

A New Species of *Puncturella* (*Cranopsis*) from the Northeastern Pacific

BY

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AND

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(Plate 13; 1 Text figure)

WEST AMERICAN SPECIES of the genus *Puncturella* LOWE, 1827, have been treated in a dissertation by McLEAN (1966). We have recently become aware of an undescribed species not covered by McLEAN (op. cit.) and have decided to present a detailed description before the review of the genus is to be published by him.

The subgenus *Cranopsis* A. ADAMS, 1860 (type species, *Cranopsis pelex* A. ADAMS, 1860, Japan), has previously been characterized as applying to species of *Puncturella* having the fissure placed in nearly central position on the anterior face of the shell. McLEAN (op. cit.) showed that a more useful criterion is the presence of a major double rib, extending from the anterior terminus of the fissure to the margin of the shell. The two halves of this rib are connected by a channel showing a distinct line of suture, visible under magnification. In the soft parts of the animal the roof of the mantle cavity is split from the mantle margin to the fissure. The suture on the anterior rib evidently results from the shell being produced by the split mantle margin. In *Puncturella s. str.* the mantle roof is continuous and is perforated only in contact with the fissure of the shell.

West American species heretofore placed in *Puncturella s. str.* but having the above diagnostic features of *Puncturella* (*Cranopsis*) are: *Puncturella* (*C.*) *major* DALL, 1891; *P. (C.) cucullata* (GOULD, 1846); and *P. (C.) multistriata* DALL, 1914.

Puncturella (*Cranopsis*) *decorata* COWAN & McLEAN,
spec. nov.

(Plate 13, Figures 1 to 5; 1 Text figure)

Description of Holotype: Shell of moderate size for the genus; basal outline ovoid, sides nearly parallel, anterior end slightly narrower than the posterior. Width to length ratio 0.74. Anterior outline slightly convex; posterior slightly concave; apex approximately central, strongly down-curved and slightly deflected to the left. Fissure long and narrow with a constricted lower portion. Radial sculpture strong, composed of primary and secondary ribs regularly placed and clearly demarked; primary ribs originating on the apex; secondary ribs originating 2 to 3 mm below; 5 mm below the apex these number 13 ribs (7 primary and 6 secondary) in a 5 mm horizontal distance; secondary ribs precisely equidistant from each primary and nearly equal in strength to the primary ribs at the shell margin. Tertiary ribs originating 5 to 8 mm below the apex, but not reaching the size of the primary and secondary ribs at the margin. Ribs at margin broader than interspaces. The primary rib extending below the fissure is a double rib having a well defined sutural line extending to the margin. This compound rib is slightly deflected toward the right and is broader but not as raised as are the adjacent primary and secondary ribs. Ribs elegantly beaded, deriving from regular horizontal rid-

ges associated with the lines of growth, extending across the sulci as well as over the radial ridges. Numerous minute whitish punctations scattered in the channels between ribs; entire external surface speckled with minute chestnut flakes of what appears to be a cuticle, their abundance giving a brown appearance over the white shell. Inner surface of shell glossy and translucent, transmitting traces of the radial sculpture. Septum in the form of an open arc, slanted forward. Internal groove from fissure to margin clearly defined; margin of shell crenulate, corresponding to extension of the ribbing.

Dimensions: Long. 19.7 mm; lat. 14.5 mm; alt. 10.3 mm.

Type Material: Holotype, National Museum of Canada (NMC), cat. no. 45745 (Plate 13, Figure 1).

Type Locality: Off west coast, Queen Charlotte Island, British Columbia, 53°21.3' N latitude; 133°04.1' W longitude, at a depth of 106 fathoms (193 m). Collected by Mr. Frank Bernard aboard Fisheries Research Board of Canada vessel *G. B. Reed*, Bernard station 67-46, 11 August 1967. Seven additional paratypes of smaller size were taken in the same haul. Two are deposited in the type collection of the Los Angeles County Museum of Natural History (LACM), cat. no. 1175; one in the United States National Museum (USNM), cat. no. 678542; one in the Paleontological type collection of the California Academy of Sciences (CAS), cat. no. 13102; one in the Stanford University Paleontological type collection (SUPTC), cat. no. 9961; and two in the Cowan collection, cat. no. 7283a-b.

