A NEW TUBIFICID FROM THE BAY OF MONTEVIDEO

EVELINE DU BOIS-REYMOND MARCUS *

In May 1944 Professor Ergasto H. Cordero, Montevideo, collected Tubificids in the sand of the beach of Capurro, where the water is brackish, never quite fresh nor quite salt. Entrusted with 38 specimens and 2 cocoons I verified that they belong to a new species of the genus Monopylephorus Levinsen (= Rhisodrilus Smith). I have the pleasure to name it in honour of Doctor Cordero.

It is the first South American representative of the genus, the former species of which are known from all other continents, where they live on the coast as well as in fresh water.

Monopylephorus corderoi, n. sp.

Figures 1-6

The worms preserved in alcohol are colourless, up to 10-11 mm. in length and 0,6 mm. thick. The number of segments is 48-67. The elitellum (d) begins at the level of the setae of segment 10 and extends onto segment 13. All segments are higher and broader than long; the anterior ones are not biannulate. The prostomium is a blunt cone, as broad at the base as it is high or long. The skin that forms fine transverse folds is smooth, without cuticular hairs (pilosus Goodrich), papillae or incrustations. Sessile Peritricha of the group Alorianta, that belong to the genus Rhabdostyla or Scyphidia, are attached to the body, especially to the hind region.

The setae (Fig. 2) are bifid crotchetis in all bundles, there are no single-pointed ones as in the posterior part of several other species of the genus. In the anterior segments each bundle contains 4-6 setae, backwards their number diminishes to 3 or 2. Segment 11 has no ventral setae. The length of the setae varies from 70 to 110 μ. The nodulus lies in the distal third of the shaft. The prongs are of equal length; the distal one is a little thinner than the proximal one in the posterior part of the body.

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The pharynx is short and occupies only the third segment. As described by Stephenson (1923, p. 105) for M. parvus also the pharynx of the present species is a dorsal, glandular, and sucker-like pouch of the alimentary tube and is suspended to the body wall by strong bundles of muscle fibres (e), as the pharynx of Enchytraeids in Stephenson’s diagram (1930, fig. 38). The pharyngeal lumen is lined by a high columnar epithelium with long cilia and scarce nuclei. These are numerous in the pharyngeal gland cells (f) that are arranged in four cords dorsally and dorso-laterally. Chromophil cells (e) lie in segment 4-6. I did not find the strands that connect them with the pharynx in M. limosus (Chen 1940, p. 89). After Stephenson (1930, p. 85) such a communication does not occur in the Tubificidae.

From segment 5 on the gut is covered with chloragocytes (eh). The intestine (i) is constricted by each septum (s) and widened in the middle of each segment. The anal opening is subterminal. Septum 3/4 is the first well developed. The coelomic amoeboocytes are up to 8 μ in diameter.

The cerebral ganglia form a bilobed brain (b) deeply cleft in front. A layer of muscle fibres is attached to the dorsal surface of the ventral nerve cord (u).

The dorsal vessel runs on the left side of the alimentary tube. The latter is surrounded by a dense network (j) of vessels in segments 7-8 and farther backward. The fine capillaries (k) in segments 2 and 3 are applied to the body wall but do not enter the musculature. The commissures (h) between the dorsal and ventral vessel in segments 6-10 are simple, without the valves and moniliform appearance of M. pilosus (Goodrich 1895, fig. 5, 10).

The testes (t) lie on the anterior wall of segment 10 and the ovaries (o) on that of segment 11. Septum 9/10 forms an anterior sperm sac (a) and septum 10/11 a posterior one (p) that extends to segment 16. In one of the examined worms the posterior sperm sac is contained in the ovisac (q), in another the two sacs lie side by side (Fig. 4).

