Two new free-living marine species of *Desmodorella* (Nematoda: Desmodoridae) from the continental shelf of Northeast Brazil, with an emended diagnosis of the genus and a dichotomous key to the species (#119644)

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Two new free-living marine species of *Desmodorella* (Nematoda: Desmodoridae) from the continental shelf of Northeast Brazil, with an emended diagnosis of the genus and a dichotomous key to the species

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Two new species of *Desmodorella* are described from sediment samples collected in the continental shelf of northeastern Brazil. Although the occurrence of the genus has been previously reported for this region, the present study presents the first two species of *Desmoderella* described from sediments collected along the Brazilian coast. *Desmodorella cornuta* sp. nov. possesses a protuberant horn-shaped cuticular projection positioned dorsally in the pharyngeal region, a unique characteristic among other species of the genus. *Desmodorella parabalteata* sp. nov. differs from other species by having a cephalic capsule and cuticle ornamented with vacuoles, multispiral amphidial fovea, longitudinal rows of ridges that are often indistinct under optical microscopy, two pairs of lateral rows with spines that are more distinct among the other rows of spines, thin spicules, practically straight, with a slightly swollen proximal end and no capitulum. An emended diagnosis of the genus and a dichotomous key to species are provided.

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Two new species of *Desmodorella* are described from sediment samples collected in the continental shelf of northeastern Brazil. Although the occurrence of the genus has been previously reported for this region, the present study presents the first two species of *Desmoderella* described from sediments collected along the Brazilian coast. *Desmodorella cornuta* **sp. nov.** possesses a protuberant horn-shaped cuticular projection positioned dorsally in the pharyngeal region, a unique characteristic among other species of the genus. *Desmodorella parabalteata* **sp. nov.** differs from other species by having a cephalic capsule and cuticle ornamented with vacuoles, multispiral amphidial fovea, longitudinal rows of ridges that are often indistinct under optical microscopy, two pairs of lateral rows with spines that are more distinct among the other rows of spines, thin spicules, practically straight, with a slightly swollen proximal end and no capitulum. An emended diagnosis of the genus and a dichotomous key to species are provided.

Key words: Desmodorinae, Potiguar Basin, Taxonomy, Desmodora, Nematode diversity.

Introduction

The Family Desmodoridae Filipjev, 1922 currently includes six subfamilies, 50 genera and about 430 species (Nemys, 2025). The available literature on the genus *Desmodorella* Cobb, 1933 records revisions that changed its status throughout its taxonomic history (Cobb, 1933; Gerlach, 1950; Wieser, 1954; Gerlach, 1963; Lorenzen, 1976; Verschelde, Gourbault & Vincx, 1998).

After being erected by Cobb (1933), Gerlach (1950) raised the hypothesis that the genus *Desmodorella* could be a subgenus of *Desmodora* de Man, 1889. Nevertheless, in the aforementioned study, Gerlach only mentions this possibility, without formally repositioning the taxon in question. Later, Wieser (1954), based on Gerlach (1950), reduced *Desmodorella* to a subgenus of *Desmodora*. Similarly, Gerlach (1963) in his review of the desmodorids, considered *Desmodorella* ~~as~~ a subgenus of *Desmodora*. The same author argued that several genera closely related to *Desmodora* had been described by Cobb (1920; 1933), but that, in his opinion, these taxa should be classified as subgenera of *Desmodora*. In the same study, Gerlach provided a key for the identification of the subgenera and used the morphology of the amphidial fovea as the primary character for the differentiation of the taxa.

Lorenzen (1976) disagreed with Gerlach (1963) regarding the differentiation of the subgenera *Desmodora* and *Desmodorella* through the morphology of the amphidial fovea and synonymized *Desmodorella* with the subgenus *Desmodora*. Verschelde, Gourbault & Vincx (1998) revised the genus *Desmodora* and, although they agreed with Lorenzen regarding the morphology of the amphidial fovea as an insufficient character for the differentiation of the genera, they disagreed with him regarding the synonymy between *Desmodorella* and *Demodora*. Verschelde, Gourbault & Vincx (1998) reconsidered *Desmodorella* as a genus of Desmodoridae and argued that *Desmodorella* can be easily distinguished from *Desmodora* by the presence of

longitudinal rows of ridges or spines along the body, where this characteristic is always present in *Desmodorella* species and absent in *Desmodora* species. Additionally, the authors mention that *Desmodorella* species present spicules without or with only a tiny capitulum and without velum.

Marine representatives of *Desmodorella* have been recorded throughout the Pacific (Verschelde, Gourbault & Vincx, 1998), Atlantic (Gerlach, 1950; Riera, Núñez & Brito, 2012), Indian (Annapurna *et al*., 2012) and Antarctic Oceans (Ingels *et al*., 2006), and can be found from the intertidal zone (Riera, Núñez & Brito, 2012) to the deep-sea (Verschelde, Gourbault & Vincx, 1998; Fadeeva, Mordukhovich & Zograf, 2016). The occurrence of this taxon has also been recorded in freshwater bodies (Gagarin & Nguyen, 2003; Decraemer & Smol, 2006). For the Brazilian coast, the occurrence of this genus was recorded in dissertations/theses for deep-sea regions in the Campos Basin, Southeast Brazil (Silva, 2012; Moura, 2013) and for the Continental Shelf of the Potiguar Basin, Northeast Brazil (Larrazábal-Filho, 2020).

This study details records of *Desmodorella* for the continental shelf of Northeastern Brazil, describes two new species and promotes the inclusion of new characters in the diagnosis of the genus. Here we also propose a dichotomous key based on male characteristics to facilitate the identification of the species of the genus. In addition, we highlight the main characteristics that, together, should be considered for the differentiation/identification of the species of the genus.

Material and methods

Study area and sampling (Table 1). The sediment for the study of these animals was obtained from two projects that carried out sampling at different stations along the coast of Northeast Brazil. Table 1 presents details of the collection stations relevant to this study. In both projects the sediment samples were taken in triplicate. For sediment collection, a box-corer or van Veen grab was used (see table 1), while meiofauna samples were collected with a 10 cm × 10 cm corer. The collected material was transferred into plastic containers and preserved using a 4% formaldehyde solution.

Laboratory processing. In the laboratory, sediment samples underwent sieving using a 0.500 mm mesh, followed by a 0.045 mm mesh sieve, which was employed to capture the meiobenthic organisms. The material retained in the 0.045 mm mesh was subsequently extracted using SICOL-40 colloidal silica solution (specific gravity 1.18) (Somerfield, Warwick & Moens, 2005).

Nematodes were counted and extracted under a stereomicroscope utilizing a Dollfus plate. Each specimen was subsequently placed into a small glass container filled with a solution comprising 99% formaldehyde (4%) and 1% glycerin (Solution 1 – De Grisse, 1969). The procedure for transferring each organism to glycerin was implemented, followed by diaphanization in accordance with the method outlined by De Grisse (1969). The specimens were then permanently mounted on glass slides, adapting the technique described by Cobb (1920). The genus was identified using the identification keys provided by Warwick, Platt & Somerfield (1998) as well as Decraemer & Smol (2006). Species identification was achieved by comparing their characteristics with those detailed in the original descriptions. Illustrations were created with the

assistance of an Olympus CX 31 optical microscope equipped with a drawing tube. Body measurements were recorded using a mechanical map meter.

For scanning electron microscopy (SEM), specimens were taken from previously mounted glycerin-paraffin slides. These specimens underwent rehydration using distilled water, following the procedure outlined by Abolafia (2015). Subsequently, the specimens were transferred to a meiofauna processing container, as described by Abolafia (2015), and subjected to a gradual dehydration process through a series of graded ethanol concentrations (10% for one day, followed by 20, 30, 40, 50, 60, 70, 80, 90, 92, 95, and two rounds of 100% on the second day, with transitions between concentrations occurring every two hours). After dehydration, the specimens were dried using a critical-point dryer. Finally, the specimens were removed from the container, placed on an aluminum stub ~~that was~~ covered with conductive tape, coated with gold, and examined under TM4000 SEM at 10 kV with a backscattered electron (BSE) detector or by combining this with the secondary electron (SE) detector.

The holotype and a female paratype of each species are held in the Nematoda Collection at the Museum of Oceanography Prof. Petronio Alves Coelho (MOUFPE) in Brazil. Additional paratypes are stored in the Meiofauna Laboratory within the Zoology Department at the Federal University of Pernambuco (NM LMZOO-UFPE).

The digital version of this article, presented in Portable Document Format (PDF), represents a published study in compliance with the standards established by the International Commission on Zoological Nomenclature (ICZN). As a result, the new names introduced in this digital edition are regarded as effectively published under the Code, relying exclusively on the electronic format. This research, along with its nomenclatural decisions, has been properly recorded in ZooBank, the online registration system of the ICZN.ZooBank Life Science Identifiers (LSIDs) are available for access, and the related information can be viewed in any standard web browser by adding the LSID to the prefix http://zoobank.org/. The LSID for this publication is: urn:lsid:zoobank.org:pub:0EC65900-F3B5-4486-B067-5721DAC18C4D. The online version of this research is preserved and can be accessed via the following digital repositories: PeerJ, PubMed Central, and CLOCKSS.

