

# *Guitartia tridentata* n. gen., n. sp. (Monhysterida: Xyalidae) and *Macrodontium gaspari* n. gen., n. sp. (Chromadorida: Microlaimidae), free-living marine nematodes from the Caribbean Sea

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**Summary** – Two new genera of free-living marine nematodes are described from the muddy bottom of Cienfuegos Bay, Caribbean Sea. *Guitartia* n. gen. (Xyalidae, Monhysterida) is characterised by three long tooth-like structures in the stegostom, second and third circle of anterior sensilla separate and posterior genital branch of the female restricted to a long post-vulvar sac. The type species is *Guitartia tridentata* n. gen., n. sp. Within the Xyalidae, *Guitartia* n. gen. is morphologically close to *Amphimonhystrella*, *Cobbia*, *Elzalia*, *Scaptrella* and *Valvaelaimus*, all being characterised by sclerotised structures in the stoma and transverse striation of the body cuticle. Main features for discrimination are the type of stoma structure, the shape and relative size of amphidial fovea, the presence of a post-vulvar sac and gubernacular apophyses and the absence of terminal setae on the tail. *Macrodontium* n. gen. (Microlaimidae, Chromadorida) is characterised by a heavily sclerotised stoma with one large dorsal tooth and two smaller subventral teeth, sexual dimorphism in size and position of the amphidial fovea and males with a single anterior testis. The type species is *Macrodontium gaspari* n. gen., n. sp. Within the Microlaimidae, *Macrodontium* n. gen. is similar to the genera *Acanthomicrolaimus* and *Bolbolaimus* due to sclerotised stoma and presence of large dorsal tooth. The new genus is similar to *Aponema* in sexual dimorphism in the size of the amphidial fovea, monorchic males, presence of a gubernacular apophysis and conico-cylindrical tail shape. Morphological characters of diagnostic value within the family are the ornamentation of the body cuticle, relative length of cephalic sensilla, stoma sclerotisation and number of testes.

**Keywords** – description, morphology, morphometrics, new genus, new species, taxonomy.

Documenting the biodiversity of free-living marine nematodes is a challenging task because of high diversity the inherent difficulty of the group (*i.e.*, small size) and various taxonomic impediments. Even with relatively modern approaches to the identification of species (barcoding, developmental biology, video vouchering), the classical morphological approach remains the first comprehensive step for recording, describing and classification. In the present study, we use the morphological species concept for delimiting species and propose two new species belonging to two new genera.

The marine nematofauna from coastal areas has been extensively studied in temperate regions, but less effort has been devoted to tropical areas. Since 2005 we have

been studying the free-living marine nematodes from a tropical semi-enclosed bay in the Caribbean Sea with the aim of describing ecological patterns and carrying out taxonomic research. We detected relatively few species of nematodes (79) in Cienfuegos Bay, most of them belonging to the order Monhysterida due to the dominance of fine, muddy, sediments in the basin. Two genera of free-living marine nematodes from this bay have been reported as new for science (*Cienfuegia* Armenteros, Vincx & Decraemer, 2009 and *Pseudoterschellingia* Armenteros, Vincx & Decraemer, 2009). In this article we present the description of two new genera belonging to the families Xyalidae Chitwood, 1951 and Microlaimidae Micoletzky, 1922a.

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The family Xyalidae Chitwood, 1951 appears to be monophyletic after Meldal *et al.* (2007) and within-family relationships have been revised, according to cladistic principles based on morphological and morphometric features, by Nicholas and Trueman (2002). According to these authors, the family is characterised by an annulated cuticle, six outer labial setae plus four cephalic setae arranged in one circle, and female with a single, outstretched, anterior ovary. From our results, an emended diagnosis of the family is proposed. In their analysis, Nicholas and Trueman (2002) recognised 33 genera within the family. Other genera have been included in the meantime: *Arabanema* Turpeenniemi, Nasira & Maqbool, 2001; *Cienfuegia*; *Dactylaimoides* Blome, 2002; *Enchonema* Bussau, 1993; *Manganonema* Bussau, 1993; *Marisalbinema* Tchesunov, 1990; *Paragonionchus* Blome, 2002; *Paramphimonhystrella* Huang & Zhang, 2006; *Parelzalia* Tchesunov, 1990; *Pseudechionotheristus* Blome, 2002; and *Sacrimarinema* Shoshin, 2001.

