New Desmodoridae (Nematoda : Desmodoroidea) : 
three new species from Ceriops mangrove sediments (Kenya) 
and one related new species from the North Sea

A. MUTHUMBI (1), D. VERSCHELDE AND M. VINCX

University of Gent, Department of Morphology, Systematics & Ecology, Marine Biology Section, K.L. Ledeganckstraat 35, 9000 Gent, Belgium
(1) On leave from Kenya Marine & Fisheries Research Institute, P.O. Box 81651 Mombasa, Kenya.

Abstract: Three new species of nematodes (Chromaspirina okemwai sp.n., Pseudochromadora interdigitatum sp. n. and Eubostrichus africanus sp. n.) from Ceriops mangrove sediments and one new species (Eubostrichus longosetosus sp. n.) from the North Sea, along the Belgian coast, are described. Chromaspirina okemwai is characterized by four cephalic sensory and unispiral amphids; Pseudochromadora interdigitatum has unique lateral alae where body annules split into two, three or four smaller ones. Eubostrichus africanus has short (6 μm) cephalic and subcervical setae and five pairs of strong broad based setae at the tail region; Eubostrichus longosetosus has long (14 μm) cephalic and subcervical setae, three pairs of strong setae on the tail and two fine ones at the tail tip. Eubostrichus parasitiferus as described by Hopper and Cefalu (1973) is given a new name, E. hopperi sp. n. A revision of the genus Chromaspirina and Pseudochromadora is also included.

Résumé: Trois nouvelles espèces de nématodes, Chromaspirina okemwai sp. n., Pseudochromadora interdigitatum sp. n. et Eubostrichus africanus sp.n., d'une mangrove à Ceriops et une nouvelle espèce, Eubostrichus longosetosus sp. n., de la Mer du Nord, sont décrites. Chromaspirina okemwai est caractérisée par quatre soies céphaliques et par des amphides unispirales ; Pseudochromadora interdigitatum a des champs latéraux uniques sur lesquels les rangées transversales sont divisées en deux, trois ou quatre petits anneaux. Eubostrichus africanus présente des soies céphaliques et subcervicales courtes et cinq paires de soies robustes dans la région caudale ; Eubostrichus longosetosus a des soies céphaliques et subcervicales longues, trois paires de soies robustes sur la queue et deux soies fines à l’extrémité de la queue. L’espèce E. parasitiferus, correspondant à la description de Hopper & Cefalu (1973) est renommée E. hopperi sp. n. Les genres Chromaspirina et Pseudochromadora sont révisés.

Keywords: Taxonomy, genera revision, marine nematodes.

Introduction

This study is part of an ecological work done on the Ceriops mangrove sediments where a number of genera represented by known and new species were encountered. Desmodoridae were numerically the most important, contributing to 39% of the population.

In this paper, three new desmodorid species of the genera Chromaspirina Filipjev, 1918, Pseudochromadora Daday, 1889 and Eubostrichus Greeff, 1869 are described from the same site. A closely related new species of the genus Eubostrichus is described from the North Sea.
Materials and Methods

The study area in the Ceriops mangrove sediments is Gazi bay, 50 kilometers south of Mombasa (Kenya). Samples were collected from the high intertidal zone inundated during high tide only. Description of the area is in Schriijers et al (1995). The North Sea samples were collected along the Belgian coast. The samples were immediately fixed in hot (60°C) 4% formaldehyde solution and nematodes were transferred slowly to glycerine. Drawings were made with the aid of a camera lucida on a Leitz Dialux 20 EB microscope.

Scanning electron microscopic pictures were taken from formalin fixed animals postfixed in OsO₄, dehydrated, dried and coated with 20-25 μm of gold (SEM: JEOL JSM 840).

Type specimens are deposited in the collection of the University of Gent, Department of Ecology, Morphology & Systematics (slides nos. 3888-3897) and the Muséum National d'Histoire Naturelle (MNHN), Paris, France (slides nos. 246-249).

Results

Family Desmodoridae Filipjev, 1922

Genus Chromaspirina Filipjev, 1918

Type species: Chromaspirina pontica Filipjev, 1918

Emended diagnosis

Spriniinae. Robust animals with rounded head end and conical tail. Cuticle faintly annulated; amphideal fovea always surrounded by the cuticular annulation. Cephalic setae at the level of the amphideal fovea. Amphideal fovea spiral, loop shaped with cuticular outline. Buccal cavity obviously sclerotized with one big dorsal tooth and two smaller subventral ones; a ventral field of small denticles may be developed. Pharynx with weakly developed pear shaped bulb. No ventral gland. Preanal supplements weakly developed. Spicules of variable shape but with capitulum and velum.