Results

SYSTEMATICS

Taxonomic classification, according to Decraemer & Smol (2006)

Class Chromadorea Inglis, 1983

Subclass Chromadoria Pearse, 1942

Order Desmodorida De Coninck, 1965

Suborder Desmodorina De Coninck, 1965

Superfamily Desmodoroidea Filipjev, 1922

Family Desmodoridae Filipjev, 1922

Subfamily Desmodorinae Filipjev, 1922

Genus *Desmodorella* **Cobb, 1933**

Diagnosis. (Emended from Leduc & Zhao, 2016) Annulated cuticle ornamented with longitudinal rows of ridges or hair-like spines (sometimes indistinct under light microscope). **Cuticular vacuoles present or absent**. Lateral alae absent. **Two pairs of lateral rows with more distinct spines, among the other rows of spines ("false lateral alae") present or absent. Two to eight longitudinal rows of somatic setae. Horn-shaped cuticular projections present or absent**. Head capsule truncated or rounded, smooth or ornamented with numerous vacuoles **(can be seen as smooth or wrinkle in SEM analysis)**. Cephalic setae anterior to or at level of the anterior edge of amphidial fovea. **Rows of subcephalic setae present or absent (additional setae may be present without forming rows)**. Large multispiral to loop-shaped amphidial fovea located on head capsule (**largest portion of the amphidial fovea on the labial region in *D. spineacaudata***). Pharynx with rounded or oval posterior bulb. Slender or filiform spicules, variable in length (short or elongated), **without prominent capitulum, without velum**. Gubernaculum present, with or without lateral pieces (crurae). **Precloacal supplements present or absent. Tail often conical, but may have a cylindrical terminal portion.**

Type species: *Desmodorella tenuispiculum* (Allgén, 1928) Verschelde, Gourbault & Vincx, 1998

Valid species of *Desmodorella* Cobb, 1933

The valid species list is based on Verschelde, Gourbault & Vincx (1998), Leduc & Zhao (2016) and the website Nemys (2025), with modifications:

Desmodorella abyssorum (Allgén, 1929) Gerlach, 1963

Syn *Desmodora abyssorum Allgén*, 1929

Desmodorella aquaedulcis (Gagarin & Nguyen, 2003) Decraemer & Smol, 2006

Syn *Desmodora aquaedulcis* Gagarin & Nguyen, 2003

Desmodorella balteata Verschelde, Gourbault & Vincx, 1998

Desmodorella cornuta **sp. nov.**

Desmodorella curvispiculum (Jensen, 1985) Verschelde, Gourbault & Vincx, 1998

Syn *Desmodora curvispiculum* Jensen, 1985

Desmodorella filispiculum (Lorenzen, 1976) Verschelde, Gourbault & Vincx, 1998

Syn *Desmodora filispiculum* Lorenzen, 1976

Desmodorella papillostoma (Murphy, 1962) Verschelde, Gourbault & Vincx, 1998

Syn *Desmodora papillostoma* Murphy, 1962

Desmodorella parabalteata **sp. nov.**

Desmodorella perforata (Wieser, 1954) Verschelde, Gourbault & Vincx, 1998

Syn *Desmodora perforata* Wieser, 1954

Desmodora wieseri Inglis, 1968

Desmodora wolfgangi (Inglis, 1968)

Xenodesmodora wieseri Inglis, 1968

Desmodorella sanguinea (Southern, 1914) Verschelde, Gourbault & Vincx, 1998

Syn *Desmodora sanguinea* Southern, 1914

Desmodorella schulzi (Gerlach, 1950) Verschelde, Gourbault & Vincx, 1998

Syn *Desmodora schulzi* Gerlach, 1950

Desmodorella sinuata (Lorenzen, 1976) Verschelde, Gourbault & Vincx, 1998

Syn *Desmodorella sinuata* Lorenzen, 1976

Desmodorella spineacaudata Verschelde, Gourbault & Vincx, 1998

Desmodorella tenuispiculum (Allgén, 1928) Verschelde, Gourbault & Vincx, 1998

Syn *Desmodora (Desmodorella) cephalata* Cobb, 1933

Desmodora cephalata (Cobb, 1933)

Desmodora cephalia (Cobb, 1933) Gerlach & Riemann, 1973

Desmodora tenuispiculum Allgén, 1928

Desmodorella cephalia (Cobb, 1933) Gerlach & Riemann, 1973

Desmodorella verscheldei Leduc & Zhao, 2016

Invalid species

Desmodorella hirsuta (Chitwood, 1936) Verschelde, Gourbault & Vincx, 1998 (*nomen dubium*)

Desmodorella bullata (Steiner, 1916) Verschelde, Gourbault & Vincx, 1998 (*taxon inquirendum*)

Description of new species.

Desmodorella cornuta **sp. nov.**

(Table 2; figures 1–3)

Material studied. Holotype male (MOUFPE 0034), paratype female 1 (MOUFPE 0035), 2 male paratypes (511–512 NM LMZOO-UFPE) and 2 female paratypes (513–514 NM LMZOO-UFPE).

Type locality. South Atlantic Ocean, Continental shelf of the State of Rio Grande do Norte (Potiguar Basin), Brazil, station ME2B2R3 (S 5°02'30.3"S W 36°23'12.3"), June, 2013, 8.5m.

Locality of paratypes. **Paratype female 1**: South Atlantic Ocean, Continental shelf of the State of Rio Grande do Norte (Potiguar Basin), Brazil, (S 5°02'29.6" W 36°23'11.9"), June, 2013, 8.5 m. **Male paratypes**: (1) South Atlantic Ocean, Continental shelf of the State of Rio Grande do Norte (Potiguar Basin), Brazil, (S 5°01'12.4"S W 36°23'27.6"), June, 2012, 8.1 m; (2) South Atlantic Ocean, Continental shelf of the State of Rio Grande do Norte (Potiguar Basin), Brazil, (S 05°02'29.6" W 36°23'11.9"), 8.5 m. **Female paratypes 2 and 3**: South Atlantic Ocean, Continental shelf of the State of Rio Grande do Norte (Potiguar Basin), Brazil, (S 5°01'12.4"S W 36°23'27.6"), June, 2012, 8.1 m.

Etymology. The specific epithet of the *Desmodorella cornuta* **sp. nov.** is due to the presence of horn-shaped cuticular projections positioned dorsally.

Holotype male. Body cylindrical (1,254 µm long), narrowest in region between the base of the pharynx and anterior end of testis and widest in the region of the testis. Maximum body diameter corresponding to 2.2 times the head diameter. Cuticle coarsely annulated and ornamented with transversal rows of small vacuoles. Cuticle pattern differs along the body. Annules in the anterior pharyngeal region of the body are broad and widely spaced (first ten annules below the head capsule = 30 µm), gradually narrowing (in thickness and spacing) towards the mid-body region (ten annules in the mid-body region = 18 µm) and expanding from the precloacal region towards the tail (ten annules occupy about 20 µm in the tail). Twelve longitudinal rows of hair-like spines, sometimes difficult to see under light microscopy, (5–7 µm long) arranged along the body, most clearly visible about 85 µm from the base of the pharynx, extending to the precloacal region. About 136 µm from the base of the pharynx, the two sublateral pairs of longitudinal spines come together laterally, forming "false lateral alae" (as mentioned by Verschelde, Gourbault & Vincx, 1998) composed of shorter and more robust spines that extend to the region of the beginning of the testis. After the "false lateral alae" end, the rows move apart, and the spines resume the morphology observed in the other rows. Somatic setae (3–8 µm long) arranged in two longitudinal rows (one dorsal and other ventral longitudinal rows) along the entire body except in the tail region. Protuberant horn-shaped cuticular projection (9 µm long) positioned dorsally at the 14th annule (64.5 µm from the anterior end or 44% of the pharynx length). Long, well-developed head capsule ornamented with numerous small vacuoles below the amphidial fovea. Anterior sensilla arranged according to 6+6+4 pattern: six inner labial papillae, six outer labial papillae setiform (about 2 µm long) and four small cephalic setae (3.5 µm long). Cephalic setae corresponding to 16% of the head diameter. Rows of subcephalic setae absent. Two additional setae (about 3 µm long), one dorsal and the other ventral, posteriorly located on the head capsule. Amphidial fovea distinctly sclerotized, multispiral, about 3 turns, occupying 43% of corresponding body diameter and located 3.5 µm from anterior end (about 0.2 times the head diameter). Buccal cavity with a strong dorsal tooth and a small ventrosublateral tooth. Pharynx muscular (145 µm long), cylindrical forming slightly oval terminal bulb that occupies 49% of the corresponding body diameter. Nerve, Secretory-excretory system and cardia not observed. Reproductive system with single anterior outstretched testis to the left of intestine. Spicules slender (79 µm long), arched ventrally, with slightly swollen proximal end (2.6 times the cloacal body diameter) and without capitulum. Gubernaculum with short lateral crurae. Precloacal supplements absent. Caudal glands indistinct. Tail conical elongated, about 4 times the cloacal body diameter.

Paratype female 1. Largely similar to male. Body measuring 1,221 µm in length, with a maximum diameter of 57 µm at the level of the vulva (about 2.4 times the head diameter). Cuticular annule pattern similar to male (first ten annules below the head capsule = 27 µm; ten annules in the narrowest body region = 16 µm and ten annules in the tail = 19 µm). Several apparently incomplete or bifurcated annules present along the body (more visible at the pharynx level). Longitudinal rows of hair-like spines and head capsule largely similar to male. Somatic setae arranged similarly to male and visible along approximately the first two-thirds of the body. Horn-shaped cuticular projection (8 µm long) positioned dorsally at the 13th annule (56 µm from the anterior end or 39% of the pharynx length). Labial region invaginated. Cephalic setae correspond to 13% of the head diameter. Amphidial fovea similar to male. Basal bulb occupies 38% of the corresponding body diameter. Vulva located 858 µm from anterior end, at 70% of body length. Reproductive system didelphic, with reflexed ovaries. Tail conical elongated, 4.3 times the cloacal body diameter.

Diagnosis. *Desmodorella cornuta* **sp. nov.** characterized by the combination of the following characters: cuticle coarsely annulated and ornamented with transversal rows of small vacuoles; protuberant horn-shaped cuticular projection positioned dorsally between 38–44% of the pharynx length; twelve longitudinal rows of hair-like spines arranged along of the body; two pairs of lateral rows with more distinct spines among the other rows of spines (false lateral alae); head capsule ornamented with numerous small vacuoles; amphidial fovea multispiral (about 3 turns) occupying 42–51% of the corresponding body diameter; rows of subcephalic setae absent and additional setae present; tail conical (3.7–4.4 times the cloacal/anal body diameter); males with slender, ventrally arched spicules (55–79 µm long; 2–2.6 times the cloacal body diameter) and with slightly swollen proximal end.

Differential diagnosis (Table 3). *Desmodorella cornuta* **sp. nov.** shares with *D. curvispiculum* (Jensen, 1985) Verschelde, Gourbault & Vincx, 1998, *D. perforata* (Wieser, 1954) Verschelde, Gourbault & Vincx, 1998 and *D. balteata* Verschelde, Gourbault & Vincx, 1998 the following features: head capsule ornamented with numerous small vacuoles; length of the spicules (table 3) and rows of subcephalic setae absent. Additionally, *D. cornuta* **sp. nov.** and *D. balteata* share the presence of "false lateral alae". However, *D. cornuta* **sp. nov.** is the only species of *Desmodorella* that has a protuberant horn-shaped cuticular projection positioned dorsally in the pharynx region (between 38–44% of the pharynx length). This characteristic facilitates its identification and differentiates *Desmodorella cornuta* **sp. nov.** from both *D. curvispiculum*, *D. perforata*, *D. balteata* and the other valid species of the genus.

