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# New species and a new genus of chitons (Mollusca: Polyplacophora) from Polynesian coral reefs

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Two new species of Polyplacophora from Polynesia are described, viz. *Weedingia alborosea* gen. nov., sp. nov. from Tikehau in the Tuamotu Archipelago and *W. mooreana* sp. nov. from Moorea in the Society Islands. The new genus *Weedingia* is classified with the Hanleyidae in the suborder Lepidopleurina.

Key words: Polyplacophora, Hanleyidae, taxonomy, Polynesia.

## INTRODUCTION

Mrs. Dr. Mireille Peyrot-Clausade of the Station Marine d'Endoume, Marseille, France, sent me for identification a lot of chitons which she collected on the Great Barrier Reef, Queensland, Australia, and in the Tuamotu and Society Islands, Polynesia. Among them are four samples of two small species from Polynesia that cannot be identified with any known Recent form of Polyplacophora, as they possess unslit insertion plates on all valves.

So far there is only one Recent species known with unslit insertion plates on all valves, *Choriplax grayi* (H. Adams & Angas, 1864) from southern Australia, but that species has the tegmentum much reduced and, consequently, very large insertion plates. That is the reason why Starobogatov & Sirenko (1975) erected the new suborder Choriplacina for it.

The new species have a normal, finely pustulose tegmentum, not clearly divided into central, lateral or jugal areas, and well developed unslit insertion plates on all valves, a more or less spinulose girdle and merobranchial, adanal (with interspace) gills.

From a conchological point of view, the Polynesian specimens somewhat resemble certain species of the extinct genus *Afossochiton* Ashby, 1925, from Pliocene beds in Victoria, Australia, originally considered to be unslit allies of the Acanthochitonidae, but classified as the family Afossochitonidae in the suborder Lepidopleurina by Van Belle (1981: 8, and 1983: 59). Gowlett-Holmes (1987: 109) recognizes *Afossochiton* again as a genus of Acanthochitonidae, so that Afossochitonidae becomes a synonym.

However, the new species differ from *Afossochiton* in the absence of a well marked jugal area, which is a unique feature of the Acanthochitonidae. As the shape of the tail valve in no way resembles that of the Acanthochitonidae and the girdle does not show any trace of pocketed sutural tufts, it seems justified to incorporate them in the suborder Lepidopleurina, family Hanleyidae, of which the genus *Hanleya* Gray, 1857, has an unslit insertion plate on valve I only; the genus *Hemiarthrum* Carpenter in Dall, 1876, bears unslit insertion plates on both end valves and the new genus on all valves.

## SYSTEMATICS

Ordo Neoloricata
Subordo Lepidopleurina
Family Hanleyidae

### **Weedingia** gen. nov.[1]

Diagnosis. — Animal with well developed unslit insertion plates on all valves. Tegmentum finely granulose, intermediate valves not clearly divided into lateral, central and/or jugal areas. Perionotum covered with small, spiculoid calcareous corpuscules and intersegmental and supra-marginal bunches of long, smooth, curved needles. Gills merobranchial, adanal with interspace. Type of the genus *W. alborosea* sp. nov.

### **Weedingia alborosea** sp. nov.
figs. 1-17

Material. — Polynesia, Tuamotu Archipelago, Tikehau, pinnacle of lagoon, 6 m deep, M. Peyrot-Clausade leg., 13.X.1982, sta. 13, 1 specimen 3.3 × 1.8 mm (holotype), MNHN; do, sta. 14, 3 specimens, paratypes, the largest 4.5 × 2.5 mm, MNHN; do., sta. 16, 5 specimens, paratypes, the largest c. 5 mm long, 2 desarticulated, MNHN/4, RMNH/1 disarticulated.[2]

