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NEW SPECIES OF OVULIDAE AND REINSTATEMENT OF *MARGOVULA PYRULINA* (A. ADAMS, 1854) (GASTROPODA)

Crawford Neill Cate
Museum Associate, Invertebrate Zoology, Los Angeles County
Museum of Natural History, Los Angeles, California 90007

ABSTRACT

Eight species of living Ovulidae are described as new, and the species Margovula pyrulina *(A. Adams, 1854) is reinstated.*

Ovulidae Fleming, 1828
Prionovolva Iredale, 1930

Prionovolva castanea Cate, new species
(Figure 1)

Description (holotype): Shell of medium size, pyriformly ovate, thin, light-weight in construction. Terminals are roundly produced, smooth. Dorsum smooth, sub-glossy, without transverse striation at the beaks. Base inflated, smooth, ovate, narrowing to the front as a longitudinally thickened ridge, and constricting on the anterior base to form a broad, bold terminal ridge.

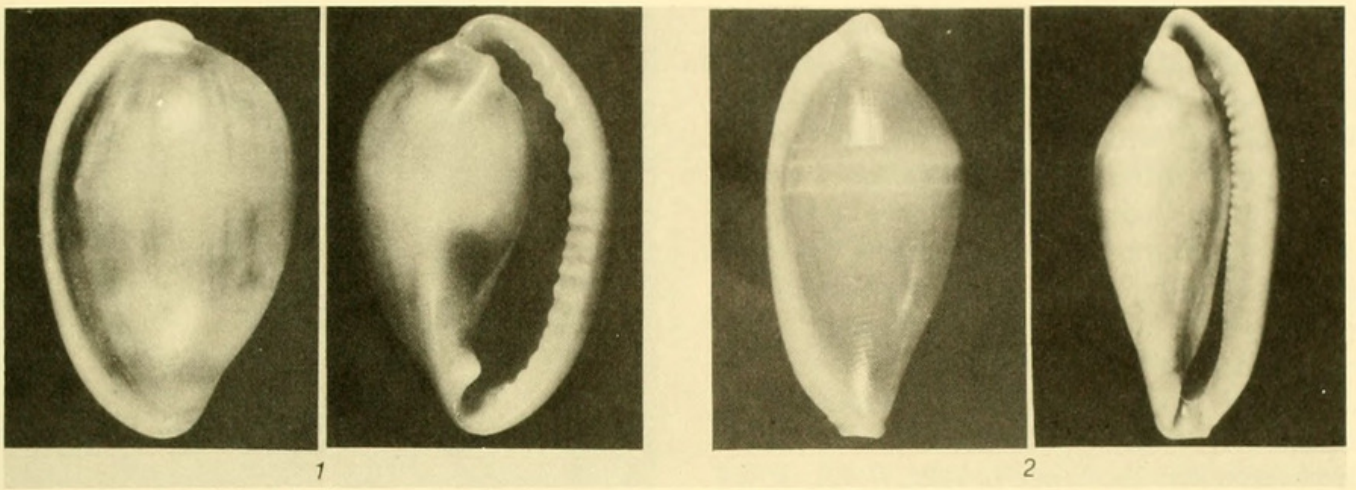

FIG. 1, Prionovolva castanea *Cate, new species. 11.4 mm. Algeria.* 2, Aperiovula testudiana *Cate, new species 14.3 mm. Japan.*

Funiculum somewhat prominent, triangularly thickened at its base. Columella long, curved, flattened, barely depressed. A deepened fossular area is a broadening of the columella in front. Aperture wide, curving, becoming more open abapically. Outer lip edge moderately thickened with callus, and having numerous (approx. 21) large, fairly well developed teeth. Shell color light chestnut brown, with a thinning of color in various dorsal areas; the outer lip, teeth, funiculum, terminal ridge, and terminal beaks are rich ivory.

Measurements: holotype: L-11.4; W-7.3; H-5.8 mm.

Type Locality: Gulf of Oran, Algeria (Mediterranean Sea), N Africa; (35°45′N; 00°38′W).

Holotype: Los Angeles County Museum of Natural History, No. 1789.

Discussion: This new species may be compared with *Prionovolva pudica* (A. Adams, 1854) [cf. Cate, 1973; fig. 15]. The Cate 1973 figure appears rather convincingly similar to *P. castanea* Cate; however, their color and certain morphological differences seem to easily separate them. This new species is less solidly formed, thinner and more fragile in shell construction; the different application of shell color is brown, rather than rosy-lilac; there is no dorsal striation apparent, nor sub-angular, transverse surface ridging; and the outer lip teeth are shorter, not extending to the outer lip's periphery.

