

# Revision of the Scalpellidae (Crustacea, Cirripedia) in the collection of the Muséum national d'Histoire naturelle, France, studied by Abel Gruvel

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## ABSTRACT

The collection of scalpellids from the Muséum national d'Histoire naturelle, studied by Gruvel, are reviewed, and their type specimens redescribed, including their appendages. *Euscalpellum renei* (Gruvel, 1902), *Gruvelialepas pilsbryi* (Gruvel, 1911), *Catherinum recurvitergum* (Gruvel, 1900), *Arcoscalpellum atlanticum* (Gruvel, 1900), *Teloscalpellum luteum* (Gruvel, 1900), *Verum hoeki* (Gruvel, 1901), *Weltnerium bouvieri* (Gruvel, 1906) and *Ornatoscalpellum vanhoeffeni* (Gruvel, 1907) are considered valid species. The following synonyms are recognized: *Smilium longirostrum* (Gruvel, 1900) (= *Smilium acutum* [Hoek, 1883]), *Scalpellum edwardsii* Gruvel, 1900 (= *Neoscalpellum debile* [Aurivillius, 1898]), *Scalpellum patagonicum* Gruvel, 1900 (= *Ornatoscalpellum gibberum* [Aurivillius, 1892]), *Scalpellum striatum* Gruvel, 1900, *Arcoscalpellum curvatum* (Gruvel, 1900) and *Amigdoscalpellum talismani* (Gruvel, 1900) (= *Amigdoscalpellum rigidum* [Aurivillius, 1898]), *Scalpellum alatum* Gruvel, 1900 (= *Arcoscalpellum michelottianum* [Seguenza, 1876]), *Weltnerium weltneri* (Gruvel, 1907) (= *Weltnerium bouvieri* [Gruvel, 1906]). The samples considered as *Scalpellum gigas* Hoek, 1883 (*Trianguloscalpellum* Zevina, 1978) by Gruvel from deep-water stations from Azores (*Talisman* Expedition 1883) are indeed *Trianguloscalpellum ovale* (Hoek, 1883). *Arcoscalpellum crenulatum* Foster & Buckeridge, 1995 is considered synonym of *A. atlanticum* (Gruvel, 1900).

## KEY WORDS

Crustacea,  
Cirripedia,  
Scalpellidae,  
revision,  
A. Gruvel,  
deep-sea,

Muséum national d'Histoire naturelle.

## RÉSUMÉ

*Révision des Scalpellidae (Crustacea, Cirripedia) de la collection du Muséum national d'Histoire naturelle, France, étudiés par Abel Gruvel.*

La collection de Scalpellidae du Muséum national d'Histoire naturelle, étudiée par Gruvel, est révisée et les spécimens types redécrits y compris leurs appendices. *Euscalpellum renei* (Gruvel, 1902), *Gruvelialepas pilsbryi* (Gruvel, 1911), *Catherinum recurvitergum* (Gruvel, 1900), *Arcoscalpellum atlanticum* (Gruvel, 1900), *Teloscalpellum luteum* (Gruvel, 1900), *Verum hoeki* (Gruvel, 1901), *Weltnerium bouvieri* (Gruvel, 1906) et *Ornatoscalpellum vanhoeffeni* (Gruvel, 1907) sont considérées comme des espèces valides. Les synonymes suivants sont reconnus : *Smilium longirostrum* (Gruvel, 1900) (= *Smilium acutum* [Hoek, 1883]), *Scalpellum edwardsii* Gruvel, 1900 (= *Neoscalpellum debile* [Aurivillius, 1898]), *Scalpellum patagonicum* Gruvel, 1900 (= *Ornatoscalpellum gibberum* [Aurivillius, 1892]), *Scalpellum striatum* Gruvel, 1900, *Arcoscalpellum curvatum* (Gruvel, 1900) et *Amigdoscalpellum talismani* (Gruvel, 1900) (= *Amigdoscalpellum rigidum* [Aurivillius, 1898]), *Scalpellum alatum* Gruvel, 1900 (= *Arcoscalpellum michelottianum* [Seguenza, 1876]), *Weltnerium weltneri* (Gruvel, 1907) (= *Weltnerium bouvieri* [Gruvel, 1906]). Les échantillons identifiés comme *Scalpellum gigas* Hoek, 1883 (*Trianguloscalpellum* Zevina, 1978) par Gruvel de stations d'eau profonde des Açores (Expédition du *Talisman* 1883) sont en fait *Trianguloscalpellum ovale* (Hoek, 1883). *Arcoscalpellum crenulatum* Foster & Buckeridge, 1995 est considéré synonyme de *A. atlanticum* (Gruvel, 1900).

## MOTS CLÉS

Crustacea,  
Cirripedia,  
Scalpellidae,  
révision,  
A. Gruvel,  
mer profonde,

Muséum national d'Histoire naturelle.

## INTRODUCTION

Abel Gruvel described 23 species of *Scalpellum* s.l., these species are nowadays distributed in 13 genera and two families: Calanticidae Zevina, 1987 and Scalpellidae Pilsbry, 1907. He also gave a new name *Scalpellum neogratile* Gruvel, 1920 for *S. gracile* Pilsbry, 1907, name preoccupied by *S. gracile* Hoek, 1907, ignoring the previously new name given by Pilsbry (1908) – *Arcoscalpellum chiliense* Pilsbry, 1908 for the same species.

Gruvel's largest study concerned the cirripeds of the *Travailleur* and *Talisman* Expedition from the Azores region from which he described 10 species (genera names between parenthesis refer to the valid names): *Scalpellum edwardsii* Gruvel, 1900 (*Neoscalpellum*), *S. recurvitergum* Gruvel, 1900 (*Catherinum*), *S. longirostrum* Gruvel, 1900 (*Smilium*), *S. atlanticum* Gruvel, 1900 (*Arcoscalpellum*), *S. striatum* Gruvel, 1900 (*Amigdoscalpellum*), *S. alatum* Gruvel, 1900 (*Arcoscalpellum*), *S. luteum* Gruvel, 1900 (*Teloscalpellum*), *S. curva-*

*tum* Gruvel, 1900 (*Arcoscalpellum*), *S. talismani* Gruvel, 1900 (*Amigdoscalpellum*) and *S. pilsbryi* Gruvel, 1911 (*Gruvelialepas*) (Gruvel 1900a, 1902a, 1911).

From the Antarctic region, Gruvel studied the material recollected during the Expedition of the *Gauss* describing four species: *S. berndti* Gruvel, 1907 (*Trianguloscalpellum*), *S. gaussi* Gruvel, 1909 (*Trianguloscalpellum*), *S. weltneri* Gruvel, 1907 (*Weltnerium*) and *S. vanhoeffeni* Gruvel, 1907 (*Ornatoscalpellum*) (Gruvel 1907a, 1909); and part of the *Discovery* Expedition material adding two more species: *S. bouvieri* Gruvel, 1906 (*Weltnerium*) and *S. discoveryi* Gruvel, 1906 (*Litoscalpellum*) (Gruvel 1906, 1907b). Most of the samples collected by *Discovery* were subsequently studied by Nilsson-Cantell (1930, 1939). The Expedition of the Prince de Monaco, also from the Azores region, provided a large amount of scalpellids, however only two were new species: *S. richardi* Gruvel, 1920 (*Weltnerium*) and *S. alboranense* Gruvel, 1920 (*Neoscalpellum*) (Gruvel 1920).

In small reports Gruvel described *S. patagonicum* Gruvel, 1900 (*Ornatoscalpellum*) from Patagonia (Gruvel 1900b), *S. salartiae* Gruvel, 1901 (*Ornatoscalpellum*) from Cape Horn (Gruvel 1901a), *S. hoeki* Gruvel, 1901 (*Verum*) from Pacific Ocean, without detailed locality (Gruvel 1901a), *S. giganteum* Gruvel, 1901 (*Litoscalpellum*) from the coast of Cuba (Gruvel 1901b), and *S. renei* Gruvel, 1902 (*Euscalpellum*) from Saint-Paul-de-Loanda (Gruvel 1902b).

Some species described by Gruvel are nowadays perfectly recognizable (e.g., *Euscalpellum renei* and *Catherinum recurvitergum*). But others were described and illustrated without details and were not referred again (e.g., *Arcoscalpellum curvatum* and *A. atlanticum*) or were considered synonyms of other species (e.g., *Neoscalpellum alboranense* and *Arcoscalpellum alatum*).

This paper intends to redescribe the types of Gruvel deposited in the Muséum national d'Histoire naturelle, France (MNHN), including their shell and appendage morphology, and to reevaluate the present synonymies. The MNHN houses the type series of the *Talisman* and *Travailleur* Expedition, part of the type series of the *Gauss* Expedition (*Weltnerium weltneri* [Gruvel, 1907] and *Ornatoscalpellum vanhoeffeni* [Gruvel, 1907]), part of the *Discovery* Expedition (*Weltnerium bouvieri* [Gruvel, 1906]) and the types of *Scalpellum patagonicum* and *S. hoeki*. The type of *S. salartiae* is supposed to be in this collection, but it was not found.

Gruvel did not designate holotypes; lectotypes and paralectotypes are designated herein following the rules of the *International Code of Zoological Nomenclature* (ICZN 1999: Article 74).

#### ABBREVIATIONS

MNHN Ci	Muséum national d'Histoire naturelle, Cirriped collection;
drag.	dredging;
spec.	specimen;
cl	carino-latus peduncular scale;
l	lateral peduncular scale;
L1	upper-latus;
rc	rostro-carinal peduncular scale;
sr	sub-rostrum peduncular scale;
sc	sub-carina peduncular scale;
tl	total length.

## SYSTEMATICS

### VALID SPECIES

Order PEDUNCULATA Lamarck, 1818  
Suborder SCALPELLOMORPHA Newman, 1987

Family CALANTICIDAE Zevina, 1978

Genus *Euscalpellum* Hoek, 1907

*Euscalpellum renei* (Gruvel, 1902)

(Figs 1-3)

*Scalpellum renei* Gruvel, 1902c: 229, pl. 12, figs 5-7; 1902d: 523; 1905: 39, fig. 38. — Schmalz 1906: 67.

*Scalpellum (Smilium) renei* – Pilsbry 1907: 13.

*Euscalpellum renei* – Pilsbry 1908: 108. — Krüger 1911: 17. — Joleaud 1916: 39. — Withers 1953: 171. — Zevina 1978a: 1001; 1981a: 86, fig. 57. — Young 1995: 244.

*Smilium renei* – Bassindale 1961: 485. — Stubbings 1961a: 9, fig. 1; 1961b: 181; 1967: 233.

TYPE MATERIAL. — Angola. Saint-Paul-de-Loanda, 1886, Cavalier de Cunerville leg., lectotype by present designation, rc (tl) 2.6 (3.6) mm (MNHN Ci 373); paralectotypes 3 spec., cl (tl) 1.2 (1.4) to 3.4 (4.4) mm (MNHN Ci 373).

MATERIAL EXAMINED. — Golf of Guinea, *Calypso*, stn 19, 5°2'90"N, 5°24'40"W, 21-27 m, 1956, 1 spec., cl (tl) 5.4 (7.1) mm (MNHN Ci 374). Hermaphrodite without males. The body was dissected, with the appendages mounted on slides.

DIAGNOSIS. — Capitulum with 15 plates, distributed in three rows; all plates without apical umbo except tergum.

### DESCRIPTION

Hermaphrodite. Capitulum (Fig. 1A, B) with 15 plates, covered by hairless cuticle; length a little larger than twice width; carinal margin bent, basal portion straight, distal portion concave, occludent margin concave. Plates thin, nearly smooth, with thin growth lines. Plates separated from each other by cuticle.

Scutum (Fig. 1B) approximately quadrangular, with umbo a little above middle of occludent margin; length more than twice its width; occludent and lateral margins nearly straight, tergal and basal margins concave.

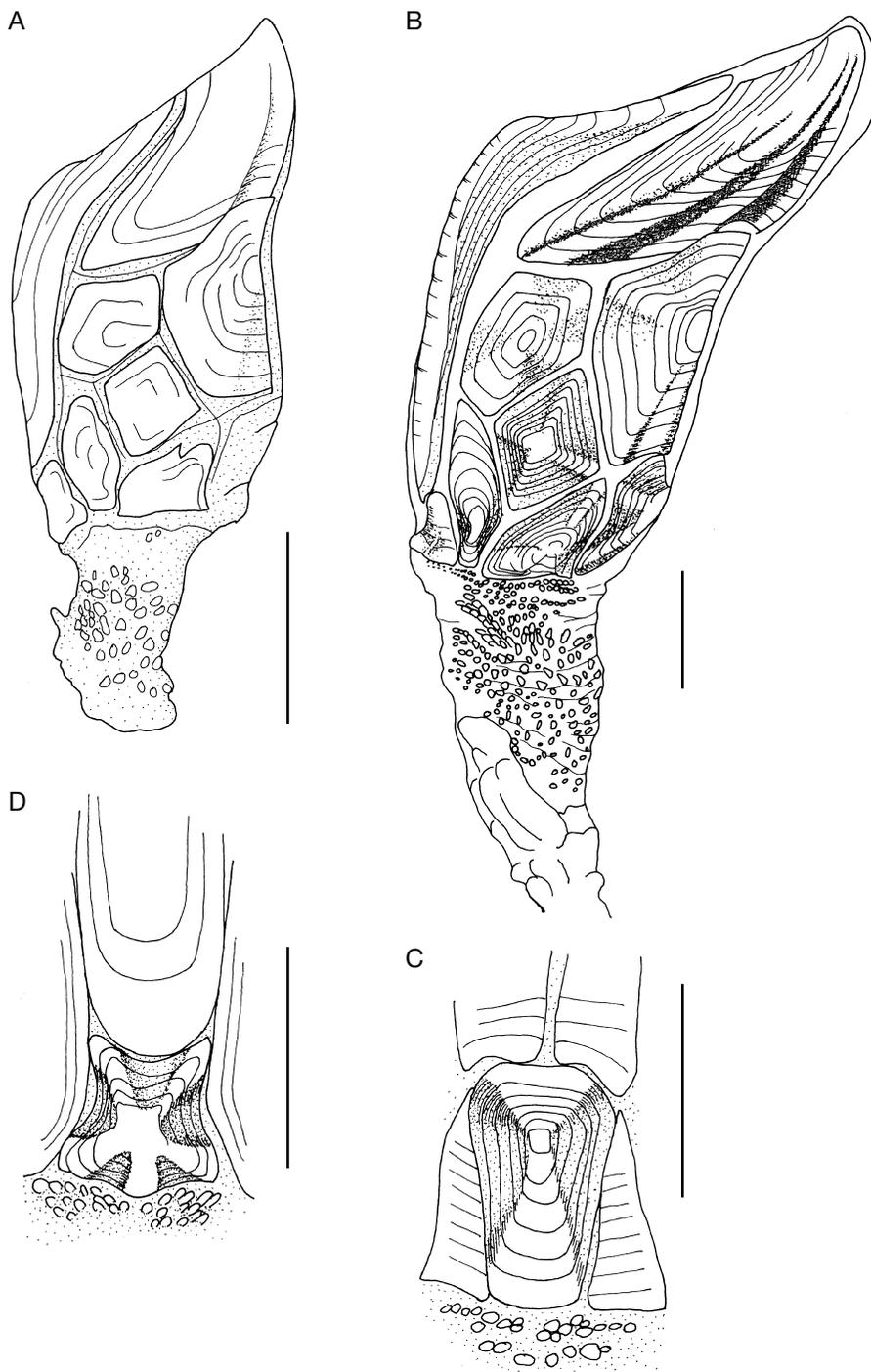


FIG. 1. — *Euscalpellum renei* (Gruvel, 1902); **A**, lectotype (MNHN Ci 373), left lateral view; **B-D**, *La Calypso* (MNHN Ci 374); **B**, left lateral view; **C**, rostral view; **D**, carinal view. Scale bars: 1 mm.

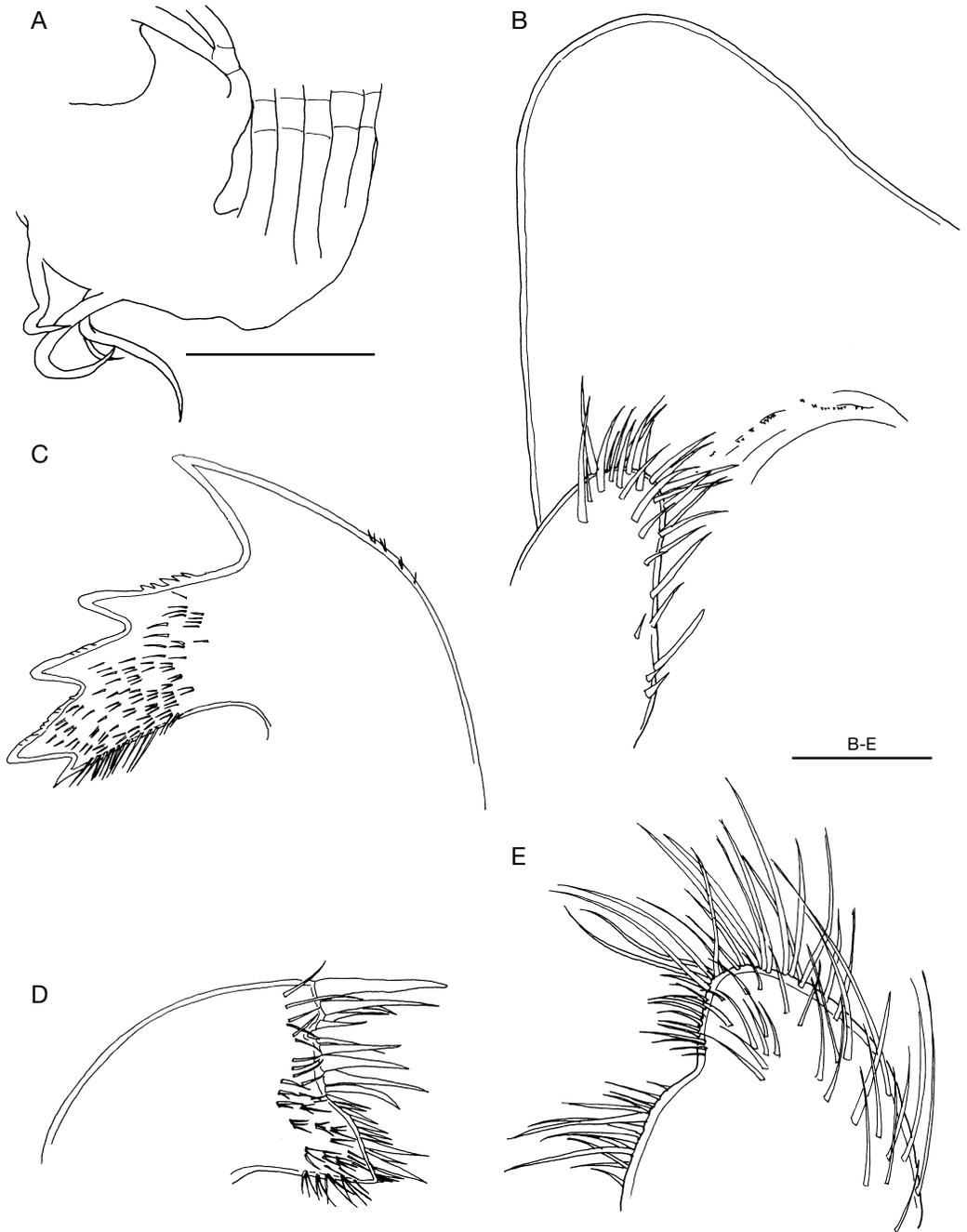


FIG. 2. — *Euscalpellum renei* (Gruvel, 1902), *La Calypso* (MNHN Ci 374); **A**, prosoma with filamentary appendages; **B**, labrum and palp; **C**, mandible; **D**, maxilla I; **E**, maxilla II. Scale bars: A, 1 mm; B-E, 0.1 mm.

