

sum, and a more prominent basal marginal callus. Inzani (1995) figured specimens that display a range of minor shell differences, but all are consistent with the subspecies *Z. (Z.) porcellus cocconii*.

*Etymology*: This new species is named for William D. and Lois J. Pitt, Sacramento, California, in recognition of their numerous important paleontological works on the Tertiary of Ecuador and Panamá.

Subgenus PSEUDOZONAIRA  
Schilder, 1927

*Pseudozonaria* SCHILDER, 1927, Arch. Naturges., v. 91A, p. 115.

Type Species: *Cypraea arabicula* Lamarck, 1810, by original designation; Recent, Panamic Province.

ZONARIA (PSEUDOZONARIA) CATHYAE  
Groves, n.sp.

Plate 1, figures 9, 10

*Zonaria (Pseudozonaria)* n.sp. GROVES, 1997, West. Soc. Malac., Ann. Rept., v. 29, p. 8.

*Diagnosis*: A *Zonaria (Pseudozonaria)* with oval shape, strong teeth on terminal canals, and wide, denticulated fossula.

*Description*: Shell oval in shape, medium in size; spire covered, with prominent pit near spire callus; dorsum highly arched, maximum height slightly posterior of midpoint; wide straight aperture slightly curved posteriorly toward columella; denticulation fine and incised with smooth interstices; labial lip with 18 teeth; columellar lip with 16 teeth; strong teeth on terminal canals; wide fossula crossed by columellar teeth; basal marginal callus prominent; deep and well developed terminal canals.

*Type Material*: Holotype LACMIP 12433; length 22.3 mm, width 15.8 mm, height 12.8 mm, H.E. and E.H. Vokes collectors (pl. 1, figs. 9, 10).

*Type Locality*: TU locality 1397 (= P-100; LACMIP locality 16944), lower Pliocene Esmeraldas beds, Onzole Formation; Quebrada Camarones, cut-bank on east side of canyon, east of the village of Camarones, 20 km east of bridge over Río Esmeraldas, Esmeraldas, Esmeraldas Province, Ecuador.

*Occurrence*: Esmeraldas beds, Onzole Formation; TU locality 1397 [= P-100; LACMIP locality 16944] (1 specimen).

*Discussion*: The new species is most similar to *Z. (P.) portelli* (Petuch, 1990) from the Pleistocene Bermont Formation, Dade County, Florida and the Recent Panamic *Z. (P.) robertsi* (Hidalgo, 1906). *Zonaria (Pseudozonaria) cathyae*, n.sp., has finer and more numerous apertural teeth than both similar species, a more prominent basal marginal callus, and a thicker more prominent labial lip with incised teeth. The upper Miocene *Zonaria (Pseudozonaria) telembiensis* differs from *Z. (P.) cathyae* by its smaller size, fewer and coarser apertural teeth, and a weaker basal marginal callus.

*Etymology*: This new species is named for my wife Cathy L. Groves, of the Echinoderms Section of Invertebrate Zoology, Natural History Museum of Los Angeles County.

ZONARIA (PSEUDOZONARIA) TELEMBIENSIS  
(Olsson, 1964)

Plate 1, figures 11, 12

*Cypraea (Pseudozonaria) telembiensis* OLSSON, 1964, Neogene Moll. Northwest. Ecuador, p. 175, pl. 31, figs. 6a-b.

*Zonaria (Pseudozonaria) telembiensis* (Olsson). SCHILDER and SCHILDER, 1971, Inst. Roy. Sci. Nat. Belgique, Mem. 85, p. 46, 162; GROVES, 1993, West. Soc. Malac., Ann. Rept., v. 25, p. 12; GROVES, 1997, West. Soc. Malac., Ann. Rept., v. 29, p. 8.

*Type Material*: Holotype USNM 644048, 19.5 mm length, 13.4 mm width, 10.1 mm height, A.A. Olsson collector (pl. 1, figs. 11, 12).

*Type Locality*: Río Cayapas, Telembi, Esmeraldas Province, Ecuador; upper Miocene, Angostura Formation.

*Occurrence*: Known only from a single specimen from the type locality (Olsson, 1964).

*Discussion*: *Zonaria (Pseudozonaria) telembiensis* is the earliest known species of its subgenus.

Family OVULIDAE Fleming, 1822

Subfamily EOCYPRAEINAE

Schilder, 1924

Tribe CYPROGLOBININI Schilder, 1924

Genus JENNERIA Jousseauime, 1884

*Jenneria* JOUSSEAUIME, 1884, Bull. Soc. Zool. France, v. 9, p. 98-99.

Type Species: *Cypraea pustulata* [Lightfoot, 1786], by original designation; Recent, Panamic Province.

Subgenus JENNERIA Jousseau, 1884

JENNERIA (JENNERIA) PANAMENSIS  
(Olsson, 1967)

Plate 1, figures 13, 14

*Cypropterina pustulata* (Lamarck, 1810). OLSSON, 1942, *Bulls. Amer. Paleontology*, v. 27, no. 106, p. 21. Not *Cypraea pustulata* [Lightfoot, 1786].

*Jenneria panamensis* OLSSON, 1967, *Notulae Naturae*, p. 9, pl. 1, figs. 3-3a.

*Cypropterina (Jenneria) panamensis* (Olsson). SCHILDER and SCHILDER, 1971, *Inst. Roy. Sci. Nat. Belgique, Mem.* 85, p. 71, 141; GROVES, 1993, *West. Soc. Malac., Ann. Rept.*, v. 25, p. 12; GROVES, 1997, *West. Soc. Malac., Ann. Rept.*, v. 29, p. 8.