The family Microlaimidae Micoletzky, 1922a also appears to be monophyletic according to Meldal *et al.* (2007). The presence of a 12-fold vestibulum in stoma, teeth in the stegostom and outstretched ovaries are homopomorphies of the family (Lorenzen, 1994). A revision of the Microlaimidae was done by Jensen (1978), who proposed the erection of a new family (Molgolaimidae Jensen, 1978) and the subdivision of Microlaimidae into two subfamilies (Bolbolaiminae Jensen, 1978 and Microlaiminae Micoletzky, 1922a). Further arguments by Lorenzen (1994) suggest an absence of support for Jensen's classification and we, therefore, follow Lorenzen's classification concerning the Microlaimidae. After Lorenzen (1994) the family Microlaimidae contains seven valid genera: *Aponema* Jensen, 1978; *Bolbolaimus* Cobb, 1920; *Calomicrolaimus* Lorenzen, 1976; *Cintonema* Cobb, 1920; *Crassolaimus* Kreis, 1929; *Ixonema* Lorenzen, 1971; and *Microlaimus* de Man, 1880; and one doubtful genus, *Ungulilaimella* Allgén, 1958. Another four valid genera have been proposed: *Acanthomicrolaimus* Stewart & Nicholas, 1987; *Bathynox* Bussau & Vopel, 1999; *Caligocanna* Bussau & Vopel, 1999; and *Spirobolbolaimus* Soetaert & Vincx, 1988.

## Materials and methods

Samples were taken in subtidal stations from Cienfuegos Bay, Caribbean Sea (22°07'N, 80°22'W) in February, May and September 2006. The bay is a semi-enclosed

basin with relatively high organic content in the sediment and a predominantly muddy bottom. Samples were collected using hand-held cores and preserved in 8% buffered formalin. Sediment samples were processed by sieving over two sieves with 500 and 45  $\mu\text{m}$  mesh size and specimens were extracted by the flotation technique using a high-density sugar solution (1.16  $\text{g cm}^{-3}$ ). Sorted animals were transferred to anhydrous glycerin and mounted on glass slides.

The description and drawings were made using a Leica DMR phase contrast microscope (maximum magnification 1500 $\times$ ) with drawing tube. Measurements of straight and curved features were taken with a ruler and a curvimeter, respectively, with 1  $\mu\text{m}$  of error at highest magnification and ca 60  $\mu\text{m}$  for longer measurements such as body length. The taxonomic classification of Lorenzen (1994) was followed at taxonomic levels above genus.

## Descriptions

### Family Xyalidae Chitwood, 1951

#### DIAGNOSIS (EMENDED)

The present diagnosis is based mainly on Lorenzen (1994), Nicholas and Trueman (2002) and on features of the new genus.

#### *Order Monhysterida Filipjev, 1929*

Body cuticle fine to coarsely annulated; annules smooth or ornamented with longitudinal striae, single or V-shaped ridges. Second and third circles of anterior sensilla inserted at same level or very close, exceptionally in two separate circles (*Guitartia tridentata* n. gen., n. sp.). Female with single anterior ovary located to left of intestine (exceptionally right of intestine in *Hofmaenneria niddensis* Gerlach & Meyl, 1957 and *Steineria pilosa* (Cobb, 1914) Micoletzky, 1922b), with or without a post-vulvar sac. Male diorchic or monorchic.

### *Guitartia*\* n. gen.

#### DIAGNOSIS

#### *Xyalidae* Chitwood, 1951

Body cuticle with fine transverse striation. Stoma narrow, cylindrical, with three long teeth-like structures

\* Named in honour of the late Prof. Dr Dario Guitart, Emeritus Professor at the University of Havana, and professor of several generations of marine biologists in Cuba.

appearing bifid at tip. Pattern of anterior sensilla 6+6+4, first circle probably papilliform but not visible by light microscopy, second and third circles of setiform anterior sensilla separate and of similar length. Amphidial fovea round, relatively large (more than 50% of corresponding body diameter (cbd)). Female reproductive system with one anterior outstretched ovary, located to left of intestine, post-vulvar sac present. Male reproductive system with anterior outstretched testis, located to left of intestine. Gubernaculum with short dorso-caudal apophyses. Tail with three caudal glands, terminal setae at tail tip absent.

#### TYPE AND ONLY SPECIES

*Guitartia tridentata* n. gen., n. sp.

#### RELATIONSHIPS

*Guitartia* n. gen. belongs to the Monhysterida in having an outstretched ovary, a holapomorphy for the order. The new genus is classified within the superfamily Monhysteroidea due to holapomorphy of a single anterior ovary (Lorenzen, 1994). Other features, such as the round amphidial fovea and pharynx lacking a proper posterior bulb, also suggest membership of this superfamily. Within the Monhysteroidea, *Guitartia* n. gen. is classified in the Xyalidae due to the anterior gonad (ovary or testis) being located to the left of the intestine. Other features supporting classification within the Xyalidae are the transverse striation of the body cuticle, six outer labial sensilla being about equal or slightly shorter in length than the four cephalic setae of the third circle of anterior sensilla, stegostom well developed and surrounded by pharyngeal tissue but gymnostom reduced or absent, and ventral gland apparently absent.