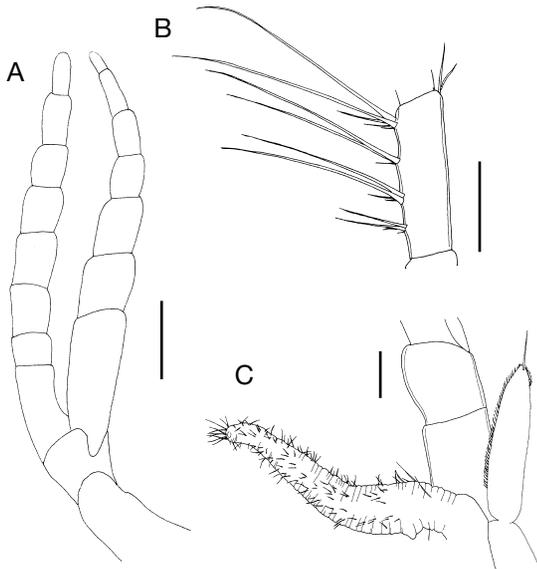


FIG. 3. — *Euscalpellum renei* (Gruvel, 1902), *La Calypso* (MNHN Ci 374); **A**, cirrus I; **B**, median article of cirrus VI; **C**, protopodite of cirrus VI, caudal appendage and penis. Scale bars: 0.2 mm.

Tergum (Fig. 1B) elongate, apex blunt, curved to carina; occludent and carinal margins convex, basal margin mostly convex, but with a concavity near upper portion of scutum; surface area larger as that of scutum; three apico-basal ridges at occludent surface.

Carina (Fig. 1B, D) bent, basal portion straight, upper portion curving upward, umbo at two thirds of length, tectum uniformly convex, basal margin rounded.

Upper-latus (L1) (Fig. 1B) flat, pentagonal, higher than wide, slightly wider apically than basally; all margins almost straight; carinal margin longest, followed by inframedian-lateral margin, and tergal and scutal margins which have equal length, basal smallest; length of plate about half length of scutum; umbo central not projected.

Inframedian-latus (Fig. 1B) flat, displaced from lower whorl, situated higher than that of the other laterals, quadrangular, equilateral, all margins straight; umbo central, not projected.

Plates of the lower whorl convex with irregular shape. Rostrum (Fig. 1B, C) large; half the length of scutum; situated as high as carino-latus and higher than other in lower whorl plates; in lateral

view, uniformly curved toward scuta; in rostral view, nearly quadrangular, with medio-apical umbo projected.

Rostro-latus (Fig. 1B) large, irregularly shaped, all margins straight except by rostral, which is undulated; umbo nearly central, projected outwards.

Carino-latus (Fig. 1B) elongated, with umbo medio-basal, projected, much higher than wide and wider above umbo.

Sub-carina (Fig. 1B, D) in lateral view triangular, in carinal view pentagonal, with umbo nearly central, all margins concave.

Peduncle (Fig. 1B) short, about one third of capitulum length. Cuticle thick, with several small conic scales well embedded in cuticle, with apparently no organization.

Prosoma (Fig. 2A) with four filamentary appendages along dorsal midline, one anteriorly and others together, all with almost same length.

Labrum (Fig. 2B) bullate, crest with scattered denticles. Palp (Fig. 2B) small, paddle-like, simple setae along the inner margin and distal portion.

Mandible (Fig. 2C) with four large teeth, second to fourth with upper margin denticulate, and a small pointed tooth on lower angle; distance between first and second tooth twice that between second and third. Maxilla I (Fig. 2D) with cutting edge with a small notch on upper portion and slightly projected below; upper portion with two large and strong and three median setae above notch, and five median spines below notch, and two large and 10 thin setae on projected portion. Maxilla II (Fig. 2E) slightly bilobed, with simple and finely pinnate setae along margins, except in the notch; papilla of maxillary gland not pronounced.

Cirrus I (Fig. 3A) situated far apart from the cirrus II, with rami of almost same length; articles clothed with numerous, simple and finely pinnate setae. Cirri II-VI with equal rami; intermediate articles of cirrus VI (Fig. 3B) three times as long as wide, armed with four pairs of long setae and setulae at the base of long setae, all setae simple, two setae on posterior angle. Setal-article ratio about 5:1. Caudal appendage leaf-like (Fig. 3C), unarticulated, with a constriction near base, short, smaller than protopodite, with several

setulae along anterior margin and apex and one long, thin, distal seta. Penis (Fig. 3C) short, a little larger than protopodite, clothed by small setae. Males absent. Number of articles of cirri I-VI is presented in Table 1.

#### REMARKS

The type series contains very small specimens, mostly decalcified, with most characters difficult to observe. The description above is based on the specimens collected by *La Calypso*.

Gruvel (1902c) described this species based on three very small specimens (capitular length varying between 1.2 and 3.4 mm). The present description is based on one specimen from Guinea Gulf with 5.4 mm of capitular length, which was studied previously by Stubbings (1961b).

*Euscalpellum* encompasses six species, characterized by the presence of 15 plates on capitulum arranged in three rows. Of these species, only *E. renei* and *E. rostratum* (Darwin, 1852) have the capitular plates with umbo not apical, except the tergum and rostrum in *E. rostratum*. But the shape and umbo position of the other capitular plates clearly distinguish *E. renei* from *E. rostratum*. Otherwise, *E. rostratum* has an Indo-west Pacific distribution and *E. renei* is known only from the tropical west coast of Africa. *E. renei* is recorded from Guinea (French Guinea) to Angola (11°N to 9°S) from 21-27 to 63 m. It was collected on tubes of polychaetes and hydroids.

Genus *Gruvelialepas* Newman, 1980

*Gruvelialepas pilsbryi* (Gruvel, 1911)  
(Figs 4-6)

*Scalpellum pilsbryi* Gruvel, 1911: 290; 1912: 346, pl. 7, fig. 2. — Klepal 1987: 304.

*Calantica (Scillaelepas) pilsbryi* – Krüger 1940: 462.

*Scillaelepas pilsbryi* – Zevina 1976: 1150; 1978a: 1001; 1981a: 68.

*Scillaelepas (Gruvelialepas) pilsbryi* – Newman 1980: 391, figs 11, 12.

*Gruvelialepas pilsbryi* – Young 1998a: 12, fig. 8b.

TABLE 1. — Number of articles for rami of cirri I-VI and caudal appendages of lectotype (MNHN Ci 373) of *Euscalpellum renei* (Gruvel, 1911). Abbreviations: **CI-CVI**, cirri I to VI; **ca**, caudal appendage; **rc**, right cirri; **lc**, left cirri; **+**, broken ramus.

	CI	CII	CIII	CIV	CV	CVI	ca
rc	9/14	19/18	20/20	16/18	15+/20	19/17	1
lc	10/14	17/16	18/18	17/18	19/18	20/18	1

TYPE MATERIAL. — South of Cape Bojador, on bryozoans, 882 m, *Talisman*, 1883, paralectotype, cl (tl) 13.6 (22.8) mm (MNHN Ci 1).

DIAGNOSIS. — Capitulum with 15 plates, including two subrostra; rostro-latus separated from carino-latus; peduncular scales small, rounded.

#### DESCRIPTION

Hermaphrodite. Capitulum (Fig. 4A) with 15 plates, covered by thick cuticle; length a little larger than width; carinal margin slightly convex, occludent margin convex. Plates thick, with longitudinal ridges and thin growth lines. Plates mostly approximate from each other.

Scutum (Fig. 4A) triangular, with an apicobasal ridge, with both sides flat, but angulose along ridge; length 1.5 time its width; occludent and basal margins slightly convex, tergal margin concave; apex slightly curving outward.

Tergum (Fig. 4A) balloon-shaped, with a large, flat apicobasal ridge dividing plate in two similar, flat sides; apex slightly curving outward; occludent margin straight, carinal margin slightly convex; surface area larger than that of scutum.

Carina (Fig. 4A, C) slightly arched, with a narrow tectum and two large, flat laterals, basal margin cutted V-shaped, umbo apical, projecting upwards, extending up to mid-point of carinal margin of tergum.

Upper-latus (L1) (Fig. 4A) triangular, symmetrical, wider than high, concave medially, situated in the lower whorl; apex nearly straight, situated between scutum and tergum junction.

Rostrum (Fig. 4A, B) large; about one third the length of scutum; projected backward, and slightly curved toward scuta; tectum concave medially.

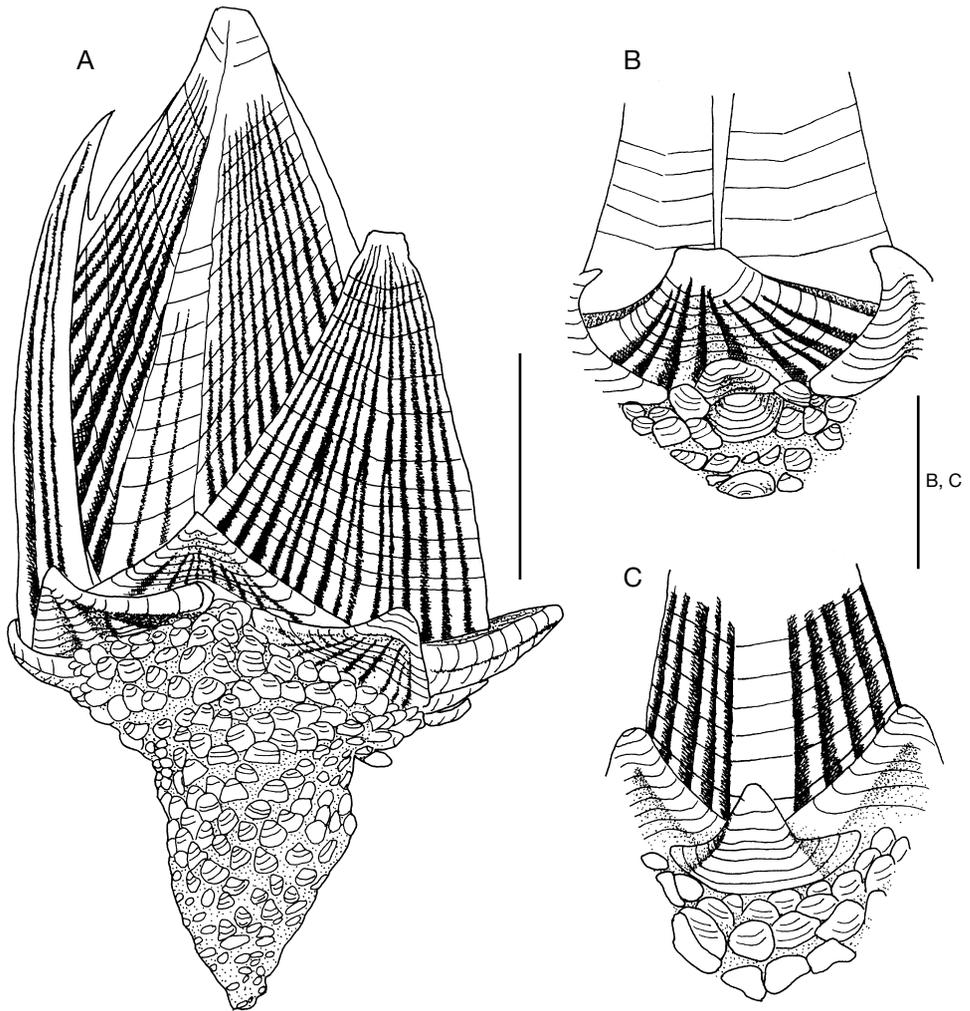


FIG. 4. — *Gruvelialepas pilsbryi* (Gruvel, 1911), paralectotype (MNHN Ci 1); **A**, left lateral view; **B**, rostral view; **C**, carinal view. Scale bars: A, 5 mm; B, C, 3 mm.

Rostro-latus and carino-latus (Fig. 4A, B) separated from each other, triangular, wider than high, slightly concave medially; umbos incurved. Sub-carina (Fig. 4A, C) triangular, equilateral, as wide as high, umbo apical; apex strongly curved to carina. Sub-rostrum 1 (Fig. 4A, B) triangular, surface slightly concave and sub-rostrum 2 triangular with surface convex.

Peduncle (Fig. 4A) short, about two thirds length of capitulum. Cuticle thick, covered by several small nearly triangular scales.

Prosoma without filamentary appendages.

Labrum (Fig. 5A) bullate, crest without teeth. Palp (Fig. 5A) small, paddle-like, finely pinnate setae along the inner margin and surface. Mandible (Fig. 5B) with four teeth, fourth with upper margin denticulate, lower angle denticulate; distance between first and second tooth almost same of between second and third. Maxilla I (Fig. 5C) with cutting edge irregular in outline; upper portion with two large, strong and one median, strong setae, followed by six small

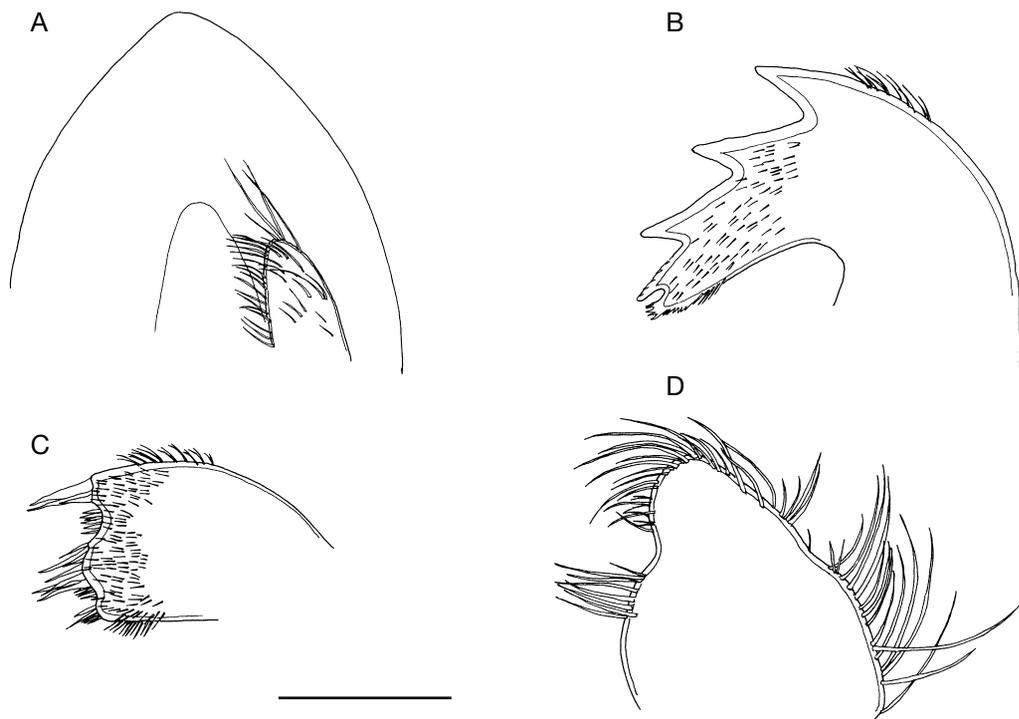


FIG. 5. — *Gruvelialepas pilsbryi* (Gruvel, 1911), paralectotype (MNHN Ci 1); **A**, labrum and palp; **B**, mandible; **C**, maxilla I; **D**, maxilla II. Scale bar: 0.5 mm.

spines in a large concavity, seven median spines on a projection and several small, thin spines below. Maxilla II (Fig. 5D) slightly bilobed, with finely pinnate long setae along margins, except in the notch; papilla of maxillary gland not projecting.

Cirrus I (Fig. 6A) not situated far apart from the cirrus II with anterior ramus shorter than posterior, about 0.7 time length of posterior; basal articles protuberant, clothed with numerous, simple and finely pinnate setae. Cirri II-VI with equal rami; intermediate articles of cirrus VI (Fig. 6B) about twice longer than wide, armed with four pairs of long, finely pinnate setae, setulae at the base of long setae, and one small seta between each longer setae pair on anterior margin; two to six long setae simple or finely pinnate on posterior angle. Setal-article ratio about 5:1. Caudal appendage (Fig. 6C) unarticulated, short, about one quarter the height of coxopodite of cirrus VI,

with few simple setae at apex. Penis absent. Males absent. Number of articles of cirri I-VI is presented in Table 2.

#### REMARKS

This species was studied by Newman (1980) who described one specimen of the type series. In order to give more details of the appendages and to compare them with that studied by Newman, I dissected another specimen, which presented some distinctive characters from that previously dissected: 1) the prosoma did not present any filamentary appendages and Newman (1980: 391) observed two sets of filamentary appendages; 2) the intermediate article of cirrus VI was armed with four pairs of long setae and Newman observed five pairs.