Chromaspirina closely resembles Spirinia but differs from it in that Spirinia has a narrow stoma with a small dorsal tooth and a rounded terminal pharyngeal bulb.

List of valid species:
Chromaspirina chabaudi Boucher, 1975
Chromaspirina crinita Gerlach, 1952
Chromaspirina cylindrocollis Cobb, 1920
Chromaspirina dubia Inglis, 1968
Chromaspirina gerlachi Blome, 1982
Chromaspirina indica Gerlach, 1963
Chromaspirina inglesi Warwick, 1970
Chromaspirina lunatica Gerlach, 1965
Chromaspirina madagascariensis Gerlach, 1953
Chromaspirina multitapillata Jayasree & Warwick, 1977
Chromaspirina parapontica Luc & De Coninck, 1959

Chromaspirina parma Ott, 1972
Chromaspirina pontica Filipjev, 1918
Chromaspirina thieryi De Coninck, 1943
Chromaspirina okemwai sp. n.

Species inquirendae

Chromaspirina robusta Wieser, 1954 (known from two juveniles).

Chromaspirina paucispina Shuurnans Stekhoven, 1950 (known from one female).

Chromaspirina dimorpha (Hopper, 1961), Chromaspirina inflexa (Wieser, 1954) and Chromaspirina rabosa (Gerlach, 1956) are transferred again to their original genus, Desmodora. Chromaspirina longosetosa Jensen, 1985 is transferred to the genus Bolbolaimus.

Discussion

Desmodora inflexa Wieser, 1954, D. dimorpha Hopper, 1961 and Desmodora rabosa Gerlach, 1956 were transferred to the genus Chromaspirina by Gerlach (1963), but we agree with the original status of these species as re-instated by Wieser & Hooper (1967) because the three species are heavy annulate and have a well developed head capsule with the amphids situated outside the rings.

Chromaspirina longosetosa Jensen, 1985 is transferred to Bolbolaimus because of the posterior position of the cephalic setae, on a well developed cephalic capsule, minute buccal cavity and long somatic setae.

Chromaspirina okemwai sp. n.

(Table 1, Fig. 1 A-H and 2 A-G)

Material examined. Five males, five females.
Holotype ♀, on slide no. 3888
Allotype ♂, on slide no. 3889
Paratype ♂, on slide no. 3889, 246
Paratype ♀, on slide no. 3890, 247, 3891

Type Locality

All specimens were collected from intertidal sediments of the Ceriops mangrove in Gazi Bay, Kenya (4°25’S and 39°50’E), on 17/06/1992. The sediments consist of fine sand (80%) and mud (15%).

Etymology

This species is named in honour of Dr. Ezekiel Okemwa, director of the Kenya Marine & Fisheries Research Institute, Mombasa, Kenya.

Measurements: see Table 1

Description

Males

The body is cylindrical, with blunt head and conical tail (Fig 1H). The cuticle is annulated with annules extending...
Table 1. Measurements of Chromaspirina okemwai sp.n.

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Abbreviations used in Tables: a: L/maximum diameter; abd: anal body diameter; amph%: diameter of amphid as a percentage of the corresponding head diameter; bw: pharynx length; mbd: maximum bulb diameter; bdnr: body diameter at nerve ring; cs: length of cephalic setae; damph: distance from anterior to mid level of the amphid; dnr: distance from anterior edge to nerve ring; dv: distance from anterior to vulva; gb: length of the gubernaculum; hw: head width; mbd: maximum body diameter; L: Total body length; mbdph: maximum body diameter at pharynx; ph: pharyngeal length; spic: length of spicules measured along the curve; t: tail length; V: position of vulva as a percentage of the total body length from anterior.

N.B. All measurements (but not ratios) are in micrometres (µm).

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Six internal and six external tiny labial sensilla (only seen by SEM pictures, Fig. 2B). Four cephalic setae, located at the anterior level of the amphids just in front of the first body annule (Fig. 1G and 2B). Amphids unispiral; fovea having the appearance of two concentric circles (Fig. 2B). Lip region intrusive (Fig. 2A). Stoma with one dorsal tooth and two smaller subventral ones (Fig. 1D). Pharynx cylindrical with a slightly swollen terminal bulb (Fig. 1D).

