	1.3	1a	Others	3.2	1a	Cervonema	2.8	1a	Cyartonema	
Parareolaimus	1.06	1a	Eubostrichus	1.3	1a	Terschellingia	2.2	1a	Others	2.5	1a	Molgolaimus	
Oxystomina	0.94	1a	Leptolaimus	0.9	1a	Pselionema	2.0	1a	Pselionema	1.6	1a	Diplopeltula	
Astomonema	0.84	1a	Cervonema	0.9	1a	Diplopeltula	1.3	1a	Cyartonema	1.6	1a	Oxystomina	
Quadricoma	0.81	1a	Tricoma	0.9	1a	Rhabdocoma	1.1	1a	Oxystomina	1.4	1a	Rhabdocoma	
Linhystera	0.78	1a	Quadricoma	0.9	1a	Oxystomina	1.1	1a	Leptolaimoides	1.3	1a	Cervonema	
Molgolaimus	0.68	1a	Dasynemoides	0.9	1a	Astomonema	1.1	1a	Diplopeltoides	1.2	1a	Diplopeltoides	
Eubostrichus	0.57	1a	Leptolaimoides	0.8	1a	Leptolaimus	1.0	1a	Terschellingia	1.2	1a	Quadricoma	
Pselionema	0.57	1a	Rhabdocoma	0.8	1a	Cyartonema	1.0	1a	Desmoscolex	1.2	1a	Leptolaimoides	
Cyartonema	0.46	1a	Astomonema	0.8	1a	Leptolaimoides	0.9	1a	Diplopeltula	1.1	1a	Desmorolenzenia	
Diplopeltula	0.45	1a	Pterygonema	0.7	1a	Diplopeltoides	0.7	1a	Disconema	1.1	1a	Thalassoalaimus	
Metadasynemella	0.36	1a	Nannolaimus	0.6	1a	Litinium	0.7	1a	Rhabdocoma	0.9	1a	Pselionema	
Ceramonema	0.34	1a	Desmorolenzenia	0.5	1a	Parareolaimus	0.6	1a	Litinium	0.9	1a	Manganonema	
Diplopeltoides	0.31	1a	Setoplectus	0.5	1a	Disconema	0.6	1a	Quadricoma	0.8	1a	Setoplectus	
Leptolaimoides	0.30	1a	Ceramonema	0.4	1a	Quadricoma	0.6	1a	Aegloloalaimus	0.7	1a	Disconema	
Cervonema	0.27	1a	Tarvaia	0.4	1a	Southerniella	0.5	1a	Calligyrus	0.6	1a	Southerniella	
Gerlachius	0.26	1a	Draconema	0.4	1a	Antimicron	0.5	1a	Antimicron	0.6	1a	Aegloloalaimus	
Tarvaia	0.25	1a	Cinctonema	0.4	1a	Calligyrus	0.4	1a	Camacolaimus	0.5	1a	Parareolaimus	
Tricoma	0.25	1a	Coninckia	0.3	1a	Setoplectus	0.4	1a	Southerniella	0.4	1a	Pareudesmoscolex	
Halaphanolaimus	0.24	1a	Diplopeltula	0.3	1a	Pareudesmoscolex	0.3	1a	Setoplectus	0.3	1a	Desmoscolex	
Desmorolenzenia	0.23	1a	Pareudesmoscolex	0.3	1a	Desmoscolex	0.3	1a	Linhystera	0.3	1a	Calligyrus	
Southerniella	0.20	1a	Pierrickia	0.3	1a	Thalassoalaimus	0.3	1a	Pareudesmoscolex	0.3	1a	Litinium	
Calligyrus	0.19	1a	Southerniella	0.3	1a	Trefusia	0.2	1a	Wieseria	0.3	1a	Wieseria	
Rhabdolaimus	0.16	1a	Areolaimus	0.2	1a	Aeglaloalaimus	0.2	1a	Thalassoalaimus	0.3	1a	Terschellingia	
Disconema	0.13	1a	Leptolaimella	0.2	1a	Metadasynemella	0.2	1a	Metadasynemella	0.2	1a	Rhabdolaimus	
Pareudesmoscolex	0.12	1a	Diplopeltoides	0.2	1a	Tarvaia	0.2	1a	Rhabdolaimus	0.2	1a	Pierrickia	
Nannolaimus	0.11	1a	Trefusia	0.2	1a	Linhystera	0.2	1a	Greeffiella	0.2	1a	Trefusia	
Rhabdonema	0.10	1a	Oxystomina	0.2	1a	Wieseria	0.2	1a	Astomonema	0.2	1a	Greeffiella	
Rhabdocoma	0.08	1a	Camacolaimus	0.2	1a	Dasynemoides	0.2	1a	Tricoma	0.2	1a	Linhystera	
Desmoscolex	0.07	1a	Greeffiella	0.1	1a	Tricoma	0.2	1a	Pierrickia	0.2	1a	Thalassironus	
Thalassoalaimus	0.07	1a	Cyartonema	0.1	1a	Ceramonema	0.2	1a	Trefusialaimus	0.2	1a	Anticoma	
Pterygonema	0.07	1a	Notochaetosoma	0.1	1a	Coninckia	0.2	1a	Paroxystoma	0.2	1a	Metadasynemella	
Dasynemoides	0.07	1a	Chitwoodia	0.1	1a	Desmorolenzenia	0.2	1a	Trefusia	0.1	1a	Crenopharynx	
Aegioloalaimus	0.07	1a	Hapalomus	0.1	1a	Pterygonema	0.1	1a	Manganonema	0.1	1a	Tarvaia	
Desmogerlachia	0.06	1a	Aegloloalaimus	0.1	1a	Micoletzkyia	0.1	1a	Pterygonema	0.1	1a	Pterygonema	
			Parareolaimus	0.1	1a	Gerlachius	0.1	1a	Desmorolenzenia	0.1	1a	Meylia	
			Terschellingia	0.1	1a	Rhabdolaimus	0.1	1a	Epsilonema	0.1	1a	Dasynemoides	
			Metadasynemella	0.1	1a	Manganonema	0.1	1a	Dasynemoides	0.1	1a	Draconema	
			Calligyrus	0.1	1a	Meylia	0.1	1a	Tubolaimoides	0.1	1a		
						Greeffiella	0.1	1a	Gerlachius	0.1	1a		
						Desmogerlachia	0.1	1a	Notochaetosoma	0.1	1a		
						Draconema	0.1	1a	Ceramonema	0.1	1a		
						Eubostrichus	0.1	1a	Metepsilonema	0.1	1a		
						Metepsilonema	0.1	1a					
						Cinctonema	0.1	1a					
						Pierrickia	0.1	1a					

App. IX cont..

1			2			3			4			5		
Daptonema	10.6	1b	Daptonema	4.7	1b	Sabatieria	6.2	1b	Monhystera	8.7	1b	Monhystera		
Others	2.4	1b	Sabatieria	3.5	1b	Monhystera	4.8	1b	Sabatieria	6.6	1b	Others		
Sabatieria	1.8	1b	Others	3.1	1b	Others	4.5	1b	Others	5.0	1b	Eumonhystera		
Monhystera	1.7	1b	Paramonhystera	3.1	1b	Daptonema	3.2	1b	Monhysterid	4.2	1b	Monhystrella		
Xyala	1.4	1b	Rhynchonema	2.3	1b	Amphimonhystrella	2.6	1b	Daptonema	2.8	1b	Sabatieria		
Richtersia	1.3	1b	Xyala	1.6	1b	Campylaimus	1.3	1b	Amphimonhystrella	1.4	1b	Daptonema		
Elzalia	1.3	1b	Monhystera	1.4	1b	Monhysteridae	1.2	1b	Xyalid	1.1	1b	Amphimonhystrella		
Gnomoxyala	1.2	1b	Richtersia	1.3	1b	Theristus	1.0	1b	Eumonhystera	0.9	1b	Monhysterid		
Paradontophora	1.2	1b	Eumonhystera	1.1	1b	Eumonhystera	0.8	1b	Campylaimus	0.7	1b	Xyalid		
Monhystrella	1.1	1b	Theristus	0.8	1b	Elzalia	0.7	1b	Metalinhomoeus	0.6	1b	Campylaimus		
Metalinhomoeus	0.9	1b	Elzalia	0.7	1b	Xyalidae	0.7	1b	Monhystrella	0.6	1b	Amphimonhystera		
Amphimonhystrella	0.9	1b	Filitonchus	0.7	1b	Metalinhomoeus	0.6	1b	Kenyanema	0.4	1b	Rhynchonema		
Eumonhystera	0.8	1b	Metalinhomoeus	0.6	1b	Kenyanema	0.6	1b	Metasabatieria	0.4	1b	Xyala		
Paramonhystera	0.7	1b	Campylaimus	0.6	1b	Richtersia	0.5	1b	Amphimonhystera	0.4	1b	Paramonhystera		
Campylaimus	0.7	1b	Monhystrella	0.5	1b	Paramonhystera	0.5	1b	Richtersia	0.3	1b	Diplolaimelloides		
Theristus	0.5	1b	Prorhynchonema	0.5	1b	Monhystrella	0.5	1b	Theristus	0.3	1b	Diplolaimella		
Metasabatieria	0.4	1b	Amphimonhystera	0.4	1b	Xyala	0.4	1b	Rhynchonema	0.3	1b	Theristus		
Promonhystera	0.4	1b	Praeacanthonchus	0.4	1b	Paradontophora	0.4	1b	Gnomoxyala	0.3	1b	Gnomoxyala		
Rhynchonema	0.4	1b	Amphimonhystrella	0.3	1b	Setosabatieria	0.3	1b	Elzalia	0.2	1b	Elzalia		
Prorhynchonema	0.4	1b	Desmolaimus	0.3	1b	Latronema	0.3	1b	Prorhynchonema	0.2	1b	Eleutherolaimus		
Megadesmolaimus	0.2	1b	Stylotheristus	0.2	1b	Gnomoxyala	0.2	1b	Paramonhystera	0.2	1b	Praeacanthonchus		
Odontophora	0.2	1b	Setosabatieria	0.2	1b	Amphimonhystera	0.2	1b	Stylotheristus	0.2	1b	Metalinhomoeus		
Retrotheristus	0.1	1b	Xyalidae	0.2	1b	Axonolaimus	0.2	1b	Xyala	0.1	1b	Megadesmolaimus		
Eumorpholaimus	0.1	1b	Ammotheristus	0.2	1b	Minolaimus	0.2	1b	Praeacanthonchus	0.1	1b	Metadesmolaimus		
Kenyanema	0.1	1b	Paradontophora	0.2	1b	Rhynchonema	0.2	1b	Didelta	0.1	1b	Richtersia		
Paralinhomoeus	0.1	1b	Gnomoxyala	0.1	1b	Paralinhomoeus	0.2	1b	Paralinhomoeus	0.1	1b			
Amphimonhystera	0.1	1b	Latronema	0.1	1b	Metadesmolaimus	0.2	1b	Setosabatieria	0.1	1b			
Monhysterid	0.1	1b	Minolaimus	0.1	1b	Didelta	0.1	1b	Nannolaimoides	0.1	1b			
Stylotheristus	0.1	1b	Axonolaimus	0.1	1b	Stylotheristus	0.1	1b	Minolaimus	0.1	1b			
Echinotheristus	0.1	1b	Xenolaimus	0.1	1b	Ammotheristus	0.1	1b	Megadesmolaimus	0.1	1b			
Ammotheristus	0.1	1b	Didelta	0.1	1b	Eleutherolaimus	0.1	1b	Eumorpholaimus	0.1	1b			
Latronema	0.1	1b	Subsphaerolaimus	0.1	1b	Promonhystera	0.1	1b	Eleutherolaimus	0.1	1b			
			Megadesmolaimus	0.1	1b				Desmolaimus	0.1	1b			
			Odontophora	0.1	1b				Metadesmolaimus	0.1	1b			

1			2			3			4			5		
Dorylaimopsis	6.8	2a	Microlaimus	6.4	2a	Acantholaimus	3.8	2a	Acantholaimus	4.6	2a	Acantholaimus		
Psammonema	2.8	2a	Desmodora	2.5	2a	Dorylaimopsis	1.7	2a	Microlaimus	1.6	2a	Microlaimus		
Comesa	2.0	2a	Ptycholaimellus	2.2	2a	Microlaimus	1.6	2a	Others	1.5	2a	Others		
Microlaimus	1.8	2a	Actinonema*	2.0	2a	Paralongicyatholaimus	1.2	2a	Cobbia	0.9	2a	Longicyatholaimus		
Dichromadora	1.7	2a	Dichromadora	2.0	2a	Others	1.0	2a	Longicyatholaimus	0.6	2a	Metacyatholaimus		
Marylynnia	1.3	2a	Cobbia	1.5	2a	Laimella	1.0	2a	Dichromadora	0.6	2a	Paralongicyatholaimus		
Aponema	1.3	2a	Others	1.5	2a	Cobbia	0.8	2a	Desmodora	0.6	2a	Desmodora		
Neotonchus	1.2	2a	Paralongicyatholaimus	1.5	2a	Comesa	0.8	2a	Paralongicyatholaimus	0.6	2a	Calomicrolaimus		
Trochamus	1.2	2a	Laimella	1.2	2a	Marylynnia	0.8	2a	Laimella	0.5	2a	Camacolaimus		
Paracomesoma	1.1	2a	Paracanthonchus	1.2	2a	Desmodorella	0.8	2a	Hopperia	0.5	2a	Actinonema*		
Actinonema*	0.9	2a	Ixonema	1.1	2a	Metacyatholaimus	0.8	2a	Aponema	0.5	2a	Aponema		
Hypodontolaimus	0.8	2a	Marylynnia	0.9	2a	Longicyatholaimus	0.7	2a	Metacyatholaimus	0.4	2a	Marylynnia		
Others	0.8	2a	Paracyatholaimoides	0.7	2a	Calomicrolaimus	0.6	2a	Linhomoeus	0.4	2a	Onchium		
Neochromadora	0.7	2a	Desmodorella	0.6	2a	Hopperia	0.5	2a	Dorylaimopsis	0.3	2a	Cobbia		
Calomicrolaimus	0.7	2a	Prochromadorella	0.6	2a	Actinonema*	0.5	2a	Paramicrolaimus	0.3	2a	Paracanthonchus		
Desmodora	0.7	2a	Metacyatholaimus	0.6	2a	Dichromadora	0.4	2a	Paracanthonchus	0.3	2a	Chromadora		

App. IX cont..