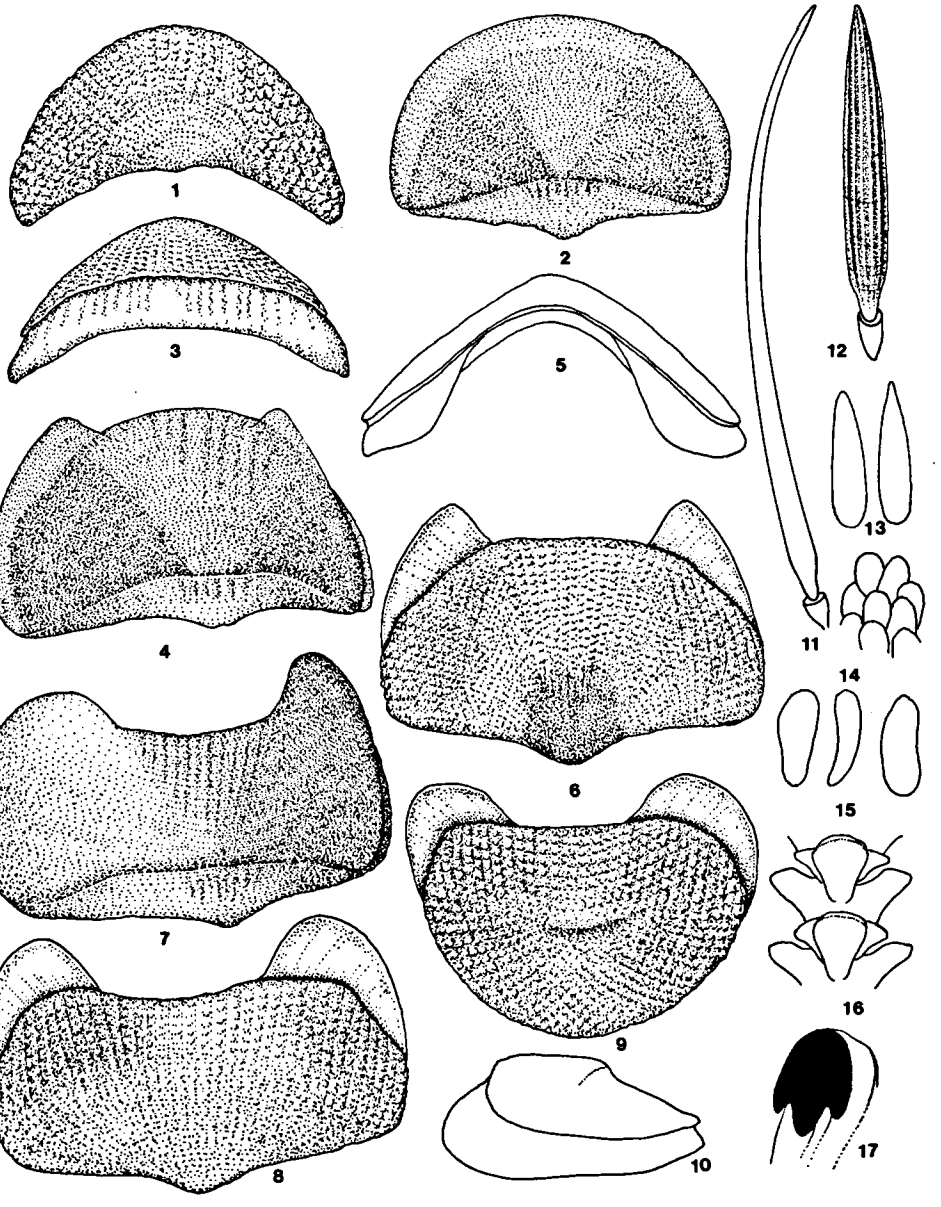
Diagnosis. — Animal small, up to 5 mm long, oval, moderately elevated, subcarinate, side slopes almost straight, valves beaked, lateral and/or jugal areas not indicated. Girdle rather wide. Tegmentum variably tinged with white and roseate, some with a few dark rose-brown spots.

Description. — Animal small, oval, the largest 5 × 3 mm, moderately elevated (dorsal elevation c. 0.40), subcarinate, side slopes straight to slightly convex. Valves, including I, decidedly beaked, tegmentum not divided into areas. All valves with well developed, unslit insertion plates. Girdle rather wide, dorsally covered with very small, juxtaposed spinuloid calcareous corpuscules and small groups of intersegmental and supra-marginal, rather long, curved, smooth needles. Colour of tegmentum variable; in some specimens yellowish white predominates, with some valves partly or wholly light roseate, others are almost quite roseate, with some white patches on some valves: in a few specimens the lateral parts of one or two valves are deep reddish brown, the others showing the normal combination of yellowish white and roseate.