The reproductive system is monorchic, outstretched, located to the right of the intestine (Fig. 1H) and contains large sperm cells (19-22 µm in diameter). The spicules are arcuate, with a strongly sclerotized capitulum and a thin velum with a typical shape (Fig. 1E). Gubernaculum is half as long as the spicule. Tail conical (twice anal body diameter); with a wide anterior part that quickly narrows down posteriorly (Fig. 1E). Non-annulated tail end is one third of the tail length. Three caudal glands open at the tip through a spinneret.

Females

The females are similar to the males in general body shape, pattern of somatic setae, anterior setae (Fig. 2A), amphids (Fig. 1B, 2A) and pharyngeal region. The repro-
Figure 1. Chromaspirina okemwai sp. n.
A: ♀生殖系统  E: ♂尾
B: ♀头区  F: ♂尾
C: ♀口器  G: ♂头区
D: ♂吻  H: ♂体形

Figure 1. Chromaspirina okemwai sp.n.
A: ♂生殖器  E: ♂尾
B: ♂cephalique  F: ♂尾
C: ♂buccale  G: ♂cephalique
D: ♂pharynx  H: ♂habitus

Figure 1. Chromaspirina okemwai sp. n.
A: ♀appareil reproducteur  E: ♂queue
B: ♂région céphalique  F: ♂queue
C: ♂région buccale  G: ♂région céphalique
D: ♂pharynx  H: ♂habitus
Figure 2. *Chromaspirina okewmawi* sp. n.
A: ♀ 2 head region on lateral view.
B: ♀ 2 head region.
C: ♀ 2 cuticular structures (fine hairs).
D: ♀ 2 showing spine-like setae on body.
E: ♀ 2 tail (devoid of fine hairs).
F: ♀ 2 new and old cuticle covered with the fine hairs (arrow head indicates new cuticle, arrow indicates old cuticle).
G: ♀ 3 tail region showing presence of the fine hairs on non-sonicated specimens (note also the suctorian protozoa).

(Scale bars indicate 1 μm in A, B, C and F; 10 μm in D, E, and G.)
The presence of pre-cloacal supplements, which are lacking cuticular and vagina uterina muscular (Fig. 1A). The tail is didelphic, amphidelphic with reflected system is didelphic, amphidelphic with reflexed supplements (which Warwick (1970) referred to as shorter cephalic setae) are 6 μm while the cephalic ones (which he referred to as longer cephalic setae) are 11 μm long.

**Genus Pseudochromadora Daday, 1889**

Type species: *Pseudochromadora quadripapillata* Daday, 1889

**Emended diagnosis**

Desmodorinae. Cephalic capsule well developed, consists of two parts: the apical part bears the four cephalic setae, the posterior part has the amphideal fovea. The fovea is unispiral, the spiral origin is obvious by its central spot. Lip region obviously cuticularized. No subcephalic setae on the cephalic capsule. Lateral alae present. Buccal cavity with one dorsal tooth. Terminal pharyngeal bulb is prominent and it is a fifth to a sixth of the pharyngeal length. Pore-like precoacal supplements can be present. A ventral row of stout pre-cloacal setae can be present in the male (Fig 5D).

- List of valid species:
  - *Pseudochromadora cazca* (Gerlach 1956), 1963
  - *Pseudochromadora incubans* Gourbault & Vincx, 1990
  - *Pseudochromadora interdigitatum* sp. n.

*Pseudochromadora interdigitatum* sp. n.  
(24° 19' S, 39° 50' E)  
Type locality  
All the specimens were collected from intertidal sediments of the Ceriops mangroves Gazi Bay, Kenya (4° 25' S and 39° 50' E) on 17/06/1992. The sediments consist of fine sand (80%) and mud (15%).

*Etymology*  
The species name is derived from Latin, meaning criss-crossing finger-like structures. The name was chosen as it describes the nature of the body annules at the lateral alae.