1		2		3		4		5
Laimella	0.7 2a	Acanthonchus	0.6 2a	Vasostoma	0.4 2a	Actinonema*	0.3 2a	Diodotolaimus
Ptycholaimellus	0.7 2a	Paracyatholaimus	0.6 2a	Aponema	0.4 2a	Onchium	0.3 2a	Ixonema
Acanthonchus	0.5 2a	Innocuonema	0.5 2a	Paracanthonchus	0.3 2a	Desmodorella	0.3 2a	procamacolaimus
Paramesonchium	0.5 2a	Comesa	0.5 2a	Paramicrolaimus	0.3 2a	Ixonema	0.2 2a	Linhomoeus
Hopperia	0.4 2a	Calomicrolaimus	0.5 2a	Trochamus	0.3 2a	Gophionchus	0.2 2a	Dichromadora
Catanema	0.4 2a	Catanema	0.5 2a	Desmodora	0.3 2a	Calomicrolaimus	0.2 2a	Comesa
Paralongicyatholaimus	0.4 2a	Acantholaimus	0.4 2a	Spirinia	0.3 2a	Crassonema	0.2 2a	Paracyatholaimoides
Paracanthonchus	0.4 2a	Longicyatholaimus	0.4 2a	Kraspedonema	0.2 2a	Paracyatholaimoides	0.2 2a	Chromadorita
Prochromadorella	0.4 2a	Paramicrolaimus	0.4 2a	Ixonema	0.2 2a	Paracyatholaimus	0.2 2a	Prochromadorella
Camacolaimus	0.3 2a	Trochamus	0.3 2a	Prochromadorella	0.2 2a	Marylynnia	0.2 2a	Cricolaimus
Onchium	0.3 2a	Paracomesoma	0.2 2a	Camacolaimus	0.2 2a	Diodotolaimus	0.2 2a	Paracyatholaimus
Ixonema	0.3 2a	Parachromadorita	0.2 2a	Psammonema	0.2 2a	Spirinia	0.1 2a	Paramicrolaimus
Linhomoeus	0.2 2a	Mesacanthion	0.2 2a	Neotonchus	0.2 2a	Acanthonchus	0.1 2a	Chromadorella
Longicyatholaimus	0.2 2a	Cyatholaimus	0.2 2a	Spirobolbolaimus	0.1 2a	Prochromadorella	0.1 2a	
Desmodorella	0.2 2a	Linhomoeus	0.2 2a	Praeacanthonchus	0.1 2a	Cyatholaimus	0.1 2a	
Spirinia	0.2 2a	Dorylaimopsis	0.2 2a	Diodotolaimus	0.1 2a	Psammonema	0.1 2a	
Praeacanthonchus	0.2 2a	Trichromadora	0.2 2a	Linhomoeus	0.1 2a	Chromadorita	0.1 2a	
Cobbia	0.2 2a	Spirobolbolaimus	0.2 2a	Chromadora	0.1 2a	Kraspedonema	0.1 2a	
Innocuonema	0.1 2a	Neotonchus	0.2 2a	Paramesonchium	0.1 2a	Comesa	0.1 2a	
Chromadorita	0.1 2a	Endeolophos	0.1 2a	Hypodontolaimus	0.1 2a	Dagda	0.1 2a	
Paramicrolaimus	0.1 2a	Polysigma	0.1 2a	Cricolaimus	0.1 2a			
Paracyatholaimoides	0.1 2a	Aponema	0.1 2a	Acanthonchus	0.1 2a			
Rhinema	0.1 2a	Spiliphera	0.1 2a	Graphonema	0.1 2a			
Trichromadora	0.1 2a	Spirinia	0.1 2a	Paracyatholaimoides	0.1 2a			
Diodotolaimus	0.1 2a	Metacomesoma	0.1 2a					
Metacyatholaimus	0.1 2a	Onchium	0.1 2a					
Cyatholaimus	0.1 2a	Euchromadora	0.1 2a					
Crassonema	0.1 2a	Gophionchus	0.1 2a					
		Hypodontolaimus	0.1 2a					
		Paramesonchium	0.1 2a					

1		2		3		4		5
Viscosia	3.2 2b	Chromaspirina	1.5 2b	Sylingolaimus	1.4 2b	Sylingolaimus	1.5 2b	Sylingolaimus
Sphaerolaimus	0.9 2b	Viscosia	1.0 2b	Gammanema	1.0 2b	Gammanema	1.0 2b	Doliolaimus
Chromaspirina	0.7 2b	Bolbolaimus	0.9 2b	Bolbolaimus	0.9 2b	Viscosia	0.9 2b	Bolbolaimus
Bathyeurystomina	0.4 2b	Cheironchus	0.5 2b	Doliolaimus	0.8 2b	Doliolaimus	0.6 2b	Viscosia
Belbolla	0.3 2b	Synonchium	0.4 2b	Halichoanolaimus	0.5 2b	Halichoanolaimus	0.5 2b	Halichoanolaimus
Pomponema	0.2 2b	Paramesacanthion	0.4 2b	Viscosia	0.5 2b	Bolbolaimus	0.4 2b	Dolicholaimus
Onyx	0.2 2b	Pseudonchus	0.3 2b	Cheironchus	0.4 2b	Sphaerolaimus	0.3 2b	Sphaerolaimus
Others	0.2 2b	Choanolaimus	0.3 2b	Siphonolaimus	0.3 2b	Anoplostoma	0.2 2b	Others
Metasphaerolaimus	0.2 2b	Gammanema	0.3 2b	Others	0.2 2b	Others	0.1 2b	Gammanema
Halichoanolaimus	0.1 2b	Others	0.3 2b	Anoplostoma	0.2 2b	Enoplaimus	0.1 2b	Synonchiella
Siphonolaimus	0.1 2b	Oncholaimus	0.3 2b	Chromaspirina	0.2 2b	Rhabdonema	0.1 2b	Rhabdonema
Parasphaerolaimus	0.1 2b	Enoploides	0.2 2b	Enoplaimus	0.2 2b	Chromaspirina	0.1 2b	Bathyeurystomina
Enoplolaimus	0.1 2b	Trissonchulus	0.2 2b	Metasphaerolaimus	0.1 2b	Sigmophoranema	0.1 2b	Subsphaerolaimus
Dolicholaimus	0.1 2b	Sphaerolaimus	0.2 2b	Valvalaimus	0.1 2b	Belbolla	0.1 2b	Enoploides
Valvalaimus	0.1 2b	Halichoanolaimus	0.2 2b	Choanolaimus	0.1 2b	Dolicholaimus	0.1 2b	Paramesacanthion
Cheironchus	0.1 2b	Pomponema	0.2 2b	Filoncholaimus	0.1 2b	Siphonolaimus	0.1 2b	Anoplostoma
Paramesacanthion	0.1 2b	Bathyeurystomina	0.2 2b	Synonchiella	0.1 2b	Metasphaerolaimus	0.1 2b	Cheironchus
Sigmophoranema	0.1 2b	Anoplostoma	0.2 2b	Pomponema	0.1 2b			
Pareurystomina	0.1 2b	Sylingolaimus	0.2 2b	Belbolla	0.1 2b			
Enoploides	0.1 2b	Onyx	0.1 2b	Parasphaerolaimus	0.1 2b			

App. IX cont..

1	2		3		4	5
	Mesachantholdes	0.1 2b	Oxynchulus	0.1 2b		
	Polygastrophora	0.1 2b	Chaetonema	0.1 2b		
	Siphonolaimus	0.1 2b	Paramesacanthion	0.1 2b		
	Parasphaerolaimus	0.1 2b	Parallelocoides	0.1 2b		
	Demonema	0.1 2b	Thalassironus	0.1 2b		
	Pareurystomina	0.1 2b				
	Synonchiella	0.1 2b				
	Scaptrella	0.1 2b				
	Halanonchus	0.1 2b				

APPENDIX X to XXV
FOR PART III

Appendix X a: Percentage proportion of the genera of Chromadoridae per station for June/July

	127	128	131 E	132 E	133 C	133D	133 E	120 E	121	136	108 E	108 F	111 A	114 A	114 C	114 D	117 A	117 B	117 E	118	119 E	119 F	103 E	105 A	105 B	105 C	105 D	105 E	106 E	106 F	107 F	107G
Acantholaimus	0.00	0.00	0.00	0.00	28.57	85.71	95.00	7.41	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	41.67	90.91	33.33	100.00	92.86	82.35	12.50	50.00	33.33	66.67	100.00	70.00	50.00	50.00	83.33	100.00
Actinonema	7.69	0.00	33.33	33.33	57.14	4.76	0.00	0.00	44.44	0.00	0.00	0.00	0.00	20.00	29.41	0.00	16.67	9.09	11.11	0.00	0.00	17.65	25.00	0.00	33.33	0.00	0.00	10.00	0.00	0.00	0.00	0.00
Chromadora	0.00	0.00	0.00	0.00	0.00	4.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33	0.00	0.00	0.00	0.00	0.00	0.00
Chromadorella	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromadorita	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	9.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	0.00
Denticulella	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dichromadora	23.08	20.00	33.33	33.33	14.29	0.00	0.00	22.22	44.44	0.00	66.67	83.33	0.00	50.00	29.41	45.45	8.33	0.00	11.11	0.00	0.00	0.00	25.00	50.00	0.00	25.00	0.00	10.00	50.00	50.00	0.00	0.00
Endeolophos	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euchromadora	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graphonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hypodontolaimus	46.15	0.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Innocuonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	16.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Neochromadora	7.69	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	16.67	0.00	0.00	5.88	18.18	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Parachromadorita	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prochromadorella	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	10.00	17.65	18.18	25.00	0.00	22.22	0.00	7.14	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00
Ptycholaimellus	3.85	0.00	0.00	0.00	0.00	0.00	0.00	40.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rhips	11.54	0.00	0.00	33.33	0.00	0.00	0.00	3.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trichromadora	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	17.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trochamus	0.00	60.00	0.00	0.00	0.00	4.76	0.00	0.00	0.00	0.00	0.00	0.00	100.00	10.00	0.00	9.09	0.00	0.00	22.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix X b: Percentage proportion of the genera of Chromadoridae per station for November/December

	528A	528B	531A	531B	532A	533A	533B	550A	550B	552A	552B	511A	511B	514A	514B	517A	517B	518A	518B	519A	519B	503B	505A	505B	505C	505D	506A	506B	507A	507B
Acantholaimus	0	0	60	0	69.2	91.3	78.3	0	0	93.33	75	0	0	0	0	87.5	100	93.3	100	100	84.6	0	75	76.9	90.9	83.3	80	86.7	100	83.3
Actinonema	29.17	0.00	0.00	100.00	0.00	4.35	8.70	9.09	17.65	0.00	0.00	0.00	0.00	0.00	33.33	0.00	0.00	6.67	0.00	0.00	0.00	50.00	0.00	15.38	4.55	0.00	0.00	13.33	0.00	0.00
Chromadora	0.00	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67
Chromadorella	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromadorita	0.00	8.33	0.00	0.00	0.00	0.00	8.70	0.00	0.00	0.00	0.00	4.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.69	0.00	0.00	13.33	0.00	0.00	0.00
Denticulella	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dichromadora	0.00	0.00	10.00	0.00	23.08	4.35	0.00	0.00	5.88	6.67	0.00	38.10	0.00	33.33	33.33	12.50	0.00	0.00	0.00	0.00	7.69	0.00	6.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Endeolophos	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euchromadora	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graphonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hypodontolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Innocuonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.88	0.00	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Neochromadora	16.67	16.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Parachromadorita	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	0.00	0.00	0.00	0.00	0.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prochromadorella	4.17	0.00	0.00	0.00	7.69	0.00	0.00	0.00	17.65	0.00	0.00	14.29	0.00	0.00	22.22	0.00	0.00	0.00	0.00	0.00	7.69	0.00	12.50	0.00	0.00	0.00	6.67	0.00	0.00	0.00
Ptycholaimellus	33.33	66.67	0.00	0.00	0.00	0.00	0.00	63.64	17.65	0.00	0.00	4.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rhips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.18	11.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	0.00	0.00	0.00	0.00
Trichromadora	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trochamus	16.67	8.33	30.00	0.00	0.00	0.00	0.00	0.00	17.65	0.00	12.50	14.29	100.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	0.00	50.00	0.00	0.00	4.55	0.00	0.00	0.00	0.00	0.00

Appendix XI a: Percentage proportion of the species of Chromadoridae per station for June/July

