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NOTES ON LORICATA (MOLLUSCA) 11-14*

by

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Four new species of chitons (Mollusca, Polyplacophora) are described, viz *Leptochiton (L.) dispersus* and *L. (L.) permodestus* from Transkei, *L. (L.) meiringae* from the eastern Cape Province, S Africa (note 11) and *Ischnochiton (Stenosemus) vanbellei* from the Mediterranean Sea (note 14). New records are given for little known species, such as *Leptochiton (L.) chariessa* (Barnard, 1963) (note 11), *Ischnochiton (I.) obtusus* Carpenter in Pilsbry, 1893 (note 12), *Leptochiton (L.) lineatus* (Nierstrasz, 1905), *L. (L.) rissoi* (Nierstrasz, 1905), *Loricella oviformis* (Nierstrasz, 1905), and *Placiphorella albitestae* Is. Taki, 1954 (note 13).

New synonyms: *Squamophora* Nierstrasz, 1905, and *Componochiton* Milne, 1963 = *Loricella* Pilsbry, 1893; *Paricoplax profundior* Dell, 1956, and *Componochiton raceki* Milne, 1963, are junior objective synonyms of *Loricella oviformis* (Nierstrasz, 1905) (note 13).

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ABBREVIATIONS

AMS	Australian Museum, Sydney.
BMNH	British Museum (Natural History), London.
ITZ	Instituut voor Taxonomische Zoölogie, Zoölogisch Museum, Amsterdam.
K	Private collection of the author now in RMNH.
MNHN	Muséum National d'Histoire Naturelle, Laboratoire de Malacologie, Paris.
NMP	Natal Museum, Pietermaritzburg.
NMNZ	National Museum of New Zealand, Wellington.
NMV	National Museum of Victoria, Melbourne.
RGM	Rijksmuseum voor Geologie en Mineralogie, Leiden.
RMNH	Rijksmuseum van Natuurlijke Historie, Leiden.
SAMC	South African Museum, Cape Town.

* Notes on Loricata 10, see Basteria 42: 73-75 (1978).

11. NEW SPECIES OF *LEPTOCHITON* GRAY, 1847, DREDGED OFF EAST LONDON AND TRANSKEI, SOUTH AFRICA

Dr. R.N. Kilburn, malacologist at the Natal Museum, Pietermaritzburg, sent me for identification several samples of small chitons, dredged in 1982-1984, from the research vessel Meiring Naudé off the coast of East London and Transkei, South Africa. The material appears to contain four species of the genus *Leptochiton* Gray, 1847, three of which are new to science. They are described here.

Order Neoloricata
Suborder Lepidopleurina
Leptochitonidae

Leptochiton (Leptochiton) chariessa (Barnard, 1963)

Lepidopleurus chariessa Barnard, 1963: 332, fig. 29h.
Leptochiton (L.) chariessa; Kaas & Van Belle, 1985: 76, fig. 33, map 13.

Material. — Transkei, off Whale Rock, 31°58.7'S 29°15.1'E, dredged, 70-83 m, marine growth, calcareous debris, RV Meiring Naudé, 16.vii.1982, 1 specimen, dry, c. 6 × 3.5 mm, NMP C5891

This is the second record of this species, of which only the holotype and one paratype are known from the Cape Province: off Cape St. Blaize, 225 m, SAMC A9338.

Leptochiton (Leptochiton) dispersus spec. nov.
(figs. 1-13)

Material. — Transkei, off Qolora R., 32°45.0'S 28°35.3'E, dredged, 96 m, gorgonians, sponges, RV Meiring Naudé, 13.vi.1983, 1 specimen (holotype) preserved in alcohol, now disarticulated, NMP C4658.

Description. — Animal small (estimated length when stretched c. 11 mm, width 6 mm), elongate oval, rather elevated (dorsal elevation 0.44), the back evenly rounded, not carinated, side slopes convex. Valves not beaked, lateral areas only little raised (fig. 1). Posterior margins about straight, anterior margin convex in valve II, concave in III-VIII.

Tegmental sculpture (fig. 2) consisting of irregularly longitudinally

displayed chains of small, round, flat-topped, ochraceous to brownish pustules, only partly covering the central areas of the intermediate valves and the antemucronal area of the tail valve; the interstices chalky white. Head valve, lateral areas of intermediate valves, and postmucronal area of tail valve evenly covered with much crowded, quincuncially arranged, round, ochraceous pustules, less prominent than those on the central areas.

Articulamentum entirely white, the apophyses small, triangular, wide apart. Posterior margin of valves II-VII about straight, without a distinct apex; anterior margin convex in valve II, concave in III-VIII.

Head valve (fig. 3) semicircular, anterior slope straight; there are three well-marked, concentric growth lines close to the outer margin. The intermediate valves (figs. 4-6) hardly show any growth lines. Tail valve (figs. 7-8) semicircular, only little smaller than I, the mucro pointed, subcentral, posterior slope deeply concave. Two or three lines of growth are hardly discernible.

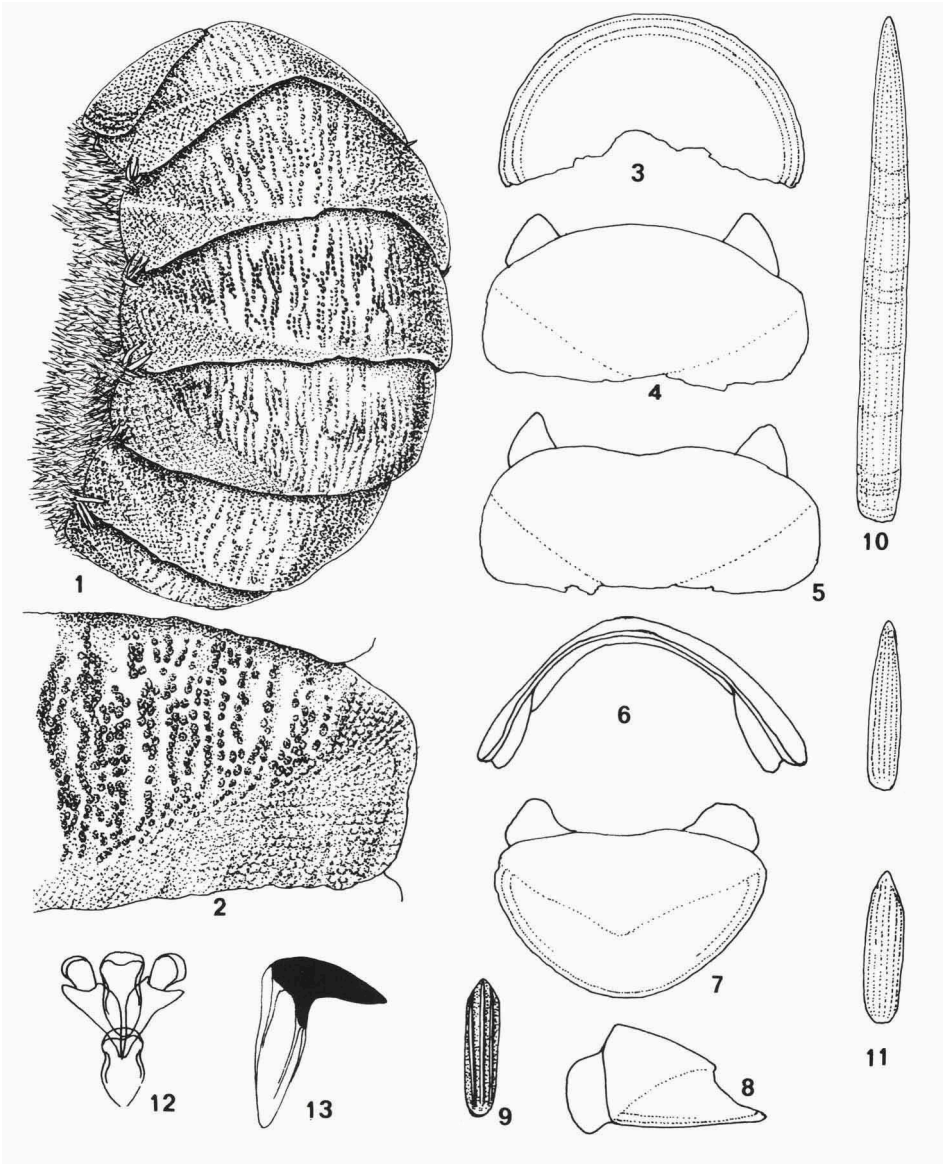
Girdle moderately wide, dorsally covered with imbricating, parallel-sided, elongated, bluntly pointed, flattened and slightly bent calcareous scales, bearing three or four narrow, elevated riblets, up till 112 × 28 μm (fig. 9). Among them, dispersed without order, long, straight or slightly bent, abruptly pointed, finely striated, white spicules are found, up till 450 × 40 μm; groups of these are found intersegmental (fig. 10). Ventral side of girdle densely covered with imbricating scales, somewhat larger than the dorsal ones, up to 140 × 30 μm, only finely longitudinally striated (fig. 11). There is no marginal fringe.