The Xyalidae is taxonomically a difficult group because of high morphological diversity, relationships within the family not being completely resolved and several genera appearing paraphyletic (Nicholas & Trueman, 2002). Based on the phylogenetic tree obtained, the authors recognised 15 groups, only a few representing clades. An attempt to place the new genus within the cladistic analysis by Nicholas and Trueman (2002) did not show any clade/group where the new genus could be included. In addition, a further subdivision of the family into three subfamilies (Rhynchonematinae De Coninck, 1965, Cobbiinae De Coninck, 1965, and Corononeminae Nicholas & Stewart, 1995) has no clear phylogenetic basis (Nicholas & Trueman, 2002) so we did not include *Guitartia* n. gen. in any subfamily.

Two relatively conspicuous morphological features allow an initial discrimination of the new genus within the Xyalidae, viz., the sclerotisation of the stoma and the structure and ornamentation of the body cuticle. The presence of sclerotised tooth-like structures is relatively uncommon in the Xyalidae (see genera below) and allows the differentiation of the new genus from the species-rich genera *Daptonema* Cobb, 1920 and *Theristus* Bastian, 1865. The relatively simple pattern of transverse striation of the body cuticle of *Guitartia* n. gen. (i.e., no longitudinal striae, punctations or ridges) allows further discrimination from other genera like *Gonionchus* Cobb, 1920 (only *G. heipi* Vincx, 1986 has simple transverse striation), *Omicronema* Cobb, 1920, *Rhynchonema* Cobb, 1920 and *Xyala* Cobb, 1920. Table 1 shows the morphologically most similar genera to the new genus within Xyalidae and the most useful features for species differentiation. However, even the genera included in Table 1 are highly divergent in morphology.

#### *Guitartia tridentata*\* n. gen., n. sp.

(Fig. 1)

#### MEASUREMENTS

See Table 2.

#### DESCRIPTION

##### *Adults*

Body slender, tail with long filiform portion. Body cuticle with fine transverse striation (striae ca 1  $\mu\text{m}$  apart) except for smooth head region. Anterior sensilla pattern 6 + 6 + 4, inner labial sensilla papilliform, not visible with light microscope, outer labial setae and cephalic setae at different level (circles) and of ca same length. Four submedian cervical setae arranged in one circle posterior to amphidial fovea, 10-12  $\mu\text{m}$  long, one pair of lateral setae (10-12  $\mu\text{m}$ ) immediately posterior to fovea. Somatic setae rare, one preloocal seta present in male. Amphidial fovea large, round, located at level of posterior stoma. Cheilostom present, no apparent gymnostom, stegostom long, tubular, only posteriorly narrowing, surrounded by pharyngeal tissue, walls of lumen well sclerotised, anteriorly provided with three tooth-like structures (13  $\mu\text{m}$  long) with anterior bifid tip

\* Specific epithet named in respect of the three teeth present in the buccal cavity.

**Table 1.** Main morphological features differentiating *Guitartia* n. gen. from most similar genera within family Xyalidae (cbd = corresponding body diam.).

Genus	Stoma armature	Amphidial fovea	Posterior genital branch	Gubernacular apophyses	Terminal setae
<i>Amphimonhystrella</i> Timm, 1961	Weakly sclerotised	>0.5 cbd	Poorly developed	Absent	Present
<i>Cobbia</i> de Man, 1907	Three teeth	<0.5 cbd	Absent	Absent	Absent
<i>Elzalia</i> Gerlach, 1957	Heavily sclerotised	>0.5 cbd	Absent or poorly developed	Absent	Present
<i>Guitartia</i> n. gen.	Processes teeth-like	>0.5 cbd	Poorly developed	Present	Absent
<i>Scaptrella</i> Cobb, 1917	Six odontia	<0.5 cbd	?	Absent	Present
<i>Valvaelaimus</i> Lorenzen, 1977	Processes teeth-like	<0.5 cbd	Poorly developed	Absent	Absent

**Table 2.** Morphometrics of *Guitartia tridentata* n. gen., n. sp. All measurements are in  $\mu\text{m}$ .

Character	Male		Female	
	Holotype	Paratype 1	Paratype 2	
L	1750	1750	1813	
a	70.0	62.5	32.4	
b	10.0	9.3	9.6	
c	5.0	4.7	5.0	
c'	19.4	18.8	14	
V (%)	–	59	*	
Head diam.	16	15	22	
Length of outer labial setae	16	16	18	
Length of cephalic setae	14	15	16	
Stegostom diam.	4	4	7	
Amphidial fovea from anterior end	6	8	11	
Amphidial fovea diam.	16	12	15	
Position of nerve ring (%)	54	50	n.o.	
Max. body diam.	25	28	56	
Anterior genital branch	833	132	*	
Posterior genital branch	–	69	*	
Spicule (arc)	25	–	–	
Spicule (chord)	20	–	–	
Gubernaculum	4	–	–	
Gubernacular apophyses	5	–	–	
Anal body diam.	18	20	26	
Tail	350	375	363	
Conical portion of tail (%)	36	43	41	

\* specimen damaged.

n.o., not observable.