	127	128	131 E	132 E	133 C	133D	133 E	120 E	121	136	108 E	108 F	111 A	114 A	114 C	114 D	117 A	117 B	117 E	118	119 E	119 F	103 E	105 A	105 B	105 C	105 D	105 E	106 E	106 F	107 F	107 G
Acantholaimus vermeulenl	0.00	0.00	0.00	0.00	0.00	4.76	0.00	0.00	0.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	0.00	0.00	0.00	21.43	17.65	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00
A. helpl	0.00	0.00	0.00	0.00	0.00	19.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	0.00	0.00	0.00	11.76	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00
A. elegans	0.00	0.00	0.00	0.00	0.00	4.76	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	0.00	0.00	0.00	17.65	0.00	50.00	0.00	16.67	0.00	0.00	0.00	0.00	0.00	0.00
A. verscheldi	0.00	0.00	0.00	0.00	0.00	4.76	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	11.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	0.00	0.00	33.33
A. gathumai	0.00	0.00	0.00	0.00	0.00	9.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	0.00	0.00	21.43	17.65	0.00	0.00	0.00	16.67	0.00	0.00	0.00	50.00	0.00	0.00
A. geraerti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A. invaginatum	0.00	0.00	0.00	0.00	28.57	4.76	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	8.33	0.00	10.00	0.00	0.00	0.00	16.67
Acantholaimus sp. 1	0.00	0.00	0.00	0.00	0.00	4.76	0.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33	0.00	22.22	11.11	7.14	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 2	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 4	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.88	0.00	0.00	0.00	25.00	100.00	0.00	0.00	0.00	0.00	16.67
Acantholaimus sp. 5	0.00	0.00	0.00	0.00	0.00	4.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.18	0.00	0.00	0.00	0.00	0.00	0.00	33.33	0.00	0.00	0.00	0.00	0.00	16.67	0.00
Acantholaimus sp. 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11	7.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 8	0.00	0.00	0.00	0.00	0.00	9.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11	7.14	5.88	0.00	0.00	0.00	0.00	0.00	0.00	16.67	0.00	16.67	0.00
Acantholaimus sp. 9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 11	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	0.00
Acantholaimus sp. 12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	0.00
Acantholaimus sp. 13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 15	0.00	0.00	0.00	0.00	0.00	0.00	15.00	3.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33	18.18	0.00	0.00	7.14	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00	16.67
Acantholaimus sp. 16	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	0.00
Acantholaimus sp. 19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 24	0.00	0.00	0.00	0.00	0.00	0.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 29	0.00	0.00	0.00	0.00	0.00	19.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus uniden	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	0.00	0.00	16.67
Actinonema longicaudata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	23.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Actinonema sp. 1	0.00	0.00	0.00	33.33	42.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33	0.00	0.00	0.00	0.00	11.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Actinonema sp. 2	0.00	0.00	33.33	0.00	0.00	0.00	0.00	0.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	5.88	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00
A. nicolae	3.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A. paraceltica	3.85	0.00	0.00	0.00	14.29	4.76	0.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	5.88	0.00	8.33	9.09	0.00	0.00	0.00	0.00	0.00	0.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromadora sp.	0.00	0.00	0.00	0.00	0.00	4.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33	0.00	0.00	0.00	0.00	0.00	0.00
Chromadorella sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromadorita sp. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	0.00
Chromadorita sp. 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromadorita sp. 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Denticulella sp.	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dichromadora cucullata	3.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	11.76	9.09	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	50.00	0.00	0.00
Dichromadora sp. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	0.00	0.00	0.00
Dichromadora sp. 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dichromadora sp. 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dichromadora sp. 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D. gathuai	0.00	20.00	0.00	0.00	0.00	0.00	0.00	7.41	11.11	0.00	0.00	0.00	0.00	30.00	0.00	36.36	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	10.00	16.67	0.00	0.00	0.00
D. loisae	19.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00	83.33	0.00	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D. longicaudata	0.00	0.00	33.33	33.33	14.29	0.00	0.00	14.81	11.11	0.00	0.00	0.00	0.00	0.00	17.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	0.00	0.00	0.00	0.00	0.00	0.00

Appendix XI a continued...	127	128	131	132	133	133	133	120	121	136	108	108	111	114	114	114	117	117	117	118	119	119	103	105	105	105	105	105	106	106	107	107	
D.quadripapillata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.26
Endeolophos sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
Euchromadora sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graphonema sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hypodontolaimus marleenae	38.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20
H. angelae	7.69	0.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.28
Innocuonema sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	16.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.26
Neochromadora sp.	7.69	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	16.67	0.00	0.00	5.88	18.18	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.92
Parachromadorita sp. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39
Prochromadorella daroe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	0.00	0.00	0.00	7.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	1.29
Prochromadorella sp. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prochromadorella sp. 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54
Prochromadorella sp. 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35
Prochromadorella sp. 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prochromadorella sp. 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
Proch. ditlevsenl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	17.65	9.09	0.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50
Ptycholaimellus macrodentatus	3.85	0.00	0.00	0.00	0.00	0.00	0.00	18.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.70
P. penninae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69
Rhips reginae	0.00	0.00	0.00	33.33	0.00	0.00	0.00	3.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.55
Rhips sp. 1	11.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
Trichromadora longicaudata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	17.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.90
Trochamus bulbosa	0.00	0.00	0.00	0.00	0.00	4.76	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.27
T. complexus	0.00	60.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.57
T. polki	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T. prosoporus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	9.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60

Appendix XI a continued...	127	128	131	132	133	133	133	120	121	136	108	108	111	114	114	114	117	117	117	118	119	119	103	105	105	105	105	105	106	106	107	107
D.quadripapillata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33	0.00	0.00	0.00	0.00	0.00	0.00
Endeolophos sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euchromadora sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graphonema sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hypodontolaimus marleenae	38.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H. angelae	7.69	0.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Innocuonema sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	16.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Neochromadora sp.	7.69	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	16.67	0.00	0.00	5.88	18.18	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Parachromadorita sp. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prochromadorella daroe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	0.00	0.00	0.00	7.14	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00
Prochromadorella sp. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prochromadorella sp. 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prochromadorella sp. 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prochromadorella sp. 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prochromadorella sp. 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proch. ditlevseni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	17.65	9.09	0.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ptycholaimellus macrodentatus	3.85	0.00	0.00	0.00	0.00	0.00	0.00	18.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
P. penninae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rhips reginae	0.00	0.00	0.00	33.33	0.00	0.00	0.00	3.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rhips sp. 1	11.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trichromadora longicaudata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	17.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trochamus bulbosa	0.00	0.00	0.00	0.00	0.00	4.76	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T. complexus	0.00	60.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T. polki	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T. prosoporus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	9.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix XI b: Percentage proportion of the species of Chromadoridae per station for November/december

	528A	528B	531A	531B	532A	533A	533B	550A	550B	552A	552B	511A	511B	514A	514B	517A	517B	518A	518B	519A	519B	503B	505A	505B	505C	505D	506A	506B	507A	507B
Acantholaimus vermeuleni	0.00	0.00	10.00	0.00	23.08	8.70	4.35	0.00	0.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.67	0.00	14.29	0.00	0.00	0.00	0.00	4.55	0.00	0.00	20.00	5.88	0.00
A. helpi	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14	7.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A. elegans	0.00	0.00	30.00	0.00	15.38	0.00	0.00	0.00	0.00	6.67	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14	0.00	0.00	0.00	15.38	13.64	0.00	0.00	13.33	5.88	0.00
A. verscheldi	0.00	0.00	10.00	0.00	7.69	4.35	17.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.33	6.67	0.00	7.14	0.00	0.00	6.25	7.69	13.64	16.67	13.33	0.00	0.00	25.00
A. gathumai	0.00	0.00	0.00	0.00	15.38	13.04	4.35	0.00	0.00	6.67	0.00	0.00	0.00	0.00	0.00	12.50	0.00	6.67	16.67	7.14	7.69	0.00	6.25	7.69	13.64	0.00	20.00	0.00	5.88	8.33
A. geraerti	0.00	0.00	0.00	0.00	0.00	0.00	13.04	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	6.67	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.67	0.00	0.00	0.00
A. invaginatum	0.00	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.67	0.00	7.14	7.69	0.00	31.25	0.00	18.18	0.00	13.33	0.00	17.65	8.33
Acantholaimus sp. 1	0.00	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	6.67	0.00	0.00	0.00	0.00	0.00	0.00	16.67	13.33	8.33	0.00	7.69	0.00	0.00	7.69	18.18	33.33	0.00	13.33	0.00	8.33
Acantholaimus sp. 2	0.00	0.00	0.00	0.00	0.00	4.35	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.25	7.69	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.67	0.00	0.00
Acantholaimus sp. 5	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	6.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.76	8.33
Acantholaimus sp. 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	12.50	16.67	0.00	8.33	0.00	7.69	0.00	6.25	7.69	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 7	0.00	0.00	0.00	0.00	0.00	8.70	0.00	0.00	0.00	6.67	25.00	0.00	0.00	0.00	0.00	12.50	0.00	13.33	8.33	0.00	0.00	0.00	6.25	15.38	0.00	0.00	0.00	6.67	0.00	0.00
Acantholaimus sp. 8	0.00	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33	0.00	7.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 9	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 10	0.00	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 12	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	6.67	0.00	0.00	0.00	0.00	0.00	0.00	16.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.67	0.00	0.00	0.00
Acantholaimus sp. 13	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.67	0.00	0.00
Acantholaimus sp. 14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	0.00	0.00	0.00	0.00
Acantholaimus sp. 15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.33	12.50	0.00	0.00	0.00	0.00	12.50	16.67	6.67	8.33	0.00	7.69	0.00	6.25	7.69	4.55	0.00	6.67	13.33	0.00	0.00
Acantholaimus sp. 16	0.00	0.00	0.00	0.00	0.00	0.00	8.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.88	0.00
Acantholaimus sp. 17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.67	0.00	0.00	0.00
Acantholaimus sp. 18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14	7.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	7.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 21	0.00	0.00	0.00	0.00	0.00	4.35	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.67	0.00	0.00	0.00	0.00	0.00	0.00	4.55	0.00	0.00	0.00	0.00	8.33
Acantholaimus sp. 22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67
Acantholaimus sp. 24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.67	0.00	0.00	0.00
Acantholaimus sp. 26	0.00	0.00	0.00	0.00	7.69	8.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.25	0.00	0.00	16.67	0.00	0.00	5.88	0.00
Acantholaimus sp. 27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 28	0.00	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.67	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus sp. 30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acantholaimus uniden	0.00	0.00	10.00	0.00	0.00	17.39	0.00	0.00	0.00	6.67	0.00	0.00	0.00	0.00	0.00	12.50	0.00	13.33	25.00	7.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.67	41.18	0.00
Actinonema longicaudata	29.17	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.33	0.00	0.00
Actinonema sp. 1	0.00	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Actinonema sp. 2	0.00	0.00	0.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A. nicolae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	11.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55	0.00	0.00	0.00	0.00	0.00
A. paraceltica	0.00	0.00	0.00	50.00	0.00	4.35	0.00	0.00	5.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.67	0.00	0.00	0.00	50.00	0.00	15.38	0.00	0.00	0.00	0.00	0.00	0.00
Chromadora sp.	0.00	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67
Chromadorella sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromadorita sp. 1	0.00	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.33	0.00	0.00	0.00
Chromadorita sp. 2	0.00	0.00	0.00	0.00	0.00	0.00	8.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.69	0.00	0.00	0.00	0.00	0.00	0.00
Chromadorita sp. 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Denticulella sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dichromadora cucullata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dichromadora sp. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dichromadora sp. 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dichromadora sp. 3	0.00	0.00	10.00	0.00	7.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dichromadora sp. 4	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix XI b continued...	528	528	531	532	533	533	550	550	552	552	511	511	514	514	517	517	518	518	519	519	503	503	505	505	505	505	506	506	507	507
D. gathual	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.67	0.00	0.00	0.00	0.00	33.33	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D. loisae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D. longicaudata	0.00	0.00	0.00	0.00	15.38	0.00	0.00	0.00	5.88	0.00	0.00	0.00	0.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D.quadripapillata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Endeolophos sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Euchromadora sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Graphonema sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hypodontolaimus marleenae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
H. angelae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Innocuonema sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.88	0.00	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Neochromadora sp.	16.67	16.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Parachromadorita sp. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	0.00	0.00	0.00	0.00	0.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prochromadorella daroe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.69	0.00	12.50	0.00	0.00	0.00	6.67	0.00	0.00	0.00
Prochromadorella sp. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prochromadorella sp. 2	0.00	0.00	0.00	0.00	7.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prochromadorella sp. 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prochromadorella sp. 4	4.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Prochromadorella sp. 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Proch. ditlevseni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.76	0.00	0.00	9.52	0.00	0.00	22.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ptycholaimellus macrodentatus	33.33	66.67	0.00	0.00	0.00	0.00	0.00	63.64	17.65	0.00	0.00	4.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
P. penninae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rhips reginae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.18	11.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	0.00	0.00	0.00	0.00
Rhips sp. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trichromadora longicaudata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trochamus bulbosa	0.00	0.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55	0.00	0.00	0.00	0.00	0.00
T. complexus	4.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T. polki	12.50	8.33	0.00	0.00	0.00	0.00	0.00	0.00	17.65	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T. prosoporus	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix XIIa: Percentage proportion of the genera of the comesomatidae in June/July

	127	128	131E	132E	133E	133C	133D	120E	121	136	108E	108F	111B	114C	114D	114A	117A	117B	117E	118	119E	119F	103E	105A	105B	105C	105D	105E	106E	106F	107G	107H
Sabatieria	12.50	4.00	0.00	57.14	94.12	28.57	33.33	100.00	27.27	54.55	58.06	16.67	5.00	2.17	0.00	0.00	55.00	50.00	79.31	63.64	100.00	14.29	0.00	37.78	38.60	41.67	33.33	37.50	46.67	44.00	66.67	0.00
Setosabatieria	0.00	0.00	8.70	7.14	0.00	0.00	0.00	0.00	9.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cervonema	0.00	0.00	30.43	7.14	0.00	57.14	33.33	0.00	18.18	31.82	3.23	0.00	0.00	2.17	12.50	0.00	30.00	25.00	13.79	18.18	0.00	57.14	0.00	42.22	12.28	29.17	44.44	37.50	40.00	44.00	0.00	100.00
Laimella	0.00	0.00	13.04	0.00	0.00	0.00	33.33	0.00	36.36	4.55	12.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.45	0.00	0.00	0.00	66.67	11.11	1.75	4.17	2.78	4.17	6.67	0.00	0.00	0.00
Pierrickia	0.00	0.00	0.00	7.14	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.57	0.00	0.00	1.75	0.00	0.00	0.00	0.00	0.00	33.33	0.00
Paracomesoma	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.23	66.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.33	2.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dorylaimopsis	0.00	68.00	34.78	14.29	0.00	0.00	0.00	0.00	9.09	0.00	22.58	16.67	95.00	89.13	87.50	100.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	2.22	19.30	8.33	5.56	4.17	0.00	0.00	0.00	0.00
Hopperia	0.00	12.00	8.70	7.14	0.00	0.00	0.00	0.00	0.00	4.55	0.00	0.00	0.00	2.17	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.79	4.17	2.78	4.17	6.67	12.00	0.00	0.00
Vasostoma sp	0.00	16.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kenyanema monorchis	0.00	0.00	4.35	0.00	5.88	0.00	0.00	0.00	0.00	4.55	0.00	0.00	0.00	4.35	0.00	0.00	0.00	12.50	3.45	18.18	0.00	0.00	0.00	4.44	5.26	12.50	8.33	8.33	0.00	0.00	0.00	0.00
Paramesonchium mombasi	37.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.78	0.00	0.00	0.00	0.00	0.00
Metasabatieria sp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.26	0.00	0.00	4.17	0.00	0.00	0.00	0.00