*Measurements:* see Table 2
The male reproductive system is monorchic with outstretched testis situated to the left of the intestine (Fig. 4D). Spicules are arcuate with a well developed funnel shaped capitulum and a velum (Fig. 4G). Gubernaculum is half as long as the spicules. There are 15-17 ventral precloacal thorn-like setae extending from the cloaca to about 125 μm anteriorly (Fig. 4D, G). A group of ventral copulatory thorns is found anterior to the thorn-like setae at around 125-163 μm anterior of the cloaca. Anterior to the copulatory thorns there is a ventral row of short single thorns (Fig. 4D, J), extending till the level of the tip of the testes (these single thorns are also found in females, Fig. 4I). The tail is conical with a non-annulated tip (non-annulated part about one fifth of the tail). A group of post-cloacal thorns at about half way the tail length (Fig. 5E). Three caudal glands terminate in a prominent spinneret.

**Females**

The body of most mature females appears swollen all along the reproductive system (Fig. 4I). The head capsule, anterior sensilla (Fig. 4A), stoma (Fig. 4H) and tail shape (Fig. 4E) are however similar to those of the males. The females only have the ventral row of single thorns that extends from the anterior region of the antepundendum (genital tubes proceeding anteriorly from the vulva), (Maggenti, 1981) to the vulva. The reproductive system is didelphic, amphidelphic with reflexed ovaries (Fig. 4I). The vagina vera is cuticularized and the vagina uterina is short. The tail lacks the post-cloacal thorns (Fig. 4E).

**Differential diagnosis**

*Pseudochromadora interdigitatum* closely resembles *P. cazca* Gerlach, 1956 but differs from it in the shape of the spicule; *P. interdigitatum* sp. n. has a funnel shaped capitulum and it is ventrally pointed while in *P. cazca* the capitulum is triangular. The copulatory thorns are in three groups and they are raised in *P. cazca*. *Pseudochromadora interdigitatum* also resembles *P. incubans* Gourbault & Vincx, 1990 but differs from it in the position of the cephalic setae, which are situated at the second part of the cephalic capsule in *P. incubans*, and in the shape of the amphideal fovea, which is loop-shaped with a circular profile.

**Discussion**

Because of the emended diagnosis, a lot of the species originally in *Pseudochromadora* are transferred to other genera of Desmodorinae. The following species of the sub-
Figure 4. *Pseudochromadora interdigitatum* sp. n.

A: ♀1 head region
B: ♂1 pharynx
C: ♀1 head region
D: ♂1 habitus
E: ♀1 tail
F: ♂1 lateral alae
G: ♂1 tail
H: ♀1 stoma
I: ♀1 reproductive system
J: ♂3 thorns, copulatory thorns and thorn-like setae (arrow head indicates the last single thorn, arrow indicates the first copulatory thorn)
Figure 5. *Pseudochromadora interdigitatum* sp. n.

- **A**: $\delta_2$ head region on lateral view
- **B**: $\delta_2$ habitus
- **C**: $\delta_2$ head region anterior view
- **D**: $\delta_2$ ventral view showing precloacal thorn-like setae and cloaca
- **E**: $\delta_1$ tail showing post cloacal thorns
- **F**: $\delta_2$ showing the lateral alae. (Scale bars indicate 1 μm in A, C; 10 μm in B, D, E and F)

**Figure 5. Pseudochromadora interdigitatum** sp. n.

- **A**: $\delta_2$ région céphalique en vue latérale
- **B**: $\delta_2$ habitus
- **C**: $\delta_2$ région céphalique vue antérieure
- **D**: $\delta_2$ vue ventrale montrant les soies pré-cloacaies en forme d’épine et le cloaque
- **E**: $\delta_2$ queue montrant les épinces post-cloacaies
- **F**: $\delta_2$ montrant la carène latérale. (Echelles = 1 μm pour A et C; 10 μm pour B, D, E, et F).
genus “Pseudochromadora” are transferred to the genus Desmodora:  
Desmodora brachypharynx (Allgén), 1947  
Desmodora campbelli (Allgén), 1932  
Desmodora coniseta (Schuurmans & Stechhoven), 1950  
Desmodora deconincki (Inglis), 1968  
Desmodora microchaeta (Allgén), 1922  
Desmodora pontica (Filipjev), 1922

Genus Eubostrichus Greeff, 1869

Type species: Eubostrichus filiformis Greeff, 1869

Diagnosis

The diagnosis of Eubostrichus is based on that of Platt & Warwick (1988) and Hopper & Cefalu (1973).

The microbial associations of Eubostrichus are filamentous and crescent forms, while those of Catanema (a related genus) are coccoid forms (Hopper & Cefalu, 1973). However, some coccoid forms have been detected among the filamentous forms on certain Eubostrichus specimens. (This is also the case in the North Sea specimens). Eubostrichus can therefore be distinguished from Catanema (synonym Robbea, Platt and Zhang 1982), by the presence of an annulation at the cephalic capsule and the absence of a well developed anterior muscular buccal bulb, present in Catanema.

