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SIPUNCULOIDEA AND ECHIUROIDEA
FROM WEST AFRICA
TOGETHER WITH A BIBLIOGRAPHY
ON GEPHYREA AFTER 1920,

by Elise WESENBERG-LUND (Copenhagen)

The small collection of sipunculids and echiuroids here worked up was obtained on board of the Ocean Minesweeper « DE BROUWER » by M. S. LEFEVERE to the coastal waters of West Africa south of the Equator in 1955.

The material belongs to the Institut Royal des Sciences Naturelles de Belgique (I. G. 20.403). The drawings were made by the Danish scientific drawer Poul H. WINTHER.

I extend my best thanks to the board of directors of the Institut Royal des Sciences Naturelles de Belgique which for the fourth time has entrusted me with its collections of Gephyrea.

In 1920 R. V. CHAMBERLIN published a short note on gephyreans from the Canadian Arctic Expedition 1913-1918. This paper included a nearly complete bibliography on all the three groups embodied in this systematically artificial group of Gephyrea. In the present paper I have followed the line of R. V. CHAMBERLIN giving a bibliography from 1920 to 1956 as complete as I have been able to make it, and including a few papers of older date which are not mentioned in R. V. CHAMBERLIN's paper.

SIPUNCULOIDEA

Sipunculus titubans SELENKA & DE MAN, 1883.

Material :

No 347 : 5° 52' 05" S — 12° 07' E, 24, VIII, 1955. 10 fathoms.

The single specimen measures 21 mm with fully withdrawn proboscis. The colour is greyish white, the anterior and posterior end lighter and more thinly skinned than the middle part of the trunk, where the skin, due to the strong contraction, is very thick and tough. There are 28 longitudinal muscle bands which nowhere anastomose. The ventral retractors arise from the 3rd and 4th, the dorsal retractors from the 10th-11th band, all of them with two short roots and at the same level. The retractors unite close to the tentacular crown. The intestine is filled with numerous small rusty-red pellets and it fastened posteriorly by a thin spindle muscle. Two contractile vessels. The segmental organs open in front of the anus between the 4th and the 5th muscles.

In 1895, p. 7, W. FISCHER described a variety of the species from West-Africa (*S. titubans* var. *diphychus*). It differs from the main species in having anastomoses between the muscle bands and in the character that the dorsal retractors arise from 11th-14th muscles. Furthermore, the variety has « zwei an der Eichel befindliche sich gegenüber stehende Hautfalten, die bei allen Exemplaren beobachtet wurden, nicht also zufällige Bildungen eines Exemplares waren ». There is no doubt that the present specimen belongs to the main species.

Distribution. — *Sipunculus titubans* SELENKA & DE MAN, 1883, was described from Punta Arenas; later refound at S. José de Guatemala and Nossi-Be, Madagascar; the variety is hitherto only known from the Gold Coast at Accra, 8 1/2 m.

Phascolosoma scolops (SELENKA & DE MAN), 1883.

- Syn. : *Phymosoma scolops* SELENKA & DE MAN, 1883, p. 85.
Phymosoma granulatatum scolops W. FISCHER, 1895, p. 10.
Physcosoma scolops W. FISCHER, 1914, p. 63.

Material :

No 343 : 22-VIII-1955, in fouling timber in the harbour of Cabinda; 1 spec. juv.; 2,5 mm mounted on a slide.

No 378 : 6° 15' S — 12° E, 16-IX-1955, 35 fms., shell-sand; 2 specimens.

The two specimens measure 20 mm and 18 mm; they are deep red brown with still darker papillae irregularly scattered, and especially well developed and crowded at the base of the proboscis and round the posterior end. There are only 15 rings of hooks close behind the tentacular crown, and posteriorly to the rings there is a girdle of numerous dark pigmented spots, annularly arranged, and of big oval, glandular bodies. The hooks agree closely with the figure given by E. SELENKA & DE MAN (op. cit. pl. X, fig. 139); they have the characteristic triangular space at the convex side, and the long clear streak is bordered by a dark line, which at its concave side has two characteristic abrupt bends.

