

Shallow Water Chitons (Mollusca: Polyplacophora) from Puerto Galera, Mindoro Island, the Philippines

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Abstract. Taxonomic examination of 69 specimens of chitons collected from intertidal and subtidal zones of Puerto Galera, Mindoro Island, the Philippines, revealed 17 species belonging to 12 genera in six families, of which two species, *Ischnochiton albinus* Thiele, 1911 and *Callistochiton granifer* Hull, 1923 are recorded for the first time from the Philippines. Two other species, *Leptoplax varia* Nierstrasz, 1905 and *Acanthochitona biformis* (Nierstrasz, 1905) originally described from the Philippines and Indonesian waters, were rediscovered after 100 years and are redescribed here with illustrations. *Cryptoplax plana* Ang, 1967 originally described from Puerto Galera is also redescribed with a more complete morphology. *Callistochiton carpenterianus* Kaas, 1956 is synonymized with *C. granifer* Hull, 1923.

Key words: Polyplacophora, chiton, fauna, Mindoro Island, Philippines.

Introduction

After Nierstrasz's (1905) report on chitons collected by the "Siboga Expedition", only a few papers had been published on the chiton fauna of the Philippines before Ang (1967) reported 20 shallow water species. Several deep-sea species were described from the Philippines by Leloup (1981), Kaas (1982, 1989, 1990), and Kaas and Van Belle (1987); however, the chiton fauna in shallow water of this area has not been reviewed to date.

Specimens examined by Ang (1967) were collected from throughout the Philippines but mainly from Puerto Galera, northern Mindoro Island, approximately at 13°50'N, 121°00'E. The area around Puerto Galera has complicate shorelines, with many peninsulas and passages or coves (Fig. 1). The present author collected chitons from this area in March 2005. Taxonomic examination on a total of 69 specimens obtained during this sampling found 17 species belonging to 12 genera in six families. This paper reports those chitons collected from Puerto Galera and attempts to review identification of species previously reported by

Ang (1967).

Material and Methods

Specimens were collected by hand in the intertidal zone and by SCUBA down to 20 m. Sampling sites are shown in Fig. 1. Specimens were all fixed in 10% formalin, then rinsed with tap water and preserved in ca. 80% ethanol. In preparing samples for examination by scanning electron microscope (SEM), the following procedure was adopted. Valves were dissected for observation of the sculpture and aesthete pores, and together with the radulae, were boiled in KOH solution for one to two minutes and rinsed with tap water. All samples were cleaned with an ultrasonic cleaner and dehydrated using a series of ethanol concentrations. Then, the valves were air-dried and all other samples were immersed in t-butyl alcohol and dried by a JEOL JFD-300 freeze-dryer. All samples examined by SEM were observed in high vacuum mode. Measurements of the spicules and scales of the girdle were made using an optical micrometer under a light microscope. In determining the number of

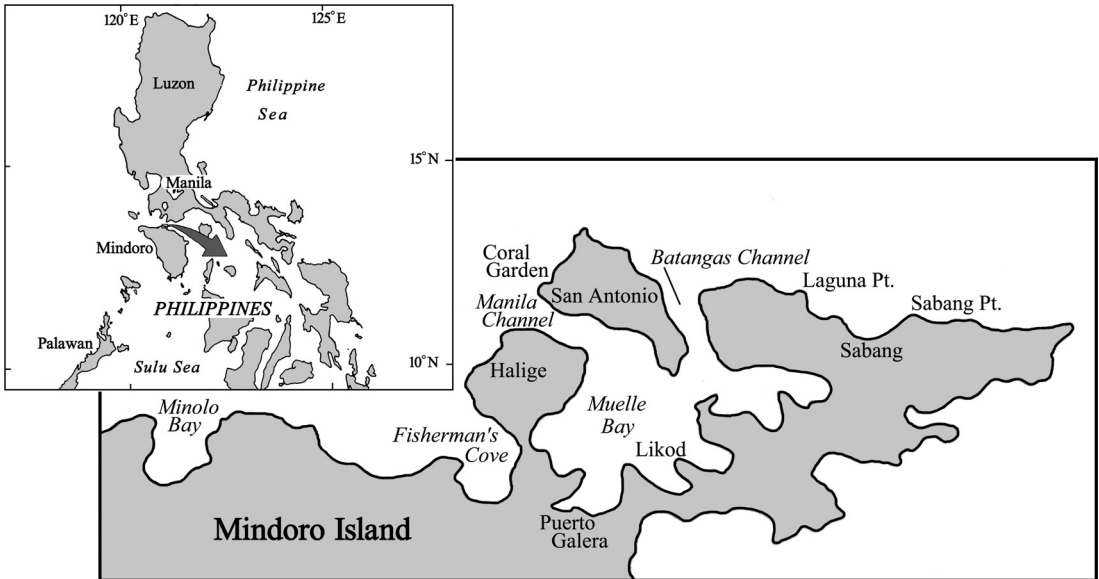


Fig. 1. Sampling sites in Mindoro Island, the Philippines.

the transverse rows of radular teeth, only the mineralized head of major lateral teeth were counted. Specimens are deposited in the Zoology Division, National Museum of the Philippines and Department of Zoology, National Science Museum, Tokyo.

Abbreviations used in the text are as follows: BL, body length; ITZ, Institute of Systematics and Population Biology, (Zoological Museum) University of Amsterdam; NSMT, National Science Museum, Tokyo.

Taxonomy

Order **Lepidopleurida** Thiele, 1929

Suborder **Lepidopleurina** Thiele, 1910

Family **Lepidopleuridae** Pilsbry, 1892

Genus ***Parachiton*** Thiele, 1909

***Parachiton* sp.**

(Fig. 5A)

Material examined. 5 specimens, BL 5.6–6.5 mm, Sabang Cove, 6 m, 15 Mar. 2005; 1 specimen, BL 11.0 mm, Halige, 11 m, 17 Mar. 2005; 3 specimens, BL 4.7–6.4 mm, Batangas Channel, 7.5 m, 19 Mar. 2005.

Remarks. This species resembles *Parachiton ronaldi* (Kaas & Van Belle, 1985) and *P. communis* Saito, 1996, but differs from them by having radiating rows of granules in the lateral areas and wider dorsal scales with finer riblets. The color of living animals is much more reddish than that of *P. communis*.

Order **Chitonida** Thiele, 1929

Suborder **Chitonina** Thiele, 1910

Family **Ischnochitonidae** Dall, 1889

Genus ***Ischnochiton*** Gray, 1847

Ischnochiton albinus Thiele, 1911

(Fig. 5B)

Material examined. 3 specimens, BL 6.0–7.8 mm, Likod, Muelle Bay, 16 Mar. 2005; 2 specimens, BL 4.7 and 6.1 mm, Fisherman's Cove, 5m, 18 Mar. 2005; 1 specimen, BL 5.0 mm, Minolo Bay, 9 m, 18 Mar. 2005; 1 specimen, BL 7.2 mm, Coral Garden, 10 m, 19 Mar. 2005.