Of special interest in *Prionovolva castanea* Cate is the thin brown dorsal stain (almost periostracum-like). It is as if the coloring were applied externally, rather than being an internal part of the shell's nacre. In Cate, 1973: 22; fig. 39, *Globovula tripolia* Cate, 1973, an ovulid species from the Gulf of Oran, a similar application of shell coloring was referred to thus: "Dorsum covered with a semi-smooth, light brown periostracum."

The new name, *castanea,* is derived from the Latin adjective *castaneus,* meaning 'of the color of chestnuts.'

Aperiovula Cate, 1973

Aperiovula testudiana Cate, new species

(Figure 2)

Description (holotype): Shell of medium size, oblong-ovate, narrow, glossy, strongly formed. Terminals produced, solid, narrowing to a fairly pointed adapical beak; narrowing squarely to the front. Dorsum glossy, smooth, except for transversely incised striae emanating restrictedly from both terminal beaks, leaving one half of the dorsal surface without sculpture; with a strong adapical dorsal protuberance at the base of rear terminal beak, and two transverse dorsal flattened bands, one wider than the other, subcentrally. Base almost glossy, convex, somewhat acutely ridged longitudinally; ridge angling downward and away to the right shell margin and to the columellar edge within; base narrows evenly to the front, where it terminates as a longitudinal terminal ridge; the rear base with a large, thick, slightly bumpy-edged funiculum forming the right rear wall of the posterior canal.

Aperture somewhat long, narrow, almost straight, curving gently posteriorly, broadening abapically. Anterior and posterior canals open. Columella broad, concave, with a long, upraised, adaxial carinal ridge within, defines a broad fossular cavity in front. Outer lip sharply angular inward to aperture, with numerous denticles on the inner edge graduating to a smaller size anteriorly. Shell color a rich rosy-mauve with paler transverse bands; base, funiculum, outer lip, side margins and posterior dorsal protuberance ivory colored.

Measurements: holotype: L-14.3; W-6.6; H-5.4 mm.

Type Locality: Mukaishima, Japan.

Holotype: Muséum National d'Histoire Naturelle, Paris, France; without catalogue number. (Bouchet, *in litt.*)

Discussion: This new ovulid species perhaps most closely resembles *Aperiovula takae* Cate, 1973, from which it differs by having a usually larger shell; by having transverse dorsal sculptured banding; by the differently formed outer lip, with more denticles on the inner edge, in a different pattern; the rear funicular callosity is also much more ponderous and larger, with a different relationship to the posterior canal and terminal beak; and the shell color is different, with an absence of dorsal coloring on the base.

This new species is dedicated to Anne-Marie Testud, Laboratoire de Malacologie (MNHN), Paris, who has assisted me immeasurably in many ways.

Primovula Thiele, 1925

Primovula (Primovula) santacarolinensis

Cate, new species

(Figure 3)

Description (holotype): Shell small, somewhat narrow, rhomboidly ovate, centrally humped. Terminals: tapering to a dull point adapically, less sharply anteriorly. Dorsum shiny, with longitudinal incremental growth lines, transversely marked with numerous incised striae, more widely separated over the central part. Base shiny, spindle-shaped, sub-ovate, in some areas striae obscured by a thin nacreous covering. Funiculum curiously sculptured, and denticulate. Aperture long, narrow, curving, broader at the front. Columella long, narrow, concave, with only a vestige of a fossula. Outer lip narrow, posterior

