STUDIES ON THE FAUNA OF CURAÇAO AND OTHER CARIBBEAN ISLANDS: No. 75.

NEMERTEANS FROM CURAÇAO

by

DIVA DINIZ CORRÊA
(Departamento de Zoologia da Universidade de São Paulo)

All species treated in this paper were collected by me between January and June 1962, during my stay at the "Caraïbisch Marien-Biologisch Instituut" (Caribbean Marine Biological Institute), Curaçao.

I am deeply indebted to the Government of the Netherlands, which awarded me a grant enabling me to work in Curaçao; to Dr. INGVAR KRISTENSEN, Director of the Institute mentioned, for the kind hospitality shown to me; and to my friend Miss HERTHA CAPRILES, who spared no effort to make my stay on "dushi Corsou" as pleasant as possible.

The first paper on nemerteans from Curaçao (WIJNHOFF 1925) contains descriptions of 9 species, of which only 2 were found again by me. They are: *Baseodiscus delineatus* var. *curta* (Hubrecht, 1879), considered by WIJNHOFF (p. 102–103) as an independent species; and GIRARD's species *atra*, 1851, classified with doubt by WIJNHOFF (p. 108–109) as *Cerebratulus*.

The types of the new species, and some of the further material, have been deposited in the Department of Zoology, University of São Paulo, Brazil.

This paper contains descriptions of:

Palaeonemertini

Tubulanus rhabdotus Corrêa

Heteronemertini

Baseodiscus delineatus var. *curta* (Hubrecht)
Dushia atra (Girard)
Corsoua kristenseni, new species

Hoplonemertini

Zygonemertes virescens (Verrill)
Amphiporus texanus Coe
Prostomatella enteroplecta Corrêa
Tetrastemma herthae, new species
Tetrastemma worki Corrêa

Tubulanus rhabdotus Corrêa, 1954

CORRÊA 1954, p. 12–25, pl. 1 fig. 1–6, pl. 2 fig. 7–9, pl. 3 fig. 10–11, pl. 4 fig. 12–18; 1961, p. 5–8, fig. 5–6.

CURAÇAO: Piscadera Baai, among algae; intertidal zone.
One worm; April 1962.

Coast of São Paulo, Brazil; Virginia Key, Key Biscayne, MacArthur Causeway, Miami, Fla.; Curaçao (new). — Intertidal zone.

The living worm was 7 cm long, but the species can reach a length of 25 cm. The ground color is ocher-greenish, with several black rings, of irregular breadth and irregularly set apart from each other; black spots, both scattered and disposed in rows; and light halos, which also occur on the rings. The cephalic lobe is triangle-shaped, flattened dorso-ventrally, bears no eyes, and has black spots and light halos like the trunk. Lateral sense organs are present within the fourth black ring.

Baseodiscus delineatus var. **curta** (Hubrecht, 1879)

WIJNHOFF 1925, p. 102–103, fig. 2*a–e*, pl. 5 fig. 6, as *Baseodiscus curtus;* CORRÊA 1956, p. 199–201, pl. 2 fig. 6–9, 11, as *B. curtus;* 1958, p. 443, pl. 1 fig. 1–2; 1961, p. 11–12, fig. 7.

CURAÇAO: Piscadera Baai, under blocks of dead coral and among algae; intertidal zone.
Several worms; January–June 1962.

Cosmopolitan. Coast of São Paulo, Brazil; Curaçao; Virginia Key, Miami, Fla. — Intertidal zone.

The living worms measured up to 15 cm in length. The ground color is creamy, with several narrow, irregular, brown-reddish stripes which are lighter on the ventral surface. Eyes are present, irregularly distributed on both sides of the cephalic lobe. Horizontal lateral cephalic slits absent.

Dushia, new genus

Heteronemertini with horizontal lateral cephalic slits; without a caudal cirrus; proboscis pore sub-terminal; cutis not separated from the external longitudinal muscle layer of the body wall by connective tissue; cephalic glands absent; diagonal muscles absent; dorsoventral muscles between the intestinal diverticles present;

median gut with lateral diverticles; proboscis with three layers of muscles: external longitudinal, circular, internal longitudinal; two muscle crosses in the proboscis; more than two pre-cerebral blood vessels; fibrous core of the dorsal cerebral ganglia bifurcated; with neurochord cells and neurochords; cerebral organs closely connected with the dorsal cerebral ganglia.

Type of the genus: *Dushia atra* (Girard, 1851).

The first generic name applied to the present species is *Meckelia* (BÜRGER 1904, p. 124). This name cannot be used again because the type species of *Meckelia*, *M. somatotomus* Leuckart, 1828, is a synonym of *Cerebratulus marginatus* Renier, 1804 (ibid., p. 112). Consequently *Meckelia* becomes a synonym of *Cerebratulus* Renier, 1804.

The other genera adopted for GIRARD's species, *Cerebratulus* and *Lineus*, cannot be used either. *Cerebratulus* (Friedrich, 1960) includes species with a caudal cirrus, sharp lateral margins, cutis separated from the external longitudinal muscles of the body wall by connective tissue, dorso-ventral muscles very strong and diagonal muscles present. Nevertheless, in 1960 FRIEDRICH (p. 59) still could not give a univocal diagnosis of *Lineus*, owing to: incomplete and contradictory information about it. It is true that many species were allotted to *Lineus* without discussion of the generic characteristics. In 1960, however, these were known from FRIEDRICH's description of *Heterolineus longissimus* (Gunnerus, 1770). This is the oldest species of *Lineus* Sowerby, 1806, and the only one with which the genus was introduced (BÜRGER 1904, p. 87, 93). Consequently, *L. longissimus* is the type species of *Lineus* and must keep this generic name. *Heterolineus* FRIEDRICH (1935. p. 310) becomes a synonym of *Lineus*. From the new description of *L. longissimus* we know that muscle crosses are absent in *Lineus*.

