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Dentition of Six Syncerid Genera
Gasteropoda, Prosobranchiata, Synceridae:
(Assimineidae)

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This paper deals with the teeth of the genera of the family Synceridae treated by Cooke and Clench [B. P. Bishop Mus., Occ. Papers 17 (20), 1943], and was done under the direction of Dr. C. Montague Cooke, Jr.

The animals, except those of *Fijianella calciphila* and *Quadrasiella mucronata*, were preserved by Cooke's method: drowned overnight and preserved in 50 percent alcohol in the field. After extraction in the laboratory, they were dehydrated for an hour in 98 percent alcohol and finally stored in 75 percent alcohol. The teeth of *Fijianella calciphila* and *Quadrasiella mucronata* were from the dried animals adhering to the apertural region of the shells.

To extract the radulae, the animals were heated in a 5 to 10 percent solution of potassium hydroxide. The radulae were then washed in distilled water and stained by a modified Peile's method: oxidized in potassium permanganate plus acetic acid, bleached with a grain of potassium oxalate, stained in methyl violet for an hour, and mounted in canada balsam.

The radulae are narrow, long, and semi-tubular in all six genera. The teeth are basically similar, the variations minor; taenioglossate or ptenoglossate (Simroth, 6, p. 471)¹ somewhat assimineoid (Thiele, 8, p. 169, fig. 147), leaning posteriad at 45 degrees, marginals slightly askew, formula 1-2-1-2-1. Where possible, each tooth is figured from the frontal, lateral, and dorsal aspects. The descriptions refer to the

¹ Numbers in parentheses refer to Bibliography, page 318.

principal drawings unless otherwise noted. It was not possible to find the centrals and marginals on edge; frontal views of the first laterals are rare.

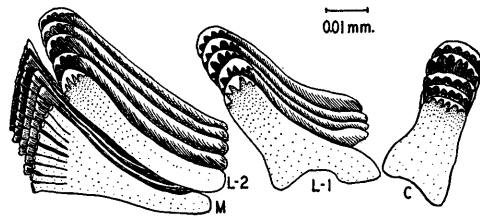


FIGURE 1.—Syncerid teeth, diagrammatic, gross aspect of left half of five transverse rows (model, *Electrina*).

The illustrations are made with camera lucida, except figure 1, which is diagrammatic and represents all of the six genera under study. The scale represents 0.01 millimeters.

It is customary to designate the two outermost teeth as the marginals, but as the pectinated fan-shaped marginal definitely isolates itself, while the succeeding two inner teeth are closely similar having relatively large cusps, the latter are designated as laterals 1 and 2, commencing from the central tooth. Simroth (6, p. 472) suggests such a course.

***Electrina succinea* (Sowerby) (fig. 2).**

Cyclostoma succineum Sowerby, Zool. Soc. London, Proc., 32, 1832.

Central (fig. 2, C): broad below, shouldered at middle, narrower dorsad, rounded at apex; base concave, exterior corners cut aslant, spikelets above base; cusps small, central the longest, formula about 4-1-4; height 0.03 mm. *Lateral 1*: broad below, gradually narrowing apicad, curving; base asymmetrical, the inner curving inward and forward; cusps large, heavy, triangular in frontal view, hooked or clawed, central the longest, formula about 3-1-3; height 1.5 × central. *Lateral 2*: narrow, long, rounded below, laterally curved, hooked distally: cusps 8-10, delicate, sharp, central the longest; height 1.75 × central. *Marginal* (M): fan shaped, pectinated, roughly triangular, stout at root, quickly fanning out apicad: apex with 18-20 narrow linear bands or strips, 0.3 length of tooth, the longest innermost, each with a head of microscopic denticles 4-6 in number (see *O. dubia*, fig. 3, M); height 2.3 × central.

Rapa: Tumu Valley, 140237 (Mangarevan Expedition, July 13, 1934).

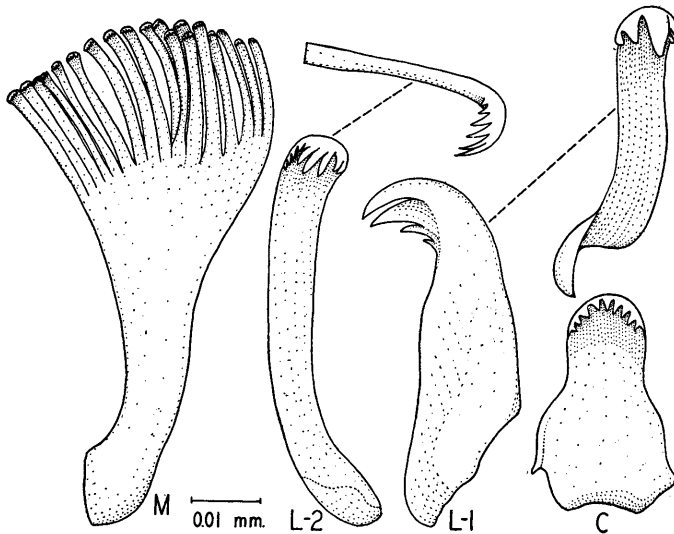


FIGURE 2.—Teeth of *Electrina succinea*, with supplementary aspects of first and second lateral teeth: C, central; L-1, first lateral; L-2, second lateral; M, marginal.

