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Desmodoridae from the Bay of Morlaix (Brittany) and the Southern Bight of the North Sea.

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Abstract : Three new Desmodoridae species are described from the Bay of Morlaix (Brittany), *Perspiria megamphida* sp.n., *Perspiria papillata* sp.n. and *Desmodora granulata* sp.n.. The type species of *Spirinia*, *S. parasitifera* (Bastian, 1865) is redescribed : additional morphological information is given on the head structure and the copulatory apparatus. The two subgenera of *Spirinia* : *S. (Spirinia)* Gerlach, 1963 and *S. (Perspiria)* Wieser & Hopper, 1967, are raised to genus level.

Résumé : Description de trois espèces nouvelles récoltées en Baie de Morlaix : *Perspiria megamphida* sp.n., *P. papillata* sp.n., *Desmodora granulata* sp.n. et redescription de l'espèce type du genre *Spirinia*, *S. parasitifera* (Bastian, 1865) ; données complémentaires sur la structure de la capsule céphalique et la morphologie de l'appareil copulateur. Les deux sous-genres de *Spirinia* : *S. (Spirinia)* Gerlach, 1963 et *S. (Perspiria)* Wieser & Hopper, 1967 sont élevés au rang de genre.

INTRODUCTION

During an ecological survey of the Bay of Morlaix (Gourbault 1981, 1987), three new Desmodoridae species were found : two *Spirinia* and one *Desmodora* species. The genus *Spirinia* Gerlach, 1963, has been split up already into two subgenera : *S. (Spirinia)* Gerlach, 1963, and *S. (Perspiria)* Wieser & Hopper, 1967. Recently, Coles (1987) revised this genus and described two new species, one related to each subgenus. The two new species from Brittany were found to belong to the subgenus *Perspiria*. However, examination of the type species of *Spirinia*, *S. parasitifera* (Bastian, 1865) revealed that the two subgenera differ enough from each other to be considered as two different genera.

MATERIAL AND METHODS

The nematodes were collected and sorted as already indicated in all our previous papers. Type specimens are deposited in the nematode collections of the Instituut voor Dierkunde (RUG), Gent, and Muséum national d'histoire naturelle (MNHN), Paris.

RESULTS

After examination of our material (see further), the subgenera *Spirinia* (*Spirinia*) and *S.* (*Perspiria*) are both raised to the genus level. The new diagnoses are as follows :

SPIRINIA Gerlach, 1963

Type species : *Spirinia parasitifera* (Bastian, 1865) Gerlach, 1963 ; syn. *Spira parasitifera* Bastian, 1865.

Diagnosis : Spiriniinae Chitwood, 1936. Cuticle with faint and fine annulations. Somatic setae arranged in eight longitudinal rows. Amphideal fovea surrounded by cuticular annulation. Cephalic setae at the level of the amphid (anterior, mid- or posterior level). Amphideal fovea with circular outline, but spiral and loop-shaped origin obvious. Buccal cavity very small and narrow with a small dorsal tooth. Pharynx with short, round terminal bulb. Ventral gland absent. Numerous epidermal gland cells. Spicules with prominent capitulum and velum. No preanal supplements. Conical tail.

List of valid species :

Spirinia gerlachi (Luc & De Coninck, 1959) Gerlach, 1963

Spirinia gnaigeri Ott, 1977

Spirinia hopperi Coles, 1987

Spirinia laevoides Gerlach, 1963

Spirinia laevis (Bastian, 1865) Gerlach, 1963

Spirinia parasitifera (Bastian, 1865) Gerlach, 1963

Spirinia schneideri (Villot, 1875) Gerlach, 1963

Spirinia septentrionalis (Cobb, 1898) Gerlach, 1963

Spirinia tenuicauda (Allgén, 1959) Gerlach, 1963

Species inquirendae : *Spirinia granulata* (Allgén, 1929) is only known from two juveniles and therefore not well defined (the position of the "circular" amphid is also not characteristic for *Spirinia*). *Spirinia sabulicola* (Filipjev, 1918) Gerlach, 1963 and *Spirinia similis* (Cobb, 1898) Gerlach, 1963 are both considered as *nomina dubia* by Coles, 1987.

Remark : *Spirinia spp.* may be very abundant (> 30 % of a community) in littoral muddy to coarse sands and in sublittoral muddy to clean sands (cf. Southern Bight of the North Sea, Vincx, 1986) : they are extremely dominant also in Western Channel area (Gourbault, 1987 ; Gourbault & Renaud-Mornant, 1985).