Appendix XIIb: Percentage proportion of the genera of the comesomatidae in November/December

	528A	528B	531A	531B	532A	533A	533B	550A	550B	552A	552B	511A	511B	514A	514B	517A	517B	518A	518B	519A	519B	503A	503B	505A	505B	505C	505D	506A	506B	507A	507B
Sabatieria	11.11	20.00	21.74	32.35	34.78	57.14	75.00	25.00	0.00	90.00	66.67	20.00	8.33	40.00	9.52	50.00	85.00	50.00	53.85	66.67	75.00	8.33	25.00	59.38	65.22	36.36	50.00	86.11	75.00	0.00	0.00
Setosabatieria	22.22	0.00	4.35	5.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cervonema	0.00	5.00	30.43	35.29	13.04	42.86	25.00	0.00	0.00	10.00	22.22	0.00	0.00	0.00	19.05	22.73	10.00	35.71	38.46	33.33	25.00	0.00	0.00	12.50	13.04	36.36	47.06	11.11	0.00	100.00	0.00
Laimella	33.33	20.00	21.74	5.88	13.04	0.00	0.00	25.00	0.00	0.00	0.00	0.00	33.33	3.33	0.00	9.09	0.00	0.00	0.00	0.00	0.00	41.67	75.00	9.38	13.04	13.64	0.00	0.00	12.50	0.00	0.00
Pierrickia	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55	0.00	7.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00
Paracomesoma	11.11	40.00	0.00	0.00	0.00	0.00	0.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	4.76	0.00	0.00	0.00	0.00	0.00	0.00	41.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dorylaimopsis	22.22	10.00	13.04	20.59	8.70	0.00	0.00	0.00	0.00	0.00	0.00	60.00	58.33	53.33	52.38	9.09	5.00	0.00	0.00	0.00	0.00	0.00	0.00	6.25	8.70	4.55	0.00	0.00	0.00	0.00	0.00
Hopperia	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.76	0.00	0.00	7.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	2.94	2.78	0.00	0.00	0.00
Vasostoma sp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kenyanema monorchis	0.00	0.00	4.35	0.00	4.35	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	0.00	9.52	0.00	0.00	0.00	7.69	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paramesonchium mombasi	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metasabatieria sp	0.00	0.00	0.00	0.00	21.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix XIIIa: Percentage proportion of the species of Comesomatidae in June/July

	127	128	131E	132E	133E	133C	133D	120E	121	136	108E	108F	111B	114C	114D	114A	117A	117B	117E	118	119E	119F	103E	105A	105B	105C	105D	105E	106E	106F	107G	107H
Sabatieria conicauda	0.00	0.00	0.00	42.86	58.82	0.00	0.00	0.00	0.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	0.00	62.07	36.36	0.00	0.00	0.00	11.11	22.81	25.00	13.89	29.17	46.67	36.00	0.00	0.00
S. lucia	0.00	0.00	0.00	0.00	0.00	14.29	0.00	0.00	0.00	4.55	0.00	0.00	0.00	0.00	0.00	0.00	15.00	50.00	13.79	0.00	100.00	14.29	0.00	6.67	5.26	8.33	5.56	0.00	0.00	4.00	0.00	0.00
S. pissina	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00	9.09	0.00	0.00	0.00	20.00	10.53	4.17	13.89	8.33	0.00	0.00	0.00	0.00
S. aff. furcillata	0.00	4.00	0.00	0.00	0.00	0.00	0.00	81.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S. aff. americana	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55	0.00	0.00	58.06	16.67	5.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sabatieria sp. 1	0.00	0.00	0.00	0.00	23.53	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	66.67	0.00
Sabatieria sp. 2	12.50	0.00	0.00	0.00	5.88	0.00	0.00	13.64	18.18	0.00	0.00	0.00	0.00	2.17	0.00	0.00	0.00	0.00	3.45	0.00	0.00	0.00	0.00	0.00	0.00	4.17	0.00	0.00	0.00	4.00	0.00	0.00
Sabatieria sp. 3	0.00	0.00	0.00	14.29	5.88	0.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sabatieria sp. 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sabatieria sp. 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sabatieria sp. 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Setosabatieria	0.00	0.00	8.70	7.14	0.00	0.00	0.00	0.00	9.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cervonema tenuicauda	0.00	0.00	8.70	0.00	0.00	28.57	0.00	0.00	18.18	13.64	0.00	0.00	0.00	2.17	12.50	0.00	10.00	0.00	3.45	18.18	0.00	57.14	0.00	28.89	7.02	16.67	38.89	33.33	13.33	24.00	0.00	0.00
C. minutus	0.00	0.00	17.39	0.00	0.00	14.29	33.33	0.00	0.00	18.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.45	0.00	0.00	0.00	0.00	2.22	1.75	8.33	0.00	0.00	13.33	0.00	0.00	0.00
C. gourbaulti	0.00	0.00	4.35	7.14	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	25.00	6.90	0.00	0.00	0.00	0.00	11.11	3.51	0.00	0.00	4.17	0.00	0.00	0.00	0.00
C. aff. jenseni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.33	8.00	0.00	100.00
Cervonema sp. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.17	0.00	0.00	0.00	0.00	0.00	0.00
Cervonema sp. 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.00	0.00	0.00
Cervonema sp. 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cervonema sp. 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.56	0.00	0.00	0.00	0.00	0.00
Laimella aff. vera	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
L. aff. filicaudata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Laimella aff. minuta	0.00	0.00	0.00	0.00	0.00	0.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.45	0.00	0.00	0.00	0.00	8.89	1.75	0.00	0.00	0.00	6.67	0.00	0.00	0.00
Laimella sp. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	0.00	12.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	66.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Laimella sp. 2	0.00	0.00	13.04	0.00	0.00	0.00	0.00	0.00	9.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.17	0.00	0.00	0.00	0.00	0.00	0.00
Laimella sp. 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.18	4.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.78	4.17	0.00	0.00	0.00	0.00
Laimella sp. 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.33	0.00
Pierrickia sp. 1	0.00	0.00	0.00	7.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pierrickia sp. 2	0.00	0.00	0.00	0.00	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pierrickia sp. 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pierrickia sp. 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pierrickia sp. 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pierrickia sp. 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paracomesoma sp. 1	37.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.23	66.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paracomesoma sp. 2	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dorylaimopsis variabilis	0.00	68.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	95.00	86.96	87.50	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D. coomansi	0.00	0.00	17.39	14.29	0.00	0.00	0.00	0.00	9.09	0.00	22.58	16.67	0.00	2.17	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D. gerardi	0.00	0.00	17.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	2.22	19.30	8.33	5.56	4.17	0.00	0.00	0.00	0.00
Hopperia indiana	0.00	4.00	8.70	7.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.79	4.17	2.78	4.17	6.67	12.00	0.00	0.00
Hopperia sp. 1	0.00	8.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55	0.00	0.00	0.00	2.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vasostoma sp	0.00	16.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kenyanema monorchis	0.00	0.00	4.35	0.00	5.88	0.00	0.00	0.00	0.00	4.55	0.00	0.00	0.00	4.35	0.00	0.00	0.00	12.50	3.45	18.18	0.00	0.00	0.00	4.44	5.26	12.50	8.33	8.33	0.00	0.00	0.00	0.00
Paramesonchium mombasi	37.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.78	0.00	0.00	0.00	0.00	0.00
Metasabatieria sp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.26	0.00	0.00	4.17	0.00	0.00	0.00	0.00
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Appendix XIIIb: Percentage proportion of the species of Comesomatidae in November/December

	528A	528B	531A	531B	532A	533A	533B	550A	550B	552A	552B	511A	511B	514A	514B	517A	517B	518A	518B	519A	519B	503A	503B	505A	505B	505C	505D	506A	506B	507A	507B
Sabatieria conicauda	0.00	0.00	13.04	26.47	13.04	28.57	25.00	0.00	0.00	80.00	22.22	0.00	0.00	0.00	0.00	0.00	15.00	35.71	38.46	0.00	25.00	0.00	0.00	50.00	34.78	36.36	50.00	86.11	75.00	0.00	0.00
S. lucia	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	33.33	0.00	0.00	0.00	0.00	31.82	5.00	7.14	15.38	0.00	25.00	0.00	25.00	3.13	26.09	0.00	0.00	0.00	0.00	0.00	0.00
S. pissina	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	11.11	0.00	0.00	0.00	0.00	9.09	60.00	0.00	0.00	0.00	0.00	0.00	0.00	6.25	4.35	0.00	0.00	0.00	0.00	0.00	0.00
S. aff. furcillata	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33	40.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
S. aff. americana	0.00	0.00	0.00	2.94	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sabatieria sp. 1	0.00	0.00	8.70	0.00	4.35	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	0.00	0.00	50.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sabatieria sp. 2	11.11	20.00	0.00	0.00	0.00	14.29	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55	0.00	0.00	0.00	0.00	0.00	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sabatieria sp. 3	0.00	0.00	0.00	0.00	8.70	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14	0.00	16.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sabatieria sp. 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	9.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sabatieria sp. 5	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sabatieria sp. 6	0.00	0.00	0.00	2.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Setosabatieria	22.22	0.00	4.35	5.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cervonema tenuicauda	0.00	5.00	8.70	11.76	0.00	28.57	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.43	15.38	33.33	25.00	0.00	0.00	6.25	13.04	4.55	11.76	0.00	0.00	66.67	0.00
C. minutus	0.00	0.00	13.04	5.88	13.04	14.29	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	9.09	5.00	7.14	15.38	0.00	0.00	0.00	0.00	0.00	0.00	4.55	2.94	0.00	0.00	0.00	0.00
C. gourbaulti	0.00	0.00	8.70	2.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.05	13.64	5.00	7.14	7.69	0.00	0.00	0.00	0.00	3.13	0.00	4.55	5.88	5.56	0.00	0.00	0.00
C. aff. jenseni	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.94	0.00	0.00	33.33	0.00
Cervonema sp. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cervonema sp. 2	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.73	2.94	0.00	0.00	0.00	0.00
Cervonema sp. 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cervonema sp. 4	0.00	0.00	0.00	14.71	0.00	0.00	0.00	0.00	0.00	0.00	22.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.13	0.00	0.00	20.59	5.56	0.00	0.00	0.00
Laimella aff. vera	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.13	13.04	0.00	0.00	0.00	0.00	0.00	0.00
L. aff. filicaudata	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Laimella aff. minuta	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.33	0.00	4.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.25	0.00	9.09	0.00	0.00	12.50	0.00	0.00
Laimella sp. 1	22.22	10.00	0.00	2.94	0.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	20.83	0.00	0.00	4.55	0.00	0.00	0.00	0.00	0.00	16.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Laimella sp. 2	11.11	10.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	75.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Laimella sp. 3	0.00	0.00	21.74	2.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Laimella sp. 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55	0.00	0.00	0.00	0.00	0.00
Pierrickia sp. 1	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pierrickia sp. 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pierrickia sp. 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pierrickia sp. 4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pierrickia sp. 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pierrickia sp. 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00
Paracomesoma sp. 1	11.11	35.00	0.00	0.00	0.00	0.00	0.00	50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paracomesoma sp. 2	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dorylaimopsis variabilis	22.22	5.00	8.70	17.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	60.00	58.33	46.67	52.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D. coomansi	0.00	5.00	0.00	2.94	8.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D. gerardi	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	5.00	0.00	0.00	0.00	0.00	0.00	0.00	6.25	8.70	4.55	0.00	0.00	0.00	0.00	0.00
Hopperia indiana	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.76	0.00	0.00	7.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	2.94	2.78	0.00	0.00	0.00
Hopperia sp. 1	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vasostoma sp	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kenyanema monorchis	0.00	0.00	4.35	0.00	4.35	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	0.00	9.52	0.00	0.00	0.00	7.69	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paramesonchium mombasi	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Metasabatieria sp	0.00	0.00	0.00	0.00	21.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	100	100	100	100	100	100	100	100	0	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Appendix XIV a: Percentage proportion of the genera of the family Microlaimidae in June/July

	127	128	131 E	132 E	133 C	133D	133 E	120 E	121	136	108 E	108 F	111B	114 A	114 C	114 D	117 A	117 B	117 E	118	119 E	119 F	103 E	105 A	105 B	105 C	105 D	105 E	106 E	106 F	107 F	107 G
Aponema	0.00	0.00	7.69	0.00	20.00	0.00	0.00	0.00	0.00	15.38	0.00	0.00	91.67	0.00	0.00	0.00	0.00	10.00	0.00	0.00	4.76	8.33	0.00	14.29	0.00	0.00	0.00	0.00	7.69	14.29	0.00	0.00
Bolbolaimus	0.00	0.00	0.00	0.00	40.00	0.00	0.00	11.11	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	30.00	21.43	33.33	4.76	16.67	21.05	0.00	0.00	14.29	0.00	33.33	15.38	7.14	0.00	0.00
Calomicrolaimus	62.50	0.00	7.69	0.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.83	0.00	0.00	0.00	4.76	25.00	0.00	0.00	0.00	0.00	8.33	33.33	7.69	0.00	0.00	50.00
Cinctonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crassonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.38	0.00	0.00	0.00
Ixonema	6.25	0.00	0.00	0.00	0.00	0.00	0.00	22.22	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.17	0.00	0.00	0.00	0.00	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Microlaimus	31.25	60.00	0.00	45.45	0.00	100.00	52.94	0.00	71.43	15.38	100.00	100.00	8.33	100.00	100.00	80.00	33.33	30.00	35.71	66.67	57.14	8.33	68.42	57.14	0.00	35.71	58.33	16.67	7.69	7.14	0.00	0.00
Spirobolbolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molgolaimus	0.00	40.00	84.62	54.55	20.00	0.00	47.06	44.44	0.00	69.23	0.00	0.00	0.00	0.00	0.00	20.00	16.67	20.00	42.86	0.00	28.57	25.00	10.53	14.29	100.00	50.00	33.33	16.67	46.15	71.43	100.00	50.00

