

Crustacea : Cirripedia

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ABSTRACT

A total of 29 species are reported in this paper. Of the total, 28 belong to Order Thoracica and 1 to Order Acrothoracica. Four species and 1 subspecies are new to science. These are: Calantica (Paracalantica) newmani, Calantica (Paracalantica) rossi, Smilium vaubanianum, Paralepas robusta and Mesoscalpellum dicheloplax philippinensis. Of the 24 previously known species, 12 are reported for the first time from Philippine waters.

RÉSUMÉ

Les espèces mentionnées dans ce travail sont au nombre de 29, dont 28 appartiennent à l'ordre des Thoraciques et 1 à l'ordre des Acrothoraciques. Quatre espèces et une sous-espèce sont nouvelles pour la science. Ce sont: Calantica (Paracalantica) newmani, Calantica (Paracalantica) rossi, Smilium vaubanianum, Paralepas robusta et Mesoscalpellum dicheloplax philippinensis. Des 24 espèces précédemment connues, 12 sont signalées pour la première fois des Philippines.

INTRODUCTION

The Philippine deep-sea cirripedian fauna has, up to the present, not yet been investigated extensively. This is partly due to the difficulty in obtaining specimens from the deeper areas within Philippine territorial seas in view of the lack of necessary facilities and equipment. However, the most impor-

tant or significant contributions made, so far, towards this effort were those collected by the HMS *Challenger* Expedition (1873-1876), the *Albatross* Expedition (1893-1906), the HMS *Siboga* Expedition (1899-1900) and the Dr. Th. MORTENSEN's Pacific Expedition (1914-16). The present material collected

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by "MUSORSTOM 76" Philippines, added and contributed to our present knowledge of the deep sea species inhabiting Philippine waters.

The present collection is represented by two orders viz., Order Thoracica and Order Acrothoracica, 4 suborders, 7 families, 14 genera and 29 species. Of the 29 species, 4 species: *Calantica* (*Paracalantica*) *newmani*, *Calantica* (*Paracalantica*) *rossi*, *Smilium vaubanianum*, *Paralepas robusta* and 1 sub-species, *Mesoscalpellum dicheloplax philippinensis*, are introduced here as new to science. Of the 24 previously known species, 12 are reported for the first time from Philippine waters.

All holotypes and some paratypes are deposited in the Department of Zoology, College of Arts and Sciences, University of the Philippines as part of its crustacean collection. The numbers that they bear are those of that collection. Some of the paratypes, whenever available, are deposited in the Museum National d'Histoire Naturelle, Paris, France; in the U. P. Marine Sciences Center of the University of the Philippines, Diliman, Quezon City and in the National Museum, Manila, Philippines. Duplicates of other species, whenever available, are also distributed among the above mentioned depositories.

The following is the list of species identified from the collection. In addition to the new species described, those that bear an asterisk (*) are reported for the first time from the Philippines.

Order Thoracica:

1. *Scalpellum stearnsii* Pilsbry, 1890
2. *Sc. salartiae* Gruvel, 1901

- *3. *Arcoscalpellum hamulus* (Hoek, 1907)
4. *Calantica* (*Paracalantica*) *newmani* n. sp.
5. *C. (P.) rossi* n. sp.
6. *Smilium vaubanianum*, n. sp.
7. *Mesoscalpellum dicheloplax philippinensis* n. subsp.
- *8. *Heteralepas cornuta* (Darwin, 1851)
9. *Paralepas robusta* n. sp.
- *10. *Oxynaspis connectens* Broch, 1931
- *11. *O. bocki* Nilsson-Cantell, 1921
12. *Trilasmis* (*Temnaspis*) *tridens* (Aurivillius, 1894)
13. *T. (T.) excavatum* (Hoek, 1907)
14. *Megalasma* (*Megalasma*) *striatum* Hoek, 1883
15. *M. (M.) minus* Annandale, 1906
16. *Octolasmis* (*Dichelaspis*) *orthogonia* (Darwin, 1851)
- *17. *O. (D.) Weberi* Hoek, 1907
- *18. *Verruca* (*Alliverruca*) *nitida* Hoek, 1883
- *19. *V. (A.) sulcata* Hoek, 1883
- *20. *V. (Metaverruca)* *cookei* Pilsbry, 1927
21. *Balanus amphitrite amphitrite* Darwin, 1854
22. *B. variegatus cirratus* Darwin, 1854
23. *B. amaryllis* Darwin, 1854
24. *B. tenuis* Hoek, 1883
- *25. *B. maldivensis* Borradaile, 1903
26. *B. auricoma* Hoek, 1913
- *27. *B. hawaiiensis* Pilsbry, 1916
- *28. *B. echinoplacis* Stubbings, 1936

Order Acrothoracica:

- *29. *Trypetesa lampas* (Hancock, 1849)

Lists of Species per Station

Station 3.—19.03.1976, 14° 01.7' N, 120° 16.0' E, 183-185 m: *Oxynaspis connectens*, *Balanus hawaiiensis*, *B. amaryllis*, *Arcoscalpellum hamulus*.

Station 10.—19.03.1976, 13° 59.8' N, 120° 18.2' E, 187-205 m: *Trilasmis* (*Temnaspis*) *tridens*.

Station 11.—20.03.1976, 13° 59.8' N, 120° 23.7' E, 230-217 m: *Octolasmis* (*Dichelaspis*) *orthogonia*, *Trilasmis* (*Temnaspis*) *excavatum*, *Oxynaspis bocki*.

Station 12.—20.03.1976, 14° 00.8' N, 120° 20.5' E, 210-187 m: *Megalasma* (*Megalasma*) *striatum*, *Balanus echinoplacis*, *B. amaryllis*, *Trypetesa lampas*.

Station 15.—20.03.1976, 14° 00.3' N, 120° 18.0' E, 192-188 m: *Balanus echinoplacis*.

Station 16.—20.03.1976, 13° 59.0' N, 120° 10.5' E, 164-150 m: *Megalasma striatum*, *Balanus echinoplacis*.

Station 19.—21.03.1976, 13° 57.8' N, 120° 18.2' E, 167-187 m: *Verruca cookei*.

Station 26.—22.03.1976, 14° 00.9' N, 120° 16.8' E, 189 m: *Balanus amaryllis*.

Station 27.—22.03.1976, 13° 59.8' N, 120° 18.6' E, 192-188 m: *B. auricoma*, *Scalpellum stearnsii*.

Station 32.—23.03.1976, 14° 02.2' N, 120° 17.7' E, 193-184 m: *Megalasma striatum*, *Paralepas robusta* n. sp., *Verruca* (*Metaverruca*) *cookei*, *Balanus echinoplacis*, *B. tenuis*, *Calantica* (*Paracalantica*) *newmani* n. sp., *B. hawaiiensis*, *Scalpellum stearnsii*.

Station 34.—23.03.1976, 14° 01.0' N, 120° 15.8' E, 191-188 m: *Megalasma striatum*, *Balanus amaryllis*, *B. echinoplacis*, *B. tenuis*.

Station 35.—23.03.1976, 14° 01.2' N, 120° 20.2' E, 210-187 m: *M. striatum*, *Balanus echinoplacis*.

Station 36.—23.03.1976, 14° 01.2' N, 120° 20.2' E, 210-187 m: *Octolasmis orthogonia*, *Heteralepas cornuta*, *Trilasmis tridens*.

Station 42.—24.03.1976, 13° 55.1' N, 120° 28.6' E, 379-407 m: *Megalasma minus*, *Balanus amaryllis*, *B. tenuis*, *Scalpellum salartiae*.

Station 43.—24.03.1976, 13° 50.5' N, 120° 28.0' E, 484-448 m: *Balanus amaryllis*, *Octolasmis weberi*, *Megalasma minus*.

Station 47.—25.03.1976, 13° 40.7' N, 120° 30.0' E, 757-685 m: *M. minus*.

Station 49.—25.03.1976, 13° 49.1' N, 119° 59.8' E, 925-759 m: *Verruca (Aliverruca) nitida*.

Station 54.—26.03.1976, 13° 54.2' N, 119° 57.9' E, 1075-975-1125 m: *Megalasma striatum*, *Verruca sulcata*, *V. nitida*, *Mesoscalpellum dicheloplax philippinensis* n. subsp.

Station 55.—26.03.1976, 13° 55.0' N, 120° 12.5' E, 200-194 m: *Balanus echinoplacis*.

Station 61.—27.03.1976, 14° 02.2' N, 120° 18.1' E, 202-184 m: *Calantica (Paracalantica) rossi* n. sp.

Station 63.—27.03.1976, 14° 00.8' N, 120° 15.8' E, 191-195 m: *Balanus maldivensis*.

Station 65.—27.03.1976, 14° 00.0' N, 120° 19.2' E, 202-194 m: *Smilium vaubanianum* n. sp., *Trilasmis tridens*.

ACKNOWLEDGMENT.—The author wishes to express his thanks and deep appreciation to those who were instrumental in the accomplishment of this work, particularly to Professor Jacques FOREST, Expedition Leader of MUSORSTOM 76, of the Museum National d'Histoire Naturelle, Paris and his counterpart Dr. Alain CROSNIER of the Office de la Recherche Scientifique et Technique Outre-Mer, Paris, both of whom agreed that the cirripede collection be examined and worked out by the writer. Dr. Edgardo D. GOMEZ, Director of the Marine Sciences Center of the University of the Philippines liaised with the *Vauban* expedition and made the necessary arrangements for the specimens to be brought back to the Philippines after sorting. The Marine Sciences Center and the Natural Science Research Center of the University of the Philippines provided additional assistance and facilities in the pursuit of the undertaking.

SYSTEMATIC ACCOUNT

Order **Thoracica** Darwin, 1854

Suborder **Lepadomorpha** Pilsbry, 1916

Family **SCALPELLIDAE** Pilsbry, 1916

Genus ***Scalpellum*** Leach, 1817

1. *Scalpellum stearnsii* Pilsbry, 1890 (Plate I, e)
Scalpellum stearnsii Pilsbry, 1890: 441; BROCH, 1922: 235, fig. 6; 1931: 16; NILSSON-CANTELL, 1934: 33; HIRO, 1939: 237. *Scalpellum stearnsi*, GRUVEL, 1905: 44, fig. 46.

Crust. Coll. No. 312.

MATERIAL

St. 27, between 13° 59.8' N., 120° 18.6' E., 192 m and 14° 00.5' N, 120° 15.7' E, 188 m (March 22, 1976): one specimen on an empty gastropod shell, *Fusinus* sp.—St. 32, between 14° 02.2' N., 120° 17.7' E., 193 m and 13° 59.4' N., 120° 18.0' E., 184 m (March 23, 1976): one specimen detached from its attachment.

The specimens represented in the present collection are in conformity with those of PILSBRY's (1890) form as well as with those of other workers.

The specimen from St. 27 has a total length of 95 mm, 46 mm is of the capitulum. The one from St. 32 has a total length of 81 mm, 39 mm is of the capitulum.

HABITAT

Attached on gastropod shells, like *Fusinus* sp. and on a carrier shell, *Xenophora pallidula* Reeve,

dredged northeast off Lubang island. Depth 184-193 meters.

REMARKS

This species has been previously reported (BROCH, 1922, 1931) from S. of Jolo, Sulu Archipelago. Depth 457-500 meters.

2. *Scalpellum salartiae* Gruvel, 1901 (Plate I, f-h)
Scalpellum salartiae Gruvel, 1901: 239, pl. 12, 8-9; 1905: 47, fig. 50.

S. aff. salartiae, BROCH, 1922: 241, fig. 9.

Crust. Coll. No. 313

MATERIAL

St. 42, between 13° 55.1' N., 120° 28.6' E., 379 m and 13° 54.1' N., 120° 29.1' E., 407 m (March 24, 1976): one small specimen attached on *Balanus tenuis* which was attached on a spine of a sea urchin.

The present form is similar to those of GRUVEL (1901) and BROCH (1922). Capitulum with 14 valves. Rostrum (fig. g) like those of Gruvel, *loc. cit.*, quadrangular and not covered by the edges of rostral latera. On the other hand, it is like BROCH's form being covered with fine hairs becoming more numerous on carinal side and with several scales on peduncle.

The species like those previously obtained is rather small. For comparison, size of present specimen and those of GRUVEL and BROCH are herein given (in mm):

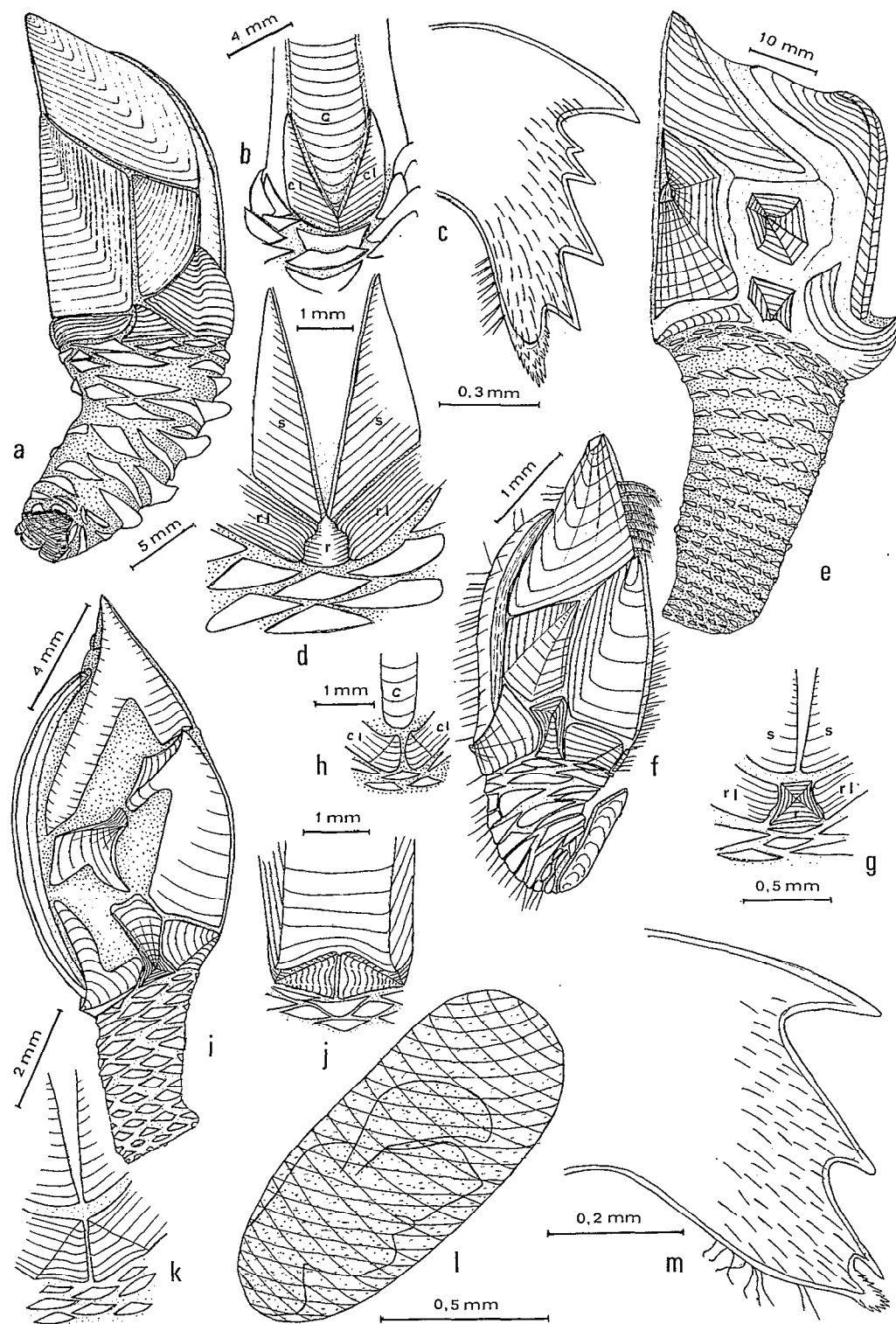


Plate I

Arcoscalpellum hamulus (Hoek), 1907. a, whole animal, lateral view; b, carinal side; c, mandible; d, rostral side.