The dissected specimen has 21 longitudinal muscles which do not anastomose; the rectum has a fairly large diverticle, and the intestine which has only few coils, is fastened posteriorly by means of the spindle muscle. The retractors arise in the posterior part of the middle third of the trunk, the dorsal only slightly in front of the ventral pair. The segmental organs reach nearly to the roots of the dorsal retractors. The body cavity was filled with myriads of oval, ripe ova.

Distribution. — The species was formerly reported from West-Africa: The Gold Coast: Old Fort Brandenburg; Ilha das Rolas at São Tomé; Island Annobón. Widely distributed in tropic, subtropic and temperate areas; circummundan.

Phascolosoma agassizi KEFERSTEIN, 1866.

Syn.: *Phymosoma Agassizii* W. FISCHER, 1895, p. 10.

Phyrcosoma Agassizii, W. FISCHER, 1914, p. 67.

Material:

No 362: Off the church of Banana, 7-IX-1955, 2,73 fms; 2 specimens.

Two young specimens measuring 14 mm by 2 mm; the colour is light brown with a girdle of darker and rather prominent papillae round the base of the proboscis and the posterior end. The internal structure of the hooks, which are arranged in about 20 rings, resembles W. KEFERSTEIN's figures (1866, pl. 6, figs. 4 and 8), but the secondary tooth is lacking in all of them. This is in agreement with what W. FISCHER (1914, p. 67) writes about his West-African specimens: « Nebenzähne schwer, oft gar nicht zu erkennen ». — On account of the state of preservation it was difficult to study the interior anatomy: the longitudinal muscles were loosened from the skin, the intestine was completely empty and squeezed up to a delicate web, and as far as could be seen only with very few coils. It was fastened posteriorly by a spindle muscle. The segmental organs were long and fastened to the body wall in their whole length; their openings were at the same level as the anus. The longitudinal muscle layer is very thin and the separation in bands very indistinct; the animals were evidently juvenile, and most probably the final development of the muscles does not take place until the animal has reached a later stage, at any rate the present specimen agrees with what W. FISCHER (1914) has seen in his West-African specimens: « Bei den jugendlichen Tieren von Kap Palmas waren Längsbündel nur unter dem Mikroskop an Hautpräparaten zu sehen ».

Distribution. — The type locality is Mendocino in California; now we have records from many localities all over the world from all tropical and temperate seas. — In the Atlantic from Bermuda, Villefranche; the Mediterranean. Previously known from the West coast of Africa: Cape Palmas (Liberia) and Ambrizette (Angola).

Aspidosiphon mülleri DIESING, 1851.

Syn. : *Aspidosiphon mirabilis* THEEL, 1875, p. 17.

A. armatus KOREN & DANIELSSEN, 1881, p. 14.

Material :

No 342 and No 343 : the road of Cabinda, 22.VIII.1955, 1-2 fms.; 7 specimens.

No 344 : 5° 41' S — 11° 58' E, 23.VIII.1955, 22 fms.; 4 specimens.

No 347 : 5° 52' 05" S — 12° 07' E, 24.VIII.1955, 10 fms.; 1 specimen.

No 348 and No 349 : 5° 48' S — 11° 54' E, 24.VIII.1955, 30 fms.; 8 specimens.

No 355 : 5° 55' S — 12° 07' E to 6° S — 12° 11' E, 25.VIII.1955, 10 fms.; 3 specimens.

The colour is brown with darker specks; all specimens are small, never more than about 20 mm; none of them with protruded proboscis. The anal shield has, in the middorsal posterior part, about 22 longitudinal keels; in the anterior part it is finely granulate, the granules arranged in distinct, transversal rows; the colour of this shield is much darker than the skin, whereas the posterior shield is lighter and often indistinctly delimited; it is radially furrowed, and the central part, where the radii meet, are often elevated into a small tip.

The longitudinal muscles are of a silky lustre and form a continuous layer, except in front of the anus (where they are separated into about 10 bundles). The two retractors arise with broad roots at the hindmost tip of the shield and unite rapidly; between the roots the stout spindle muscle fastens.