Appendix XIV a: Percentage proportion of the genera of the family Microlaimidae in November/December

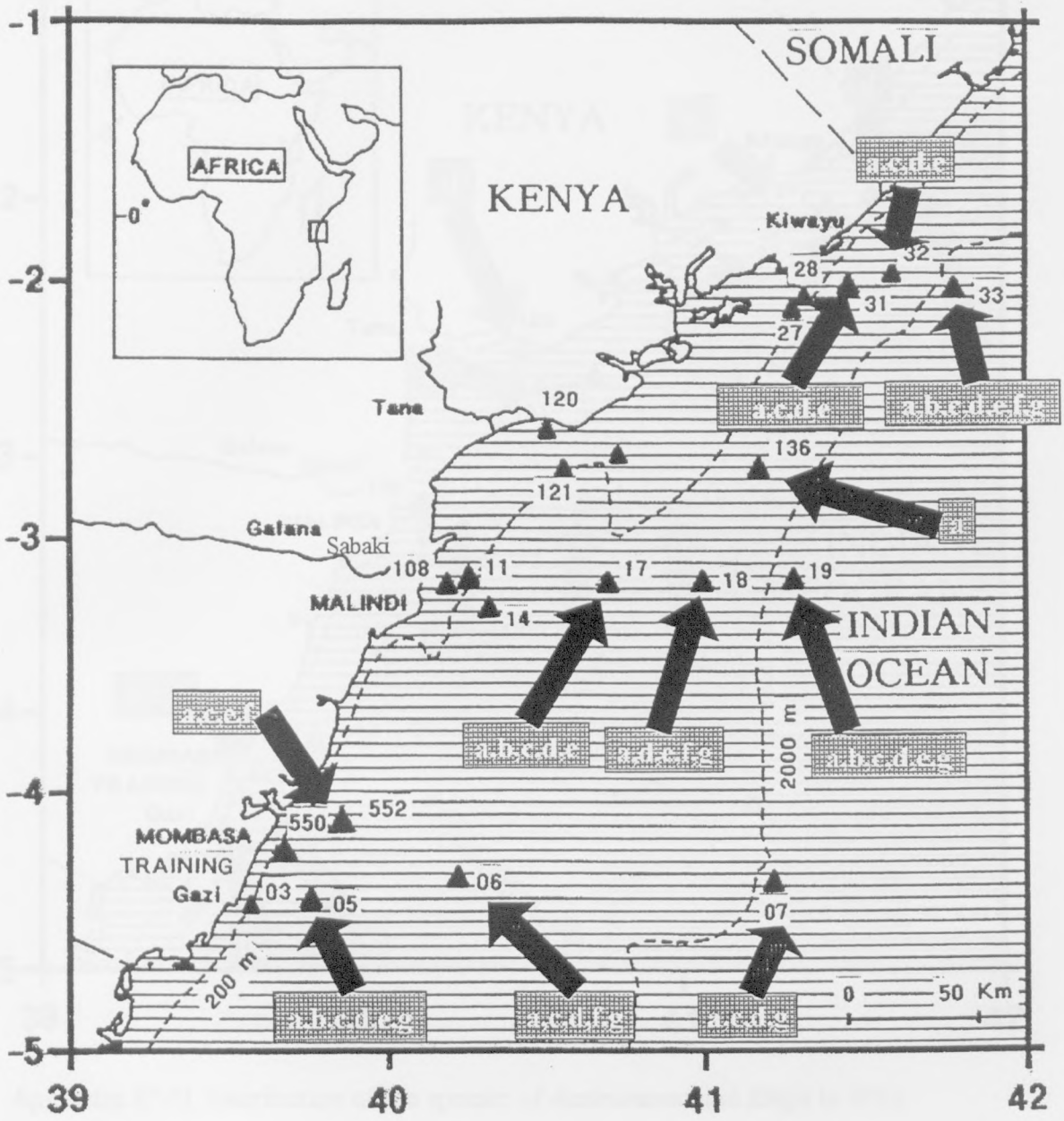
	528A	528B	531A	531B	532A	533A	533B	550A	550B	552A	552B	511A	511B	514A	514B	517A	517B	518A	518B	519A	519B	503A	503B	505A	505B	505C	505D	506A	506B	507A	507B
Aponema	0.00	0.00	22.22	0.00	0.00	15.79	0.00	0.00	0.00	0.00	0.00	0.00	61.54	25.00	27.27	4.35	7.14	0.00	0.00	0.00	14.29	6.25	0.00	6.25	0.00	7.69	0.00	11.76	6.25	11.11	0.00
Bolbolaimus	0.00	0.00	11.11	10.00	0.00	21.05	18.18	5.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.04	14.29	0.00	9.09	50.00	0.00	0.00	4.35	12.50	14.29	0.00	28.57	11.76	0.00	33.33	16.67
Calomicrolaimus	16.67	0.00	0.00	0.00	0.00	15.79	18.18	10.53	8.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14	0.00	9.09	0.00	0.00	12.50	0.00	37.50	28.57	15.38	14.29	11.76	0.00	0.00	8.33
Cinctonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	15.38	0.00	0.00	0.00	0.00	0.00
Crassonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.25	0.00	0.00
Ixonema	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.53	12.00	0.00	22.22	45.45	7.69	25.00	0.00	0.00	0.00	0.00	9.09	50.00	14.29	15.63	0.00	12.50	0.00	0.00	0.00	17.65	6.25	0.00	0.00
Microlaimus	50.00	37.50	22.22	40.00	22.22	21.05	18.18	47.37	60.00	14.29	22.22	45.45	0.00	50.00	72.73	30.43	7.14	50.00	18.18	0.00	14.29	62.50	78.26	0.00	17.86	0.00	0.00	11.76	12.50	44.44	16.67
Spirobolbolaimus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	4.35	6.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molgolaimus	33.33	62.50	44.44	50.00	77.78	26.32	45.45	10.53	20.00	85.71	55.56	9.09	30.77	0.00	0.00	47.83	64.29	50.00	54.55	0.00	57.14	3.13	8.70	25.00	39.29	61.54	57.14	35.29	68.75	11.11	58.33

Appendix XV a: Percentage proportion of the species of the Microlaimidae in June/July

	127	128	131 E	132 E	133 C	133D	133 E	120 E	121	136	108 E	108 F	111B	114 A	114 B	114 C	114 D	117 A	117 B	117 E	118	119 E	119 F	103 E	105 A	105 B	105 C	105 D	105 E	106 E	106 F	107 F	107 G	Total
Aponema sp. 1	0.00	0.00	7.69	0.00	20.00	0.00	0.00	0.00	0.00	15.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	4.76	8.33	0.00	14.29	0.00	0.00	0.00	0.00	7.69	14.29	0.00	0.00	3.56
Aponema sp. 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	91.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.56
Bolbolaimus sp. 1 a	0.00	0.00	0.00	0.00	40.00	0.00	0.00	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.17	20.00	14.29	0.00	4.76	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.24
Bolbolaimus sp. 2a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	10.00	7.14	0.00	0.00	8.33	15.79	0.00	0.00	0.00	0.00	0.00	16.67	0.00	0.00	0.00	3.88
Bolbolaimus sp. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.17	0.00	0.00	33.33	0.00	0.00	5.26	0.00	0.00	14.29	0.00	16.67	15.38	7.14	0.00	0.00	2.91
Bolbolaimus sp. 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bolbolaimus sp. 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Calomicrolaimus sp. 1	0.00	0.00	7.69	0.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.83	0.00	0.00	0.00	4.76	25.00	0.00	0.00	0.00	0.00	8.33	33.33	0.00	0.00	0.00	50.00	4.85
C. aff. conspicuus	62.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.69	0.00	0.00	0.00	3.56
Cinctonema sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97
Crassonema sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.38	0.00	0.00	0.00	0.65
Ixonema sp. 1	6.25	0.00	0.00	0.00	0.00	0.00	0.00	22.22	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.17	0.00	0.00	0.00	0.00	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.94
Microlaimus texianus	6.25	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100.00	8.33	0.00	0.00	50.00	40.00	0.00	10.00	28.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.18
Microlaimus sp. 1a	12.50	0.00	0.00	0.00	0.00	72.73	29.41	0.00	0.00	7.69	0.00	0.00	0.00	0.00	0.00	0.00	40.00	4.17	0.00	0.00	66.67	42.86	8.33	36.84	0.00	0.00	0.00	16.67	0.00	0.00	0.00	0.00	0.00	12.94
Microlaimus sp. 2a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32
Microlaimus sp.1	6.25	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	50.00	0.00	0.00	0.00	0.00	0.00	9.52	0.00	0.00	0.00	0.00	0.00	8.33	16.67	0.00	7.14	0.00	0.00	2.59
Microlaimus sp. 2	0.00	0.00	0.00	0.00	0.00	0.00	5.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	0.00	0.00	0.00	0.00	0.00	0.97
Microlaimus sp. 3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Microlaimus sp. 4	0.00	0.00	0.00	18.18	0.00	0.00	11.76	0.00	0.00	7.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.27
Microlaimus sp. 5	0.00	0.00	0.00	0.00	0.00	9.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.97
Microlaimus sp. 6	0.00	0.00	0.00	27.27	0.00	9.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	7.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.94
Microlaimus sp. 7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Microlaimus sp.	0.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.17	10.00	0.00	0.00	0.00	0.00	5.26	0.00	0.00	0.00	7.14	0.00	0.00	0.00	0.00	0.00	1.62
M. globiceps	6.25	0.00	0.00	0.00	0.00	9.09	5.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.67	0.00	0.00	0.00	4.76	0.00	21.05	57.14	0.00	7.14	16.67	0.00	7.69	0.00	0.00	0.00	6.47
M. aff. cochleatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14	0.00	0.00	0.00	0.00	0.00	0.00	0.32
M. aff. zosterae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	71.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.62
M. aff. macrocirculus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32
Spirobolbolaimus sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	8.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65
Molgolaimus tyrol	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.17	0.00	7.14	0.00	4.76	8.33	0.00	0.00	20.00	7.14	33.33	0.00	0.00	35.71	0.00	50.00	5.50
M. abyssorum	0.00	0.00	15.38	18.18	0.00	0.00	5.88	11.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.71	0.00	19.05	8.33	0.00	14.29	40.00	14.29	0.00	0.00	7.69	0.00	100.00	0.00	7.44
M. gazii	0.00	0.00	0.00	0.00	0.00	0.00	17.65	0.00	0.00	23.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.76	0.00	10.53	0.00	0.00	7.14	0.00	0.00	7.69	0.00	0.00	0.00	3.56
M. sabakii	0.00	0.00	0.00	9.09	0.00	0.00	0.00	0.00	0.00	15.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	8.33	0.00	0.00	20.00	14.29	0.00	0.00	0.00	14.29	0.00	0.00	3.88
M. kiwayui	0.00	0.00	30.77	9.09	0.00	0.00	5.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.69	7.14	0.00	0.00	2.91
M. tanai	0.00	40.00	7.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.29
Molgolaimus sp. 1	0.00	0.00	7.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14	0.00	0.00	23.08	0.00	0.00	0.00	1.62
Molgolaimus sp. 2	0.00	0.00	23.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97
Molgolaimus sp. 3	0.00	0.00	0.00	18.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65
Molgolaimus sp. 4	0.00	0.00	0.00	0.00	20.00	0.00	11.76	33.33	0.00	23.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	0.00	0.00	16.67	0.00	14.29	0.00	0.00	4.53
Molgolaimus sp. 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molgolaimus sp. 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molgolaimus sp. 7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Molgolaimus sp.	0.00	0.00	0.00	0.00	0.00	0.00	5.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0.00	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