Scalpellum stearnsii Pilsbry, 1890. e, whole animal, lateral view.

Scalpellum salariae Gruvel, 1901. f, whole animal, lateral view; g, rostral side; h, carinal side.

Mesoscalpellum dicheloplax philippinensis n. subsp.

Holotype. i, whole animal, lateral view; j, carinal side; k, rostral side; l, dwarf male; m, mandible.

(c, carina; cl, carinoialateral; r, rostrum; rl, rostrolateral; s, scutum)

	Present specimen	Gruvel's specimen	Broch's specimen
Length of capitulum.....	3.5	1.75	5.5
Breadth of capitulum.....	2.0	1.25	3.2
Length of peduncle.....	1.5	0.7	3.0
Breadth of peduncle.....	1.2	0.4	—
Total length.....	5.0	2.45	8.5

HABITAT

Attached on the compartmental plate of *B. tenuis* which on the other hand was attached to a sea urchin spine dredged northeast off Lubang Island. Depth 379-407 meters.

REMARKS

This species was previously reported (BROCH, 1922) from 15 miles W. 1/2 S. of Jolo, Sulu Archipelago. Depth 457 meters.

Genus *Arcoscalpellum* Hoek, 1907

3. *Arcoscalpellum hamulus* (Hoek, 1907) (Plate I, a-d)

Scalpellum (*Arcoscalpellum*) *hamulus* Hoek, 1907: 86, pl. 7, fig. 14-14a.

Crust. Coll. No. 314

MATERIAL

St. 3, between 14° 01.7' N., 120° 16.0' E., 183 m and 14° 01.5' N., 120° 13.3' E., 185 m (March 19, 1976): one small specimen attached to *Balanus hawaiiensis*.—St. 21, between 14° 01.0' N. lat.-120° 20.3' E., 223 m and 14° 02.8' N., 120° 24.3' E., 174 m (March 21, 1976): two specimens attached to the cirri of a crinoid.

The present material agrees fairly well with the description and illustrations of HOEK (1907). The single specimen from St. 3 had a total length of 3 mm while one of the 2 specimens from St. 21 had a total length of 32 mm, 22 mm of this is of the capitulum. The size of the latter is larger than those of HOEK whose total length was 30 mm, that of the capitulum 19 mm. HOEK did not mention the presence of a complementary male. Like his form, the present specimen did not possess any complementary male too.

HABITAT

Attached on the compartment of *B. hawaiiensis* and on the cirri of a crinoid dredged northeast off Lubang island. Depth 174-223 meters.

REMARKS

So far, this is the second world record and first for the Philippines. HOEK's material obtained somewhere in Banda Sea (397 m deep), Indonesia, is represented only by a single specimen. The present material is represented by 3 specimens. Most probably it is quite a rare species.

Genus *Calantica* Gray, 1825

Subgenus *Paracalantica* Utinomi, 1949

4. *Calantica* (*Paracalantica*) *newmani* n. sp. (Plates II, a-b, III, c-e)

Crust. Coll. No. 315. Holotype deposited in the Department of Zoology, College of Arts & Sciences, University of the Philippines.

MATERIAL

St. 32, between 14° 02.2' N., 120° 17.7' E., 193 m and 13° 59.4' N., 120° 18.0' E., 184 m (March 23, 1976): a single specimen on a gorgonian stem together with *Calantica* (*Paracalantica*) *rossi* n. sp.

The animal is completely enclosed, except orifice, by the coenenchyme of host gorgonian with polyps and large spicules all over.

Capitulum triangular (Pl. II, a), laterally compressed, covered with thin transparent cuticle; valves 11, approximate, consisting of 2 whorls. Upper whorl is composed of paired scuta, terga and a carina. The lower whorl consists of 2 pairs of latera, a rostrum and a subcarina.

Scutum triangular, more or less convex externally; umbo subcentral. Tergum elongated, wedged between scuta and carina, lower end reaching subcarina; umbo subcentral. Carina large, convex, apex pointed, basal end broad setting on subcarina.

Carinal latus dark colored in contrast to other valves which are white, small, triangular, slightly elongated towards rostral latus, apex not prominently projecting. Rostral latus triangular, larger than carinal latus, distinctly projecting. Subcarina large, more or less bowed, apex pointed projecting beyond carinal margin. Rostrum triangular, sharply pointed, prominently projecting beyond occludent margin of scuta, straight, its axis more or less at right angles to main axis of capitulum, upper surface with a smooth median ridge running at the center from base to apex.

Peduncle short, cylindrical covered with leaf-like closely imbricating projecting scales with rounded free ends. Size: Length of capitulum 7 mm (up to apex of tergum), breadth 4 mm; length of peduncle 2.5 mm, breadth 2 mm. Ovigerous with developing nauplii inside mantle sac cavity.

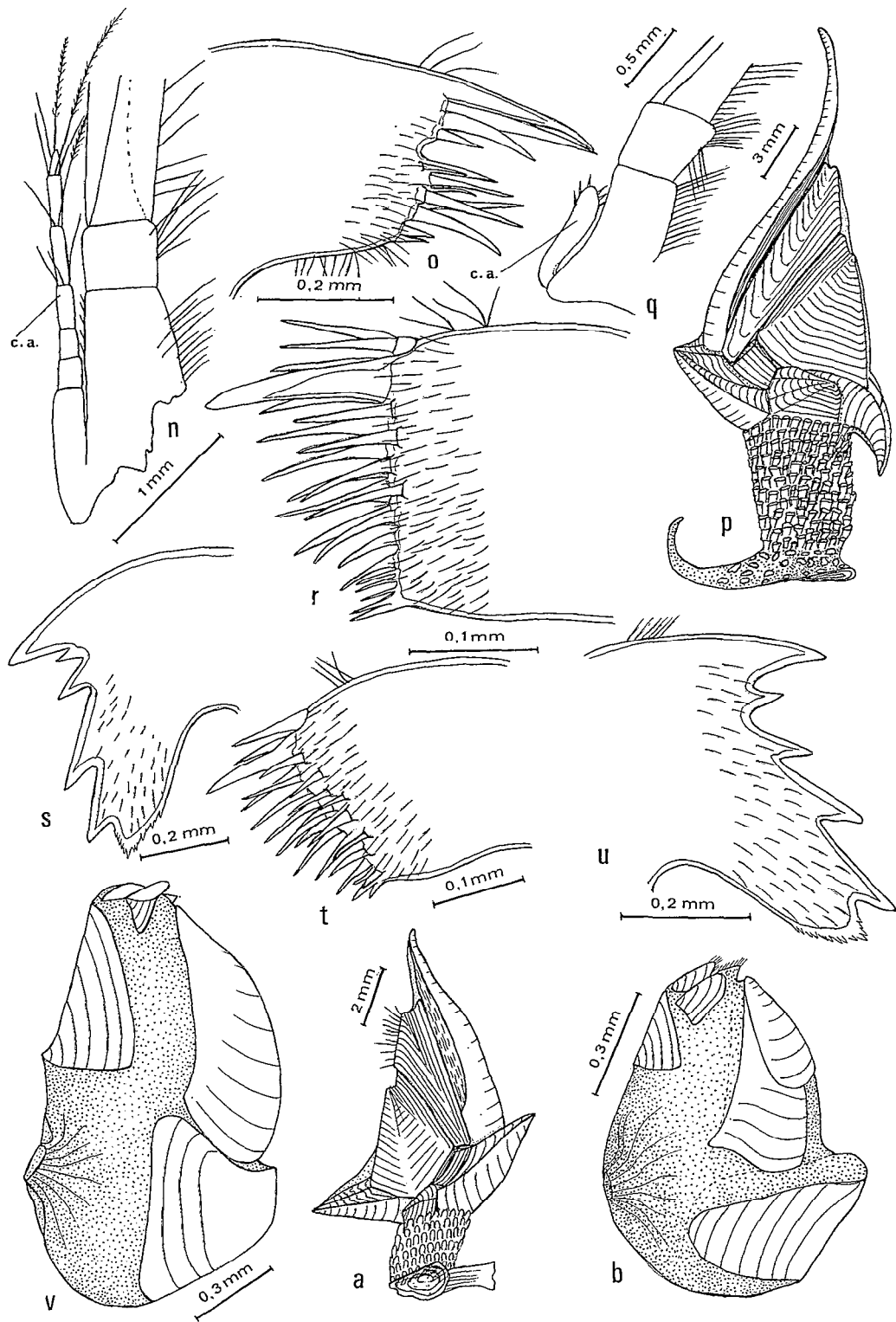


Plate II

Mesoscalpellum dicheloplax philippinensis n. subsp.

Holotype. **n**, cirrus (VI) part showing caudal appendage (c.a.); **o**, maxilla I.

Calantica (Paracalantica) rossii n. sp. **p**, whole animal, lateral view; **q**, cirrus VI (part) showing caudal appendage (c.a.); **r**, maxilla I, **s**, mandible; **t**, maxilla I; **u**, mandible; **v**, complemental male.

(Holotype, **p**, **r**, **s**, **v**: Paratype, **q**, **t**, & **u**).

Calantica (Paracalantica) newmani n. sp.

Holotype. **a**, whole animal, lateral view; **b**, complemental male.

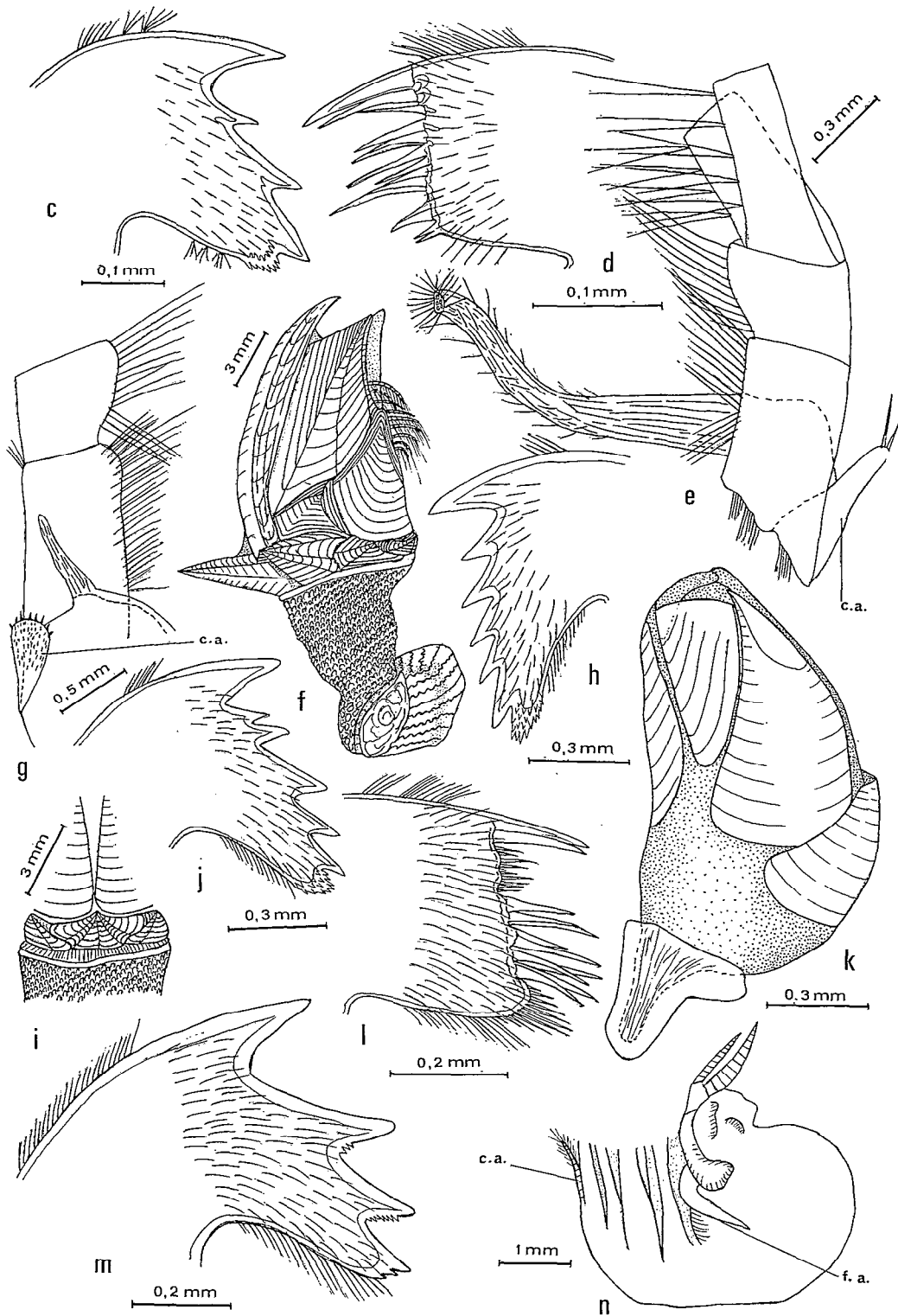


Plate III

Calantica (Paracalantica) newmani n. sp.

Holotype. c, mandible; d, maxilla I; e, Cirrus VI (part) showing penis and caudal appendage (c.a.).

Smilium vaubanianum n. sp.

Holotype. f, whole animal, lateral view; g, Cirrus VI (part) showing penis and caudal appendage (c.a.); h, mandible; i, rostral side of animal; j, mandible; k, complemental male; l, maxilla I.

Paralepas robusta n. sp.

Holotype. m, mandible; n, body showing filamentary appendage (f.a.) and caudal appendage (c.a.).

Mouth parts.—Labrum not bullate, crest without denticles. Palpus small, club-shaped with few short setae on its outer margin. Mandible (Pl. III, c) with 4 teeth, second tooth smallest, interior angle rounded and pectinated. Maxilla I (Pl. III, d) with straight frontal margin, superior angle supports 2 large spines, inferior angle with 2 minute spines, intermediate spines of moderate sizes. Maxilla II triangular, apex produced, margin setose.

Cirrus I, posterior ramus always appearing longer, although they may have same number of segments, than anterior ramus. Intermediate segments of Cirrus II bears 3 pairs of subequal setae, Cirrus III, 3 or 4 pairs, Cirrus IV, 4 or 5 pairs but rami of Cirri V and VI bears only 4 pairs, proximal pairs always minute. In all instances with additional spinules between bases.

Segmentation of Cirri are as follows: Holotype

	I	II	III	IV	V	VI
Right row...	11:11	12:13	15:15	15:16	17:16	15:16
Left row....	10:12	13:15	13:15	15:15	17:16	17:16

*Cut

Caudal appendage (Pl. III, e) uniarticulate about half the length of first pedicel of protopodite of Cirrus VI. Penis long and slender, faintly annulated, hairy especially towards distal half of organ.

Complemental male (Pl. II, b) lodged on rostral end of orifice between scuta. It has well developed plates consisting of paired scuta, terga, a carina and a large rostrum. Total length 0.94 mm.

HABITAT

Attached on a gorgonian stem dredged northeast off Lubang island. Depth 184-193 meters.

ETYMOLOGY

The specific name is after Dr. William A. NEWMAN of the Scripps Institution of Oceanography who has contributed significantly to the cirripede research effort.

REMARKS

This species is closely allied to *Calantica* (*P.*) *ikedai* Utinomi, 1949. However, only mandibles of this species and that of Utinomi are very similar. The present form is smaller having a total length of 11.5 mm, which was already mature being ovigerous. Utinomi's form has a total length of 28 mm. Moreover, the segments of rami are fewer when compared to species *ikedai*, bearing only 3 or 4 pairs, very rarely 5 pairs of subequal setae. Species *ikedai* bears 5 pairs of setae on its rami. The present form is considered new to science designated as *Calantica* (*Paracalantica*) *newmani* n. sp.