Desmodorella parabalteata **sp. nov.**

(Table 4; figures 4–8)

Material studied. Holotype male (MOUFPE 0036), paratype female 1 (MOUFPE 0037), 10 male paratypes (515–524 NM LMZOO-UFPE) and 8 female paratypes (525–532 NM LMZOO-UFPE).

Type locality. South Atlantic Ocean, Continental shelf of the State of Bahia, Brazil, (S 13°04'10.32" W 38°25'46.98"), Dezember 11, 2019, 65 m.

Locality of paratypes. **Paratype female 1**: South Atlantic Ocean, Continental shelf of the State of Sergipe, Brazil, (S 11°00'00.54" W 36°49'58.98"), December 10, 2019, 54 m. **Male paratypes**: (1 and 2) South Atlantic Ocean, Continental shelf of the State of Bahia, Brazil, (S 13°04'10.32" W 38°25'46.98"), Dezember 11, 2019, 65 m; (3–7) South Atlantic Ocean, Continental shelf of the State of Sergipe, Brazil, (S 11°00'00.54" W 36°49'58.98"), December 10, 2019, 54 m; (8) South Atlantic Ocean, Continental shelf of the State of Sergipe, Brazil, (S 10°44'59.28" W 36°25'32.88"), December 09, 2019, 58 m; (9 and 10) South Atlantic Ocean, Continental shelf of the State of Alagoas, Brazil (S10°07'05.7" W 35°50'58.0"), December 09, 2019, 63 m. **Other female paratypes**: (2, 3 and 7) South Atlantic Ocean, Continental shelf of the State of Sergipe, Brazil, (S 11°00'00.54" W 36°49'58.98"), December 10, 2019, 54 m; (4, 5 and 9) South Atlantic Ocean, Continental shelf of the State of Bahia, Brazil, (S 13°04'10.32" W 38°25'46.98"), December 11, 2019, 65 m; (6 and 8) South Atlantic Ocean, Continental shelf of the State of Alagoas, Brazil (S10°07'05.7" W 35°50'58.0"), December 09, 2019, 63 m.

Etymology. The specific epithet of the *Desmodorella parabalteata* **sp. nov.** is due to the similarity with the specie *Desmodorella balteata*.

Holotype male. Body cylindrical (697.5 µm long), narrowest ~~in the region~~ between ~~the~~ base of ~~the~~ pharynx and anterior end of ~~the~~ testis ~~and~~ widest in the region of the testis. Maximum body diameter corresponding to 2.1 times ~~the~~ head diameter. Cuticle annulated ~~and~~ ornamented with transversal rows of small vacuoles (more evident in ~~the~~ pharyngeal region). Cuticle pattern differs along ~~the~~ body. Annules in the anterior pharyngeal region of the body are broad (first ten annules below ~~the~~ head capsule = 16.5 µm), gradually narrowing towards ~~the region of~~ widest body ~~diameter~~ (ten annules ~~in the widest body region~~= 6 µm) ~~and~~ expanding progressively from ~~the level of the~~ proximal region of ~~the~~ spicule ~~towards the~~ tail (~~ten rings occupy about 11 µm in the tail~~). Only in paratype male 9 are longitudinal rows of ridges or short spines visible under light microscopy (Fig 5C) (indistinct in the holotype under light microscopy). About 30 µm from the base of the pharynx, two sublateral pairs of longitudinal spines come together laterally, forming "false lateral alae" (as mentioned by Verschelde, Gourbault & Vincx, 1998) composed of more robust spines that extend to the first third of the testis. Somatic setae arranged in six longitudinal rows (four sublateral, one dorsal, and one ventral ~~longitudinal row~~). Dorsal and ventral rows of somatic setae ~~(~~2–7 µm long~~)~~ present along ~~the~~ entire body except ~~in the~~ tail region. Sublateral rows of somatic setae (<2–6 µm long) visible about 70 µm from the base of the pharynx to the caudal region. In the region of the smallest body diameter, setae of the sublateral rows are small and difficult to see. In the widest body region, sublateral setae are longer and those closest to the precloacal region are slightly more robust than the other somatic setae. Long, well-developed head capsule ornamented with numerous small vacuoles below ~~the~~ amphidial fovea. Anterior sensilla arranged according to 6+6+4 pattern: six inner labial papillae, six outer labial setae (about 3 µm long) and four small cephalic setae (4 µm long). Cephalic setae corresponding to 21% of ~~the~~ head diameter. Rows of subcephalic setae absent. Two additional setae, one dorsal and the other ventral (about 2 µm long). Amphidial fovea distinctly sclerotized, multispiral, about 3.5 turns ~~(~~52% of ~~the corresponding~~ body diameter~~)~~, ~~with~~ anterior edge at ~~the~~ same level as ~~the~~ cephalic setae ~~and~~ located 6.5 µm from anterior end (about 0.3 times ~~the~~ head diameter). Buccal cavity with a strong dorsal tooth and a small ventrosublateral tooth. Pharynx muscular ~~(~~123 µm long~~)~~, cylindrical ~~forming~~ slightly oval terminal bulb ~~that occupies~~ 55% of ~~the~~ corresponding body diameter. Nerve,

secretory-excretory system and cardia not observed. Reproductive system with single anterior outstretched testis to the left of intestine. Spicules slender (36.5 µm long; 1.7 times the cloacal body diameter), practically straight, with slightly swollen proximal end and without capitulum. Gubernaculum funnel-shaped surrounding the spicules at the distal end. Precloacal supplements absent. Three caudal glands. Tail conical elongated, about 5 times the cloacal body diameter.

Paratype female 1. Largely similar to male. Body measuring 795 µm in length, with a maximum diameter of 51 µm at the level of the vulva. Cuticular annule pattern similar to male (first ten annules below the head capsule = 20 µm; ten annules in widest body region= 6.5 µm and ten annules in the tail = 13 µm). Longitudinal rows of ridges visible under light microcopy in female paratypes 6, 7 and 9 (Fig 6C) (indistinct in paratype female 1). Somatic setae (<2–8 µm long) arranged similarly to male (but in smaller numbers) and distributed along the entire body except in the tail region. Head capsule largely similar to male. Labial region invaginated. Cephalic setae correspond to 22% of the head diameter. Amphidial fovea similar to male. Basal bulb occupies 70% of the corresponding body diameter. Vulva located 510 µm from anterior end, at 64% of body length. Reproductive system didelphic, with reflexed ovaries. Three caudal glands. Tail conical elongated, 4 times the cloacal body diameter.

SEM analyses. **Male paratypes (8 and 10) and Paratype female 3:** Wrinkled head capsule (Fig 7B, C and 8B). Cuticular annules of the first third of the body are ornamented with numerous bars arranged transversely (Fig 7B, C, D and 8B). Towards the second third of the body (towards the narrowest region of the body), the number of bars decreases and, apparently, they elongate forming structures similar to short spines organized in longitudinal rows (Fig 7E). The number of longitudinal rows varies along the body (it is not possible to determine precisely the number of rows). Bifurcated cuticular annules occur along the body. Spines of the false lateral alae are largest in the anterior portion of the rows and progressively decrease in size toward the end (Fig 7E and 8C). After the false lateral alae end, the rows move apart, and the spines resume the morphology observed in the other rows (Fig 8D).

Diagnosis. *Desmodorella parabalteata* **sp. nov.** characterized by the combination of the following characters: cuticle coarsely annulated and ornamented with transversal rows of small vacuoles (numerous bars arranged transversely in SEM analysis); longitudinal rows of ridges or short spines (often indistinct under light microscopy) arranged along the body; two pairs of lateral rows with more distinct spines among the other rows of spines (false lateral alae); somatic setae arranged in six longitudinal rows (four sublateral, one dorsal, and one ventral longitudinal row); head capsule ornamented with numerous small vacuoles below the amphidial fovea (head capsule wrinkled in SEM analysis); amphidial fovea multispiral, about 3.5 turns, with anterior edge at the same level as the cephalic setae and occupying 43–59% of the corresponding body diameter; rows of subcephalic setae absent and additional setae present; tail conical elongated (4–6 times the cloacal/anal body diameter); males with slender and practically straight spicules (25–41.5 µm long; 1.4–1.8 times the cloacal body diameter), with slightly swollen proximal end and without capitulum.

Differential diagnosis. *Desmodorella parabalteata* **sp. nov.** is closely related to *D. balteata*. These species share a large number of characteristics, including: cephalic capsule ornamented with numerous small vacuoles below the amphidial fovea; absence of subcephalic setae; multispiral

amphidial fovea; longitudinal rows of ridges often indistinct under light microcopy; two pairs of lateral rows with more distinct spines among ~~the~~ other rows ~~of spines~~ (false lateral alae); six longitudinal rows of somatic setae. Together, these characteristics, separate both species from the others classified in *Desmodorella*.

Yet, *D. parabalteata* **sp. nov.** differs from *D. balteata* in the following features: presence of cuticular vacuoles in *D. parabalteata* **sp. nov.** [versus (*vs*) absent in *D. balteata*]; number of amphid turns (3.5 turns in the new species *vs* 2.6 turns in *D. balteata*); spicule length (25–41.5 µm long in *D. parabalteata* **sp. nov.** *vs* 65–85 µm long in *D. balteata*); spicule morphology (males with thin, practically straight spicules, with a slightly swollen proximal end and without capitulum in *D. parabalteata* **sp. nov.** *vs* males with slightly arched spicules, with a tiny, rounded capitulum in *D. balteata*). In addition, males of *D. balteata* present a ventral row of strongly built precloacal setae, a feature ~~that is~~ absent in the new species.