Remarks. Although the distributional records of this species have been published scarcely, it is considered to be widespread in the Indo-West Pacific (Saito, unpublished). Previous records in-

clude Shark Bay, Western Australia (type locality, Thiele, 1911), Nha Trang, Vietnam (Leloup, 1952), and Goto Islands, Japan (Saito, 1998). This is the first record of this species from the Philippines.

Ischnochiton bouryi Dupuis, 1917

(Fig. 5C)

Material examined. 2 specimens, BL 11.7 and 16.2 mm, Halige, 5–11 m, 17 Mar. 2005; 2 specimens, BL 8.7 and 11.7 mm, Fisherman's Cove, 5 m, 18 Mar. 2005.

Remarks. The species reported by Ang (1967) under the name "*Ischnochiton atkinsoni* Iredale & May, 1916" [= *I. variegates* (H. Adams & Angas, 1864): *vide* Kaas & Van Belle, 1990] seems to represent the present species.

This species has been reported from several localities in Ambon, Indonesia, Andaman Islands, Sri Lanka, and Karachi, Pakistan (Kaas & Van Belle, 1990) other than the Philippines.

Genus ***Stenoplax*** Dall, 1879

Stenoplax alata (Sowerby, 1841)

(Fig. 6D)

Material examined. 1 specimen, BL 47.0 mm, Manila Channel, 18 Mar. 2005; 1 specimen, BL 37.1 mm, Fisherman's Cove, 5 m, 18 Mar. 2005.

Remarks. Ang (1967) reported this species from Puerto Galera, Cebu, and Iloilo. This species is widespread in the Indo-West Pacific and commonly found on the underside of stones or dead coral blocks in sea grass beds on coral reefs.

Family **Callochitonidae** Plate, 1901

Genus ***Callochiton*** Gray, 1847

***Callochiton* sp.**

(Fig. 5F)

Material examined. 1 specimen, BL 9.1 mm, Coral Garden, 9 m, 15 Mar. 2005.

Remarks. The present species may be identical with *Callochiton subsulcatus* Kaas & Van Belle, 1985 described from South of Saleyer, Indonesia, by having weak, hardly discernible sulci on the pleural area, and rather short spicules on the girdle margin. However, more detailed comparisons are needed for an exact identification.

Family **Callistoplacidae** Pilsbry, 1893

Genus ***Callistochiton*** Carpenter in Dall, 1879

Callistochiton granifer Hull, 1923

(Fig. 6A)

Material examined. 1 specimen, BL 14.3 mm, Coral Garden, 10 m, 19 Mar. 2005.

Remarks. *Callistochiton carpenterianus* Kaas, 1956 [new name for *Callistochiton carpenteri* Nierstrasz, 1905 which is preoccupied by *Callistochiton carpenteri* (Clessin, 1903) = *C. pulchellus* (Gray, 1828), *vide* Kaas, 1956] described from Banda Islands, Indonesia, is regarded to be a synonym of the present species (**new synonymy**). This species has been reported from several localities in the Indo-West Pacific: Queensland (type locality, Hull, 1923; Slieker, 2000), Samoa Islands (Schwabe, 2001), Banda Islands, Indonesia (Nierstrasz, 1905), and Nansei Islands, Japan (Saito, 2000, as *C. carpenterianus*). This is the first record from the Philippines.

Family **Chitonidae** Rafinesque, 1815

Genus ***Tegulaplax*** Iredale & Hull, 1926

Tegulaplax hululensis (E. A. Smith, 1903)

(Fig. 5E)

Material examined. 2 specimens, BL 13.1 and 15.2 mm, Minolo Bay, 9 m, 18 Mar. 2005; 2 specimens, BL 4.1 and 18.4 mm, Coral Garden, 19 Mar. 2005; 1 specimen, BL 5.6 mm, Batangas Channel, 19 Mar. 2005.

Genus *Acanthopleura* Guilding, 1829

Acanthopleura miles (Carpenter in Pilsbry, 1893)
(Fig. 6F)

Material examined. 2 specimens, BL 32.5 and 35.7 mm, Coral Garden, 15 Mar. 2005.

Remarks. Ang (1967) reported “*Squamopleura curtisiana* (Smith, 1884)” from Puerto Galera and Guimaras Island, Iloilo. However, the specimens examined by Ang have large dorsal scales (at least in the figured specimen in Pl. XI), which separate the present species from *Squamopleura curtisiana* [= *Acanthopleura curtisiana* (Smith, 1884)].

Acanthopleura gemmata (de Blainville, 1825)
(Fig. 6G)

Material examined. 4 specimens, BL 29.2–48.6 mm, Coral Garden, 15 Mar. 2005; 4 specimens, BL 12.8–44.8 mm, Sabang Cove, 16 Mar. 2005; 3 specimens, BL 23.8–35.0 mm, Laguna Point, 17 Mar. 2005; 4 specimens, BL 24.3–37.5 mm, Manila Channel, 18 Mar. 2005.

Remarks. *Acanthozostera virens* Ang, 1967 described from the Philippines was regarded as a junior synonym of the present species (Ferreira, 1986).

Acanthopleura spinosa (Bruguère, 1792)
(Fig. 6H)

Material examined. 1 specimen, BL 85.3 mm, Laguna Point, 17 Mar. 2005.

Remarks. This species was reported by Ang (1967) from Puerto Galera, Quezon, and Iloilo.

Genus *Lucilina* Dall, 1882

Lucilina lamellosa (Quoy & Gaimard, 1835)
(Fig. 6B)

Material examined. 1 specimen, BL 17.1 mm, Laguna Point, 17 Mar. 2005; 2 specimens, BL 17.9 and 21.4 mm, Halige, 3–5 m, 17 Mar.

2005.

Remarks. Ang (1967) reported *Lucilina confossa* (Gould, 1846) and *L. truncata* (Sowerby, 1841) from Puerto Galera, but both of the figured specimens are identical with the present species. *Lucilina confossa* is regarded as a synonym of the present species (Kaas & Van Belle, 1998). *Lucilina truncata* has much stronger sculpture on valves.

Lucilina sp.
(Fig. 5D)

Material examined. 1 specimen, BL 7.3 mm, Minolo Bay, 9 m, 18 Mar. 2005; 1 specimen, BL 5.7 mm, Coral Garden, 10 m, 19 Mar. 2005; 1 specimen, BL 3.7 mm (slightly curled), Batangas Channel, 7.5 m, 19 Mar. 2005.