The large male funnels (u) are beset with sperms. The vas deferens penetrates the septum 10/11 and its first section is a narrow (20 μ), ciliated tube about 60 μ in length that bends upwards in segment 11. The following ascending part is 0.4 mm. long and covered with 20 μ high peritoneal prostatic cells (g). It is 58 μ in diameter, of which only 6 μ belong to the lumen. Near the dorsal wall of segment 11 the male duct loses the prostatic cells and turns vertically downwards (te). Its lumen is wider (25 μ) in this part, the transverse duct of Benham (1915, fig. 9, 10), that is provided with outer annular and inner longitudinal muscles. The transverse duct is 0.1 mm. long and separated from the following part by a strong constriction (l). At this constriction the inner epithelium of the transverse duct forms a small plug that somewhat resembles the penis of Postiodrilus sonderi Boldt (see Michaelson 1927, fig. 17c). Ventrally to the constriction lies the atrium (v). It is 0.25 mm. long, about 60 μ in diameter and has no cilia. Its efferent end, the atrial duct (ad) narrows and bends forwards and medially. Coming from the right and left side the atrial ducts open on
two papillae (y) of the spermiducal chamber (x) that lies in the middle of segment 11.

The two pear-shaped spermathecae (r) in segment 10 contain loose sperms and open on the limit between segments 9 and 10 with two pores (rp). These are separated by a distance of 50-60 μ.

The ovaries lie dorsally to the male ducts. The oocytes are grouped in clusters of ca. 32 cells each, and several such groups in various stages of growth are contained in the ovisacs. The very inconspicuous female funnels are situated on the limit between the segments 11 and 12; the ovisac of septum 11/12 reaches segment 15 or even 17. Of the two present cocoons one contains one and the other (Fig. 6) six eggs.

Discussion of Monopylephorus corderoi

Goodrich (1892; 1895) was the first who fully described a species that is congeneric with the present one. The name of the genus, Vermiculus Goodrich (1892, p. 474) cannot be preserved, as it is occupied for Nemertines (see Bürgers 1904, p. 151). After my opinion Vermiculus can be substituted by Monopylephorus Levinsen (1884, p. 225), a monotypical genus (M. rubroniveus). As Levinsen’s description is very short, Beddard (1895, p. 268, 271) and Michaelson (1900, p. 54) did not accept his genus and considered it a doubtful synonym of Bothrioneurum Stole 1886.

M. rubroniveus Lev. was found on Kalvebodstrand near Copenhagen, where the salinity is 10-20 per mille. All the six known species of Bothrioneurum are fresh water forms (Marcus 1942, p. 200; Du Bois-Reymond Marcus 1949, p. 5). Therefore the occurrence of a Bothrioneurum-species at the original locality of Monopylephorus rubroniveus Lev. is highly improbable. Very likely Ditlevsen (1904, p. 423) is right to consider his gregarious species that is common on Kalvebodstrand as Monopylephorus rubroniveus Lev. The organisation of Ditlevsen’s species agrees with that of Goodrich’s from the English coast.

I think one is right to assume the specific identity of Levinsen’s, Goodrich’s and Ditlevsen’s worms. Therewith the type of the genus Monopylephorus becomes morphologically and geographically well defined, and Michaelson’s (1900, p. 522) substitution of Vermiculus by Rhizodrilus Smith (1900, p. 444) is not necessary. The type of Rhizodrilus, Rh. lacteus, is an inhabitant of North American fresh water. It differs from Goodrich’s species in setal and vascular characters so far, that Nomura (1915, p. 43-44) and Chen (1940, p. 87) maintain Rhizodrilus and Monopylephorus separated. Michaelson and Stephenson who do not approve this separation use the two names in various ways. Michaelson, who introduced (l. e.) Rhizodrilus instead of Vermiculus and considered Monopylephorus a doubtful synonym of Bothrioneurum, described (1913 p. 143) a new species from Transvaal as Monopylephorus africanus. Later on (1927, p. 14; 1928, p. 105) he turned back to Rhizodrilus. Stephenson used Monopylephorus in two of his important papers on the East Indian Oligochaeta (1917, p. 485;
1923, p. 103) and in the general part of his monograph (1930, p. 19; 85, 86, etc.), but *Rhizodrilus* in the systematic part (p. 752).