Dichotomous identification key for valid species of *Desmodorella* Cobb, 1933

1. Multispiral (2 or more turns) amphidial fovea.....2

- Multispiral (less than 2 turns) or not multispiral amphidial fovea.....3

2. Spicules greater than 100 µm long….....4

- Spicule less than 100 µm long….....5

3. Spicules greater than 100 µm long……..6

- Spicule less than 100 µm long….....9

4. Amphidial fovea ~~completely positioned in the~~ main part of ~~the~~ head capsule; presence of vacuoles in the head capsule……..…….....7

- Anterior edge of the amphidial fovea located in ~~the~~ lip region and posterior edge ~~located anteriorly~~ in ~~the~~ head capsule; smooth head capsule; four ventrosublateral rows of ~~thorns (3–4 thorns per row)~~ on ~~the~~ tail…….*D. spineacaudata*

5. Head ~~capsula does not bulge medially~~; gubernaculum less than $^{1}/_{3}$ of ~~the length of the spicules~~.....8

- Head capsule ~~bulges strongly medially at the level of the amphidial fovea;~~ gubernaculum equivalent to about ½ of spicule length……...……..*D. abyssorum*

6. Spiral (cryptospiral) amphidial fovea; absence of two lateral pairs of longitudinal rows of larger spines (“false lateral alae” absent)……..……11

- Question mark-shaped amphids (amphidial fovea loop-shaped); presence of two lateral pairs of longitudinal rows of larger spines (“false lateral alae” present)….*D. verscheldei*

7. Spicules (220–250 µm length) sinuous in the posterior portion; short subcephalic setae; “false lateral alae” present; 12 longitudinal rows of hair-like spines.....*D. sinuata*

- Arched spicules (about 150 µm long); elongated cephalic and subcephalic setae; “false lateral alae” absent.....*D. papillostoma*

8. Presence of two pairs of lateral rows with more distinct spines, among the other rows of spines (“false lateral alae” present).……12

- “False lateral alae” absent……..……..……..……...13

9. Spiral (loop-shaped) amphidial fovea……..…….……10

- Unispiral amphidial fovea……..…....……..*D. aquaedulcis*

10. Elongated subcephalic setae (2 circles ~~with~~ 8 subcephalic setae each); smooth cephalic capsule; 8–12 longitudinal rows of hair-like spines; precloacal supplements in form of four rows of triangular cuticular spines; “false lateral alae” present; shoe-shaped gubernaculum…….…….....……..*D. schulzi**

- Short subcephalic setae; head capsule with vacuoles after the amphidial fovea; lamellar gubernaculum……...*D. perforata*

11. Spicule length between 240–325 µm long; sixteen (16) longitudinal rows of hair-like spines……..……..*D. filispiculum*

- Spicule length between 182–224 µm long; ten (10) longitudinal rows of hair-like spines ……..……*D. sanguinea*

12. Protuberant horn-shaped cuticular projection positioned dorsally at the pharynx level; two longitudinal rows of somatic setae……*D. cornuta* **sp. nov.**

- Horn-shaped cuticular projection ~~positioned dorsally at the pharynx level~~ absent; six longitudinal rows of somatic setae……...14

13. Subcephalic setae absent; 10–14 longitudinal rows of ridges.……*D. curvispiculum*

- Subcephalic setae present; 12–24 longitudinal rows of ridges.....….*D. tenuispiculum***

14. Cuticular vacuoles absent; spicules (65–85 µm long) slightly arched, with a tiny, rounded capitulum.; ventral row of strongly built precloacal setae……..…….*D. balteata*

- Cuticular vacuoles present; spicules (25–41.5 µm long) practically straight, with slightly swollen proximal end and without capitulum……..*D. parabalteata* **sp. nov.**

(*): Vincx (1983), redescribed *D. schulzi* and mentioned that this species presents what, like Verschelde, Gourbault & Vincx (1998), we call here "false lateral alae" and 12 longitudinal rows of hair-like spines.

(**): original description of *D. tenuispiculum* does not report the number of longitudinal rows of ridges; 12–20 rows in *D. cephalata* sensu Chitwood (1936); 16 rows in *D. cephalata* sensu Gerlach (1950); 24 rows sensu Gerlach (1963); 12 rows sensu Boucher (1975); 15 sensu Platt & Warwick (1988); 16–18 sensu Fadeeva, Mordukhovich & Zograf (2016).

Discussion

Gerlach, 1950 described *Desmodora schulzi* and, years later in his revision (Gerlach, 1963), synonymized *Desmodora schulzi* with *Heterodesmodora hirsuta* Chitwood, 1936 establishing the new combination *Desmodora hirsuta* (Chitwood, 1936). Vincx (1983) redescribed *Desmodora schulzi*, disagreeing with Gerlach (1963) ~~regarding the~~ proposed synonymy and indicated the characteristics that segregate *Heterodesmodora hirsuta* from *Desmodora schulzi*. Later, Verschelde, Gourbault & Vincx (1998) transferred both species to the genus *Desmodorella*, considering them ~~as~~ valid and distinct from each other. We agree with Vincx (1983) and Verschelde, Gourbault & Vincx (1998) in treating *Desmodorella hirsuta* and *Desmodorella schulzi* as distinct species, and therefore not synonymous. When comparing females of both species, it is possible to note that, with the exception of the total body length and the de Man ratio "c", other features and body proportions differ (see the comparison between these taxa in the discussion section in Vincx, 1983). Additionally, although both species share the number of longitudinal rows of spines (*D. hirsuta*: 10 rows; *D. schulzi*: 8–10 rows), this feature is not sufficient to synonymize the species. Similar to the aforementioned species, *D. sanguinea* also has 10 longitudinal rows of spines, and is easily distinguished from *D. schulzi* by comparing the characteristics present in males (spicules length, morphology of the gubernaculum and precloacal supplements). However, we disagree with Vincx (1983) and Verschelde, Gourbault & Vincx (1998) regarding the validity of *D. hirsuta*. Since this species was described based on a female (Chitwood, 1936), which makes it difficult to differentiate/identify it from other *Desmodorella* species, we believe that there is no sustainable evidence to consider it as a valid species. Here, we formally suggest that *Desmodorella hirsuta* (Chitwood, 1936) Verschelde, Gourbault & Vincx, 1998 be regarded as a *nomen dubium*.

To develop the dichotomous key, the main characteristics that, together, effectively helped distinguish the *Desmodorella* species were: morphology and number of turns of the amphidial fovea; spicule length (short or elongated) and morphology; presence/absence of vacuoles in the head capsule, as well as in the rings along the body; presence/absence and morphology (elongated or short) of the subcephalic setae; presence/absence of two pairs of lateral rows of more distinct spines, among the other rows of spines (referred to by Verschelde, Gourbault & Vincx (1998) as "false lateral alae"); number of longitudinal rows of somatic setae; number of longitudinal rows of ridges or spines; and morphology of the precloacal supplements. Although relevant characteristics for species identification/differentiation, the presence/absence of subcephalic setae and the number of longitudinal rows of ridges or spines should be analyzed with caution. Subcephalic setae can be lost during specimen preparation, and their presence, in some cases such as in *D. filispiculum*, is inferred due to the visualization of the insertion point of the setae (Lorenzen, 1976). The number of longitudinal rows of ridges or short spines can often be difficult to determine, especially through optical microscopy, as mentioned by Verschelde, Gourbault & Vincx (1998) when describing *D. balteata*. Despite providing SEM analyses, Verschelde, Gourbault & Vincx (1998) did not mention the number of longitudinal rows of spines that occur in *D. balteata* and *D. spineacaudata*. When redescribing *D. tenuispiculum,* Fadeeva, Mordukhovich & Zograf (2016) reported that the

visualization of rows was only possible through SEM analyses. Although it was possible to visualize the rows of ridges in some paratypes of *D. parabalteata* **sp. nov.**, the SEM analysis allowed us to demonstrate the configuration of these structures more clearly. However, it was not possible to precisely determine the number of rows that occur in the referred species, with variation in the number of rows along the body (greater number of rows in the widest part in relation to the median region where the body narrows) combined with the occurrence of discontinuous rows. The literature on *D. tenuispiculum* records a large variation in the number of longitudinal rows of ridges present in this species. When describing *D. tenuispiculum*, Allgén (1928) did not indicate the number of rows present in the species. In subsequent redescriptions, the number of rows varied between 12 and 24 (Chitwood, 1936; Gerlach, 1950 and 1963; Boucher, 1975; Platt & Warwick, 1988; Fadeeva, Mordukhovich & Zograf, 2016). Similarly, when redescribing *D. schulz,* Vincx (1983) reports the presence of 12 longitudinal rows of hair-like spines along the body, while the original description (Gerlach, 1950) reports that there are 8–10 rows. These variations may be due to the difficulty in visualizing and determining the number of rows or reflect an intraspecific variation regarding this feature. Therefore, it is extremely important that the characteristics found in *Desmodorella* species are analyzed together to determine/identify the species.

Desmodorella cornuta **sp. nov.** possesses a protuberant horn-shaped cuticular projection positioned dorsally in the pharyngeal region. This feature is unique among the *Desmodorella* species but can be observed in the Desmodoridae genus *Spinonema* Larrazábal-Filho *et al*., 2019. This genus encompasses species that possess a strongly cuticularized dorsal spine located in the pharyngeal region. However, *Spinonema* species have C-shaped anteriorly oriented lateral alae (without spines) and spicules in which the velum may be present. *Desmodorella cornuta* **sp. nov.**, on the other hand, has two pairs of lateral rows with more distinct spines, among the other rows of spines and spicules without velum, a combination of characteristics typically found in representatives of the genus *Desmodorella*. The genus *Spinonema* was originally described from specimens found in sediment samples collected in the Potiguar Basin, Northeastern coast of Brazil, the same type locality as *Desmodorella cornuta* **sp. nov**. We believe that the occurrence of similar structures in different Desmodoridae genus may reflect a process of adaptive convergence. The occurrence of a protuberant horn-shaped cuticular projection in the pharyngeal region was included in the diagnosis of the genus.

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Figure 1

Figure 1. *Desmodorella cornuta* sp. nov. Holotype male and paratype female 1.

Holotype male: (A) overview; (B) cuticle - 1: at the pharynx level, 2: at the beginning of the false lateral alae; 3: at the end of the of the false lateral alae), (C) anterior region, (D) buccal cavity, (E) spicule and gubernaculum. Paratype female 1: (F) overview, (G) anterior region.