Gills merobranchial, adanal, with 10 ctenidia on the left, 9 on the right side.

Central tooth of the radula with an evenly rounded blade, a little pinched in the anterior half; first laterals with a small, narrow blade and a wing-like procession at the base (fig. 12); major lateral teeth with a unicuspid head, the denticle long, slender and sharp (fig. 13).

Etymology. — From the Latin verb *dispergere* meaning to disperse, in reference to the chains of pustules on the tegmentum.

Observations. — This new species is quite unlike the other South African Leptochitons. It somewhat resembles *L. lineatus* (Nierstrasz, 1905) from Indonesia and the Philippines, from which it differs in being less elevated, not carinated, and in the tegmental pustules which are arranged in wavy, oblique series in *lineatus*. Moreover, *lineatus* has a different armature of the girdle and a radula with a bicuspid head on the major lateral tooth.



Figs. 1-13. *Leptochiton (Leptochiton) dispersus* spec. nov., holotype. 1, whole specimen before disarticulation, slightly curled up, x 9.6; 2, part of valve IV, dorsal view, × 20; 3-8, camera lucida sketches of disarticulated valves, × 9.6: valves I, II, IV (dorsal view), IV (anterior view), VIII (dorsal view) and VIII (lateral view) respectively; 9, dorsal girdle scale, × 200; 10, dorsal spicule, × 200; 11, ventral scales, × 200; 12. central and first lateral radula teeth, ×100; 13, major lateral radula tooth, × 100.

Leptochiton (Leptochiton) permodestus spec. nov.
(figs. 14-25)

Material. — Transkei, off Stony Point, 32°37.5'S 28°45.8'E, 390-400 m, muddy sand, small stones, dredged RV Meiring Naudé, 2.vii.1984, 6 specimens in alcohol: holotype (NMP C8005/T3044) and 3 paratypes in alcohol, 1 disarticulated paratype preserved dry (NMP C8006/T3045), 2 paratypes in alcohol (K 5084). All specimens strongly curled up.

Transkei, off Nqbara Point, 32°24.7'S 28°58.4'E, 400-410 m, muddy sand with shell conglomerate, 13.vii.1984, 1 paratype in alcohol, curled up (NMP C8007/T3048).

Description. — Animal small, estimated length c. 8 mm, broadly oval, moderately elevated (dorsal elevation 0.40), the back evenly rounded (fig. 14), lateral areas not raised, hardly discernible, tegmentum granulated all over. Colour yellowish white.

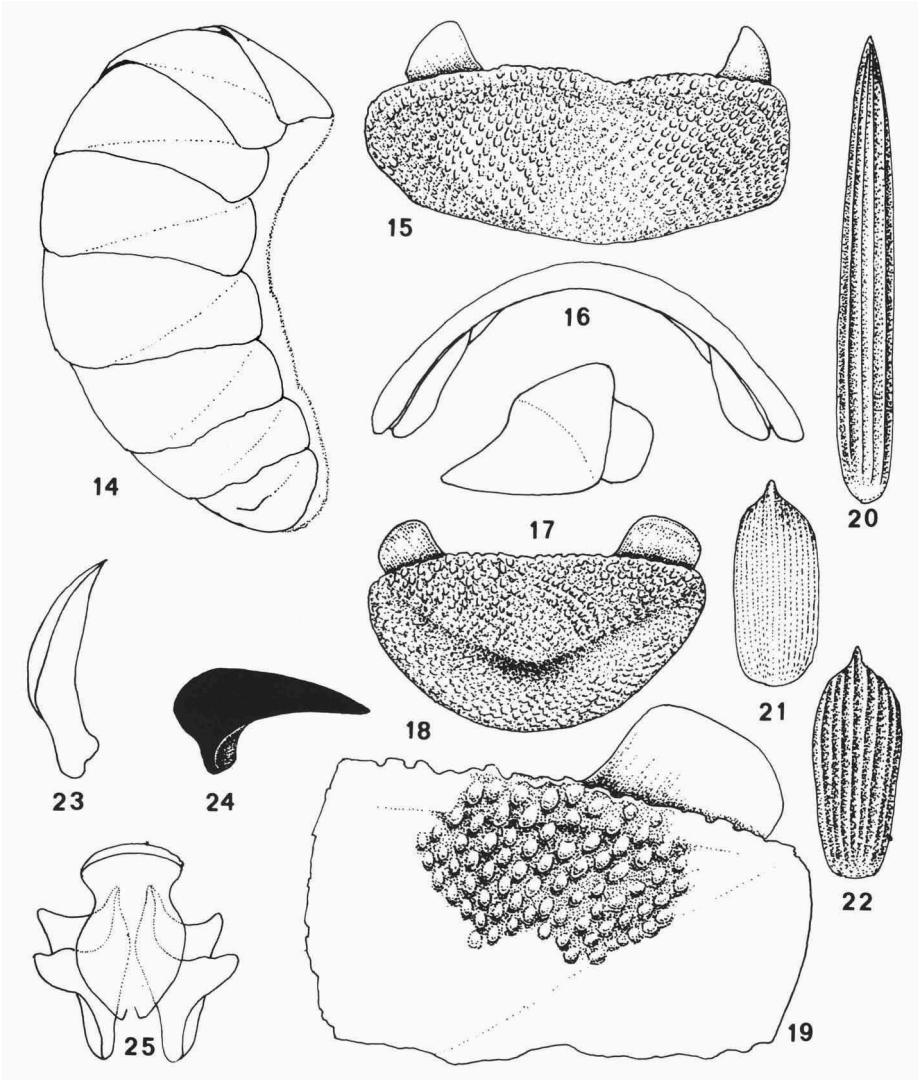
Valves thin and brittle, not beaked, apices hardly developed, the profile regularly arched (fig. 16). Head valve semicircular, anterior slope straight to slightly convex, without growth marks. Tegmentum sculptured with well raised and well spaced oval, convex-topped granulae, neatly arranged in quincunx.

Intermediate valves (figs. 15, 16) rectangular, 2.5 times broader than long, the anterior margin straight or slightly convex in II, concave in III-VII, central areas sculptured like the head valve, the quincuncial arrangement continuing on the lateral areas, which are not raised, only discernible by the slightly more crowded granules (fig. 19). Circumference of valve VIII about one third of a circle, the front margin almost straight, the mucro behind the centre, at three fifths of the length of the valve, the postmucronal slope deeply concave directly behind the mucro. Sculpture of tegmentum as in I-VII (figs. 17, 18).

Articulamentum thin, white, the sculpture and colour of the tegmentum showing through. Apophyses somewhat trapezoid, looking triangular when viewed from above, very wide apart.