The numbers of setae on the articles of cirrus VI probably are variations related to distinct sizes of the specimens. But the variations in the number of

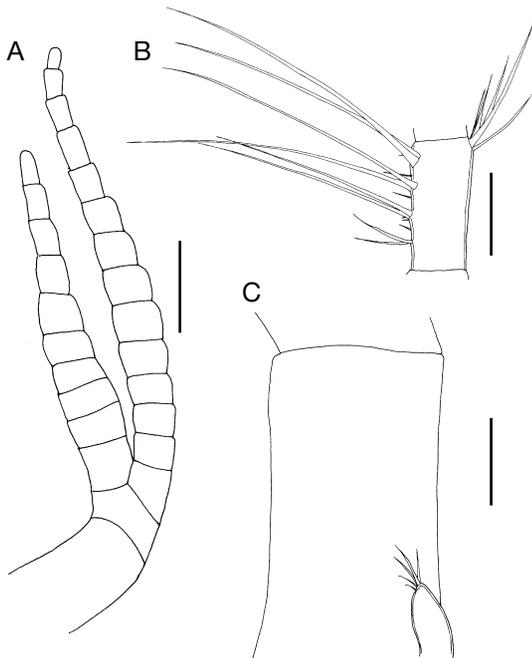


FIG. 6. — *Gruvelialepas pilsbryi* (Gruvel, 1911), paralectotype (MNHN Ci 1); **A**, cirrus I; **B**, median article of cirrus VI; **C**, coxopodite of cirrus VI and caudal appendage. Scale bars: A, 1 mm; B, C, 0.5 mm.

TABLE 2. — Number of articles for rami of cirri I-VI and caudal appendages of paralectotype of *Gruvelialepas pilsbryi* (Gruvel, 1902). Abbreviations: **CI-CVI**, cirri I to VI; **ca**, caudal appendage; **rc**, right cirri; **lc**, left cirri; **+**, broken ramus.

	CI	CII	CIII	CIV	CV	CVI	ca
rc	8/8	11/12	10+/14	16/14	14/14	13/14	1
lc	8/8	12/12	13/12+	13+/14	15/14	14/12	1

filamentary appendages are very curious. By all the other characteristics I discard the possibility that the type series of *S. pilsbryi* contains more than one species. Therefore, the variation in the number of filamentary appendages can be accepted as a variation of the species. The number of filamentary appendages is commonly used for distinguishing species in several genera (e.g., *Lepas* and *Glyptelasma*) and to my knowledge the variation in their number was not reported before.

*Gruvelialepas pilsbryi* was described from south of Bojador Cape, 882 m (Gruvel 1911, 1912) and

subsequently reported only once from Meteor seamounts (Young 1998a). Gruvel (1920: 79) cites in the list of species *G. pilsbryi* as having been collected by SAS Le Prince de Monaco Expedition in the station 1349 (38°35'30"N, 28°05'45"W, 1250 m), but this species is not presented in any part of the text. In this station, he also found *Scillaelepas grimaldi*, which is discussed in the main text. Therefore, I consider this record of *G. pilsbryi* an error of citation, which was probably a first identification of the other *Scillaelepas* s.l. collected.

Family SCALPELLIDAE Pilsbry, 1907  
Genus *Catherinum* Zevina, 1978

*Catherinum recurvitergum* (Gruvel, 1900)  
(Figs 7-9)

*Scalpellum recurvitergum* Gruvel, 1900a: 190; 1902a: 67, pl. 2, figs 3H, 21, 22; 1902c: 245; 1902d: 523; 1905: 49, fig. 54. — Weltner 1922: 72. — Nilsson-Cantell 1938: 8; 1955: 218. — Zevina 1976: 1155.

*Scalpellum (Episcalpellum) recurvitergum* — Broch 1924: 41.

*Catherinum recurvitergum* — Zevina 1978b: 1348, fig. 14; 1981a: 245, fig. 181. — Young 1998a: 40, figs 4, 5; 2001: 741, fig. 25.

TYPE MATERIAL. — SW of Azores, *Talisman*, 1883, drag. 118, 3175 m, holotype by monotypy, cl (tl) 11.2 (14.2) mm (MNHN Ci 402).

DIAGNOSIS. — Capitulum with 14 plates striated longitudinally. Inframedian-latus hourglass-shaped with umbo nearly central. Carino-latus about twice higher than wide. Rostro-latus trapezoidal, a little wider than high. Cirrus I with anterior ramus three quarters the length of posterior ramus. Median article of cirrus VI with four pairs of setae on anterior margin. Caudal appendage longer than propopodite.

DESCRIPTION

Capitulum (Fig. 7A) oval, length less than twice the width, carinal and occludent margins similarly curved. Plates striated, except by carina and most of tergum; with thin growth lines. Cuticle thin.

Tergum (Fig. 7A) with its surface area greater than scutum; without apicobasal ridge. Basal margin nearly straight. Carinal margin slightly

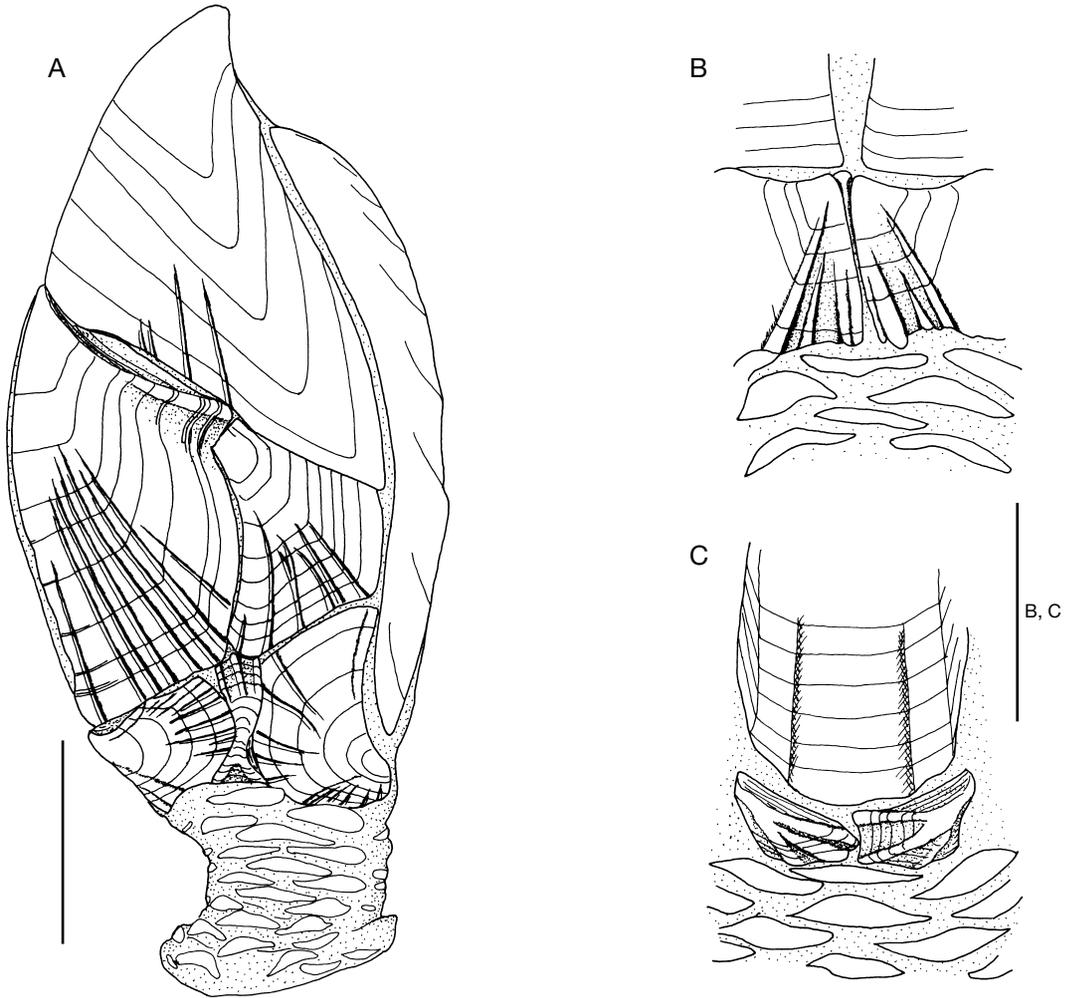


FIG. 7. — *Catherinum recurvitergum* (Gruvel, 1900), holotype (MNHN Ci 402); **A**, right lateral view; **B**, rostral view; **C**, carinal view. Scale bars: A, 3 mm; B, C, 2 mm.

convex at lower portion and concave near apex. Occludent margin convex. Apex acute, curved toward carina.

Scutum (Fig. 7A) with carinal portion with a large furrow in front of upper-latus apex and occludent portion regularly convex, with conspicuous apicobasal ridge; height about twice the greatest width. Basal margin straight. Tergal margin nearly straight, presenting a lid. Occludent margin accentually convex. Lateral margin convex, except for upper concavity, to accept apex of

upper-latus. Apex slightly curved, superimposed on tergum.

Carina (Fig. 7A, C) arching regularly, wider at upper portion, with umbo apical. Tectum flat bordered by high lateral ridges, angularly flexed to laterals; basal margin nearly rounded.

Upper-latus (Fig. 7A) pentagonal with apex curved toward scutum, umbo subapical, projecting. Scutal margin largest, followed in size by tergal, carino-lateral, carinal and, the smallest rostro-lateral margins; scutal and carino-

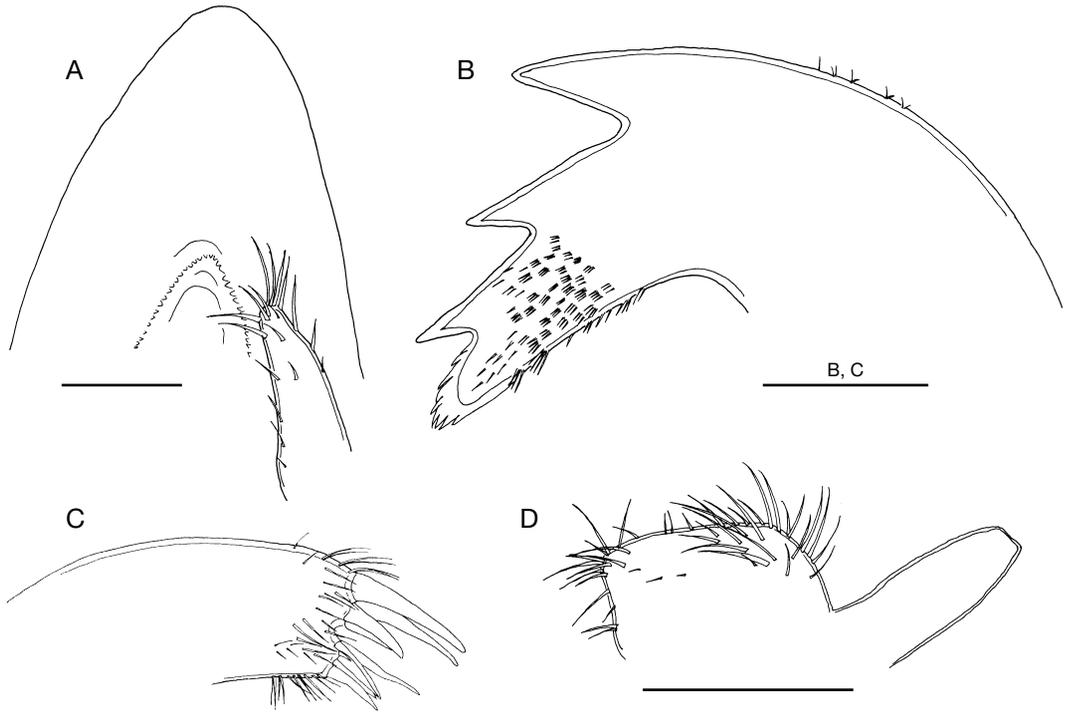


FIG. 8. — *Catherinum recurvitergum* (Gravel, 1900), holotype (MNHN Ci 402); **A**, labrum and palp; **B**, mandible; **C**, maxilla I; **D**, maxilla II. Scale bars: A-C, 0.2 mm; D, 0.5 mm.

lateral margins concave; other margins almost straight.

Carino-latus (Fig. 7A, C) nearly pentagonal, about twice higher than wide, with umbo at carinal base, not projecting backward; curving regularly under carina. Carino-latera slightly interdigitating with one another below carina.

Inframedian-latus (Fig. 7A) hourglass-shaped, higher than wide, umbo nearly central and projected.

Rostro-latus (Fig. 7A) trapezoidal, little wider than high, with conspicuous apico-basal ridge; basal one half of distal margin, parallels, umbo not projecting backwards.

Rostrum (Fig. 7B) reduced, small, elongate, mostly situated bellow carino-latera.

Peduncle (Fig. 7A) with one quarter capitulum length, mostly covered by wide, large scales in an eight-plated pattern: sr-l-sc; rl-cl.

Labrum (Fig. 8A) bullate, with a series of about 35 teeth. Palp (Fig. 8A) long, thin, with simple

setae on margins. Mandible (Fig. 8B) with three acute teeth, distance between first and second tooth 1.25 times distance between second and third; lower angle denticulate. Maxilla I (Fig. 8C) with anterior border nearly straight, having a shallow, medial notch; two large and two median strong spines above notch and four median spines below. Maxilla II (Fig. 8D) nearly rectangular, covered by numerous simple or finely pinnate setae; papilla of maxillary gland strongly pronounced.

Cirrus I (Fig. 9A) with unequal rami, anterior ramus three quarters the length of posterior ramus; former with protuberant articles. Cirrus II to VI with equal, long rami. Median article of cirrus VI (Fig. 9B) almost three times longer than wide, four pairs of simple or finely pinnate large setae on anterior margin; two to three setae on posterior angle. Setal-article ratio about 4:1. Caudal appendage (Fig. 9C), with eight articles,

1.3 times longer than protopodite of cirrus VI; articles with long setae on distal margins, and cluster of simple setae on apex. Penis absent. Number of articles of cirri I-VI and caudal appendage is presented in Table 3.

#### REMARKS

The holotype shows an intermediate stage in the development of longitudinal ridges: the larger specimens have their plates with a greater number of longitudinal ridges (Young 1998a: 40). This species was originally described from Azores region (Gruvel 1900a) and posteriorly recorded from the West European and Iberian basins (Young 1998a, 2001). The characters of the specimens taken after Gruvel agree with the holotype description. Furthermore, *C. recurvitergum* was recorded from Indian Ocean, near the coast of Somali by Weltner (1922) but he did not described or figured these specimens. This last record needs to be reevaluated. In the Atlantic, it was recorded from 34 to 44°N and from 2 to 36°W, between depths of 2900 and 4270 m.

#### Genus *Arcoscalpellum* Hoek, 1907

#### *Arcoscalpellum atlanticum* (Gruvel, 1900) (Figs 10-12)

*Scalpellum atlanticum* Gruvel, 1900a: 190; 1902a: 74, pl. 2, figs 3F, 17, 18; 1902c: 246; 1902d: 523; 1905: 68, fig. 76; 1920: 26, pl. 7, fig. 5. — Hoek 1914: 4. — Belloc 1959: 3.

*Teloscalpellum atlanticum* — Zevina 1978b: 1350; 1981a: 377, fig. 294.

*Arcoscalpellum crenulatum* Foster & Buckeridge, 1995: 170, fig. 5a-f.

*Arcoscalpellum tritonis* non *Arcoscalpellum tritonis* (Hoek, 1883) — Young 1998a: 19, figs 15, 16; 1998b: 36, fig. 1 (non *Arcoscalpellum tritonis* [Hoek, 1883]).

*Arcoscalpellum atlanticum* — Young 2001: 739, figs 23, 24.

TYPE MATERIAL. — Azores Region, *Talisman*, 1883, drag. 128, 38°7'N, 29°32'W, 960-998 m, lectotype by present designation, only the capitulum, cl 11.4 mm (MNHN Ci 398).

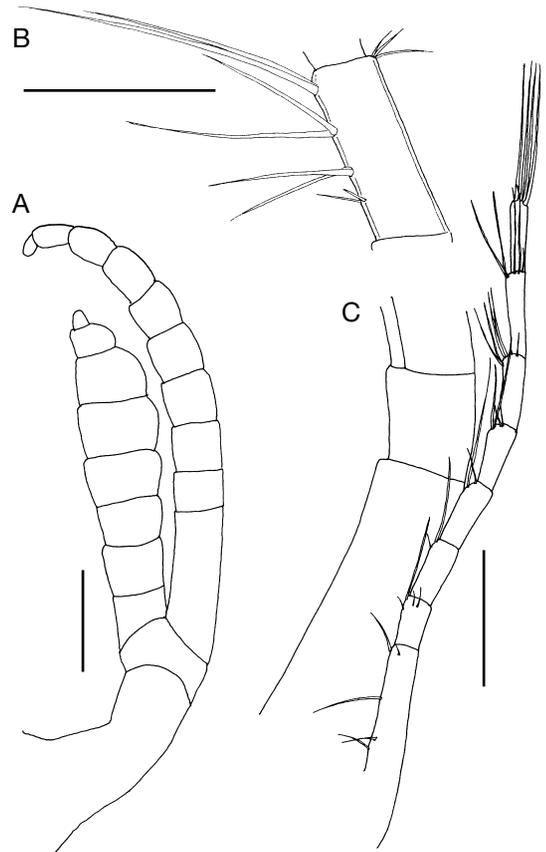


FIG. 9. — *Catherinum recurvitergum* (Gruvel, 1900), holotype (MNHN Ci 402); **A**, cirrus I; **B**, median article of cirrus VI; **C**, protopodite of cirrus VI and caudal appendage. Scale bars: 0.5 mm.

TABLE 3. — Number of articles for rami of cirri I-VI and caudal appendages of holotype (MNHN Ci 402) of *Catherinum recurvitergum* (Gruvel, 1900). Abbreviations: **CI-CVI**, cirri I to VI; **ca**, caudal appendage; **rc**, right cirri; **lc**, left cirri.

	CI	CII	CIII	CIV	CV	CVI	ca
rc	8/10	16/19	23/22	24/23	23/23	24/24	7
lc	8/10	17/19	21/22	23/24	22/25	26/24	8

DIAGNOSIS. — Capitulum oval, flattened with smooth plates. Carina with tectum flat, bordered by lateral ridges. Carino-latus almost twice higher than wide, with umbo at carinal base, slightly projecting backward. Inframedian-latus triangular, slightly higher than wide. Rostro-latus slightly wider than high. Cirrus I with anterior ramus three quarters the length of posterior ramus. Caudal appendage slightly longer than protopodite of cirrus VI.