5. *Calantica* (*Paracalantica*) *rossi* n. sp. (Plate II, p-v)

Crust. Coll. No. 316. Holotype deposited in the Department of Zoology, College of Arts & Sciences, University of the Philippines. Paratypes with the Museum National d'Histoire Naturelle (2 specimens), Paris, France; U. P. Marine Sciences Center (1 specimen), Diliman Quezon City; National Museum (1 specimen), Manila Philippines.

MATERIAL

St. 32, between 14° 02.2' N., 120° 17.7' E., 193 m and 13° 59.4' N., 120° 18.0' E., 184 m (March 23, 1976): two specimens attached on a gorgonian stem. —St. 61, between 14° 02.2' N., 120° 18.1' E., 202 m and 13° 59.7' N., 120° 16.8' E., 184 m (March 27, 1976): six specimens attached on a gorgonian stem.

Like the preceding species, *C. newmani*, the whole animal is also completely surrounded, except orifice, by the coenenchyme of host gorgonian.

Capitulum triangular (fig. p), more or less laterally compressed, covered with thin transparent cuticle; valves 11, white, consisting of two whorls, upper whorl consisting of paired scuta, terga, and a carina. Terga occupying entire space between scuta and carina. Lower whorl is made up of 2 pairs of latera, a rostrum and a subcarina. Upper and inframedian latera absent. The valves constituting the upper whorl are approximate, leaving no space between them.

Scutum triangular, base broad, apex produced; umbo subcentral. Tergum, like *C. ikedai*, elongated, occludent and carinal margins straight, lower end reaching subcarina, placed obliquely to long axis of capitulum; umbo, like scuta, subcentral. Carina very long exceeding beyond apex of terga, strongly convex, broader at base, tapers apically which may either be distinctly or very slightly recurving.

Carinal latus subtriangular, base rounded, slightly transversely elongated toward rostral latus, upper end standing out or protruding; umbo apical. Rostral latus triangular, protruding, apex either erect or recurving. Rostrum triangular, apex pointed, protruding beyond scutal margin, distinctly or prominently recurving, upper surface hollowed out, groove extending up to its apex filled up with a transparent cuticle. Subcarina large, pyramidal, stronger than rostrum, protruding beyond carina, upper surface hollowed out where lower end of carina is seated, apically straight or slightly recurving.

Peduncle cylindrical, shorter than capitulum, covered with a thin transparent cuticle, furnished with numerous projecting scales whose free ends are more or less rectangular.

Sizes of types in millimeters:

	1*	2.	3.	4.	5.	6.
Length of capitulum...	14.5	12.3	11.6	11.8	11.4	10.5
Breadth of capitulum...	9.5	8.3	7.6	7.1	6.7	8.3
Length of peduncle....	8.0	3.8	4.3	3.6	3.8	4.0
Breadth of peduncle....	4.5	3.8	4.0	4.3	4.0	4.3
Total length.....	22.5	16.1	15.9	15.4	15.2	14.5

*Holotype

Length of capitulum was measured from lower edge of inframedian latus up to apex of tergum, portion of carina exceeding beyond apex of tergum is quite variable; breadth was from outer edge of carina to basal occludent margin of scutum, excluding tips of subcarina and rostrum.

Segmentation of cirri are as follows:

	I	II	III	IV	V	VI
1*. Right row..	13 15	16 17	18 20	19 21	21 21	18 17
Left row....	14 14	16 20	18 17	18 19	19 19	18 19
2**. Right row..	13 15	15 16	16 20	18 20	19 18	20 19
Left row....	14 —	15 16	17 19	18 20	17 20	18 20

*Holotype **Paratype

Cirrus I, anterior ramus shorter than posterior ramus, highly setose, setae finely pinnate; larger and longer setae on summit of last segment also finely pinnate. Intermediate segments of Cirri II-VI bears 4-6 pairs of finely pinnate setae with spinules between bases. Caudal appendage (fig. q) uniarticulate, club-shaped, not reaching distal margin of first pedicel of protopodite of Cirrus VI, armed with short setae on its margin. Penis moderately long, tapering, clothed with numerous hairs especially the distal 2/3 of organ.

Mouth parts.—Labrum without any denticles. Palpus small, club-shaped, inferior margin setose. Mandible (fig. s & u) with 5 teeth, second tooth small. Inferior angle more or less produced where 2 small denticles are seated, inferior or sometimes superior margin serrated. Maxilla I (fig. r & t), frontal margin straight with numerous stout spines, superior angle bears a moderately large spine with 2 or 3 smaller spines dorsally; inferior angle bears 2 small spines.

Complemental male (fig. v) present, lodged in a depression just below adductor muscle between scuta. It has well developed plates consisting of paired scuta, terga a carina and a large rostrum. Peduncle very short. Total length 1.48 mm.

The total length of holotype is 22.5 mm and one paratype dissected is 15.2 mm, both were ovigerous with developing eggs inside their mantle sac cavity.

HABITAT

Attached on a gorgonian stem dredged northeast off Lubang island. Depth 184-202 meters.

ETYMOLOGY

The specific name is after Dr. Arnold Ross of the San Diego Natural History Museum who, like Dr. William A. Newman, has contributed significantly to our present efforts on cirripede research.

REMARKS

This form is undoubtedly a *Calantica* on the arrangement of its capitular plates; tergum occupying the space between scuta and carina. It belong to the subgenus *Paracalantica* Utinomi (1949), there being only 2 pairs of latera. It differs from species *ikedai* and the preceding new species *newmani* by several morphological features both externally and internally. The present form is new to science designated as *Calantica (Paracalantica) rossi* n. sp.

Genus *Smilium* Leach, 1825

6. *Smilium vaubanianum* n. sp. (Plate III, f-1)

Crust Coll. No. 317. Holotype deposited in the Department of Zoology, College of Arts & Sciences, University of the Philippines.

MATERIAL

St. 65, between 14° 00.0' N., 120° 19.2' E., 202 m and 14° 00.8' N., 120° 16.2' E., 194 m (March 27, 1976): one specimen attached on a coral fragment, *Dendrophyllia* sp. (?).

Capitulum more or less rectangular (fig. f), plates tinged with blotches of light orange-color; valves 13, approximate, consisting of 2 whorls. Upper whorl consisting of paired scuta, terga, upper latera and a carina; lower whorl composed of paired carinal latera, rostral latera, a rostrum and a subcarina.

Scutum triangular, basal portion broad, apex produced with a blotch of light-orange color towards carinal angles; umbo subapical, tergum, irregularly diamond-shaped, both ends are pointed, apex diverging at about level of apex scutum; a band of light-orange hue present at this level and another blotch of similar collar at its lower end confluent with the blotch on scutum. Carina long, a little bit exceeding apex of terga, tainted light-orange becoming darker near its lower end, apex claw-like, keeled from base to apex. Upper latera triangular, darkly colored than other valves, wedged between scuta and carina; apex curving towards scuta.

Subcarina long and pointed, projecting beyond carinal keel, faintly colored orange, laterally overlaid by carinal latus. Carinal latus pyramidal with distinct sharp edges, distinctly projecting laterally overlapping subcarina. Rostral latus triangular, slightly projecting, partly overlapped by rostrum. Rostrum (fig. i) triangular laterally overlaying rostral latera, apically curving. Inframedian latera absent. Umbones of all plates, except scuta, apical.

Peduncle cylindrical, shorter than capitulum, tapering towards point of attachment; a distinct narrow chitinous band devoid of scales present at the capitulo-peduncular junction. Color light-orange, covered with numerous diagonally arranged small projecting scales imbedded in a thin chitinous material.

Size: Length of capitulum 19 mm, breadth, near the capitulo-peduncular junction, 6.5 mm, near its base, 4 mm. Oviparous with developing nauplii inside mantle sac cavity.

Mouth parts.—Labrum not bullate, crest convex devoid of denticles. Palpus club-shape densely setose near and at rounded apex; setae finely pinnate. Mandible (fig. h & j) with 6 teeth, second tooth usually the smallest, inferior angle rounded, protuberant and pectinated. Maxilla I (fig. l), frontal margin supports 3 kinds of spines; upper angle with 2 large spines, margin below this bears several minute spines followed by 9 moderate sized spines; inferior angle protuberant supporting numerous small straight spines.

Segmentation of cirri are as follows: Holotype

	I	II	III	IV	V	VI
Right row.....	12 14	19 18	19 20	20 20	20 21	21 22
Left row.....	14 14	19 19	19 21	19 22	21 21	18 22

Intermediate segments of rami of Cirri II-VI bear 5-6 pairs of subequal finely pinnate setae, proximal pair minute, with spinules between bases.

Caudal appendage (fig. g) uniarticulate, paddle-shaped, apical margin with minute spines. Penis very small and short not reaching distal margin of first pedicel of protopodite of Cirrus VI.

Complemental male (fig. k) with well developed plates consisting of paired scuta, terga, a carina and a rostrum; it has a short peduncle. This was found attached near rostral angle between scuta. Total length 1.63 mm.

HABITAT

Attached on a stony coral fragment, *Dendrophyllia* sp. (?), dredged northeast off Lubang island. Depth 194-202 meters.

ETYMOLOGY

The specific nomenclature is after the research vessel *Vauban* used in the expedition of which the present material was a part of the collection.

REMARKS

This species is somewhat related to *S. aries* (Hoek, 1907). However, instead of the rostrum being well developed and prominently projecting, it is the subcarina. Moreover, carina in the present species projects beyond apex of terga, apex claw-like and apically not adherent to tergal plates. The present material is considered new to science designated *Smilium vaubanianum* n. sp.

Genus *Mesoscalpellum* Hoek, 1907

7. *Mesoscalpellum dicheloplax philippinensis* n. subsp. (Plates I, i-m; II, n-o)

Crust. Coll. No. 318. Holotype deposited in the Department of Zoology, College of Arts & Sciences, University of the Philippines.

MATERIAL

St. 54, between 13° 54.2' N., 119° 57.9' E., 1,075 m and 13° 56.0' N., 119° 58.3' E., 1,125 m (March 26, 1976): one specimen dislodged from its attachment.

Capitulum ovate (Pl. I, i), apex pointed, laterally compressed, covered with thin smooth transparent cuticle; longer than peduncle, length 16 mm, breadth 8 mm, Valves 13, white; terga, scuta, upper latera and carinal latera are V-shaped, arms of V of first 3 plates directed basally while those of carinal latera directed apically.

Scutum broad basally and narrower apically with a small calcified tergal arm; occludent margin convex, apex pointed slightly overlapping basal end of tergum; umbo apical. Tergum carinal arm longer than occludent arm, triangularly pointed almost touching carinal arm of upper latera; basal margin of occludent arm transverse, slightly overlapped by pointed apex of scutum, carinal margin slightly curved with a small projection a little above apex of carina; occludent margin slightly convex; umbo apical. Carina curved more pronounced near its apex, overlapping about 3/4 of tergum, roof not deeply groove, lateral ridges low.

Upper latus, carinal arm broader than occludent arm; umbo apical. Carinal latus (Pl. I, j), occludent margin divided, carinal arm longer, almost reaching carinal arm of upper latus, carinal margin more or less straight while occludent margin sinuous; umbo like *Mesoscalpellum dicheloplax* Pilsbry, 1916, recurved

projecting below and beyond carina. Inframedian latera fan-shaped, broader apically and very narrow basally, tergal margin slightly notched, rostral border straight, a little concave near its base; carinal border also straight but a little concave near its base; basal margin straight; umbo subcentral, unlike subsp. *benthopila* (Pilsbry, 1907) which is central. Rostral latera (Pl. I, k), entire, not divided into two arms; umbo apical.

Peduncle short, about 1/3 that of capitulum, length 5 mm, breadth 3 mm; cylindrical covered with prominent projecting scales in 12 rows of 7-8 scales each.

Mouth parts.—Labrum bullate covered with numerous spinelets, crest without denticles. Palpus small, club-shaped, apex produced with few short setae. Mandible (Pl. I, m) with 3 teeth, 3rd tooth small and pointed placed very close to inferior angle; inferior angle protuberant, superior and inferior margins serrated. Maxilla I (Pl. II, o) with a small distinct notch inferior to 3 large and a small spines, margin inferior to notch bears 7 moderate spines, 2 inferiormost spines short. The other maxilla is atrophied without any spine on its cutting edge.

Intermediate segments of Cirri II-VI bears 3, 4 or 5 pairs of setae with spinules near their bases. Caudal appendage (Pl. II, n) multiarticulate, 7 and 10 segments, bearing long setae on its distal margin. No penis was observed. A dwarf male (Pl. I, l) was recovered on inner side of left scutum near occludent margin; enclosed in a sausage-shaped thin transparent membrane traversed diagonally by fine lines and studded with very minute setae.

HABITAT

Unknown being detached from its attachment, dredged northeast off Lubang island. Depth 1075-1125 meters.

REMARKS

The present form is quite similar to the Atlantic subspecies *Mesoscalpellum dicheloplax benthopila* (Pilsbry, 1907). This is especially true with regards to the shape of terga, scuta, carina, upper latera and rostral latera. The size is more or less the same. In PILSBRY's form, capitulum is 15 mm long, breadth 7.5 mm; length of peduncle 4.5 mm. Whereas the Philippine form, capitulum is 16 mm long, breadth 8 mm; length of peduncle 5 mm.

However, it differs from the Atlantic form on the shape of carinal latera and inframedian latera. The present material could be a distinct subspecies from the Atlantic form which was obtained between Cape May and Nantucket at a depth of 2843 m, while the present form was obtained northeast off Lubang island at a depth of 1075-1125 meters. In

view of these morphological differences and their zoogeographic distance, the present specimen is considered new to science designated as *Mesoscalpellum dicheloplax philippinensis* n. subsp.

Family HETERALEPAPIDAE Nilsson-Cantell, 1921

Genus *Heteralepas* Pilsbry, 1907

8. *Heteralepas cornuta* (Darwin, 1851) (Plate IV, g-l)

Alepas cornuta Darwin, 1851: 165, pl. III, 6; GRUVEL, 1905: 161, fig. 178.

Heteralepas cornuta, STUBBINGS, 1967: 239 (listed only).

Crust. Coll. No. 319.

MATERIAL

St. 36, between 14° 01.2' N., 120° 20.2' E., 210 m and 14° 00.3' N., 120° 17.0' E., 187 m (March 23, 1976): six specimens attached on an echinoid spine together with several specimens of *Octolasmis* (*Dichelaspis*) *orthogonia*. On one large specimen some *O. orthogonia* were found attached to its capitulum and peduncle together with numerous vorticellids.

Nothing much could be added to the previous descriptions given by several workers. The specimen illustrated herein have only 2 projections along the carinal margin, however, other smaller specimens have 3, the third projection being "generally close to the orifice" as stated by DARWIN (1851). Several drawings are given to augment the illustrations provided by DARWIN when he first described the species. Inner rami of Cirri V and VI are shorter and slenderer than outer rami, those of Cirri II-IV, rami are normal.

HABITAT

Attached on an echinoid spine dredged northeast off Lubang island. Depth 187-210 meters.

REMARKS

Previous specimens were obtained from St. Vincent, West Indies on Antipathes. According to STUBBINGS (1967) the species was also reported by NILSSON-CANTELL (1938) from Andaman Sea. Its presence in Philippine waters extends its zoogeographic range further eastward.