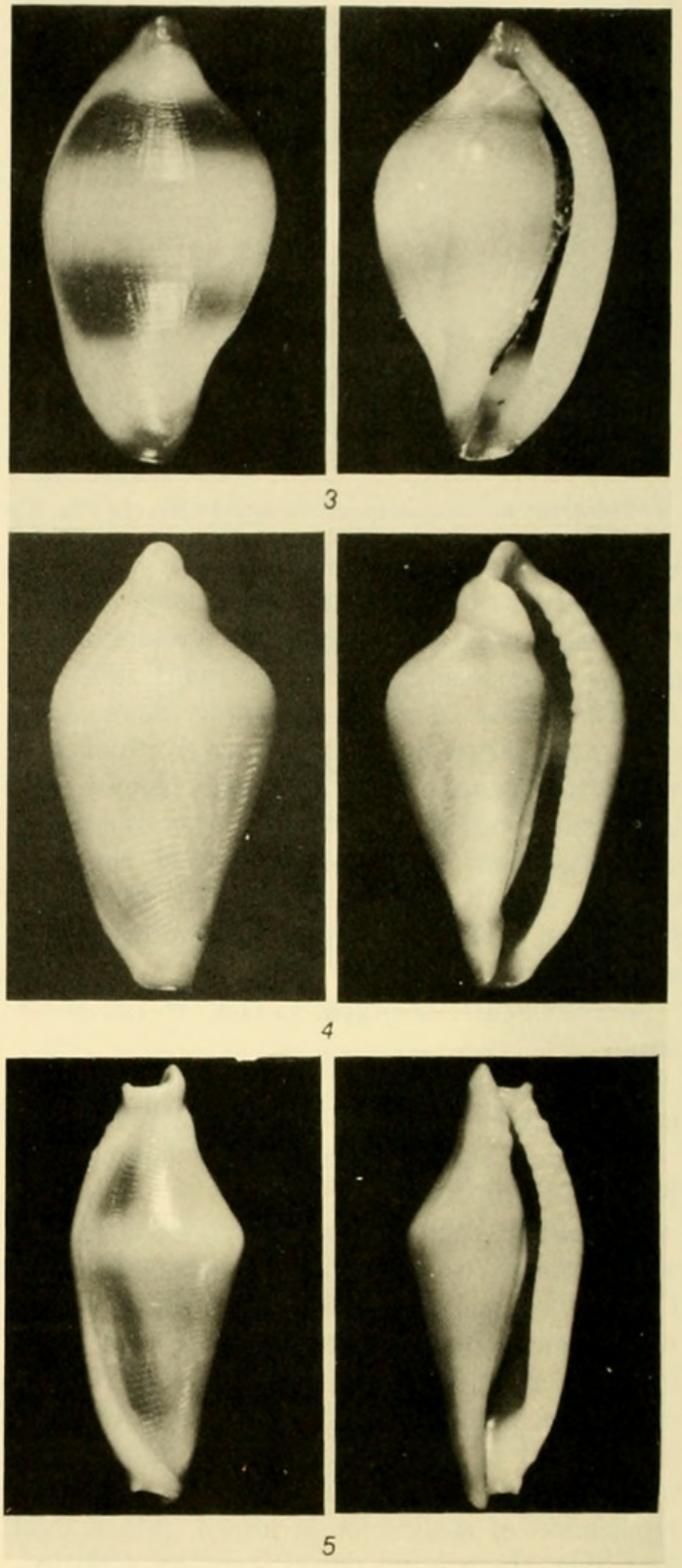

FIG. 3, Primovula (Primovula) santacarolinensis *Cate, new species. 8.2 mm. Mozambique.* 4, Primovula (Primovula) uvula *Cate, new species. 7.4 mm. Australia.* 5, Crenavolva (Crenavolva) periopsis *Cate, new species. 10 mm. Indonesia.*

half somewhat convex, anterior half flattened, slanting adaperturally; ventral lip surface minutely crenulate. Shell color basically dark to medium beige, with two broad, transverse bands of dark brown; both canals and terminal beaks dark brown.

Measurements (holotype): L-8.2; W-4.5; H-4.0 mm.

Type Locality: Mozambique, East Africa; 400 yards W of Santa Carolina, dredged in 18 meters of water, from a coral and rock bottom; leg. E. Roscoe, 1 March 1976 (15°03′S;40°42′E).

Holotype: Natal Museum, Pietermaritzburg, South Africa, No. G-7280.

Discussion: Although this new ovulid species seems to be distinct, it may be compared with the more southern East African *Primovula beckeri* (Sowerby III, 1900). *Primovula santacarolinensis* Cate differs by having a slightly larger shell; by lacking the longer, protruding teeth on the posterior outer lip's peripheral edge; by having the striking, broad dorsal bands of dark coloring on the terminal beaks and canals, and transverse dorsal incised striation is less boldly apparent.

The new name is derived from that of the type locality of the species.