Remarks. This species has sculpture which consists of longitudinal grooves on the pleural areas, and thus may be identified with *Tonicia sowerbyi* Nierstrasz, 1905 [= *Lucilina sowerbyi* (Nierstrasz, 1905)] described from Indonesian waters. Precise identification requires examination of type specimens of *T. sowerbyi* as well as its congeners in the Indo-West Pacific.

Genus *Onithochiton* Gray, 1847

Onithochiton sp.
(Fig. 6E)

Material examined. 1 specimen, BL 29.8 mm, Coral Garden, 15 Mar. 2005.

Remarks. This species must be conspecific with “*Onithochiton lyellii* (Sowerby, 1832)” reported by Ang (1967) from Manila Channel, Puerto Galera, where is close to the present locality. But, a revisional work on the genus *Onithochiton* in the Indo-West Pacific is needed for final identification of the species, as the taxonomy of the genus has been poorly understood to date.

Suborder **Acanthochitonina** Bergenhayn, 1930

Family **Acanthochitonidae** Pilsbry, 1893

Genus ***Leptoplax*** Pilsbry, 1893

Leptoplax coarctata (Sowerby, 1841)

(Fig. 5G, H)

Material examined. 1 specimen, BL 11.8 mm, Coral Garden, 9 m, 15 Mar. 2005; 2 specimens, BL 13.3 and 14.0 mm, Coral Garden, 10 m, 19 Mar. 2005; 4 specimens, BL 7.8–11.0 mm, Halige, 11 m, 17 Mar. 2005; 1 specimen, BL 13.0 mm, Fisherman's Cove, 18 Mar. 2005.

Remarks. *Acanthochitona* sp. reported by Ang (1967) from Sabang Cove, Puerto Galera can be identified with the present species by having rather narrow valves with drop-shaped pustules, outline of the articulamentum, and the multiple slitting of the valve VIII.

Leptoplax varia Nierstrasz, 1905

(Figs 2A–G, 5I)

Material examined. 2 specimens, BL 7.7 and 9.4 mm, Batangas Channel, 7.5 m, 19 Mar. 2005.

Description. Body small, elongate oval in outline. Tegmentum reduced, narrow. Color of tegmentum ivory with fine brownish flecks. Color of girdle light brown with grayish transverse bands (Fig. 5I), these bands faded out in preserved specimens.

Valves moderately elevated, narrowest at valve I, widest at valve VII. Tegmentum small, semicircular in Valve I, roughly trapezoid in valves II–VII, increasing width in posterior valves, drop-shaped, wider than long in valve I. Jugum wedge-shaped, wider than latero-pleural area in valve II. Lateral areas hardly discernible. Mucro located slightly posterior to center (Fig. 2A).

Tegmentum sculptured with drop-shaped, weakly concaved pustules. Each pustule with 1–4 macroaesthete pores usually in proximal half (Fig. 2B). Tegmentum plain with numerous microaesthete pores. Jugum with wavy side margins, smooth surface, and numerous microaesthete pores.

Sutural laminae weakly projected anteriorly in valves II–VII, truncated, partially protruded at inner corners in valve VIII. Insertion plates long and striated on outside. Slit formula 5/1/7–8. Slit rather wide, each accompanied by shallow groove tinted with pink.

Perinotum densely covered with small, slender, curved, sharply pointed spicules of two different sizes, smaller one 60–70 μm in length, 7–8 μm in width, larger one 100–120 μm in length, 9–11 μm in width, intermingling with long, slightly curved, smooth needles, attaining 160 μm in length, 15 μm in width (Fig. 2C). Spicules of sutural tuft similar to long needles of perinotum, but larger, attaining 250 μm in length, 15 μm in width (Fig. 2D). Spicules of marginal fringe slender, angulate on surface, roughly drop-shaped to hexagonal in cross section, attaining 250 μm in length, 12 μm in width (Fig. 2F). Spicules on hypnotum lanceolate in shape, flat, smooth, 100–120 μm in length, 15–17 μm in width (Fig. 2E).

Gills merobranchial abanal type, with 14–15 ctenidia on each side.

Radula 2.3 mm in length, with 24 rows of mineralized teeth. Central tooth large, round at top, expanded laterally, and keeled at base. Centro-lateral teeth thin, weakly angulated at antero-dorsal corner. Major lateral teeth with flat anterior surface of tricuspid head. Major uncinus teeth with narrow blade (Fig. 2G).

Remarks. The shape of small valves and their sculptures and fleshy, smooth girdles of the present specimens match well with those of the syntypes of *Leptoplax varia* Nierstrasz, 1905 deposited in ITZ.

The present species resembles *Leptoplax coarctata* (Sowerby, 1841), and Leloup (1951) regarded it as a junior synonym of the latter. However, the present species differs in having a much reduced tegmentum and smooth surface of large curved spicules on perinotum.

The general morphology of the radula matches well with that of other congeners shown in Saito (2004: 95, Fig. 8).

The syntypes of the present species were collected from Pulu Sanguisapo, the Tawi Tawi Is-