The intestine is long with numerous coils. The rectum is fastened by a very broad wing muscle; its outermost fibres reach as far as the nephridiopores which are placed slightly anteriorly to the anus. The spindle muscle crosses the wing muscle and fastens far in front of it. A rectal diverticle could not be found. The last coil and the rectum are in many specimens strongly distended by the contents of brownish detritus mixed with *Foraminifera*. The segmental organs reach far into the last third of the trunk and are fastened to the body wall in nearly their whole length. The neprostomes have two small lips.

All the specimens were found in coiled gastropod shells of many kinds. The coils are always cemented with a fine layer of mud; the introvert was only partly protruded through a hole in the centre of the mud plug. R. SOUTHERN (1912, p. 31-33) writes that *A. mülleri* DIESING, 1851 « does not diminish the entrance to the shell in which it lives by cementing sand round it », and he continues : « The aperture of the shell is often choked up with mud or ooze, through which the proboscis projects, but this seems to be quite accidental, and the mud is not strengthened with cement and mucus ». As regards the present specimens I am inclined to think that the lining of mud in the outer coils of the shell is not

accidental but purposely done. None of the specimens shared their residence with *Syllis cornuta* RATHKE, 1843, as is often the case with boreal forms.

The proboscis of two specimens were dissected; they showed that the hooks were scattered over a very long stretch, mainly not arranged in rings, and if so only in the anterior part; they were exceedingly small and all of them unidentate. *A. mülleri* was originally described from the Mediterranean; the typical form differs from the here described specimens in having bidentate hooks in the anterior rows (as figured by Oscar SCHMIDT, 1865, pl. 1, figs. 3-4). The present specimens closely agree with W. MICHAELSEN's specimens from West-Africa (1914, p. 69) and with R. SOUTHERN's (op. cit.) from other parts of the Atlantic. C. P. SLUITER (1912, p. 19) has however studied specimens from the Azores and the Cape Verde Islands and found that the hooks may vary to a considerable degree, since specimens with unidentate, others with bidentate, others again with both kinds and even specimens without any hooks at all occur; this character is therefore without specific value, and the Mediterranean form is without any doubt the same as the Atlantic form.

In 1912 R. SOUTHERN proved that *A. mirabilis* THEEL (1875, p. 17) and *A. armatus* KOREN & DANIELSEN (1881, p. 4) are identical with *A. mülleri*.

Distribution. — The species is especially common in the northern temperate zone of the Atlantic Ocean, from where it enters the Arctic. From the west coast of Norway it occurs along the whole European coast mainly in littoral zones. From the Mediterranean it has immigrated into the Red Sea, and a few finds are reported from the Malayan Archipelago and Japan. — The species was previously reported from West-Africa, e.g. Dahomey, South Nigeria, Accra, French Congo.

Aspidosiphon venabulum SELENKA & DE MAN, 1883.

Aspidosiphon venabulum SELENKA & DE MAN, 1883, p. 123.

A. venabulum W. FISCHER, 1895, p. 18.

Material:

No 344 : 5° 41' S — 11° 58' E, 23.VIII.1955; 22 fms.

No 349 : 5° 48' S — 11° 54' E; 24 m from Kupundgi Light in the 284°, 24.VIII.1955; 30 fms.

No 355 : 5° 55' S — 12° 07' E to 6° S — 12° 11' E, 25.VIII.1955; 10 fms.

The specimens are all very small, slender and delicate, the longest of them only 14 mm by 1 mm; several of them are transparent; the colour is white or greyish with a lustre of mother-of-pearl. Only the anal shield is dark brown with big, spine-like papillae arranged neither in rows nor in rings, but evidently without any order. The shield is sharply delimited from the surroundings. This is not the case with the caudal shield, which

has nearly the same light colour as the trunk and the papillae of which are low, light but also irregularly scattered. The posterior end in most of the specimens is cut off straight. Hooks could not be seen through the inverted proboscis which on account of its delicacy was not cut open. — The skin between the shields is quite smooth with only a few glandular bodies.

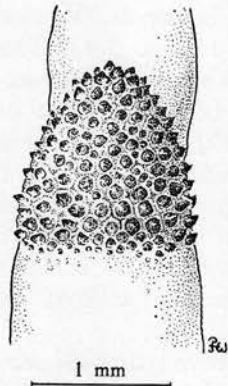


Fig. 1. — *Aspidosiphon venabulum* SELENKA & DE MAN, 1883.
Anal shield.