Primovula (Primovula) uvula Cate, *n. sp.*
(Figure 4)

Description, (holotype): Shell small, solid, subglossy, rhomboidal in peripheral outline. Terminals produced, bluntly square anteriorly, roundly pointed, twisted adapically. Dorsum roughened, with numerous deeply incised transverse striae over all; dorsum transversely angulate subcentrally with a broad hump. Funiculum a highly elevated, thick, massive callus, forming the left wall of the posterior canal. Base narrowly rhomboid, dorsal striation extending onto base of columella, with a thin layer covering abapical base. Columella consisting of a long, somewhat narrow, fairly deep concave groove, becoming a fossula anteriorly. Aperture fairly evenly broad throughout. Outer lip broad, with a flattened ventral surface; lip surface angling downward, inward to aperture, with about 8 denticles extending from apertural edge to outer periphery of lip, and a noticeable gap between the last tooth and posterior terminal beak; denticles more numerous, but insignificant to crenulate anteriorly. Shell color pale greenish ivory over all, except much lighter on dorsal hump; anterior terminal canal outlet tinted with brown; (C 4147).

Measurements (holotype): L-7.4; W-3.7; H-3.0 mm. Los Angeles Co. Mus. Nat. Hist., No. 1790.

Type Locality: Moreton Bay, Queensland, Australia; dredged from deep water; (27°12′S; 153°12′E); *ex* Miss Elizabeth Grigg coll., Cairns.

Discussion: This Australian ovulid species seems unlike most of its congeners from Japanese deep water, notably from the Kii Channel. The acutely angular shoulders appear to be a major character in their separation. However, it may be compared with a species from the Philippines, *Primovula bellica* Cate, 1973, from which it differs in its more acutely angled shell form; by the brown coloring in the anterior canal; by virtue of the more tortuously twisted adapical terminal beak; its more elevated and massive rear funicular process, in that its base is striate, rather than smooth and glossy; and the columellar sulcus is broader and deeper.

The name of this new species is derived from the Latin noun, *uvula*, meaning pendant.

Crenavolva Cate, 1973
Crenavolva (Crenavolva) periopsis Cate, n. sp.
(Figure 5)

Description (holotype): Shell small, slightly reflexed, narrow, rhomboidly elongate, shell tapering, narrowing evenly at either end. Terminals squarely, cylindrically produced, with thickly rolled exterior edges. Dorsum shiny, divided by sub-central, transversely sharply elevated, angular dorsal ridge; dorsum numerously, incisedly striate over all. Base elongate, narrowly rhomboid, becoming very narrow and somewhat constricted anteriorly. Funiculum multi-knobbed (4), forming left wall of adapical canal. Columella long, narrow, smoothly concave, bordered adaxially by a longitudinal carinal ridge within. Fossula nearly obsolete. Aperture long, narrow, becoming wider anteriorly. Outer lip fairly broad, flatly angled inward, smooth, partly dentate; having three strong, separated teeth anteriorly, with several (11) denticles traversing ventral lip surface from the outer

margin to its inner edge, two of which extend beyond peripheral lip-edge. Shell color creamy-white over all, with darker tone visible through a thinned base color; a broad creamy-white band of color on dorsal ridge separating the anterior and posterior rear dorsum; the base and rolled terminal edges a contrasting darker ivory.

Measurements, (holotype): L-10.0; W-4.1; H-3.2 mm.

Type Locality: Soerabaja, Java, Indonesia (07°22′S; 112°40′E).

Holotype: Los Angeles County Museum of Natural History, No. 1791.

Discussion: This new species seems most closely to resemble the Western Indian Ocean species *Crenavolva (Crenavolva) hesperia* Cate, 1973.

Crenavolva (C.) periopsis differs from it, however, by having a slightly larger shell form; by a more elevated, sharply angled dorsal ridge, over which is a broad transverse band of light coloring. In addition, the rear outer lip teeth are larger, stronger, more prominent, and extend beyond the peripheral outer lip edge.

This new name is derived from the Greek prefix, *peri,* and the Latin suffix *opsis.* The combination denotes 'a likeness to'.

Spiculata Cate, 1973
Spiculata advena Cate, *n. sp.*
(Figure 6)

Description, (holotype): Shell of medium size, thin, translucent, long, narrow, tapering from center to either end. Terminals somewhat pointed, more sharply so adapically. Dorsum glossy, smooth, except for a few minute, restricted, incised striae over posterior beak. Base (apertural face) polished, glossy, narrowly ovate (spindle-shaped), curving very narrowly anteriorly. Columella rounded, polished, glossy, without longitudinal groove or carina, but with a minute fossular depression at the front. Aperture wide, open, nearly straight. Funiculum an upraised, massive, spiralling cord. Outer lip smooth, evenly curving, with a thin, cord-like edge callus. Shell color dark ivory over all, except for outer lip edge and terminal ends a contrasting glossy pale ivory.