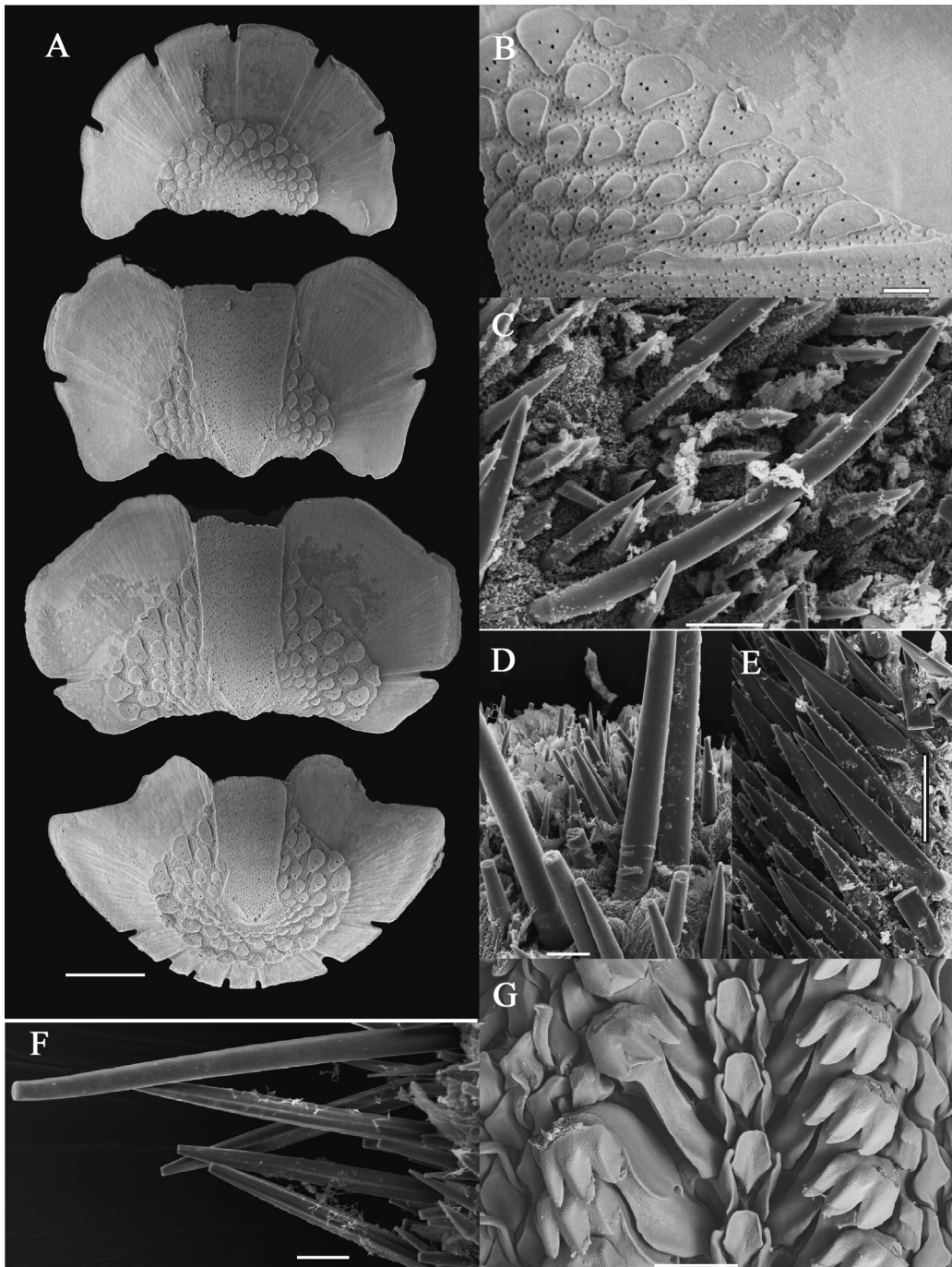


Fig. 2. *Leptoplax varia* Nierstrasz, 1905, BL 9.4 mm. A, Valves I, II, VII, and VIII (from top), dorsal view; B, valve VII, showing pustules and aesthete pores; C, spicules on perinotum; D, sutural tuft; E, spicules on hyponotum; F, marginal spicules; G, radula. Scales: 500 μm for A; 100 μm for B; 20 μm for C, D, F; 50 μm for E, G.

lands, the Sulu Archipelago, the Philippines as well as from Indonesian waters. This is the second record after the original description in 1905.

Genus *Acanthochitona* Gray, 1821

Acanthochitona biformis (Nierstrasz, 1905)

(Figs 3A–G, 5J)

Material examined. 1 specimen, BL 7.6 mm, Batangas Channel, 7.5 m, 19 Mar. 2005.

Description. Animal small, elongate oval in outline. Valves rather wide for the genus, low, back rounded. Color of tegmentum white with reddish brown maculation; jugum with yellowish tint (Fig. 5J).

Valve I with five obsolete radial undulations; anterior slope convex. Valves II–VII wide, roughly oval to fan-shaped in outline; side slope slightly convex; jugum narrow, smooth. Valve VIII small, with central mucro (Fig. 3A).

Tegmentum sculptured with drop-shaped or oval, flat pustules. Each pustule with one macroaesthete pore at slightly anterior to center (Fig. 3B). No aesthete pore on tegmental plain. Jugum with fine growth lines, but practically smooth; microaesthete pores sparsely distributed.

Sutural laminae rounded, widely apart from each other in valves II–VII, truncated in valve VIII. Insertion plate rather short, smooth on surface. Slit formula 5/1/2.

Perinotum densely covered with minute, slender, sharply pointed spicules, measuring about 200 μm in length, 16–19 μm in width. Sutural tufts prominent, consisting of long, slightly curved, and smooth needles attaining about 1 mm in length, about 50 μm in width (Fig. 3D), and small, sharply pointed, orange spicules present around long needle, these spicules 230–270 μm in length, 15–20 μm in width (Fig. 3E). Spicules of marginal fringe long, gently curved, finely ribbed, measuring 500–600 μm in length, 30–40 μm in width (Fig. 3C). Spicules on hyponotum lanceolate in shape, flat, smooth, 150–160 μm long, 18–20 μm wide.

Radula 2.6 mm in length, with 28 rows of min-

eralized teeth. Central tooth small, spatulate in outline, thin, sharply keeled in basal portion. Centro-lateral teeth with thickened antero-dorsal corner. Major lateral teeth with flat anterior surface of tricuspid head; each denticle obtuse at tip. Major uncinus teeth moderate in width (Fig. 3F, G).

Gills merobranchial abanal type, with 9 ctenidia on each side. Gonopore located between posterior third and fourth gills and nephridiopore located between posteriormost and second gills.

Remark. This species is distinct from the congeners in the Indo-West Pacific by having wide valves with a rather narrow jugum and densely packed round pustules. However, the morphology of pustules and radula suggests a close relationship with *Acanthochitona intermedia* (Nierstrasz, 1905).

The syntypes of the present species were collected from Pulu Sanguisiapo, the Tawi Tawi Islands, the Sulu Archipelago, the Philippines as well as from Indonesian waters. This is also the second record after the original description in 1905.

Family **Cryptoplacidae** H. & A. Adams, 1858

Genus *Cryptoplax* de Blainville, 1825

Cryptoplax plana Ang, 1967

(Figs 4A–G, 6C)

Material examined. 1 specimen, BL 26.9 mm (shrunk), Coral Garden, 15 Mar. 2005; 2 specimens, BL 36.5 and 52.3 mm (shrunk), Coral Garden, 19 Mar. 2005; 1 specimen, BL 38.2 mm, Manila Channel, intertidal, 18 Mar. 2005.

Description. Animal moderate in size. Body fleshy, vermicular. Tegmentum very narrow in valves IV–VII. Color dark brown in tegmentum, chocolate brown usually with irregular whitish maculation in perinotum, but uniformly fleshy colored in hyponotum (Fig. 6C).