Girdle covered with hardly imbricating, oval, distally abruptly pointed scales, 160 × 60 μm, longitudinally sculptured with about eight sharp, well raised riblets (fig. 22), interspersed with longitudinally strongly ribbed spicules, with four or five sharp ribs on the visible half, 320 × 36 μm (fig. 20). There are no bunches of intersegmental spicules; marginal fringe absent. Ventral side of girdle covered with imbricating, radiating series of finely striated scales, homomorphic to the dorsal ones, 144 × 60 μm (fig. 21).

Central tooth of radula, 240 × 144 μm, with a narrow, rounded blade, pinched in the distal half; first lateral teeth triangular, with two wing-like processions directed outward (fig. 25). Head of the major lateral tooth unicuspidate, the cusp rather long, slender, sharply poined (fig. 24); spatulate uncinal teeth



Figs. 14-25. *Leptochiton (Leptochiton) permodestus* spec. nov., holotype (14) and disarticulated paratype (15-25). 14, camera lucida sketch of whole specimen (holotype), lateral view, × 9.6; 15, valve IV, dorsal view, × 20; 16, do, camera lucida sketch, rostral view, × 20; 17, camera lucida sketch of valve VIII, lateral view, × 20; 18, valve VIII, dorsal view, × 20; 19, detail of sculpture on pleural side of lateral area, valve IV, × 40; 20, dorsal girdle spicule, × 200; 21, ventral girdle scale, × 200; 22, dorsal scale, × 200; 23, spatulate uncinal radula tooth, × 100; 24, head of major lateral radula tooth, × 100; 25, central and first lateral radula teeth, × 100.

slightly curved, with a narrow blade (fig. 23).

Gills merobranchial, adanal, with 12-14 ctenidia on either side.

Etymology. — From the Latin *permodestus,* meaning very modest, in reference to its sculpture.

Observations. — In some respects *L. permodestus* resembles *L. alveolus* (Lovén, 1846) and *L. belknapi* Dall, 1878. From *alveolus* it differs in being less elongated and less elevated; the granulation of the tegmentum is much coarser, the granules near the front margin on the pleural sides of the valves measuring 80-100 μm in diametre in a 6 mm long specimen, whereas the granules of an almost twice as large specimen of *alveolus* are twice as small (42-50 μm). The dorsal girdle scales are also quite different.

L. belknapi, although coarser granulated than *alveolus*, differs from *permodestus* especially in its more solid, carinated valves, with straight side slopes (*permodestus* and *alveolus* are both round-backed).

Leptochiton (Leptochiton) meiringae spec. nov.
(figs. 26-30)

Material. — S Africa, Eastern Cape, off East London, 33°04.7'S 28°07.2'E, 90 m, coarse sand, sponges, gorgonians, 17.vii.1984, 1 specimen, partly broken along median axis (holotype), curled up, NMP D265/T3046.

Description. — Animal small, at best 6 × 3 mm, broadly oval, moderately elevated, slightly carinated. Valves hardly beaked, lateral areas moderately raised. Colour of tegmentum yellowish (fig. 26).

Head valve semicircular, covered with much crowded, minute, little elevated, flat, round granules arranged in radiating, branching series. Anterior slope straight. Intermediate valves broadly rectangular, posterior margin widely V-shaped to almost straight, side margins bluntly rounded. Lateral areas sculptured like head valve, central areas ornamented with c. 36 elevated longitudinal chains of oval granules, resembling strings of flattened beads, on the jugum close together, towards the sides wider apart (fig. 27), the interstices somewhat latticed. Tail valve rather short, anterior margin almost straight, mucro posterior, at about two thirds of the length of the valve, posterior slope deeply concave. Antemucronal area sculptured like central areas of intermediate valves, postmucronal area like head valve.

Articulamentum white, very thin, especially towards the outer margins, which are very porous.

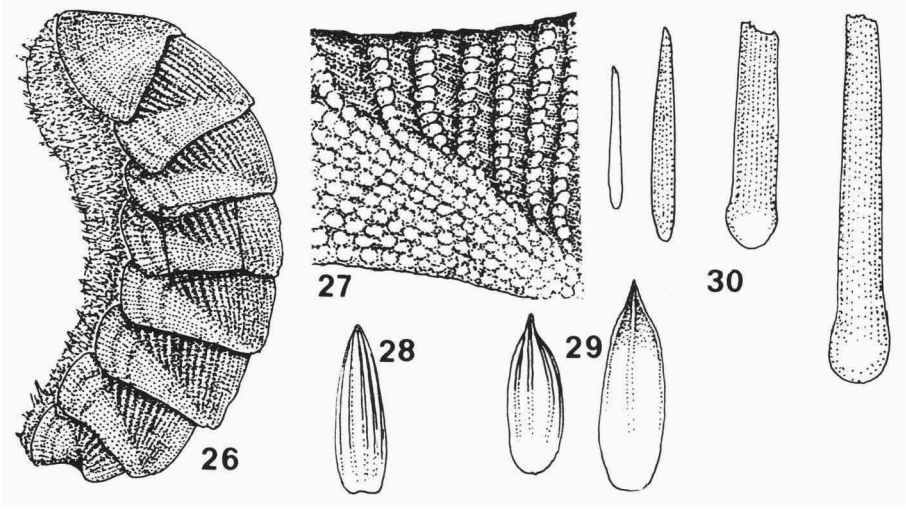
Girdle rather narrow, covered with elongate oval, bluntly pointed,

longitudinally striated scales, about 96 × 28 μm (fig. 28), interspersed with finely striated, straight, slender spicules, tapering to a rather sharp point, varying in size from 80 × 8 μm to more than 300 × 28 μm. There are no bunches of intersegmental spicules. Ventral side of girdle paved with radiating rows of imbricating oval scales, up to 120 × 36 μm, with three sharp, narrow riblets on the distal half, which is abruptly sharply beaked (fig. 29).

Gills merobranchial, adanal, with c. 10 ctenidia on both sides.

Observations. — Of the unique specimen the valves III-VII are broken along the median axis, so that it was not possible to dissect it without it falling apart into sherds. That is why the radula has not been taken out and described. By its sculpture it is easily recognized from the other S African species of *Leptochiton*. It mostly resembles the strictly littoral Australian *L. (L.) liratus* (H. Adams & Angas, 1864), which, however, growth more than twice as large and has a different girdle covering.

Etymology. — I take pleasure in naming this species after the RV Meiring Naudé.



Figs. 26-30, *Leptochiton (Leptochiton) meiringae* spec. nov., holotype. 26, whole specimen, lateral view, × 12; 27, detail of tegmental sculpture (the square in fig. 26), × 50; 28, dorsal girdle scale, × 125; 29, ventral scales, × 125; 30, dorsal spicules, × 125.

12. *ISCHNOCHITON OBTUSUS* CARPENTER IN PILSBRY, 1893, REDISCOVERED (figs. 31-40)

Recently Dr. Ir. J.J. van Aartsen handed to me two loose valves of a chiton species found in shell-grit from the Ria de Arosa, Spain, dredged by Dr. G.C. Cadée in 1962 during the RMNH/RGM Ria de Arosa expedition. The shell plates, a tail valve and an intermediate valve, are much eroded, the inside callous, the insertion plates almost worn away. They are of a uniform pale greyish colour. There is not the slightest doubt as to their identity, for they perfectly match the corresponding valves of the holotype of *Ischnochiton obtusus* Carpenter in Pilsbry, 1893.

I. obtusus, described in MS by Carpenter (before 1875) from a single specimen in the Cuming collection, labelled "Portugal", was originally, although with some doubt, allocated to the genus *Lepidopleurus* sensu Carpenter, 1873 (*non* Gray, 1847) = *Lepidozona* Pilsbry, 1892. Carpenter's Latin diagnosis was translated by Pilsbry and published in Tryon's Manual of Conchology, vol. 14: 134 (1893) in the section *Lepidozona* of the genus *Ischnochiton*. Both texts are quoted here side by side.

Carpenter's diagnosis
MS 1: 118
"*?Lepidopleurus obtusus* n. s.