Measurements, (holotype): L-14.6; W-5.6; H-4.3 mm.

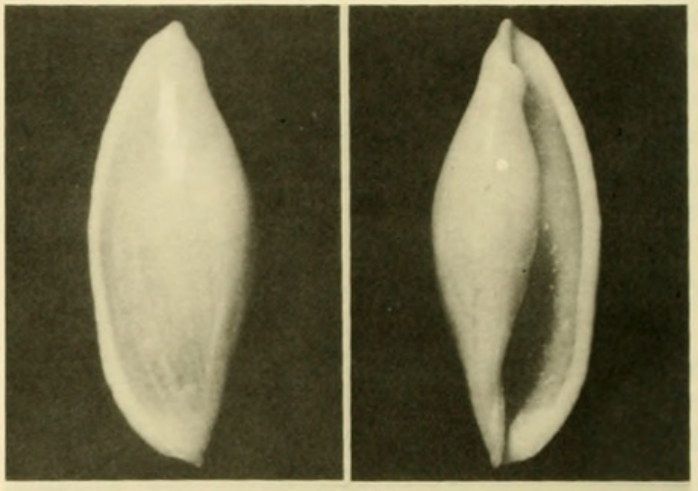

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FIG. 6. Spiculata advena *Cate, new species. 14.6 mm. Florida.*

Type Locality: Off Sand Key, Florida; 7 miles SW of Key West (approx. 24°33′N; 81°47′W).

Holotype: Los Angeles County Museum of Natural History, No. 1794.

Discussion: This new species may be compared with the west Gulf of Mexico ovulid species, *Simnialena marferula* Cate, 1973, from which it differs by having a larger shell and by having an open, straight apertural canal posteriorly. The funiculum is differently formed, with much less distortion of the posterior base and terminal area, and the shell colors are entirely different.

The new name for this species is derived from the Latin noun *advena,* meaning newcomer (as this species is to the Western Atlantic Ovulidae).

Cyphoma Röding, 1798
Cyphoma rhomba Cate, *n. sp.*
(Figures 7 and 8)

Description (holotype): Shell relatively small, sub-rhomboid (rectangularly elongate), sub-glossy, less solidly formed than any of its congeners. Terminals broad, beaks squared, calloused, as are the roundly thickened side margins. Dorsum smooth, tapering, barely corded, elevated ridge. Base (apertural face) smooth, elongate, sub-rhomboid, with a low transverse modification of the extended dorsal ridge crossing it. Columella rounded, smooth, curved. Both funicular and fossular sculptural characters absent. Aperture