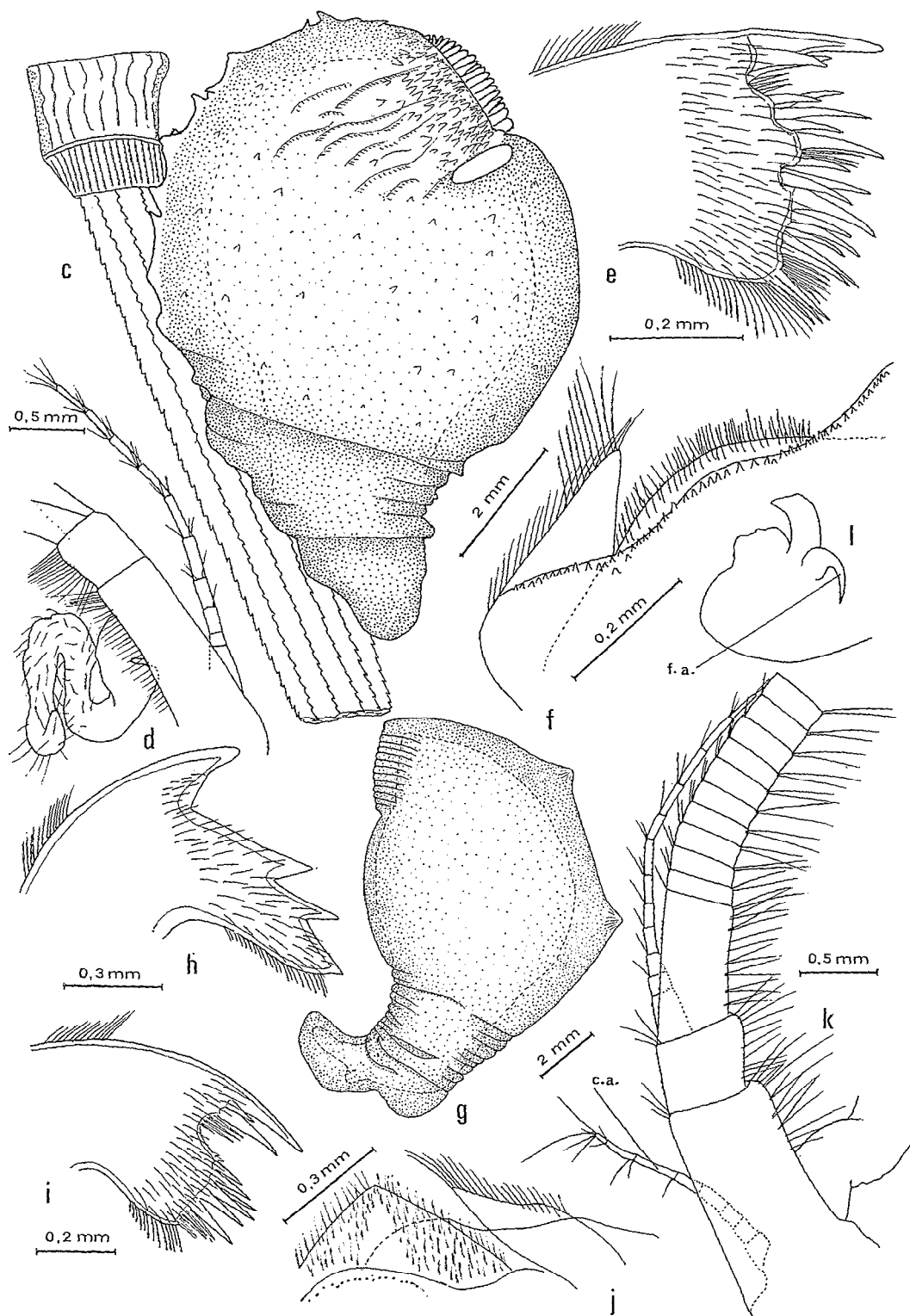


Plate IV

Paralepas robusta n. sp.

Holotype. **c**, whole animal, lateral view attached to an echinoid spine; **d**, Cirrus VI (part) showing penis and caudal appendage; **e**, maxilla I; **f**, labrum and palpus.

Heteralepas cornuta (Darwin), 1851. **g**, whole animal, lateral view; **h**, mandible; **i**, maxilla I; **j**, labrum and palpus; **k**, Cirrus VI and caudal appendage (c.a.); **l**, body showing filamentary appendage (f.a.).

Genus *Paralepas* Pilsbry, 19079. *Paralepas robusta* n. sp. (Plates III, m-n; IV, c-f)

Crust. Coll. No. 320. Holotype deposited in the Department of Zoology, College of Arts & Sciences, University of the Philippines.

MATERIAL

St. 32, between 14° 02.2' N., 120° 17.7' E., 184 m deep (March 23, 1976): one specimen attached on an echinoid spine.

Capitulum globular (Pl. IV, c), a little broader than long; length 6 mm, breadth 6.09 mm; distinct from peduncle; membrane enclosing the animal is thick and tough with numerous small tubercles, rough especially proximal to orifice where a number of ridges and tubercles are present; a carinal keel present but not very pronounced with triangular tubercles. Scuta present, oblong-shaped, horny and transparent. Orifice small, more or less tubular, fringed with lappet-like prominences. Color in spirit, yellowish-brown to ash gray.

Peduncle robust and wrinkled with few scattered tubercles, shorter than capitulum; length 2.09 mm, breadth 2.66 mm.

Mouth parts.—Labrum (Pl. IV, f) not quite bullate furnished with minute hairs; crest with a row of blunt denticles. Palpus moderate in size, distinctly produced with few setae on its upper margin. Mandible (Pl. III, m) with 3 teeth, inferior margin of second and third teeth pectinated; inferior angles protuberant, tooth-like, inferior margin with 2 small denticles, similar to *Paralepas pedunculata* (Hoek, 1883). Maxilla I (Pl. IV, e) with a distinct notch inferior to 3 large spines seated on superior angle; small short spines are present on this notch; margin inferior to this notch irregular, bearing several moderate sized spines; inferior angle rounded with 2 smaller and several minute spines. Maxilla II rounded in outline, setose on its frontal and apical margins, on its posterior basal margin with long setae.

Number of segments in the cirri: Holotype.

	I	II	III	IV	V	VI	C.A.
Right row..	9 9	15 14	19 17	21 16	21 16	17 17	10
Left row...	10 9	14 15	17 14	17 15	16 15	18 16	10

Cirrus I, even if rami have equal number of segments, anterior ramus appears longer than posterior ramus; highly setose, setae plumose. Setae on Cirri II-VI acanthopod, setae on lesser curvature smaller and brush-like confined to distal angle, while those on greater curvature are larger and stronger, claw-like, arranged linearly along its distal margin;

basal segment of rami broad, upper ones shorter and narrower. Posterior rami of Cirri III-VI usually with fewer segments, except Cirrus VI of right row, where number of segments are equal.

Caudal appendages (Pl. IV, d) multiarticulate, 10 segments each, longer than protopodite of Cirrus VI, distal margin of each segment bears a circlet of fine small setae especially on upper segments. Penis long and tapering with few scattered hairs towards its distal half. A single filamentary appendage (Pl. III, n) is present arising from behind the base of Cirrus I.

HABITAT

Attached on an echinoid spine dredged northeast off Lubang island. Depth 184-193 meters.

ETYMOLOGY

The specific name is based on the appearance of the animal especially the capitulum which is quite robust.

REMARKS

The present form was compared to several species of *Paralepas*, like *pedunculata*, *morula*, *minuta*, *xenophora*, *intermedia*, *lithotrya*, *scutiger*, *globosa*, *typica*, *dannevigi*, *nodulosa* and *tuberosa*. However, it doesn't appear similar to any of the above species. It comes very close to *P. pedunculata* (Hoek, 1883) with respect to morphology of their mandibles, except that in Hoek's form inferior margin of second tooth is not pectinated. Moreover, in Hoek's species the scuta are wanting, without carinal crest and tubercles. The present form is considered new to science designated *Paralepas robusta* n. sp.

Family OXYNASPIDAE Pilsbry, 1907

Genus *Oxynaspis* Darwin, 185110. *Oxynaspis connectens* Broch, 1931 (Plate V, c-h)

Oxynaspis connectens Broch, 1931: 34, fig. 13.

Crust. Coll. No. 321.

MATERIAL

St. 3, between 14° 01.7' N., 120° 16.0' E., 183 m and 14° 01.5' N., 120° 13.3' E., 185 m (March 19, 1976): four specimens (1 young) attached on Antipathes.

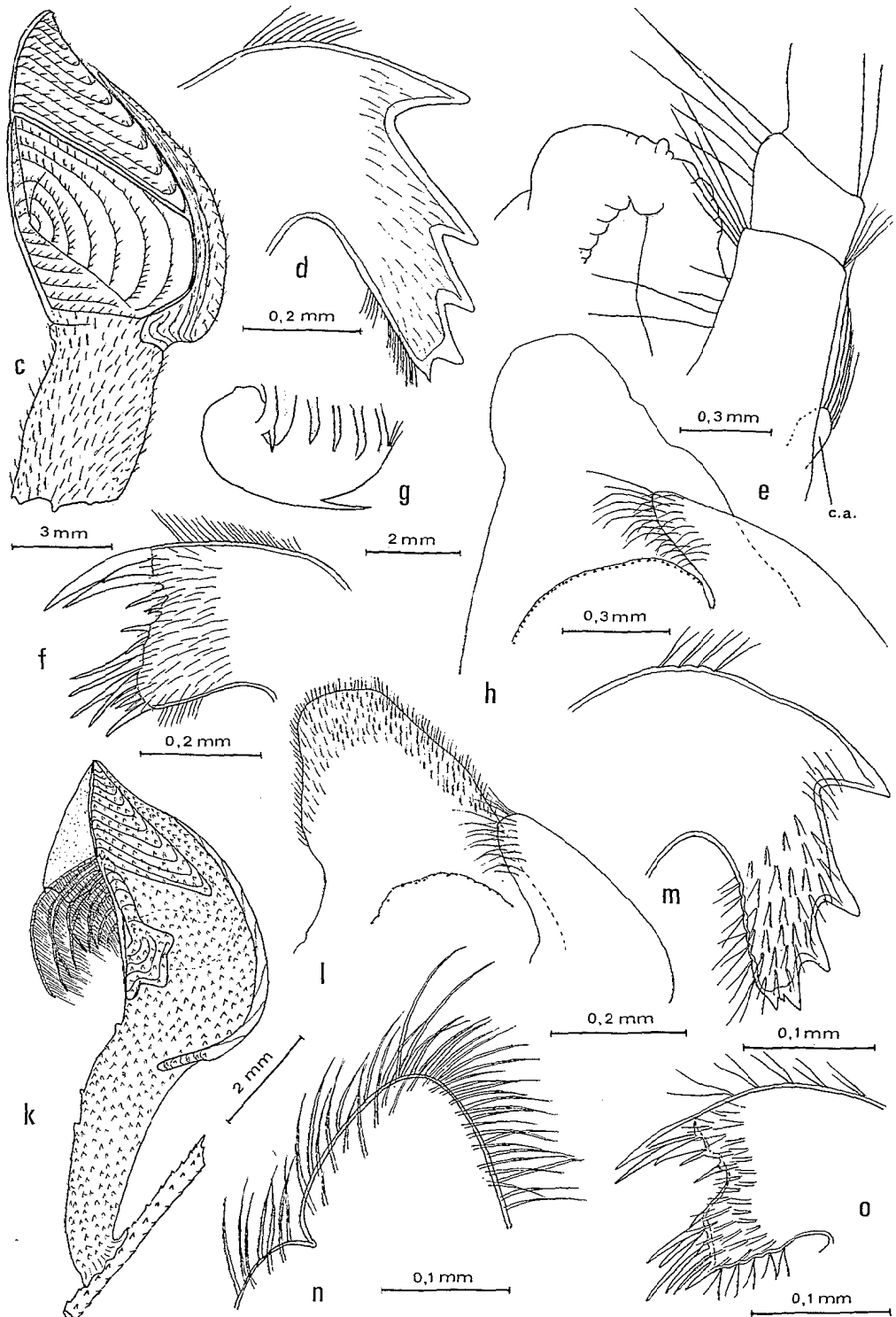


Plate V

Oxyropsis connectens Broch, 1931. **c**, whole animal, lateral view; **d**, mandible; **e**, Cirrus VI (part) showing caudal appendage (c.a.); **f**, maxilla I; **g**, body showing filamentary appendage at the base of Cirrus I and a middorsal filamentary appendage; **h**, labrum and palpus.

Oxyropsis bocki Nilsson-Cantell, 1921. **k**, whole animal, lateral view; **l**, labrum and palpus; **m**, mandible; **n**, maxilla II; **o**, maxilla I.

I encountered some difficulty with the present material, although externally I did not hesitate in assigning the present form as *O. connectens* Broch, 1931. The shape of the valves, apex of tergum is very similar to Broch's species, fig. 13, a, somewhat pointing backward; shape of carina is basically similar (fig. c). Moreover, it has a small filamentary appendage on first pedicel of protopodite of Cirrus I and on median dorsal line of the body (fig. g), although unlike *O. connectens*, not directly above the first pair of cirri but more posteriorly, approximately at the level of the third pair.

BROCH (1931) mentioned the absence of a caudal appendage in his species. However, in the present material a well developed unarticulate caudal appendage is indicated (fig. e) with very long setae on its summit. This is true to the right side, however, on the left side it is devoid of setae. Furthermore, according to BROCH (1931) his species "does not live imbedded in Antipatharian corals; it is a free living species". The present material, on the other hand were found attached on Antipatharian coral. In view of this, I was inclined to place the present form as *O. celata* Darwin, 1851. More so when we consider the number of teeth on the mandibles (fig. d). Like DARWIN's form there are only 4 teeth, or 5 teeth if we include the smaller one seated at the inferior angle (fig. d). BROCH's species have 5 teeth excluding the one at inferior angle (fig. 13, e).

However, according to DARWIN (1851), *O. celata* does not possess any filamentary appendages. In view of this and considering the shaped of plates, their zoogeographic location, *O. celata* (from Madeira), *O. connectens* (from Indonesia), I decided to assign the present form to the latter species.

Sizes of the specimens in millimeters:

	1	2	3	4
Length of capitulum.....	15.0	13.8	9.0	4.7
Breadth of capitulum.....	6.0	9.6	5.4	2.5
Length of peduncle.....	10.0	6.7	2.7	0.9
Breadth of Peduncle.....	4.0	5.8	3.5	1.3
Total length.....	25.0	20.5	11.7	5.6

HABITAT

Attached on Antipatharian coral dredged north-east off Lubang island. Depth 183-185 meters.

REMARKS

This is the second record since BROCH (1931) described the species. It is reported for the first time from Philippine waters.

11. *Oxynaspis bocki* Nilsson-Cantell, 1921 (Plate V, k-o)

Oxynaspis bocki Nilsson-Cantell, 1921: 228, text fig. 38, pl. III, 1.

Crust. Coll. No. 322.

MATERIAL

St. 11, between 13° 59.8' N., 120° 23.7' E., 230 m and 14° 00.9' N., 120° 21.5' E., 217 m (March 20, 1976): six specimens attached on antipatharian coral.

Capitulum (fig. k) of 5 plates, laterally flattened, apically produced, covered with thin transparent chitinous membrane studded with chitinous points. Peduncle more or less laterally flattened, shorter than peduncle, chitinous, like capitulum also studded with triangular chitinous spines.

Scutum reduced, basal part broader than apical segment; basal margin indented, carinal segment broad with sinuous carinal margin, similar to NILSSON-CANTELL's (1921) form, Plate III, 1; umbo subcentral. Tergum triangular, transversely elongated towards carina, basal margin facing apical end of scutum dentated. Carina distinctly arched, apically pointed overlapping halfway carinal margin of tergum, basal end bifurcate with very short arms.

Mouth parts.—Labrum (fig. l) elongated, tongue-like when viewed from above, distally furnished with fine hairs, crest with a row of minute blunt denticles. Palpus club-shaped, apex rounded with few short setae near its apex and on rounded apical margin. Mandible (fig. m) with 4 teeth, upper margin of second to third teeth with minute sharp spines, although in some, these are absent on superior margin of second tooth. Inferior angle more or less rounded with a small denticle seated on it, sometimes with an additional small one between third tooth and this angle. Maxilla I (fig. o) with a broad notch below upper 3 large spines on superior angle, seated on this notch are few small spines; margin inferior to this notch supports 5-6 moderate sized spines, one is situated at the inferior angle. Maxilla II (fig. n) more or less triangular with rounded apex, divided into 2 lobes, lower lobe smaller, margin bearing several setae.