?L. t. minore, valde elevatâ, ovali, jugum parum acuto; mucrone mediano, conspicuo; rufofuscâ, pallidiore varie maculatâ; ar. centr. sulcis altis subparallelis utr. lat. circ. 10, supra jugum obsoletis; ar. lat. rugis radiantibus 3-4, interdum divaricantibus, v. term. 20-40 irregularibus, à rugis incrementi huc et illui interruptis; intus, v. post. 8-, ant. 9-, lat. 1- fiss., fissuris parvis; dent. brevissimis, obtusissimis, interdum rugulosis sed haud pectinatis, intus callosis; subgr. minimis; sinu modico, excurvato, laevi; zonâ squamulis minoribus, solidissimus, subrotundatis, laevibus, confertissime instructâ.

Long. .5, lat. .3, div. 85°.

Hab. Portugal; Mus. Cum. no. 105" (shorthand notes in pencil in the margin; only the name *mertensii* in ordinary handwritting)

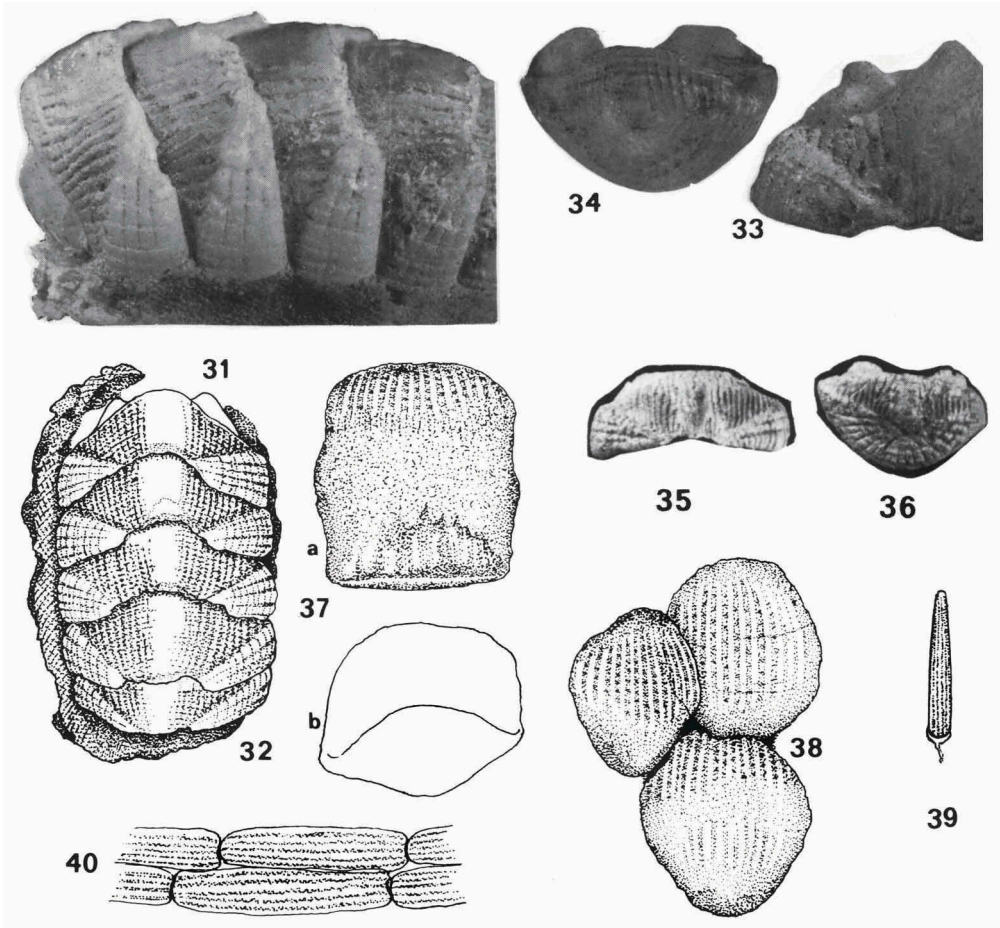
Pillsbry's translation
Man Conch. 14: 134
"*Ischnochiton (Lepidozona) obtusus* Carpenter n. sp.

Shell small, strongly elevated, oval, the jugum little acute; mucro median, conspicuous. Reddish brown variously maculated with paler. Central areas having about ten subparallel deep sulci on each side, obsolete upon the jugum; lateral areas with 3 to 4 radiating wrinkles, sometimes divaricating, the end valves having 20 to 40, here and there interrupted by wrinkles of growth. Interior: posterior valve having 8, central valves 1, anterior valve 9 slits; slits small, teeth very short and obtuse, sometimes rugulose or almost pectinated; calloused inside; eaves small; sinus moderate, excurvated, smooth. Girdle furnished with very close, small, very solid, rounded, smooth scales.

Length $12\frac{1}{2}$, width $7\frac{1}{2}$ mm; divergence 85°.

Portugal (Mus. Cum., no. 105) A remarkable shell, presenting some general resemblance to *mertensii* in the appearance of the valves."

"The girdle scales are as small as in *Trachydermon*, but very solid. The specimen is much worn outside, which may account for the bluntness and callosity of the teeth. (*Cpr.*)"



Figs. 31-40. *Ischnochiton (Ischnochiton) obtusus* Carpenter in Pilsbry, 1893. 31, latero-dorsal view of partly disarticulated specimen, × 11; 32, dorsal view of same, × 4.8; 33, valve II, latero-dorsal view, × 9; 34, valve VIII, dorsal view, × 9; 35, intermediate valve, dorsal view, × 6; 36, valve VIII, dorsal view, × 6; 37, isolated dorsal girdle scale, × 200, a dorsal view, b ventral view; 38, dorsal scales in situ, × 200; 39, dorsal spicule, × 380; 40, ventral scales, × 40. — 31-34, 37-40, holotype from Portugal, BMNH 1951.2.1.13 (ex Mus. Cuming); 35-36, loose valves dredged in Ria de Arosa, Galicia, Spain, Dr. G.C. Cadée leg., K 5009.

A few years ago Mrs. K.M. Way of the British Museum (Natural History), Mollusca section, generously granted me the loan of the holotype, registered BM(NH) 1951.2.1.13. It is preserved dry, the weak parts of the animal removed, valves I, II and VIII disarticulated (figs. 31-34). The coulour of the tegmentum, as described above, has vanished in the course of more than a century. It is now of a uniform pale greyish. The species certainly cannot be

attributed to the genus *Lepidozona*, which is especially characterized by a sutural lamina, separated from the apophyses by notches, and pectinated on the inside, a feature not shown in *I. obtusus*.

Dorsally the girdle is covered with imbricating, roundish to squarish, slightly curved scales, sculptured with c. 18 longitudinal, faint riblets, as wide as the finely pitted interstices, 100-140 μm long (figs. 37-38). Among these, scattered without order, small, striated, bluntly pointed spicules in stalked chitinous cups are found, about 70 μm long (fig. 39). Ventrally the girdle is paved with close radiating series of elongate, rectangular, striated scales, more than four times as long as wide, 72 × 16 μm (fig. 40).

Thanks are due to Ir. A. Verduin, who is responsible for the photographs of the holotype (figs. 31, 33, 34).

The two valves from Ria de Arosa, Galicia, Spain (figs. 35, 36), prove that the habitat "Portugal" given by Hugh Cuming, is reliable. Apparently *I. obtusus* is a rare species, possibly living in crevices of rocks exposed to heavy surf, judging from the much eroded valves.

13. ON SOME LITTLE KNOWN CHITONS FROM THE TROPICAL WESTERN PACIFIC OCEAN

(map 1, figs. 41-54)

Dr. Philippe bouchet, curator of marine mollusks at the Muséum National d'Histoire Naturelle, Laboratoire de Malacologie, Paris, sent me for identification a few samples of chitons collected by him during the "Corindon"-Makassar-Expédition, 1980, and the "Vauban"- New Caledonia-cruises, 1978-79, in the tropical western Pacific. Six speciments of chitons were procured, belonging to four species, viz:

Leptochiton (L.) lineatus (Nierstrasz, 1905)

Lepidopleurus lineatus Nierstrasz, 1905: 8, pl. 1 fig. 4, pl. 2 figs. 48-51.
Leptochiton (L.) lineatus; Kaas, 1982: 87 (bibliography and synonymy); Kaas & Van Belle, 1985: 113, fig. 49, maps 22, 44.