(visible as six tips at anterior border stegostom). Pharynx largely cylindrical, gradually enlarging posteriorly but without a proper pharyngeal bulb, pharyngeal glands apparently with outlet anteriorly in stoma. Cardia weakly developed, variable in shape. Ventral gland, duct and opening apparently absent. Tail conical-cylindrical with three caudal glands and small spinneret at tail tip.

### Male

Monorchic, testis to left of intestine, *vesicula seminalis* with large cells, *vas deferens* with differentiated granulation. Spicules ventrally curved, no offset capitulum, lamina mostly of equal width, only tapering towards distal tip, velum absent. Gubernaculum with short dorsal apophyses. No precloacal supplements, only a single precloacal seta present.

### Female

Monodelphic, anterior single genital branch arranged to left of intestine, ovary outstretched, posterior branch not developed except for a post-vulvar sac (spermatheca). Vagina anteriorly directed, with weakly sclerotised lumen wall.

### TYPE HABITAT AND LOCALITY

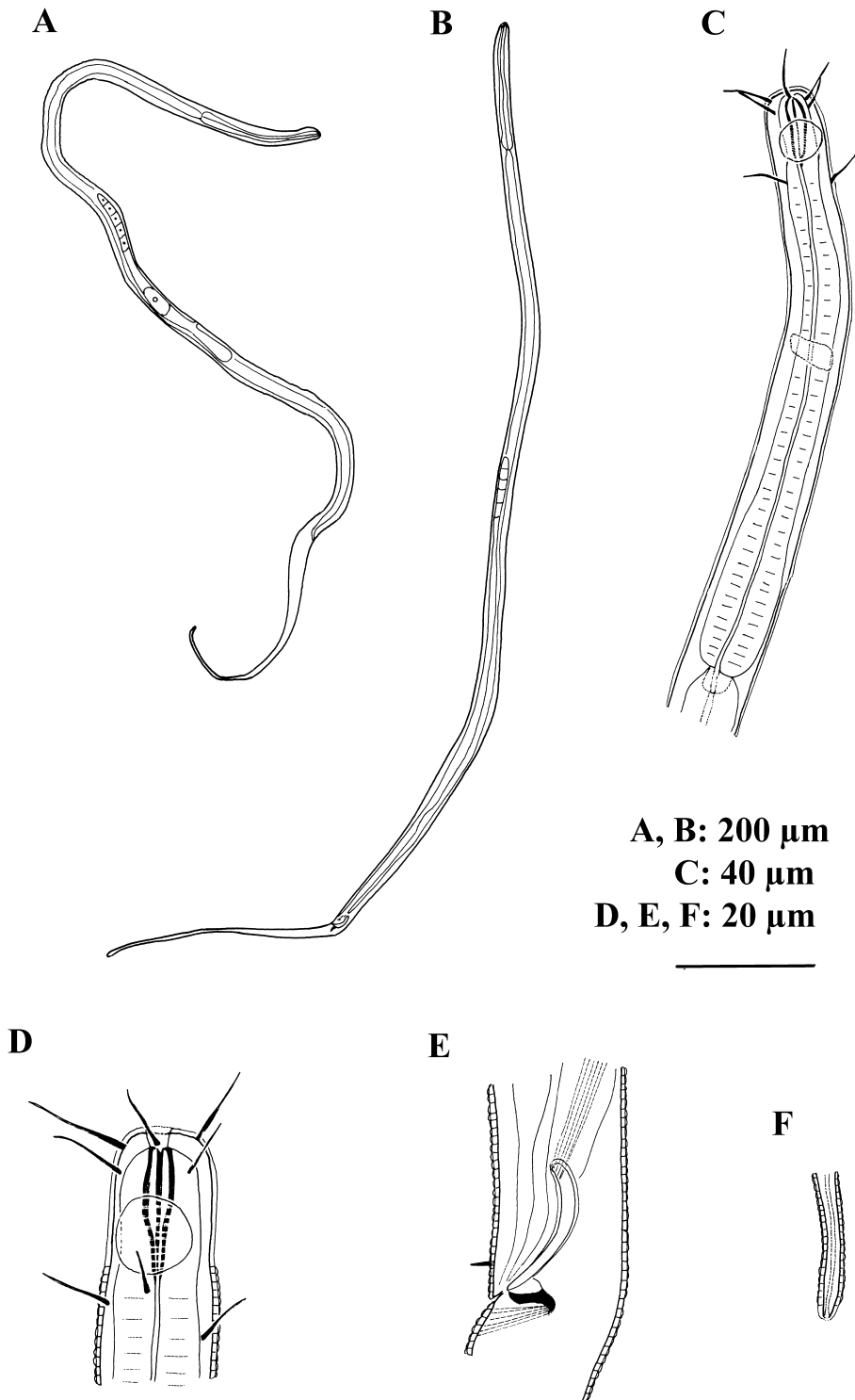
Subtidal muddy bottom at Cienfuegos Bay, Caribbean Sea (22°9'N, 80°27'W). Collected in the wet and dry seasons in 2006 by M. Armenteros.