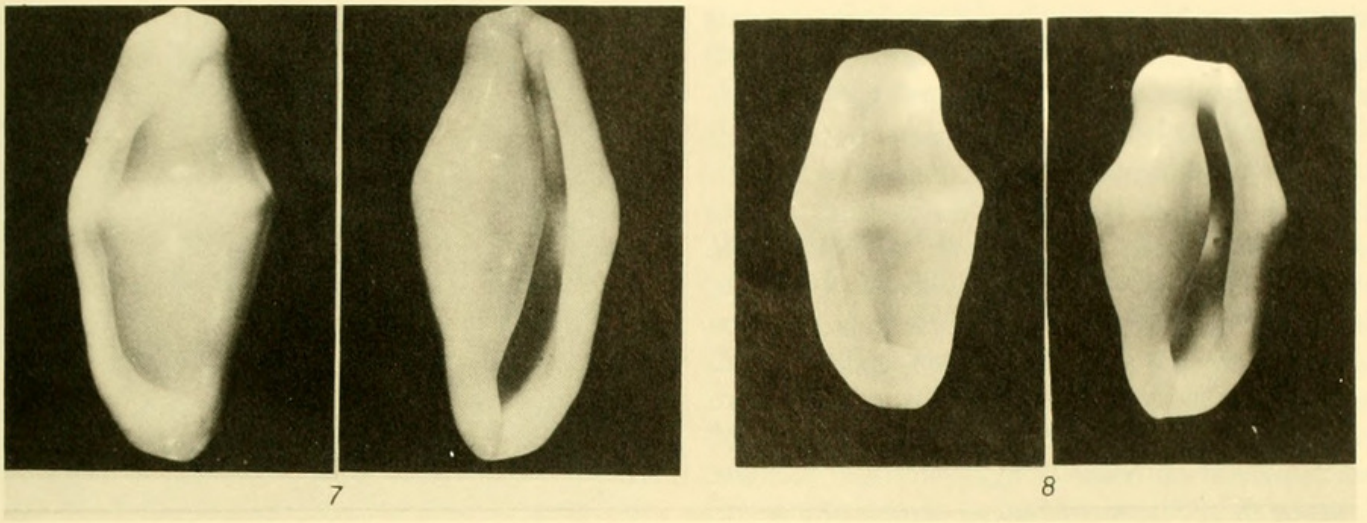

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FIG. 7, Cyphoma rhomba *Cate, new species, holotype 22.7 mm. Florida.* 8, Cyphoma rhomba *Cate, new species, paratype 20.9 mm. Florida.*

long, gently curving, somewhat wide, especially anteriorly. Outer lip smooth, fairly narrow, without dentition. Shell color: dorsum pale mauve, with the terminal tips, side margins, transverse dorsal ridge, and apertural face a contrasting bright white.

Measurements (holotype): L-22.7; W-10.5; H-8.3 mm. Paratype: L-20.9; W-11.1; H-8.9 mm. (Figs. 7 and 8 respectively).

Type Locality: Fort Lauderdale Reef, Florida; in 18 meters of water, living on Sea Whips (approx. 27°00′N; 80°00′W); leg. William Chapman, Fort Lauderdale, Florida, 20 February 1971.

Holotype: Los Angeles County Museum of Natural History, No. 1792; paratype in author's collection (C 3891).

Discussion: This new cyphomid species appears to be distinct and has generally a smaller shell than other species of the genus, with the possible exception of the Eastern Pacific *Cyphoma emarginatum* (Sowerby I, 1830.)

This new species seems most closely to resemble *Cyphoma emarginatum* (Sowerby I, 1830) in many morphological respects, but appears to differ in several important ways: by lacking the distorted adapical terminal beak, being smoothly terminated and less emarginate; by lacking the spiral funicular cord on the posterior columella, and by having a more thickly and heavily applied coat of callus on the terminal ends and side margins.

The basic color of the living animal is lavender over all. The mantle is decorated with fairly large, dark lavender spots (similar in shape to those of *Cyphoma mcgintyi* Pilsbry, 1939; (cf. Cate, 1973; figs. 150-150a); the foot is alternately marked with long and short stripes of dark lavender, and the peripheral edge of the foot is yellow. The animal's siphon is long, pale in color, with a dark lavender tip; the white tipped antennae emerge from a lavender base.

I am indebted to Kirk Anders, Fort Lauderdale, who sent the shells of this new species for study; and to William Chapman and Alfred Calabrese, Fort Lauderdale, Florida, for the pertinent details.

The rhomboid shape of the shell suggests its new name.

Pseudocyphoma Cate, 1973

Pseudocyphoma gibbulum Cate, new species

(Figure 9)

Description (holotype): Shell of medium size, solid, though not thickly formed; spindle-shaped, tapering equally, evenly to either end. Terminals dully pointed. Dorsum smooth (this dead shell may have been glossy when alive), without transverse striation, but having a distinct gibbous, sub-acute, transverse, sub-central angular ridge. Base (apertural face) evenly, narrowly ovate, smooth. Funiculum thick, obliquely corded. Columella smoothly rounded, without depression, with a very long inner carinal ridge on the anterior half. Fossula somewhat long, narrow, enhanced by ridge within. Aperture long, gently

curving, of medium width. Outer lip's ventral edge narrowly thickened, edentate, somewhat flattened abapically, and shouldered above. Shell color pale yellow-ivory.

Measurements (holotype): L-16.1; W-6.4; H-5.2 mm.

Type Locality: in 18 meters of water, dredged from a coral rubble bottom, off the Dry Tortugas Islands, SW Florida (24°40′N; 82°55′W).

Holotype: Los Angeles County Museum of Natural History, No. 1793.

Discussion: This new ovulid species is probably best compared with *Pseudocyphoma intermedium* (Sowerby I, 1828), which has a present range in the central West Indies. *Pseudocyphoma gibbulum* Cate differs from it, however, by having a smaller shell form and a more light-weight shell construction; by having less ponderous, more fragile terminal beaks, with the anterior canal opening flatter; and by having a more narrowly thickened outer lip edge. The base is less angularly ovate, with less narrowing and lengthening of the front base.

