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A NEW SPECIES OF *EUPLEURA* (GASTROPODA:MURICIDAE)
FROM THE GATUN FORMATION, PANAMA

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In the process of determining the identity of the species cited by Olsson (1964, p. 139) as "*Eupleura thompsoni* Woodring subspecies," from the Angostura Formation of northwestern Ecuador, it became obvious that there are two species of *Eupleura* in the Gatun beds of Panama. One of these is the species named *Eupleura thompsoni* Woodring, 1959, and compared by him to the living *E. muriciformis* (Broderip, 1833). However, the similarity is much greater to the more spinose and long-canaled *E. pectinata* (Hinds 1844), which is found on the west coast of tropical America, from Mexico to Panama.

The second is a smaller form that is more closely related to another species living on the west coast of tropical America, *Eupleura nitida* (Broderip, 1833), characterized by nodulose intervarical areas and a scabrous surface texture. From the appearance of the new Gatun species, it is al-

most certainly ancestral to the rather atypical *E. nitida*.

In the Gatun Formation, *E. thompsoni* is by far the more common and widespread form. In the Tulane Collections we have over 500 specimens from seven localities. The new species is much rarer - it has only been taken at two localities, with just 50 specimens. The majority of these (47) are from one locality, TU 958, which must represent a different environment from most of the Gatun localities, as it was here that we also collected a large number of *Poirieria* (*Panamurex*) *gatunensis* (Brown and Pilsbry, 1911) (see Vokes, 1970, p. 42).

The genus *Eupleura* is a small group with but six Recent species (all well-figured by Radwin and D'Attilio, 1976, pl. 19, figs. 1-7), all found in the Western Hemisphere. Two of these are living today in the western Atlantic: *E. caudata* (Say, 1822), type of the genus, and *E. sulciden-*

tata Dall, 1890. Four are living in the eastern Pacific: *E. muriciformis* (Broderip, 1833), *E. triquetra* (Reeve, 1844), *E. pectinata* (Hinds, 1844) and *E. nitida* (Broderip, 1833). The relationship between the Atlantic and Pacific forms is interesting. The Pacific species *E. muriciformis* and *E. triquetra* are very closely related to the Atlantic *E. sulcidentata* and *E. caudata*, respectively. The other two Pacific species are most closely related to the two Gatun species treated herein. The Gatun is an Atlantic fauna but there are no living Atlantic descendants of either of these Gatun fossil species.

Class GASTROPODA

Order NEOGASTROPODA

Superfamily MURICACEA

Family MURICIDAE Rafinesque, 1815

Subfamily THAIDINAE Jousseaume, 1888

Genus *EUPLEURA* Adams and Adams, 1853

Eupleura H. ADAMS and A. ADAMS, 1853, Gen. Recent Mollusca, v. 1, p. 107.

Type species: *Ranella caudata* Say, 1822, by subsequent desig., F. C. Baker, 1895.

EUPLEURA THOMPSONI Woodring

Plate 1, figs. 6-8

Eupleura thompsoni WOODRING, 1959, U. S. Geol. Surv., Prof. Paper 306-B, p. 219, pl. 36, figs. 6-9.

Holotype: USNM 562587; height 45.7 mm, diameter 29.5 mm.

Type locality: Woodring locality 136A, Gatun Formation; north side Transisthmian (Boyd-Roosevelt) Highway, knoll about 30 m north of highway, 1.2 km northwest of Sabanita, Prov. of Colón, Panama.

Figured specimens: Fig. 6, USNM 445394; height 27.6 mm, diameter 16.9 mm. Fig. 7, USNM 445395; height 34.6 mm, diameter 21.0 mm. Fig. 8, USNM 445396; height 19.3 mm, diameter 12.2 mm. Locality of all, TU 958.

Occurrence: Gatun Formation, Panama. TU localities 958 (227 specimens), 961, 962, 757, 1411, 1432, 1433.

Discussion: When originally described, *E. thompsoni* was indicated by Woodring (1959, p. 219) as being the first western Atlantic species of *Eupleura* described south of Florida. Since that time, Jung has described two additional Caribbean fossil species: *E. kugleri* (1965, p. 524, pl. 70, figs. 3-6), from the Early Miocene Cantare

Formation, Venezuela; and *E. lehneri* (1969, p. 491, pl. 50, figs. 1-4), from the Late Miocene Melajo Clay, Trinidad. But, as Woodring noted, there are still no living species of the genus in the warmer waters of the Caribbean Sea.

However, the relationship of this Gatun species is not with the Caribbean fauna, as one might anticipate, but with the eastern Pacific fauna, *E. thompsoni* having a marked resemblance to the living *E. pectinata* (Hinds, 1844). The differences between the two forms include a much higher spire in *E. pectinata*, which also has a body whorl that is somewhat better delineated from the longer siphonal canal. In *E. pectinata* the varices are more excavated on the abapertural side, the varical spines are longer, and the spine at the shoulder is more adapically directed. Moreover, the early whorls of the two species are so completely different that the resemblance between the two may be due only to convergence.