The longitudinal muscle layer is continuous, but in the anterior part just beneath the anal shield they are separated into frequently anastomosing bundles. The strong retractor arises with two roots in the central part of the caudal shield; between the roots the spindle muscle inserts. The intestine is long with several coils; a diverticle could not be found. The segmental organs were in both of the dissected specimens about two thirds of the length of the trunk. In E. SELENKA's original description they are stated to be nearly as long as the whole trunk, whereas W. FISCHER, 1895, p. 18, writes that they reach only to the middle of the body.

All specimens were found in shells of *Dentalium*. The sipunculid never reached the hindmost tip of the shells, and they were all withdrawn into them, only part of the inverted proboscis protruded through a circular hole in the middle of the plug of mud, which filled the last few millimetres of the shell. The anal shield fits closely in the entrance, and the animal itself fitted the tube very accurately. This was not cemented, but completely free from mud, the worm lying in a state of strong tension in the tube. Nearly all the shells were bored by *Natica*; the inhabitants were evidently not damaged, but where the hole was, the cuticle of the sipunculid was considerably thickened and closed the hole as a plug; most probably the tube was bored before the worm invaded it.

Distribution. — *A. venabulum* is reported from numerous localities from the west coast of Africa. it was originally described from

Congo; later by W. FISCHER (1895 and 1914) reported from Senegal, Liberia, the Gold Coast, Accra, the Cameroons, Victoria, Loanga, Cabinda, Angola, from soft mud in littoral areas and in different gastropod shells such as *Tomella*, *Turritella*, *Nassa*, *Natica*, *Dentalium* etc.

In the literature available to me I have only found the species recorded by E. SELENKA and W. FISCHER.

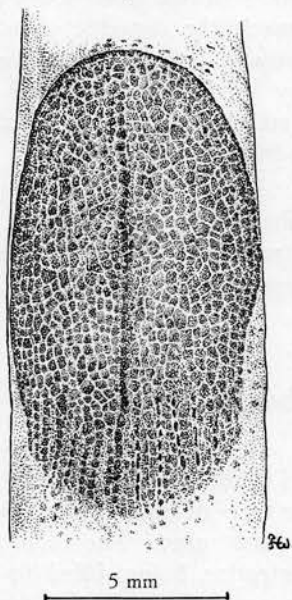


Fig. 2. — *Aspidosiphon hartmeyeri* W. FISCHER, 1919.
Anal shield.

Aspidosiphon hartmeyeri W. FISCHER, 1919.

Aspidosiphon Hartmeyeri W. FISCHER, 1919, p. 281; 1927, p. 204.

Material:

No 375 : 6° 28' S — 11° 56' E, 15.IX.1955, 60 fms.; 1 specimen.

The trunk of the single specimen measured 8 mm, the only partly protruded proboscis 4 mm, the width of the trunk 1 mm. The colour is white and the animal nearly transparent. The anal shield is brown, elliptic, with a shallow furrow in the longitudinal midline; it is composed of numerous polygonal platelets, largest in the central part; between the largest of them a great number of smaller ones. The shield is distinctly delimited by a row of very small, closely lying, dark brown platelets. At the hindmost border they are arranged in short longitudinal rows, and the delimitation to the trunk is less sharp; the hindmost border

resembles a small fringe. Small chalk granules partly cover the surface of the shield. The hooks could not be studied since the threadlike proboscis was not protruded. — The anal shield is circular, less distinctly delimited, lighter, with about 20 furrows. The skin papillae resemble those described and figured by W. Fischer (1914, pl. 2, fig. 14).

The animal was dissected as far as its rather bad condition and its diminutiveness allowed. The longitudinal muscles form a continuous layer; the retractor inserts with two short roots just in front of the shield; the segmental organs reach the anterior part of the last third of the trunk. The intestine forms a coil of the ordinary kind; it was not as described and figured by W. FISCHER in 1919 and 1927.

The specimen was extracted from one of the furrows between two septa of a *Caryophyllia*-like solitary coral.