Eubostrichus was first described from the English channel by Greeff (1869). Up to now, eight species are described in that genus, i.e. E. gerlachi (Hopper and Cefalu, 1973) Platt & Zhang, 1982; E. filiformis Greeff, 1869; E. parasitiferus Chitwood, 1936; E. phalacrus Greeff, 1869, E. diaenea Hopper & Cefalu, 1973, E. africanus sp. n., E. longosetosus sp. n. and E. hopperi sp. n.

Eubostrichus parasitiferus Chitwood, 1936 has been redescribed by Hopper & Cefalu (1973). Their specimens were characterized by the presence of eight cervical setae at the anterior border of the amphid and eight behind the amphid; the body length varies between 2140 and 2680 μm. The original description of E. parasitiferus by Chitwood (1936) only mentioned twice 4 cervical setae and a shorter tail (c’ = 2.5-2.6 for specimens of Chitwood; c’ = 3.4-4.9 in specimens of Hopper and Cefalu, 1973). E. parasitiferus sensu Gerlach (1963) has two strong porids and two fine ones posterior to the cloaca while the specimens of Hopper & Cefalu have three strong and two fine porids. Therefore, we consider E. parasitiferus as described by Hopper and Cefalu (1973) as a new species and we propose the name Eubostrichus hopperi sp. n. The descriptions of Gerlach (1963, 1964) of E. parasitiferus conform with the original description of that species.

Eubostrichus africanus sp. n.

Tab. 3, Fig. 6 A-G

Material studied, three males, five females.

### Table 3. Measurements of Eubostrichus africanus sp. n.

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Holotype ♀ on slide no. 3894
Allotype ♀ on slide no. 3895
Paratype ♀ ♀ on slide no. 3895
Paratype ♀ ♀ on slide no. 3894, 3895

Type locality

All specimens were collected from intertidal sediments of the Ceriops mangroves in Gazi Bay, Kenya (4° 25' S and 39° 50' E) on 17/06/1992. The sediments consist of fine sand (80%) and mud (15%).

Etymology

This species name is derived from the name of the continent (Africa) where the type material was collected.

Measurements: see Table 3

Description

Males

Body filiform with blunt anterior end and cylindrical tail. Anterior cervical region slightly swollen (Fig. 6C). Cuticle with very fine striations (Fig. 6B) and sometimes symbiotic bacteria attached in a typical Eubostrichus association. Anterior labial sensilla are tiny setae hardly visible with the light microscope. Four cephalic and four cervical setae of the same length (Fig. 6B) located at the level of the amphids; four more cervical setae immediately posterior to the amphids and eight to ten other cervical setae located 20 μm posterior to the amphids. Amphids spiral but not distinct. Stoma small without teeth. Pharynx with a pyriform terminal bulb (Fig. 6C). Cardia not distinct. Male reproductive system monorchic; testis outstretched located to the right...
Figure 6. *Eubostrichus africanus* sp. n.

A: ♀ 1 reproductive system
B: ♂ 1 head region
C: ♂ 1 pharynx
D: ♀ 2 head region
E: ♀ 2 pharynx
F: ♂ 1 tail
G: ♀ 2 tail

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Figure 6. *Eubostrichus africanus* sp. n.

A : ♀ 1 appareil reproducteur
B : ♂ 1 région céphalique
C : ♂ 1 pharynx
D : ♀ 2 région céphalique
E : ♀ 2 pharynx
F : ♂ 1 queue
G : ♀ 1 queue
of the intestine; it contains small rounded to oval shaped sperm cells. Spicules arcuate with a rounded capitulum (Fig. 6F). Gubernaculum about half as long as the spicules and hooked distally and narrow proximally. Subventrally, short broad precloacal setae and five pairs of special strong setae, that are referred to as porids by Hopper and Cefalu (1973) (porids = tubular setae serving as outlets for glands, Cobb 1925), are found at the end of the conical tail (c' = 3.6 and 4.3) (Fig. 6F). The three caudal glands open through a spinneret.

Females
Females are similar to males in general body shape, anterior sensillae (Fig. 6D), cervical setae and pharyngeal region (Fig. 6E). Reproductive system is didelphic, amphidelphic with reflected ovaries (Fig. 6A). Vulva and vagina simple. Tail lacks setae and is more slender (c' = 5) than in males (Fig. 6G).