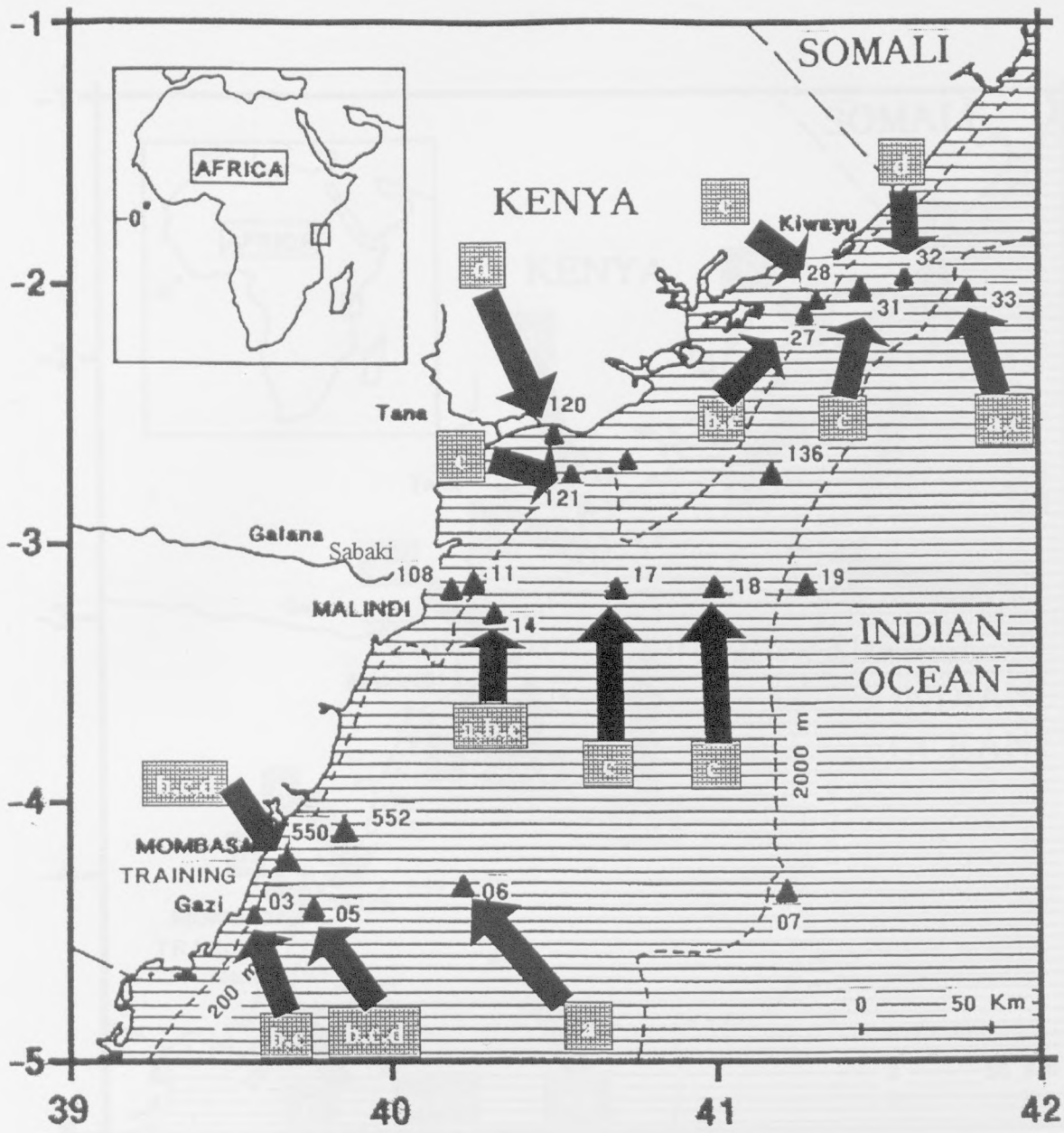
Appendix XVb: Percentage proportion of the species of the Microlaimidae in November/December

	528A	528B	531A	531B	532A	533A	533B	550A	550B	552A	552B	511A	511B	514A	514B	517A	517B	518A	518B	519A	519B	503A	503B	505A	505B	505C	505D	506A	506B	507A	507B	Total
Aponema sp. 1	0.00	0.00	22.22	0.00	0.00	15.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14	0.00	0.00	0.00	0.00	6.25	0.00	6.25	0.00	7.69	0.00	11.76	6.25	11.11	0.00	3.41
Aponema sp. 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	61.54	25.00	27.27	4.35	0.00	0.00	0.00	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.41
Bolbolaimus sp. 1 a	0.00	0.00	0.00	10.00	0.00	21.05	9.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.88	0.00	0.00	0.00	1.70
Bolbolaimus sp. 2a	0.00	0.00	0.00	0.00	0.00	0.00	9.09	5.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.04	14.29	0.00	0.00	50.00	0.00	0.00	0.00	0.00	14.29	0.00	28.57	5.88	0.00	22.22	8.33	4.38
Bolbolaimus sp. 1	0.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	0.00	0.00	0.00	0.00	6.25	0.00	0.00	0.00	0.00	0.00	11.11	8.33	1.22
Bolbolaimus sp; 2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
Bolbolaimus sp.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
Calomicrolaimus sp. 1	0.00	0.00	0.00	0.00	0.00	15.79	18.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.14	0.00	9.09	0.00	0.00	0.00	0.00	37.50	25.00	15.38	14.29	11.76	0.00	0.00	8.33	6.33
C. aff. conspicuus	16.67	0.00	0.00	0.00	0.00	0.00	0.00	10.53	8.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	0.00	0.00	3.57	0.00	0.00	0.00	0.00	0.00	0.00	2.43
Cinctonema sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	15.38	0.00	0.00	0.00	0.00	0.00	0.97
Crassonema sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.25	0.00	0.00	0.24
Ixonema sp. 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.53	12.00	0.00	22.22	45.45	7.69	25.00	0.00	0.00	0.00	0.00	9.09	50.00	14.29	15.63	0.00	12.50	0.00	0.00	0.00	17.65	6.25	0.00	0.00	6.81
Microlaimus texianus	50.00	37.50	0.00	0.00	0.00	0.00	0.00	0.00	8.00	0.00	11.11	9.09	0.00	25.00	63.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.25	0.00	0.00	4.62
Microlaimus sp. 1a	0.00	0.00	22.22	10.00	22.22	21.05	9.09	5.26	24.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	7.14	20.00	9.09	0.00	14.29	6.25	4.35	0.00	3.57	0.00	0.00	5.88	6.25	22.22	0.00	7.54
Microlaimus sp. 2a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.26	4.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.50	26.09	0.00	0.00	0.00	0.00	0.00	0.00	11.11	0.00	3.16
Microlaimus sp.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.26	4.00	0.00	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	9.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97
Microlaimus sp. 2	0.00	0.00	0.00	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33	0.73
Microlaimus sp.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
Microlaimus sp. 4	0.00	0.00	0.00	10.00	0.00	0.00	0.00	0.00	12.00	0.00	0.00	27.27	0.00	0.00	0.00	8.70	0.00	0.00	0.00	0.00	0.00	12.50	17.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.14
Microlaimus sp. 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	21.88	26.09	0.00	3.57	0.00	0.00	0.00	0.00	0.00	8.33	4.14
Microlaimus sp. 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.00	0.00	13.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97
Microlaimus sp. 7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.13	4.35	0.00	7.14	0.00	0.00	0.00	0.00	0.00	0.00	1.22
Microlaimus sp. 8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.26	4.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.57	0.00	0.00	5.88	0.00	0.00	0.00	1.22
M. globiceps	0.00	0.00	0.00	0.00	0.00	0.00	9.09	10.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.35	0.00	10.00	0.00	0.00	0.00	6.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.70
M. aff. cochleatus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49
M. aff. zosterae	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	0.00	0.00	0.00	0.00	0.00	9.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49
M. aff. macrocirculus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.24
Spirobolbolaimus sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	4.35	6.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.22
Molgolaimus tyroi	0.00	0.00	0.00	0.00	22.22	10.53	0.00	0.00	0.00	42.86	11.11	0.00	0.00	0.00	0.00	4.35	35.71	20.00	0.00	0.00	0.00	0.00	0.00	6.25	25.00	23.08	14.29	5.88	6.25	0.00	0.00	7.30
M. abyssorum	0.00	0.00	0.00	0.00	22.22	10.53	0.00	5.26	12.00	0.00	0.00	0.00	0.00	0.00	0.00	17.39	0.00	20.00	9.09	0.00	14.29	0.00	0.00	0.00	0.00	15.38	14.29	5.88	12.50	11.11	50.00	7.06
M. gazii	0.00	0.00	0.00	0.00	11.11	5.26	0.00	0.00	0.00	14.29	0.00	0.00	0.00	0.00	0.00	4.35	7.14	0.00	0.00	0.00	14.29	0.00	0.00	18.75	10.71	23.08	14.29	0.00	12.50	0.00	0.00	4.38
M. sabakii	0.00	0.00	0.00	0.00	0.00	0.00	9.09	5.26	0.00	14.29	33.33	0.00	0.00	0.00	0.00	0.00	0.00	10.00	27.27	0.00	14.29	0.00	4.35	0.00	0.00	0.00	0.00	0.00	6.25	0.00	0.00	3.16
M. kiwayui	0.00	0.00	0.00	0.00	11.11	0.00	27.27	0.00	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.29	0.00	6.25	0.00	0.00	1.70
M. tanai	16.67	50.00	11.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.19
Molgolaimus sp. 1	16.67	0.00	22.22	20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.88	18.75	0.00	0.00	2.19
Molgolaimus sp. 2	0.00	12.50	11.11	30.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.69	0.00	0.00	0.00	0.00	0.00	9.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.65	0.00	0.00	0.00	2.43
Molgolaimus sp. 3	0.00	0.00	0.00	0.00	11.11	0.00	0.00	0.00	0.00	0.00	11.11	0.00	0.00	0.00	0.00	8.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97
Molgolaimus sp. 4	0.00	0.00	0.00	0.00	0.00	0.00	9.09	0.00	8.00	0.00	0.00	9.09	0.00	0.00	0.00	8.70	21.43	0.00	0.00	0.00	0.00	0.00	4.35	0.00	3.57	0.00	0.00	0.00	6.25	0.00	0.00	2.92
Molgolaimus sp. 5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.33	0.49
Molgolaimus sp. 6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
Molgolaimus sp. 7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	0.00	0.00	3.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49
Molgolaimus sp.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100



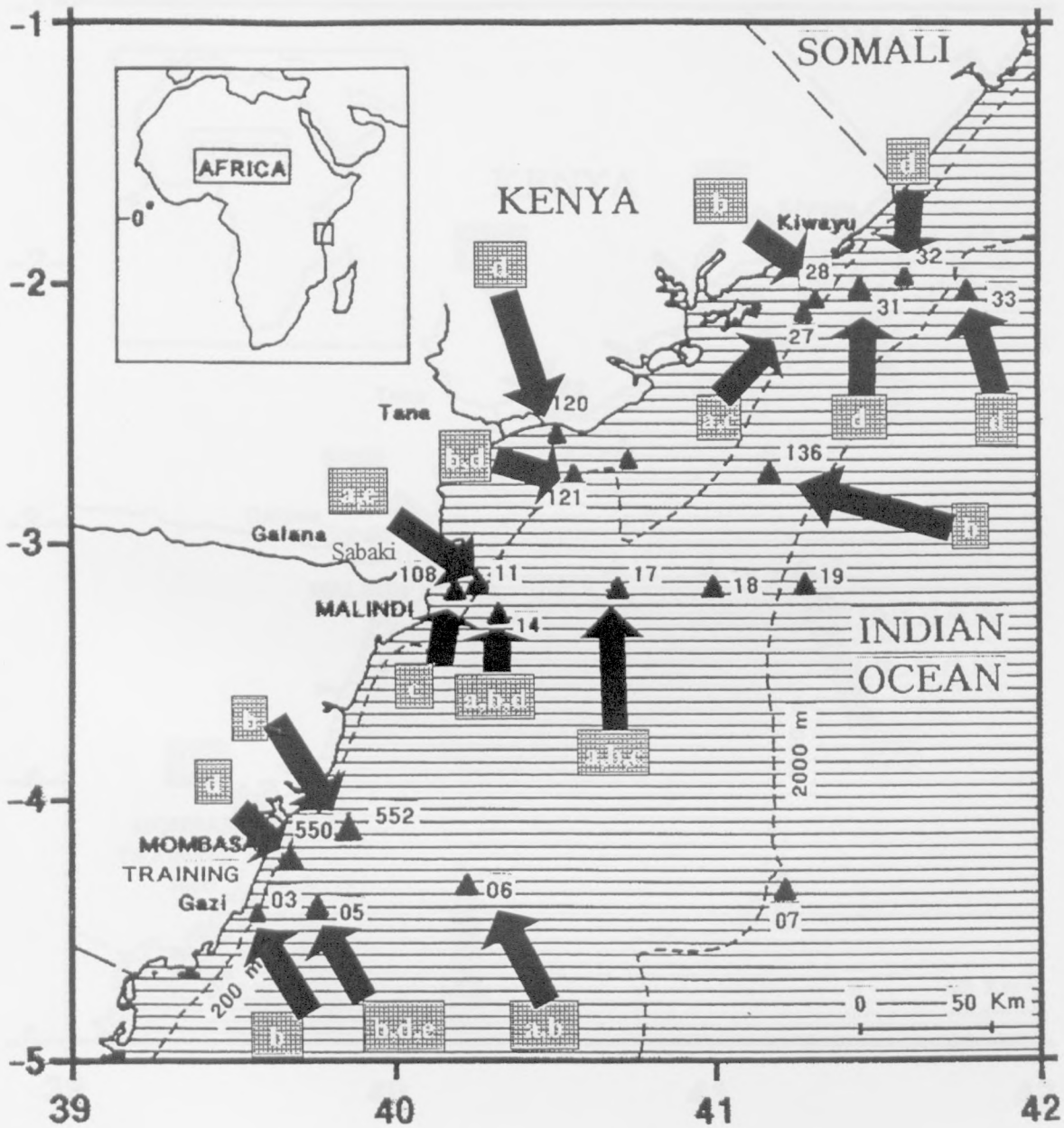
Appendix XVI: Distribution of the species of *Acantholaimus* in WIO

a: *Acantholaimus vermeuleni*
b: *A. heipi*
c: *A. elegans*
d: *A. verscheldi*
e: *A. gathumai*
f: *A. geraerti*
g: *A. invaginatum*