### TYPE MATERIAL

Holotype male (specimen 985.I.5) deposited in Centro Nacional de Colecciones Marinas, Acuario Nacional de Cuba (CNCM-ANC). One paratype female deposited in the CNCM-ANC (specimen 1029.D.5) and in the nematode collection of the Royal Belgian Institute of Natural Sciences (specimen RIT764).

### DIAGNOSIS

*Guitartia tridentata* n. gen., n. sp. is characterised by the relatively long outer labial and cephalic setae which are of similar length (15–18  $\mu\text{m}$ ), large, round, amphidial fovea (more than 50% of cbd), spicules 1.4 anal body



**Fig. 1.** *Guitartia tridentata* n. gen., n. sp. A: Habitus of paratype female; B: Habitus of holotype male; C: Neck region of paratype female; D: Head region of paratype female; E: Spicular apparatus of holotype; F: Tail tip of paratype female.

diam. long, ventrally curved and without offset capitulum, precloacal supplements absent and tail with long, filiform, posterior portion.

#### ECOLOGICAL REMARKS

Specimens of *Guitartia tridentata* n. gen., n. sp. were collected from muddy and organically enriched bottom sediments. They probably show some tolerance to hypoxic conditions and chemical pollution as the concentration of some metals in these sediments (chromium, copper, nickel, vanadium) was high.

### ***Macrodontium*\* n. gen.**

#### DIAGNOSIS

*Microlaimidae* Micoletzky, 1922a

Body cuticle transversely striated. Four cephalic sensilla, larger than six outer labial sensilla. Amphidial fovea cryptospiral without protruding *corpus gelatum*, larger in male (sexual dimorphism). Stoma rather large, sclerotised, armed with a large dorsal tooth, two minute consecutive subventral teeth. Pharynx without differentiated anterior part but with terminal bulb. Male monorchic, gubernaculum with one well developed dorso-caudal apophysis. Female didelphic-amphidelphic with outstretched ovaries. Tail conico-cylindrical.

#### TYPE AND ONLY SPECIES

*Macrodontium gaspari* n. gen., n. sp.

#### RELATIONSHIPS

The main morphological features differentiating the new genus from other genera within *Microlaimidae* are summarised in Table 3. The most conspicuous feature of *Macrodontium* gen. n. is the presence of a well sclerotised stoma with one large dorsal tooth and two consecutive subventral teeth, a combination suggesting *Acanthomicrolaimus* and *Bolbolaimus* as similar genera. *Macrodontium* gen. n. differs from the former genus in having the body cuticle simply transversely striated vs covered with spine-like ornamentations and from the latter genus by cephalic sensilla longer than outer labial sensilla vs shorter.

Within the family *Microlaimidae*, most genera possess males with two testes and only two genera, *Bathynox* and

*Crassolaimus*, have males with a single testis as observed in the new genus (note that in *Acanthomicrolaimus* the posterior testis is reduced). *Aponema* is the only genus in the family that shows a mixture of the monorchic and diorchic condition with four monorchic species and two diorchic species, namely *A. decraemerae* Muthumbi & Vincx, 1999 and *A. mnazi* Muthumbi & Vincx, 1999. The new genus differs from *Bathynox* by the form of the stoma, non-pedunculate somatic setae and anterior position of the amphidial fovea without protruding *corpus gelatum* (vs weakly sclerotised stoma, somatic setae on peduncles, amphidial fovea located near mid-pharynx, amphid opening small and protruding *corpus gelatum*). *Macrodontium* gen. n. differs from *Crassolaimus* by stoma armature with sclerotised walls and large dorsal tooth, presence of a gubernacular apophysis and absence of precloacal supplements vs small dorsal indentation in stoma, absence of gubernacular apophysis and presence of precloacal supplements.