EUPLEURA PRENITIDA Vokes, n. sp.

Plate 1, figs. 1-4

Description: Shell small, seven teleoconch whorls in adult; protoconch unknown. Spiral ornamentation on earliest teleoconch whorls of two cords, a third partially covered by suture. Gradually secondary threads intercalated, until body whorl has approximately ten major cords, best seen on abapertural sides of varices, with between each pair, three to five secondary threads; another six faint threads on siphonal canal. Axial ornamentation on earliest teleoconch whorls of approximately 12 lamellae, diminishing in number and becoming more like axial ridges until about fifth teleoconch whorl two develop into varices, two per whorl, with three strong intervarical nodes between each pair. Varices not well-aligned on opposite sides of the shell, a marked offset between varices on succeeding whorls of as much as 30 degrees. Varices scalloped by extensions of the spiral cords, forming short spines, that at the shoulder directed adapically. Apertural face of the varices consisting of multiple laminae enfolded into grooves formed by the spiral cords, giving a lacinated appearance to the varical face. Shell surface between the varices also marked by numerous axial growth lines that cause shell material to be drawn out adaperturally where the spiral threads are crossed, giving the entire shell surface a lacinated appearance. Aperture elongate-oval; inner lip adnate, with numerous faint rugae reflecting the underlying spiral cords;

margin of outer lip reflected abaperturally, crenulated by grooves of spiral cords; inner side with six strong denticles located between the spiral cords. Siphonal canal moderately long, straight, almost closed over but open by a narrow slit.

Holotype: USNM 445390; height 31.1 mm, diameter 17.7 mm (Plate 1, fig. 1).

Paratype A: USNM 445391; height 27.0 mm, diameter 17.2 mm; locality same as holotype (Plate 1, fig. 2).

Paratype B: USNM 445392; height (incomplete) 23.5 mm, diameter 14.6 mm, locality same as holotype (Plate 1, fig. 3).

Paratype C: USNM 445393; height 15.3 mm, diameter 9.5 mm, locality same as holotype (Plate 1, fig. 4).

Type locality: TU 958, Gatun Formation, hill-slope on east side of road from Boyd-Roosevelt Highway to Refineria Panama, S. A., about 0.5 km north of junction, just east of Cativá, Prov. of Colón, Panama.

Occurrence: Gatun Formation, Panama. TU localities 958 (47 specimens), 1431 (3 specimens).

Discussion: This new species occurs together with the more common *E. thompsoni* at only two localities and at only one of these, the type locality, does it occur in any numbers. There is no possibility of confusing it with *E. thompsoni*, as the two have only a generic resemblance. The species to which it is most closely related is a new species, described elsewhere in this volume (Vokes, 1989), from the Late Miocene Angostura Formation of Ecuador. From the slightly older species the Panama shell differs in its more scabrous nature, which is a result of the combination

of stronger secondary spiral ornamentation crossed by axial growth lines. In addition, the shoulder spines of the Panama species are more upturned and the varical offset is greater. Nevertheless the two species are extremely close and are more closely related to each other than to any other known species.

There is another species, *E. lehneri* Jung, described from the Late Miocene Melajo Clay of Trinidad (Jung, 1969, p. 491, pl. 50, figs. 1-4) that has a superficial resemblance to this new species. The Trinidadian species has longer spines than *E. prenitida*, with more expanded varices and a longer canal. The surface of *E. lehneri* is smoother than that of *E. prenitida*, except for the major spiral cords. In many ways, *E. lehneri* has a stronger resemblance to the living *E. pectinata* than to *E. prenitida*. The spines extending beyond the varical webbing, the extreme adapical angle of the shoulder spine, and the smooth surface texture all suggest that, perhaps, *E. lehneri* gave rise to *E. pectinata*, and *E. thompsoni* is not part of the direct lineage.

It is presumed that the new Panama species gave rise to the Recent *E. nitida* (Broderip, 1833), which today lives in the eastern Pacific from Mexico to Ecuador. The living species has the same sort of lacinated surface texture that is seen in *E. prenitida*, but differs in having small nodules developed where the spiral cords cross the intervarical nodes. The varices are also

PLATE 1

Figures

1-4. *Eupleura prenitida* Vokes, n. sp.

1. (X 2) USNM 445390 (holotype); height 31.1 mm, diameter 17.7 mm.

2. (X 2) USNM 445391 (paratype A); height 27.0 mm, diameter 17.2 mm

3. (X 2) USNM 445392 (paratype B); height (incomplete) 23.5 mm, diameter 14.6 mm.

4. (X 3) USNM 445393 (paratype C); height 15.3 mm, diameter 9.5 mm.

Locality of all: TU 958, Gatun Formation, Panama.

5. *Eupleura nitida* (Broderip, 1833)

(X 2) USNM 860472; height 22.1 mm, diameter 15.5 mm.