Tegmentum reduced, widest at valve II, narrowest at valve V, longest at valve IV or V, shortest at valve I. Valves I–IV in contact with each other, while valves V–VIII widely separated. Valve I horseshoe-shaped in outline, longer than

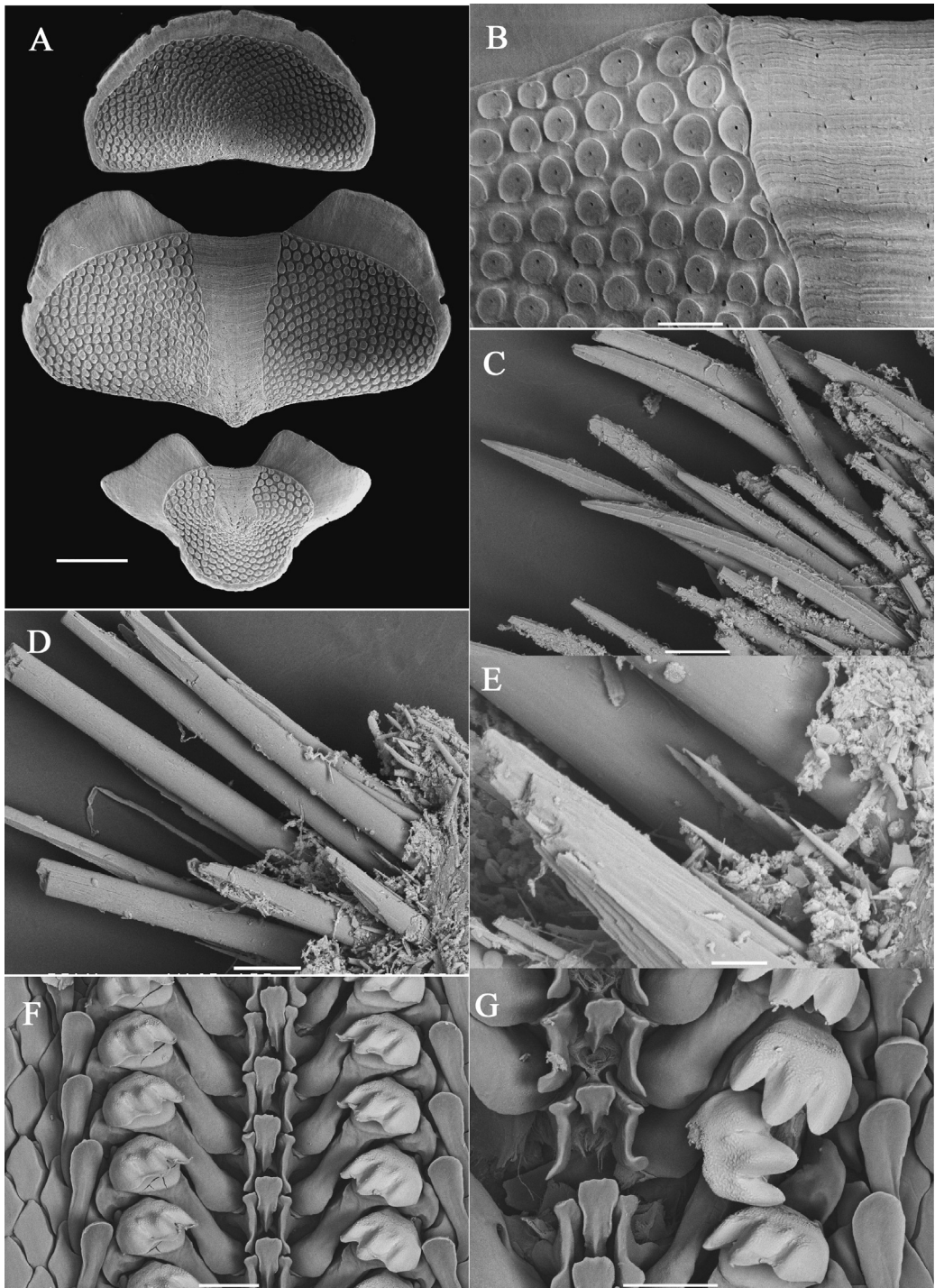


Fig. 3. *Acanthochitona biformis* (Nierstrasz, 1905), BL 7.6 mm. A, Valves I, IV, and VIII (from top), dorsal view; B, valve IV, showing pustules and aesthete pores; C, marginal spicules; D, sutural tuft; E, sutural tuft, basal portion; F, radula; G, radula, central part. Scales: 500 μm for A; 100 μm for B, C, D; 20 μm for E; 50 μm for F, G.