Appendix XVII: Distribution of the species of *Actinonema* and *Rhips* in WIO

a: Actinonema longicaudatum
b: A. nicolae
c: A. paraceltica
d: Rhips reginae



Appendix XVIII: Distribution of the species of *Dichromadora* in WIO

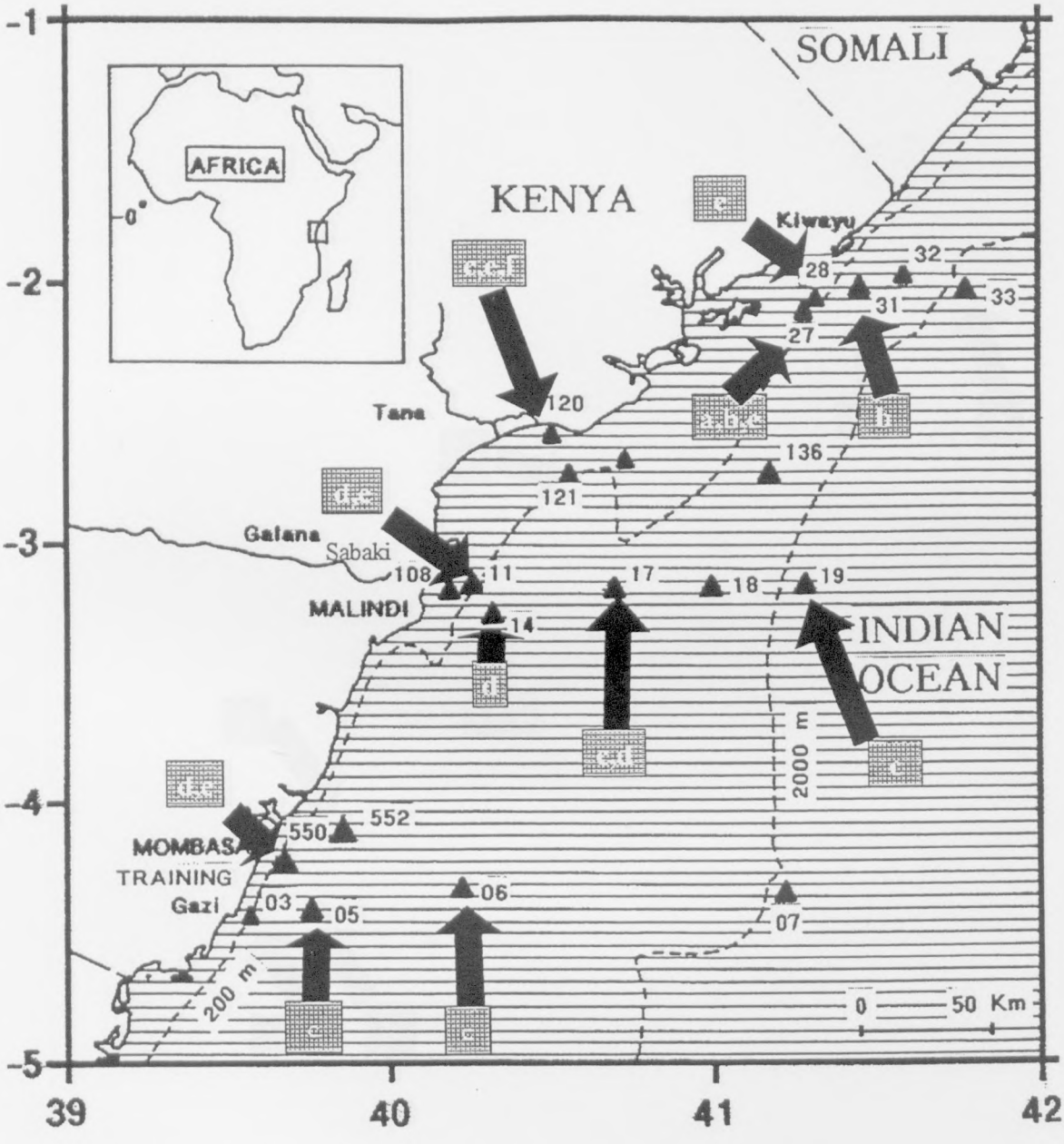
a: *Dichromadora cucullata*

b: *D. gathuai*

c: *D. loiseae*

d: *D. longicaudata*

e: *D. quadripapillata*



Appendix XIX: Distribution of the species of *Hypodontolaimus*, *Prochromadorella* and *Ptycholaimellus* in WIO.

a: *Hypodontolaimus marleenae*

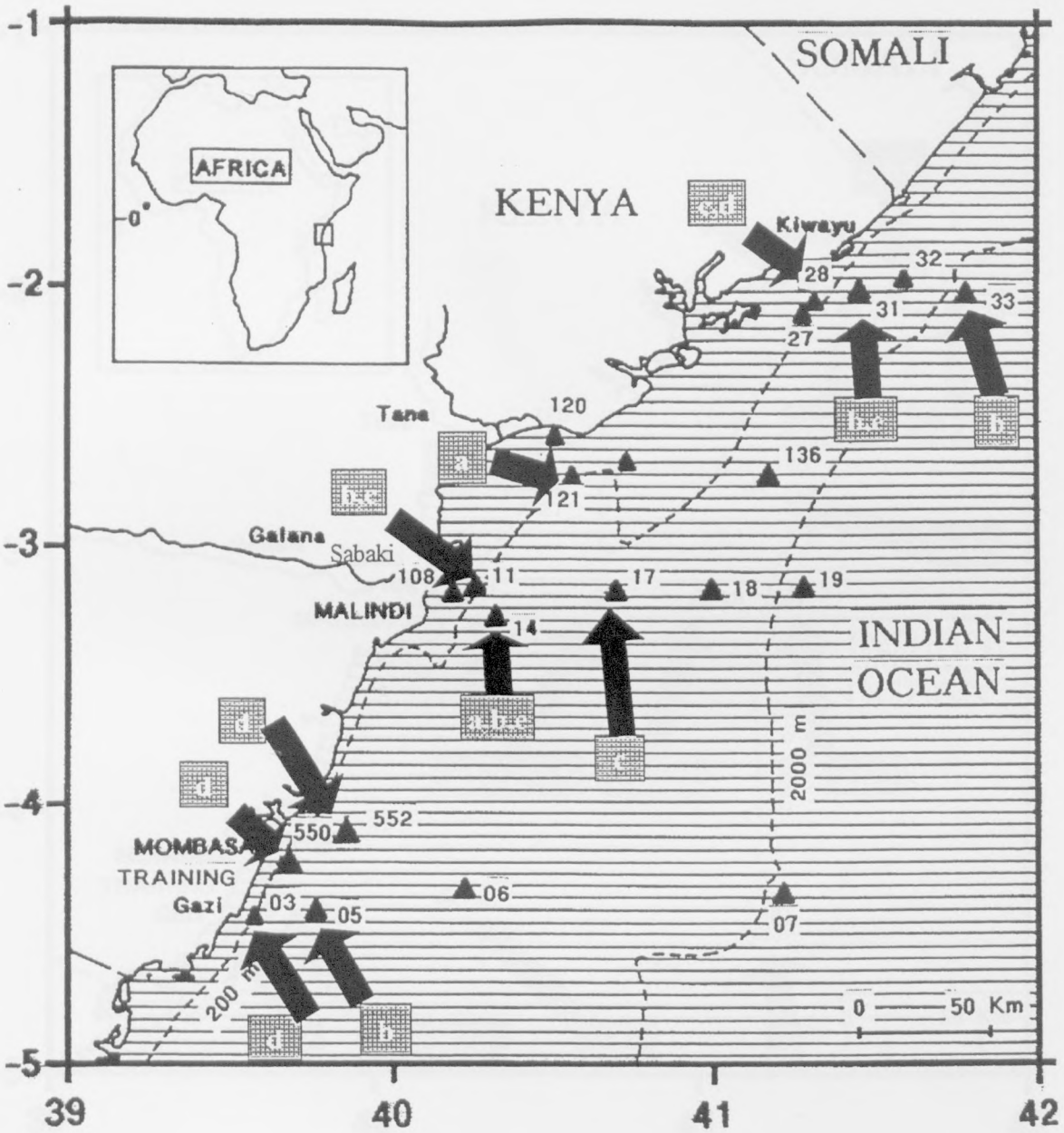
b: *H. aff. angelae*

c: *Prochromadorella daroe*

d: *P. ditlevseni*

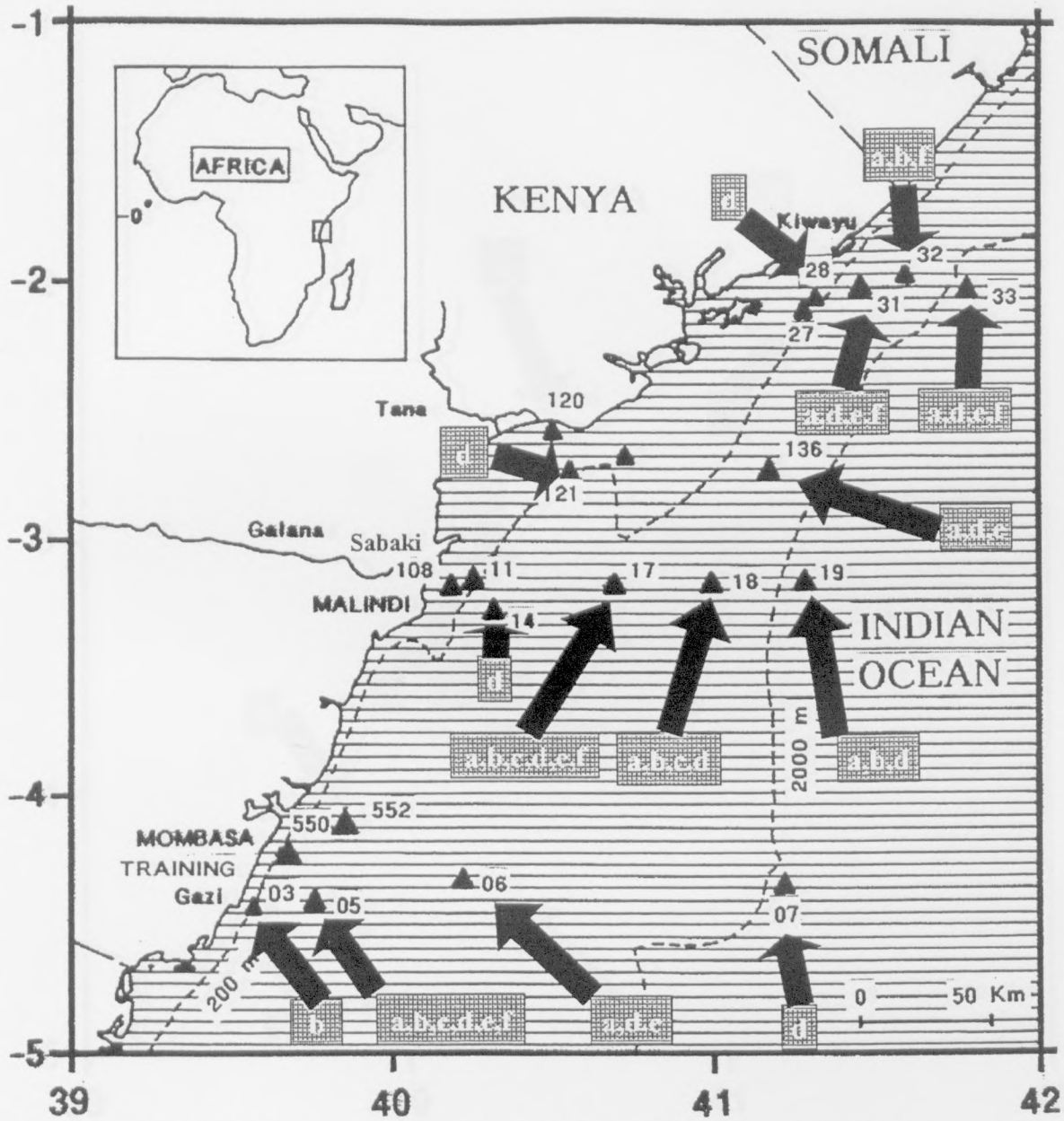
e: *Ptycholaimellus macrodentatus*

f: *P. peninnae*



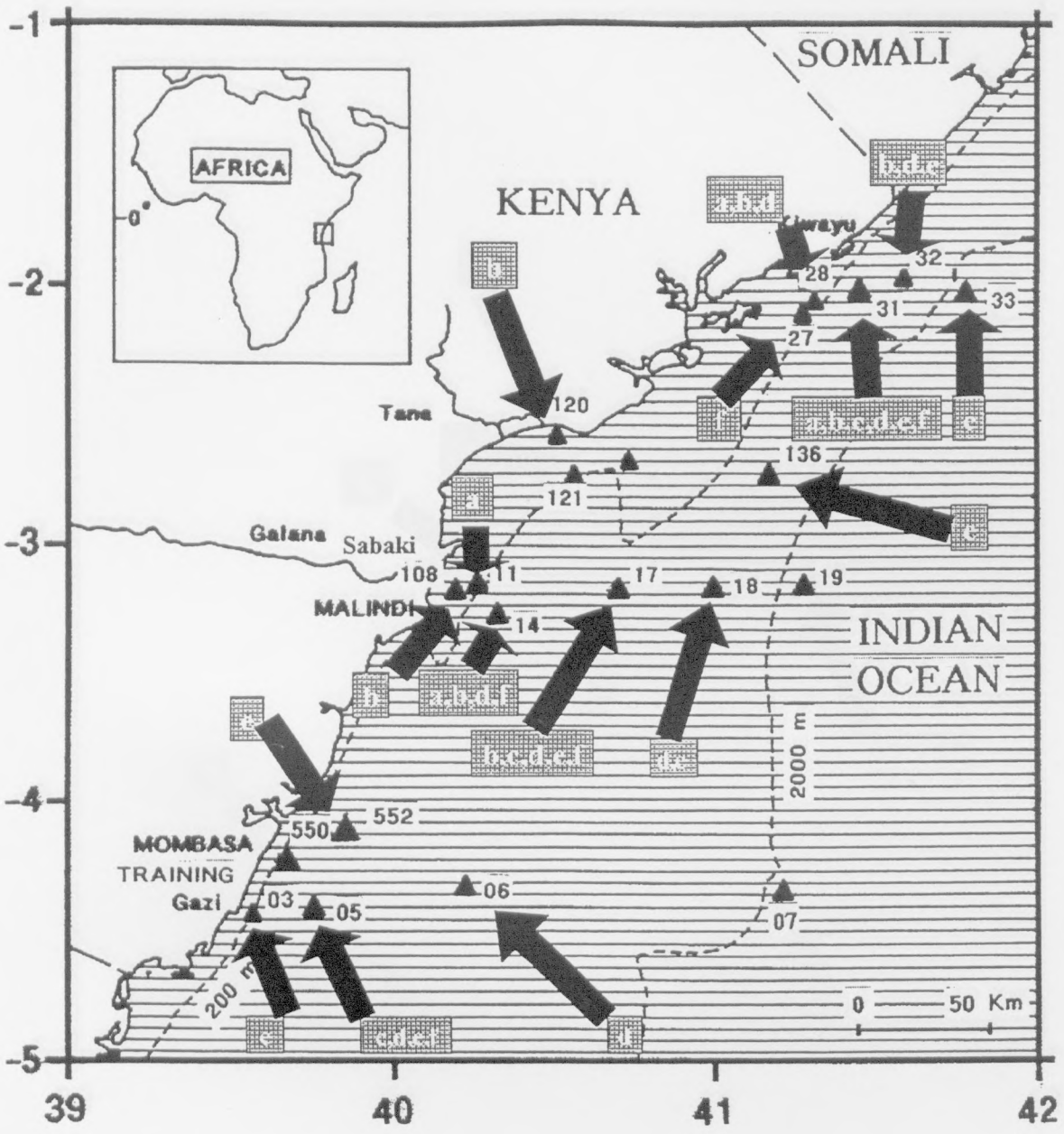
Appendix XX: Distribution of the species of *Trichromadora* and *Trochamus* in WIO

a: *Trichromadora longicaudata*
b: *Trochamus bulbosa*
c: *T. complexus*
d: *T. polki*
e: *T. prosoporus*