I also compared the new genus *Dushia*, based on FRIEDRICH's modern key (1960), with all heteronemertean genera with horizontal lateral cephalic slits and three-layered proboscis wall. They are: *Micrurina* Wijnhoff, 1942, with only one muscle cross in the proboscis, fibrous core of dorsal cerebral ganglia not bifurcated, and without neurochord cells and neurochords; *Evelineus* Corrêa,

1954, with a frontal organ, cutis separated from the body wall musculature by connective tissue, with large cephalic glands and without muscle crosses in the proboscis; *Micrurides* Friedrich, 1960, with circular muscles of the rhynchocoel at least partially connected with the longitudinal muscles of the body wall; *Parborlasia* Friedrich, 1960, with connective tissue between cutis and external longitudinal muscles of the body wall.

Dushia atra (Girard, 1851) Figs. 18–24

Cerebratulus ater, BÜRGER 1904, p. 124. — *Cerebratulus ater* (?), WIJNHOFF 1925, p. 108–109. — *Cerebratulus ater*, COE 1943, p. 253. — *Lineus ater*, COE 1951, p. 330; 1951*a*, p. 181.

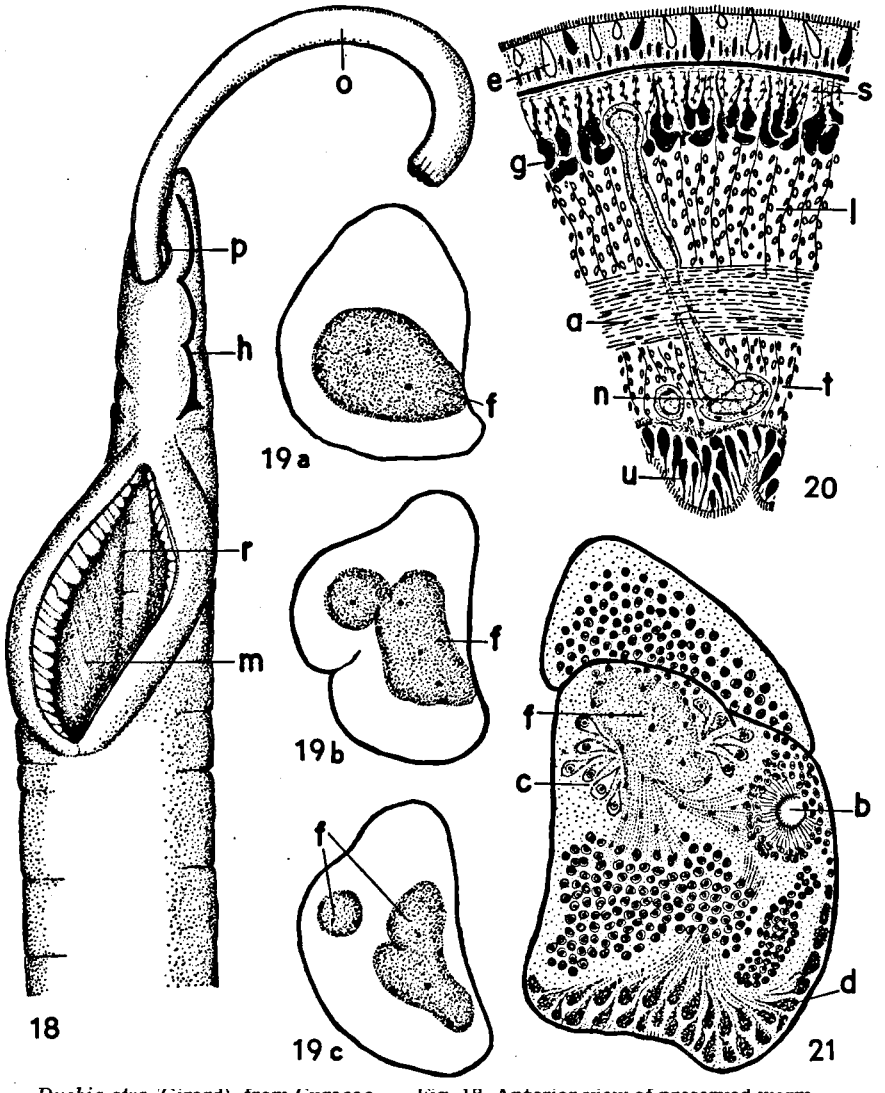
CURAÇAO: Piscadera Baai, Blauw Baai, Vaersen Baai, abundant in coralline sand under blocks of dead coral; high-water level. The worms live entangled in masses of several specimens, and their black color contrasts strongly with the white sand.
Several worms; January–June 1962.

Off Cape Florida, dredged in deep water; Key West, Fla., on a reef; Curaçao.

The living worms measured up to 50 cm in length in full distension. The width is variable along the body. It ranges from 1 to 5 mm. The worms are highly contractile. The tip is acutely pointed and the posterior end is rounded. The whole body is flattened dorsoventrally. The color is uniformly black except for the tip, which is pure white above and below, as are also the anterior borders of the deep horizontal lateral cephalic slits and the lip. The mouth (Fig. 18, m) is an enormous longitudinal slit. To avoid protraction of the proboscis (o) and excessive contraction the worms were relaxed in magnesium chloride solution for about 30 minutes before preservation in hot formalin.