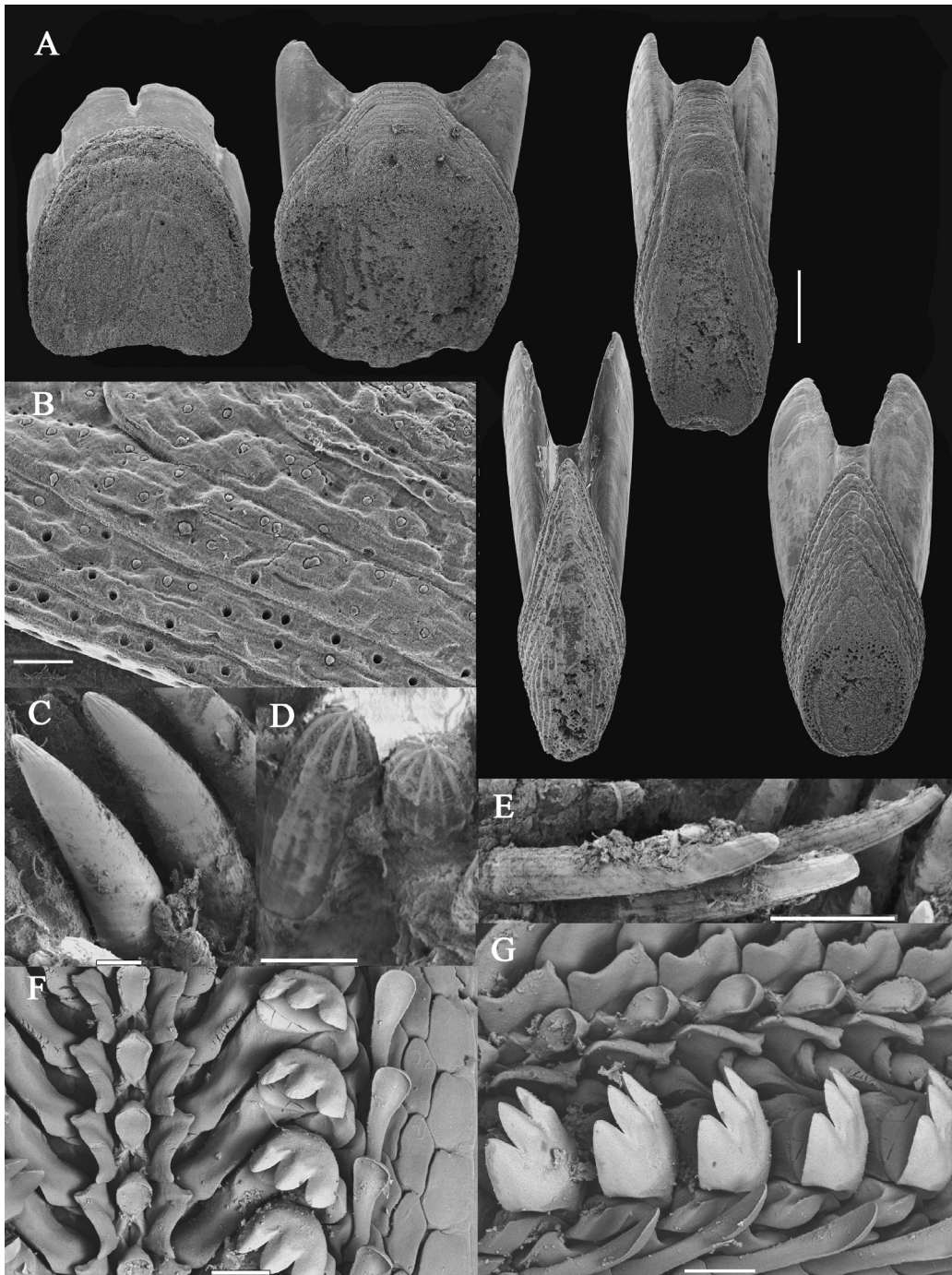


Fig. 4. *Cryptoplax plana* Ang, 1967, BL 38.2 mm. A. Valves I, II, and IV (upper row, from left), and VI, VIII (lower row, from left), dorsal view; B, valve VIII, showing pustules and aesthete pores; C, spicules on perinotum, near dorsal midline; D, small spicules on perinotum; E, marginal spicules; F, radula; G, radula, dorso-lateral view. Scales: 1 mm for A; 100 μ m for B, D–G; 50 μ m for C.

wide, low in profile. Valves II roughly pentagonal in outline. Valves III–VIII narrow, spindle-shaped in outline. Valve VIII wider than valves V–VII; exact position of mucro uncertain due to abrasion, but supposedly terminal or subterminal since posterior part of tegmentum being protruded beyond posterior margin. Jugum narrow, smooth, wedge-shaped in valve II, almost parallel-sided in valves III–VIII, becoming obsolete in anterior part of tegmentum (Fig. 4A).

Sculpture of valve I invisible owing to abrasion. Latero-pleural areas of valves II–VII and antemucronal area of valve VIII all sculptured with fine longitudinal riblets in earlier growth stages, these riblets becoming concentric later. Each riblet with merged, squarish, convex pustules. These sculptures often abraded. Each pustule with one or two macroaesthetes on top, with microaesthetes distributed along base of merged pustules (Fig. 4B).

Articulamentum thick, light brown. Sutural laminae narrow, strongly projected forward, separated by sinus in valves II–V, narrowly connected in valves VI–VIII. Insertion plate exceedingly long in head valve, rather short, projected antero-ventrally in tail valve (Fig. 4A). Slit formula 3/0/0.

Perinotum densely covered with minute, slightly depressed, round topped spicules, intermingling with large, curved spicules; minute spicules with fine, distinct longitudinal riblets, measuring about 150 μm in length, 35–40 μm in width (Fig. 4D); large spicules variable in shape, sculpture, and size in different regions of perinotum, gradually narrowing toward tip, almost smooth, 450–600 μm long, 80–90 μm wide in spicules near dorsal mid-line (Fig. 4C), while club-shaped, deeply grooved, near girdle margin, measuring 260–280 μm in length, about 70 μm in width. Spicules of sutural tufts similar to large, curved spicules near dorsal mid-line, but paler in color. Marginal spicules slender, slightly curved, finely grooved on surface, round at tip, 320–340 μm in length, about 70 μm in width (Fig. 4E). Spicules on hyponotum minute, elongate, flat, round at tip, 80–85 μm long, 17–19 μm

wide (Fig. 4D).

Gills merobranchial, abanal type. Specimen of BL 38.2 mm with 22 gills on left side, 23 on right. Gonopore and nephridiopore not detected.

Radula 12.0 mm in length, with 62 rows of mature teeth in specimen of BL 38.2 mm. Central tooth small, thick, with rather deep concavity at dorsal half of posterior surface, weakly keeled at base. Centro-lateral teeth thickened at antero-dorsal corner, shallowly grooved on inner lateral surface of posterior plate. Head of major lateral teeth tricuspid, wide, with flat anterior surface; each denticle with obtuse but sharp margin at tip. Major uncinus teeth with blade of moderate width (Fig. 4F, G).

Remarks. This species is easily recognizable by its dark, chocolate brown coloration and large tegmentum of valve VIII. The valve surfaces are usually eroded in most individuals, caused by the movement of the animals in rock holes as was noted in the original description. The position of the eroded (defaced) parts vary somewhat among different individuals, thus the size of exposed part of the valves look variable, even in valve VIII.

Additional description with SEM images based on the topotypic specimen from Manila Channel, Puerto Galera, is given for the arrangement of aesthete pores, sculpture of the girdle elements, and the radula, which are lacking in the original description by Ang (1967).

This species has been known only from the type locality and Ambon Island, Indonesia (Strack, 2001). A specimen from the latter was illustrated by Slieker (2000).

Discussion

A total of 17 species of chitons are recorded from intertidal and subtidal zones of Puerto Galera, Mindoro Island, the Philippines. Of these, two species are recorded for the first time from the Philippines, and three species are identified only to genus. Ang (1967) reported 20 species of chitons from this area. In the present work, Ang's species are reduced to 17, including