The new genus shows some similarities with *Aponema* in body cuticle arrangement, sexual dimorphism in size of amphidial fovea (larger in males), presence of a gubernacular apophysis and conical-cylindrical tail shape. It differs from *Aponema* mainly by the stoma sclerotisation, the monorchic condition (*partim* in *Aponema*) and the number of gubernacular apophyses.

The genus *Microlaimus* is the most species-rich in the family, showing interspecific morphological variability in shape and size of amphidial fovea and tail shape. However, the heavy sclerotisation of the stoma and presence of an apophysis are important diagnostic features for discrimination between *Macrodontium* n. gen. and *Microlaimus*.

### ***Macrodontium gaspari*\*\* n. gen., n. sp.** (Fig. 2)

#### MEASUREMENTS

See Table 4.

#### DESCRIPTION

##### *Adults*

Body slender, anterior half slightly broader than posterior half. Body cuticle transversely striated, striae ca 1  $\mu\text{m}$

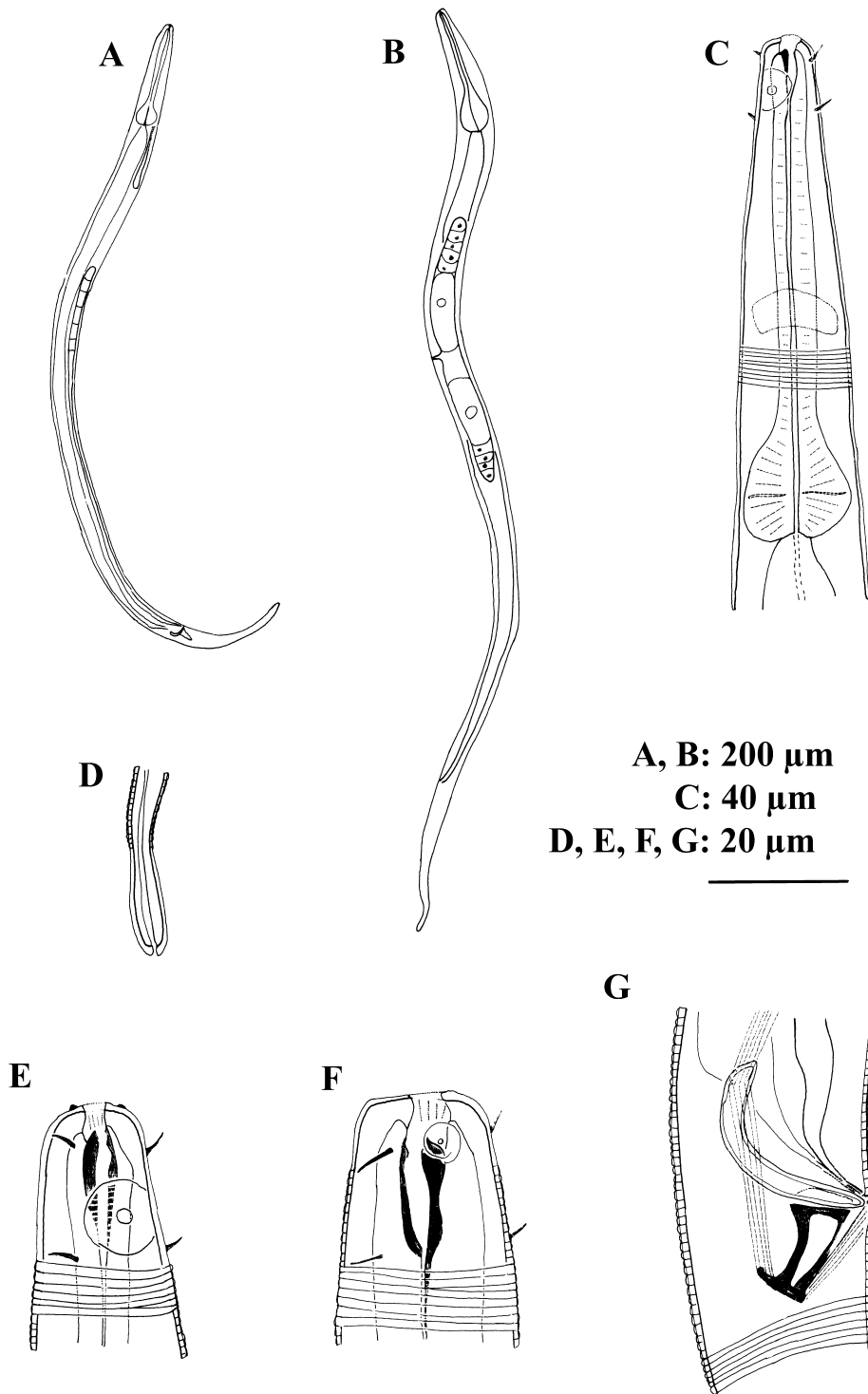
\*\* Named in honour of Prof. Dr Gaspar González-Sansón, Professor of Marine Ecology at the University of Havana, Cuba, and leader of marine research in Cuba.