Material. — "Corindon"-Makassar-Expédition, 1980, sta. CH 209, 00°07'S 117°53'E, 490 m, 1 specimen, MNHN.

Nierstrasz reported it from four stations in the Indonesian Archipelago. Leloup (1981: 317, as *Lepidopleuris belknapioides*) and Kaas (1982: 87)

reported it from many stations of the French "Musorstom" 1 and 2 Philippines Expeditions, 1976 and 1980, in the northern part of the Verde Island Passage, between the Lubang Is and Luzon (130-137 m).

Leptochiton (L.) rissoi (Nierstrasz, 1905)

Lepidopleurus rissoi Nierstrasz, 1905: 6, pl. 1 fig. 5, pl. 2 fig. 52, pl. 3 figs. 53-55: Ferreira, 1979: 163, figs 30-32.
Leptochiton (L.) rissoi Kaas & Van Belle, 1985: 110, fig. 48, map 24. *Non*: *Leptochiton rissoi*; Ferreira, 1981: 36, figs 1-2.

Material. — "Corindon"-Makassar-Expédition, 1980, sta. CH280, 01°59'S 119°10'E, 715-800 m, 1 specimen c. 40 × 22 mm, MNHN.

Nierstrasz reported 10 syntypes from six "Siboga" stations in the Indonesian Archipelago between 3°27.1'N and 10°39'S, and between 119°08.5'E and 131°00.5'E, in depths varying from 216 to 2053 m, the largest syntype measuring 25 × 13 mm.

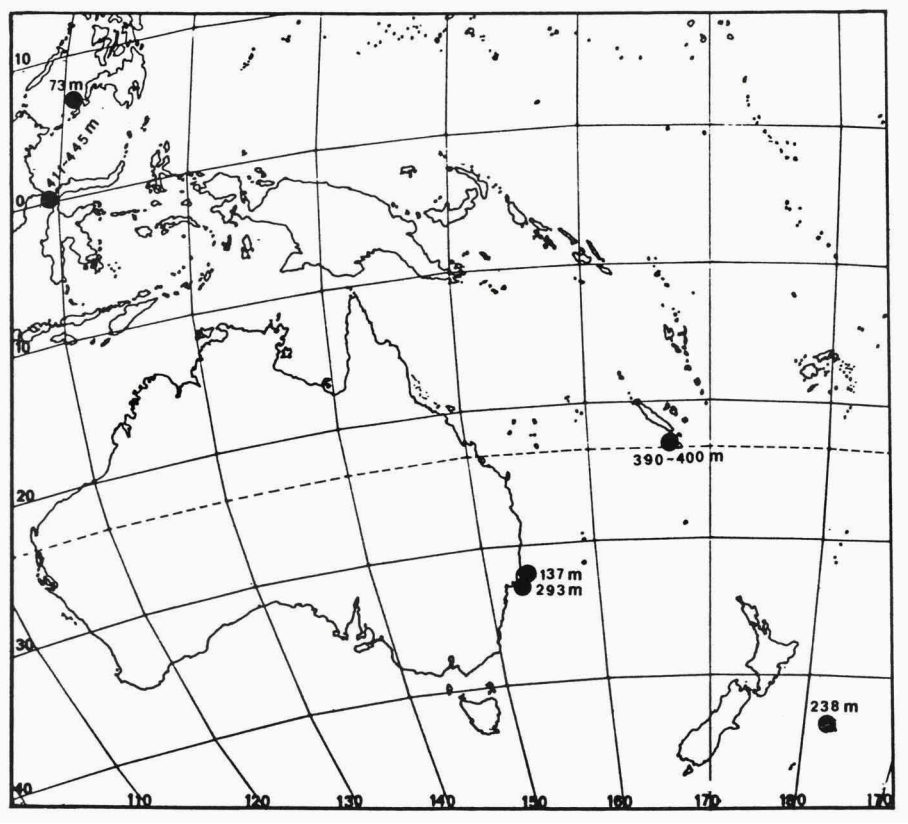
The *"L. rissoi"* reported by A.J. Ferreira from the western shores of the Americas proved to be misidentified. It is described as *L. (L.) americanus* in Kaas & Van Belle, 1985: 91, fig. 40, map 41.

Loricella oviformis (Nierstrasz, 1905)

Squamophora oviformis Nierstrasz, 1905: 50, pl. 1 figs. 15-16, pl. 4 figs. 97-101.
Paricoplax profundior Dell, 1956: 157, pl. 21 figs. 213-219.
Componochiton raceki Milne, 1963: 25, figs. 1-5.

Material. — "Corindon"-Makassar-Expédition, 1980, sta. CH229, 00°02'S 119°50'E, 411-445 m, 1 specimen, 15.5 × 12 mm, MNHN; "Vauban"-cruises (P. Bouchet), 1978-79, sta. 16, 22°46'S 167°12'E, 390-400 m, 1 specimen, 13 × 7.5 mm (girdle folded under), MNHN; "Siboga" Exp., 1899-1900, sta. 108, 6°10.3'N 121°32'E, 73 m, 1 specimen, 20 × 13 mm, holotype of *Squamophora oviformis* Nierstrasz, 1905, in ITZ (partly disarticulated).

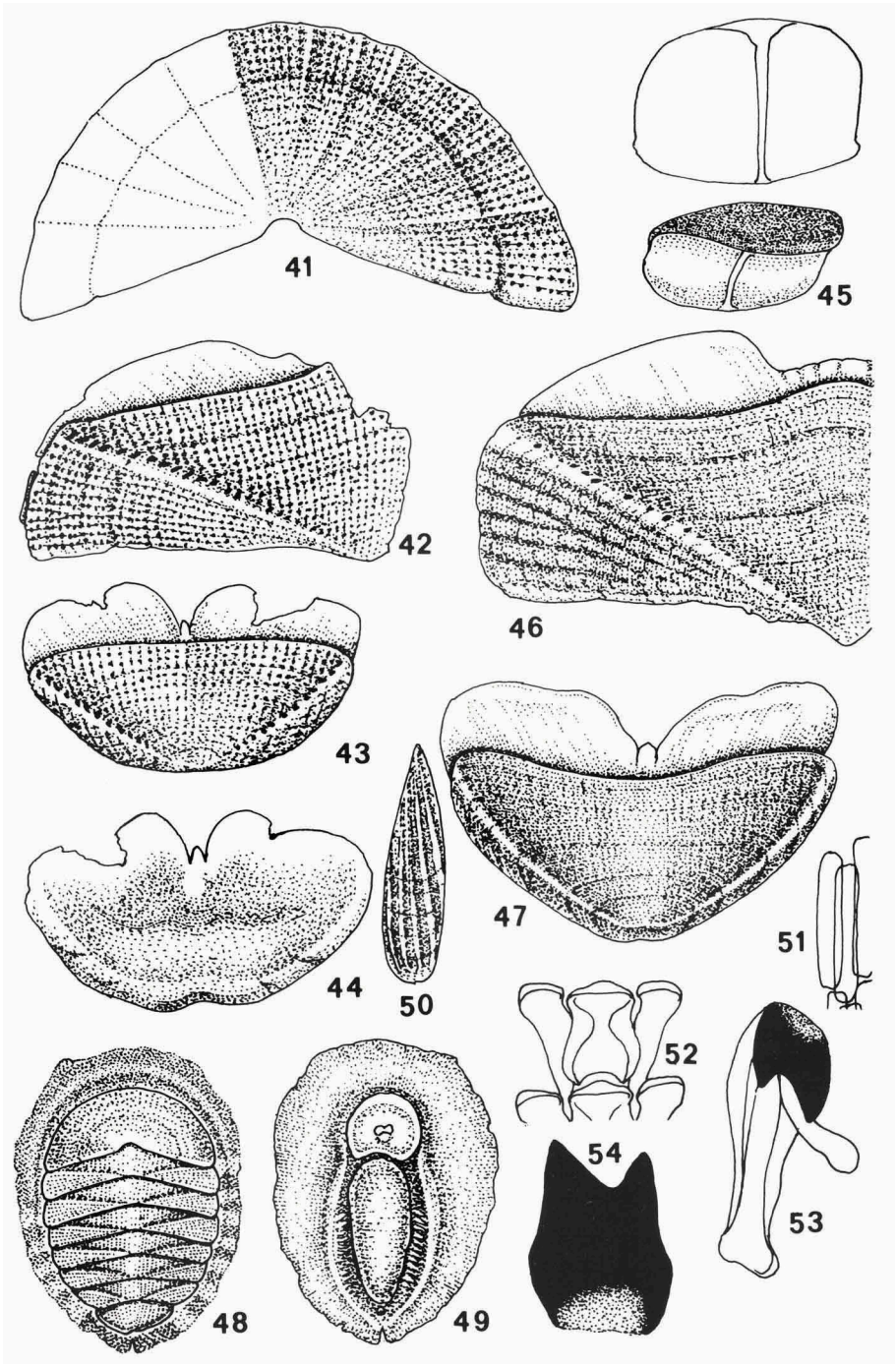
This species has puzzled all chiton workers confronted with it. Nierstrasz (1905:51) placed it in the Mopaliidae on account of the possession of a median posterior sinus in the unslit tail valve (like *Plaxiphora* Gray), but the girdle covering (scales) is not Mopalioid, so he created a new genus *Squamophora* for it. R.K. Dell (1956: 158) placed it in the genus *Paricoplax* Iredale & Hull, 1929, which is a mere synonym of *Callochiton* Gray, 1847, describing it as *P. profundior*. His specimens (holotype in the NMNZ no. M 9727, paratypes in the NMNZ and Canterbury Museum) were dredged off the Forty-fours (=