The ciliated epidermis (Fig. 20), extremely rich in flask-shaped gland cells (e), is underlain by a thin basement membrane. The epidermis of the horizontal lateral cephalic slits (Fig. 22, h) lacks glands, at least in the proximal part of it. Subepithelial circular and longitudinal muscles (Fig. 20, s) are present. The thick cutis layer, composed of large gland cells (g), is embedded in the external longitudinal muscles of the body wall (l) without any separating layer of connective tissue. The cutis is interrupted at the level of the cephalic slits (Fig. 22). Of the three muscular layers of the body wall, viz. the external longitudinal (Fig. 20, l), circular (a) and internal longitudinal (t), the first is the thickest, and the circular one is slightly thinner than the internal longitudinal one. However, the thickness of the muscle layers varies along the body. Dorso-ventral muscles between the intestinal diverticles are present but not strong. Diagonal muscles are absent. At the level of the esophagus there is a rather thick and distinct central plate of horizontal muscles between the esophagus and the rhynchocoel wall. Fibers coming from the circular, pre-cerebral muscles form a rather thick net through the longitudinal muscles (Fig. 22). Parenchymatic cells are rare, and cephalic glands are absent.

The esophageal epithelium (Fig. 20, u) is glandular and ciliated. The epithelium



Dushia atra (Girard), from Curaçao. — Fig. 18. Anterior view of preserved worm. — Figs. 19*a–c*. Bifurcation of fibrous core of dorsal cerebral ganglia. — Fig. 20. Transverse section of body wall. — Fig. 21. Connection between dorsal cerebral ganglia and cerebral organ. — *a*, circular muscles of body wall. – *b*, cerebral canal. – *c*, neurochord cells. – *d*, cerebral organ cells. – *e*, flask-shaped epidermic gland cells. – *f*, fibrous core of dorsal cerebral ganglia. – *g*, cutis gland cells. – *h*, horizontal-lateral cephalic slit. – *l*, external longitudinal muscles of body wall. – *m*, mouth. – *n*, nephridial canal. – *o*, proboscis evaginated. – *p*, proboscis pore. – *r*, rhynchocoel wall. – *s*, sub-epithelial muscles of body wall. – *t*, internal longitudinal muscles of body wall. – *u*, esophageal epithelium.

of the median gut is provided with eosinophilous gland cells (Fig. 24, t). A thin circular splanchnic musculature is present in the gut. The intestine has numerous and deep lateral diverticles.

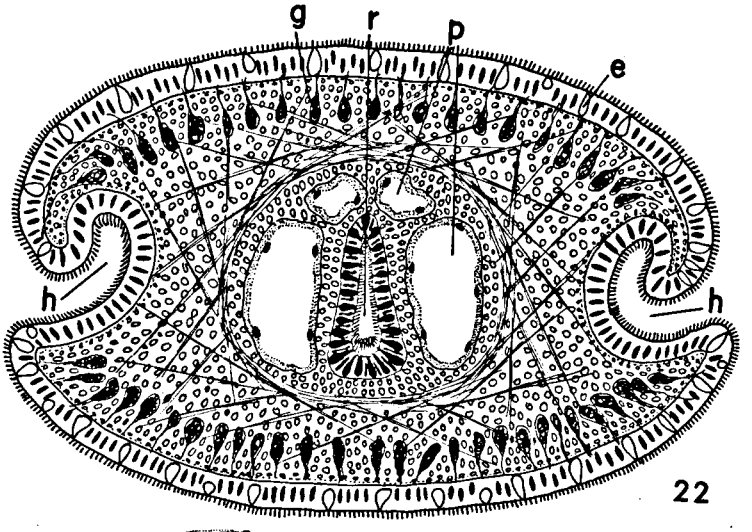
The proboscis pore (Fig. 18, p) is a small, sub-terminal, ventral slit. The rhynchodaeum epithelium (Fig. 22, r) is glandular and has long cilia. The rhynchocoel wall is composed of a flat epithelium facing the rhynchocoel cavity, a layer of longitudinal muscles, and a layer of circular muscles slightly thinner than the former. I did not see any cross formed by the rhynchocoelic circular muscles with the circular muscles of the body wall. For the terminology of the proboscis layers I continue to use the position of the everted proboscis, as is also advised by FRIEDRICH (1960, p. 54); but my drawings represent the resting organ. The proboscis wall is composed of an external high and glandular epithelium (Fig. 23, a), a thin layer of external longitudinal muscles (l), a nervous plexus (n), a layer of circular muscles (c), a thick layer of internal longitudinal muscles (i), and the flat internal epithelium (u). Fibers coming from the circular layer pass through the internal longitudinal layer, forming two muscle crosses, of these the dorsal (d) is stronger than the ventral one (v), but on the whole both belong to the weak type.

At the rhynchodaeum level there are four blood vessels (Fig. 22, p); two small ones situated dorsally to the rhynchodaeum, and two larger ones situated on the sides of the rhynchodaeum. The dorsal vessels are joined at some levels, or can be duplicated by dorso-ventral strands of fibers. At the level of the closed proboscis septum the pre-cerebral vessels collapse. At the point where the ventral cerebral ganglia give rise to the lateral nerve cords two large postcerebral vessels occur, which are the main vessels running posteriorly. No rhynchocoelic vessel was recognizable.