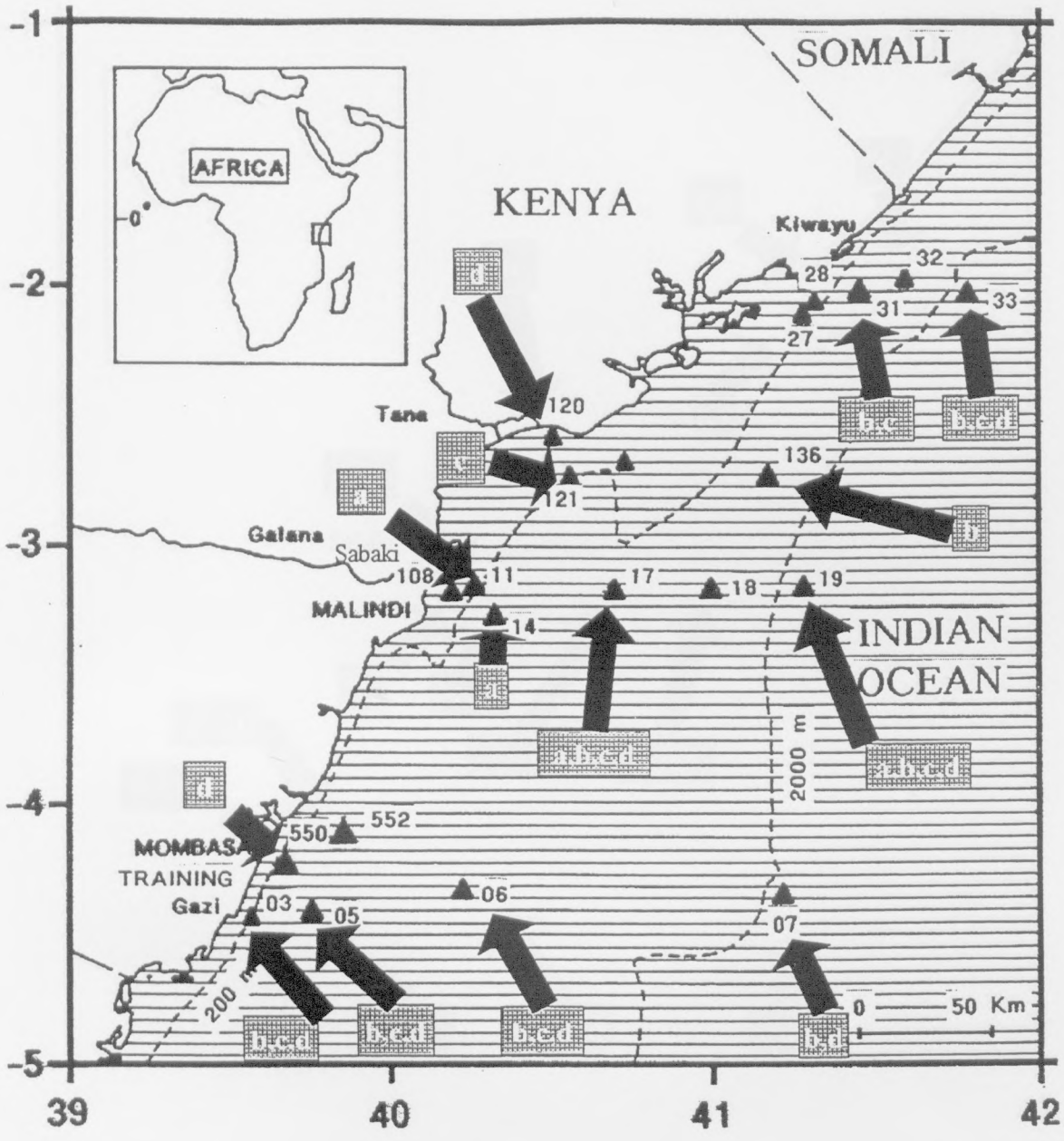
Appendix XXI : Distribution of the species of *Sabatieria* and *Cervonema* in WIO

a: *Sabatieria conicauda*
b: *S. lucia*
c: *S. pisinna*
d: *Cervonema tenuicauda*
e: *C. minutus*
f: *C. gourbaulti*



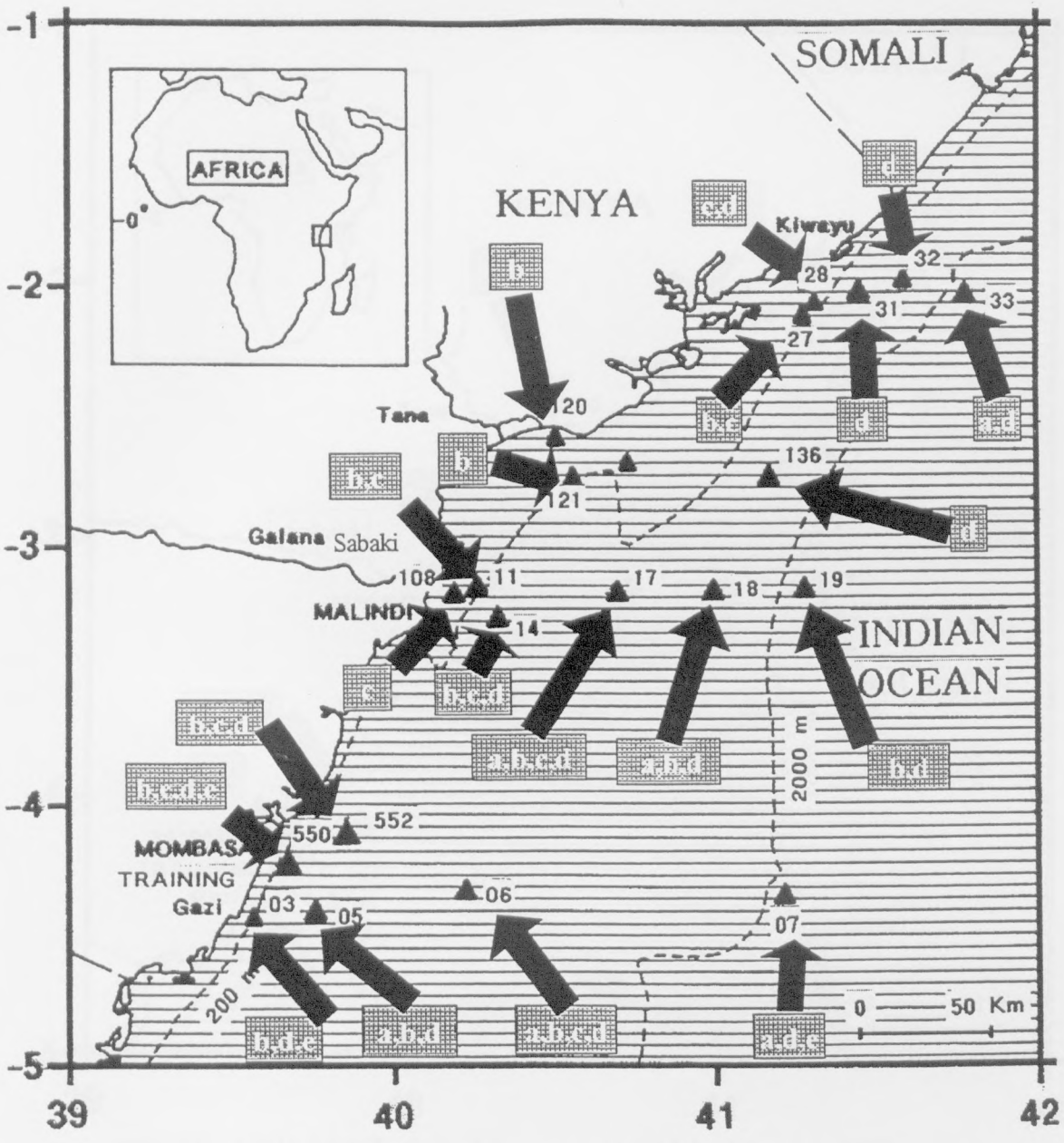
Appendix XXII: Distribution of the species of *Dorylaimopsis*, *Hopperia*, *Paramesonchium* and *Kenyanema* in WIO

a: *Dorylaimopsis variabilis*
b: *D. coomansi*
c: *D. gerardi*
d: *Hopperia indiana*
e: *Paramesonchium mombasi*
f: *Kenyanema monorchis*



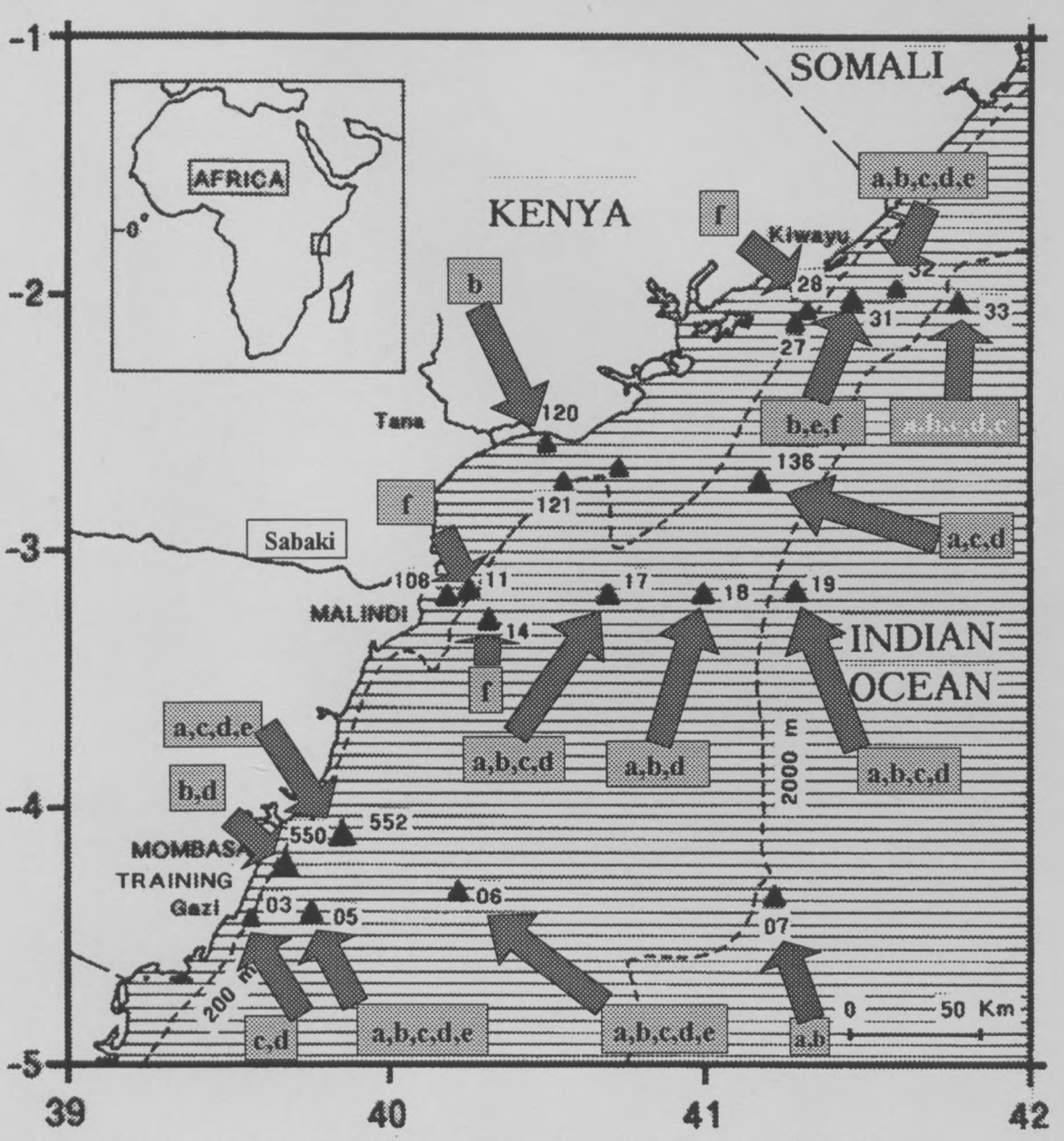
Appendix XXIII: Distribution of the species of *Aponema* and *Bolbolaimus* in WIO

a: *Aponema sp. 1*
b: *Aponema sp. 2*
c: *Bolbolaimus sp. 1a*
d: *Bolbolaimus sp. 2a*



Appendix XXIV: Distribution of the species of *Calomicrolaimus*, *Ixonema* and *Microlaimus* in WIO

a: *Calomirolaimus sp. 1*
b: *Ixonema sp. 1*
c: *Microlaimus texianus*
d: *Microlaimus sp. 1a*
e: *Microlaimus sp. 2a*



Appendix XXV: Distribution of the species of *Molgolaimus* in WIO

a: *Molgolaimus tyroi*
b: *M. abyssorum*
c: *M. gazii*
d: *M. sabaki*
e: *M. kiwayui*
f: *M. tanai*