Type Material: Holotype NSP 31312, missing (E. Benamy, pers. commun., 1990).

Type Locality: Upper Pliocene, Charco Azul Formation, Río Blanco, Burica Peninsula, Chiriquí Province, Panamá (Olsson, 1967).

Figured Specimen: LACMIP 12434, TU locality 1399 (= P-101; LACMIP locality 16882); length 25.8 mm, width 16.9 mm, height 11.8 mm, H.E. and E.H. Vokes collectors; roadcut on west side of village of Camarones, 20 km east of bridge over Río Esmeraldas, Esmeraldas, Esmeraldas Province, Ecuador.

Occurrence: Charco Azul Formation, Panamá (Olsson, 1967); Esmeraldas beds, Onzole Formation, Ecuador (herein).

Discussion: *Jenneria (Jenneria) panamensis* is the only species of fossil ovulid from the Neogene of Ecuador. The Pleistocene through Recent Panamic species *J. (J.) pustulata* [Lightfoot, 1786] appears to be more closely related to the "Florida group" of pustularias of Olsson (1967), based on shell characteristics than to *J. (J.) panamensis* and is the sole surviving species of this genus.

VI. LOCALITY REGISTER  
OF FIGURED SPECIMENS

ANSP 13665. Jama Formation, Puerto Jama, Manabí Province, Ecuador. Early Pliocene.

TU 1397. Esmeraldas beds, Onzole Formation, Quebrada Camarones, cut-bank on east side of canyon, which is at east edge of village of Camarones, 20 km (by road) east of bridge over Río Esmeraldas, Esmeraldas Province, Ecuador. Early Pliocene. [= P-100; LACMIP 16944].

TU 1399. Esmeraldas beds, Onzole Formation, road-cut on west side of village of Camarones, which is 20 km (by road) east of bridge over Río Esmeraldas, Esmeraldas Province, Ecuador. Early Pliocene. [= P-101; LACMIP 16882]

TU 1507. Angostura Formation, large point just east of Río Verde, or approximately 30 km east of Río Esmeraldas, Esmeraldas Province, Ecuador. Late Miocene. [= P-102; LACMIP 16943].

USNM 644048. Angostura Formation, Telembi, Río Cayapas, Manabí Province, Ecuador. Late Miocene.

VII. LITERATURE CITED

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## THE TULANE GEOLOGICAL COLLECTIONS

In 1956 when Harold E. Vokes came to Tulane University to build up the Geology Department and institute a graduate program in Geology and Paleontology, the collections of fossil and Recent material consisted of the remnants of what originally had been exhibited at the Louisiana Cotton Centennial Exposition. This exposition, which marked the 100-year anniversary of the shipment of the first bale of cotton from the port of New Orleans, was held in what is now Audubon Park, across St. Charles Avenue from the present Tulane campus. Like all such expositions at this time, fossils, minerals, zoological specimens, etc., were sent by countries all over the world (there was a beautiful mineral collection from Uruguay, for example). After the exposition ended the material was donated to Tulane University and for the next 70 years comprised a "natural history museum" in the attic of the main administration building, Gibson Hall. However, in 1956, coinciding with Vokes's arrival, the University disbanded the museum and distributed the specimens between the Geology and Biology departments.

In this collection there were beautiful European ammonites and such, but almost no American fossils. Professor Vokes's first order of priority was to establish a collection of stratigraphic guide fossils for the purposes of teaching Stratigraphic Paleontology. To this end, 49 of the first 50 TU fossil localities are Paleozoic.

But soon Professor and Mrs. Vokes turned to the Cenozoic outcrops of the Gulf and Atlantic Coastal Plain, and in 1962 drove from New Orleans to Isla Mujeres, Quintana Roo, Mexico, beginning their fascination with the Tertiary formations of the Isthmus of Tehuantepec. In 1968 a longer drive from New Orleans to Panama introduced them to the beautiful outcrops in Panama and Costa Rica, which were subsequently revisited many times. In 1976 political stability finally permitted collecting in the Dominican Republic and for the next eight years this was the scene of greatest interest.

Other trips added localities in France, Australia, New Zealand, South America, and other sites throughout the world. By 1995, when Mr. Vokes's health ended their activities, the Tulane collection numbered 1545 localities, that last number being, of all places, a hitherto undiscovered locality on the Chipola River, in an area where they already had 55 localities.

At the same time the fossils were being collected, Recent mollusks were also being added to the collections, with a total of 666 localities ranging from Iceland to Antarctica, although the vast majority were more tropical in nature -- especially from the Yucatan Peninsula, as a result of the Vokes's publication on the fauna of that area.

But in 1996 Emily Vokes retired from Tulane, Harold having already been required to retire at the then mandatory age of 70 in 1978. With the realization that no one at the Tulane Geology Department any longer had any interest in these collections it was agreed that the material be placed in institutions where it would be conserved (hopefully) in perpetuity. Therefore, the collections have been dispersed to three institutions. All of the Dominican Republic material, as well as the Paleozoic and most of the Mesozoic localities are now at the Paleontological Research Institution, Ithaca, New York. The rest of the non-U.S. Tertiary, as well as a few Mesozoic localities, are now at the U.S. National Museum of Natural History, Washington, D.C. But the bulk of the collection, including almost all of the U.S. Cenozoic localities, as well as all of the Recent mollusks (except for Australia and New Zealand localities, which were given to the USNM) are now in the Florida Museum of Natural History, Gainesville, Florida.