Differential diagnosis
Eubostrichus africanus has a finely striated body cuticle, slightly swollen anterior cervical region, labial sensillae, tiny setiform, hardly visible with the light microscope, while the four cephalic setae are as long as the four cervical ones. Five pairs of 'porids' subventrally at the tail end in the males.

Eubostrichus africanus can be distinguished from all other described species by its slightly swollen anterior cervical region. It differs from E. filiformis by the total length (discussion) and from E. phalacrus by the length of the cephalic and cervical setae (discussion). It differs from E. dianeae in the number and position of the cervical setae (16 setae that are close to the amphid in E. dianeae), the pyriform terminal bulb and the broad spicule with a flat capitulum in E. dianeae. Eubostrichus hopperi sp. n. has longer cephalic and cervical setae and the amphideal fovea in the male are also wider compared to those of E. africana. Eubostrichus parasitiferus sensu Gerlach (1963), has two strong porids and two fine ones on the tail and it is shorter and wider (table 5) compared to E. africanus. Eubostrichus africanus closely resembles E. longosetosus sp. n., but differs from it in that E. longosetosus has long cephalic and cervical setae and large sperm cells.

Eubostrichus longosetosus sp. n.
Tab. 4, Fig. 7 A-I

Material studied. Two males, one female.
Holotype δ slide no. 3896
Allotype δ slide no. 3897
Paratype δ slide no. 249

Type locality
Southern Bight of the North Sea; three localities (51° 28'N and 02° 15'E; 51° 19'N and 02° 40'E; 51° 15'N and 02° 37'E) along the Belgian coast at water depths of 32 m, 15 m and 14 m respectively. The sediment composition was 15.3% gravel, 0.93% silt and the median of the sand fraction was 255 μm diameter for the first locality, 3.42% gravel, 0.3% silt and the median of the sand fraction was 654 μm diameter for the second locality while the last locality had no gravel, 0.15% silt and the median of the sand fraction was 211 μm diameter.

Etymology
The species name is derived from Latin meaning long seta. This name was chosen as it describes the nature of the cephalic setae.

Measurements: see Table 4

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<th>Par. δ</th>
<th>All. δ</th>
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<td>L</td>
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<td>2 985</td>
<td>3 145</td>
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</tr>
<tr>
<td>b</td>
<td>25.6</td>
<td>25.6</td>
<td>36.1</td>
</tr>
<tr>
<td>c</td>
<td>35.7</td>
<td>33.9</td>
<td>35.3</td>
</tr>
</tbody>
</table>

Table 4. Measurements of Eubostrichus longosetosus sp. n.
Tableau 4. Dimensions de Eubostrichus longosetosus sp. n.
Figure 7. *Eubostrichus longosetosus* sp. n.

A: $\delta_2$ habitus
B: $\delta_1$ head region
C: $\delta_2$ head region
D: $\varphi_1$ head region
E: $\delta_2$ tail
F: $\delta_1$ left spicule
G: $\delta_1$ right spicule
H: $\varphi_1$ crescent-shaped microbes around mid body
I: $\delta_1$ sperm cell

Figure 7. *Eubostrichus longosetosus* sp. n.

A: $\delta_2$ habitus
B: $\delta_1$ région céphalique
C: $\delta_1$ région céphalique
D: $\varphi_1$ région céphalique
E: $\delta_2$ queue
F: $\delta_1$ spicule gauche
G: $\delta_1$ spicule droit
H: $\varphi_1$ bactéries en forme de croissant dans la région moyenne du corps
I: $\delta_1$ spermatozoïde
Numerous epidermal gland cells are spread over the whole body length in eight longitudinal rows. The amphidial fovea are spiral, loop shaped and ventrally wound; the corpus gelatum may be extruded and is then visible as a very long ribbon-like structure (88 μm in \(5\_1\)); the anterior border of the amphidial fovea is more heavily sclerotized than the posterior border which is not so pronounced (Fig. 6B). Buccal cavity slit-like, very small and without teeth. Pharynx very narrow except for the well developed rounded muscular terminal bulb. In its anterior part, the pharynx is slightly broader than in the middle part. Cardia very long (16 μm) with no clear cellular structure. Nerve ring at 54% of the neck length (Fig. 6D).