Epizoic Suctorina often present.

PERSPIRIA Wieser & Hopper, 1967 n. rank

Type species : *Perspiria striaticaudata* (Timm, 1962) comb. n. ; syn. *Spirinia striaticaudata* Timm, 1962

Diagnosis : Spiriniinae Chitwood, 1936. Cuticle with faint striations which surround the amphideal fovea partly. Cephalic setae at anterior or mid-level of the amphideal fovea. Amphideal fovea with circular outline but with spiral origin obvious. Buccal cavity very

small (with three minute teeth ?). Pharynx with prominent round to pyriform terminal bulb. Ventral gland present or absent. Spicules slender with well-developed capitulum (+ velum). Preanal supplements present (pore-like or tubiform) or may be lacking. Filiform tail prominently striated.

List of valid species :

Perspiria flagellata Vitiello, 1971

Perspiria hamata Wieser & Hopper, 1967

Perspiria megamphida sp.n.

Perspiria mokii Coles, 1987

Perspiria papillata sp.n.

Perspiria striaticaudata (Timm, 1962) comb.n.

syn. *Spirinia striaticaudata* Timm, 1962

Remark : the two new species lack the ventral gland.

Perspiria spp. are found in littoral and sublittoral sandy sediments.

Suctoria may occur.

Perspiria megamphida sp.n.

(Fig. 1)

Material studied : one male.

Type material : holotype male on slide n° 39 (RUG)

Type locality : Bay of Morlaix (Channel, France) : 0,5 m depth, upper station 2, fine sublittoral sand with 30 % silt ; November 1978.

Measurements

$$\text{Holotype } \delta 1 = \frac{-107192 \text{ M}1510}{17 \ 32 \ 48 \ 52 \ 44} 1 \ 615 \ \mu\text{m},$$

a = 31.1, b = 8.4, c = 15.4, c' = 2.4, spic = 55 μm .

Description

Body cylindrical with rounded head end and conical tail with a short filiform end. Cuticle obviously annulated up to the level of the cephalic setae (Fig. 1A). Internal labial sensilla not found, six external labial sensilla papilliform, four cephalic setae, 5 μm long, situated at the level of the posterior half of the amphideal fovea. Somatic setae short and numerous on the males tail. Amphideal fovea with a circular outline, but the spiral origin is made obvious by the central spot and the interruption at the dorsal side ; it is ventrally wound.

Buccal cavity very minute ; teeth apparently lacking. Pharynx muscular with pyriform terminal bulb (Fig. 1D). Cardia 15 μm long. Nerve ring at 56 % of the neck length. Ventral gland and pore not found.

Monorchic with anterior testis at the right of the intestine. Spicules slender, irregularly curved ; with prominent capitulum and a small ventral velum. The gubernaculum is rather short (16 μm) and clumsy. Prominent protractors of spicules and gubernaculum developed.