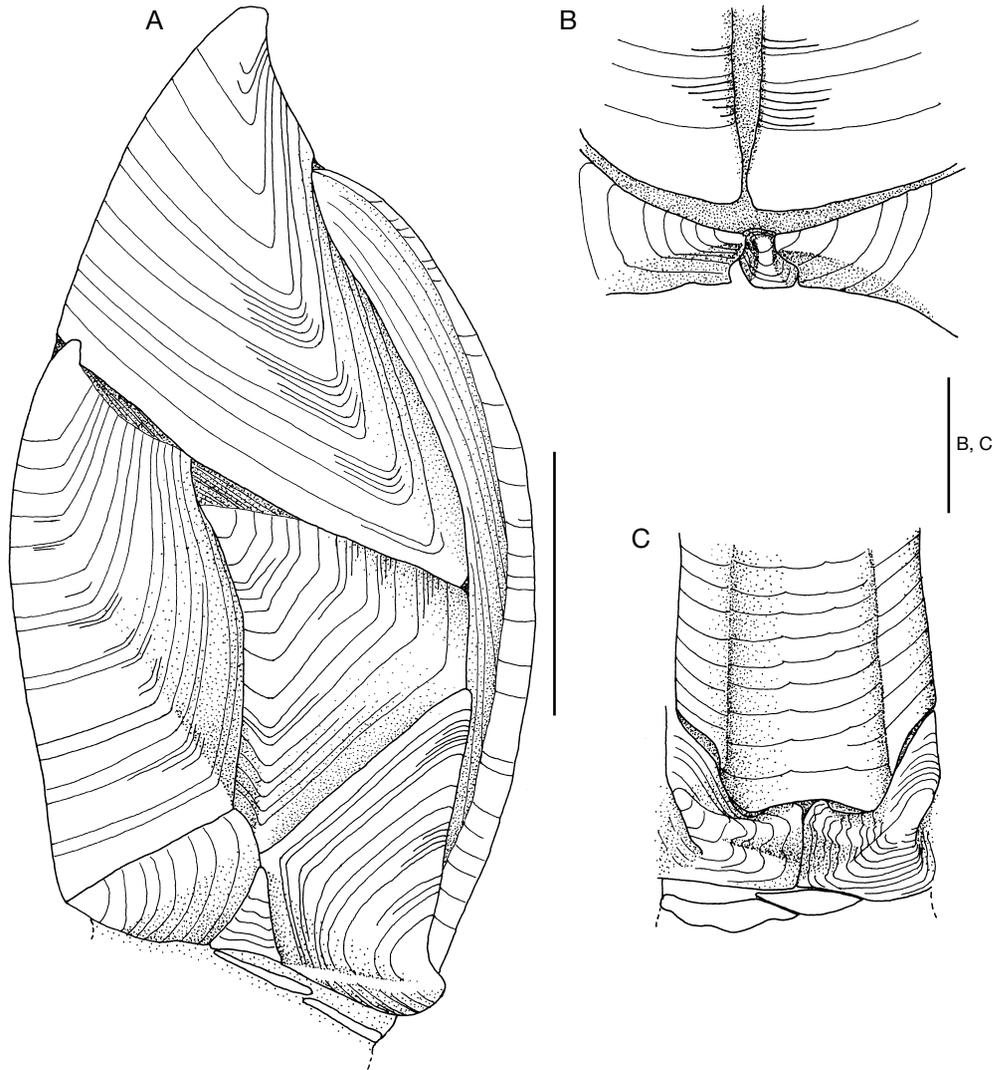


FIG. 10. — *Arcoscalpellum atlanticum* (Gravel, 1900), lectotype (MNHN Ci 398); **A**, right lateral view; **B**, rostral view; **C**, carinal view. Scale bars: A, 3 mm; B, C, 1 mm.

DESCRIPTION

Capitulum (Fig. 10A) oval, flattened, length almost twice the width, carinal margin more curved than occludent margin. Plates smooth, with thin growth lines, presenting alternate a hyaline white bands and other darker. Cuticle thin.

Tergum (Fig. 10A) with its surface area greater than scutum; inconspicuous apicobasal ridge. Basal margin convex. Carinal margin slightly

convex at lower portion and concave near apex. Occludent margin convex. Apex curved toward carina.

Scutum (Fig. 10A) convex, with inconspicuous apicobasal ridge; height more than twice the greatest width. Basal margin straight. Tergal margin slightly concave, presenting a lid. Occludent margin nearly straight at mid-basal part and distally convex. Lateral margin convex except for

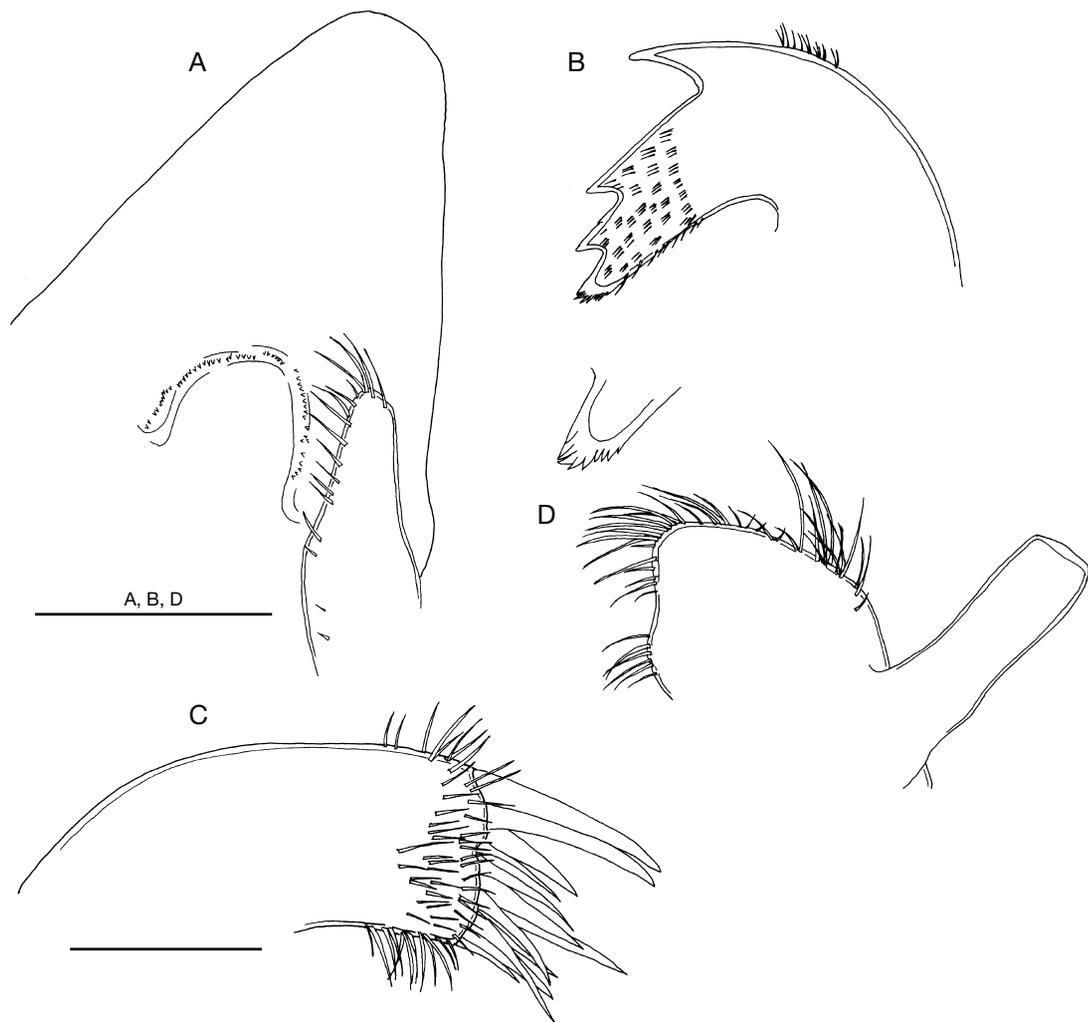


FIG. 11. — *Arcoscalpellum atlanticum* (Gruvel, 1900), lectotype (MNHN Ci 398); **A**, labrum and palp; **B**, mandible; **C**, maxilla I; **D**, maxilla II. Scale bars: A, B, D, 0.5 mm; C, 0.2 mm.

upper concavity to accept apex of upper-latus. Apex curved, superimposed on tergum.

Carina (Fig. 10A, C) arching continuously, slightly wider at upper portion, with umbo apical. Tectum flat with undulated growth lines, bordered by lateral ridges; basal margin slightly concave.

Upper-latus (Fig. 10A) pentagonal with apex curved toward scutum, umbo sub-apical, projecting. Scutal margin largest, followed in size by tergal and carino-lateral margins with same length, carinal margin and the smallest rostro-lateral

margin. Scutal margin concave; other margins straight.

Carino-latus (Fig. 10A, C) nearly pentagonal, almost twice higher than wide, with umbo at carinal base, slightly projecting backward; with a ridge from umbo to basal angle. Carino-latera with ridges posteriorly, but not interdigitating with one another below carina.

Inframedian-latus (Fig. 10A) triangular, slightly higher than wide, shorter than rostro-latus, with umbo straight.

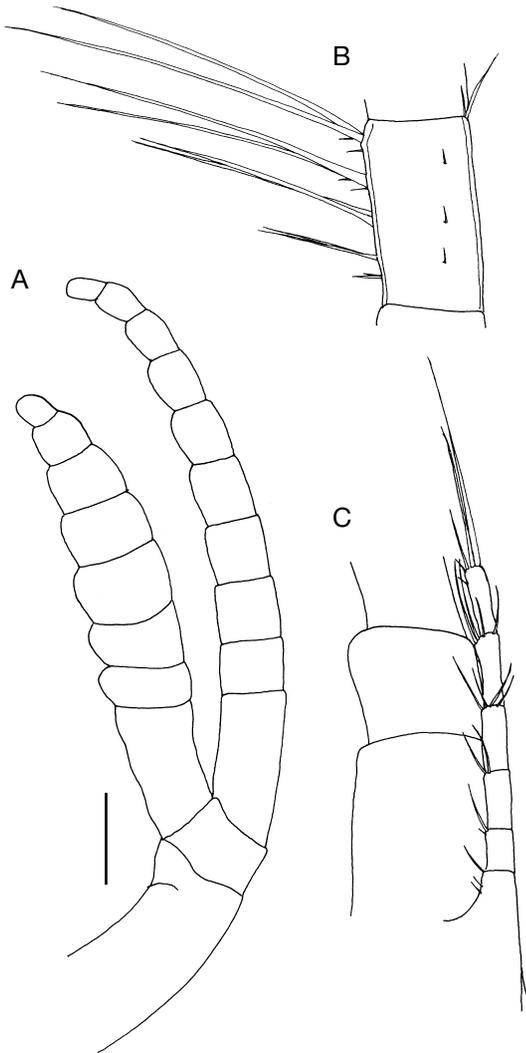


FIG. 12. — *Arcoscalpellum atlanticum* (Gravel, 1900), lectotype (MNHN Ci 398); **A**, cirrus I; **B**, median article of cirrus VI; **C**, protopodite of cirrus VI and caudal appendage. Scale bars: 0.5 mm.

Rostro-latus (Fig. 10A, B) triangular, slightly wider than high, with an inconspicuous apico-basal ridge.

Rostrum (Fig. 10B) small, reduced to small triangular point between rostro-latera.

Peduncle (Fig. 10A) not anymore available in the lectotype. There are only one sc, one rl and one l scales. In the figures of Gravel (1920: pl. 2, figs 17, 18) the peduncle is one third the capitu-

lum length and is covered by large scales; the rl-cl and l-sc scales can be observed (Fig. 10A). Therefore, I suppose this species has an eight-plate whorl pattern: rl-cl; sr-l-sc.

Labrum (Fig. 11A) bullate, with one series of about 50 denticles. Palp (Fig. 11A) short, acuminate with few simple setae. Mandible (Fig. 11B) with three acute teeth, distance between first and second tooth more than twice distance between second and third; lower angle denticulate. Maxilla I (Fig. 11C) with anterior border having an inconspicuous, shallow, medial notch, and two large and 10 median unpaired spines. Maxilla II (Fig. 11D) nearly triangular, covered with numerous large and simple setae except for median region on anterior margin; papilla of maxillary gland strongly pronounced.

Cirrus I (Fig. 12A) with unequal rami, anterior ramus the three quarters length of posterior ramus; former with protuberant articles. Cirrus II with equal rami but shorter than posterior cirri. Cirri III to VI with equal, long rami. Median article of cirrus VI (Fig. 12B) less than twice longer than wide, five pairs of simple long setae and few fine setulae between larger pairs on anterior margin; three or four setulae on lateral surface; two setae on posterior angle. Setal-article ratio about 3.5:1. Caudal appendage (Fig. 12C) with six articles, slightly longer than protopodite of cirrus VI; articles with few, small setae on distal margins, and cluster of simple setae on apex. Penis absent. Number of articles of cirri I-VI and caudal appendage is presented in Table 4.

#### REMARKS

Gravel (1900a) described *Arcoscalpellum atlanticum* based on two specimens collected from the *Talisman* Expedition, drag. 128, but only one specimen was found.

*Arcoscalpellum atlanticum* is difficult to diagnose and can be confused with *A. tritonis* (Hoek, 1883) and also with small specimens of species of Meroscalpellinae, which still present capitulum with unreduced plates (e.g., the small forms of *Neoscalpellum debile* [Aurivillius, 1898] and *Litoscalpellum meteorica* Young, 1998). First, I thought *A. atlanticum* and *A. tritonis* were syn-

onymous, but the shape of the carina, rostro-latus and inframedian-latus separate these species: *A. tritonis* has the carina with a simple, flat roof; the rostro-latus wider than high, with a conspicuous apico-basal ridge; the inframedian-latus thin with concave lateral margins, with the lateral margins concave and as high as the rostro-latus. Furthermore, there is a geographic separation between both species: *A. tritonis* has a more northern distribution in the North Atlantic, occurring from Faroe Channel and near Iceland (Hoek 1883; Zevina 1981a), and *A. atlanticum* was recorded in more southern areas in the North Atlantic, between Azores and off Portugal coast south to Meteor seamounts and off Morocco coast (31 to 47°N and 7 to 29°W); *A. tritonis* was recorded from depths between 913-940 m and *A. atlanticum* from 950-1250 m to 3360-3600 m. The specimens examined by Young (1998a) (identified as *A. tritonis*) differ from the type specimens in that the carina has a flat surface, with the basal margin rounded; the labrum lacks teeth, and the caudal appendages are biarticulate, with less than one half the length of coxopodite. The specimens were of smaller size, between 4 and 12 mm of capitular length, which can justify these differences. Foster & Buckeridge (1995) described *Arcoscalpellum crenulatum* from Gibraltar region. Examining the type series I could observe that this species is *A. atlanticum*. All the capitular and appendages characters correspond to those of *A. atlanticum*, except to the "crenulate upper margin of rostro-latus". But the crenulation in the specimens is very delicate, and probably related to erosion of the plates, not justifying the recognition of these specimens as a new species.

Genus *Teloscalpellum* Zevina, 1978

*Teloscalpellum luteum* (Gruvel, 1900)  
(Figs 13-15)

*Scalpellum luteum* Gruvel, 1900a: 192; 1902a: 80, 135, pl. 2, figs 3E, 11, pl. 4, figs 4, 9, 10; 1902c: 248; 1902d: 523; 1905: 84, fig. 93. — Nilsson-Cantell 1955: 218. — Zevina 1976: 1155.

TABLE 4. — Number of articles for rami of cirri I-VI and caudal appendages of lectotype (MNHN Ci 398) of *Arcoscalpellum atlanticum* (Gruvel, 1900). Abbreviations: **C1-CVI**, cirri I to VI; **ca**, caudal appendage; **rc**, right cirri; **lc**, left cirri.

	C1	CII	CIII	CIV	CV	CVI	ca
rc	8/10	15/17	18/20	19/20	19/20	19/20	6
lc	8/10	15/18	18/19	20/20	19/20	20/20	6

*Teloscalpellum luteum* — Zevina 1978b: 1350; 1991a: 362, fig. 280. — Young 1998a: 44, figs 4, 6.

TYPE MATERIAL. — SW of Azores, *Talisman*, 1883, drag. 118, 34°46'N, 36°11'W, 3175 m, holotype by monotypy, only left side entire, right side with only capitular plates of lower whorl, cl (tl) 20.7 (28.4) mm (MNHN Ci 398).

MATERIAL EXAMINED. — No locality, 1 spec. with the plates disarticulated in very bad condition (MNHN Ci 384).

DIAGNOSIS. — Capitulum with plates striated, except by carina and carinal portion of tergum. Carina with tectum concave bordered by high lateral ridges. Upper-latus pentagonal, umbo subapical, projecting. Inframedian-latus triangular, higher than wide, with umbo subapical and projected. Cirrus I with anterior ramus three quarters the length of posterior ramus. Median article of cirrus VI four pairs of setae on anterior margin and a row of three to seven setulae on lateral surface. Caudal appendage as long as protopodite of cirrus VI.

DESCRIPTION

Capitulum (Fig. 13A) oval, length less than twice the width, carinal and occludent margins similarly curved. Plates striated, except by carina and carinal portion of tergum, with thin growth lines. Cuticle thin, pilose.

Tergum (Fig. 13A) with its surface area greater than scutum; inconspicuous apicobasal ridge. Basal margin nearly straight. Carinal margin slightly convex at lower portion and concave near apex. Occludent margin straight. Apex blunt, straight.

Scutum (Fig. 13A) with carinal portion flat and occludent portion convex, with conspicuous apicobasal ridge; height twice the greatest width. Basal margin straight. Tergal margin slightly concave, presenting a lid. Occludent margin convex. Lateral margin convex except for upper concavity to accept apex of upper-latus. Apex curved, slightly superimposed on tergum.