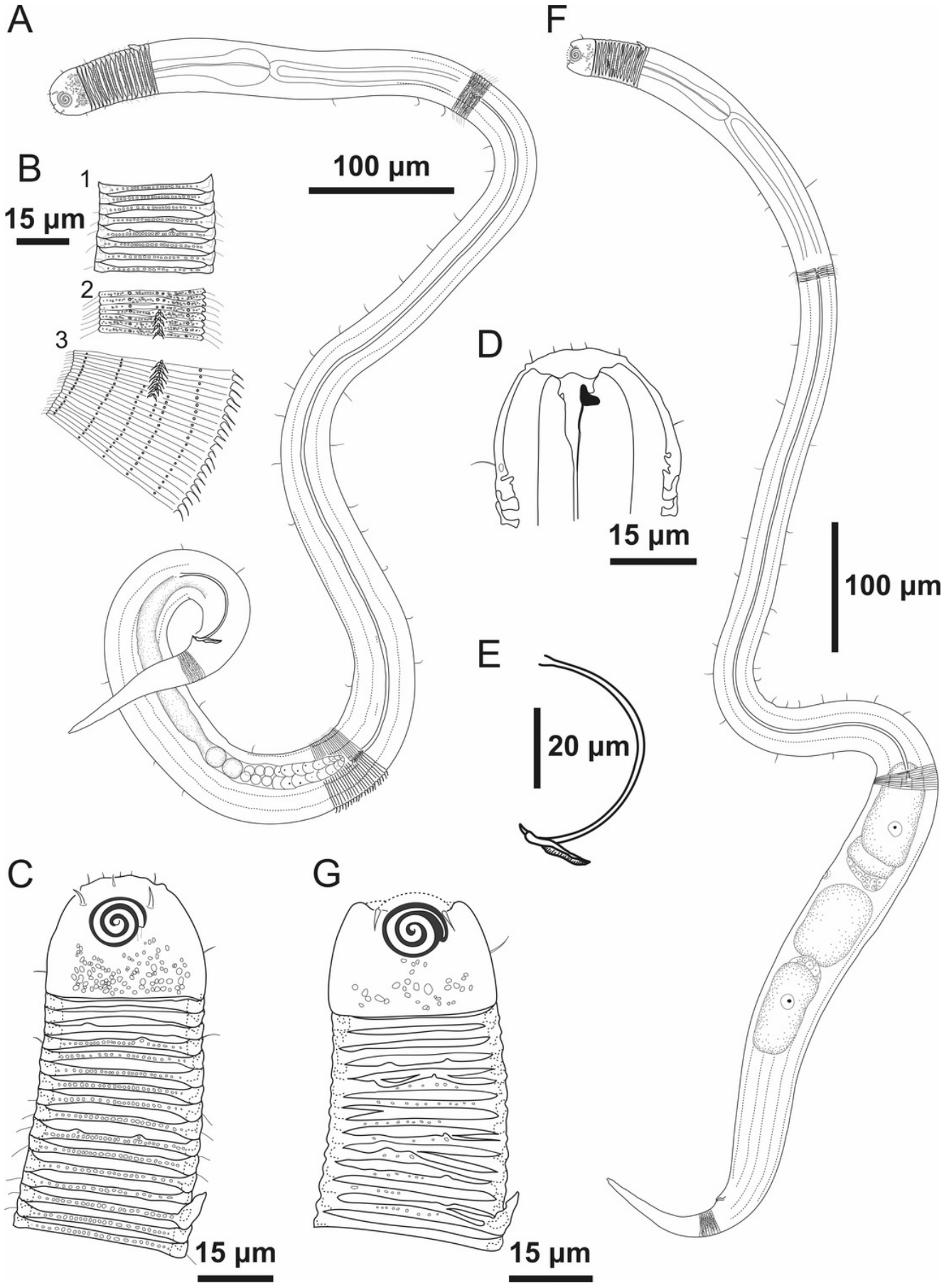
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Figure 2

Figure 2. *Desmodorella cornuta* sp. nov. Holotype male.

(A) Anterior end (cs: cephalic setae; amph: amphidial fovea), (B) anterior end (ils: inner labial setae; ols: outer labial setae; dt: dorsal tooth; hscp: horn-shaped cuticula projection), (C) anterior region, (D) beginning of the false lateral alae, (E) end of the of the false lateral alae, (F) cuticular hair-like spine and somatic setae (ss), (G) spicule, (H) gubernaculum (gub), (I) tail.

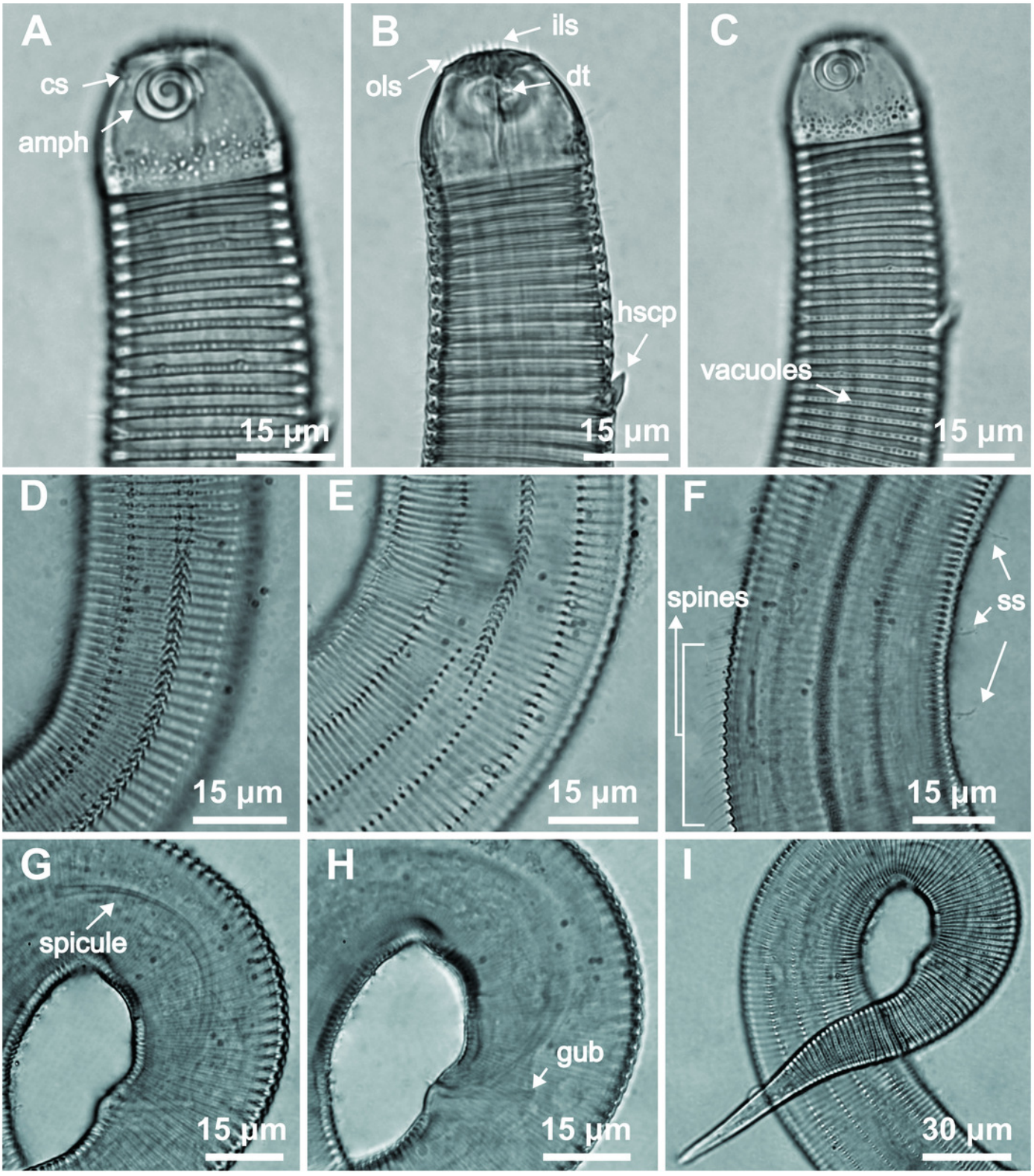
A
cs
amph
15 µm
B
ils
ols
dt
hscp
15 µm
C
vacuoles
15 µm
D
15 µm
E
15 µm
F
spines
ss
15 µm
G
spicule
15 µm
H
gub
15 µm
I
30 µm

Figure 3

Figure 3. *Desmodorella cornuta* sp. nov. Paratype female 1.

(A) anterior region (cs: cephalic setae; amph: amphidial fovea); (B) anterior region (dt: dorsal tooth; hscp: horn-shaped cuticular projection), (C) beginning of the false lateral alae; (D) end of the of the false lateral alae, (E) reproductive system (V: vulva; ant. ov.: anterior ovary), (F) posterior ovary (post. ov.), (G) tail.

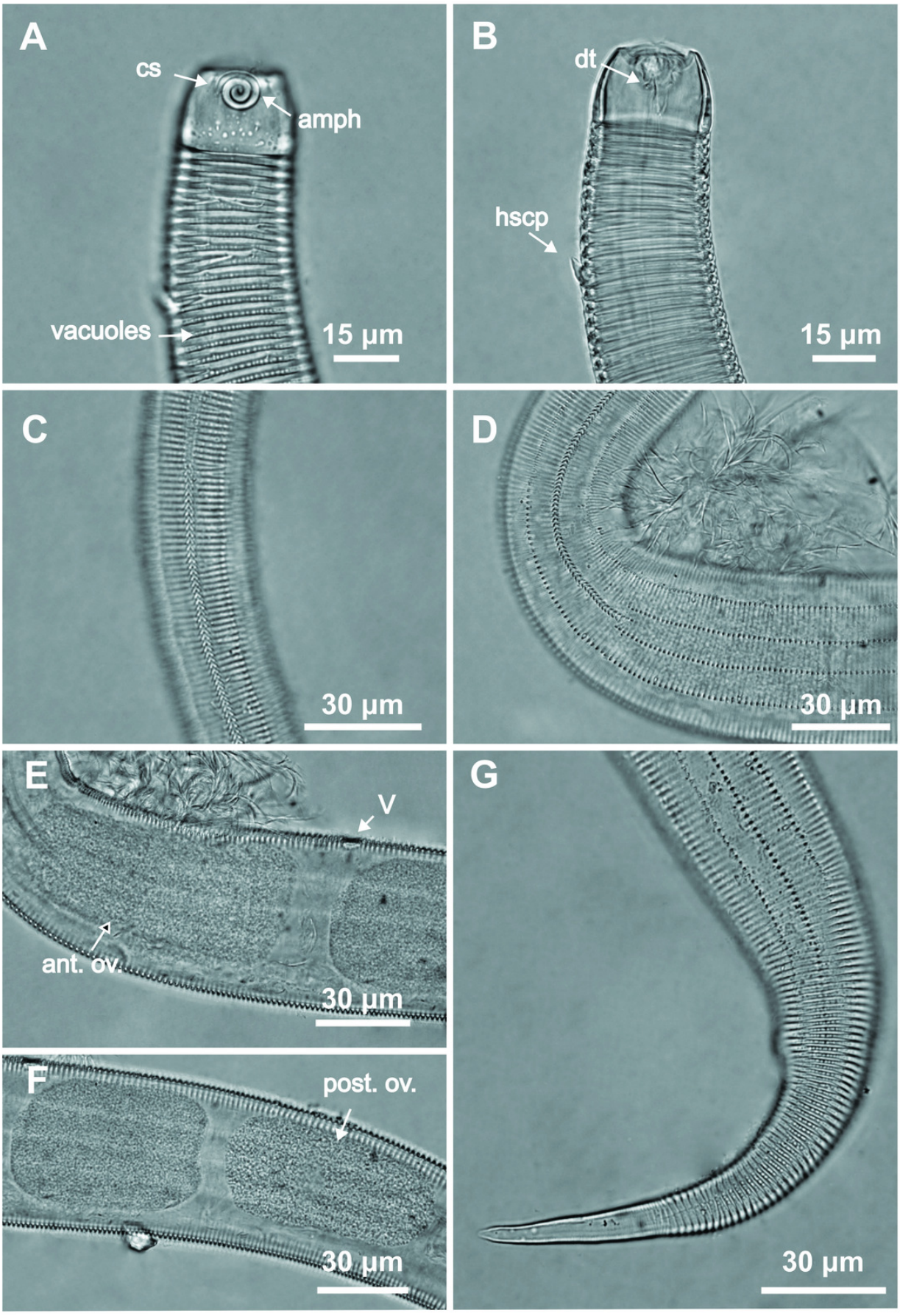
A
cs
amph
vacuoles
15 µm
B
dt
hscp
15 µm
C
30 µm
D
30 µm
E
V
ant. ov.
30 µm
F
post. ov.
30 µm
G
30 µm