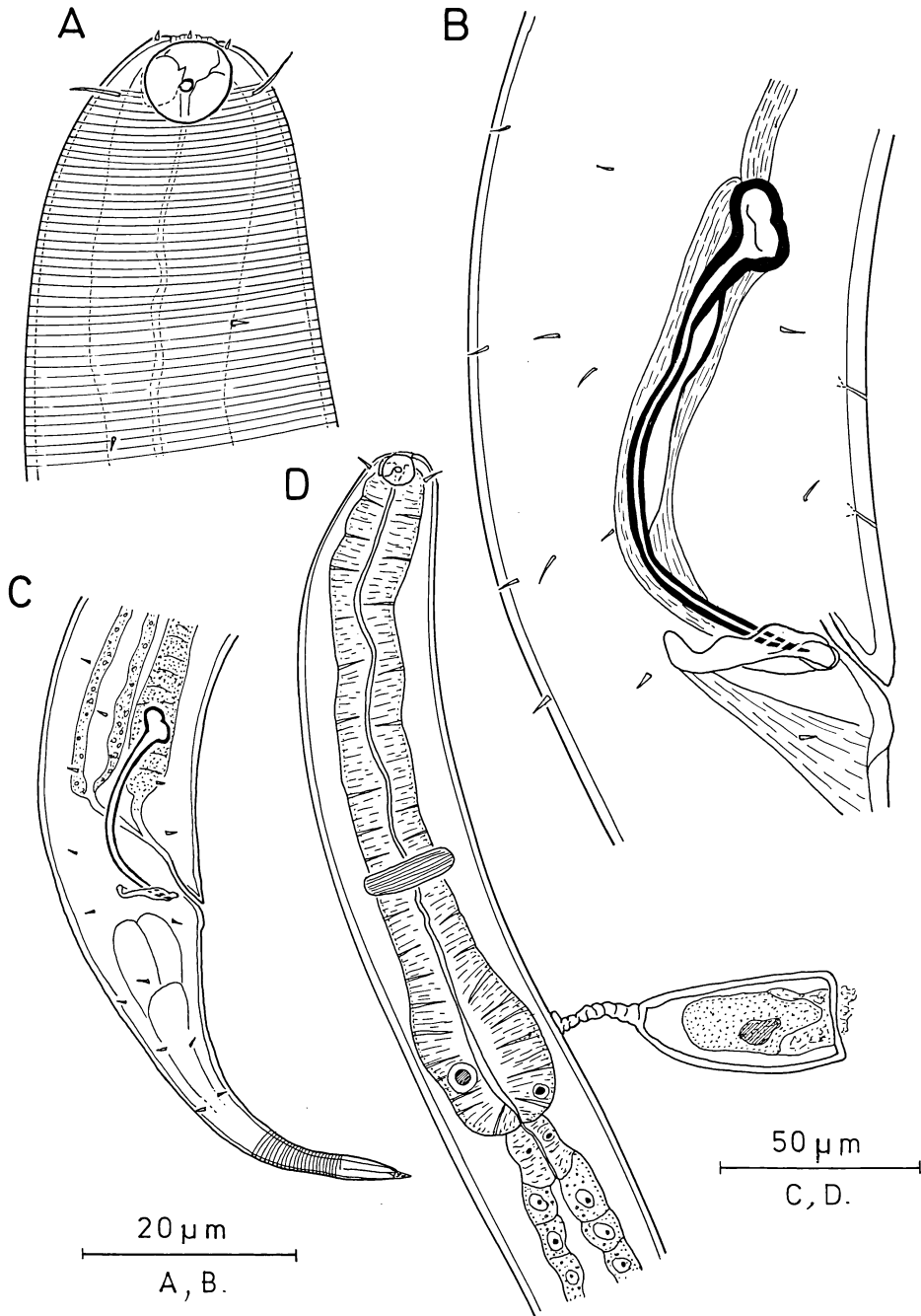


Fig. 1 - *Perspiria megamphida* sp.n. A. Head end ♂1 ; B. Copulatory apparatus ♂1 ; C. Tail region ♂1 ; D. Pharyngeal region ♂1.

Two very small pores are present in the preanal region ; they are apparently not connected with gland cells (Fig. 1B).

Tail conical in its first half, with a filiform, heavily striated end ; three caudal glands ; pointed spinneret (Fig. 1C).

Differential diagnosis

Perspiria megamphida sp.n. is characterized by its swollen amphideal fovea, slender spicule with a well developed capitulum, an irregularly curved shaft and a small ventral velum ; the tail has a rather short filiform end part which is heavily annulated.

Discussion

Up to now, four species have been described in the genus *Perspiria* : i.e. *Perspiria flagellata* Vitiello, 1971, *P. hamata* Wieser & Hopper, 1967, *P. mokii* Coles, 1987, *P. striati-caudata* (Timm, 1962).

Perspiria megamphida sp.n. is differentiated from these species by its big amphid, short tail and by the shape of its spicules.

Perspiria papillata sp.n.

(Fig. 2)

Material studied : two males.

Type material : holotype male on slide n°40 (RUG), and paratype male, slide BN 1 (MNHN).

Locality : Bay of Morlaix (Channel, France) ; upper stations 1 and 4, sublittoral fine sand with 35-40 % silt ; August 1981 and 1982.

Measurements

$$\text{Holotype } \delta 1 = \frac{-144 \text{ M } 1479}{16-27 \ 33 \ 23} \ 1 \ 710 \ \mu\text{m},$$

a = 51.8, b = 11.9, c = 7.4, c' = 10.0, spic = 32 μm .

Paratype $\delta 2$: broken tail ; spic : 35 μm .