Of the older authors Moore (1905) applied *Monopylephorus*, Benham (1909; 1915) *Rhizodrilus*. In later German papers (Ude 1929; Knöllner 1935) Michaelson’s last opinion is adopted.

Although the complete bibliography is not available for me, I give the following list of species that were described under the names *Monopylephorus* or *Rhizodrilus*. As I can mention a character for each of the older species that distinguishes it from *M. corderoi*, the latter is well established. Species with hair setae and penis, as f. ex. *Tubifex irroratus* (Verrill) Moore (1905, p. 384), and *Monopylephorus tichochaetus* Ditl., probably identical with *Postiodrilus sonderi* Boldt (Michaelson 1927, p. 15; Ude 1929, p. 77), have not been considered, though they are sometimes mentioned as *Monopylephorus* or *Rhizodrilus* in the literature.

1. *M. africanus* Michaelson (1913, p. 143) has two spermathecae in segment 9 and penial setae. After Stephenson (1917, p. 489) it is doubtful whether this species can be maintained in *Monopylephorus*.

2. *M. aucklandicus* (Benham 1909, p. 258). As the species has two male pores (Nomura 1915, p. 42), Chen (1940, p. 96) is right to remove it from *Monopylephorus* (or *Rhizodrilus*) and make it the type of a special genus, *Littodrilus*. The second atrium is enclosed in a great muscular sac.

3. *M. glaber* Moore (1905, p. 378) differs from *M. corderoi* by united spermathecal pores.

4. *M. hermadecensis* (Benham 1915, p. 180) has a single spermathecal pore in the middle of segment 10, and also the male duct differs from that of *M. corderoi*.

5. *M. lacteus* (Smith 1900, p. 444) has separate pores of the spermatheca as the new species, but large glands in segment 9, modified ventral setae in segment 9 or in 9 and 10 and a 0.14-0.16 mm. long penial seta in segment 11. The spermathecal pores open dorsally to the level of the ventral setae.

6. *M. limosus* (Hatai 1898, p. 103) has a single spermathecal pore.

7. *M. parvus* Ditlevsen (1904, p. 427) as well as the species described by Moore (1905, p. 383) and Stephenson (1917, p. 485; 1923, p. 104) under the same name have only one spermatheca. Stephenson (1917, p. 488) considered the worms from Chilka Lake and the North American Atlantic coast as certainly identical, but was not sure about their identity with Ditlevsen’s Danish material. As f. ex. the atria unite before opening into the spermidéal chamber in the American and Indian worms, and do not in the Danish ones that liken *M. corderoi* in this detail, Stephenson’s point of view can be understood. It is true that Ude (1929, p. 76)
unites all forms described as *parcus*, but he did not see any material.

(8) *M. rubroniveus* Levinsen (1884, p. 225), the type of the genus, and after Ditlevsen (1904, p. 423) identical with *Vermiculus pilosus* Goodrich (1892; 1895), has united spermathecal pores.

**LITERATURE CITED**

SMITH, F. R. 1900, Notes on Species of North American Oligochaeta. III. List of Species
PLATE I

MONOPYLEPHORUS CORDEROI, n. sp.
1. Lateral view of anterior part; dorsal and ventral vessel not drawn.
2. Seta.
3. Transverse section of pharynx region.
4. Ventral view of reproductive organs.
5. Male duct.
6. Cocoon.

a, anterior sperm sac.  ad, atrial duct.  b, brain.  c, chromophil cells.  ch, chloragocytes.  d, citellum.  e, pharyngeal muscles.  f, pharyngeal glands.  g, prostatic cells.  h, hearts of segments 6-10.  i, alimentary tube.  j, intestinal blood plexus.  k, blood vessel.  l, constriction between transverse duct and atrium.  m, mouth.  n, ventral nerve cord.  o, ovary.  p, posterior sperm sac.  q, ovisac.  r, spermathecae.  rp, spermathecal pores.  s, septum.  t, testes.  tc, transverse duct.  u, male funnel.  v, atrium.  w, female funnel and its opening.  x, spermiducaal chamber.  y, papillae of atrial ducts.
z, setal bundle.  2-13, segments 2-13.