The new name is a diminutive of the Latin noun *gibbus*, meaning humped.

Margovula Cate, 1973

Margovula pyrulina (A. Adams, 1854)

(Figures 10 and 11)

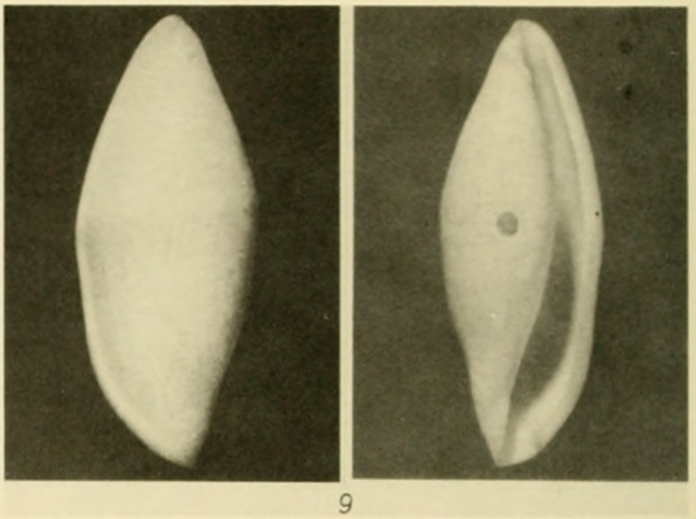
1854 *Amphiperas pyrulina* A. Adams, Proc. Zool. Soc. London **22**: 131.

Description (holotype): *"Amphiperas pyrulina*— A. testa ventricosa pyriformi, albida [pale grey], ad extremitates subproducta et pallide fulva, transversim striata; apertura angustata; labio laevi, in medio tumido, canalibus brevibus vix emarginatis, postice callo simplici instructo, labro intus crenulato." (A. Adams, 1854: 131).

Measurements (lectotype): approx. L-14.8 mm. (Figure 10); paralectotype: approx. 15.0 mm. (BM(NH), Reg. No. 1961145-2); hypotype: L-18.5; W-10.8; H-8.8 mm. (Cate coll. C 4144: Figure 11). [Measurements, *pyriformis*: L-19.7; W-11.3; H-9.4 mm. (C 3874-B: Figure 12)].

Type Locality: New Caledonia.

Locality Records: paralectotype: presumably New Caledonia (?). Hypotype: Nagai, Japan, in 3



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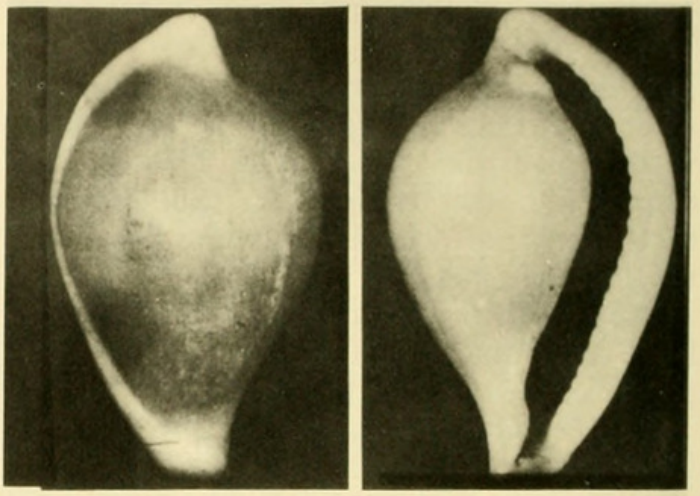

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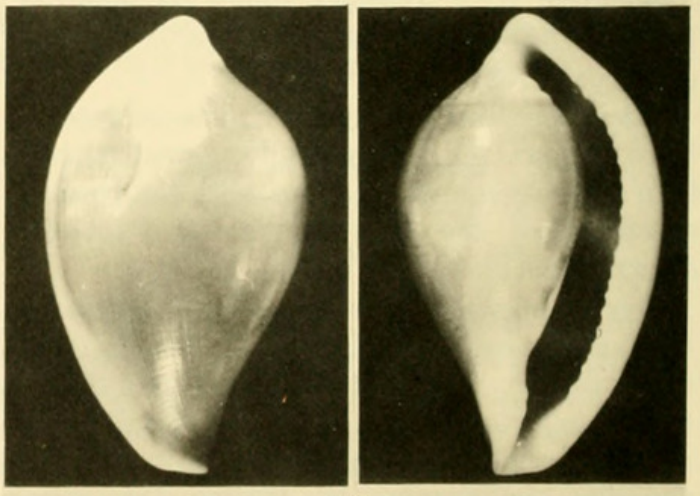