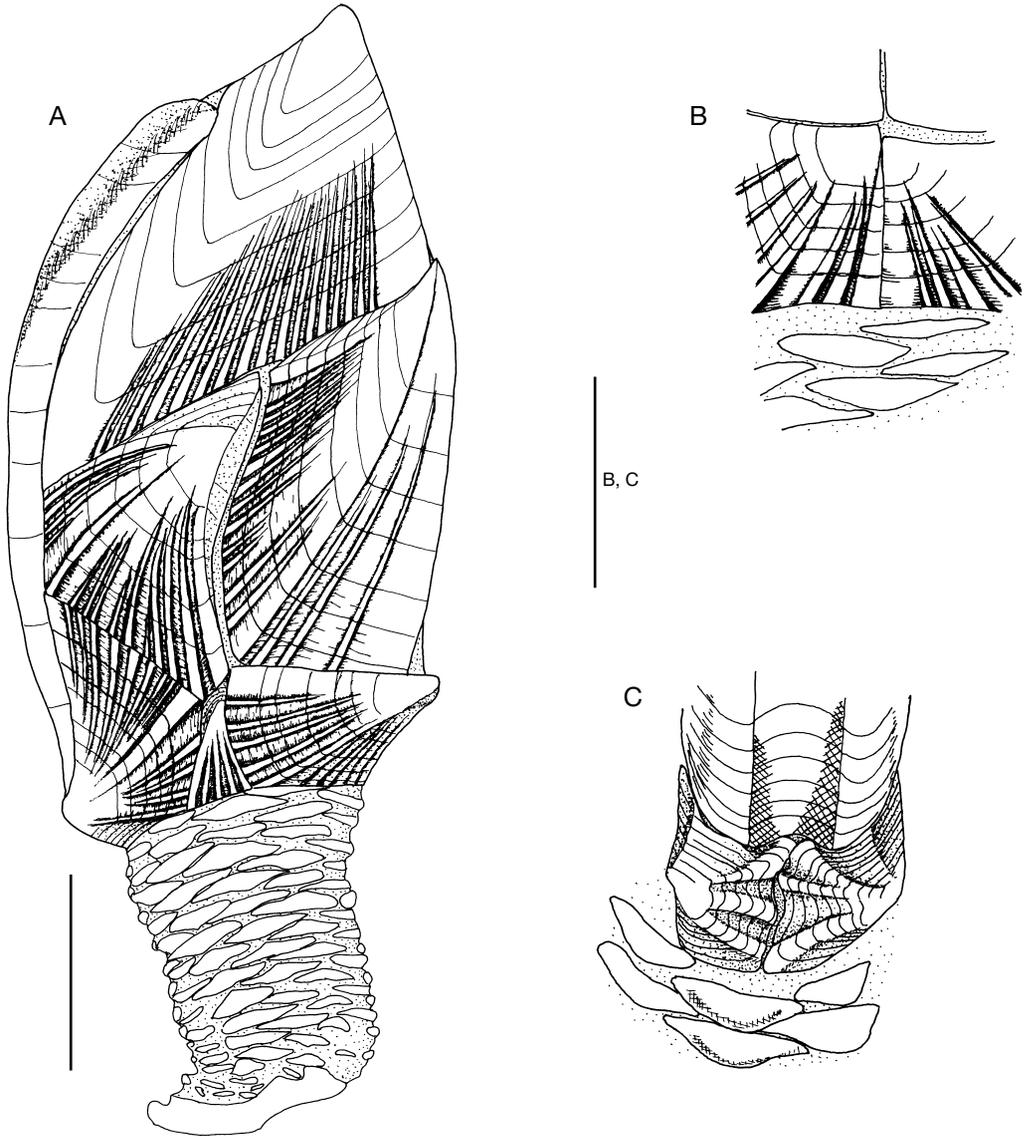


FIG. 13. — *Teloscapellum luteum* (Gruvel, 1900), holotype (MNHN Ci 398); **A**, left lateral view; **B**, rostral view; **C**, carinal view. Scale bars: A, 5 mm; B, C, 3 mm.

Carina (Fig. 13A, C) arching accentually at apical portion, wider at upper portion, with umbo apical. Tectum strongly concave bordered by high lateral ridges; basal margin W-shaped.

Upper-latus (Fig. 13A) pentagonal with apex curved toward scutum, umbo subapical, projecting. Scutal margin largest, followed in size by tergal, carino-

lateral, carinal and, the smallest rostro-lateral margins; scutal margin concave; other margins straight.

Carino-latus (Fig. 13A, C) nearly pentagonal, less than twice higher than wide, with umbo at carinal base, slightly projecting backward; with a ridge from umbo to basal angle and another from umbo to upper-inframedian latera junction.

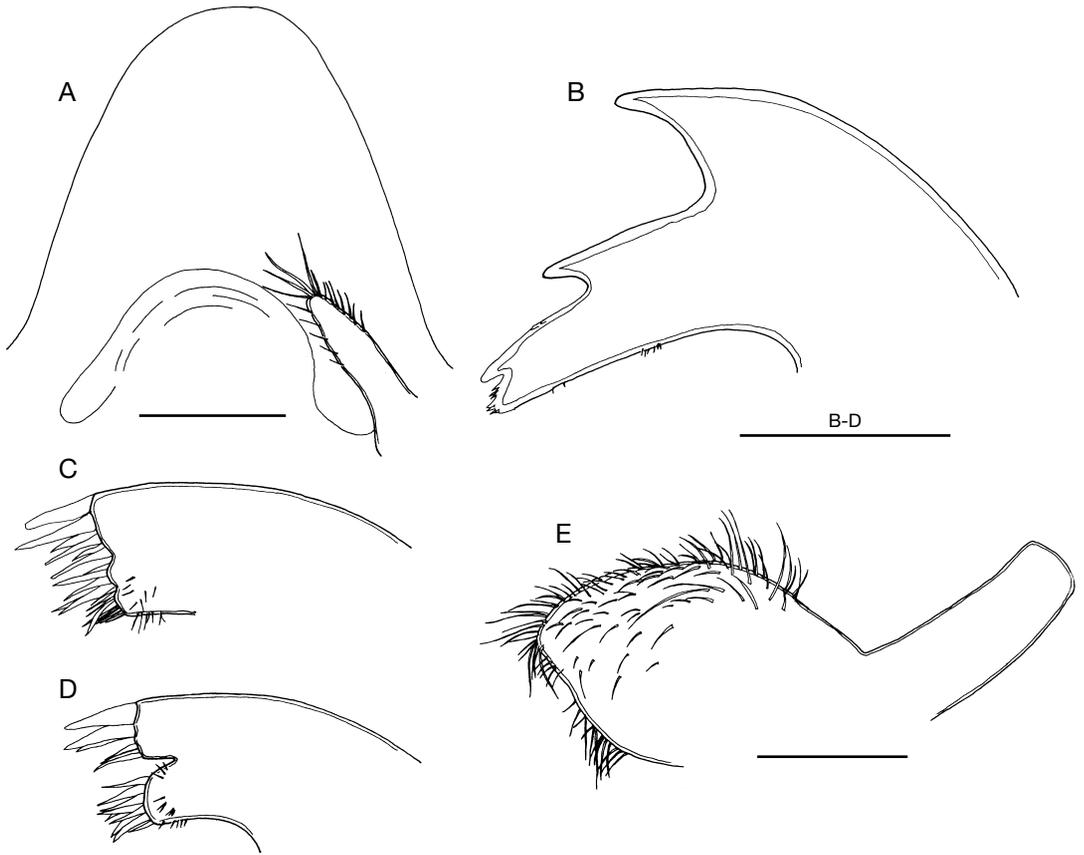


FIG. 14. — *Teloscalpellum luteum* (Gruvel, 1900), holotype (MNHN Ci 398); **A**, labrum and palp; **B**, mandible; **C**, **D**, right and left maxilla I; **E**, maxilla II. Scale bars: 0.5 mm.

Carino-latera interdigitating with one another below carina.

Inframedian-latus (Fig. 13A) triangular, higher than wide, slightly curved to rostro-latus, shorter than rostro-latus, umbo subapical and projected. Rostro-latus (Fig. 13A, B) trapezoidal, wider than high, with conspicuous apico-basal ridge; basal one half of distal margin, parallels, umbo projecting slightly backwards. Rostrum (Fig. 13B) absent. Peduncle (Fig. 13A) less than half capitulum length, mostly covered by wide, large scales in a sr-l-sc; rl-cl1-cl2 pattern.

Labrum (Fig. 14A) bullate, without teeth. Palp (Fig. 14A) short, thin, with simple setae on margins. Mandible (Fig. 14B) with three acute teeth, distance between first and second tooth 1.5 times

the distance between second and third; lower angle weakly denticulate. Maxilla I (Fig. 14C, D) with anterior border having an inconspicuous, shallow, medial notch on one of them and a deep notch on the other; two or three large and 12-16 smaller unpaired spines. Maxilla II (Fig. 14E) nearly triangular with anterior margin nearly straight, covered by numerous simple or finely pinnate setae; papilla of maxillary gland strongly pronounced.

Cirrus I (Fig. 15A) with unequal rami, anterior ramus three quarters length of posterior ramus; former with protuberant articles. Cirrus II to VI with equal, long rami. Median article of cirrus VI (Fig. 15B, C) twice longer than wide, four pairs of simple or finely pinnate setae, unequal in size, and few fine setulae between pairs on anterior margin;

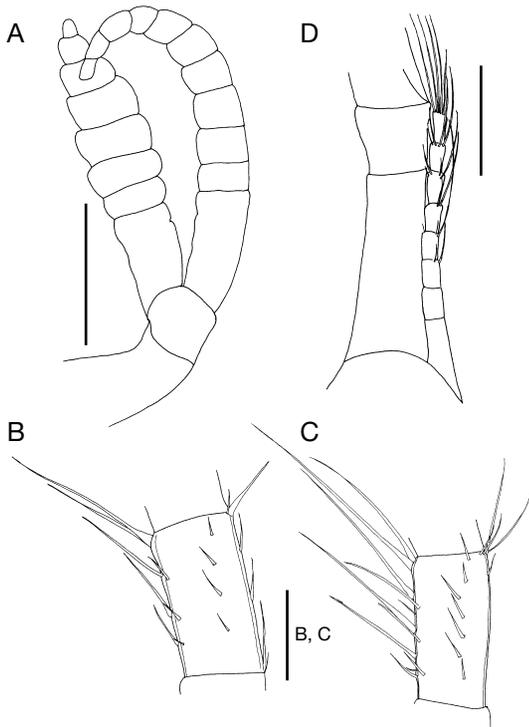


FIG. 15. — *Teloscalpellum luteum* (Gruvel, 1900), holotype (MNHN Ci 398); **A**, cirrus I; **B, C**, median articles of anterior and posterior rami of cirrus VI; **D**, protopodite of cirrus VI and caudal appendage. Scale bars: A, 0.2 mm; B, C, 0.5 mm; D, 1 mm.

TABLE 5. — Number of articles for rami of cirri I-VI and caudal appendages of holotype (MNHN Ci 398) of *Teloscalpellum luteum* (Gruvel, 1900). Abbreviations: **CI-CVI**, cirri I to VI; **ca**, caudal appendage; **rc**, right cirri; **lc**, left cirri; +, broken ramus.

	CI	CII	CIII	CIV	CV	CVI	ca
rc	6+/11	11+/19+	21+/25	26/27	26/25	34/32	8
lc	9/11	18/1+	18+/26	29/27	27/17	35/32	8

a row of three to seven setulae on lateral surface; two to five setae on posterior angle, sometimes with setae displaced along posterior margin. Setal-article ratio about 3:1. Caudal appendage (Fig. 15D) with eight articles, as long as propodite of cirrus VI; articles with few, long setae on distal margins, and cluster of simple setae on apex. Penis absent. Number of articles of cirri I-VI and caudal appendage is presented in Table 5.

REMARKS

*Teloscalpellum luteum* was described from SW Azores (Gruvel 1900a; 1902a) and subsequently recorded only once from the same region (Young 1998a). The specimens from Young (1998a: 44) are very similar to the holotype. The differences observed are that its labrum has small denticles instead of nude and the maxilla II do not present notch. *T. luteum* are recorded from depths between 3056-3000 m and 3175 m.

Genus *Verum* Zevina, 1978

*Verum hoeki* (Gruvel, 1901)  
(Fig. 16)

*Scalpellum hoeki* Gruvel, 1901a: 260; 1902a: 132, pl. 4, fig. 23; 1902b: 290, pl. 24, figs 6, 9-16, 20; 1902c: 245; 1905: 46, fig. 49.

*Verum hoeki* – Zevina 1978b: 1348; 1981a: 236, fig. 172.

TYPE MATERIAL. — Syntypes: no locality, the specimens of the type series are very badly preserved. The capitular plates are detached and fouled by fungus. I could only restore two scuta, one terga and two upper-latus, mostly very eroded (MNHN Ci 386). These plates are described below.

DIAGNOSIS. — Upper-latus triangular, with a conspicuous longitudinal ridge near scutal margin.

DISTRIBUTION. — Pacific Ocean, locality unknown, fixed on bryozoans.

DESCRIPTION

Tergum (Fig. 16A) with its surface area larger than scutum; with a slight and wide apicobasal ridge and fine longitudinal striae at mid-occludent basal portion. Basal margin nearly convex. Carinal margin straight. Occludent margin convex. Apex obtuse, nearly straight.

Scutum (Fig. 16B) separated in two surfaces by a conspicuous apico-basal ridge; with carinal portion nearly flat and occludent portion regularly convex, with some little conspicuous longitudinal striae; height about 1.5 time the greatest width. Basal and lateral margins straight. Tergal margin slightly concave. Occludent margin convex. Apex curved.

Upper-latus (Fig. 16C) triangular, umbo apical, not projecting, with a conspicuous longitudinal ridge near scutal margin. Scutal margin straight, others slightly convex, all about same size.

#### REMARKS

*Verum hoeki* was collected on bryozoans, from the Pacific Ocean, without any detailed locality (Gruvel 1902b), and never recorded again. The figure of the capitulum in Gruvel's (1902b) plate 24, fig. 6, is very schematic and most of the characters difficult to be discerned. The strong striations described by Gruvel (1902b) are not so evident in the remaining plates; only a light striation near the basal margins of the plates is discernable. But based only in the remaining plates, I suppose this species is valid due to a very characteristic upper-latus (Fig. 16C); it has a triangular shape with a conspicuous longitudinal ridge near the scutal border. I do not know any other species with this kind of upper-latus.

Genus *Weltnerium* Zevina, 1978

*Weltnerium bouvieri* (Gruvel, 1906)  
(Figs 17-19)

*Scalpellum bouvieri* Gruvel, 1906: 272; 1907b: 3, figs 7-9. — Nilsson-Cantell 1926: 2, fig. 1. — Krüger 1940: 466. — Zevina 1964: 252; 1966: 258; 1968: 92, fig. 5; 1970: 91, fig. 5.

*Scalpellum weltneri* Gruvel, 1907a: 159; 1909: 205, pl. 23, figs 4, 5, pl. 26, figs 8-11. — Broch 1927: 541. — Krüger 1940: 467. — Zevina 1968: 86; 1970: 86.

*Arcoscalpellum bouvieri* — Newman & Ross 1971: 53, fig. 20.

*Arcoscalpellum weltneri* — Newman & Ross 1971: 92, fig. 48, pl. 8B.

*Weltnerium bouvieri* — Zevina 1978b: 1347; 1981a: 205, fig. 144; 1981b: 81. — Jones 1991: 168.

*Weltnerium weltneri* — Zevina 1978b: 1347; 1981a: 212, fig. 151.

TYPE MATERIAL. — "*Scalpellum Bouvieri* A Gruvel" (from label, without any further information). Lectotype by present designation, cl (tl) 6.8 (12.2) mm (MNHN Ci 387); paralectotypes, 2 spec., cl (tl) 8.2 (15.1) and 6.6 (11.0) mm (MNHN Ci 387). —

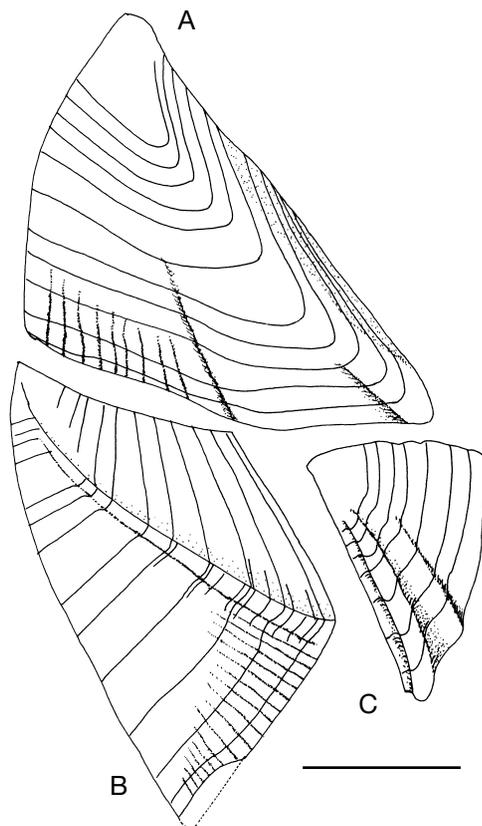


FIG. 16. — *Verum hoeki* (Gruvel, 1901), syntype (MNHN Ci 386); A, tergum; B, scutum; C, upper-latus. Scale bar: 1 mm.

"*Scalpellum Weltneri* A Gruvel, Terre de l'Empereur Guillaume II" (from label). Lectotype by present designation, cl (tl) 4.5 (6.8) mm (MNHN Ci 389); paralectotype, 1 spec., cl (tl) 5.4 (8.1) mm (MNHN Ci 389).

DIAGNOSIS. — Capitulum with smooth plates. Scutum regularly convex without arm. Carina with umbo subapical. Carino-latus twice higher than wide, with umbo at carinal base, not projecting backward. Inframedian-latus hour glass shaped. Rostro-latus higher than wide, with basal and distal margins diverging. Cirrus I with anterior ramus three quarters the length of posterior ramus.