Segmentation of cirri are as follows:

	I	II	III	IV	V	VI
Right row.....	6 9	11 12	14 13	16 15	15 14	16 14
Left row.....	6 9	11 12	14 14	15 15	16 15	15 16

Shape of segments of Cirrus I similar to posterior cirri although lesser curvature is highly setose, while rami of posterior cirri setae are of ctenopod arrange-

ment. Intermediate segments of rami of Cirri II-VI bears 6 pairs, few with 7 pairs, of subequal setae with spinnules between bases, proximal pair minute. Caudal appendage absent. Penis very long and tapering, finely annulated with few scattered hairs becoming more numerous and longer at or near the tip of organ. Size of specimens, total length ranges between 4.2-14.5 mm; length of capitulum ranging from 2.9-10 mm, that of peduncle from 1.25-4.5 mm.

HABITAT

Attached on Antipatharian coral dredged northeast off Lubang island. Depth 217-230 meters.

REMARKS

This is the second record of the species since NILSSON-CANTELL (1921) described it from Japan. It is reported for the first time from Philippine waters consequently extending its zoogeographic range by several hundred miles southward.

Family POECILASMATIDAE Nilsson-Cantell, 1921

Genus *Trilasmis* Hinds, 1844

Subgenus *Temnaspis* Fisher, 1884

12. *Trilasmis (Temnaspis) tridens* (Aurivillius, 1894) (Plate VI, h-k)

Poecilasma tridens Aurivillius, 1894: 14, pl. I, 3; VI, 12; VIII, 13, 29; GRUVEL, 1905: 117, fig. 133.

Otolasmis tridens NILSSON-CANTELL, 1934: 43, fig. 5, 6; STUBBINGS, 1967: 241 (listed only).

Dichelaspis (Dichelaspis) tridens, STUBBINGS, 1936: 7, fig. 2. *Temnaspis tridens tridens*, BROCH, 1947: 18.

Trilasmis (Temnaspis) tridens, STUBBINGS, 1961: 17.

Crust. Coll. No. 323.

MATERIAL

St. 10, between 13° 59.8' N., 120° 18.2' E., 187 m and 14° 00.2' N., 120° 20.3' E., 205 m (March 19, 1976): three specimens dislodged from their attachment.—St. 36, between 14° 01.2' N., 120° 20.2' E., 210 m and 14° 00.3' N., 120° 17.0' E., 187 m (March 23, 1976): six specimens dislodged from their attachment.—St. 65, between 14° 00.0' N., 120° 19.2' E., 202 m and 14° 00.8' N., 120° 16.2' E., 194 m (March 27, 1976): four specimens dislodged from their attachment.

The present form closely resemble f. *asymmetrica* (Broch, 1947) with respect to the number of setae

(3-4 pairs) on the intermediate segments of Cirri III-VI. AURIVILLIUS (1894) mentions 5-6 pairs when he originally described the species. However, the valves which are also strongly calcified are symmetrical and not asymmetrical wherein, according to BROCH's description and illustrations, (fig. 4, b-c), "the left side being less bulging than the right" when viewed ventrally and dorsally. BROCH's specimens from Tourane, Vietnam could be only a variant from the typical form.

HABITAT

The present material were all dislodged from their attachment dredged northeast off Lubang island. Depth 187-210 meters. Previous authors reported obtaining similar species on brachyuran and macruran decapod crustaceans, like *Neptunus pelagicus*, *Macrophthalmus tomentosus*, *Ibacus* (probably *I. verdi*) and on Palinurids.

REMARKS

This species had been previously reported (AURIVILLIUS, 1894) from the Philippines. In fact it is the type locality of the species.

13. *Trilasmis (Temnaspis) excavatum* (Hoek, 1907) (Plate VI, m-r)

Poecilasma excavatum Nilsson-Cantell, 1925: 16, fig. 5, pl. I, 1; STUBBINGS, 1936: 6.

Temnaspis excavatum, BROCH, 1931: 31, fig. 10.

Trilasmis (Temnaspis) excavatum, HIRO, 1937: 412.

Crust. Coll. No. 324.

MATERIAL

St. 11, between 13° 59.8' N., 120° 23.7' E., 230 m and 14° 00.9' N., 120° 21.5' E., 217 m deep (March 20, 1976): two specimens dislodged from their attachment.

The present material agree fairly well with HOEK's (1907) description and illustrations, likewise also with other authors. Intermediate segments of Cirri II-VI bears 4 pairs or 5 pairs of subequal setae, including the small proximal pair which Hoek mentioned in his description. Capitulum less ovoid and longer than peduncle.

HABITAT

Dredged northeast off Lubang island. Depth 217-230 meters. Previous workers reported obtaining the same species on *Pleistacantha sancti johannis*, *Echinoplax pungens*, on a palinurid, *Puerulus angulatus*, on a spiny crab, on *Macrocheira kaemferi* and on *Heteralepas japonica*.

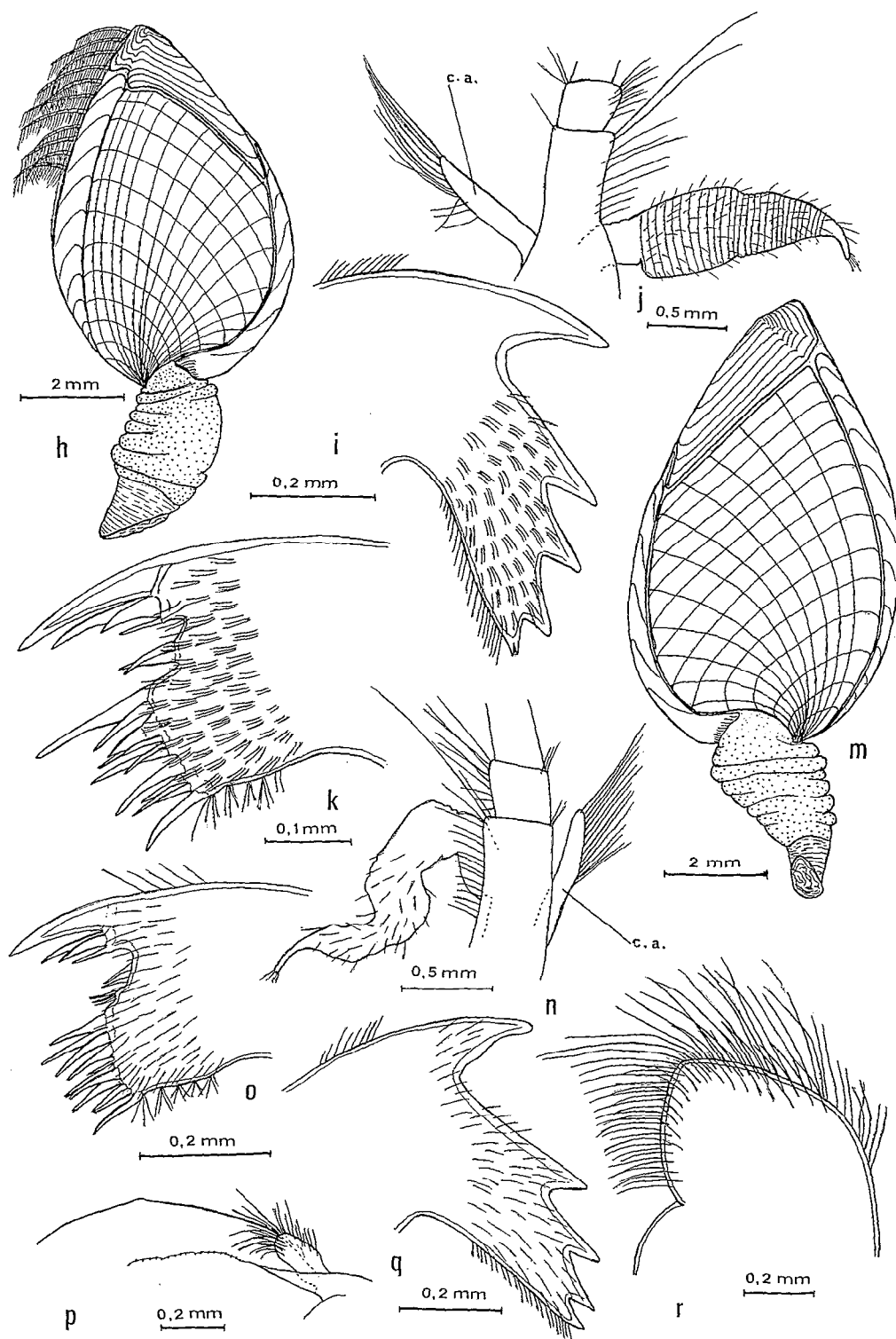


Plate VI

Trilasmis (Temnaspis) lridens (Aurivillius), 1894. **h**, whole animal, lateral view; **i**, mandible; **j**, Cirrus VI (part) showing penis and caudal appendage (c.a.); **k**, maxilla I.

Trilasmis (Temnaspis) excavatum (Hoek), 1907. **m**, whole animal, lateral view; **n**, Cirrus VI (part) showing penis and caudal appendage (c.a.); **o**, maxilla I; **p**, labrum and palpus; **q**, mandible; **r**, maxilla II.

REMARKS

This species was previously reported (BROCH, 1931) from Mindanao taken from a depth of 600 meters.

Genus *Megalasma* Hoek, 1883

Subgenus *Megalasma* Hoek, 1883

14. *Megalasma (Megalasma) striatum* Hoek, 1883 (Plate VII, g-l)

M. striatum Hoek, 1883: 51, pls II, 5-9, VII, 8-9; GRUVEL, 1905: 112, fig. 126; HOEK, 1907: 31; BROCH, 1922: 270, fig. 29-30; 1931: 33; UMINOMI, 1958: 292, fig. 4.

Crust. Coll. No. 325.

MATERIAL

St. 12, between 14° 00.8' N., 120° 20.5' E., 210 m and 14° 00.5' N., 120° 17.2' E., 187 m (March 20, 1976): six specimens on a spine of sea urchin.—St. 16, between 13° 59.0' N., 120° 10.5' E., 164 m and 13° 59.0' N., 120° 12.3' E., 150 m (March 20, 1976): two specimens dislodged from their attachment.—St. 32, between 13° 59.5' N., 120° 19.2' E., 197 m and 14° 00.6' N., 120° 16.3' E., 187 m (March 23, 1976): sixteen specimens on a sea urchin spine.—St. 34, between 14° 01.0' N., 120° 15.8' E., 191 m and 13° 59.2' N., 120° 18.8' E., 188 m (March 23, 1976): six specimens on a sea urchin spine.—St. 35, between 13° 59.0' N., 120° 18.5' E., 186 m and 14° 08.0' N., 120° 16.5' E., 187 m (March 23, 1976): one specimen on a sea urchin spine.

No additional morphological information could be given as the present material conforms pretty well to previous descriptions provided by several authors. Like the observation of BROCH (1922) there is a pair of filamentary appendages along the mid-dorsal line above the first pair of cirri.

HABITAT

Mostly were found attached on an echinoid spine dredged northeast off Lubang island. Depth 150-210 meters. Previous reports showed that same species were found attached on *Echinus* sp. on *Scalpellum stearnsii*, on cidaris and on siliceous skeleton of a sponge.

REMARKS

Type locality of this species is the Philippines. The specimen described by HOEK (1883) was collected by the HMS *Challenger* somewhere in Sibuyan Sea at 12° 43' N. lat.-122° 10' E. long.

15. *Megalasma (Megalasma) minus* Annandale, 1906 (Plate VII, m-q)

Megalasma minus Annandale, 1909: 96; PILSBRY, 1907: 408, fig. 1, a-b; BROCH, 1922: 273, fig. 31; 1931: 33; STUBBINGS, 1936: 8.

Megalasma bellum Pilsbry, 1907a: 93; 1907b: 408, fig. 2, 3b, 5, 7, pl. 31, fig. 1-5.

Megalasma lineatum Hoek, 1907: 31, pl. IV, 1-8.

Megalasma (Megalasma) minus, NILSSON-CANTELL, 1928: 20; 1934: 49.

Crust. Coll. No. 326.

MATERIAL

St. 42, between 13° 55.1' N., 120° 28.6' E., 379 m and 13° 54.1' N., 120° 29.1' E., 407 m (March 24, 1976): one specimen dislodged from its attachment.—St. 43, between 13° 50.5' N., 120° 28.0' E., 484 m and 13° 52.3' N., 120° 28.6' E., 448 m (March 24, 1976): one young specimen attached on *Antipathes* together with *O. weberi*.—St. 47, between 13° 40.7' N., 120° 30.0' E., 757 m and 13° 41.9' N., 120° 29.7' E., 685 m (March 25, 1976): two specimens attached on a sea urchin spine.

The morphology of the present form corresponds to those of the previous workers. BROCH (1922) mentioned the presence of a pair of filamentary appendages above the first pair of cirri. However, an ovigerous specimen dissected with a capitular length of 11.2 mm and a breadth of 4.5 mm possesses only a single filamentary appendage (fig. p) above the level of the first pair of cirri. Intermediate segments of rami of Cirri II-VI bears 4 pairs of subequal setae, proximal pair minute.

HABITAT

Mostly were found attached on an echinoid spine. A single small specimen (St. 43) was found attached on *Antipathes* together with *O. weberi* dredged northeast off Lubang island. Depth 379-757 meters.

REMARKS

BROCH (1922) reported obtaining the species from S. of Olutanga, Zamboanga, Mindanao on a spine of a sea urchin. Depth 300 fathoms or 548 meters.

Genus *Octolasmis* Gray, 1825

Subgenus *Dichelaspis* Darwin, 1851

16. *Octolasmis (Dichelaspis) orthogonia* (Darwin, 1851) (Plate VIII, h-i, k-o)

Dichelaspis orthogonia Darwin, 1851: 130, pl. II, 10; GRUVEL, 1905: 138, fig. 163; HOEK, 1907: 25, pls. II, 14-18, III, I, Ia, Ib, 10b.

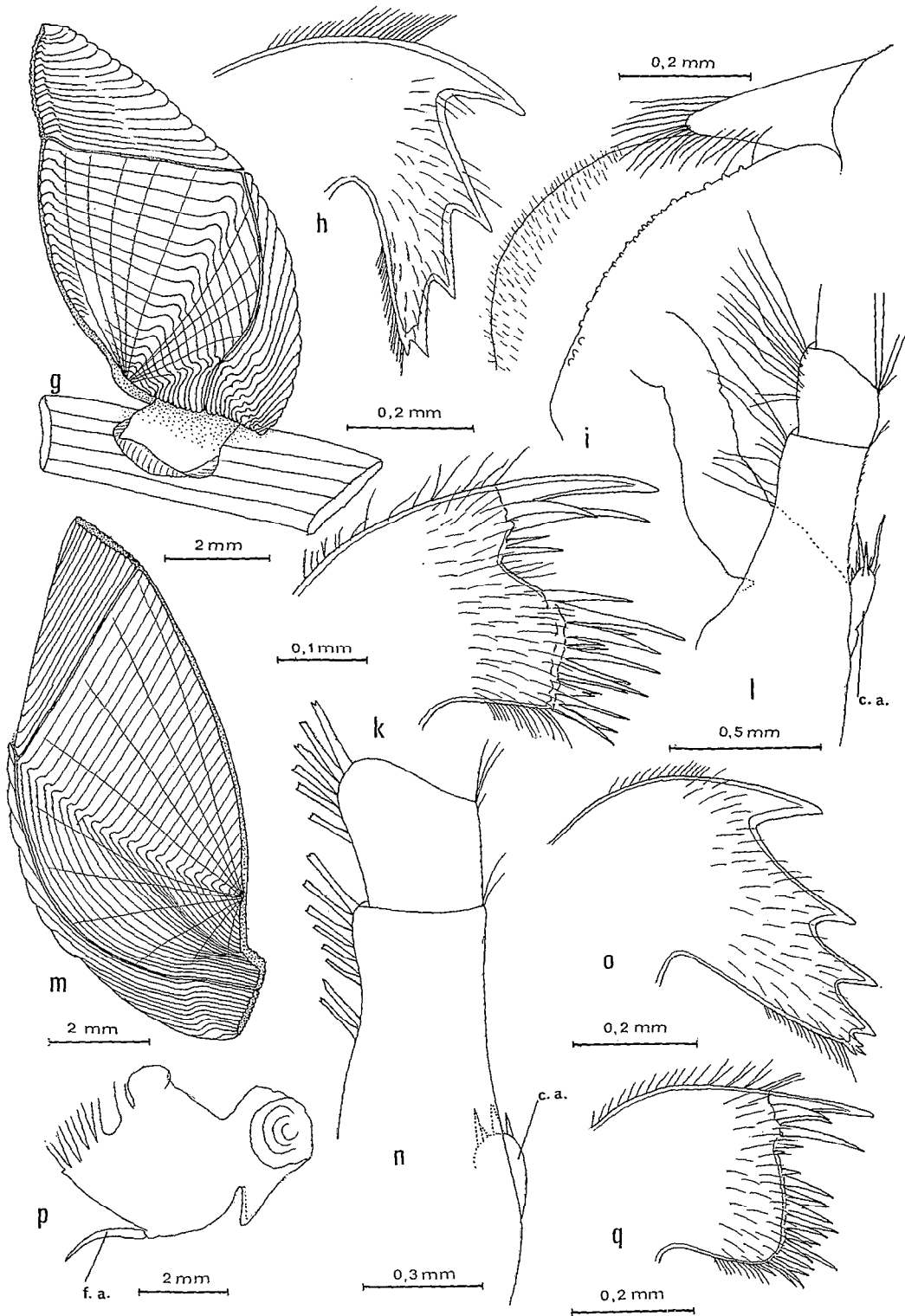


Plate VII

Megalama (Megalasma) striatum Hoek, 1883. **g**, whole animal, lateral view, attached on an echinoid spine; **h**, mandible; **i**, labrum and palpus; **k**, maxilla I; **l**, Cirrus VI (part) showing base of penis and caudal appendage (c.a.).
Megalasma (Megalasma) minus Annandale, 1906. **m**, whole animal, lateral view; **n**, Cirrus VI (part) showing caudal appendage (c.a.); **o**, mandible; **p**, body showing a single median dorsal filamentary appendage (f.a.); **q**, maxilla I.