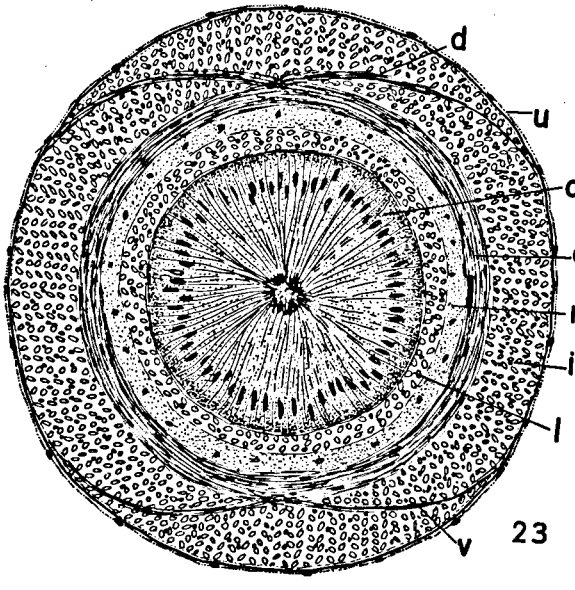
The well-developed nephridial system is situated in the anterior part of the body, dorso-laterally, close to the post-cerebral blood vessels and also surrounding the anterior gut. There are several excretory ducts crossing the body wall (Fig. 20, n). Most of the nephridiopores are dorso-laterally situated.

In front of the brain there are nerves around the rhynchodaeum and pre-cerebral blood vessels. Behind the brain there are one dorsal nerve situated externally to the circular muscles of the body wall, and two esophageal nerves. The fibrous core of the dorsal cerebral ganglia (Figs. 19 a–c), f) is split distally into two cores, the dorsal smaller than the ventral one. The cellular ganglionar layer of the brain is separated from the longitudinal muscles of the body wall by connective tissue. The cerebral organs are closely connected with the dorsal cerebral ganglia (Fig. 21). The cerebral canal (b) opens into the cephalic slit. Some fibers from the fibrous core of the dorsal cerebral ganglia (f) are directed to the cerebral canal (b). The cerebral organ cells (d) and the ganglionar cells are situated together inside the same coat. Neurochord cells in the brain (c), and neurochords in the fibrous core of the lateral nerve cords, are present. From the lateral nerve cords a nervous plexus for the body wall originates, situated outside the circular musculature. Eyes are absent.

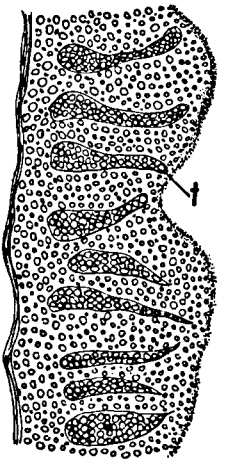
As the anatomical peculiarities of GIRARD's species are still unknown (WIJNHOFF 1925, p. 109; COE 1951a, p. 181), only external features were available for comparison with my specimens. The flattened body, uniformly black in color throughout its length except at the tip, of GIRARD's description (COE 1943, p. 253) is



22



23



24

Dushia atra (Girard), from Curaçao. — Fig. 22. Transverse section at pre-cerebral level. — Fig. 23. Transverse section of proboscis. — Fig. 24. Section of median gut. – *a*, external proboscis epithelium. – *c*, circular muscles of proboscis. – *d*, dorsal muscle cross of proboscis. – *e*, flask-shaped epidermic gland cells. – *g*, cutis gland cells. – *h*, horizontal-lateral cephalic slit. – *i*, internal longitudinal muscles of proboscis. – *l*, external longitudinal muscles of proboscis. – *n*, nervous plexus of proboscis. – *p*, pre-cerebral blood vessels. – *r*, rhynchodaeum. – *t*, erythrophilous intestinal gland cells. – *u*, internal proboscis epithelium. – *v*, ventral muscle cross of proboscis.

exhibited by my specimens. GIRARD's single specimen was dredged in deep water, whereas my rich material was collected at high-water line.

The specimen from Key West (COE 1951a, p. 181) shows short cephalic slits and a rather large mouth, which tally with those features in my specimens too; but the shape of its body is different.

WIJNHOFF (1925, p. 108–109) mentions connective tissue outside the musculature of the body wall of her two headless fragments. The presence of such connective tissue is characteristic of the following species.

Corsoua, new genus

Heteronemertini with horizontal lateral cephalic slits; without a caudal cirrus; proboscis pore terminal; cutis separated from the external longitudinal muscle layer of the body wall by connective tissue; cephalic glands present; diagonal muscles present; dorsoventral muscles between the intestinal diverticles present; median gut with lateral diverticles; proboscis with two layers of muscles: external longitudinal and internal circular; two muscle crosses in the proboscis; two pre-cerebral blood vessels; fibrous core of the dorsal cerebral ganglia bifurcated; with neurochord cells and neurochords; cerebral organs closely connected with the dorsal cerebral ganglia.

Type of the genus: *Corsoua kristenseni*, new species.

To differentiate the new genus I exclude, on the basis of FRIEDRICH's modern key (1960), all heteronemertean genera without horizontal lateral cephalic slits and all with three-layered proboscis wall. The seven remaining genera differ from *Corsoua* as follows; *Euborlasia* Vaillant, 1890, comprises stout, plump, slug-shaped forms; *Micrella* Punnett, 1901, besides having a caudal cirrus, has lateral organs and no neurochords; *Siolineus* du Bois-Reymond Marcus, 1948, has the cutis not separated by connective tissue, no neurochord cells or neurochords; *Pussylineus* Corrêa, 1956, with median dorsal and ventral cephalic slits and without intestinal diverticles; *Flaminga* Corrêa, 1958, with a caudal cirrus, cutis not

separated from the longitudinal muscles of the body wall, and only one muscle cross; *Lineopsis* Friedrich, 1958, has the cutis without connective layer, and a short intestinal caecum is present; *Micrurinella* Friedrich, 1960, without dorso-ventral muscles in the region of median gut.