#### DESCRIPTION

Capitulum (Fig. 17A) elongated, length twice the width, occludent margin nearly straight, carinal margin convex. Plates smooth, without longitudinal ridges and thin growth lines, not covering

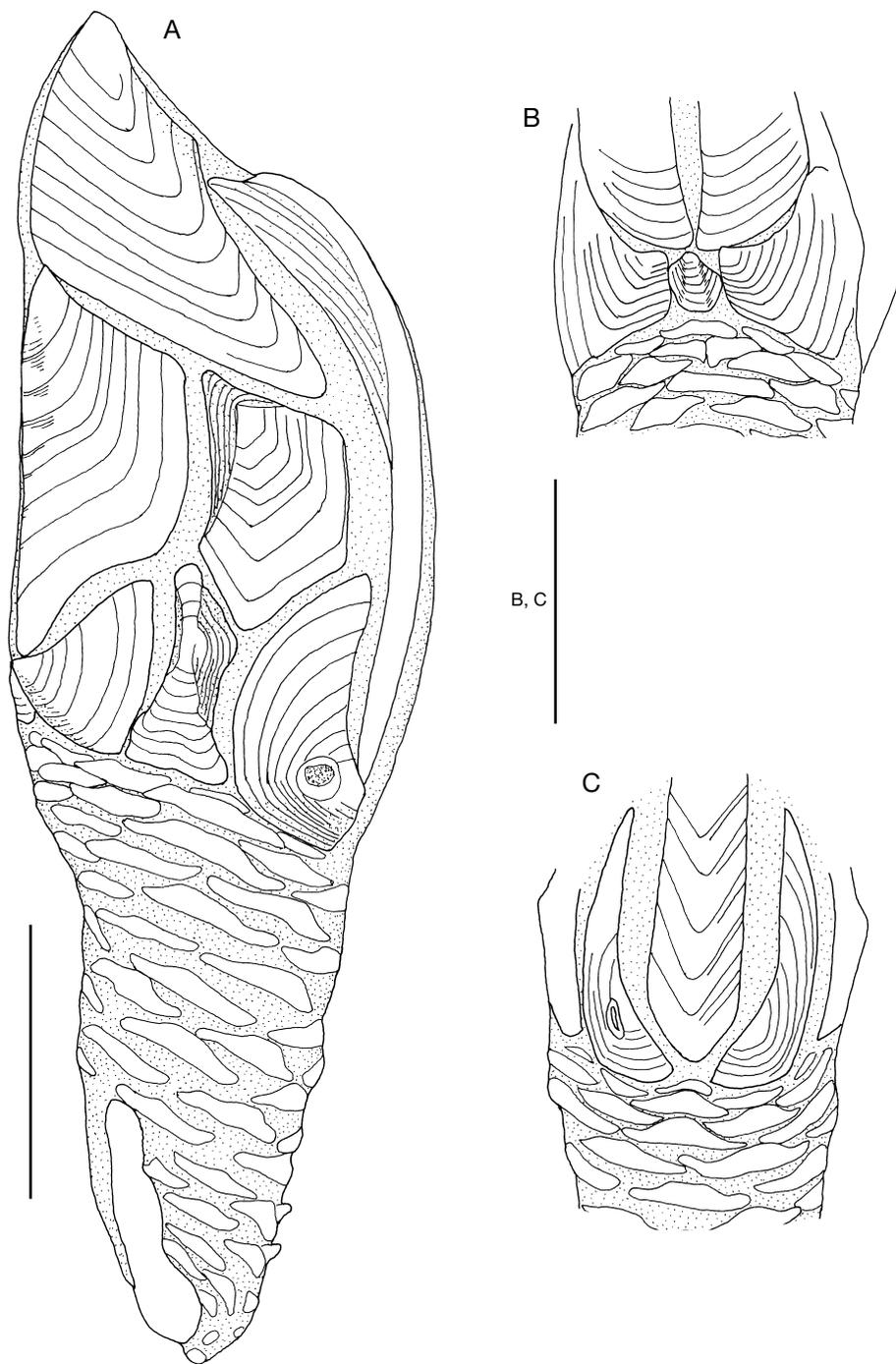


FIG. 17. — *Weltnerium bouvieri* (Gravel, 1906), lectotype (MNHN Ci 387); **A**, right lateral view; **B**, rostral view; **C**, carinal view. Scale bars: 3 mm.

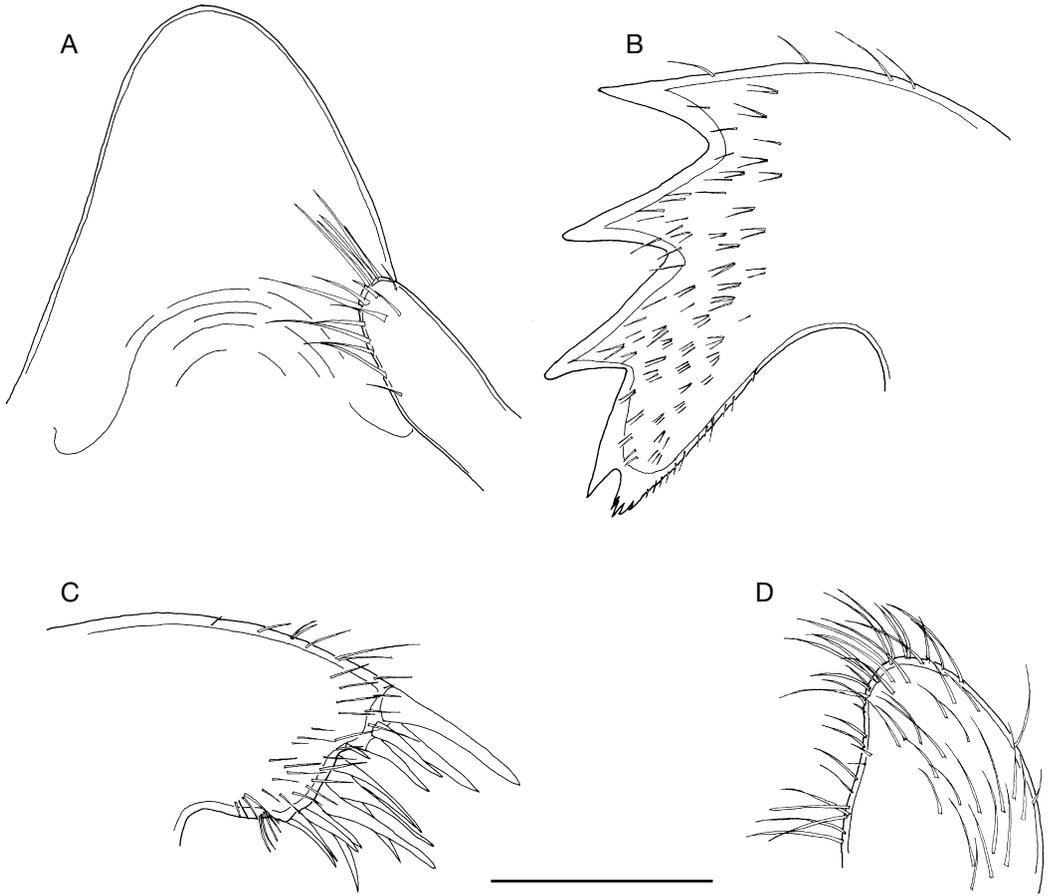


FIG. 18. — *Weltnerium bouvieri* (Gruvel, 1906), lectotype (MNHN Ci 387); **A**, labrum and palp; **B**, mandible; **C**, maxilla I; **D**, maxilla II. Scale bar: 0.3 mm.

all capitulum, with wide spaces between plates, covered by thick cuticle.

Tergum (Fig. 17A) with its surface area similar to that of scutum; without apicobasal ridge. Basal margin slightly convex. Carinal margin with two concavities and a produced part near apex of carina. Occludent margin convex. Apex obtuse, slightly curved toward carina.

Scutum (Fig. 17A) regularly convex, without apicobasal ridge; height twice the greatest width. Basal margin oblique and concave. Tergal margin concave. Occludent and lateral margins straight. Apex curved, slightly superimposed on tergum.

Carina (Fig. 17A, C) arching accentually apically, wider at upper portion, with umbo subapical.

Tectum flat without any lateral ridges, angularly flexed to laterals; basal margin V-shaped.

Upper-latus (Fig. 17A) pentagonal, umbo subapical, projecting. Scutal margin largest, tergal, carino-lateral and carinal with about same length and, the smallest inframedian-lateral margins; scutal margin concave; other margins almost straight.

Carino-latus (Fig. 17A, C) twice higher than wide, with umbo at carinal base, not projecting backward; curving regularly under carina, not forming ridges. Carino-latera not interdigitating with one another below carina.

Inframedian-latus (Fig. 17A) hour glass shaped, higher than wide, umbo displaced a little upper of middle and projected.

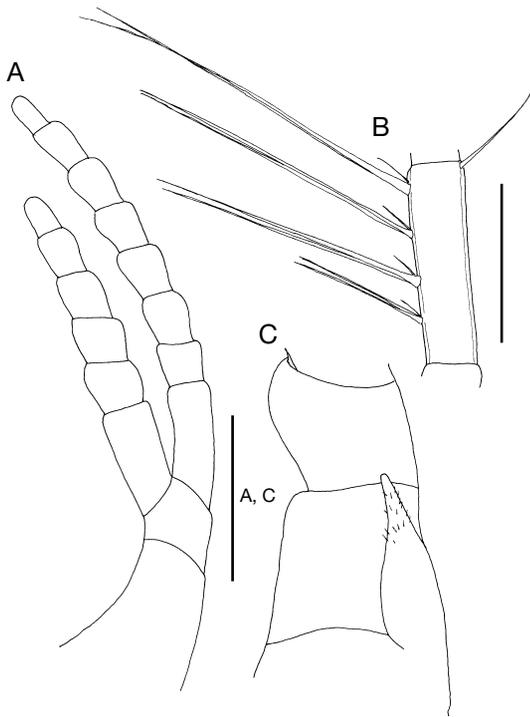


FIG. 19. — *Weltnerium bouvieri* (Gruvel, 1906), lectotype (MNHN Ci 387); **A**, cirrus I; **B**, median article of cirrus VI; **C**, protopodite of cirrus VI and penis. Scale bars: A, 0.5 mm; B, C, 0.3 mm.

TABLE 6. — Number of articles for rami of cirri I–VI and caudal appendages of lectotype (MNHN Ci 387) of *Weltnerium bouvieri* (Gruvel, 1906). Abbreviations: **CI–CVI**, cirri I to VI; **rc**, right cirri; **lc**, left cirri; **+**, broken ramus.

	CI	CII	CIII	CIV	CV	CVI
rc	6/8	5+/13	14/15	14/14	15/14	15/15
lc	6/8	12/13	11+/13	13/14	14/14	15/13

Rostro-latus (Fig. 17A, B) quadrangular, higher than wide, curving continuously, without apico-basal ridge; basal one half of distal margin, diverging, umbo not projecting backwards. Rostrum (Fig. 17B) relatively large, pentagonal, with a triangular median portion and inward projected laterals, not covered by carino-latera.

Peduncle (Fig. 17A) a little shorter than capitulum, mostly covered by wide, large scales initially with a sr-l-sc; rl-cl pattern and posteriorly with a inclusion of one more lateral.

Labrum (Fig. 18A) bullate, without teeth. Palp (Fig. 18A) short, thin, with simple setae on apex and inner margin. Mandible (Fig. 18B) with four acute teeth, distance between first and second tooth about same of distance between second and third; lower angle with denticles. Maxilla I (Fig. 18C) with anterior border with upper portion slightly projected, with two large and two median strong spines, lower portion with 10 median and large spines below. Maxilla II (Fig. 18D) nearly triangular, covered by numerous simple setae; papilla of maxillary gland not pronounced. Cirrus I (Fig. 19A) with unequal rami, anterior ramus three quarters the length of posterior ramus; former with more protuberant articles. Cirrus II to VI with equal, long rami. Median article of cirrus VI (Fig. 19B) almost four times longer than wide, four pairs of simple setae and a small setulae on anterior margin; one setae on posterior angle. Setal-article ratio about 7:1. Caudal appendage absent. Penis (Fig. 19C) reduced for a short point, smaller than protopodite. One male attached to inner pouch of scutum. Number of articles of cirri I–VI is presented in Table 6.

#### REMARKS

Gruvel (1906) described *W. bouvieri* based on numerous specimens collected during the *Discovery* Expedition, and this redescription was based only on the three specimens deposited in the MNHN.

Gruvel (1906: 272) described the presence of a caudal appendage (“appendices filamenteux”) unarticulated, a little longer than the protopodite, and the absence of penis. I could not observe any caudal appendage and the penis was very short, smaller than the protopodite.

*Weltnerium bouvieri* and *W. weltneri* were described by Gruvel (1907a, d) from Antarctic. The specimens of *W. weltneri* (Fig. 28) (tl 6.8 to 8.1 mm) are significantly smaller than those of *W. bouvieri* (tl 11.0 to 15.1 mm) and both species represent distinct stages of development of the same species. Zevina (1981a) primarily separated both species mainly by the subapical umbo of carina of *W. bouvieri* and the apical umbo of *W. weltneri*, but in specimens of *W. weltneri* the primordial valve are

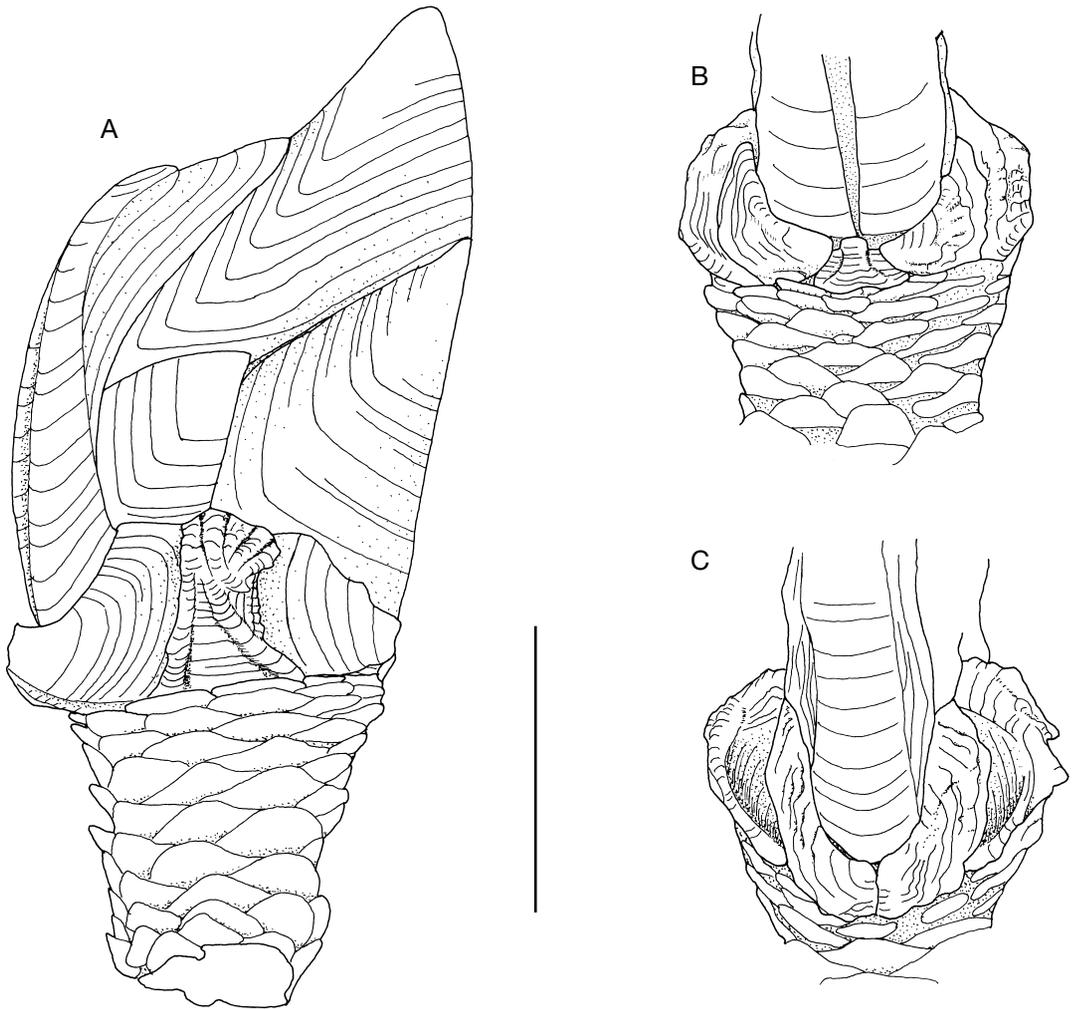


FIG. 20. — *Ornatoscalpellum vanhoeffeni* (Gruvel, 1907), lectotype (MNHN Ci 388); **A**, left lateral view; **B**, rostral view; **C**, carinal view. Scale bar: 2 mm.

being displaced backward, clearly showing the future development of a subapical umbo. The infra-median-latus of the smaller specimens do not have the upper part developed and show a more triangular shape instead of the hour glass shape of the full grown specimens. Therefore, I consider *W. weltneri* a junior synonym of *W. bouvieri*.

*Weltnerium bouvieri* (including *W. weltneri*) is recorded from the Antarctic region from Alashey Bight (67°S, 45°E) to Discovery Inlet, Ross Sea (75°S, 170°E), and South Orkney (60°22'S, 46°50'W) and South Georgia (54°51'S,

34°36'W) in depths from 18-45 m to 900-920 m (Gruvel 1906; Nilsson-Cantell 1926; Zevina 1964, 1968, 1981a; Newman & Ross 1971).

#### Genus *Ornatoscalpellum* Zevina, 1978

#### *Ornatoscalpellum vanhoeffeni* (Gruvel, 1907) (Figs 20-22)

*Scalpellum vanhoeffeni* Gruvel, 1907a: 158; 1909: 202, pl. 23, figs 1-3, pl. 25, figs 3-9. — Broch 1927: 541. — Krüger 1940: 467. — Zevina 1968: 86; 1970: 86.

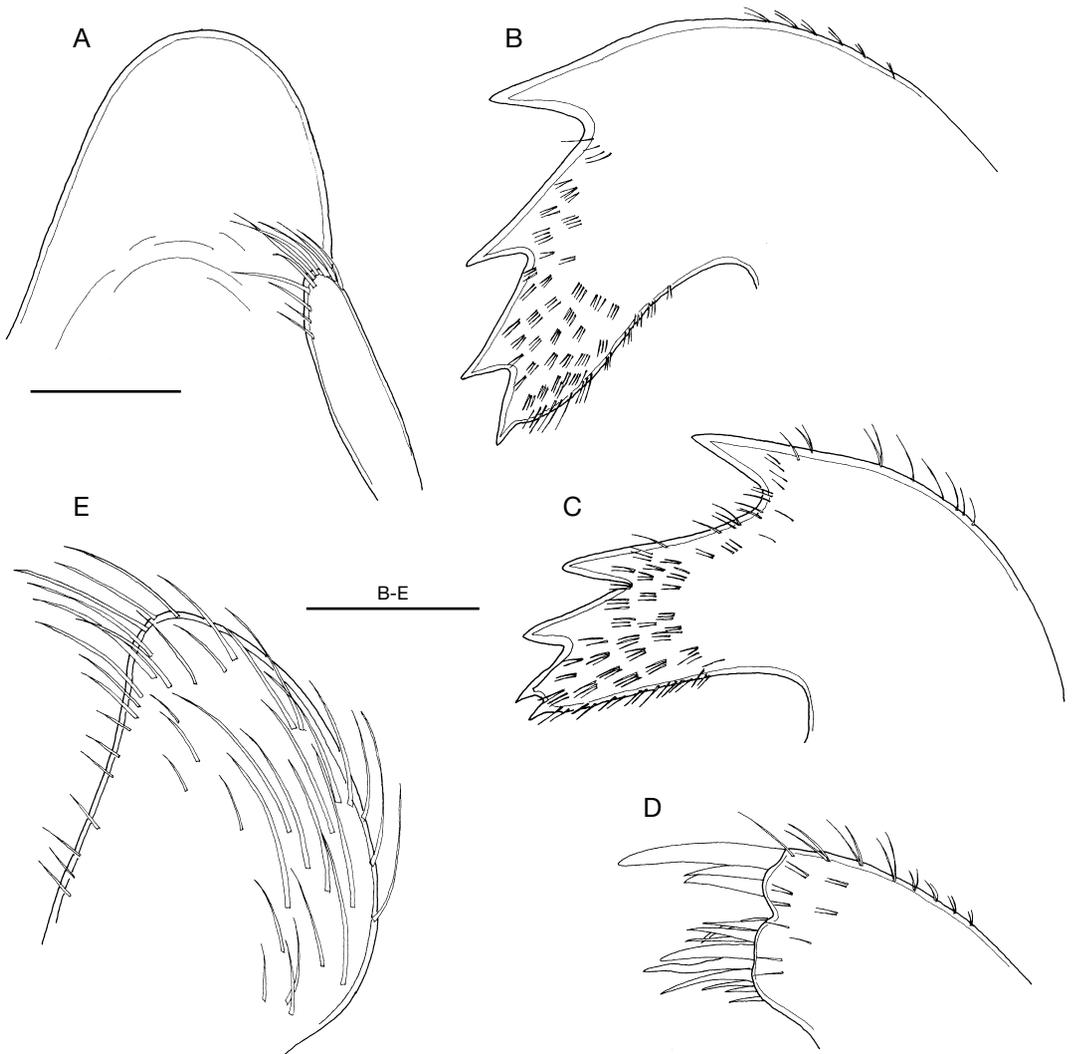


FIG. 21. — *Ornatoscalpellum vanhoffeni* (Gruvel, 1907), lectotype (MNHN Ci 388); **A**, labrum and palp; **B**, **C**, mandibles; **D**, maxilla I; **E**, maxilla II. Scale bars: A, 0.2 mm; B-E, 0.1 mm.