Figure 4

Figure 4. *Desmodorella parabalteata* sp. nov. Holotype male and paratype female 1.

Holotype male: (A) overview; (B) anterior end (C) buccal cavity, (D) posterior end, Paratype female 1: (E) overview, (F) anterior end.

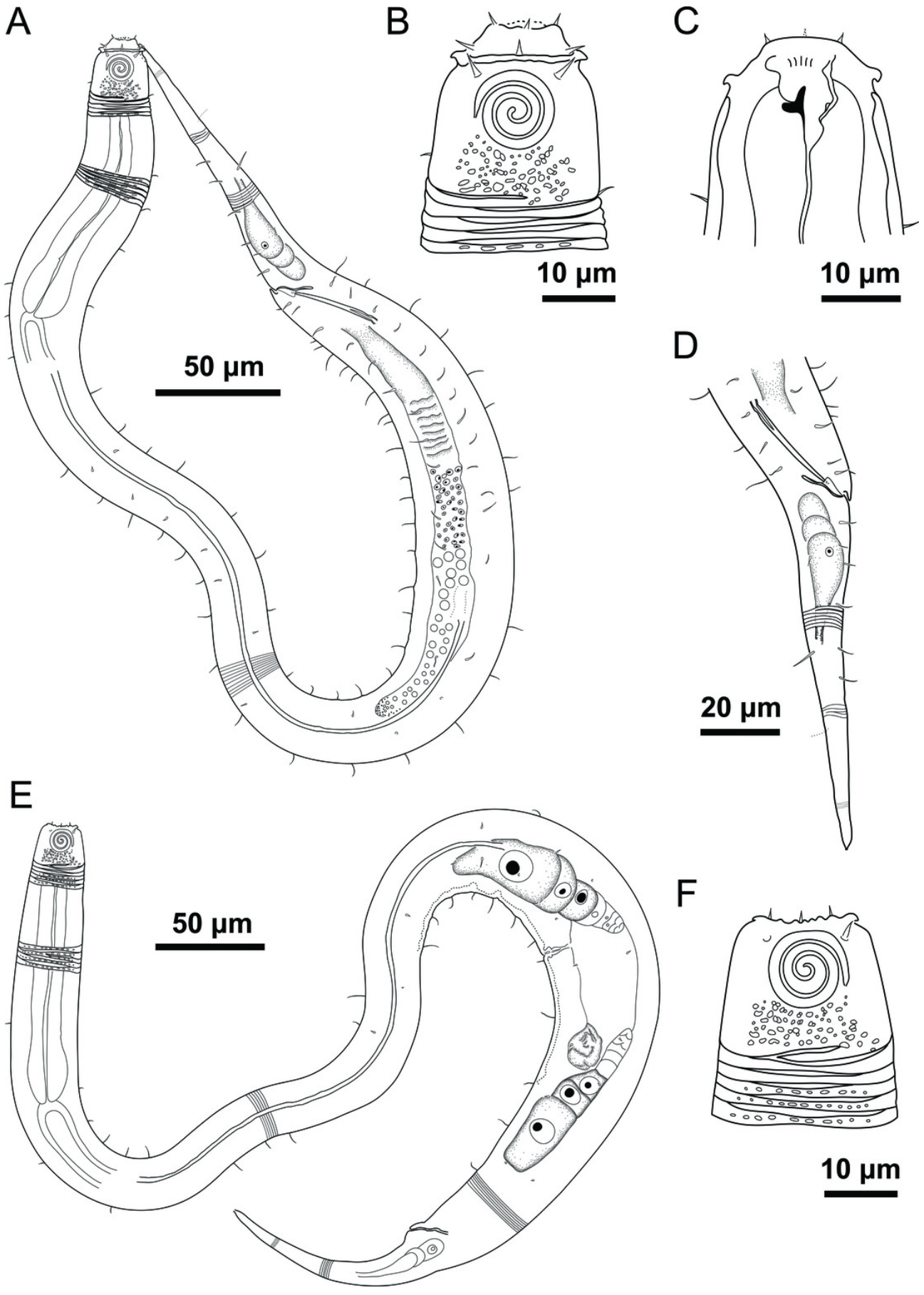
A
50 µm
B
10 µm
C
10 µm
D
20 µm
E
50 µm
F
10 µm

Figure 5

Figure 5. *Desmodorella parabalteata* sp. nov. Holotype male and male paratype 9.

Holotype male: (A) Anterior end (ols: outer labial setae; cs: cephalic setae; amph: amphidial fovea), (B) anterior end (dt: dorsal tooth; hscp: horn-shaped cuticula projection), (D and E) rows of somatic setae, (F) tail, (G) spicule (spic) and gubernaculum (gub). Male paratype 9: (C) longitudinal rows of ridges.

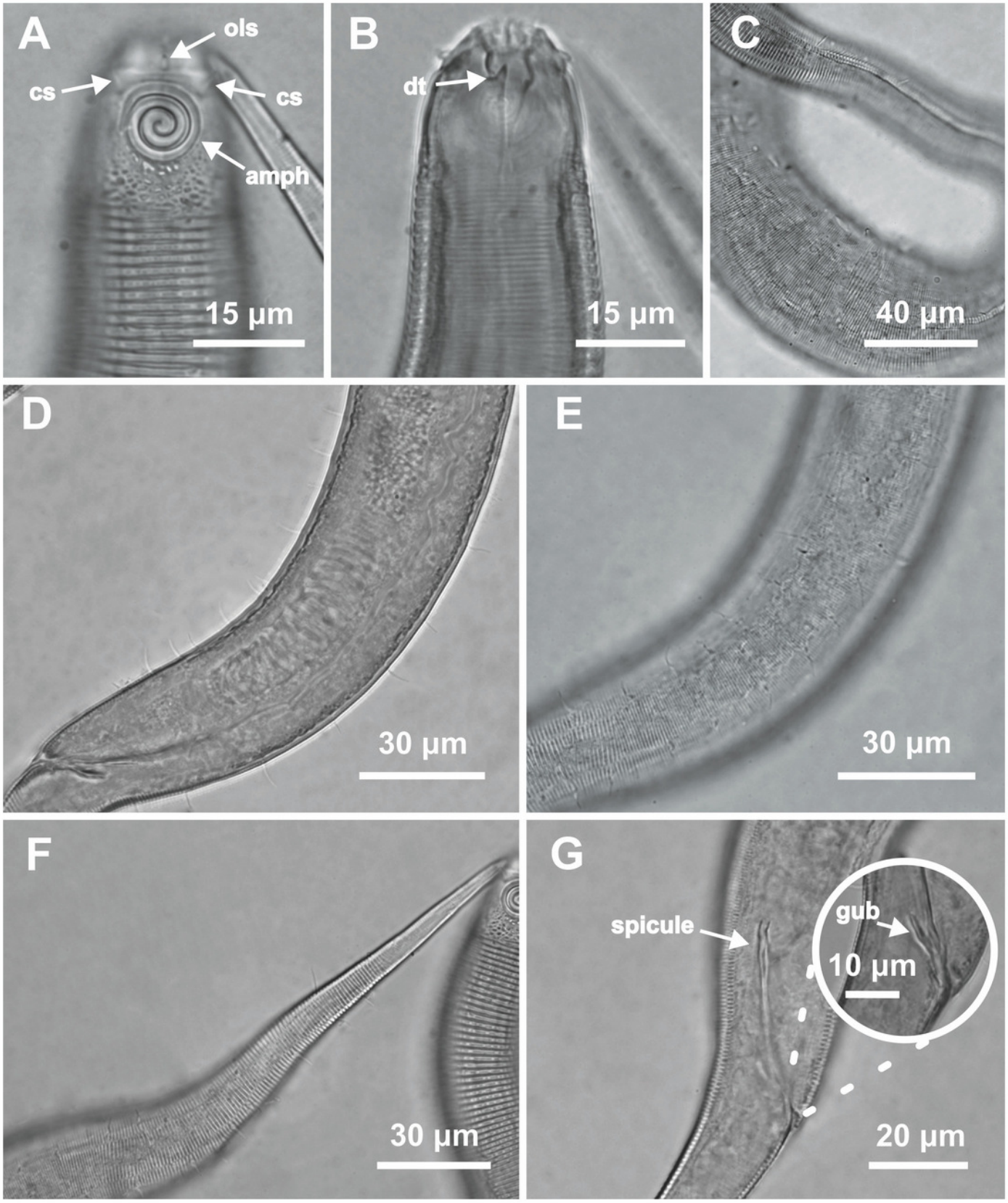
A
ols
cs
cs
amph
15 µm
B
dt
15 µm
C
40 µm
D
30 µm
E
30 µm
F
30 µm
G
spicule
gub
10 µm
20 µm

Figure 6

Figure 6. *Desmodorella parabalteata* sp. nov. Female paratype 1 and female paratype 9.