Description

Body cylindrical with rounded head end and filiform tail. Cuticle obviously annulated (8 annules over 10 μm), the annulation surrounds the amphid partly (Fig. 2A). Internal labial sensilla not found, six external labial sensilla papilliform, four cephalic setae (4 μm) located at the anterior border of the amphideal fovea. Eight cervical setae (7 μm) present. Other somatic setae not found. Amphideal fovea ventrally wound, spiral and loop shaped with a circular outline ; 6 μm (30 % of the cbd).

Buccal cavity cyathiform with minute dorsal tooth and probably two ventrosublateral teeth. Pharynx muscular with pyriform terminal bulb ; lumen not heavily cuticularized (Fig. 2C). Cardia 10 μm long. Nerve ring not found. Ventral gland and pore not found.

Monorchic : position of anterior testis in relation to intestine not clear (poor fixation). Spicules regularly curved with well developed round capitulum and a well sclerotized velum ; gubernaculum plate-shaped, 19 μm long.

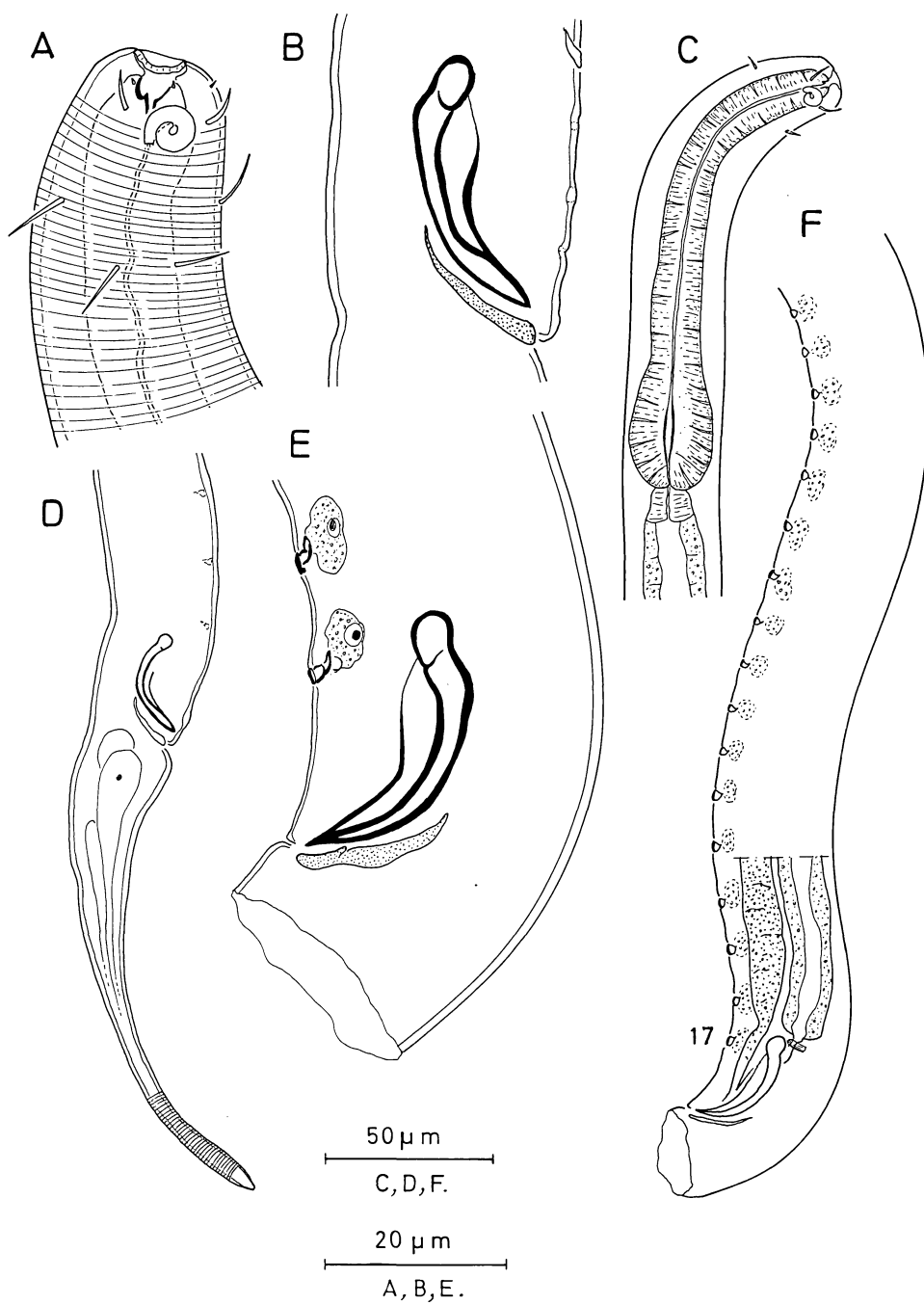


Fig. 2 - *Persipira papillata* sp.n. A. Head end ♂1 ; B. Copulatory apparatus ♂1 ; C. Pharyngeal region ♂1 ; D. Tail region ♂1 ; E. Copulatory apparatus ♂2 ; F. Preanal region ♂2.