Omphalotropis dubia (Pfeiffer) (fig. 3).

Cyclostoma dubium Pfeiffer, Zeitschr. f. Malak., 86, 1846.

Central (fig. 3, C): like that of *Electrina*, broader at base than above, slightly shouldered below; base concave, indented between base and shoulder; apex rounded, cusps broadly triangular, the central the largest and longest; formula 3-1-3; height 0.0525 mm. *Lateral 1*: as in *Electrina*, broad below, tapering and curving apicad; cusps large, sharp (this specimen well worn); height 1.5 × central. *Lateral 2*: as in *Electrina* (also well worn); formula about 3-1-3; cusps sharp, curved; height 1.75 × central. *Marginal* (M): large, triangular, base heavy, apex with short denticular strips diminishing in size outward. Three denticular heads show microscopic denticles, finely pointed about 7-10 per head. Height 1.8 × central.

Rapa: back of Area, 144673 (Mangarevan Expedition, July 24, 1934).

This genus is included for comparison with the five genera, the shells of which were discussed by Cooke and Clench.

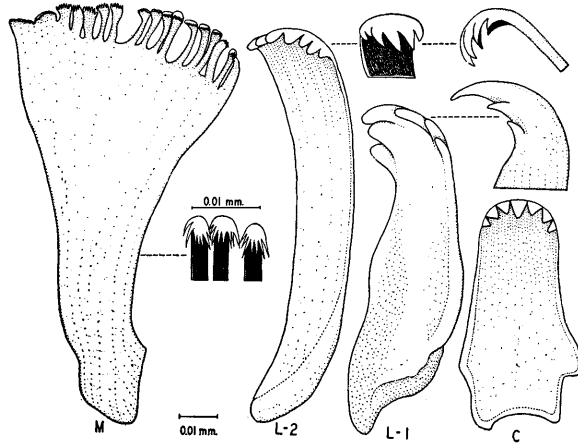


FIGURE 3.—Teeth of *Omphalotropis dubia*, with supplementary aspects of first and second laterals and an enlargement of microscopic denticles on denticular bands: C, central; L-1, first lateral; L-2, second lateral; M, marginal.

Rapanella andersoni Cooke and Clench, B. P. Bishop Mus., Occ. Papers 17 (20), 1943 (fig. 4).

Central (fig. 4, C); quadrate, base slightly broader than apex, corners not cut off; cusps large, triangular, central longest, formula 4-1-4; height 0.015 mm.

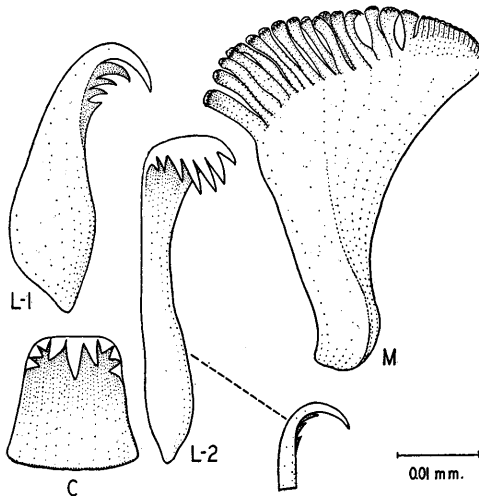


FIGURE 4.—Teeth of *Rapanella andersoni*, with supplementary aspect of second lateral tooth: C, central; L-1, first lateral; L-2, second lateral; M, marginal.

Lateral 1: like that of *Electrina*, broad and slightly pointed basally, narrowing apicad, hooked or clawed; cusps large, sharp; height $2 \times$ central. *Lateral 2*: (only fronto-lateral view found) not linear as in *Electrina*, slightly broadened and bluntly pointed basally, narrowed at middle, slightly flaring apicad; cusps about 10, slightly smaller than in first lateral, gracefully curved; height $2.3 \times$ central. *Marginal (M)*: triangular, base stout, fanning out rapidly into numerous strips or bands, inner strips the longest, gradually diminishing in height outward, about 17 large, 10-12 small; denticles microscopic, 5-6 per strip; height $3 \times$ central.