Distribution. — *A. hartmeyeri* is hitherto only reported from Southwest-Australia: Shark's Bay, Surf Point, and Brown Station, collected by W. MICHAELSEN and W. HARTMEYER (Hamburger Südwest-australische Forschungsreise 1905).

ECHIUROIDEA

Platylobostoma glaucum n. g., n. sp.

Material:

No 344: 5° 41' S — 11° 58' E, 23.VIII.1955; 22 fms.

The two specimens are of nearly the same length, 22 mm, and colour, yellowish or reddish grey. The skin is brightly distended on account of the whole intestine being filled to the breaking point with faecal pellets distinctly seen through the transparent dilated middle portion of the trunks. Also the separate longitudinal muscles can be seen through the skin. The state of preservation is poor on the whole.

There is no proboscis, and as far as I can see, there is absolutely no trace of a scar in either of the specimens. The mouth is dorsally bordered by a perfectly undamaged wall set with small papillae. At the ventral side the mouth is bordered by two big, flappy lobes, one to the right and one to the left; they are of somewhat different aspect in the two specimens as illustrated in the two figures. In one of them they are formed as two hands with three and four short blunt fingers, in the other they are more irregular and flappy. Close to them in the usual place are the two sickle-shaped, goldglimmering ventral setae, which offer nothing of interest.

The trunk ends in a small knob cut off in a plane disc, in the centre of which the anus is a longitudinal fissure; at the margins of the disc there are four parts of subulate papillae, and slightly interiorly to them and closer to the ventral side still one more on each side, smaller than the marginal ones.

The skin is thin, smooth, only with a few papillar rings round the posterior part of the trunk.