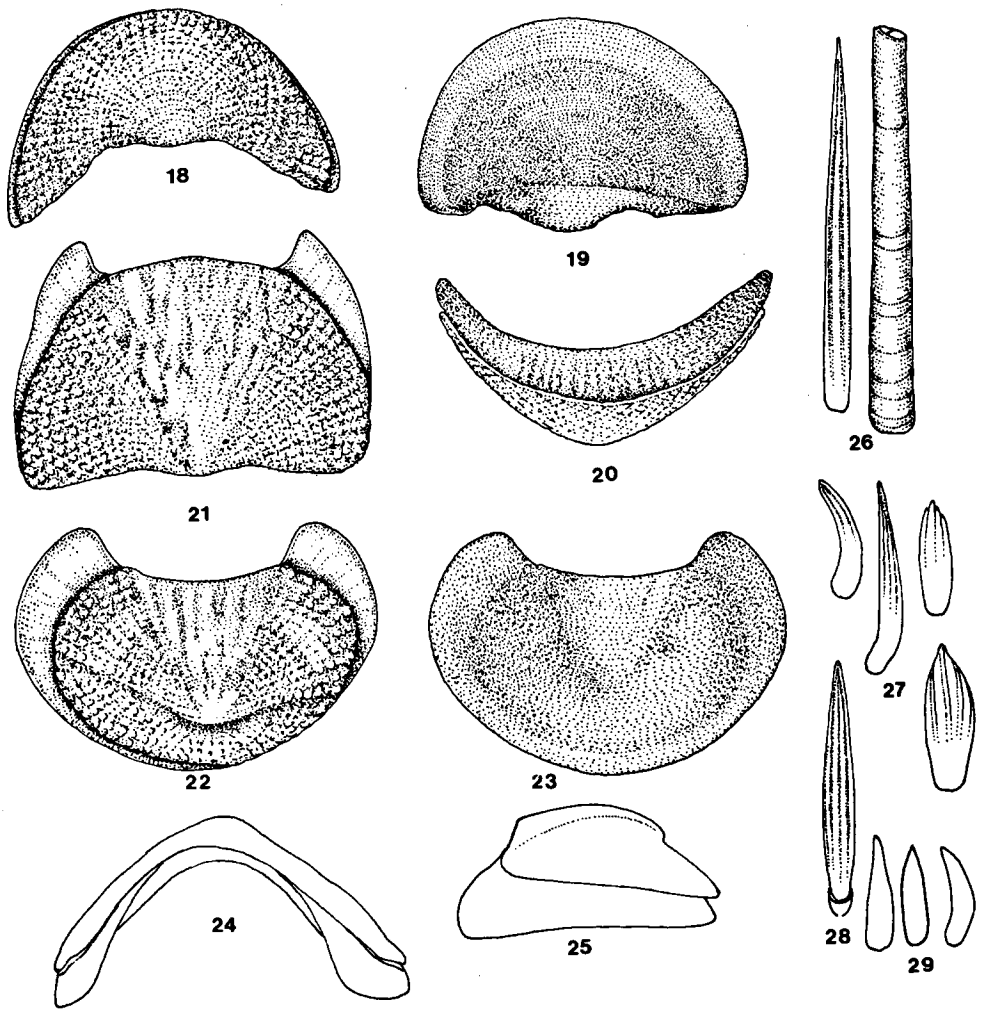
Head valve semicircular, with a small but distinct apex, the tegmentum vaguely quincuncially granulated all over, posteriorly widely folded under; intermediate valves rectangular, the anterior margin about straight between the apophyses in valve II, forming a bay-like sinus, distinctly concave in the other valves, which are almost twice as wide as long, the antero-lateral corners obliquely truncate, the tegmentum granulate, the granules arranged in longitudinal and at the same time concentric series on the antero-pleural parts, more or less radiating from the apex on the posterior parts of the valves. Tail valve semi-oval, somewhat bean-shaped, the length two thirds of the width, the mucro hardly raised, weakly indicated, central, postmucronal slope

[1] Named after the Rev. Benjamin J. Weeding (1890-1953) of Adelaide, South Australia, who, as early as 1946, put me on the trail of the chitons.