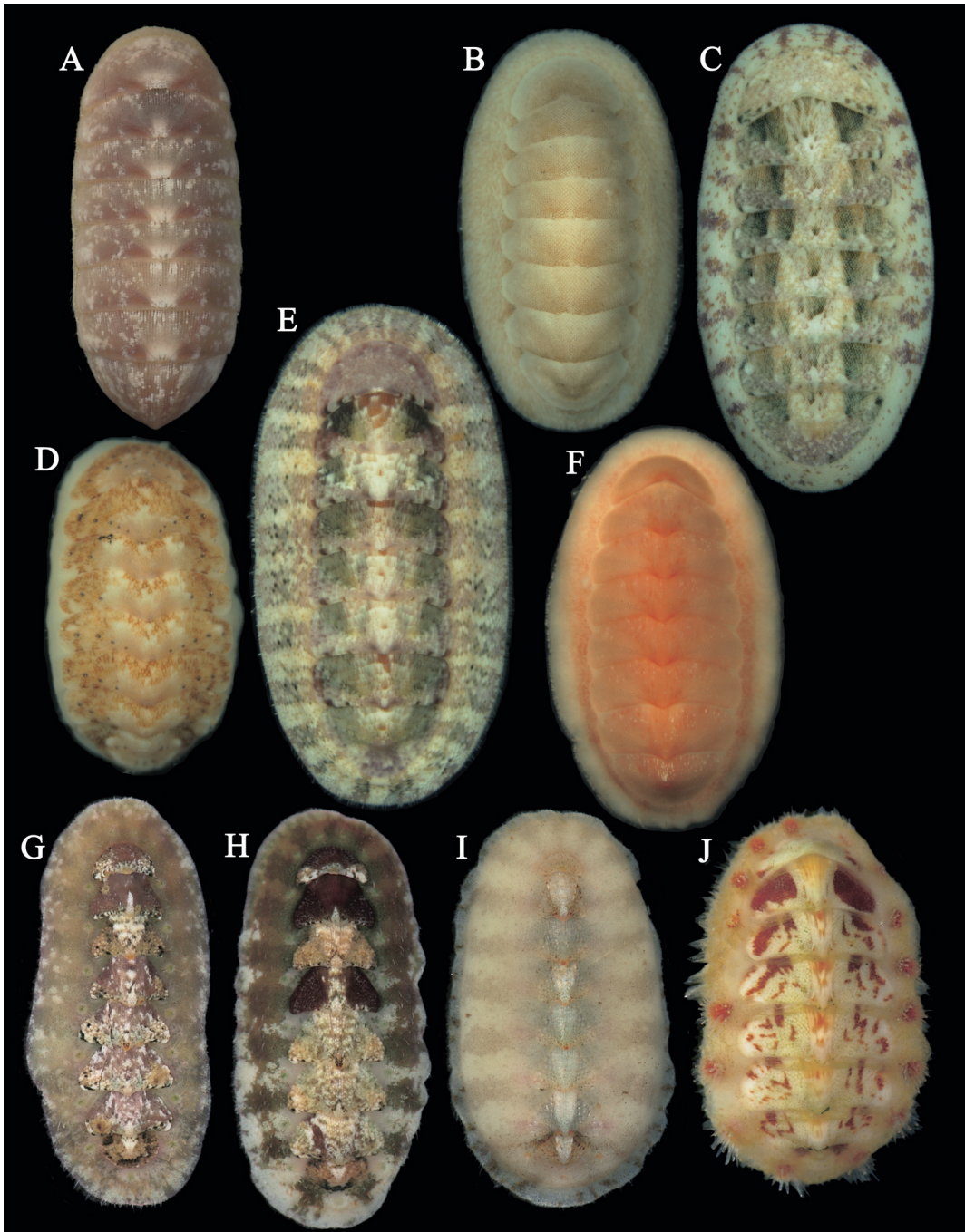


Fig. 5. A, *Parachiton* sp., BL 11.0 mm, Halige; B, *Ischnochiton albinus*, BL 7.8 mm, Likod, Muelle Bay; C, *Ischnochiton bouryi*, BL 11.7 mm, Halige; D, *Lucilina* sp., BL 3.7 mm, Batangas Channel; E, *Tegulaplex hululensis*, BL 15.2 mm, Minolo Bay; F, *Callochiton* sp., BL 9.1 mm, Coral Garden; G, H, *Leptoplax coarctata*, BL 10.0 mm (left), 8.8 mm (right), Halige; I, *Leptoplax varia*, BL 9.4 mm, Batangas Channel; J, *Acanthochitona biformis*, BL 7.6 mm, Batangas Channel.