Map 1. Distribution of *Loricella oviformis* (Nierstrasz, 1905)

Chatham Is, New Zealand). K.L. Milne (1963: 25) studied specimens dredged off the coast of central New South Wales, Australia (off New Castle and Port Stephens, 1959). He also created a new genus for it, *Componochiton*, as he thought it to be a mixture of characteristics typical for several different genera, calling it *Componochiton raceki* (holotype in AMS, no. C 63297, paratype in NMV no. F 23568, disarticulated). It is hard to understand why none of them recognized the genus *Loricella* Pilsbry, 1893 (Schizochitonidae; type-species: *L. angasi* (H. Adams & Angas, 1864) from South Australia and Tasmania, N to New South Wales) as the proper one to receive it.

There are some minor differences between the three "species" listed above and the new specimens collected by the "Corindon" and "Vauban" Expeditions. The new specimens agree in all respects with the descriptions and figures given by Dell and Milne. All valves are sculptured with very fine riblets, the interstices deeply pitted – or rather punctured – radiating in the head valve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and the well raised lateral areas of the intermediate valves, longitudinally arranged on the central areas. There is a row of larger and deep pores just before the diagonal ridges (fig. 42). The head valve (fig. 41) shows 11 somewhat stronger radial riblets, corresponding with the slits in the insertion plate. The tail valve (fig. 43) has a small posterior median sinus and a callous ridge instead of an insertion plate (fig. 44). A few indistinct grooves on both sides of the posterior sinus are quite unlike the slits in the other valves.

Of the holotype of *S. oviformis* I could study three isolated valves (figs. 46, 47), for which I thank Mr. R.G. Moolenbeek of the ITZ, department of Malacology. Only the pores along the diagonal ridges of II-VIII are still present; the others, and also the riblets on the central areas, are obviously overgrown, though still discernible in some places. The lateral areas bear 7-9 radiating riblets, some of them anastomosing towards the side margins; here all pores have disappeared.

The girdle is densely covered with imbricating, strongly vaulted, smooth scales, up to 140 × 95 μm, strengthened by a peculiar central rib on the ventral side (fig. 45). The "Corindon" specimen from Makassar Strait shows obsolete riblets on the central areas, separated by rows of small pores. The lateral areas appear almost smooth, with 8-10 radiating series of very small pores.

Marginal spicules lengthwise somewhat spirally grooved, pointed or blunt, up to 40 × 16 μm (fig. 50); ventral side of girdle covered with radiating series of elongate, rectangular scales, 80 × 16 μm (fig. 51).

There is a narrow, deep median slit in the girdle, just behind the sinus in the tail valve (fig. 48). The radula has a short and broad central tooth with a narrow blade; first lateral teeth slender, also with a small blade (fig. 52); major lateral tooth with a club-shaped protuberance just beneath the bicuspid head (figs. 53, 54).

The head of the animal is relatively large, round, half as long as the foot (fig. 49). Gill-rows occupying 3/4 the lenght of the foot, abanal, with 16/17 ctenidia in the Makassar specimen, 15/15 in the New Caledonian one. Slit-formula: 11-16/1/-. Largest specimen (holotype of *oviformis*): 20 × 13 mm.

Figs. 41-54. *Loricella oviformis* (Nierstrasz, 1905). 41-44, valves I, II and VIII (dorsal and ventral view) respectively, × 10; 45, dorsal girdle scales, × 210; 46-47, valves II and VIII, dorsal view, × 10; 48-49, whole specimen, dorsal and ventral view, × 2.5; 50, marginal spicule, × 425; 51, ventral girdle scales, × 210; 52, central and first lateral radula teeth, × 210; 53, major lateral tooth, × 210; 54, head of major lateral tooth, × 425. — 41-45, specimen from S New Caledonia, 390-400 m, MNHN; 46-47, holotype of *Squamophora oviformis* Nierstrasz, 1905, ITZ; 48-54, specimen from Makassar Strait, MNHN.

In the first instance I was inclined to regard *S. oviformis* as specifically different from the Australasian forms, but the finding of the Makassar specimen, which is somewhat intermediate between the two extremes, convinced me of their conspecificity, although it is quite thinkable that they will prove to be separable as subspecies if more specimens will turn up.

Placiphorella albitestae Is. Taki, 1954

Placiphorella albitestae Is. Taki, 1954: 22, pl. 11 figs. 1-2, pl. 12 figs. 1-3, 6-7, pl. 13 figs. 1-5, 10-12, pl. 14 figs. 1-4, pl. 15 figs. 3-6; 1962: 34; Iw. Taki, 1964: 411.

Material. — "Corindon"-Makassar-Expedition, 1980, sta. CH 229, 00°02'S 119°50'E, 411-445 m, 2 specimens: 21 × 17 and 18 × 18 mm (curled), MNHN.

This is the first record of a *Placiphorella* species in Indonesian waters. It is in all respects in accordance with Taki's ample description and beautiful illustrations of *P. albitestae*, which was hitherto only known from Japan, Honshu, Sagami Bay and off the NE Prefecture of Aomori, in depths of 200-550 m.

The (sub-) genus *Placophoropsis* Pilsbry, 1893 (type-species: *P. atlantica* (Verrill & Smith, 1882), by Monotypy) is said to differ from *Placiphorella* in having a multislit head valve and an unslit tail valve. However, in a specimen of *P. atlantica* from the Bay of Biscay (K 4753) I find an obsolete but distinct slit on both sides at some distance from the median sinus in the tail valve callus, just as in *P. velata* (Carpenter MS) Dall, 1879, whereas the Makassar specimens of *albitestae* are devoid of any slits in the tail valve. In *P. velata* from Monterey Bay, California, I count eight distinct slits in the head valve, the teeth being grooved but not subdivided, in *P. atlantica* 14 main slits and some minor incisions. Isao Taki found 14 distinct slits in *albitestae*; in the Makassar specimens it is hard to distinguish main slits from secondary slits, although some are rather deep, others only shallow, in all more than 20. In *P. japonica* (Dall, 1925) the slits in the tail valve become obsolete in adult specimens (teste Is. Taki, 1954: 24). Juveniles of *albitestae* appear to have a slit tail valve, the slits becoming overgrown by the callus in adults (Taki, loc. cit.). I therefore agree with Isao Taki that "the number of slits both in the head and the tail valve is not the definite characteristic and that will be readily traceable to the splitting or degeneration of slits on the valves. On this point of view *Placophoropsis* cannot be separated from *Placiphorella*." (Taki, loc. cit., p. 27).