Corsoua kristenseni, new species Figs. 25–27

CURAÇAO: Piscadera Baai, Spaanse Water, under rocks in muddy mangrove region; intertidal zone.
Three worms; January–June 1962.

Type: One set of 12 μ transverse sections of the anterior part of the body (10 slides), and the posterior, not sectioned part, under number C1.

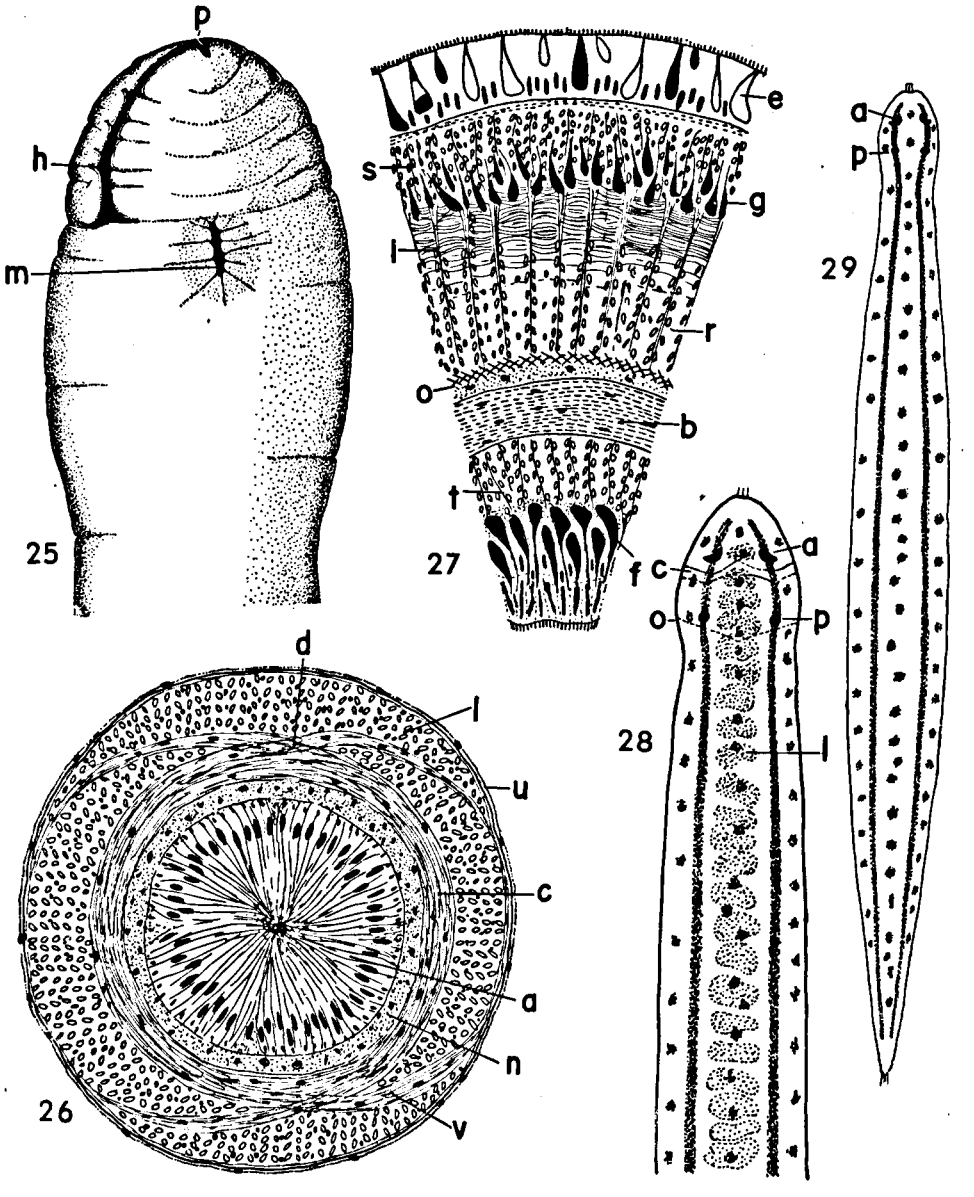
I name the species for Dr. INGVAR KRISTENSEN, director of the "Caraïbisch Marien-Biologisch Instituut".

The longest living worm measured 20 cm in length and 5 mm in maximum width. The anterior part of the body is cylindrical and the posterior is flattened. There is a shallow constriction between head and trunk which results in a cephalic lobe. The color is uniformly black without any markings. The mouth (Fig. 25, m), situated behind the cephalic constriction, is small. The horizontal lateral cephalic slits (h) reach the constriction posteriorly. The proboscis pore (p) is a terminal slit, and forms a cross with the cephalic slits.