Female paratype 1: (A) anterior end (amph: amphidial fovea), (B) buccal cavity (dt: dorsal tooth), (D) vulva region (V: vulva), (E) anterior ovary (ant. ov.), (F) posterior ovary (post. ov.). Female paratype 9: (C) longitudinal rows of ridges.

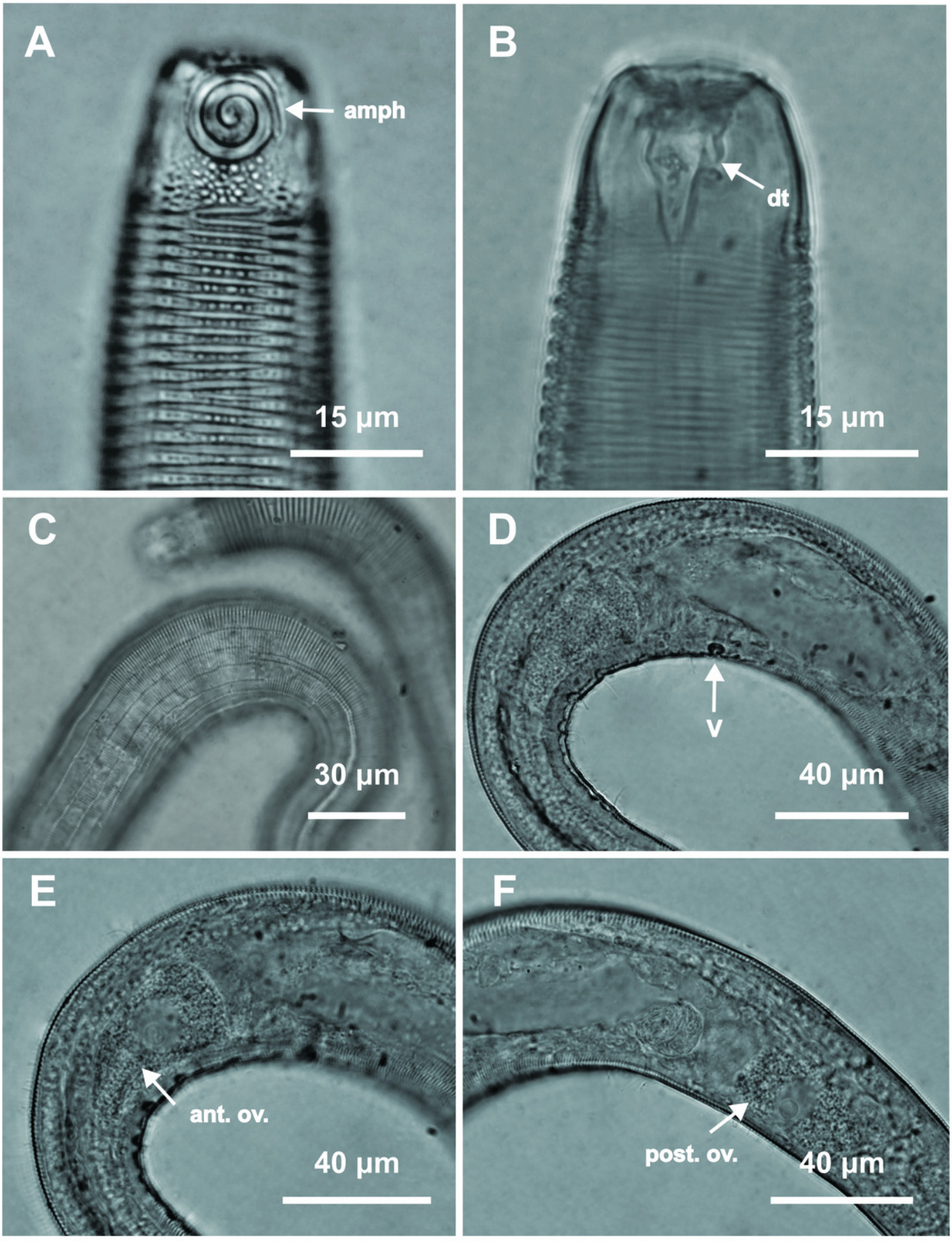
A
amph
15 µm
B
dt
15 µm
C
30 µm
D
v
40 µm
E
ant. ov.
40 µm
F
post. ov.
40 µm

Figure 7

Figure 7. *Desmodorella parabalteata* sp. nov. Male paratypes 8 and 10, SEM photographs.

Paratype male 10: (A) overview; (B) anterior end (ils: inner labial setae; ols: outer labial setae; amph: amphidial fovea); (E) false lateral alae and longitudinal rows of ridges; (F) beginning of the false lateral alae. Paratype male 8: (C) anterior end (cs: cephalic seta; amph: amphidial fovea; ads: additional setae); (D) cuticular ornamentation at the pharynx level (ss: somatic setae).

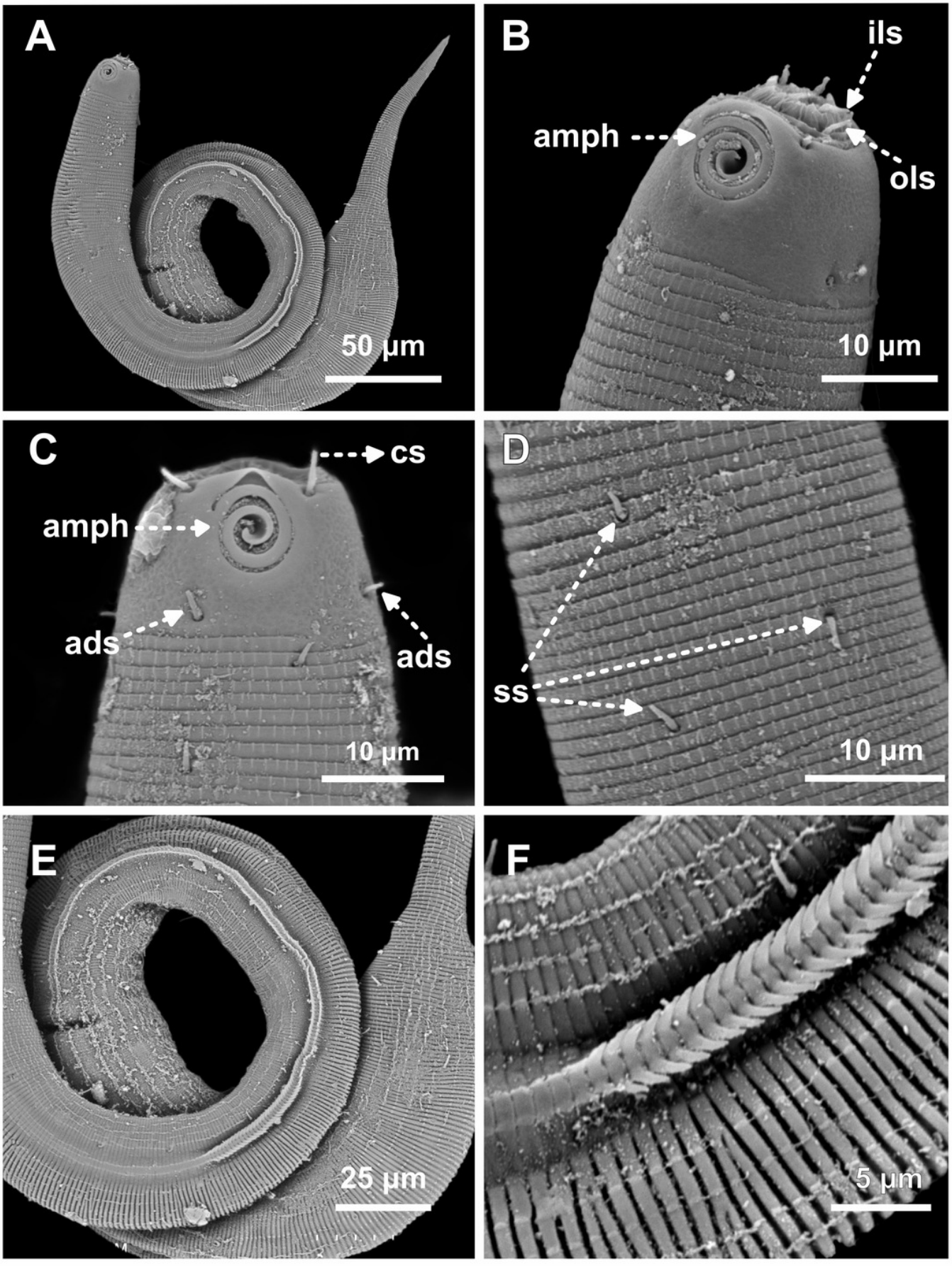
A
50 µm
B
ils
amph
ols
10 µm
C
cs
amph
ads
ads
10 µm
D
ss
10 µm
E
25 µm
F
5 µm

Figure 8

Figure 8. *Desmodorella parabalteata* sp. nov. Paratype female 3, SEM photographs.

(A) overview; (B) anterior end (amph: amphidial fovea; ss: somatic setae); (C) false lateral alae and longitudinal rows of ridges; (D) posterior end of the false lateral alae.