*Scalpellum vanhoffeni*, group of *Scalpellum stroemii* – Newman & Ross 1971: 128, fig. 65, pl. 12C.

*Ornatoscalpellum vanhoffeni* – Zevina 1978a: 1004; 1981a: 112, fig. 79.

TYPE MATERIAL. — Lectotype by present designation: “*Scalpellum Vanhoffeni* A. Gruvel, Terre de l’Empereur Guillaume II” (from label), 1 spec. with seven cypris, cl (tl) 4.5 (6.7) mm (MNHN Ci 388).

DIAGNOSIS. — Inframedian-latus large, nearly quadrangular, with umbo just below the carino-upper latus angle, strongly projecting from capitulum surface.

DESCRIPTION

Capitulum (Fig. 20A) subquadrate, length 1.5 time the width, carinal margin angulose, occludent margin straight at mid-basal portion and slightly convex at upper portion. Plates smooth, without longitudinal ridges; with thin growth lines, covering all capitulum, covered by thin cuticle.

Tergum (Fig. 20A) with its surface area a little larger than that of scutum; without apicobasal ridge. Basal margin nearly straight. Carinal mar-

gin concave basally and straight apically. Occludent margin slightly convex. Apex obtuse, straight. Scutum (Fig. 20A) regularly convex, without apicobasal ridge; height nearly twice greatest width. All margins straight. Apex straight, superimposed on tergum.

Carina (Fig. 20A, C) arching accentually apically, wider at upper portion, with umbo at three quarters of its length. Tectum flat without any lateral ridges, angularly flexed to laterals; basal margin rounded. Upper-latus (Fig. 20A) quadrangular, umbo apical, not projecting. Scutal and tergal of same length, straight; carinal margin slightly convex and carino-lateral margin straight.

Carino-latus (Fig. 20A, C) almost as high as wide, with umbo at carinal base, projecting backward; forming two ridges, one directed to upper region of inframedian-latus and another to base. Carino-latera in contact but not interdigitating with one another below carina.

Inframedian-latus (Fig. 20A) large, nearly quadrangular, with umbo just below the carino-upper latus angle, strongly projecting from capitulum surface, and forming radial ridges directed to scutum and rostro-latus.

Rostro-latus (Fig. 20A, B) trapezoidal, as high as wide, curving continuously, with apico-basal ridge; basal about one half of distal margin, diverging, umbo not projecting backwards.

Rostrum (Fig. 20B) relatively large, with a triangular median portion and inward projected laterals, covered by carino-latera.

Peduncle (Fig. 20A) about half the length of capitulum, covered by wide, large scales initially with a sr-l-sc; rl-cl pattern and posteriorly with an inclusion of one more lateral.

Labrum (Fig. 21A) bullate, without teeth. Palp (Fig. 21A) short, thin, with simple setae on apex and inner margin. Mandible (Fig. 21B, C) with four acute teeth, distance between first and second tooth 1.5 times of distance between second and third; fourth tooth on lower angle in one mandible and with another small denticle below in another mandible. Maxilla I (Fig. 21D) nearly straight with a shallow notch above middle of anterior border, with one large and two median strong spines above notch, and 10 median and

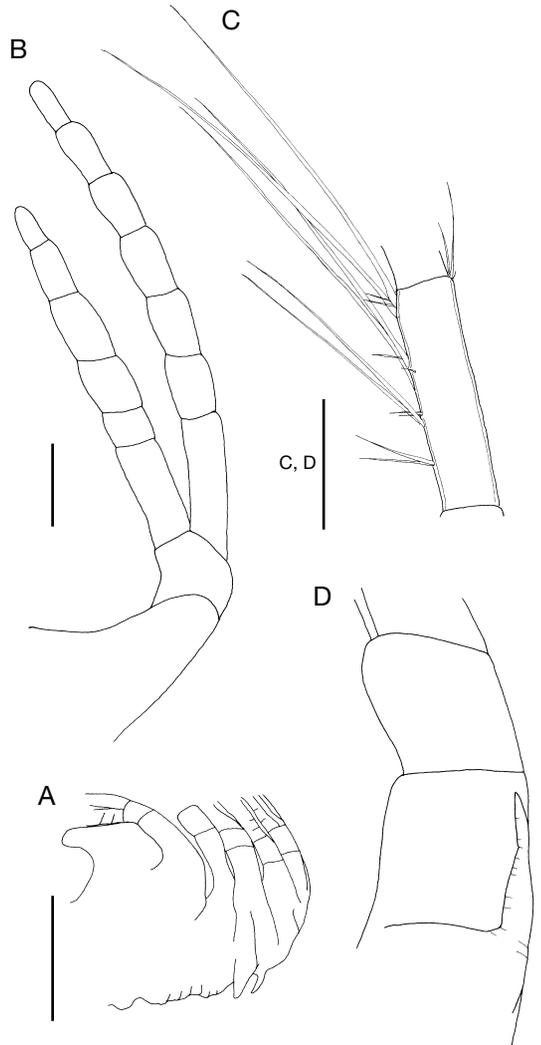


FIG. 22. — *Ornatoscalpellum vanhoeffeni* (Gruvel, 1907), lectotype (MNHN Ci 388); **A**, prosoma; **B**, cirrus I; **C**, median article of cirrus VI; **D**, protopodite of cirrus VI and penis. Scale bars: A, 1 mm; B-D, 0.2 mm.

small spines below. Maxilla II (Fig. 21E) nearly triangular, covered by numerous simple setae; papilla of maxillary gland not pronounced.

Prosoma (Fig. 22A) with two short filamentary appendages along dorsal midline, below cirri II. Cirrus I (Fig. 22B) with unequal rami, anterior ramus three quarters the length of posterior ramus. Cirrus II to VI with equal rami. Median article of cirrus VI (Fig. 22C) almost four times longer than

TABLE 7. — Number of articles for rami of cirri I-VI and caudal appendages of lectotype (MNHN Ci 388) of *Ornatoscalpellum vanhoeffeni* (Gruvel, 1907). Abbreviation: **Ci-CVI**, cirri I to VI; **rc**, right cirri; **lc**, left cirri.

	Ci	CII	CIII	CIV	CV	CVI
rc	6/7	9/10	12/12	11/12	11/13	12/12
lc	5/7	10/11	11/11	11/12	11/12	12/13

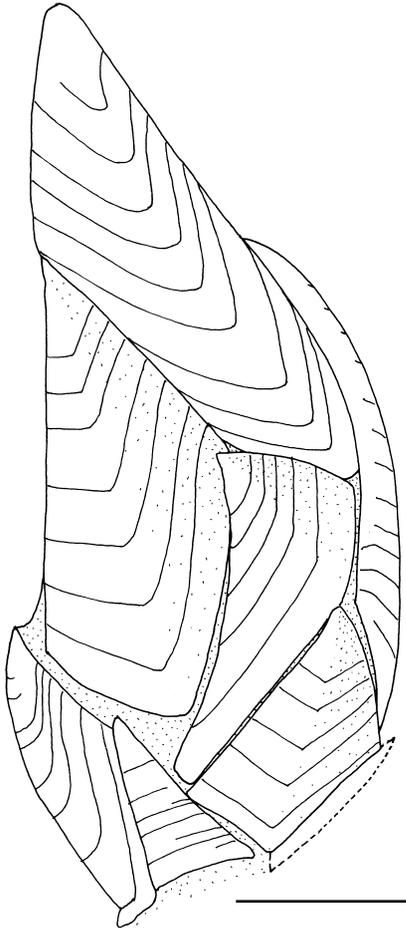


FIG. 23. — *Smilium longirostrum* (Gruvel, 1900), holotype (MNHN Ci 399), right lateral view. Scale bar: 1 mm.

wide, with four pairs of simple or pinnate setae and small setulae on anterior margin between the long pairs; one or two setae on posterior angle. Setal-article ratio about 7:1. Caudal appendage absent. Penis (Fig. 22D) reduced for a short projection,

smaller than coxopodite. Number of articles of cirri I-VI is presented in Table 7.

#### REMARKS

This species was described from various specimens collected during the “Deustchen Südpolar-Expedition” of *Gauss* and the description presented herein is based on one specimen deposited in the collection of the MNHN. The other specimens are deposited at the Museum für Naturkunde, Berlin. Newman & Ross (1971) observed radiating ridges on the capitular plates, but in the specimen studied the ridges are only slightly discernible along the rostro-latus plate. The specimen observed by them is larger (cl 5.4 mm; tl 8.2 mm) than the type specimen studied and probably this ornamentation develops during growth.

Gruvel (1909) and Newman & Ross (1971) recorded the presence of unarticulated caudal appendages and the absence of penis. When I dissected the specimen I also supposed I was examining a caudal appendage, but in a detailed examination the single projection between cirrus VI appears to be a reduced penis instead of caudal appendage. It is unpaired and annulated. *Ornatoscalpellum vanhoeffeni* is recorded from the Antarctic region in two far apart stations: “Winterstation des Gauss nördlich vom Kaiser-Wilhelm II Land” (c. 65°S, 91°E), from 350-385 m (Gruvel 1909) and South Orkney Islands, 60°22'S, 46°50'W, 298-403 m (Newman & Ross 1971).

#### OTHER SPECIES CONSIDERED SYNONYMS

Family CALANTICIDAE Zevina, 1978

Genus *Smilium* Gray, 1825

*Smilium longirostrum* (Gruvel, 1900)

(junior synonym of *Smilium acutum* [Hoek, 1883])

(Fig. 23)

*Scalpellum longirostrum* Gruvel, 1900a: 190; 1902a: 70, 124, pl. 2, figs 4, 5, pl. 3, figs 17-20; 1902c: 246; 1902d: 523; 1905 57: fig. 61. — Joleaud 1916: 40. — Calman 1918: 102. — Weltner 1922: 70. — Klepal 1987: 304.

*Smilium longirostrum* — Pilsbry 1908: 107. — Krüger 1911: 15. — Stubbings 1967: 234.

TYPE MATERIAL. — Portugal coast, *Talisman*, 1883, drag. 1, 1923 m, holotype by monotypy, without

peduncle and appendages, in bad conditions, cl 5.5 mm (MNHN Ci 399).

#### REMARKS

I suppose that *Smilium acutum* (Hoek, 1883) probably represents a complex of species due to its wide distribution and distinctions between some of its descriptions. But I cannot identify any distinctions between the holotype of *S. longirostrum* (Fig. 23) and the original description of Hoek for *S. acutum*. Both species have type localities from the northeastern Atlantic. Therefore, I confirm this synonym previously presented by several authors (Annandale 1910, 1916; Nilsson-Cantell 1921, 1938; Newman & Ross 1971; Zevina 1981a).

Family SCALPELLIDAE Pilsbry, 1907  
Genus *Scalpellum* Leach, 1817

*Scalpellum edwardsi* Gruvel, 1900  
(junior synonym of *Neoscalpellum debile*  
[Aurivillius, 1898])  
(Fig. 24)

*Scalpellum edwardsii* Gruvel, 1900a: 189; 1902a: 63, pl. 2, figs 3B, 16a, b; 1902c: 227; 1902d: 523; 1905: 28, fig. 27. — Nilsson-Cantell 1955: 218.

*Scalpellum edwardsi*, section *Neoscalpellum* – Pilsbry 1908: 110.

TYPE MATERIAL. — Azores, *Talisman*, 1883, drag. 136, 44°20'N, 19°31'W, 4255 m, holotype by monotypy, cl (tl) 23.6 (29.0) mm (MNHN Ci 390).

#### REMARKS

The great variety in the form of *Neoscalpellum debile* during its growth, with a great reduction of the plates of the capitulum, radically changing from an arcoscappelid- to a meroscappelid-form, confused many researchers which supported several supposedly new species. This is the case of *Scalpellum edwardsi* an intermediary form of *Neoscalpellum debile*. It just presents a great reduction of the capitular plates (Fig. 24) but not so large as the full grown specimens like that figured by Pilsbry (1907: fig. 28). The synonymies presented by Newman & Ross (1971) and Zevina (1976, 1981a) are reaffirmed.

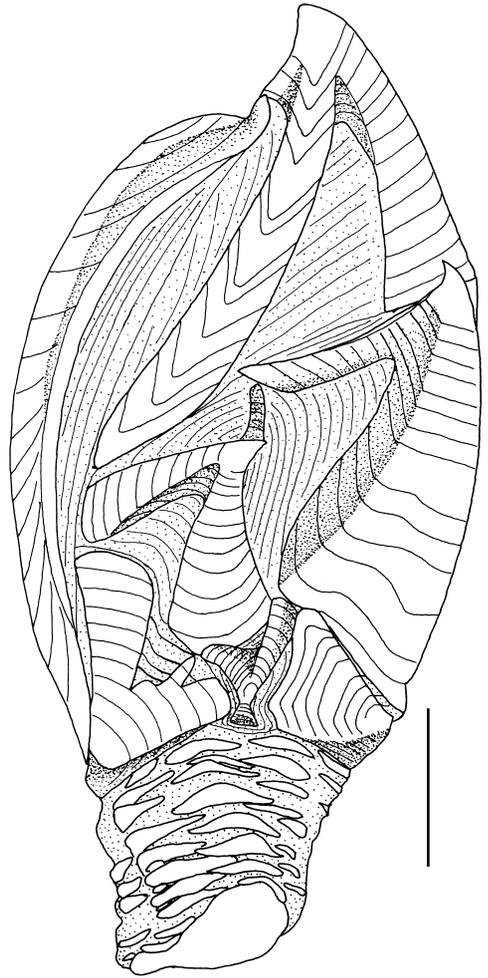


FIG. 24. — *Scalpellum edwardsi* Gruvel, 1900, holotype (MNHN Ci 390), left lateral view. Scale bar: 5 mm.

*Scalpellum patagonicum* Gruvel, 1900  
(junior synonym of *Ornatoscappelum gibberum*  
[Aurivillius, 1892])  
(Fig. 25)

*Scalpellum patagonicum* Gruvel, 1900b: 188; 1902c: 236, pl. 12, figs 1A, 16; 1902d: 523; 1905: 45, fig. 48. — Pilsbry 1907: 18; 1908: 109.

TYPE MATERIAL. — Patagonia, Lieut. Ingolf coll., 1883, holotype by monotypy, cl (tl) 3.5 (4.8) mm (MNHN Ci 403).

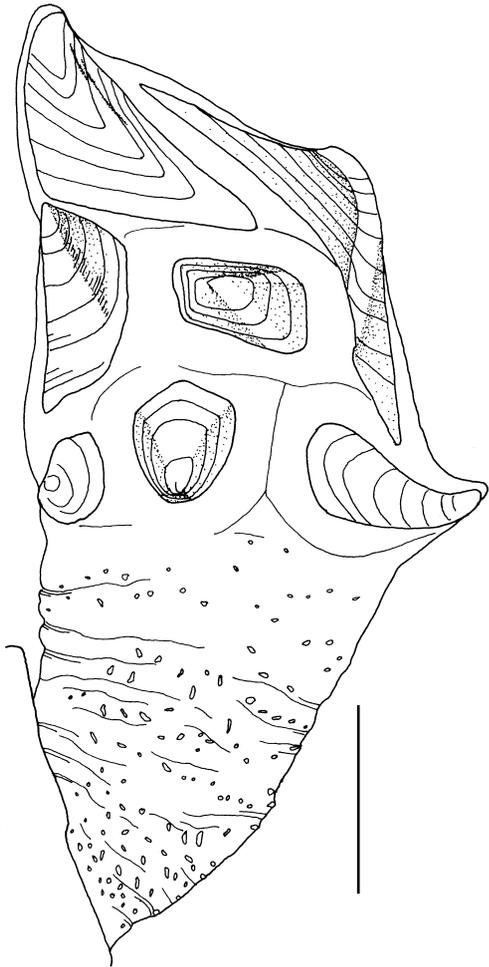


FIG. 25. — *Scalpellum patagonicum* Gruvel, 1900, holotype (MNHN Ci 403), right lateral view. Scale bar: 5 mm.

REMARKS

*Scalpellum patagonicum* is a full-grown specimen (Fig. 25) with very reduced capitular plates and which fits perfectly in the growth development of *Ornatoscalpellum gibberum* (Aurivillius, 1892) (see Newman & Ross 1971). Therefore, this species has its synonymy reaffirmed (Nilsson-Cantell 1921, 1957; Zevina 1964, 1981a; Newman & Ross 1971). Its general distribution, Patagonia, also fits that of *O. gibberum*: along the southern tip of South America, from Pacific Chilean coast, around Cape Horn northern to La Plata in the Atlantic Ocean.

*Scalpellum striatum* Gruvel, 1900  
(junior synonym of *Amigdoscalpellum rigidum*  
[Aurivillius, 1898])  
(Fig. 26A)

*Scalpellum striatum* Gruvel, 1900a: 191; 1902a: 77, 133, pl. 2, fig. 31, pl. 4, figs 3, 5, 7, 8; 1902c: 246; 1902d: 523; 1905: 72, fig. 81; 1920: 23, pl. 2, figs 4-6, 9-11, pl. 7, fig. 11. — Belloc 1959: 3.

TYPE MATERIAL. — East of Azores, *Talisman*, 1883, drag. 131, 2995 m, lectotype by present designation, cl (tl) 28.3 (36.0) mm (MNHN Ci 381); paralectotype, 1 spec., cl (tl) 26.6 (35.6) mm (MNHN Ci 380).