The epidermis of the horizontal lateral cephalic slits is provided, at least in their outer part, with flask-shaped gland cells as in the rest of the body (Fig. 27, e), each of which cells contains a brilliant acidophil drop of secretion that is often expelled and sticks to the cilia. Underneath the epidermis there is a layer of sub-epithelial muscles (s). The cutis gland cells (g), which are also present at the level of the slits, are separated from the thick external longitudinal muscles of the body wall by a thick layer of connective tissue (i). Dorso-ventral muscles are present between the intestinal diverticles, as well as diagonal muscles (o) outside the circular muscles (b) of the body wall. In the post-cerebral and esophageal regions there are dorso-ventral muscles between the rhynchocoel wall and lateral blood vessels. In front of the brain there is a net of transverse fibers, and among them lie pre-cerebral nerves and cephalic glands which do not attain the level of the brain posteriorly.

The mouth is followed by the esophagus, whose glandular epithelium is underlain by a sub-epithelial layer of glands (Fig. 27, f). The splanchnic musculature is circular. The median gut has several deep diverticles.

The terminal proboscis pore (Fig. 25, p) is situated at the junction of the two cephalic slits (h). The rhynchodaeum epithelium is low and glandular, but no cilia were recognizable. The rhynchocoel wall is composed of a flat epithelium, a longitudinal layer of muscles, and a circular layer of muscles which forms crosses with the circular muscles of the body wall. The circular layer is very thick ventrally at the esophageal level, and its fibers are entwined diagonally; the longitudinal fibers of the central plate run in the meshes of this network. In the posterior part of the body the rhynchocoel forms rhynchocoelic pouches. The proboscis wall is composed



Corsoua kristenseni, new genus, new species, from Curaçao. — Fig. 25. Anterior view of preserved worm. – Fig. 26. Transverse section of proboscis. — Fig. 27. Transverse section of body wall. – *a*, external proboscis epithelium. – *b*, circular muscles of body wall. – *c*, external circular muscles of proboscis. – *d*, dorsal muscle cross of proboscis. – *e*, flask-shaped epidermic gland cells. – *f*, esophageal epithelium.

of an external high and glandular epithelium (Fig. 26, a), a nervous plexus (n), a layer of external circular muscles (c), a thicker layer of internal longitudinal muscles (l), and the flat internal epithelium (u). Two rather strong muscle crosses are formed by the circular layer (d, v) passing through the longitudinal layer. The proboscis septum is closed.

There are two pre-cerebral blood vessels, situated on the sides of the rhynchodaeum and united anteriorly by a dorsal commissure, and two main post-cerebral ones situated on the sides of the rhynchocoel. A rhynchocoel vessel is present.

There are pre-cerebral nerves, more numerous and thicker on the sides than dorsally and ventrally. A dorsal nerve originating from the thin dorsal cerebral commissure, and a pair of esophageal nerves, are present. From the dorsal nerves arise metameric nerves for the body wall. The fibrous core of the dorsal cerebral ganglia is bifurcated distally into a small dorsal and a larger ventral core. The cellular ganglionar layer of the brain is not separated from the longitudinal muscles of the body wall by connective tissue. The large cerebral organs are closely connected with the ventral core of the dorsal ganglia. The cerebral canal opens into the cephalic slits. Neurochord cells are numerous in the brain, and neurochords are present in the lateral nerve cords. Eyes are absent.

WIJNHOFF (1925, p. 108–109) mentions connective tissue out-side the musculature of the body wall of her two headless fragments, which she classified (with doubt) as *Cerebratulus ater*. I collected several times in Spanish Water, the locality of WIJNHOFF's specimens, but did not find any specimens of *ater*. As far as I could see, this bay does not offer a biotope similar to the ones where *ater* occurs.

The two new genera, *Dushia* and *Corsoua*, differ in the following characteristics:

– *g*, cutis gland cells. – *h*, horizontal-lateral cephalic slit. – *i*, connective tissue layer. – *l*, internal longitudinal muscles of proboscis. – *m*, mouth. – *n*, nervous plexus of proboscis. – *o*, diagonal muscles of body wall. – *p*, proboscis pore. – *r*, external longitudinal muscles of body wall. – *s*, sub-epithelial muscles of body wall. – *t*, internal longitudinal muscles of body wall. – *u*, internal proboscis epithelium. – v, ventral muscle cross of proboscis.

Tetrastemma herthae, new species, from Curaçao. — Fig. 28. Antero-dorsal view of living worm. — Fig. 29. Total, dorsal view of living worm. – *a*, anterior eyes. – *c*, anterior cephalic furrow. – *l*, longitudinal band of glands. – *o*, posterior cephalic furrow. – *p*, posterior eyes.

	Dushia	*Corsoua*
connective tissue between cutis and external longitudinal muscles of body wall	absent	present
cephalic glands	absent	present
diagonal muscles	absent	present
proboscis pore	sub-terminal	terminal
layers of muscles in proboscis	three	two
pre-cerebral blood vessels	more than two	two

Zygonemertes virescens (Verrill, 1879)

VERRILL 1892, p. 400, pl. 33 fig. 4a–e, as *Amphiporus virescens;* MONTGOMERY 1897, p. 2–4, pl. 1 fig. 14–15, 23–24, 28; COE 1943, p. 270–273, fig. 63–64; 1951, p. 329; 1951a, p. 170, fig. 16a–e; CORRÊA 1961, p. 25–28.

CURAÇAO: Piscadera Baai, among algae; intertidal zone.
Several worms; January–June 1962.

From Bay of Fundy to southern Florida and on the Gulf Coast at least as far as Pensacola, Fla.; Curaçao (new). From British Columbia to Mexico on the Pacific coast. — Intertidal zone.

The living worms attain 3 cm in length. The color varies from white to yellow and green. There are pre-cerebral eyes disposed in irregular rows, and a single row of post-cerebral eyes, on each side of the body.