\* The generic name refers to the large tooth.

**Table 3.** Main morphological features differentiating the genus *Macrodontium* n. gen. from the other genera within the *Microlaimidae*.

Genus	Striation of cuticle	Somatic setae	Cephalic sensilla*	Amphidial fovea	Stoma armature	Testis	Gubernacular apophysis	Tail
<i>Acanthomicrolaimus</i> Stewart & Nicholas, 1987	Coarse	Like spines	Longer	Cryptospiral, <0.5 cbd	Heavily sclerotised, one larger dorsal tooth, two ventral	Posterior reduced	One, dorsal	Conical
<i>Aponema</i> Jensen, 1978	Fine	Scarce	Longer	Cryptospiral, sexual dimorphism	Weakly sclerotised, unarmed or with one minute dorsal and two ventrosublateral teeth	Single anterior or two	Two, dorsocaudal	Conico-cylindrical or conical
<i>Bathynox</i> Bussau & Vopel, 1999	Coarse	On peduncles	Longer	<0.5 cbd, corpus gelatum protruded	Weakly sclerotised, one small dorsal and one or two small subventral	Single anterior	Reduced	Conical
<i>Bolbolaimus</i> Cobb, 1920	Fine	Scarce	Longer	Cryptospiral, <0.5 cbd	Heavily sclerotised, one larger dorsal tooth, two pairs of smaller ventrosublateral teeth or denticles	Two	?	Conical
<i>Caligocanna</i> Bussau & Vopel, 1999	Coarse with longitudinal bars	Scarce	Shorter	Cryptospiral	Two dorsal anterior, two posterior teeth	Two	Absent	Conical
<i>Calomicrolaimus</i> Lorenzen, 1976	Coarse	Scarce	Longer	Cryptospiral, sexual dimorphism, corpus gelatum protruded	Weakly sclerotised, one small dorsal and two minute subventral teeth	Two, posterior can be reduced	Absent	Conical
<i>Cinctonema</i> Cobb, 1920	Coarse	Scarce	Longer	Round or cryptospiral, <0.5 cbd	Weakly sclerotised, one small dorsal and two small ventrosublateral teeth	?	?	Conical
<i>Crassolaimus</i> Kreis, 1929	Fine	Scarce	Longer	Cryptospiral, <0.5 cbd	Weakly sclerotised; a single ventral tooth opposite indentation dorsal wall	Single anterior	Absent	Conical
<i>Ixonema</i> Lorenzen, 1971	Absent	Rows of long setae	Longer	<0.5 cbd, corpus gelatum protruded	Weakly sclerotised; one dorsal and two smaller consecutive subventral teeth	Two	Absent	Conical
<i>Macrodontium</i> n. gen.	Fine	Scarce	longer	Cryptospiral, sexual dimorphism	Heavily sclerotised, one larger dorsal tooth, two minute consecutive subventral teeth	Single anterior	One, dorsocaudal	Conico-cylindrical
<i>Microlaimus</i> de Man, 1880	Coarse	Scarce	Longer	Round or cryptospiral, > or <0.5 cbd	Weakly sclerotised; one small dorsal and two minute subventral teeth	Two	Absent	Conical or conico-cylindrical
<i>Spirobolbolaimus</i> Soetaert & Vincx, 1988	Coarse	Scarce	Shorter	Multispiral	Weakly sclerotised; one small dorsal tooth, a pair of posterior ventrosublateral teeth and a pair of anterior tooth-like projections	Two	Absent	Conical

\* Length relative to outer labial sensilla. cbd, corresponding body diam.



**Fig. 2.** *Macrodontium gaspari* n. gen., n. sp. A: Habitus of holotype male; B: Habitus of a paratype female; C: Neck region of holotype; D: Tail tip of holotype; E: Head region of holotype; F: Head region of a paratype female; G: Spicular apparatus of holotype.



**Table 4.** *Morphometrics of Macrodonium gaspari n. gen., n. sp. All measurements are in  $\mu\text{m}$  and in the format: mean (range).*