[2] MNHN = Muséum National d'Histoire Naturelle, Laboratoire de Biologie des Invertébrés marins et Malacologie, Paris; RMNH = Rijksmuseum van Natuurlijke Historie, Leiden.




Figs 1-17, *Weedingia alborosea* sp. nov., disarticulated paratype from Polynesia, Tuamotu Archipelago, Tikehau, pinnacle of lagoon, 6 m deep, M. Peyrot-Clausade leg., 13.X.1982, sta. 16, MNHN. 1, valve I, dorsal view; 2, do, ventral view; 3, do, rostral view; 4, valve II, ventral view; 5, do, rostral view; 6, do, dorsal view; 7, valve V, ventral view; 8, do, dorsal view; 9, valve VIII, dorsal view; 10, do, lateral view; 11, intersegmental needle; 12, marginal spicule; 13, ventral spicules; 14, dorsal aspect of girdle; 15, isolated dorsal calcareous corpuscules; 16, central and first lateral radula teeth; 17, head of major lateral tooth. Figs. 1-10, x 33; 11-13, 15-17, x 330; 14, x 230.




Figs 18-29, *Weedingia mooreana* sp. nov., partly disarticulated holotype from Polynesia, Society Islands, Moorea, M. Peyrot-Clausade leg., 1.X.1982, sta. 51, MNHN. 18, valve I, dorsal view; 19, do, ventral view; 20, do, rostral view; 21, valve II, dorsal view; 22, valve VIII, dorsal view; 23, do, ventral view; 24, valve II, rostral view; 25, valve VIII, lateral view; 26, intersegmental spicules; 27, dorsal spicules; 28, marginal spicules; 29, ventral spicules. Figs. 18-25 × 37; 26-29, × 370.

straight, but for a little excavation directly behind the mucro; antero- and postmucronal areas hardly or not separated, the longitudinal rows of pustules on the sides of the anterior part regularly curving inward on the posterior part, forming a quincuncial pattern.

Articulamentum well developed, white, the rose coloured parts of the tegmentum shining through. The end valves with wide, unslit, sharp and smooth-edged insertion plates, the intermediate valves with widely separated apophyses, triangular with rounded top in shape, leaving a wide sinus, c. 40% of the valve's width, insertion plate wide, entire, that of the tail valve slightly shorter than that of the head valve; eaves very narrow, hardly porous.

Girdle rather wide, coloured like tegmentum, mostly white, banded with roseate, dorsally densely covered with juxtaposed spinuloid calcareous corpuscules, 40 × 16 µm and with intersegmental groups of 4-7 long, smooth, white, slender and curved needles in chitinous cups; similar groups or single needles are found supra-marginally, the longest up to 240 µm long, 12 µm thick. There is a beautiful marginal fringe of cylindrical, pointed spicules, with five deep grooves on the visible half, 128 × 16 µm. Ventral side of girdle closely covered with imbricating, white, smooth, rather bluntly pointed spicules, up to 56 × 12 µm.

Radula 1.2 mm long in a 4.5 mm long specimen, with 20 rows of mature teeth. Rhachidian tooth reversed pear-shaped, with a rounded, narrow blade; first laterals wing-shaped, without a blade; major lateral teeth with a tridentate head, the denticles blunt, the central one slightly longer than the others.

Gills merobranchial, adanal with interspace; c. 10 ctenidia per side.

**Weedingia mooreana** sp. nov.
figs. 18-29

Material. — Polynesia, Society Islands, Moorea, c. 17°30'S 149°30'W, on dead *Acropora* from the Tiahura Barrief Reef, M. Peyrot-Clausade leg., 1.X.1982, sta. 51, 1 specimen, 5.0 × 2.4 mm (holotype, partly disarticulated), MNHN.

Diagnosis. — Animal small, c. 5 mm long, elongate oval, moderately elevated, subcarinate, valves slightly beaked, side slopes little convex. Tegmentum of valves II-VIII not divided into central and lateral areas, the jugum widely triangular, smooth, latero-pleural areas covered with small, round pustules in curved series radiating from the apex. Articulamentum forming well developed, non fissurated insertion plates. Mucro of tail valve posterior, posterior slope straight. Girdle spinulose, without distinct sutural tufts. Tegmentum rose-red, the girdle white, banded with yellowish roseate.