Amphiporus texanus Coe, 1951

COE 1951, p. 329, fig. 1; 1951a, p. 173–174, fig. 19a–b; CORRÊA 1961, p. 35–37, fig. 30–31.

CURAÇAO: Piscadera Baai, among algae; intertidal zone.
Several worms; January–June 1962.

Port Aransas, Texas; Virginia Key, Miami, Fla.; Curaçao (new). — Intertidal zone.

The living worms measured up to 8 cm in length. The color is uniformly brown. There is a frontal row of eyes situated on the borders of the brown pigment.

Prostomatella enteroplecta Corrêa, 1954

CORRÊA 1954, p. 54–59, pl. 11 fig. 57–61, pl. 12 fig. 62; 1961, p. 37–38.

CURAÇAO: Piscadera Baai, among algae, intertidal zone.
Several worms; January–June 1962.

Coast of São Paulo, Brazil; Virginia Key, Miami, Fla.; Curaçao (new). - Intertidal zone.

The living worms measured up to 3 cm in length. The color is whitish or light yellow. There are two pairs of eyes and a band of brown pigment between the anterior eyes.

Tetrastemma herthae, new species. Figs. 28–29

CURAÇAO: Piscadera Baai, among algae (*Padina* and *Jania*) together with coralline sand; intertidal zone.
Several worms; January–June 1962.

Type: One large specimen, a mature female, under number C2.
I have named the species for Miss HERTHA CAPRILES.

The living, mature worms (Figs. 28–29) measured up to 10 mm in length and 0.3 mm in maximum width. During normal gliding the anterior end is spatulate and narrower than the trunk. Behind the head there is a constriction from which the body enlarges successively backwards to the last third, and then tapers towards the hind end. The posterior tip is either pointed or slightly rounded. Both ends bear a few tactile cilia. The ground color is milky white or yellowish white, sometimes darker owing to the intestinal contents or to brownish or blackish scattered pigment. On the back there are two lateral longitudinal stripes strongly conspicuous through their deep brown color. Sometimes they are not continuous, but appear as rows of brown irregular spots placed closely together. Between slide and cover slip they showed themselves to be composed of an irregular net of brown pigment. The stripes do not join at the ends. On the dorso-median line, between the two lateral stripes, there are one or (sometimes) two longitudinal rows of brown spots, irregular in size, shape and distribution. They reach both ends of the body. On the outer side of the lateral stripes there is one longitudinal row of brown spots, situated almost on the lateral borders of the body. These rows do not always reach the ends, and are generally composed of a small number of spots. There are two transverse cephalic furrows. The anterior furrow (Fig. 28, c) is broad, distinct, deep, slightly curved forwards, strongly ciliated and complete dorsally. The posterior one (o) is rather shallow, indistinct, but also complete. There are two pairs of eyes. They are somewhat indistinct in gliding worms, owing to brown pigment lying over them. The anterior eyes (Figs. 28–29, a), situated closely in front of the anterior cephalic furrow, have their black pigment cups directed antero-laterally. The posterior eyes (p), situated in front of the posterior cephalic furrow, are roundish and also black. Along the dorso-median zone, there are several groups of cells (Fig. 28, 1) which appear as a long opaque white band on a dark ground under the microscope. In reflected light they are seen to consist of light-brownish cells. Opaque or brownish zones on both sides are the gonads. The testes are whitish, the ovaries brownish. On the hind end the epidermis is higher than on the rest of the body. It acts as a caudal plate. The worms attach themselves by means of this plate to the substratum when they are touched, and to the pipette when they have to be removed. They also coil the body in a spiral. Caudal plate and coiling in a spiral are characteristics of haptic animals (REMANE 1933, p. 185). The worms live in an open bay, at high-water level, in a sandy and rocky region constantly agitated by the surf.

The gut has two antero-lateral pouches, which reach the posterior level of the dorsal cerebral ganglia anteriorly, and lateral unbranched diverticles. These are

deeper and narrower in males. The rhynchocoel is long and broad. It almost reaches the posterior end of the body. The anterior proboscis chamber is broad and short and lined externally by a villous epithelium which is easily seen in the stages of protraction. The diaphragm or armed chamber is quadrangular. The central smooth stylet is shorter than the pear-shaped and strong base. Around the base there is a broad band of glands. There are two to three accessory stylets in each of the two pouches. The muscular chamber is bulbar and the posterior chamber is the narrowest and longest of all the chambers. The brain is large and distinctly divided into dorsal and ventral ganglia. The cerebral organs are large, sacculiform and situated antero-laterally close to the brain. They open dorso-laterally into the anterior cephalic furrow. Their cerebral canal is long, strongly ciliated and leads to a large cerebral chamber. A second, accessory chamber seems to be present behind the main one; posteriorly it reaches the level of the ventral cerebral ganglia. A frontal sense organ is present at the tip of the head. It is a small protractile pit lined with ciliated cells. The worms are dioecious. Both sexes were well developed in the collection. The gonads are situated laterally, alternating with the intestinal diverticles.