Distribution: Localities for additional specimens identified as belonging to this species are as follows:

1) Six specimens, Bjorka Island, near Sitka, Alaska, 56°49' N; 135°50' W; 110-117 fms.; G. McT. Cowan at Fisheries Research Board of Canada Station 66-2-26, 5 September 1966; LACM 6764 a (Plate 13, Figure 2); Cowan coll. 6764b-f;

2) Five specimens, off Cape James, Hope Island, Queen Charlotte Strait, B. C., 85-95 fms.; Cowan sta. 748, Cowan and McLean, 22 May 1963; Cowan coll. 4649a-d; LACM 4649e;

3) Three specimens, south side Matole Canyon, California, 300-100 fms.; *N. B. Scofield* sta. B. 17, 11 October 1950; CAS loc. 33179 (Plate 13, Figure 4);

4) One specimen off west end of San Nicolas Island, California, 30-50 fms., Templeton Crocker Expedition, 27 August 1932; CAS loc. 27603 (Plate 13, Figure 5);

5) One specimen (juvenile), between Cortez and Tanner Banks, California, 80 fms.; Louis Zermatten, April 1965; S. S. Berry coll., Redlands, California, cat. no. 33354 (Plate 13, Figure 3);

6) One specimen, Cortez Bank, California, 60 fms., USFC sta. 2911, USNM 130419.

Table 1

		Specimen No.	Length	Breadth	Height
			(in millimeters)		
NMC	(Fig. 1)	45745	19.7	14.5	10.3
LACM		1175a	11.2	8.4	5.5
LACM		1175b	11.7	8.5	5.4
SUPTC		9961	13.7	9.4	6.4
CAS		13102	13.5	10.4	6.7
USNM		678542	11.4	8.1	5.9
Cowan		7283a	12.8	9.3	5.4
Cowan		7283b	9.0	6.5	4.9
LACM	(Fig. 2)	6764a	13.3	10.0	5.8
Cowan		6764b	12.8	9.0	5.0
Cowan		6764c	17.3	12.0	8.0
Cowan		6764d	11.0	7.9	5.2
Cowan		6764e	13.0	10.8	6.0
Cowan		6764f	9.9	7.1	4.3
Cowan		4649a	15.0	12.3	7.8
Cowan		4649b	15.3	11.0	7.8
Cowan		4649c	10.7	8.4	5.6
Cowan		4649d	10.8	—	5.2
LACM		4649e	10.5	7.4	5.7
CAS	(Fig. 4)	33179a	23.4	17.8	12.8
CAS		33179b	22.9	15.2	10.0
CAS		33179c	—	14.7	8.4
CAS	(Fig. 5)	72603	18.7	13.5	8.5
SSB	(Fig. 3)	33354	6.5	4.5	2.7
Ratio of parameters to length			75%	48%	
			314.1	236.7	159.3

Explanation of Plate 13

Figures 1 to 5: *Puncturella (Cranopsis) decorata* COWAN & McLEAN
spec. nov.

Figure 1: Holotype, National Museum of Canada, cat. no. 45745. Off west coast, Queen Charlotte Island, British Columbia, 106 fms. Long. 19.7 mm; lat. 14.5 mm; alt. 10.3 mm; × 2

Figure 2: Off Bjorka Island, near Sitka, Alaska, 110-117 fms. LACM 6764 a. Long. 13.3 mm; lat. 10.0 mm; alt. 5.8 mm; × 2

Figure 3: Between Cortez and Tanner Banks, California, 80 fms. SSB 3354. Long. 6.5 mm; lat. 4.5 mm; alt. 2.7 mm; × 5

Figure 4: South side of Matole Canyon, California, 300-100 fms. CAS 33179 a. Long. 23.4 mm; lat. 17.8 mm; alt. 12.8 mm; × 2