Description. — The holotype measures 5.0 × 2.4 mm, elongate oval in shape, the sides about parallel, median valves of equal width, girdle moderately wide (0.5-0.6 mm).

Head valve semicircular, with a small but distinct apex, the tegmentum posteriorly rather widely folded under, dorsally covered with roundish, flat, little elevated pustules, quincuncially arranged. Intermediate valves moderately elevated (dorsal elevation c. 0.35-0.40), less than twice as wide as long, the length of valve II two thirds of the width, the sinus wide, convex, the other intermediate valves with a concave jugal sinus, antero-laterally obliquely truncated, the jugal area widely triangular, smooth, not differentiated from the latero-pleural parts, which are sculptured with roundish pustules in rows radiating from the apex. Tail valve bean-shaped, posterior margin evenly rounded, not emarginated nor waved upward, the mucro at about three quarters of the length of the valve, prominent, with a small excavation behind, jugal sinus concave. Tegmentum a beautiful rose-red, with only a few small white markings on the jugum.

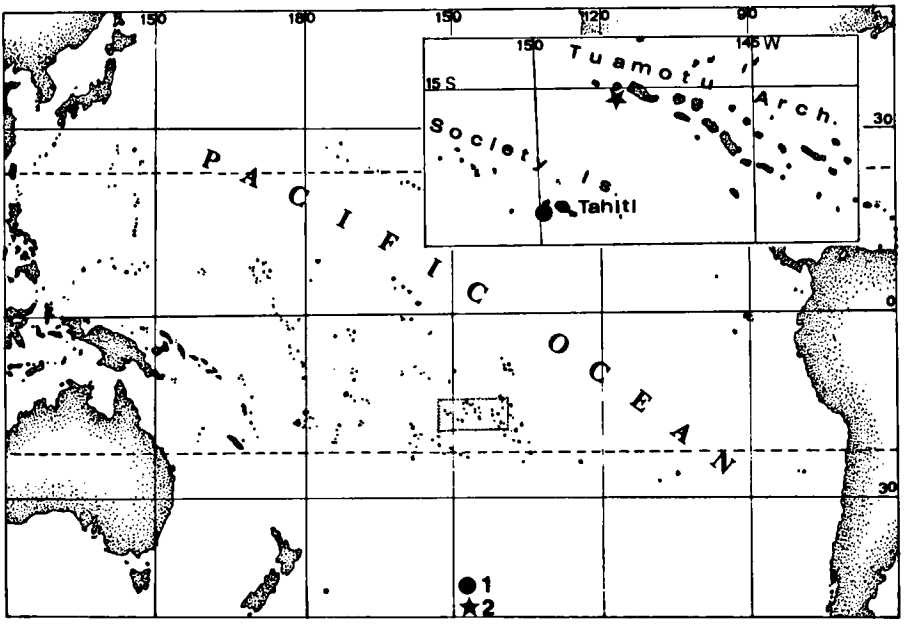



Fig. 30. Distribution of 1, *Weedingia mooreana* sp. nov.; 2, *Weedingia alborosea* sp. nov.

Articulamentum thin, white, but for the rose coloured tegmentum shining through: apophyses wide apart, triangular, regularly merging into moderately wide, smooth-edged insertion plates.

Girdle dorsally densely beset with small, stout, abruptly pointed spicules, the distal half marked with 3-4 riblets on the visible side, the largest towards the shell margins, 54 × 18 μm; they are interspersed with acutely bent spicules of equal length and short, sharply pointed, proximately curved, distally ribbed spicules of 70 × 8 μm. At the sutures small bunches of rather long needles of two kinds are found: long, smooth, white ones, c. 300 × 16 μm, and smaller, sharply pointed, ribbed ones, up to 130 × 10 μm. There is a beautiful fringe of white to yellow, slenderly spindle-shaped, longitudinally ribbed marginal spicules in short chitinous cups, 88 × 12 μm. Ventral side of girdle covered with smooth, white, pointed spicules, up to 40 × 18 μm.

Radula not examined.

Gills merobranchial, adanal with interspace, c. 10 gills on either side.

Observations. — Unfortunately only one specimen could be studied. It differs from *W. alborosea* in the wide, smooth jugum of the valves, the posterior position of the mucro and the more spinulose girdle.

## ACKNOWLEDGEMENTS

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