Locality: TU R-188, Venado Beach, Panama.

6-8. *Eupleura thompsoni* Woodring

6. (X 2) USNM 445394; height 27.6 mm, diameter 16.9 mm.

7. (X 2) USNM 445395; height 34.6 mm, diameter 21.0 mm.

8. (X 3) USNM 445396; height 19.3 mm, diameter 12.2 mm.

Locality of all: TU 958, Gatun Formation, Panama.

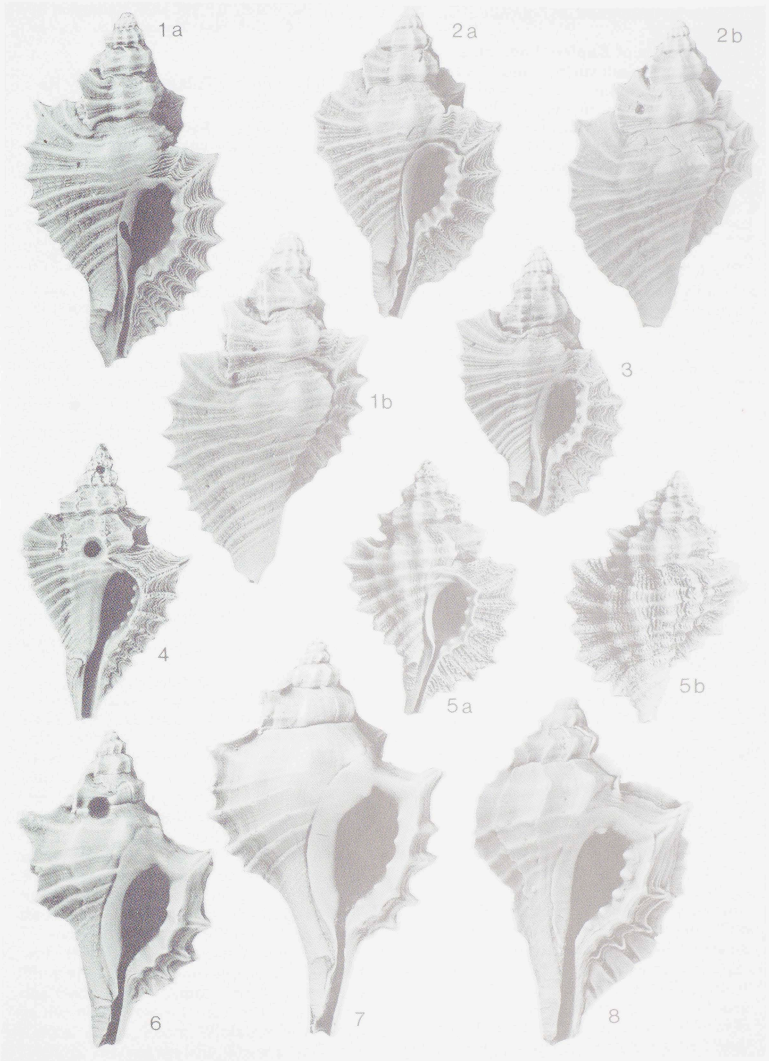


PLATE 1

more perfectly aligned on opposite sides of the shell.

Most species of *Euplera* have an almost totally smooth shell surface and it is an interesting evolutionary sequence to see the development from the relatively smooth Ecuadorian species, to the moderately scabrous *E. prenitida* to the Recent *E. nitida*, which is so scabrous as to appear frosted when the shell is unworn (see plate 1, fig. 5).

LOCALITY DATA

The following are Tulane University fossil locality numbers. All are from the Gatun Formation, Province of Colón, Panama.

757. Roadcut on south side of Boyd-Roosevelt Highway at junction of road to Refinería Panama, S. A., just east of Cativá.
958. Hillslope on east side of road from Boyd-Roosevelt Highway to Refinería Panama, S. A., about 0.5 km north of junction, just east of Cativá.
961. Roadcuts north and south side of Boyd-Roosevelt Highway, just east of Cativá (= Woodring locality 138).
962. Roadcut on road to Refinería Panama, S. A., about 0.5 km south of the gate; hillcut and fill for new (1968) power plant construction.
1431. Hilltop construction site, 0.5 km northwest of intersection of Boyd-Roosevelt Highway and road to Puerto Pilon, at Sabanita.
1432. North side of Boyd-Roosevelt Highway, clearing behind Residential Martin Luther King (formerly Palo Quemado), approximately 1.5 km east of junction of road to Refinería Panama, S. A., at Cativá.
1433. North side of Boyd-Roosevelt Highway, clearing behind Urbanization San Martin,
- approximately 0.5 km east of junction of road to Refinería Panama, S. A., at Cativá.
- The following is a Tulane University Recent locality number:
- R-188. Venado Beach, Pacific Ocean, just west of Canal Zone-Panama boundary line, Canal Zone.

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