Figure 5: Off San Nicolas Island, California, 30-50 fms. CAS 27603. Long. 18.7 mm; lat. 13.5 mm; alt. 8.5 mm; × 2

Figures 6 to 7: *Puncturella (Cranopsis) multistriata* DALL, 1914

Figure 6: Cadboro Bay, Victoria, British Columbia. LACM A.375. Long. 16.6 mm; lat. 12.4 mm; alt. 8.4 mm; × 2

Figure 7: Puget Sound, Washington, dredged. LACM A.8487. Long. 25.0 mm; lat. 20.0 mm; alt. 15.7 mm; × 2

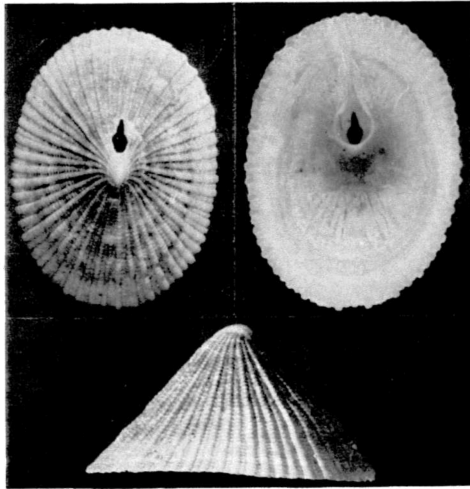


Figure 1

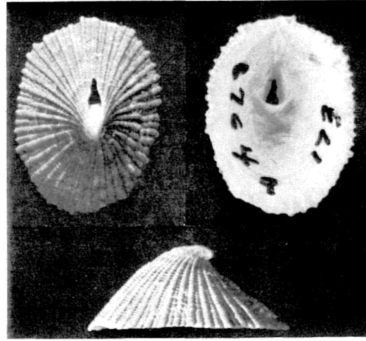


Figure 2

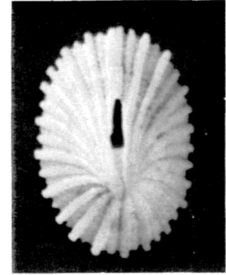


Figure 3

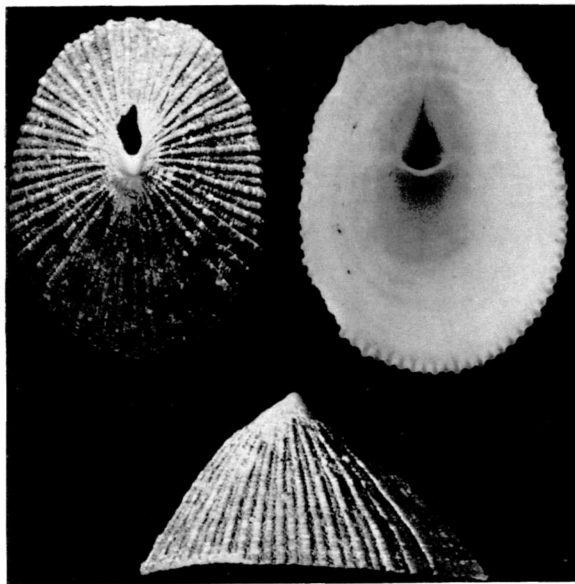


Figure 4

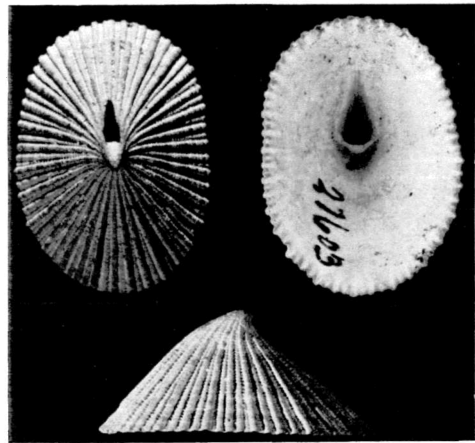


Figure 5

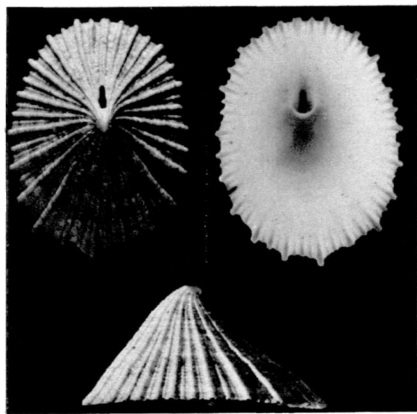


Figure 6

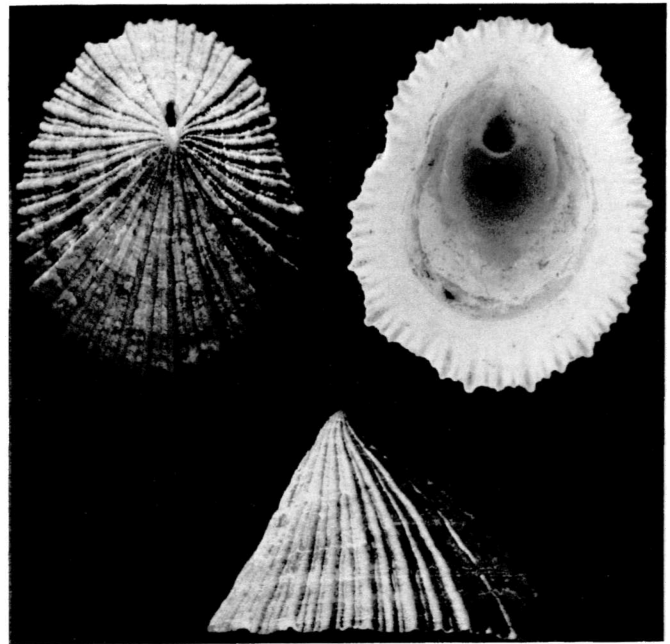


Figure 7

Dimensions: Table 1 gives the external dimensions of 24 specimens of *Puncturella decorata*. Width to length ratio is indicated as 75%, height to length ratio 48%. A corresponding series of 26 *P. multistriata* has the width to length ratio 82%, differing to an insignificant degree but this species is taller, with a height to length ratio of 62%. Regressions of width against length and height against length have been determined for samples of both species. The formulae for the width to length regression of *P. decorata* are $W = 0.771 L - 0.7$, height to length $H = 0.482 L + 0.07$. Equivalent values for *P. multistriata* are $W = 0.758 L - 0.51$ and $H = 0.716 L - 1.753$.