14. *ISCHNOCHITON (STENOSEMUS) VANBELLEI* SPEC. NOV., A NEW MEDITERRANEAN CHITON

(map 2, figs. 55-68)

My friend and cooperator Richard A. Van Belle (1977) published (in Dutch) a note on ill-known chitons of the Mediterranean. Among them were 16 loose valves, obviously belonging to the same species, dredged in a depth of 480-530 m in the Sicily Channel near the Isle of Malta, sent to him for identification by Mr. S. Palazzi of Modena, Italy. Van Belle described and illustrated four of them (p. 28-31, figs. 3-6) and provisionally identified them as *Chiton (Simplischnochiton)* cfr. *dorsuosus* (Haddon, 1886).

A close comparison of seven of these valves in Van Belle's collection with the type of *Lepidopleurus dorsuosus* Haddon, 1886, BM(NH) 1889.11.9.8, which was made possible by the courtesy of Mrs. K.M. Way, revealed that they could not be conspecific. Moreover, *L. dorsuosus* appeared to be synonymous with *Ischnochiton (Stenosemus) exaratus* (G.O. Sars, 1878). Probably Van Belle was misled by the report of *I. dorsuosus* from the Azores by Dautzenberg & Fischer (1896: 101), which also proved to relate to *I. (S.) exaratus* (*fide* Kaas, 1979: 29). In the same paper I expressed the opinion that Van Belle's possible *dorsuosus* might be *Ischnochiton obtusus* Carpenter in Pilsbry, 1893, which also proved to be a wild guess as will be shown hereafter.

Recently Mr. Giacomo di Paco of Livorno, Italy, sent me a photograph of a chiton, c. 7 × 4 mm, attached to a small piece of white coral, which was dredged by fishermen off the Isle of Gorgona, Tuscan Archipelago, Ligurian Sea, in a depth of c. 400 m (fig. 55). From its girdle alone the specimen reminded me of a species of *Ischnochiton* Gray, 1847, subgenus *Stenosemus* von Middendorff, 1847. On my request Mr. di Paco was kind enough to send me the specimen on loan, permitting me to disarticulate it in order to make a thorough scrutiny possible.

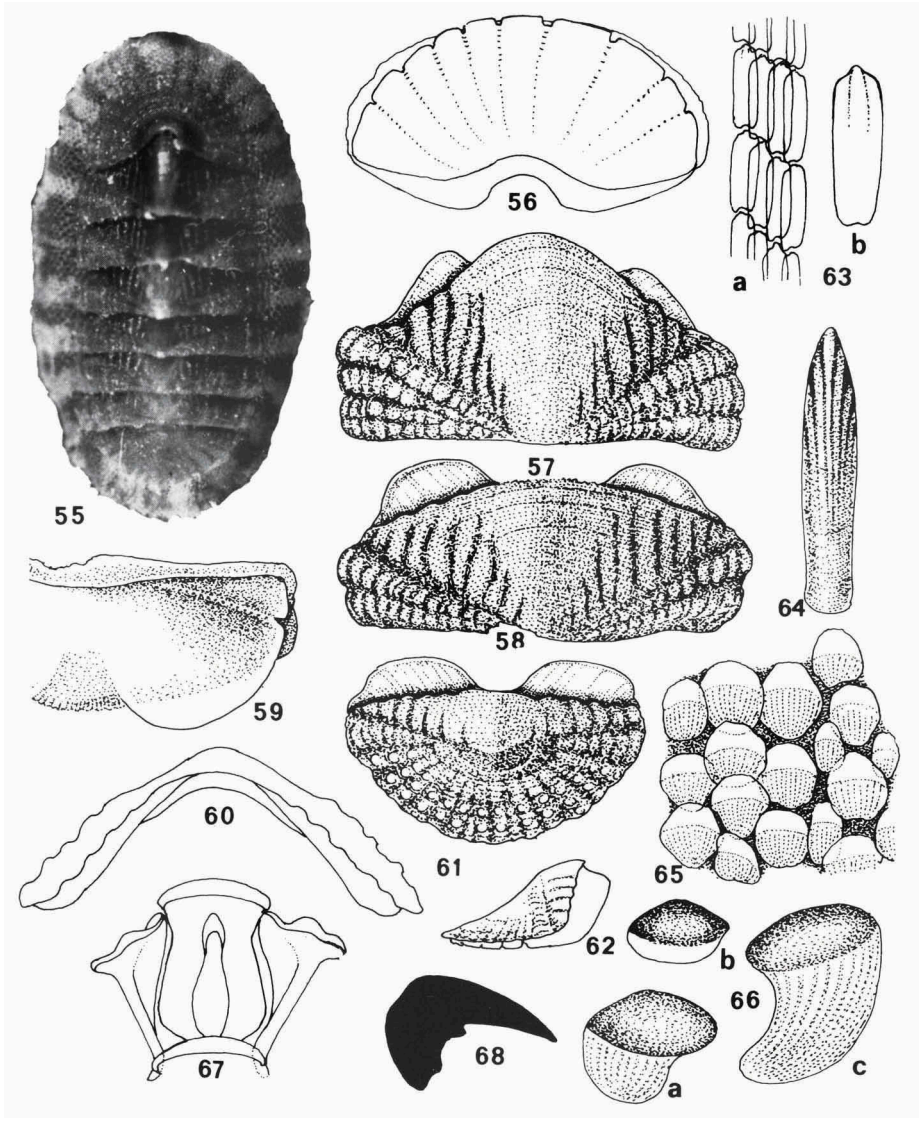
It soon became clear that this is the species to which the Maltese valves belong. As it appears to represent a hitherto unknown species it is designated here as the holotype, to be stored in the collection of the Museo di Storia Naturale di Livorno. Just after the first draft of this paper had been written, Mr. Franco Biondi, also of Livorno, sent me a photograph and, at my request, also the specimen of a second sample dredged in the same area, which becomes a paratype. Other paratypes are the Maltese loose valves in custody of the Paleontological Institution, Modena, Italy, and in the Van Belle collection.

Ischnochiton (Stenosemus) vanbellei spec. nov.

Material. — Off the Isle of Gorgona, Tuscan Archipelago, Ligurian Sea, on white coral, c. 400 m, 1984, G. di Paco leg., 1 specimen, dry, c. 7 × 4 mm, holotype, now disarticulated, radula and perinotum mounted in slides, Museo di Storia Naturale di Livorno, reg. no. 1582: Off the Isle of Capraia, "Shoal of the Widows", Tuscan Archipelago, Ligurian Sea, on white coral, c. 550 m, 1984, F. Biondi leg. and coll., 1 specimen, dry, 8.95 × 5.85 × 1.75 mm, paratype; Sicily Strait, off the Isle of Malta, 480-530 m, September 1971, S. Palazzi leg., 16 loose valves, viz one valve VIII, one valve II and seven other intermediate valves (paratypes) in the Paleontological Institution, Modena, Italy; one valve VIII, two valves II and four other intermediate valves (paratypes) in coll. Van Belle, no. 2906a.