Seventeen preanal cup-shaped supplements : each supplement consists of three parts, an outer plate, an inner cup and a proximal protrusion which is in connection with a granulated gland cell (Fig. 2E).

Tail filiform and obviously annulated ; only the small tip is smooth (Fig. 2D). Three caudal glands.

Differential diagnosis

Perspiria papillata sp.n. is characterized by the presence of 17 preanal supplements, cuticular annulation which reaches amphideal region and by the slender, heavily annulated tail ($c' = 10.0$).

Discussion

By its much shorter tail, *Perspiria papillata* sp.n. differs from *P. flagellata* Vitiello, 1971, which is the other species with preanal supplements (11) in the males, these being small tubuli while the supplements of *P. papillata* sp.n. are cup-shaped. The ventral velum on the spicules is well developed in *P. papillata* sp.n. and absent in *P. flagellata*.

Spirinia parasitifera (Bastian, 1865)

(Fig. 3)

Material studied : five males, five females.

Locality : Southern Bight of the North Sea ; 21 localities (*in* Vincx, 1986)

Measurements

$$\text{♂ 1} = \frac{-86166 \text{ M} 2660}{1736 \ 44 \ 48 \ 48} \ 2 \ 835 \ \mu\text{m} \ (\text{slide n}^\circ 10153, \text{RUG}),$$

$a = 59.1, b = 17.1, c = 16.2, c' = 3.6, \text{spic} = 79 \ \mu\text{m}.$

$$\text{♀ 1} = \frac{-1661682 \ 3183}{17- \ 48 \ 74 \ 48} \ 3 \ 380 \ \mu\text{m} \ (\text{slide n}^\circ 10154, \text{RUG}),$$

$a = 45.7, b = 20.4, c = 17.2, c' = 4.1, V = 49.8.$

Other specimens :

	<i>Males (n = 4)</i>	<i>Females (n = 4)</i>
L :	3030-3450	2915-3420
a :	43.3-56.6	39.4-48.9
b :	17.1-19.3	16.7-19.5
c :	18.0-18.3	14.8-16.0
c' :	3.2-4.2	3.5-3.9
spic/V :	76-86	48.2-49.9

Description and discussion

Spirinia parasitifera has been studied in about 60 papers. The North Sea specimens agree in most aspects with the already described specimens ; therefore, we will only discuss additional new features.