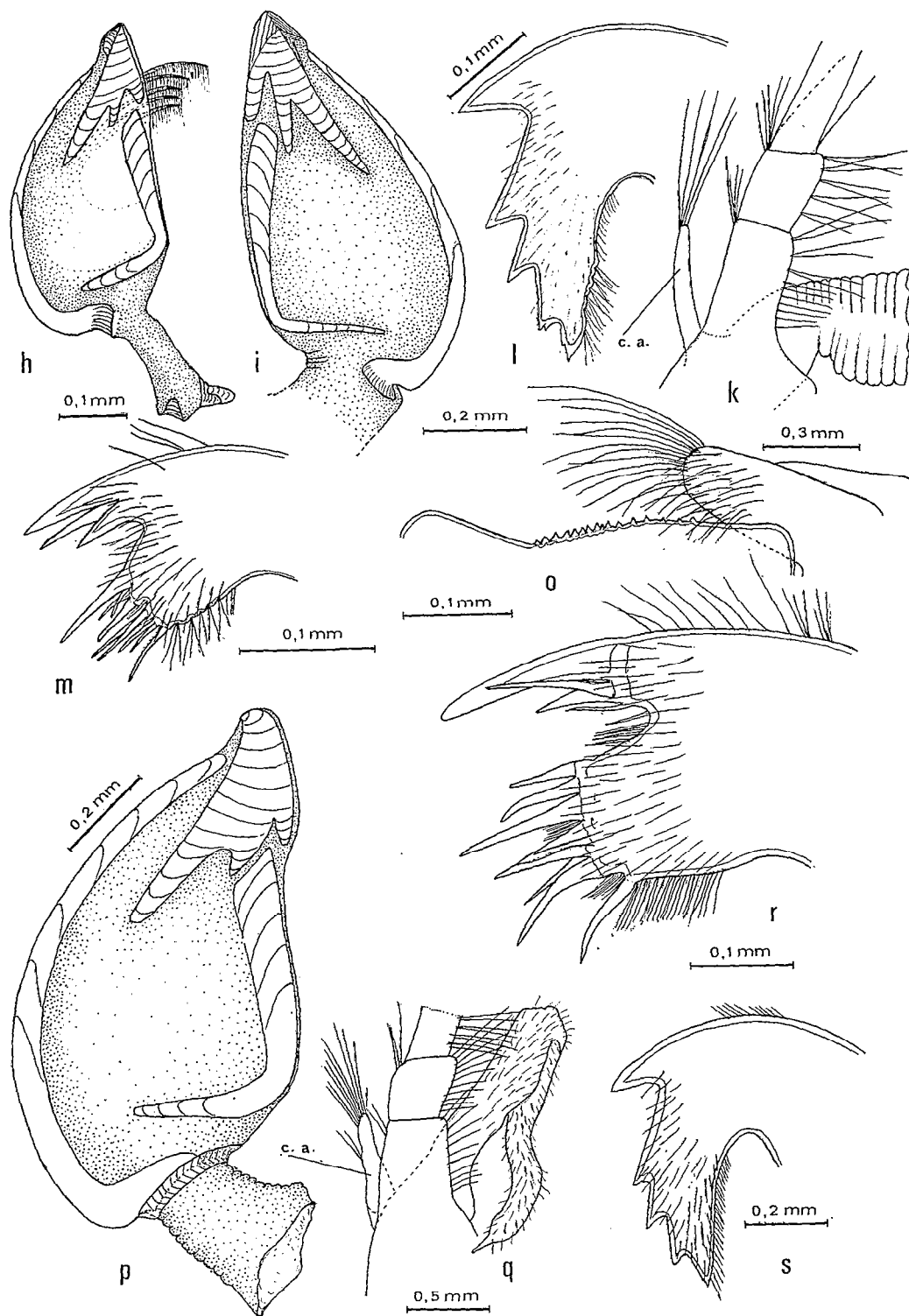


Plate VIII

Oclolasmis (Dichelaspis) orthogonia (Darwin), 1851. **h**, whole animal lateral view; **i**, another individual showing deeper indentation of basal margin of tergum; **k**, Cirrus VI (part) showing caudal appendage (c.a.); **l**, mandible; **m**, maxilla I; **o**, labrum and palpus. *Oclolasmis (Dichelaspis) weberi* Hoek, 1907. **p**, whole animal, lateral view; **q**, Cirrus VI (part) showing penis and caudal appendage (c.a.); **r**, maxilla I; **s**, mandible.

Octolasmis orthogonia, BROCH, 1922: 279; NILSSON-CANTELL, 1925: 21, fig. 8, a-f; HIRO, 1937: 415; STUBBINGS, 1963: 327, fig. 1; UTINOMI, 1970: 342.

Crust. Coll. No. 327.

MATERIAL

St. 11, between 13° 59.8' N., 120° 23.7' E., 230 m and 14° 00.9' N., 120° 21.5' E., 217 m (March 20, 1976): several (34) specimens on a hydroid; St. 36, between 14° 01.2' N., 120° 20.2' E., 210 m and 14° 00.3' N., 120° 17.0' E., 187 m deep (March 23, 1976): fourteen specimens, some were attached on a broken piece of a crustacean (?) antenna, others were dislodged from their attachment.

The present material resembles the typical form. Like DARWIN's (1851) form, intermediate segments of rami of Cirri II-VI bear 5 pairs of subequal setae. Shape of terga are basically similar. In another specimen (fig. i), projections of terga are longer but with a small projection on carinal margin near apex just above apex of carina as in the typical form; intermediate segments of rami of Cirri II-VI bears 6 pairs of subequal setae.

HABITAT

Attached on hydroids and on a broken piece of a crustacean (?) antenna dredged northeast off Lubang island. Depth 187-210 meters.

REMARKS

This species was previously reported (BROCH, 1922) from Cebu attached to an axis of *Virgularia*.

17. *Octolasmis (Dichelaspis) weberi* (Hoek, 1907) (Plate VIII, p-s)

Dichelaspis weberi Hoek, 1907: 26, pl. III, 2-7; UTINOMI, 1970: 342.

Crust. Coll. No. 328.

MATERIAL

St. 43, between 13° 50.5' N., 120° 28.0' E., 448 m and 13° 52.3' N., 120° 28.6' E., 448 m (March 24, 1976): two specimens on an Antipatharian coral together with a young *Megalasma minus*.

The present form (fig. p) is very similar to HOEK's illustration, pl. III, 2, with respect to the plates. However, in the present material, there is a chitinous band at the capitulo-peduncular junction. Length of capitulum, from apex to the "knee" of carina, 10.5 mm, breadth 5.2 mm. Length of peduncle

3.0 mm, breadth 2.0 mm. Intermediate segments of rami of Cirri II-VI bears 6 pairs of subequal setae, proximal pair minute, with spinules between bases.

HABITAT

Attached on an Antipatharian coral associated with a young *Megalasma minus* dredged northeast off Lubang island. Depth 448-484 meters.

REMARKS

This is the first record of the species from Philippine waters.

Suborder **Verrucomorpha** Pilsbry, 1916

Family VERRUCIDAE Darwin, 1854

Genus *Verruca* Schumacher, 1817

Subgenus *Altiverruca* Pilsbry, 1916

18. *Verruca (Altiverruca) nitida* Hoek, 1883 (Plate IX, r-v, x)

Verruca nitida Hoek, 1883-138, pl. 12, fig. 6-7; 1913: 150; GRUVEL, 1905: 177, fig. 194.

Crust. Coll. No. 329.

MATERIAL

St. 49, between 13° 49.1' N., 119° 59.8' E., 925 m and 13° 48.6' N., 120° 00.9' E., 750 m (March 25, 1976): three specimens on spicules of a siliceous sponge.—St. 54, between 13° 54.2' N., 119° 57.9' E., 1075 m and 13° 56.0' N., 119° 58.3' E., 1125 m (March 26, 1976): three specimens seated on a coral fragment together with *V. sulcata*; two specimens dislodged from their attachment.

Shell snow-white or dirty white, top more or less vertical (fig. v). Movable tergum (t.m.) larger than movable scutum, free. Fixed scutum (s.f.) without adductor ridge or myophore. Apex of carina (c.) projecting. The morphology of movable scutum and tergum are very similar to HOEK's (1883) description and illustrations for *V. nitida*. However, rostrum (r.) and carina are interlocking by means of 3 teeth, like those of *V. gibbosa*, instead of a single tooth as in HOEK's species *nitida*. Length between apices of rostrum and carina 8 mm; rostrocarinal basal diameter 7.2; basis membranous.

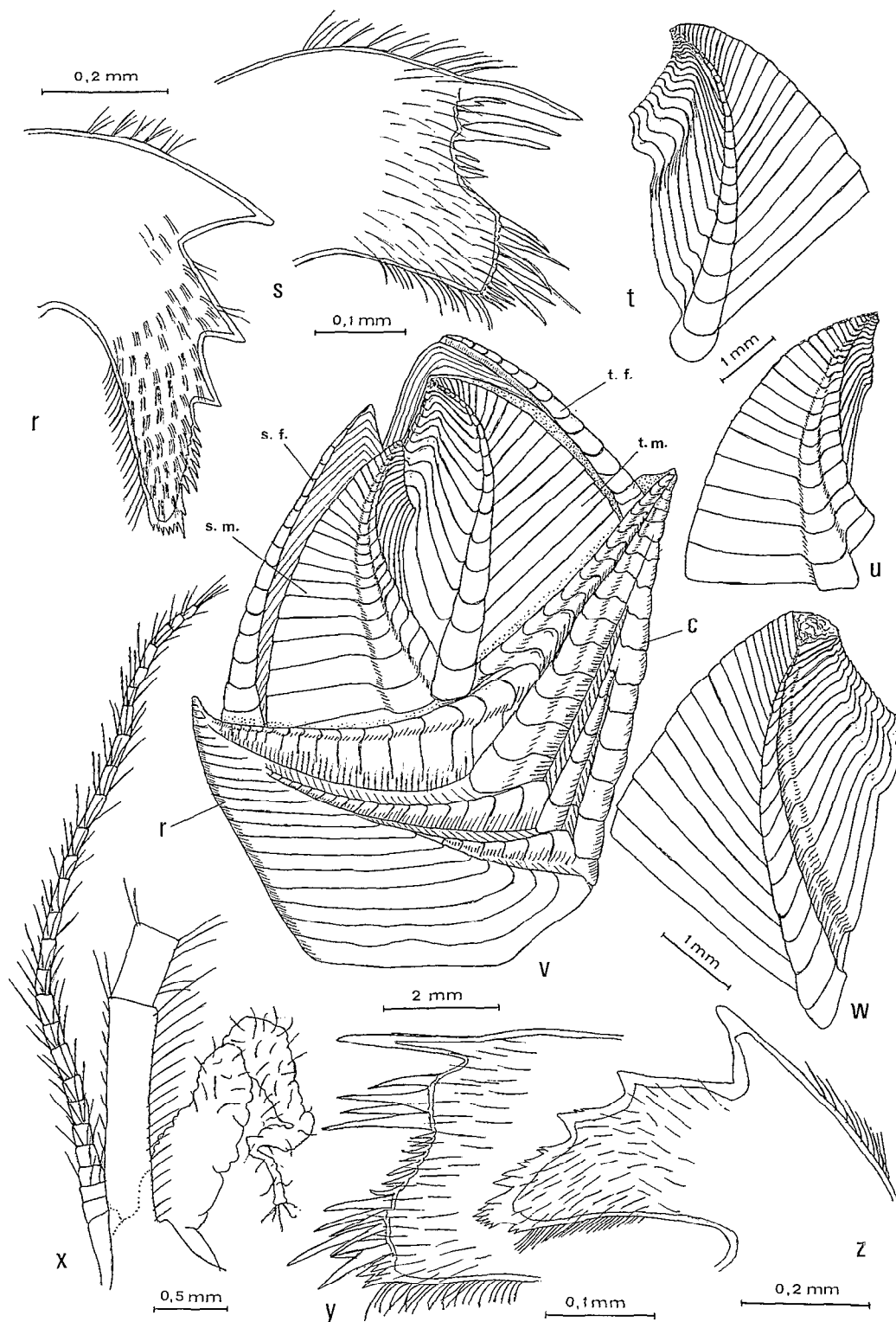


Plate IX

Verruca (Alliverruca) nitida Hoek, 1883. **r**, mandible; **s**, maxilla I; **t**, movable tergum, external view; **u**, movable scutum, external view; **v**, animal on side of movable scutum and tergum; **x**, Cirrus VI (part) showing caudal appendage and penis.
Verruca (Alliverruca) sulcata Hoek, 1883. **w**, movable tergum, external view; **y**, maxilla I; **z**, mandible. (**s.m.**, movable scutum; **s.f.**, fixed scutum; **t.m.**, movable tergum; **t.f.**, fixed tergum; **r**, rostrum; **c**, carina).

Labrum, without central notch, armed with numerous minute denticles. Mandible (fig. r) with 3 teeth, inferior part strongly protuberant whose upper margin bears several small triangular spines; lower angle more or less rounded armed with several small sharp spines. Maxilla I (fig. s) with a broad notch, upper angle supports a single large spine, intermediate spines moderate, inferior angle more or less rounded supporting 4-5 short spines. Penis short gradually tapering, finely annulated, hirsute. Caudal appendage (fig. x) very long, more or less twice as long as the first pedicel of protopodite of Cirrus VI, distal margin bears several minute setae. Intermediate segments of rami of Cirrus VI bears 3 pairs of subequal setae.

HABITAT

Attached on spicules of a siliceous sponge and coal fragment dredged northeast off Lubang island. Depth 750-1125 meters.

REMARKS

This species is reported for the first time from Philippine waters.

19. *Verruca (Altiverruca) sulcata* Hoek, 1883 (Plates IX, w, y, z; X, s-x)

Verruca sulcata Hoek, 1883: 139, pl. 6. fig. 19-20; GRUVEL, 1905: 179, fig. 196.

Crust. Coll. No. 330.