Rapa: Maitua, 140055 (Mangarevan Expedition, July 10, 1934).

Quadrasiella mucronata Moellendorff, Nachr. Deutsch. Malak. Gesell. 26: 38, 1894.

Central: $3 \times$ longer than broad, rounded above, slightly flaring below, base convex, with one sharp prong on each side; cusps small, 2-1-2, central the largest. *Lateral 1*: closest to that of *Electrina*, $1.3 \times$ length of central, base broad, steeply angled; cusps clawed, formula about 3-1-3. *Lateral 2*: long, narrow, somewhat curved, 1.5 length of central, clawed, formula 2-1-2 (see *O. dubia*, fig. 3). *Marginal*: fan shaped, $2 \times$ length of central, apex with 19-20 denticular bands, each band 0.25 length of tooth, innermost the longest, tipped with microscopic denticles as in *O. dubia*.

Guam: 86234 (paratype of Moellendorff).

Garretia biangulata (Pease).

Cyclostoma biangulatum Pease, Zool. Soc. London, Proc., 674, 1864.

Radula minute, difficult to mount or to tease apart; slides poor. Teeth only slightly larger than those of *Rapanella* (*Rapanella* central 0.0175 mm., of *Garretia* 0.0225 mm. high).

Central: apex rounded, root slightly broader than apex, cusps small, 4-1-4; height 0.0225 mm. *Lateral 1*: as in *Electrina*, body relatively less broad, $2 \times$ height of central; cusps clawed, greatly curved, formula about 2-1-2. *Lateral 2*: as in *Electrina*, long, narrow, $2 \times$ height of central; cusps obscure, due to poor slides. *Marginal*: fan shaped, $2.5 \times$ height of central, denticular bands 0.25 length of tooth, 12-15 in number, outermost slightly shorter than inner.

Cook Islands: Aitutaki, inland of Reureu, 95665 (Peter H. Buck, Nov. 15, 1929).

Fijianella calciphila Cooke and Clench, B. P. Bishop Mus., Occ. Papers 17 (20): 258, 1943.

Central: shaped nearly like that of *Electrina*, with gently curving shoulders, broadest just above base, without lateral spikes, base concave; cusps medium, central the largest, 2-1-2; height 0.03 mm. *Lateral 1*: basal angle not as acute as in *Electrina*, body broader, curvature of claw equal; cusp number not determined; height $1.5 \times$ central. *Lateral 2*: similar to that of *Electrina*, cusps 2-1-2;

height $1.75 \times$ central. *Marginal*: fan shaped, denticular bands 12-13, outermost the longest and widest ($2 \times$ width of innermost), bands 0.25 length of tooth; height $2 \times$ central.

Lau Islands: Yangasa Levu, 167154 (H. S. Ladd, July 26, 1934).

A search of available literature has failed to uncover any illustration that looks anything like the teeth of the genera discussed herein. However, Thiele (8, p. 171; 7, p. 121) gives a sketchy but sufficient description of the teeth for the subfamily Omphalotropidinae. The very close uniformity in shape and formulae of the teeth of these six genera is remarkable in view of the fact that the shells differ so much among themselves. As there are no lateral processes (Thiele's *verbindungsstück*) in any of them, it may be necessary to remove *Pseudassimineae* (Thiele, 8, p. 171) elsewhere for that genus is credited with having such processes. I have examined the teeth of *Cyclo-morpha flava* from Anaa. They are similar to those treated in this paper.

BIBLIOGRAPHY

1. BAKER, H. B., Notes on the radula of the Helicinidae, Acad. Nat. Sci. Philadelphia, Proc. 74: 29-67, 1922.
2. BAKER, H. B., Notes on the radula of the Neritidae, Acad. Nat. Sci. Philadelphia, Proc. 75: 117-178, 1923.
3. BEQUAERT, J. C., AND CLENCH, W. J., Additions to the rheophilous mollusk fauna of the Congo estuary, Mus. Comp. Zool., Bull. 88: 3-13, 1941.
4. COOKE, A. H., Cambridge Natural History 3, 1895.
5. GRAY, E. J., On the division of ctenobranchous gasteropodous mollusca into larger groups and families, Zool. Soc. London, Proc., 32-44, 1853.
6. SIMROTH, H., Bronn's Klassen und Ordnungen des Tier-Reichs 3, 1893-1907.
7. THIELE, JOHANNES, Über die Schneckenfamilie Assimineidae, Zoologische Jahrbucher Systematik 53: 113-146, 1927.
8. THIELE, JOHANNES, Handbuch der Systematischen Weichtierkunde (1), 1929.