T. herthae differs from the other two Caribbean species of *Tetrastemma* Ehrenberg, 1831, *T. candidum* (Müller, 1774), the type of the genus, and *T. worki* Corrêa, 1961, and from the seven Brazilian species, *T. primum* Corrêa, 1954, *T. piolinum* Corrêa, 1957, *T. nanum* Corrêa, 1957, *T. turdum* Corrêa, 1957, *T. basinum* Corrêa, 1957, *T. cincum* Corrêa, 1957 and *T. lilianae* Corrêa, 1958, in the presence of 3 to 4 longitudinal rows of brown spots besides the longitudinal brown stripes. These stripes, it is true, also occur in some of the species mentioned. The two older Caribbean species have no stripes at all. The second one, *T. worki*, differs from all known species of *Tetrastemma* in the presence of only one pair of eyes. One of the Brazilian species, *T. cincum*, lacks longitudinal stripes too. *T. piolinum* and *T. turdum* have but one dorso-median stripe, which is narrow in the first and broad in the second species. The four remaining species have two brown or blackish longitudinal dorso-lateral stripes. In *T. primum*, *T. basinum* and *T. lilianae*, the stripes are much broader than in *herthae*. *T. nanum* is the only species with narrow stripes; but, besides being a much smaller species, it has no longitudinal rows of brown spots.

Key for the Caribbean and Brazilian species of *Tetrastemma*.

1. With longitudinal stripes 2
– Without longitudinal stripes 8

2. One dorso-median longitudinal stripe 3
– Two dorso-lateral longitudinal stripes 4

3. Dorso-median longitudinal stripe narrow . . . . . *T. piolinum* Corrêa, 1957
– Dorso-median longitudinal stripe broad *T. turdum* Corrêa, 1957

4. Two dorso-lateral longitudinal stripes only 5
– Besides the two dorso-lateral longitudinal stripes there are longitudinal rows of brown spots . . *T. herthae*, new species

5. Two narrow dorso-lateral longitudinal stripes . . . . . *T. nanum* Corrêa, 1957
– Two broad dorso-lateral longitudinal stripes 6

6. One cephalic plate . . . . . *T. lilianae* Corrêa, 1958
– Two cephalic plates 7

7. Central stylet and base about the same length . . . . . *T. primum* Corrêa, 1954
– Central stylet much shorter than base *T. basinum* Corrêa, 1957

8. One pair of eyes . . . . . *T. worki* Corrêa, 1961
– Two pairs of eyes 9

9. Base cylindrical; length of the body up to 8 mm. . . . . *T. cincum* Corrêa, 1957
– Base pear-shaped; length of the body up to 20 mm . . . . . *T. candidum* (Müller, 1774)

Tetrastemma worki Corrêa, 1961

CORRÊA 1961, p. 40–42, fig. 32–34.

CURAÇAO: Piscadera Baai, among algae; intertidal zone. Several worms; January–June 1962.

Virginia Key, Key Biscayne, Miami, Fla.; Key Largo, Fla.; Curaçao (new). — Intertidal zone.

The living worms attain 2 cm in length. The uniform color is milky white or yellowish white. There is only one pair of eyes.

REFERENCES

BÜRGER, OTTO, 1904. Nemertini. *Das Tierreich* (Preuss. Akad. Wiss.) *20*, xvii + 151 pp.

COE, WESLEY ROSWELL, 1943. Biology of the Nemerteans of the Atlantic Coast of North America. *Trans. Conn. Acad. Arts Sci. 35*, p. 129–328, pl. 1–4.

— 1951. Geographical distribution of the Nemerteans of the Northern Coast of the Gulf of Mexico ... *J. Wash. Acad. Sci. 41*, 10, p. 328–331.

— 1951a. The Nemertean Faunas of the Gulf of Mexico and of Southern Florida. *Bull. Mar. Sci. Gulf Carib. 1*, 3, p. 149–186.

CORRÊA, DIVA DINIZ, 1954. Nemertinos do litoral brasileiro. *Bol. Fac. Fil. Ci. Letr. Univ. S. Paulo, Zoologia 19*, p. 1–90, pl. 1–14.

— 1956. Estudo de Nemertinos mediterrâneos (Palaeo e Heteronemertini). *An. Acad. Brasil. Ci. 28*, 2, p. 195–214, pl. 1–6.

— 1957. Nemertinos do litoral brasileiro (VI). *An. Acad. Brasil. Ci. 29*, 2, p. 251–271 pl. 1–6.

— 1958. Nemertinos do litoral brasileiro (VII). *An. Acad. Brasil. Ci. 29*, 3, p. 441–455, pl. 1–4.

— 1961.Nemerteans from Florida and Virgin Islands. *Bull. Mar. Sci. Gulf Carib. 11*, 1, p. 1–44.

FRIEDRICH, HERMANN, 1935. Studien zur Morphologie, Systematik und Oekologie der Nemertinen der Kieler Bucht. *Arch. Naturgesch.* (N.F.) *4*, 3, p. 293–375.

— 1960. Bemerkungen über die Gattung Micrura Ehrenberg 1831 und zur Klassifikation der Heteronemertinen nebst vorläufigem Bestimmungsschlüssel. *Ver. Inst. Meeresforsch. Bremerhaven 7*, p. 48–62.

MONTGOMERY, T. H., 1897. Descriptions of new Metanemerteans, with notes on other species. *Zool. Jahrb.* (*Syst.*) *10*, 1, p. 1–14, pl. 1.

REMANE, ADOLF, 1933. Verteilung und Organisation der benthonischen Mikrofauna der Kieler Bucht. *Wiss. Meeresunters.* (*Kiel*) *21*, p. 161–221.

VERRILL, ADDISON E., 1892. The marine Nemerteans of New England and adjacent waters. *Trans. Conn. Acad. Arts Sci. 8*, p. 382–456, pl. 33–39.

WIJNHOFF, GERARDA STIASNY, 1925. On a collection of Nemerteans from Curaçao. *Bijdr. Dierk. Amsterdam 24*, p. 97–120, pl. 5–8.