MATERIAL

St. 54, between 13° 54.2' N., 119° 57.9' E., 1075 m and 13° 56.0' N., 119° 58.3' E., 1125 m (March 26, 1976): two specimens seated on a coal fragment together with *V. nitida*; one specimen dislodged from its attachment.

The present material is similar to HOEK's (1883) form from Kermadec Island. Shell dirty or cream-white. Basis membranous; fixed scutum without adductor ridge or myophore. Length between apices of rostrum and carina 9.5 mm; rostrocarinal basal diameter 7 mm; height, tergal side 7.5 mm.

HABITAT

Attached on a coal fragment dredged northeast off Lubang island. Depth 750-1125 meters.

REMARKS

The species is reported for the first time from Philippine waters.

Subgenus *Metaverruca* Pilsbry, 1916

20. *Verruca (Metaverruca) cookei* Pilsbry, 1927 (Plate XI, r, s, u, v)

Verruca cookei Pilsbry, 1927: 308, fig. 1-2, pl. 25, fig. 9; HENRY, 1957: 28, pl. fig. a-j.

Crust. Coll. No. 331.

MATERIAL

St. 19, between 13° 57.8' N., 120° 18.2' E., 167 m and 13° 59.0' N., 120° 19.4' E., 187 m (March 21, 1976): four specimens seated on a white eroded single valve of a pelecypod shell, *Soletellina* sp. (?)—St. 32, between 14° 02.2' N., 120° 17.7' E., 193 m and 13° 59.4' N., 120° 18.0' E., 184 m (March 23, 1976): one specimen dislodged from its attachment.

Shell white, depressed, subcircular, top flat, almost parallel to basis (fig. r). Fixed scutum with adductor ridge or myophore. Movable scutum though is without an adductor ridge in the middle on the inner side of the valve as in the type species. Carina has 3 teeth on its rostral margin, similarly rostrum has same number of teeth on its carinal margin; both valves have distinct growth lines. The largest specimen measured 7.4 mm along its rostrocarinal basal axis, length between apices of rostrum and carina 5.2 mm, height 2.9 mm. Present material closely corresponds to PILSBRY's (1927) form from Oahu, Hawaii.

Mandible (fig. u) and Maxilla I (fig. s) are very similar to the type specimens. Caudal appendage (fig. v) has 7 and 8 segments bearing long setae on its frontal margin. There are 5 pairs of setae on upper segments and 4 pairs on basal segments of Cirrus VI, in which case resembling HENRY's (1957) form from Tuamotu Islands.

HABITAT

Seated on a pelecypod shell, *Soletellina* sp. (?) dredged northeast off Lubang island. Depth 167-193 meters.

REMARKS

The species is reported for the first time from Philippine waters. HENRY (1957) reported its occurrence in Tuamotu Islands, its presence in Philippine waters extends its zoogeographic range further southward into the Indo-Pacific Province.

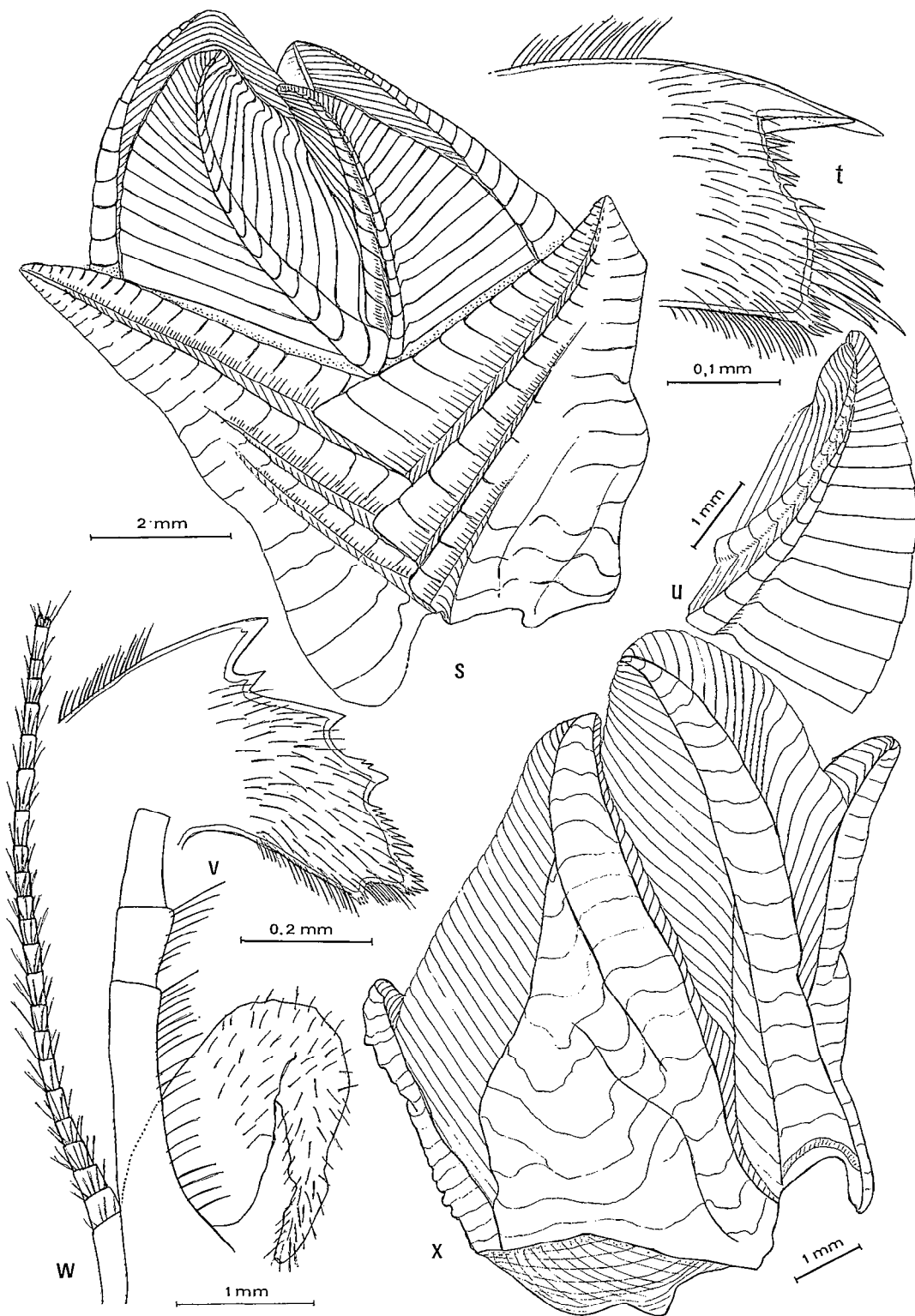


Plate X

Verruca (Alliverruca) sulcata Hoek, 1883. **s**, animal on side of movable scutum and tergum; **t**, maxilla I; **u**, movable scutum, external view; **v**, mandible; **w**, Cirrus VI (part) showing caudal appendage and penis; **x**, animal on side of fixed scutum and tergum.

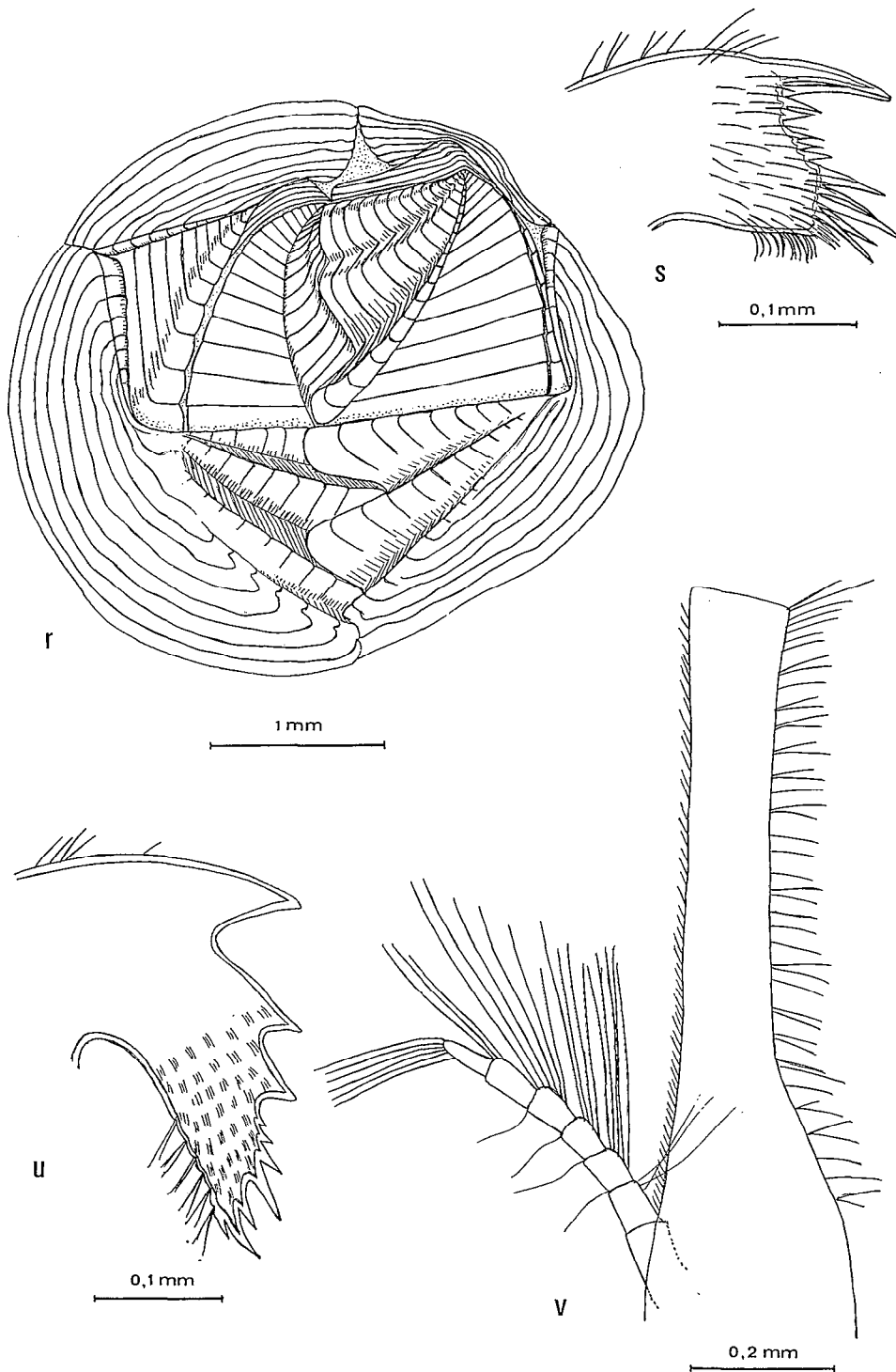


Plate XI

Verruca (Metaverruca) cooki Pilsbry, 1927. r, animal, apical view; s, maxilla I; u, mandible; v, Cirrus VI (part) showing caudal appendage.

Suborder **Balanomorpha** Pilsbry, 1916Family **BALANIDAE** Leach, 1817Subfamily **BALANINAE** Leach, 1817Genus **Balanus** Da Costa, 1778Subgenus **Balanus** Da Costa, 177821. *Balanus (Balanus) amphitrite amphitrite*
Darwin 1854*B. amphitrite* var. *communis* Darwin, 1854: 240, pl. 5, 2 e, h, l.*B. a. amphitrite*, UTINOMI, 1970: 355; ROSELL, 1973: 79, fig. 4, a-g.

MATERIAL

St. 32, between 14° 02.2' N., 120° 17.7' E., 193 m and 13° 59.4' N., 120° 18.0' E., 184 m (March 23, 1976): one empty shell dislodged from its attachment.

Morphological characters of compartmental plates and colored longitudinal bands on external lamina of compartment is undoubtedly of the above species. This is a shallow-water species most probably the animal was detached from a passing boat and fell to the bottom.

REMARKS

Very common in Philippine waters attached to various substrate including fixed or floating ones and on bottom of ships. This has been reported several times from the Philippines by several workers.

22. *Balanus (Balanus) variegatus cirratus*
Darwin, 1854*B. amphitrite* var. *cirratus* Darwin, 1854: 241.*B. variegatus cirratus*, UTINOMI, 1967: 214, fig. 8; 1970: 355; ROSELL, 1973: 91, fig. 9 a-g.

MATERIAL

Cavite, Manila Bay (March 18, 1976).

Two empty shells without any opercular valves. Outer lamina of compartment exhibits the characteristics of *B. variegatus cirratus*. Very common species in the Philippines in waters of lower salinity especially in estuarine areas.

REMARKS

Previously reported from the Philippines.

Subgenus **Chirona** Gray, 183523. *Balanus (Chirona) amaryllis* Darwin, 1854*B. amaryllis* Darwin, 1854: 279, pl. 7, fig. 6a-c; HOEK, 1913: 179, pl. 15, fig. 17-21, pl. 16, fig. 1-4; PILSBRY, 1916: 217; NILSSON-CANTELL, 1925: 329; HIRO, 1936: 624; 1939: 243; STUBBINGS, 1936: 174; UTINOMI, 1962: 216; 1969: 88.

Crust. Coll. No. 332.

MATERIAL

St. 12, between 14° 00.8' N., 120° 20.5' E., 210 m and 14° 00.5' N., 120° 17.2' E., 187 m (March 12, 1976): two specimens attached on an empty gastropod shell, *Cassis (Semicassis) japonica* Reeve with boring cirripede, *Trypetesa lampas* (Hancock).—St. 26, between 14° 00.9' N., 120° 16.8' E., 189 m and 13° 59.5' N., 120° 18.2' E., 189 m (March 22, 1976): several specimens attached to a carrier shell, *Xenophora pallidula* Reeve.—St. 34, between 14° 01.0' N., 120° 15.8' E., 191 m and 13° 59.2' N., 120° 18.8' E., 188 m (March 23, 1976): several specimens attached on a gastropod shell, *Cassis (Semicassis) japonica* Reeve, with boring cirripedes, *Trypetesa lampas*.—St. 42, between 13° 55.1' N., 120° 28.6' E., 379 m and 13° 54.1' N., 120° 29.1' E., 407 m (March 24, 1976): four specimens attached on a fragment of a sea urchin test.—St. 43, between 13° 50.5' N., 120° 28.0' E., 484 m and 13° 52.3' N., 120° 28.6' E., 448 m (March 24, 1976): five specimens (2 dead) dislodged from their attachment but some were attached to the compartment of another individual.

Compartments of all specimens in the present sample were snow-white and glossy and are referable to forma *nevea* Gruvel, 1905 (=var. b Darwin, 1854). Shell conical, radii narrow, whose growth lines are very similar to Darwin's description of the species, summits highly oblique. Inner lamina below the sheath longitudinally ribbed. Basis calcareous and porose. Intermediate segments of rami of Cirrus VI with 2 pairs of subequal setae. Penis with a basidorsal point. The specimen dissected with a rostrocarinal basal axis of 16-18 mm.

HABITAT

Attached on a gastropod shell, *Cassis (Semicassis) japonica* and on a carrier shell, *Xenophora pallidula* and on a fragment of a sea urchin test.

REMARKS

Previously reported ((DARWIN, 1854) from Philippine waters.

24. *Balanus (Chirona) tenuis* Hoek, 1883*B. tenuis* Hoek, 1883: 154, pl. 13, fig. 29-33; 1913: 190, pl. 17,

fig. 14-19, pl. 18, fig. 1; PILSBRY, 1916: 216; NILSSON-CANTELL, 1925: 34, fig. 13 a-h; BROCH, 1931: 70; UTINOMI, 1962: 216; 1968: 174; 1969: 88.

Crust. Coll. No. 333.