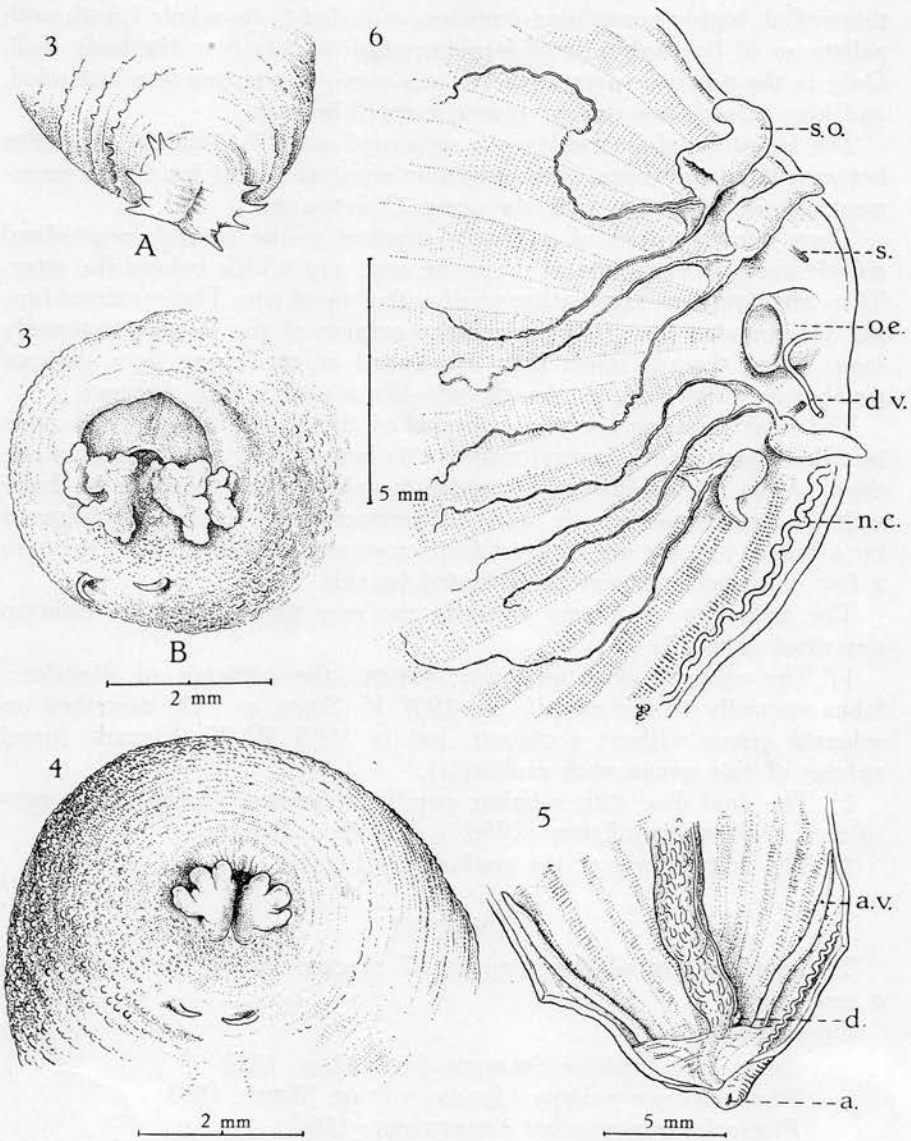


Fig. 3-6. — *Platyllobostoma glaucum* n. g., n. sp.

Fig. 3. — A = Posterior and B = Anterior end of same specimen. Fig. 4. — Anterior end of the other specimen. Fig. 5. — a.v. = anal vessel with frenula; d. = prelocaal diverticle; a. = anus. Fig. 6. — s.o. = segmental organ; s. = seta; o.e. = oesophagus; d.v. = dorsal blood vessel; n.c. = nerve cord.

One of the specimens was dissected, but proved to be in a very bad condition. It is impossible to give a detailed account of the course of the thinwalled, highly convoluted intestine, crowded in its whole length with pellets, or of the multitude of frenula, which anchor it to the body wall. Only in the posterior part of the rectum was the intestine less distended, and here a small pre-cloacal diverticle could be seen.

The longitudinal muscle layer is separated into 12-13 bands; the zones between them are crossed by numerous separated fascicles of the innermost oblique layer just as in the genus *Ochetostoma*.

There are two pairs of nephridia inserted to the second longitudinal muscle band on each side of the nerve cord and a little behind the setae. They are digitiform sacs, rather small and of equal size. Their internal funnel has rounded lips; from one of the corners of the lip two extremely long, coiled threads issue; they are united at their base by a delicate membrane which follows the threads for a rather long distance.

The anal vesicles are two unbranched thinwalled tubes which open into the cloaca on the ventral side of this latter. They are as long as one third of the trunk; numerous slender frenula anchor them to the body wall in their whole length, and furthermore each of them is fastened by a broad, delicate mesentery which crosses the cloaca. There are only a few scattered and very tiny ciliated funnels.

The following characters separate the new genus from the hitherto described echiurids :

- 1) The absence of a proboscis; instead the presence of digitiform lobes ventrally to the mouth. (In 1937 H. SATO, p. 142, described an echiurid genus without proboscis, but in 1949 W. K. FISCHER found species of this genus with proboscis).
- 2) The anal disc with subulate papillae (compare *Ochetostoma mercator* E. WESENBERG-LUND (1954, p. 13) from Angola.
- 3) The united issue of the nephrostomal coils.

SUMMARY.

The material treated here comprises 7 species, one of which represents a new genus.

Sipunculoidea :

- Sipunculus titubans* SELENKA & DE MAN, 1883
- Phascolosoma scolops* (SELENKA & DE MAN), 1883
- Phascolosoma agassizi* KEFERSTEIN, 1866
- Aspidosiphon mülleri* DIESING, 1851
- Aspidosiphon venabulum* SELENKA & DE MAN, 1883
- Aspidosiphon hartmeyer* W. FISCHER, 1919

Echiuroidea :

- Platylobostoma glaucum* n. g., n. sp.

Of these species *Ph. scolops*, *Ph. agassizi*, *Aspidosiphon mülleri* and *A. venabulum* were previously known from West Africa. *Sipunculus*

titubans was only known as the variety *diphychus* from the area under consideration. New to the area is *Aspidosiphon hartmeyer*, which hitherto was known only from the type locality : Southwest-Australia; the material of this species has allowed a closer examination than that of W. FISCHER's material.

Of special interest is the find of two specimens of an Echiuroid, which represents a new genus, which has been called *Platylobostoma* on account of the presence of two flat lobes bordering the ventral side of the mouth instead of the otherwise so characteristic proboscis.

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