The significance of differences between the corresponding regressions of the two species have been examined by the method suggested by SIMPSON, ROE & LEWONTIN (1960). The probability of significance of the differences between the length-width relationship of the two species is 0.8 to 0.9. The corresponding probability for the length-height relationship is 0.05 to 0.02.

Discussion: The soft parts are not differentiable on the basis of material on hand from other members of the subgenus. The mantle is split from the margin to the fissure. The radula of a paratype specimen (LACM 1175a) has been examined (Text figure 1). The rachidian and 4 adjacent lateral teeth have slightly overhanging edges, while the fifth lateral tooth has a large inturned central cusp and a smaller basal cusp. A lateromarginal plate is present and the marginals are numerous. The radula is similar to that of other west American species of *Puncturella*.



Figure 1

Radula of *Puncturella (Cranopsis) decorata* COWAN & McLEAN

The fissure extends nearly half the length of the anterior face of the shell in juvenile specimens (Plate 13, Figure 3), but this area decreases to about one-third to one-fourth of this dimension in mature shells.

The specimens examined are remarkably uniform in sculptural detail. The structure of the internal area adjacent to the septum is variable. A few specimens examined (Plate 13, Figure 2) show slight traces of the buttress structure posterior to the septum, typical of *Puncturella (Puncturella) galeata* (GOULD, 1846). In the subgenus *Cranopsis* this is also a characteristic feature of *P. major* DALL, 1891. Its development in *P. decorata* is considerably less than in either of these species.