MATERIAL

St. 32, between 14° 02.2' N., 120° 17.7' E., 193 m and 13° 59.4' N., 120° 18.0' E., 184 m (March 23, 1976): one specimen on an empty gastropod shell, *Gemmula cosmoi* Sykes.—St. 34, between 14° 01.0' N., 120° 15.8' E., 191 m and 13° 59.2' N., 120° 15.8' E., 191 m and 13° 59.2' N., 120° 18.8' E., 188 m (March 23, 1976): one specimen on a gastropod shell, *Fusinus turriculus* Kiener.—St. 42, between 13° 55.1' N., 120° 28.6' E., 379 m and 13° 54.1' N., 120° 29.1' E., 407 m (March 24, 1976): two specimens on a sea urchin spine. One of the specimen with *Sc. salartiae* attached to its compartment.

Orifice oval, toothed, apex of rostrum inwardly bowed; radii solid, not very broad, summits oblique, sutural edges smooth; lower lamina of solid parietes ribbed. Basis calcareous, solid. Sizes of specimens dissected with rostrocarinal basal diameter of 10-12.5 mm. Scutum with longitudinal striations.

Mandible with 5 teeth, 5th tooth small placed very close to inferior angle. Maxilla I with a small notch sometimes indistinct, below 2 uppermost large spines. Intermediate segments of Cirrus VI with 3 pairs of subequal setae.

HABITAT

Attached on gastropod shells, like *Gemmula cosmoi* Sykes and *Fusinus turriculus* Kiener. Also on spine of sea urchin dredged northeast off Lubang island. Depth 184-407 meters.

REMARKS

Previously reported (HOEK, 1883) from northwest of Mindoro and also collected in several places within Philippine waters, by the *Albatross* Expedition (PILSBRY, 1916).

Subgenus *Solidobalanus* Hoek, 1913

25. *Balanus (Solidobalanus) maldivensis* Borradaile, 1903

B. maldivensis Hoek, 1913: 195, pl. 18, fig. 13-19.

Crust. coll. No. 334.

MATERIAL

St. 63, between 14° 00.8' N., 120° 15.8' E., 191 m and 14° 00.5' N., 120° 16.3' E., 195 m (March 27,

1976): six specimens attached on the axis of a gorgonian.

Shell more or less globular, orifice oval, toothed; parietes solid, inner lamina longitudinally ribbed; basis calcareous, solid; radii solid, broad with distinct horizontal growth lines, summits oblique, however, those of rostrum concave, sutural edges denticulate; alae broad with oblique cummits. Apex of rostrum bowed. HOEK's (1913) specimen from Indonesia have a rostrocarinal basal axis of 6-7 mm, along same axis, while the present specimen dissected measured 5.0 mm.

Opercular valves more or less projecting above orifice; occludent margin of scutum and apex of tergum finely hirsute; lower median part of tergum tainted light purple; spur short, transversally rounded placed very close to basiscutal angle.

Labrum with a central deep notch, summit or crest bears 3 denticles proximal to notch. Mandible with 5 teeth, 5th tooth small very near to 4th tooth; inferior angle trident. Maxilla I with a very small distinct notch below 2 uppermost large spines, margin inferior to this notch bears 4 moderate sized spines followed by 2 large spines and several minute straight spinules near its inferior angle. Intermediate segments of Cirrus VI bear 4 pairs of subequal setae. Penis with a finely hirsute basidorsal point.

HABITAT

Attached on a gorgonian obtained northeast off Lubang island. Depth 191-195 meters.

REMARKS

BORRADAILE (1903) reported this species from Maldive Archipelago. HOEK (1913) collected the same species from Indonesia, somewhere around Flores Sea. This is the first time the species is reported from Philippine waters.

26. *Balanus (Solidobalanus) auricoma* Hoek, 1913

B. auricoma Hoek, 1913: 198, pl. 18, fig. 20-22, pl. 19, fig. 1-7; BROCH, 1922: 323, fig. 62; 1931: 71.

Crust. Coll. No. 335.

MATERIAL

St. 27, between 13° 59.8' N., 120° 18.6' E., 192 m and 14° 00.5' N., 120° 15.7' E., 188 m (March 22, 1976): several specimens attached on a gorgonian coral.

Compartment dirty-white, some with very light pinkish color; orifice oval, slightly toothed. Parietes, radii and basis solid; radii with oblique summits,

sutural edges denticulate; alae broad, summits arched or oblique; inner lamina of parietes smooth with very short longitudinal ribs basally. Size of dissected specimen 9 mm along its rostracarinal basal axis.

Scutum white, distal half of occludent margin with golden hairs, articular ridge prominent, adductor ridge not distinctly indicated. Tergum, its apex and convex carinal margin furnished with golden hairs, spur short, transversely rounded very close to basis-cutal angle.

Mandible with 5 teeth, 3rd tooth double 5th tooth small very close to inferior angle where a small distinct spine is seated. Maxilla I, with a very small notch, though sometimes indistinct, on its frontal margin. Intermediate segments of rami of Cirrus VI bears 4 or 5 pairs of subequal setae. Posterior ramus of Cirrus III with small triangular spines on its frontal margin. Penis with a low conical basidorsal point.

HABITAT

Attached on gorgonian coral taken northeast off Lubang island. Depth 188-192 meters.

REMARKS

This is the first record of the species in Philippine waters. The species had been reported (Broch, 1931) from Banda Sea, Indonesia.

27. *Balanus (Solidobalanus) hawaiiensis* Pilsbry, 1916

B. hawaiiensis Pilsbry, 1916: 222, pl. 48, 1-1g, fig. 70; UTINOMI, 1949: 96, fig. 3.

Crust. Coll. No. 336.

MATERIAL

St. 3, between 14° 01.7' N., 120° 16.0' E., 183 m and 14° 01.5' N., 120° 13.3' E., 185 m (March 19, 1976): twelve specimens and several small young ones attached on a brownish vegetable (?) material.—St. 32, between 14° 02.2' N., 120° 17.7' E., 193 m and 13° 59.4' N., 120° 18.0' E., 184 m (March 23, 1976): six specimens on a horny axis of *Antipathes*.

Compartments snow-white or tainted pinkish; orifice oval, slightly toothed, carinal side higher than rostral side; apex of carina either straight or slightly recurving; externally compartments distinctly ribbed, 2 each on carina, latera and rostrum, single on carinolatera. Parietes solid, inner lamina longitudinally ribbed; radii solid, summits slightly oblique, sutural edges denticulate; basis calcareous, solid. The specimen dissected measured 6.0 mm along its rostracarinal basal axis.

Upper half of occludent margin of scutum hirsute, likewise the convex apical margin of tergum. Among individuals whose compartments are tainted terga are also tainted with similar color. Mandible with 4 teeth, inferior angle trispinose. Maxilla I with a prominent shallow notch on its frontal margin. Intermediate segments of Cirri V-VI bears 4 pairs of subequal setae. Penis with a basidorsal point.

HABITAT

Attached on the horny axis of *Antipathes* and on a brownish material (whose origin is rather difficult to determine) dredged northeast off Lubang island. Depth 183-193 meters.

REMARKS

The present material is very similar to UTINOMI's (1949) form from Japan. The walls with prominent ribs on each compartment, like his form, carina, latera and rostrum with 2 strong ribs. Although UTINOMI mentioned only 2 ribs on rostral plate, his illustrations, fig. 3a, however showed 3 ribs on rostrum. The mandibles are similar to PILSBRY's (1916) form from Hawaii. This species is reported for the first time from Philippine waters.

28. *Balanus (Solidobalanus) echinoplacis* Stubbings, 1936

B. echinoplacis Stubbings, 1936: 45, fig. 20.

Crust. Coll. No. 337.

MATERIAL

St. 12, between 14° 00.8' N., 120° 20.5' E., 210 m and 14° 00.5' N., 120° 17.2' E., 187 m (March 20, 1976): one specimen on an echinoid spine together with *Megalasma striatum*.—St. 15, 14° 00.3' N., 120° 18.0' E., 192-188 m (March 20, 1976): five specimens (all dead) on a spine of sea urchin.—St. 16, between 13° 59.0' N., 120° 10.5' E., 164 m and 13° 50.0' N., 120° 12.3' E., 150 m (March 20, 1976): eight specimens on an echinoid spine.—St. 32, between 14° 02.2' N., 120° 17.7' E., 193 m and 13° 59.4' N., 120° 18.0' E., 184 m (March 23, 1976): five specimens on an echinoid spine.—St. 34, between 14° 01.0' N., 120° 15.8' E., 191 m and 13° 59.2' N., 120° 18.8' E., 188 m (March 23, 1976): few specimens (some dead) on a spine of an echinoid together with *M. striatum*.—St. 35, between 13° 59.0' N., 120° 18.5' E., 186 m and 14° 08.0' N., 120° 16.5' E., 187 m (March 23, 1976): thirteen specimens on an echinoid spine.—St. 55, between 13° 55.0' N., 120° 12.5' E., 200 m and 13° 54.8' N., 120° 10.5' E., 194 m (March 26, 1976): seventeen specimens on an echinoid spine.

Compartments snow-white, orifice oval, slightly toothed; parietes thick, solid, sheath not free or projecting except carina; radii solid, summits parallel to basis, horizontal growth lines distinct, sutural edges denticulate. Alae broad, summits oblique. Basis calcareous but without radiating canals. Size of specimen dissected rostrocarinal basal diameter 5.16 mm, orifice 3.6 mm, height of carina 3.4 mm.

Opercular valves very similar to STUBBINGS's (1936) form. Occludent margin of scutum finely hirsute, pit for depressor muscle distinct, basal margin emarginate, while Stubbings form it is smooth, tergum also very similar to type species.

Labrum with a median notch, 3 sharp denticles are seated on summit beside the notch. Mandibles bears 4 teeth, 2nd and 3rd teeth bifid, inferior angle bearing a distinct small spine. Maxilla I with a small notch below 2 uppermost large spines and 2 enlarged spines on lower part of margin, in between are 4 moderate sized spines.

Intermediate segments of rami of Cirri IV-VI bears 4 pairs of subequal setae. Penis very long, gradually tapering, annulated with several scattered long hairs. Basidorsal point present and finely hirsute.

HABITAT

Attached on spines of sea urchin, usually in common with *M. striatum*, obtained northeast off Lubang island. Depth 150-210 meters.

REMARKS

There are few characteristics which differ from the description of STUBBINGS (1936). This could be considered as minor variation and are not sufficient to warrant separation of the present material from the typical form. Radii whose summits are parallel to basis are very similar to the illustrations of STUBBINGS, *loc. cit.*, text fig. 20b and no doubt could be the same species. This is the second record since STUBBINGS described the species and the first from Philippine waters. This extends its zoogeographic range by several hundred miles to the east. STUBBINGS specimens were obtained off Zanzibar of the African eastern seaboard.

Order **Acrothoracica** Gruvel, 1905

Suborder **Apygophora** Berndt, 1907

Family TRYPETESIDAE Stebbings, 1910

Genus *Trypetesa* Norman, 1903

29. *Trypetesa lampas* (Hancock, 1849) (Plate XII, a-f)

Alcippe lampas Darwin, 1854: 530, pl. 22, fig. 1-15; GRUVEL, 1905: 324, fig. 336, 337, 338.

Crust. Coll. No. 338.

MATERIAL

St. 12, between 14° 00.8' N., 120° 20.5' E., 210 m and 14° 00.5' N., 120° 17.2' E., 187 m (March 20, 1976): four specimens boring on a gastropod shell, *Cassis* (*Semicassis*) *japonica* Reeve.

DARWIN (1854) described this species extensively, the present material conforms pretty well with his description and illustrations. There are only 3 pairs of appendages, I, V, and VI plus a pair of caudal appendages (fig. b). Cirri V and VI with coriaceous buttons (g) or cushions (fig. c and d) on the summits of the second segment. Cirrus I (fig. e) finely hirsute, rami unsegmented. Mandible (fig. f) with a single large tooth.

HABITAT

Boring on a gastropod shell, *Cassis* (*Semicassis*) *japonica* Reeve where numerous *B. amaryllis* are attached on the outer surface. Host shell was dredged northeast off Lubang island. Depth 210-187 meters.

REMARKS

This species is reported for the first time from Philippine waters.

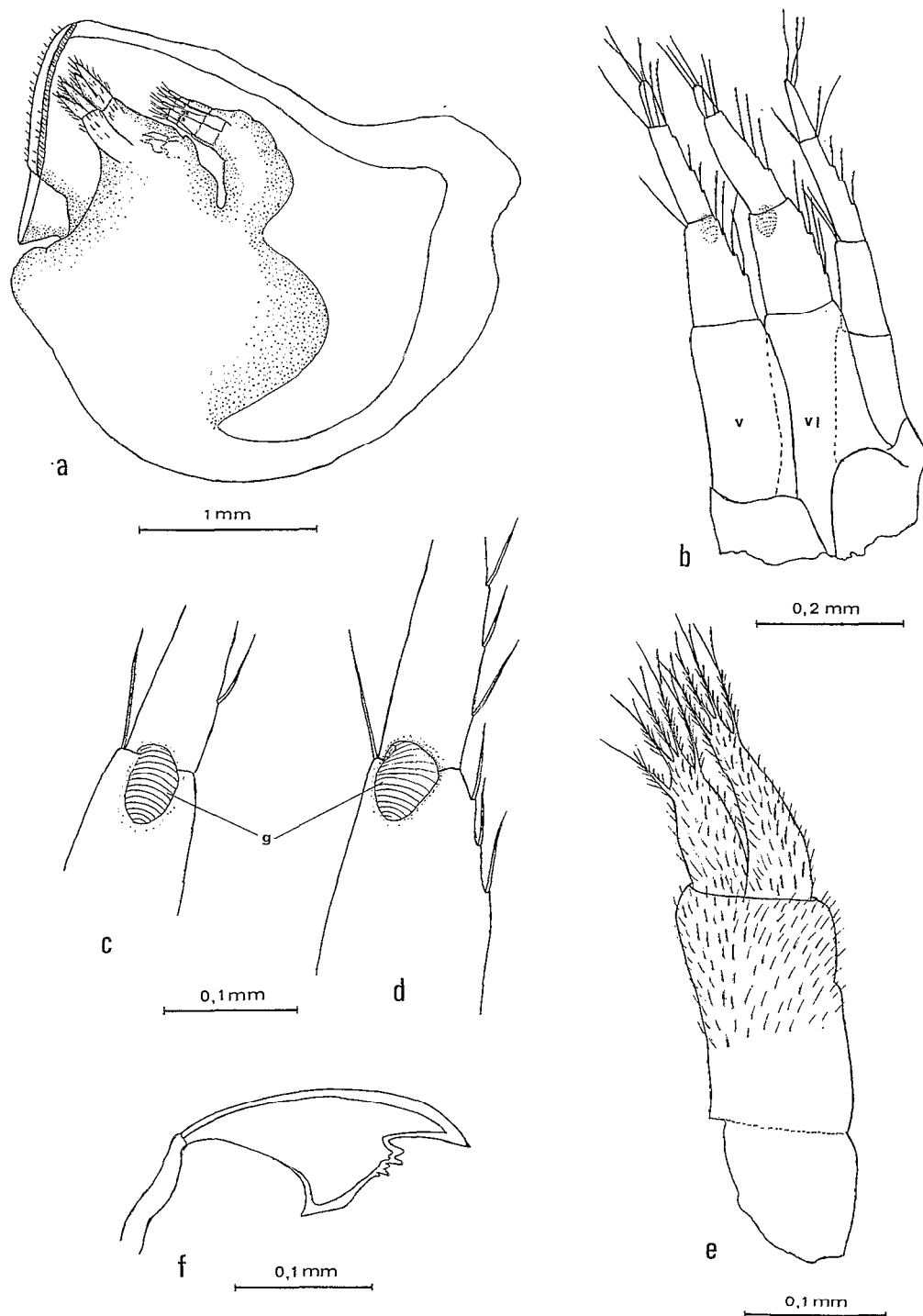


Plate XII

Trypelesa lampsas (Hancock), 1849. **a**, animal, side view with mantle partly removed; **b**, posterior thoracic appendages, V and VI including caudal appendage; **c**, cirrus V showing coriaceous button or cushion (g); **d**, cirrus VI with coriaceous button or cushion (g); **e**, cirrus I; **f**, mandible.

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