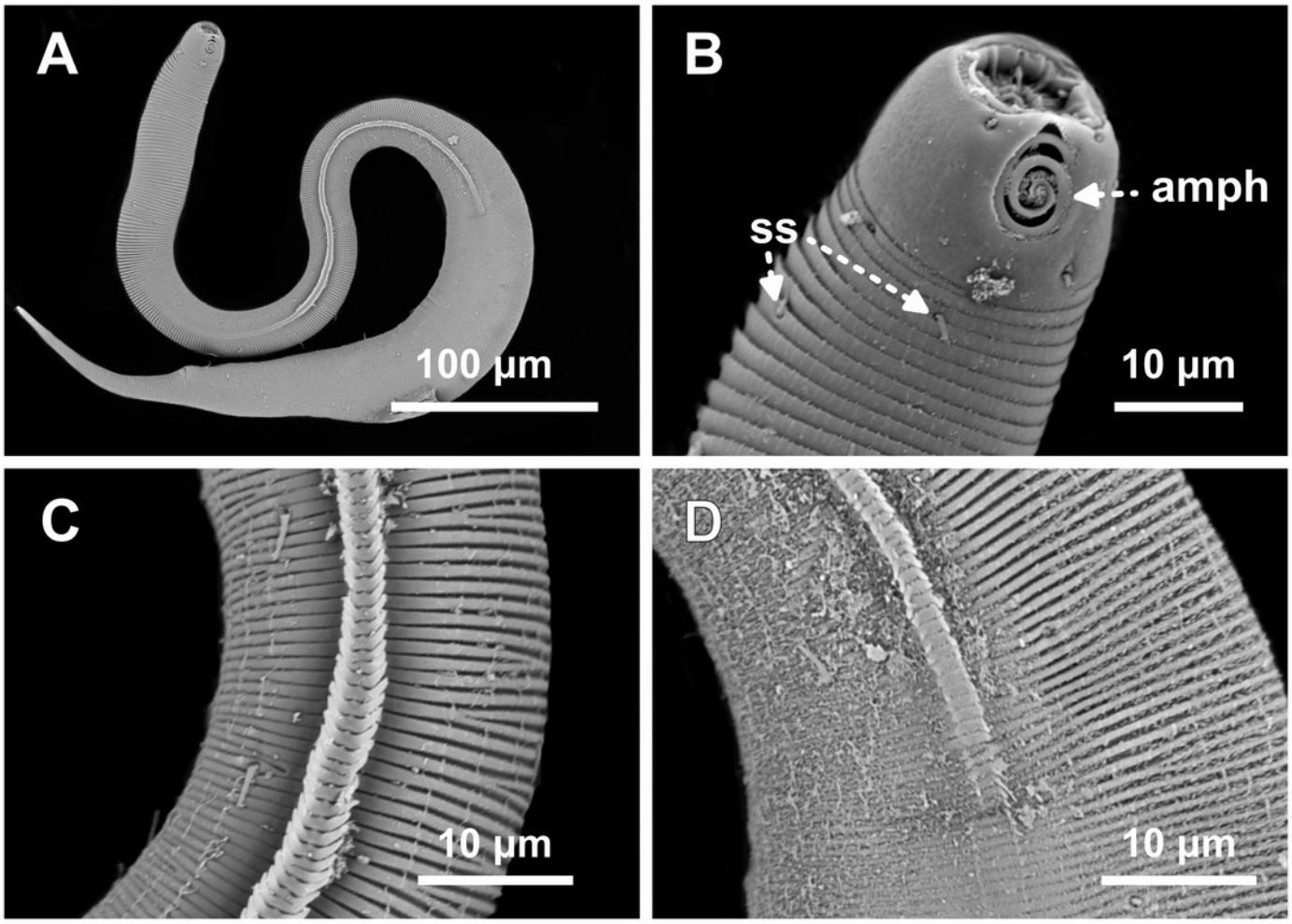

Table 1(on next page)

Table 1. Collection stations, ~~their~~ respective coordinates, depth and collection gear. The samples were collected from the continental shelf in Northeast Brazil, South Atlantic.

Project	Station	Latitude (S)	Longitude (W)	Depth (m)	Gear
Evaluation of benthic and planktonic biota in the offshore portion of the Potiguar and Ceará basins	ME2B2 R1	05°02'29.6"	36º23'11.9"	8.5	van Veen grab
	ME2B2 R3	05º02'30.3"	36°23'12.3"	8.5	
	ME2B3 R2	05º01'12.4"	36º23'27.6"	8.1	
UFPE S.O.S. SEA	14	10°07'05.7"	35°50'57.96"	63	Box-corer
	16	10°44'59.28"	36°25'32.88"	58	
	17	11°00'00.54"	36°49'58.98"	54	
	23	13°04'10.32"	38°25'46.98"	65	

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Table 2(on next page)

Table 2. Morphometric data of *Desmodorella cornuta* sp. nov. The measurements are expressed in micrometers, or if noted, as a percentage or ratio. Not applicable (*); not available for measurement (-); a, b, c, c' = de Man's ratios (1880).

Desmodorella cornuta **sp. nov.**	Holotype (Male)	Male paratypes (n=2)	Paratype (Female 1)	Other female Paratypes (n=2)
Body length	1,254	1,107–1,092	1,221	1,014–1,074
Outer labial setae length	2	2–2.5	-	-
Cephalic setae length	3.5	3–4	3	3–4
Head diameter at level of the cephalic setae	21.5	20.5–22	23.5	18.5–23
Cephalic setae in relation to head diameter at the cephalic setae level (%)	16%	14–19.5%	13%	16%–17%
Distance from anterior end to amphidial fovea	3.5	6–6.5	-	2.5–4
Amphidial fovea diameter (maximum width)	11.5	11–11.5	11	11
Body diameter at level of the amphidial fovea	26.5	26–26.5	25.5	21.5–25.5
% of the amphidial fovea diameter in relation to corresponding body diameter	43%	42–50%	43%	43–51%
Pharynx length	145	142–143	142	137–138
Distance between the horn-shaped cuticular projection to anterior end	64,5	54.5–61.5	56	53.5–56
Length of horn-shaped cuticular projection	9	8.5–9	8	9
Position of the horn-shaped cuticular projection in relation to the pharynx length (%)	44%	38–43%	39%	39%–41%
Pharyngeal bulb diameter	17	19	13	19
Body diameter at level of the pharyngeal bulb	34.5	31	34.5	30–32
% of basal bulb diameter in relation to corresponding body diameter	49%	61%	38%	59–63%
Body diameter at the level of the pharynx end	35	29–30.5	35	30–31
Maximum body diameter	48	34–55	57	42–44.5
Anal or cloacal body diameter	30	26–27	25.5	24–25
Tail length	118	109.5–114	108.5	93–106
Length of spicule along arc	79	55–71.5	*	*
Length of spicule along cord	41	50–64	*	*
Length of gubernaculum	17	17	*	*
Length of gubernaculum in relation to length of spicule along arc (%)	21.5%	24%	*	*
Length of spicule along arc in relation to cloacal body diameter	2.6	2–2.6	*	*
Distance from anterior end to vulva	*	*	858	750–756
Position of vulva from anterior end (%)	*	*	70%	70–75%
Body diameter in vulva region	*	*	57	42–44.5
Anterior ovary length	*	*	81	155.5–159
Posterior ovary length	*	*	77.5	106–108
Reproductive system length	385.5	273	98.5	130–141
% of reproductive system in relation to body length	31%	25%	8%	12–14%
a	26	20–32	21	24
b	8.7	7.7	8.6	7.4–7.8
c	10.6	9.6–10	11.3	9.6–11.6
c'	4	4–4.4	4.3	4.4–3.7

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Table 3 (on next page)

Table 3 . Comparison of species *Desmodorella cornuta* sp. nov. with morphologically similar species.

a, b, c = de Man's ratios (1880); parameter absent = (-); parameter present (+). (*) = two pairs of lateral rows of more distinct spines, among the other rows of spines (referred to by Verschelde, Gourbault & Vincx (1998) as "false lateral alae"). (**) = Protuberant horn-shaped cuticular projection positioned dorsally in pharyngeal region.

	Desmodorella curvispiculum	*D. perforata*	*D. balteata*	*D. cornuta* **sp. nov.**
Body length (μm)	1004–1042	1850–1410	867–1078	1014–1254
a	17–26	28.6–32.4	15.7–26.3	32–20
b	7.3–7.6	7.4–8.8	5.9–7.6	7.4–8.7
c	10.9–11.5	11.6-13.5	8.7–12.3	9.6–11.6
Spicule length (μm)	76	52	85–65	55–79
False lateral alae*	-	-	+	+
Subcephalic setae	-	-	-	-
Horn-shaped cp. **	-	-	-	+

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Table 4(on next page)

Table 4. Morphometric data of *Desmodorella parabalteata* sp. nov. The measurements are expressed in micrometers, or if noted, as a percentage or ratio. Not applicable (*); not available for measurement (-); a, b, c, c' = de Man's ratios (1880

Desmodorella parabalteata **sp. nov.**	Holotype (Male)	Male paratypes (n= 10)	Paratype (Female 1)	Other female paratypes (n= 9)
Body length	697.5	685.5–817.5	795	583–814.5
Outer labial setae length	3	2	2.5	2
Cephalic setae length	4	4	4	4
Head diameter at level of the cephalic setae	19.5	-	-	16–17
Cephalic setae in relation to head diameter at the cephalic setae level (%)	21%	-	-	24–25%
Distance from anterior end to amphidial fovea	6.5	5–7	-	5–8
Amphidial fovea diameter (maximum width)	11.5	10–11.5	11	9–12
Body diameter at level of the amphidial fovea	22	20–23	21.5	19–23
% of the amphidial fovea diameter in relation to corresponding body diameter	52%	43–55%	51%	43–59%
Pharynx length	123	113.5–133.5	131.5	109–129
Pharyngeal bulb diameter	18	19–25.5	21.5	17–23
Body diameter at level of the pharyngeal bulb	32.5	30.5–36	31	28–32.5
% of basal bulb diameter in relation to corresponding body diameter	55%	62–73%	70%	56–75%
Body diameter at the level of the pharynx end	29	24.5–34	30	25–32
Maximum body diameter	40.5	37–51	51	39–51
Anal or cloacal body diameter	21	17.5–24.5	23	19–23
Tail length	113	88–113.5	99	72–107
Length of the non-annulated tail end	13	13–17	15.5	9–23.5
Length of spicules	36.5	25–41.5	*	*
Length of gubernaculum	14.5	12–18	*	*
Length of gubernaculum in relation to length of spicules (%)	40%	37–56%	*	*
Length of spicule along arc in relation to cloacal body diameter	1.7	1.4–1.8	*	*
Distance from anterior end to vulva	*	*	510	389.5–525
Position of vulva from anterior end (%)	*	*	64%	64–68%
Body diameter in vulva region	*	*	51	39–51
Anterior ovary length	*	*	148	108–270
Posterior ovary length	*	*	130	97–271.5
Reproductive system length	232.5	217–317	210	142.5–229.5
% of reproductive system in relation to body length	33%	27–39%	26%	23–28%
a	17	14–21	16	13–17
b	6	6–6.5	6	5–6
c	6	7–8	8	7–9
c'	5	4–6	4	4–5

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