MATERIAL EXAMINED. — No locality, 1 spec., cl (tl) 41.6 (53.8) mm (MNHN Ci 394).

REMARKS

This species was described by Gruvel (1900a). However, he later (Gruvel 1920) considered it a synonym of *Amigdoscalpellum rigidum* (Aurivillius, 1898), but he continued using the name *S. striatum*. Afterwards several authors turned to use *A. rigidum* as the valid name (Zevina 1976, 1981a; Young 1998a), except Nilsson-Cantell (1955). The lectotype of this species is herein figured (Fig. 26A). When the type specimens of *S. curvatum*, *S. talismani* and *S. striatum* are examined, there are no doubts that all are the same species, only being distinct by stages of growth. During capitular plate growth, the inframedian-latus becomes proportionally smaller and the cuticular spaces between the capitular plates enlarge, especially the space between the carina and tergum.

*Scalpellum alatum* Gruvel, 1900  
(junior synonym of  
*Arcoscalpellum michelottianum* [Seguenza, 1876])  
(Fig. 27)

*Scalpellum alatum* Gruvel, 1900a: 192.

TYPE MATERIAL. — Morocco, Cape Cautin, *Talisman*, 1883, drag. 32, 1350-1500 m, lectotype by present designation, cl (tl) 18.2 (21.7) mm (MNHN Ci 363); paralectotypes, 8 spec.; fragments (MNHN Ci 363).

REMARKS

*Scalpellum alatum* was described from the north-eastern Atlantic (Cape Cautin, 32°33'N,

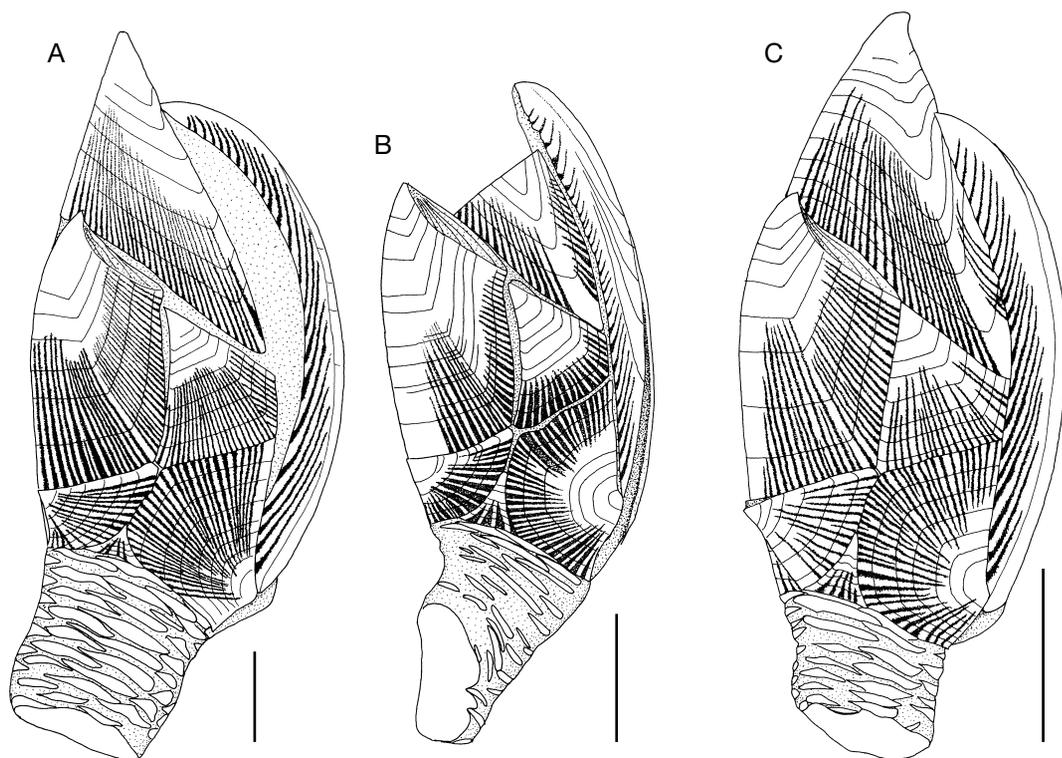


FIG. 26. — **A**, *Scalpellum striatum* Gruvel, 1900, lectotype (MNHN Ci 381), right lateral view; **B**, *Arcoscalpellum curvatum* (Gruvel, 1900), holotype (MNHN Ci 383), right lateral view; **C**, *Amigdoscalpellum talismani* (Gruvel, 1900), holotype (MNHN Ci 391), right lateral view. Scale bars: A, C, 5 mm; B, 3 mm.

9°17'W, Morocco and Cape Noun) and later considered to be a synonym of *S. velutinum* (nowadays synonym of *Arcoscalpellum michelotianum* [Seguenza, 1876]) even by the author (Gruvel 1902a, 1920). In the collection of the MNHN this sample was deposited with a label indicating "*Scalpellum velutinum*", with the handwriting of Gruvel, without any reference as being the type series of *S. alatum*.

Nowadays, the species identified as *A. michelotianum* (or *A. velutinum*) appears to be a group of distinct species (Ross *in litt.*; Young 2001). A detailed revision of this group should be done to decide which are valid species. Therefore, herein, I selected a lectotype for the *S. alatum* series, from the Cape Cautin sample. The Cape Cautin sample was labeled as *S. velutinum* by Gruvel, without mentioning they were types of *S. alatum*.

But the label of the *Talisman* Expedition, with the locality data, give no doubts that they are from the type series. The other two localities ("Maroc" and "cap Noun") recorded in his paper could not be located. The lectotype is presented in Fig. 27A-C and paralectotypes in Fig. 27D-F.

#### Genus *Arcoscalpellum* Hoek, 1907

*Arcoscalpellum curvatum* (Gruvel, 1900)  
(junior synonym of *Amigdoscalpellum rigidum*  
[Aurivillius, 1898])  
(Fig. 26B)

*Scalpellum curvatum* Gruvel, 1900a: 193; 1902a: 83, pl. 2, figs 8, 9; 1902c: 248; 1902d: 524; 1905: 85, fig. 95.

*Arcoscalpellum curvatum* – Zevina 1978b: 1350.

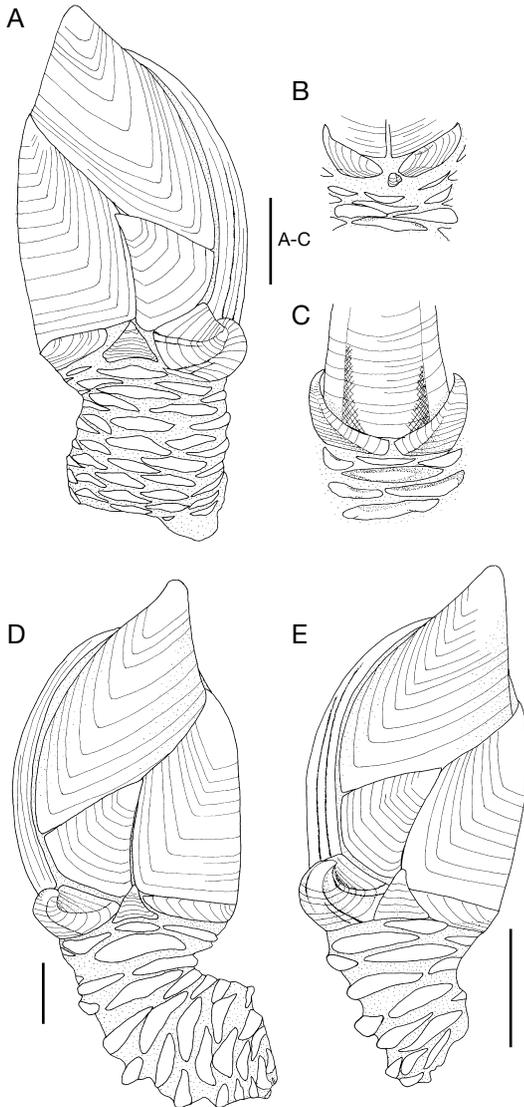


FIG. 27. — *Scalpellum alatum* Gruvel, 1900; **A-C**, lectotype (MNHN Ci 363); **A**, right lateral view; **B**, rostral view; **C**, carinal view; **D, E**, paralectotypes (MNHN Ci 363), left lateral views. Scale bars: 5 mm.

TYPE MATERIAL. — Azores, *Talisman*, 1883, drag. 128, 30°38'N, 30°41'W, 1257 m, holotype by monotypy, broken, one side with tergum broken and other side missing tergum, scutum and upper-latus (MNHN Ci 383).

MATERIAL EXAMINED. — Drag. 41, no latitude, 2100 m, 1 spec. broken (MNHN Ci 382) (identified

by Gruvel on the label as “espèce probablement nouvelle”; by Nilsson-Cantell [1930] as *Scalpellum curvatum*).

#### REMARKS

Gruvel (1900a, 1902a) described *Scalpellum curvatum* from Azores at depth of 1257 m, and after that this species was not recorded again, except the sample identified by Nilsson-Cantell, which he did not publish. Gruvel (1902a) commented *S. curvatum* was related to *Amigdoscalpellum vitreum* (Hoek, 1883) but was different in the more elongated shape of the capitulum, in the presence of cuticle separating the plates and the position of the umbo on the carino-laterals. Gruvel (1902a) did not compare *S. curvatum* to *Amigdoscalpellum rigidum* (Aurivillius, 1898) and all these distinctive characters used to separate *S. curvatum* from *A. vitreum*, could not separate *S. curvatum* from *A. rigidum*. Therefore, *S. curvatum* is considered synonym of *A. rigidum*. A lateral view of the lectotype of *Scalpellum curvatum* is presented in Fig. 26B, showing the same capitular plates pattern shown in Gruvel (1920: pl. 2, figs 4, 9) (as *S. striatum*) and Young (1998: fig. 19). Only the capitulum of the specimens presented by Gruvel (1920) are a little wider, but certainly this is well within the range of variation of *A. rigidum*, as are the variations of the length of the inframedian-latus.

The geographic distribution of *S. curvatum* is included in the general distribution of *Amigdoscalpellum rigidum*: North Atlantic Ocean.

#### Genus *Amigdoscalpellum* Zevina, 1978

*Amigdoscalpellum talismani* (Gruvel, 1900)  
(junior synonym of *Amigdoscalpellum rigidum*  
[Aurivillius, 1898])  
(Fig. 26C)

*Scalpellum talismani* Gruvel, 1900a: 193; 1902a: 86, pl. 2, figs 3D, 6, 7; 1902c: 248; 1902d: 524; 1905: 86, fig. 96. — Broch 1953: 8, fig. 4. — Nilsson-Cantell 1955: 219. — Zullo 1968: 211.

*Amigdoscalpellum talismani* – Zevina 1978b: 1349; 1981a: 269, fig. 203.

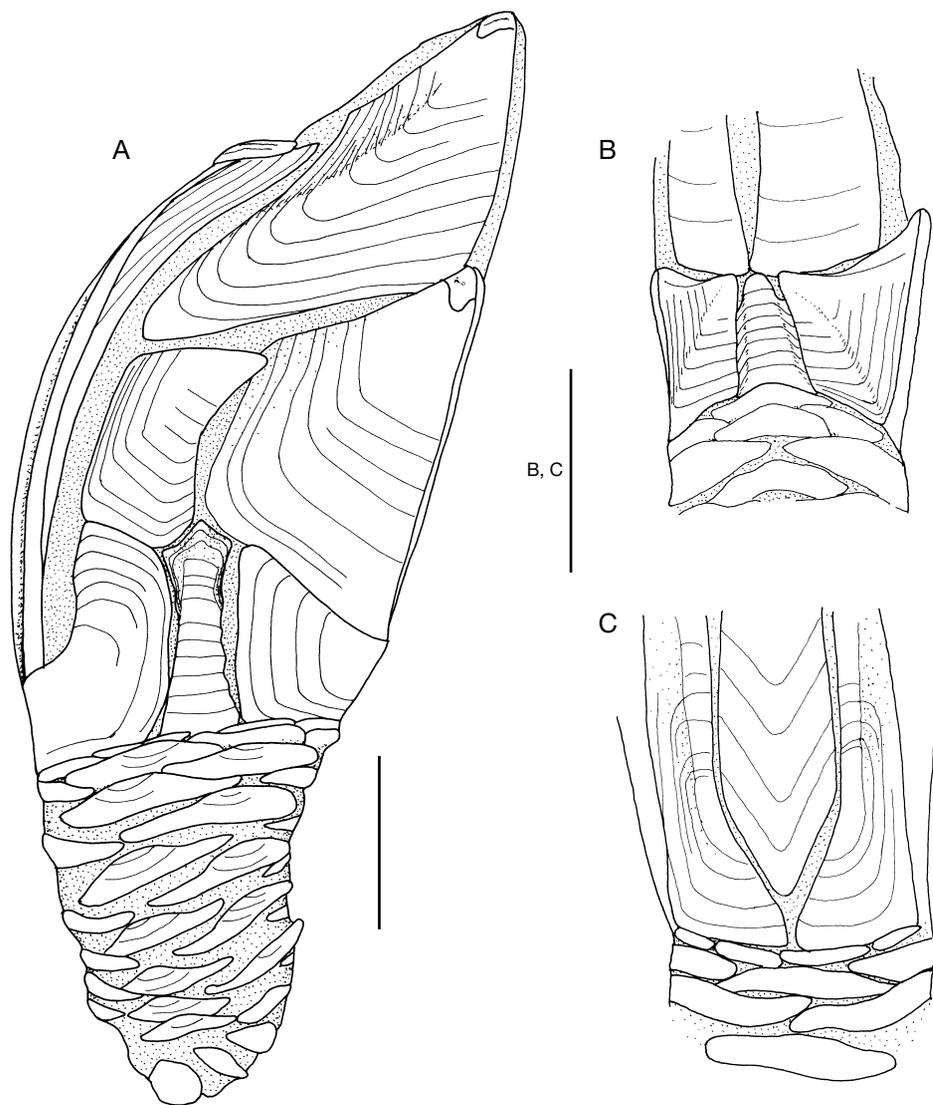


FIG. 28. — *Weltneria weltneri* (Gruvel, 1907), lectotype (MNHN Ci 389); **A**, left lateral view; **B**, rostral view; **C**, carinal view. Scale bars: 1 mm.

TYPE MATERIAL. — Bay of Biscay, *Talisman*, 1883, drag. 136, 44°20'N, 19°31'W, 4255 m, holotype by monotypy with scutum broken on one side, cl (tl) 18.2 (21.7) mm (MNHN Ci 391).

#### REMARKS

Gruvel (1902a) described *Scalpellum talismani* from one specimen collected from Bay of Biscay

(Fig. 26C). He included it in the group of *S. curvatum*, *S. vitreum* and *S. rigidum* and presented the following distinctive characters: the presence of numerous hairs on the peduncle, the peduncular scales shape and the distinctly striation of the capitular plates. Some changes occur during the development of the scales in these presumptive species, when the cuticle is more developed they

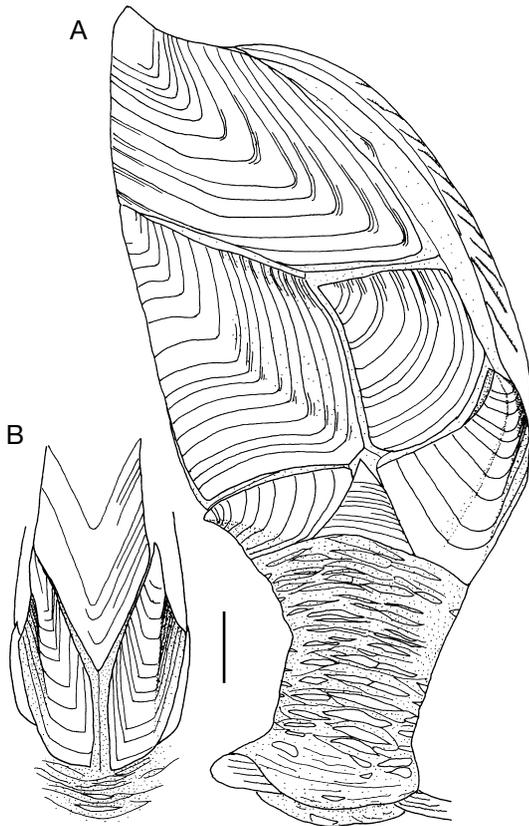


FIG. 29. — *Trianguloscapellum ovale* (Hoek, 1883) (MNHN Ci 368); **A**, right lateral view; **B**, carinal view. Scale bar: 5 mm.

are more immersed, when the cuticle is thinner the scales become more apparent. But if you clean the peduncle you will see the same pattern and the same shape of the scales. The striation on the plates is very characteristic for this group of species. As *S. curvatum*, *S. talismani* is considered a synonym of *S. rigidum*.

*Amigdoscapellum vitreum* (Hoek, 1883) was described from Japan and subsequently recorded from various localities in the Indo-Pacific Ocean with scattered records from Atlantic (Hoek 1883; Zevina 1981a). Some authors considered *S. talismani* a synonym of this species (Newman & Ross 1971; Zevina 1976). A detailed comparison between *A. rigidum* and *A. vitreum* is needed to decide if they are synonymous.

## Genus *Weltnerium* Zevina, 1978

### *Weltnerium weltneri* (Gravel, 1907) (Fig. 28)

#### REMARKS

See above the discussion under *Weltnerium bowieri*.

OTHER SAMPLES FROM THE ATLANTIC OCEAN  
Gravel (1902a: 53, pl. 2, fig. 3a; 1902d: 523) cited the occurrence from the Atlantic (*Talisman* Expedition, 1883, drag. 138, 46°9'N, 9°16'W, 4787 m, MNHN Ci 368) of *Scalpellum gigas* Hoek, 1883 (now in *Trianguloscapellum*), which was described from the mid-Pacific region (*Challenger* Expedition, stn 246, 36°10'N, 178°0'E, 3740 m). The single specimen (Fig. 29) carried on some males, which were described in the same study (1902: 126, pl. 3, figs 22-26). Due the wide discrepancy between the distribution range of *S. gigas* and the Gravel's record from Azores region, Young (1998a) considered this citation a mistake and considered it as probably *T. ovale* (Hoek, 1883), a species similar to *T. gigas* with an Atlantic distribution.

The examination of the specimen identified by Gravel confirms that this is actually *T. ovale* (Fig. 29). The general form of the capitulum and the large contact area between the carino-latera agree with the diagnosis of *T. ovale*. Furthermore, the record of *T. gigas* from Bay of Biscay of Foster & Buckeridge (1995) is indeed *T. ovale*. The three specimens from this sample agree with the *T. ovale* diagnosis.

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