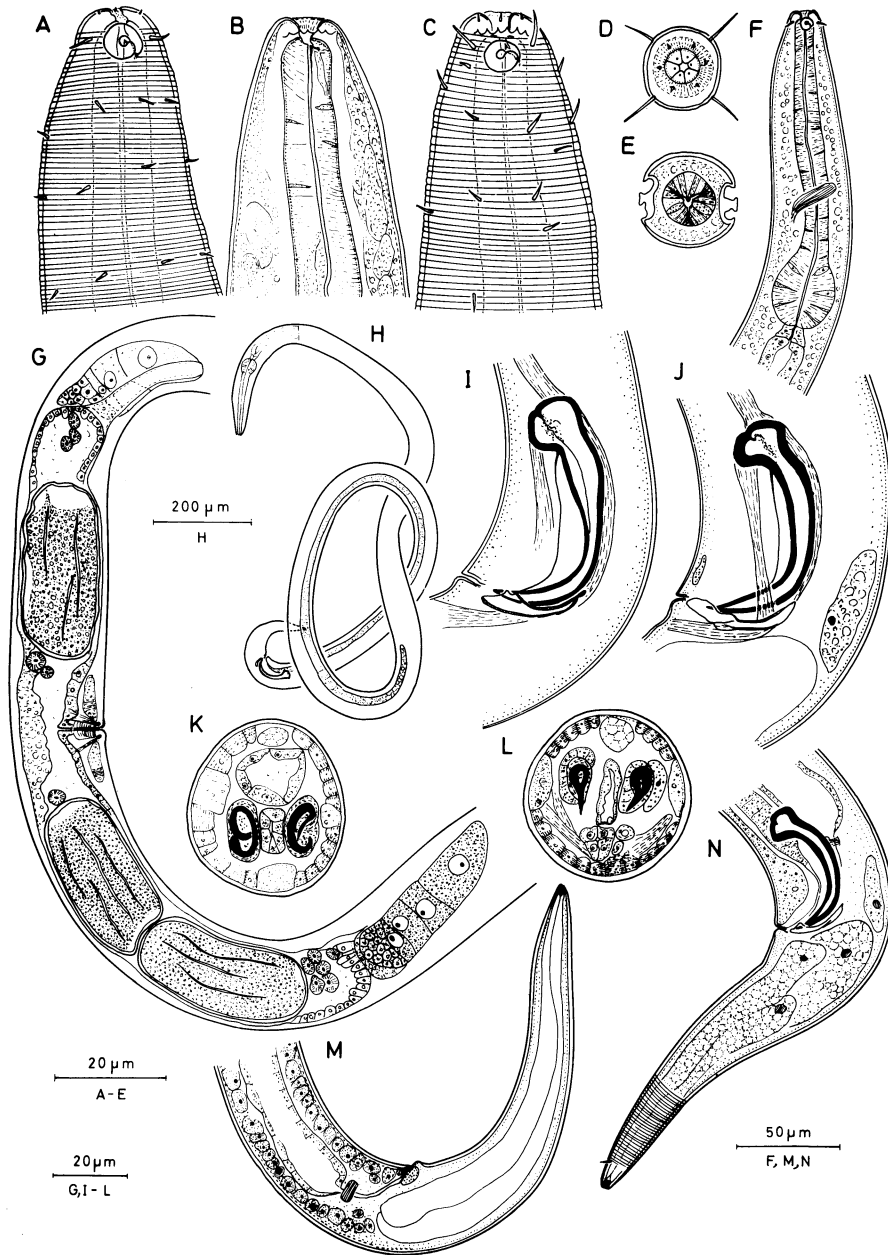


Fig. 3 - *Spirinia parasitifera*. A. Head end ♂ 2; B. Buccal cavity ♀ 1; C. Head end ♀ 1; D. Apical view of the lip region ♂; E. Cross section at the level of the amphideal fovea ♂; F. Pharyngeal region ♂ 1; G. Genital system ♀ 1; H. Total view ♂ 1; I. Copulatory apparatus ♂ 1; J. Copulatory apparatus ♂ 3; K. Cross section at the level of the capitulum of the spicules; L. Transverse section at the level of the shaft of the spicules; M. Tail region ♀ 1; N. Tail region ♂ 3. (Cross sections are orientated the dorsal side to the top of the paper).

“En face” view of the head region indicates that the six internal labial papillae are situated at the inner side of six, clearly separated lips (Fig. 3D). The external labial papillae are situated at the outer side of the lips ; the cuticle surrounds the lip region completely ; *i.e.* in lateral view, the lips are not separated from the remainder of the head. The lips seem to be completely invaginated in lateral view. The characteristic “Diadembildung”, caused by the 12-folded vestibulum is obvious in some specimens (Fig. 3C). One small dorsal tooth is present in the buccal cavity. Ventral gland absent ; numerous small epidermal gland cells are especially abundant in the pharyngeal region. The spicules are heavily sclerotized ; they consist of two parallel bars (in lateral view) provided with a well developed, closed capitulum. A cross section through the capitulum indicates that it is divided in two parts by a sagittal bar (Fig. 3K, right spicule) ; more posteriorly, the median bar becomes less pronounced and finally disappears (Fig. 3K left spicule). The capitulum is completely surrounded by the protractor muscles. In lateral view, a very thin velum at the ventral side of the spicule is visible. A cross section through the shaft of the spicule shows that the velum consists of a solid ventral protrusion ; this part is surrounded by the protractors too ; these muscles are bordered laterally by large granulated cells.

The female genital system consists of two, rather short, reflexed ovaries ; the anterior ovary is bent to the left ; the posterior ovary is bent to the right. Sperm cells are irregularly distributed in the proximal part of the uteri or in the unpaired uterine chamber. One or two eggs are present in each uterus.

Numerous Suctoria may be present, especially attached to the tail of the specimens.

Desmodora granulata sp.n.

(Fig. 4)

Material studied : four males, one female.