Character	Male		Female	Juvenile
	Holotype	Paratypes	Paratypes	Paratypes
n	–	9	10	10
L	1063	1137 (1065-1300)	1242 (1125-1375)	963 (730-1125)
a	30.4	26.7 (21.0-31.4)	25.6 (19.4-31.3)	24.2 (19.3-34.4)
b	7.1	7.7 (7.0-8.7)	7.6 (6.4-8.3)	7.0 (6.3-7.8)
c	6.5	6.9 (6.1-7.8)	6.2 (5.3-6.9)	5.9 (4.9-6.8)
c'	6.3	5.5 (4.4-6.3)	8.3 (5.5-9.7)	7.4 (6.3-9.6)
V	–	–	40 (31-44)	–
Head diam.	13	16 (13-19)	19 (16-24)	15 (11-20)
Length of cephalic setae	2	3 (2-3)	4 (2-4)	3 (2-4)
Stegostom diam.	3	4 (3-5)	5 (2-6)	4 (2-5)
Amphidial fovea from anterior end	7	8 (6-10)	5 (3-8)	5 (2-7)
Amphidial fovea diam.	10	11 (10-12)	4 (4-5)	4 (3-4)
Position of nerve ring (%)	46	47 (46-51)	43 (38-47)	45 (36-50)
Max. body diam.	35	44 (34-56)	51 (40-62)	41 (29-57)
Anterior genital branch	600	581 (467-667)	171 (100-213)	–
Posterior genital branch	–	–	159 (88-200)	–
Spicule (arc)	38	35 (31-44)	–	–
Spicule (chord)	23	25 (22-29)	–	–
Gubernaculum	7	7 (6-10)	–	–
Gubernacular apophyses	18	17 (13-19)	–	–
Anal body diam.	26	30 (26-35)	25 (22-32)	22 (17-28)
Tail	163	165 (148-188)	204 (175-213)	163 (125-200)
Conical part of tail (%)	85	89 (85-93)	87 (82-94)	86 (77-93)

apart, head region and tail terminus smooth, cuticle showing lateral differentiation visible as a groove from cardia level to cloacal aperture (not seen in all specimens, probably dependent on preservation). Head region about as broad as long, slightly marked by depression at level of amphidial fovea. Anterior sensilla pattern 6 + 6 + 4, six inner labial sensilla not visible, six outer labial sensilla minute, rarely visible, four submedian cephalic setae at level of (female and juveniles), or anterior to (male), anterior border of amphidial fovea. Four submedian cervical setae, in male located immediately posterior to fovea. Somatic setae rare; short somatic setae scattered in tail region. Stegostom lumen weakly sclerotised, provided with large dorsal tooth and two minute, consecutive, subventral teeth, posterior one slightly larger than anterior. Amphidial fovea crypto-spiral, external circle interrupted in posterior wall, fovea *ca* twice as large in male as female. Pharynx muscular, with developed posterior bulb. Ventral gland immediately posterior to pharyngeal bulb, not easily seen in majority of specimens, secretory-excretory pore and ampulla not observed. Cardia rather small, surrounded by intestine. Three caudal glands within tail, dif-

ficult to observe in most specimens, with common outlet. Tail mostly conical with slightly swollen tip.

#### Male

Single anterior testis located to right of intestine, *vas deferens* long, narrow. Spicules ventrally curved, non-cephalated. Gubernaculum with small corpus but one well developed dorso-caudal apophysis with sclerotised borders and hammer-like terminus (proximal end for attachment of protractor muscles).

#### Female

Genital system didelphic, amphidelphic. Both ovaries outstretched, often with one egg in each uterus. Position of genital branches regarding intestine variable, either to left or right of intestine. Vulva pre-median, relatively anterior in position, lumen wall relatively sclerotised.

#### TYPE HABITAT AND LOCALITY

Subtidal muddy bottom at Cienfuegos Bay, Caribbean Sea (22°9'N, 80°27'W). Collected in wet and dry seasons in 2006 by M. Armenteros.

## TYPE MATERIAL

Holotype male (specimen 550.D.1) deposited in Centro Nacional de Colecciones Marinas, Acuario Nacional de Cuba (CNCM-ANC). Three paratypes (two males and one female; specimens 550.D.3, 550.I.5, and 576.I.4, respectively) deposited in CNCM-ANC; three paratypes (two males and one female, specimens RIT764) deposited in Royal Belgian Institute of Natural Science, Belgium. Other paratype specimens deposited in the personal collection of the first author at the Centro de Investigaciones Marinas, Universidad de La Habana, Cuba.

## DIAGNOSIS

The new species is characterised by sexual dimorphism in size and shape of the amphidial fovea, size and shape of spicules (31–44  $\mu\text{m}$ , non-cephalated) and gubernaculum (6–10  $\mu\text{m}$  with one apophysis), absence of preloocal supplements.

## ECOLOGICAL REMARKS

Individuals of *Macrodontium gaspari* n. gen., n. sp. were common in muddy, organically enriched, bottom sediments subjected to pollution by heavy metals and hydrocarbons in Cienfuegos Bay. Specimens were always collected in the upper 2 cm of the sediment and were absent below this depth. The species appears to be tolerant to chemical pollution since it was relatively abundant in sediment with high concentrations of heavy metals.

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