Diagnosis. — Animal oval, small (estimated maximum length c. 10 mm), moderately to rather highly elevated (dorsal elevation varying from c. 0.3 to 0.5: holotype 0.37), carinated, side slopes nearly straight to slightly convex, the valves not or only little beaked (fig. 55). Head valve and post-mucronal area of tail valve with c. 16 nodulose radiating riblets. Lateral areas of intermediate valves raised, with two (by splitting sometimes 3-4, especially in valve II) radiating nodulose riblets. Central areas of intermediate valves and antemucronal area of tail valve with a variable number of longitudinal sulci on the pleurae, much narrower than the smooth, rounded ribs separated by them. Girdle rather wide, paved with relatively large, short, bent, round-topped, juxtaposed, calcareous corpuscules. Colour of tegmentum either brick red (holotype), or dark purple (paratype from Capraia), or variegated with yellowish and dark brown (Maltese valves), the girdle banded in the same colours, alternately light and dark.

Description. — Valve I relatively large, about semicircular, posterior margin widely V-shaped, with a rounded notch at the apex (fig. 56), tegmentum sculptured with 16 little raised, radiating, nodulose riblets, the nodules somewhate squarish as they are formed by many concentric grooves crossing the riblets; they become larger towards the periphery. Intermediate valves (figs. 57-60) about rectangular, posterior margin almost straight, the sides more or less truncated, with decidedly raised lateral areas bearing two nodulose riblets, separated by a shallow groove; only valve II, which is by far the longest, has mostly three or four ribs on the lateral parts. Central areas with (in the holotype) 7-9 longitudinal sulci on either side (more in larger specimens), the three or four innermost sulci not reaching the anterior margin, the others slightly scalloping the front margin, the ribs separated by them are smooth, rounded, much wider. Jugal area more or less triangular, smooth. Valve VIII rather short, twice as wide as long, the hinder margin about one third of a circle, the mucro anterior, little elevated, at about one third of the



Figs. 55-68. *Ischnochiton (Stenosemus) vanbellei* spec. nov., holotype. 55, whole specimen before disarticulation, dorsal view, × 8.4 (Filli Seghetti photograph); 56, camera lucida sketch of valve I, ventral view, × 17.5; 57, valve II, dorsal view, × 17.5; 58, valve V, dorsal view, × 17.5; 59, do, ventral view, × 17.5; 60, camera lucida sketch of do, anterior view, × 17.5; 61, valve VIII, dorsal view, × 17.5; 62, do, lateral view, × 17.5; 63, ventral girdle scales, a in situ, × 175, b isolated scale, × 350; 64, marginal spicule, × 350; 65, dorsal corpuscules in situ, × 87.5; 66a, b, c, isolated corpuscules, × 175; 67, central and first lateral radula teeth, × 350; 68, head of major lateral tooth, × 175.

valve's length (figs. 61, 62). Postmucronal area with 16 radiating nodulose riblets, crossed by many concentric grooves; posterior slope weakly concave, antemucronal area sculptured like the central areas of the intermediate valves.

Articulamentum whitish, the colour of the tegmentum shining through. Apophyses small, evenly rounded, separated by a wide, about straight jugal sinus (convex in valve II, narrow in valve VIII), very finely dentated at the inside. Insertion plates short, head valve with nine slits, intermediate valves with 1-1 slits, tail valve with nine inequidistant slits (holotype) or little more, the teeth blunt, somewhat rugose on the inside, slit rays very finely perforated; eaves narrow, solid.

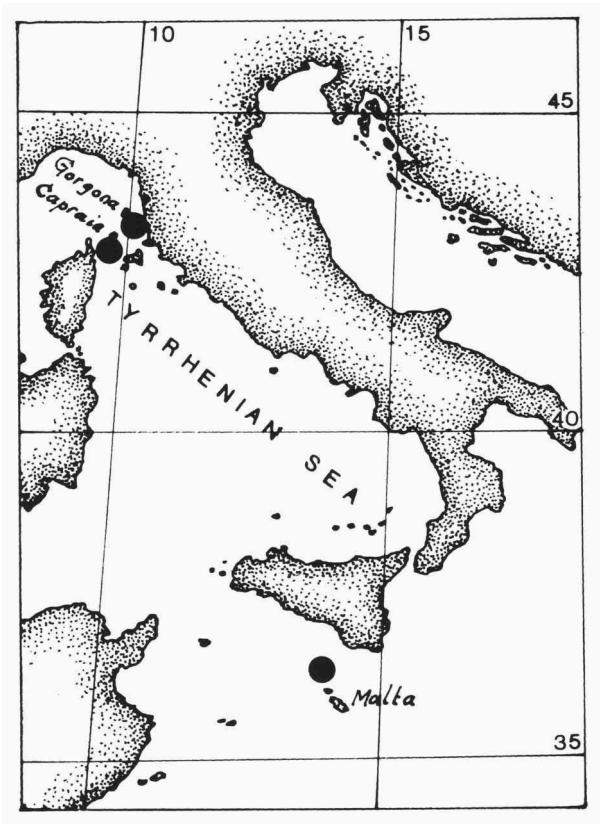
The girdle does not essentially differ from that of other species of the subgenus *Stenosemus*. It is rather wide (the central valves occupying about 60% of the total width of the animal), paved with short, curved, inverted cone-shaped calcareous corpuscules, more or less juxtaposed, not imbricating, the narrow base irregularly longitudinally grooved, the rounded "heads" smooth, sticking out of the cuticula (figs. 65, 66). They are more or less regularly quincuncially arranged, the largest c. 125 μm long, 80 μm in diameter (maximum 130 $\times$ 100 μ). There is a marginal fringe of slender, lanceolate spicules, sculptured with longitudinal deep grooves, diverging towards the top, c. 105 $\times$ 40 μm (fig. 64). Ventral side of the girdle covered with radiating rows of rectangular scales, bluntly rounded at the top, the rows partly covering each other, on the middle of the girdle the scales measure c. 56 $\times$ 16 μm (fig. 63).

Rhachidian tooth of the radula short, about 1.5 $\times$ as long as wide, a little pinched directly behind the narrow blade; first laterals elongate triangulate, with a narrow, sinuous blade (fig. 67); major laterals with a bidentate head, the main denticle long and sharply pointed, accompanied by a very small outer denticle near the base (fig. 68).

Distribution. — *I. (S.) vanbellei* appears to be a Mediterranean deep water species, by preference dwelling on the white coral banks at a depth of 400-500 m (map 2).

Etymology. — This species is named in honour of its first examiner, Mr. Richard A. Van Belle of Sint-Niklaas, Belgium, scientific collaborator of the Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussels.

Observations. — The present species is the third European representative of the subgenus. *Stenosemus*, the others being *I. (S.) albus* (Linnaeus, 1767), an arctic-boreal, circumpolar species with finely granulated, almost smooth, white valves and girdle, and *I. (S.) exaratus* (Sars, 1878), with finely longitudinally grooved central areas, and a great many fine riblets on end valves and lateral areas, always white, occurring from the Arctic Ocean



Map 2. Distribution of *Ischnochiton (Stenosemus) vanbellei* spec. nov.

throughout the whole Atlantic to the Antarctic seas, even penetrating into the Pacific along the SW coast of Chile.

Three more species are *I. (S.) simplicissimus* Thiele, 1906, off the Cape of Good Hope, *I. (S.) acelidotus* Dall, 1919, from the Magellan Straits, and *I. (S.) chiversi* (Ferreira, 1981) from the NE Pacific. With the exception of *albus*, the bathymetric range of which varies from subtidal to almost 1000 m, all others are found in depths from at least 100 to more than 4000 m.

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I wish to express my gratitude for the generosity shown by Mr. Giacomo di Paco of Livorno, by putting the holotype specimen – unique at the time – at my disposal for examination and description, and for his decision to entrust it to the Livorno Museum of Natural History, in care

of Dr. Gianfranco Barsotti, curator. I also thank Mr. Franco Biondi, Livorno, for his kindness to lend me the paratype specimen from his collection, and Mr. Richard A. Van Belle, Sint-Niklaas, Belgium, for the loan of the Maltese valves. Thanks are also due to MM Seghetti, Livorno, for the photograph of the holotype, shown in fig. 55.

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