Type material : holotype male and paratypes male and female slides n° 51, 77 (RUG) ; other paratypes slides BN 2-3 (MNHN).

Type locality : Bay of Morlaix (Channel, France) ; sublittoral fine sand with 15-30 % silt ; November 1978, December 1980 and April 1983.

Measurements:

$$\text{Holotype } \delta 1 = \frac{-71\ 127\ \text{M}922}{1726\ 26\ 31\ 26} \ 1\ 040\ \mu\text{m},$$

$$a = 33.6, b = 8.2, c = 8.8, c' = 4.5, \text{spic} = 44\ \mu\text{m}$$

$$\text{Allotype } \text{♀} 1 = \frac{-82\ 149\ 734\ 1175}{2430\ 31\ 48\ 14} \ 1\ 310\ \mu\text{m},$$

$$a = 27.3, b = 8.8, c = 9.7, c' = 5.6, V = 56.0.$$

Other paratypes : males (n=3)

$$L = 1040-1270\ \mu\text{m}, a = 30.9-38.7, b = 8.2-9.5, c' = 8.8-9.9, c = 4.1-4.5, \text{spic} = 44-46\ \mu\text{m}.$$

Description

- Males. Body cylindrical with blunt head end and attenuated tail. Cuticle annulated (annules 1.5 μm broad in the cervical region, 1 μm in the remainder of the body). Cephalic