The species is closely related to *Puncturella multistriata* DALL, 1914 (Plate 13, Figures 6, 7), which differs chiefly in that the secondary ribs do not attain the size or prominence of the secondary ribs in *P. decorata*. *Puncturella multistriata* sometimes bears distinct series of pits between the vertical ridges of the external sculpture. These can be impressed into the sides of the ridges scalloping their sides, and suggesting beading. However, none bear the regular horizontal ridges, crossing the primary and secondary ribs, as well as the intervening sulci, that give rise to the characteristic beaded sculpture of *P. decorata*. The new species differs also in the position of the apex; it is centrally placed in *P. decorata*, and about one-third the length of the shell from the anterior margin in *P. multistriata*. The upper portion of the fissure is consistently broader than that of *P. multistriata*, whereas in the latter species it is only slightly broader than the lower portion. Specimens of *P. multistriata* have not been found with the buttresses to the septum shown by a few specimens of *P. decorata*. On the basis of specimens examined, *P. multistriata* reaches a much larger size (to 32 mm long), whereas the largest *P. decorata* seen is 23 mm long (Plate 13, Figure 4). In the new species the shell appears to be thinner and more fragile in specimens of similar size.

Different geographic and bathymetric patterns of distribution are indicated for *Puncturella decorata* and *P. multistriata*. *Puncturella multistriata* has been taken in shallow depths from the Aleutian Islands and ranges south to the Puget Sound area, where it has been dredged in depths ranging to 50 fathoms. No verified records of the species are known from south of Puget Sound. DALL's (1921) record of the species "south to San Diego," was based on USNM 211927, not a *P. (Cranopsis)*; and the "Cortez Bank" record (USNM 130419) is *P. decorata*. The known range of *P. decorata* is therefore from Sitka, Alaska, south to Cortez Bank, California. The two species have thus far not been taken at the same collecting station.

ACKNOWLEDGMENTS

We are grateful to Mr. Frank Bernard of the Fisheries Research Board of Canada for making the type material available for our use. Dr. Leo Hertlein of the California Academy of Sciences and Dr. S. Stillman Berry of Redlands, California kindly arranged the loan of specimens. Photographs are by Mr. Armando Solis, Museum Photographer. The radular drawing was prepared by Cathy Pearse.

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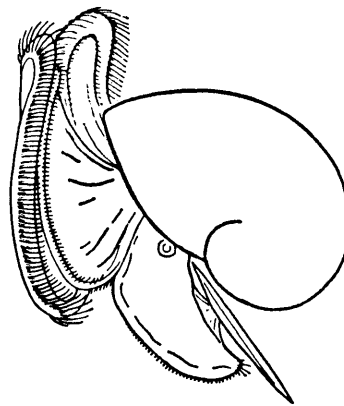
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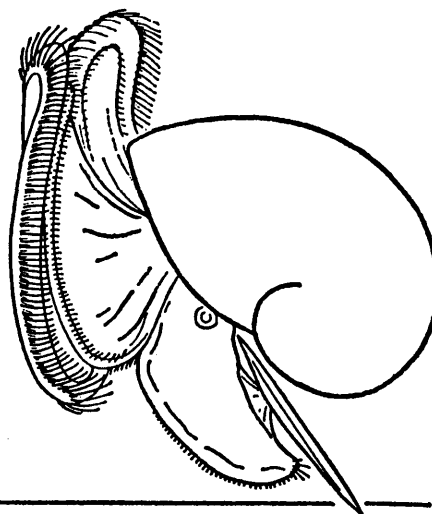
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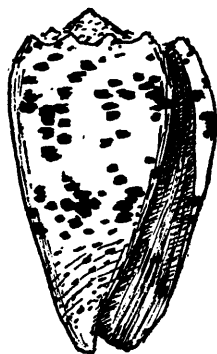
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Note: The various taxa above species are indicated by the use of different type styles as shown by the following examples, and by increasing indentation.

ORDER, Suborder, **DIVISION**, Subdivision, **SECTION**,
 SUPERFAMILY, FAMILY, Subfamily, *Genus*, (*Subgenus*)
New Taxa

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