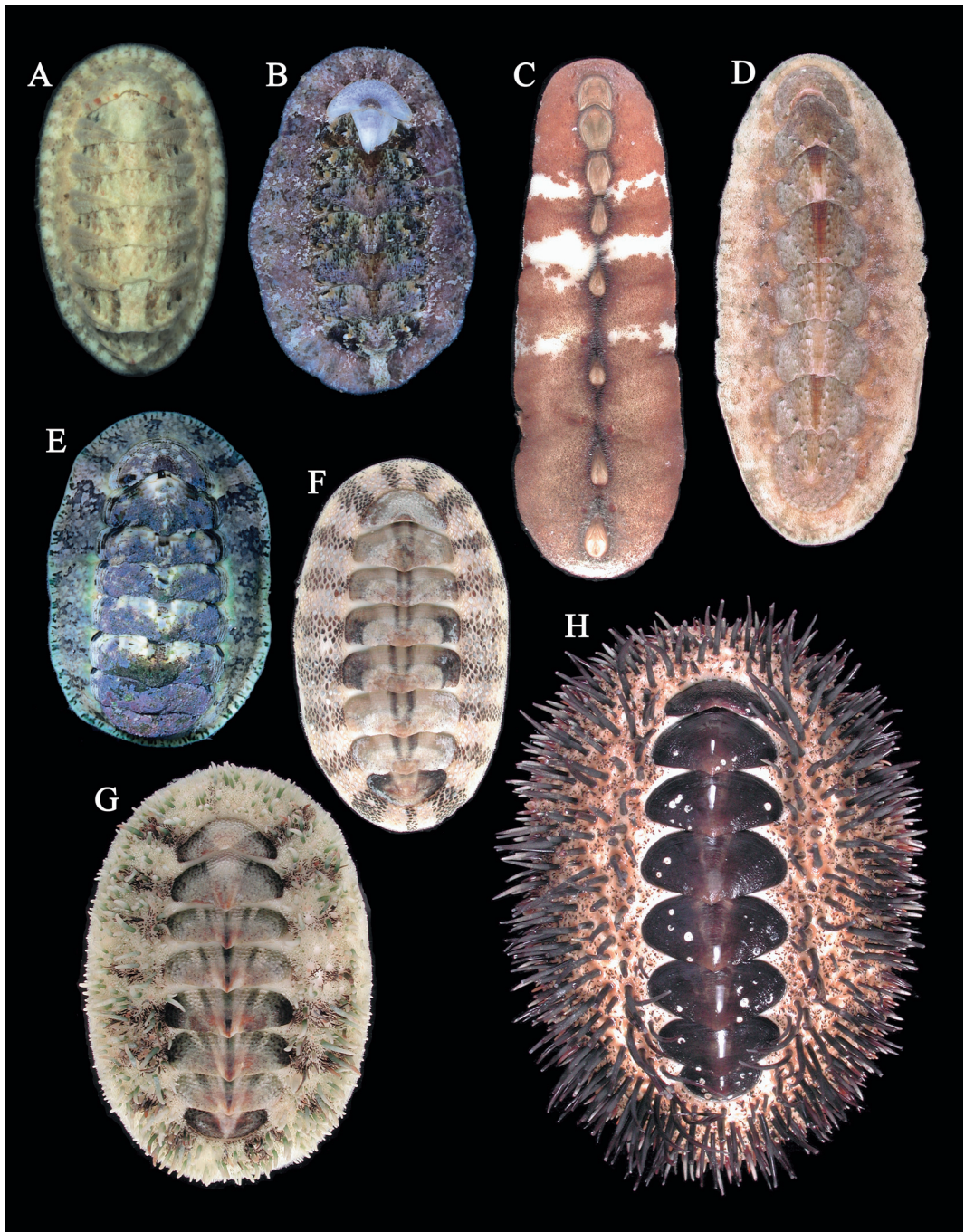


Fig. 6. A, *Callistochiton granifer*, BL 14.3 mm, Coral Garden; B, *Lucilina lamellosa*, BL 21.4 mm, Halige; C, *Cryptoplax plana*, BL 52.3 mm, Coral Garden; D, *Stenoplax alata*, BL 47.0 mm, Manila Channel; E, *Onithochiton* sp., BL 29.8 mm, Coral Garden; F, *Acanthopleura miles*, BL 32.5 mm, Coral Garden; G, *Acanthopleura gemmata*, BL 36.5 mm, Manila Channel; H, *Acanthopleura spinosa*, BL 85.3 mm, Laguna Point.

Table 1. List of chitons recorded from Puerto Galera.

Ang, 1967	Ang, 1967 re-identified herein	Present study	Total
<i>Ischnochiton (Ischnochiton) atkinsoni</i>	<i>Ischnochiton bouryi</i>	<i>Parachiton</i> sp. <i>Ischnochiton bouryi</i>	<i>Parachiton</i> sp. <i>Ischnochiton bouryi</i>
<i>Ischnochiton (Stenoplax) alatus</i>	<i>Stenoplax alata</i>	<i>Ischnochiton albinus</i> <i>Stenoplax alata</i> <i>Callistochiton granifer</i> <i>Tegulaplax hululensis</i>	<i>Ischnochiton albinus</i> <i>Stenoplax alata</i> <i>Callistochiton granifer</i> <i>Tegulaplax hululensis</i> <i>Rhyssoplax densilirata</i>
<i>Ischnochiton (Lepidozona) luzonicus</i>	<i>Rhyssoplax densilirata</i>		<i>Rhyssoplax pulcherrima</i>
<i>Rhyssoplax pulcherrimus</i>	<i>Rhyssoplax pulcherrima</i>		<i>Rhyssoplax pulcherrima</i>
<i>Squamopleura curtisiana</i>	<i>Acanthopleura miles</i>	<i>Acanthopleura miles</i>	<i>Acanthopleura miles</i>
<i>Acanthopleura spinosa</i>	<i>Acanthopleura spinosa</i>	<i>Acanthopleura spinosa</i>	<i>Acanthopleura spinosa</i>
<i>Acanthopleura brevispinosa</i>	<i>Acanthopleura</i> sp.		<i>Acanthopleura</i> sp.
<i>Acanthozostera gemmata</i>	<i>Acanthopleura gemmata</i>	<i>Acanthopleura gemmata</i>	<i>Acanthopleura gemmata</i>
<i>Acanthozostera virens</i>	<i>Acanthopleura gemmata</i>		
<i>Tonicia confossa</i>	<i>Lucinila lamellosa</i>	<i>Lucilina lamellosa</i>	<i>Lucilina lamellosa</i>
<i>Tonicia truncata</i>	<i>Lucinila lamellosa</i>		
<i>Onithochiton lyellii</i>	<i>Onithochiton</i> sp.	<i>Lucilina</i> sp. <i>Onithochiton</i> sp.	<i>Lucilina</i> sp. <i>Onithochiton</i> sp.
<i>Schizochiton polyops</i>	<i>Schizochiton incisus</i>		<i>Schizochiton incisus</i>
<i>Acanthochitona</i> sp.	<i>Leptoplax coarctata</i>	<i>Callochiton</i> sp. <i>Leptoplax coarctata</i> <i>Leptoplax varia</i>	<i>Callochiton</i> sp. <i>Leptoplax coarctata</i> <i>Leptoplax varia</i>
<i>Acanthochitona penicellatus</i>	<i>Acanthochitona intermedia</i>	<i>Acanthochitona biformis</i>	<i>Acanthochitona intermedia</i> <i>Acanthochitona biformis</i>
<i>Cryptoplax larvaeformis</i>	<i>Cryptoplax larvaeformis</i>		<i>Cryptoplax larvaeformis</i>
<i>Cryptoplax dimidiatus</i>	<i>Cryptoplax larvaeformis</i>		
<i>Cryptoplax vittatus</i>	<i>Cryptoplax mjobergi</i>		<i>Cryptoplax mjobergi</i>
<i>Cryptoplax planus</i>	<i>Cryptoplax plana</i>	<i>Cryptoplax plana</i>	<i>Cryptoplax plana</i>
<i>Cryptoplax ocellatus</i>	<i>Cryptoplax ocellata</i>		<i>Cryptoplax ocellata</i>
<i>Cryptoplax ocellatus</i> var.	<i>Cryptoplax ocellata</i>		
20 species	17 species	17 species	25 species

two species which could not be identified to species level due to lack of detailed information. The present results could be confirmed by examination of voucher specimens; however, they have not yet been located, in either University of the Philippines or National Museum of the Philippines. Together with the present records, occurrences of 25 species were confirmed from Puerto Galera (Table 1). In addition, *Craspedochiton laqueatus* (Sowerby, 1841) will probably be added to the list by future surveys, because that species was described from Calapan, close to the surveyed area and widespread in the West Pacific. Among the previous works, Hidalgo (1905) and Faustino (1928) listed 28 and 21 species, respectively, from the Philippines. Several species

were recorded from Mindoro Island; however, verification is needed for some species listed in those literature. Nierstrasz (1905) recorded 10 species from the Sulu Archipelago, the Philippines, including one deep water species. Even if the species listed in those previous works are reviewed and summed up, the number of species must be much less than the actual number occurring even in shallow water area of the Philippines. Further extensive surveys are needed to picture the chiton fauna of the Philippines.

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フィリピン・ミンドロ島プエルトガレラの浅海性多板類

齋藤 寛

フィリピンミンドロ島プエルトガレラの浅海域で多板類相を調査したところ、6科12属17種の生息を確認した。このうち *Ischnochiton albinus* シラタマヒザラガイおよび *Callistochiton granifer* ハナヤカカブトヒザラガイの2種はフィリピンからの初記録である。また、*Leptoplax varia* および *Acanthochitona biformis* の2種は共にフィリピンとインドネシアから記載されたものの、その後の記録がなく、本研究により100年ぶりの再発見となった。これら再発見の2種と、プエルトガレラから記載された *Cryptoplax plana* の計3種についてはより詳細な再記載を行い、分類学的に重要な形態的特徴を図示した。