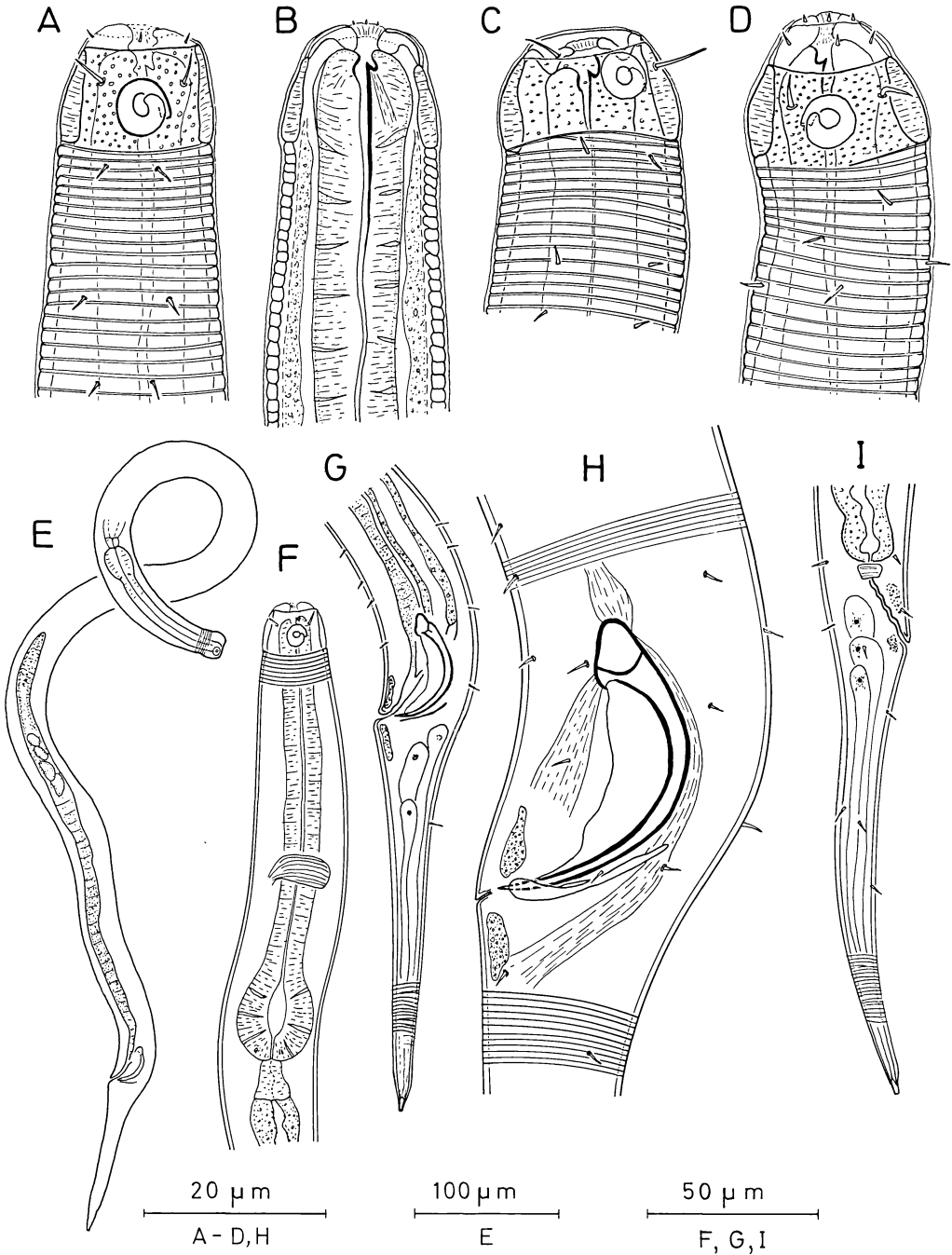


Fig. 4 - *Desmodora granulata* sp.n. A. Head end ♂4; B. Buccal cavity ♂4; C. Head end ♂1; D. Head end ♀1; E. Total view ♂1; F. Pharyngeal region ♂4; G. Tail region ♂1; H. Copulatory apparatus ♂1; I. Tail region ♀1.

capsule well developed, 18 μm broad at its base and 12 μm high, ornamented with small perforations. Lip region also well cuticularized, not perforated ; may be completely intruded.

The six internal and the six external labial sensilla are papilliform and very thin. The four cephalic setae, 4 μm long, are situated on the cephalic capsule at the anterior border of the amphideal fovea. No subcephalic setae on the cephalic capsule (Fig. 4A, C). Somatic setae arranged in eight rows along the whole body length. Amphideal fovea spiral, 1 1/4 turn, loop shaped and ventrally wound ; 6 μm width, 37 % of the chd.

A small pointed dorsal tooth (Fig. 4B) in the small buccal cavity completely surrounded by the pharynx, muscular with rounded terminal bulb. Cardia well developed, 11 μm broad at its base and 12 μm long (Fig. 4F). Nerve ring at 56 % of the neck length. Ventral gland and pore not found. Epidermal gland cells not very prominent.

Monorchic with outstretched testis at the left of the intestine. Paired spicules, regularly curved with well developed capitulum ; an indistinct velum is present between the ventral side of the capitulum and the distal tip of the spicule. Ventral protractors extend between the capitulum and the subventral body wall ; dorsal protractors follow the dorsal side of the shaft of the spicule to the gubernaculum ; a retractor is extended between the anterior part of the capitulum and the lateral body wall (Fig. 4H). The gubernaculum is plate-shaped, 18 μm long and surrounds the distal tip of the spicule. The protractor of the gubernaculum seems to be continuous with the dorsal protractor of the spicule. Two granulated glands are present anteriorly and posteriorly to the cloaca.

Tail attenuated ; tail tip not annulated and with undifferentiated cuticle ; short spinneret developed ; three caudal glands (Fig. 4G).

- Female. Resembles the male in all characters.

Genital system not well developed in this specimen ; didelphic-amphidelphic with reflexed ovaries. Vagina not much sclerotized.

Differential diagnosis

Whitout any doubt, this new species is to be included in the genus *Desmodora* according to its revision (Vincx, 1986).

Desmodora granulata sp.n. is characterized by two head capsule features : absence of subcephalic setae and presence of small perforations, but also by small dorsal tooth, round pharyngeal bulb, shape of the spicules and absence of preanal cuticular modifications in the males. It resembles *Desmodora conica* and *D. gerlachi* Vitiello, 1971, *D. masira* Warwick, 1973 and *D. scaldensis* de Man, 1889, because of the general body and tail shapes, and the presence of a capitulum on the spicule. *Desmodora granulata* sp.n. differs however from the known species in the following aspects : *D. conica* has a smaller cephalic capsule which is not perforated and its body is more clumsy (a=19). *D. gerlachi* is characterized by a more filiform tail, spicules with a capitulum with two central hooks, and the cephalic capsule is divided in two equal parts. *D. masira* is much longer (2.8-3.3 mm) with relatively longer pharynx and tail than the new species. The cuticular annulation is very fine and the cephalic capsule is shorter (its width is more than twice its height).

D. scaldensis resembles the new species most closely, but the particular shape of the spicule in *D. scaldensis* (capitulum not much broader than the shaft of the spicule and typical knick in proximal part of the spicule) and the non-perforated cephalic capsule are the main differences between the two species.

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