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FIG. **9,** Pseudocyphoma gibbulum *Cate, new species. 16.1 mm. Florida.* **10,** Margovula pyrulina *(A. Adams, 1854)* [*lectotype*]. 14.8 mm. **11,** Margovula pyrulina *(A. Adams, 1854)* [*hypotype*] × 3½.

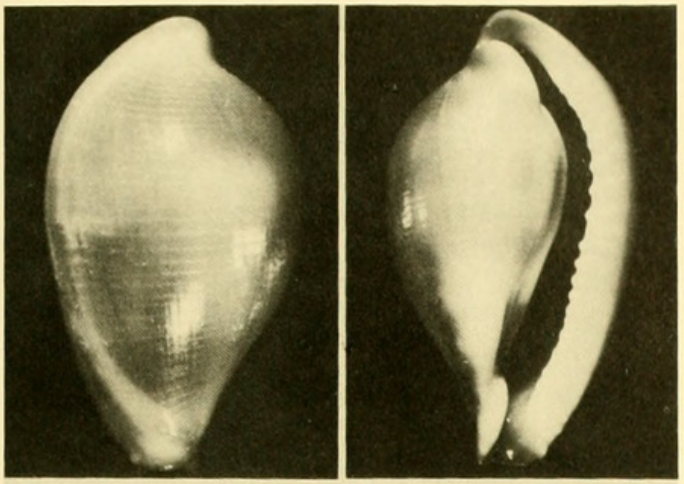

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FIG. 12, Margovula pyriformis *(Sowerby I, 1828)* [*hypotype*]. 19.7 mm.

meters of water; also collected off Jogashima, Sagami Bay, Japan (35°20′N; 139°20′E); dredged, 2-3 meters of water; leg. A. Teramachi, *ex* Elizabeth Grigg coll. Cairns, Qld., Australia. Since this species seems not to have been reported from New Caledonia (in this author's experience) in recent times, there is some question as to the validity of Adams' New Caledonia locality; the Japanese locality is the only confirmed one.

Lectotype: British Museum of Natural History, Reg. No. 1961.145-1; one of two syntypes.

Discussion: It is the purpose of this report to amend this author's earlier record (Cate, 1973: 16, fig. 28), by removing *M. pyrulina* from the synonymy of *Margovula pyriformis* (Sowerby I, 1828) and now recognizing it as a valid species.

Margovula pyrulina (A. Adams, 1854), (Figs. 10 and 11), although distinct, may be compared with *M. pyriformis* (Sowerby I, 1828) (Fig. 12) as follows: it possesses a more evenly ovate base, not acutely constricted sub-centrally at the aperture; the outer lip surface is more convex ventrally, roundly formed, less flattened as it tapers downward and inwardly; the outer lip teeth are smaller, more weakly formed; the dorsal striation is less deeply incised than that in *M. pyriformis*; the adapical canal, terminal beak, and funiculum are not so acutely reflexed to the left; the pale gray coloring of the dorsum, with the contrasting light ivory of the base, side margins, outer lip margin, and terminal beaks, all appear constant in *M. pyrulina*. The shell colors of *M. pyriformis* are many and varied (none of which is gray), ranging from light brown, yellow, deep rose, to pure white, and a pure white with a brown base (all of these color variations of *M. pyriformis* exist in the author's collection); and, finally, the canal endings are ringed with brown.

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LEOPOLD AND RUDOLPH BLASCHKA'S NUDIBRANCH GLASS MODELS

Catharine G. Kessler
and
Henry D. Russell

Museum of Comparative Zoology
Harvard University
Cambridge, Massachusetts

ABSTRACT

A brief sketch of the life of the European Blaschka family, particularly of Leopold and Rudolph, famous for their glass-blowing skills, is given. A list of their glass models of nudibranchs surviving in the Museum of Comparative Zoology, Harvard University, The Museum of Science, Boston, and the Academy of Natural Sciences of Philadelphia is presented, with a selected bibliography of general works and those that might well have been consulted by the Blaschkas in making their models.