Monorchic with outstretched testis located to the right of the intestine. Very large sperm cells, i.e. 45 μm long and 9 μm wide with granular appearance are present at the posterior end of the testis (Fig. 7I). Spicules consist of three strongly sclerotized ribs from which the ventral one is often less developed. Depending on the angle of view, the capitulum is open or closed on its proximal part; distal tip pointed (Fig. 7F, G). Spicular protractor muscles extend between the dorsal part of the gubernaculum and between the ventral part of the capitulum and the ventral body wall (Fig. 7E). Gubernaculum is 13 μm (\(5\_1\)) or 16 μm (\(5\_2\)) long and is provided with strong protractors and retractors.

One thick precloacal subventral seta is present at both sides. Three pairs of caudal subventral thick (‘porids’) setae are also well-developed on the tail (Fig. 7E). These are in connection with the underlying gland cells. The tail has a blunt tip on which two pairs of setae are found; three caudal glands are present and open through a rather broad terminal opening. The body is surrounded by numerous crescent-shaped bacteria which considerably hide the internal structures (Fig. 7H).

 Females
No drawings were made of the single female found, because many structures were completely hidden by the bacteria (even the head end). Following observations were made:
- strong setae are absent on the tail;
- two reflexed ovaries (anterior, located on the right, posterior, located on the left, of the intestine) are present.

Differential Diagnosis
_Eubostrichus longosetosus_ is characterized by the presence of four cervical setae at the same level as the cephalic setae, by eight cervical setae, four in front of the amphid and four immediately behind it; the body is very slender (\(a = 121-157\)) and the tail is rather long (\(c' = 4.7-4.9\)). _Eubostrichus longosetosus_ is very similar to _E. parasitiferus_ because of the arrangement of the anterior sensilla. However, _E. longosetosus_ can be differentiated from _E. parasitiferus_ by the presence of an additional row of cervical setae far behind the amphid, the number (three and four pairs respectively) of the setae (‘porids’) at the tail, the more slender body (\(a = 75-100\) in _E. parasitiferus_ and the longer tail (\(c' = 2.5-2.6\) in _E. parasitiferus_) (Table 5).

_Eubostrichus longosetosus_ also resembles _E. hopperi_ but differs from it in that _E. hopperi_ has eight cervical setae in front and behind the amphid. _Eubostrichus longosetosus_ differs from _E. dianea_ in the shape of the terminal bulb, the short cardia and the copulatory apparatus (refer diagnosis for _E. africanus_). _Eubostrichus longosetosus_ resembles _E. africanus_ but it can be differentiated from it because of the shorter cephalic and cervical setae, the smaller sperm cells and the short and broad based tail setae (‘porids’) in _E. africanus_.

**Table 5.** Comparison of lengths, \(a\) and \(c'\) values of _Eubostrichus_ species

<table>
<thead>
<tr>
<th></th>
<th>Length</th>
<th>(a)</th>
<th>(c,\delta)</th>
<th>(c',\delta)</th>
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<td>3105-3854</td>
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<td>121-157</td>
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<td><strong>E. parasitiferus</strong></td>
<td>2800-2920</td>
<td>75-100</td>
<td>2.5-2.6</td>
<td>3.5</td>
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<tr>
<td><strong>E. hopperi</strong></td>
<td>2140-2680</td>
<td>70</td>
<td>3.4-3.9</td>
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<td><strong>E. gerlachi</strong></td>
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<td>1.7</td>
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<tr>
<td><strong>E. dianea</strong></td>
<td>2550-3370</td>
<td>53-55</td>
<td>2.4</td>
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</tr>
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</table>

**Discussion**
_Eubostrichus longosetosus_ is the first new species described, since 1869, from a site adjacent to the type locality of the first described species, _E. phalacrus_ Greeff, 1869. Two undescribed _Eubostrichus_ species were reported by Boucher (1980) from a close by site. Important differences are however present between _E. longosetosus_ and other _Eubostrichus_ species; _E. phalacrus_ is characterized by very long cephalic setae (about 1.5-2 times the cephalic diameter) while these are about a third head diameter in _E. africanus_ and one head diameter in _Eubostrichus longosetosus_. _Eubostrichus filiformis_ seems to lack (?) cephalic setae (not drawn and not mentioned in the description) and moreover it is about 8 mm long, while the new species from the Ceriops sediments, _E. africanus_, is about 4 mm, and the one from the North sea, _E. longosetosus_, is less than 4 mm long.

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References


