

TWO NEW SPECIES OF MYTILOPSIS FROM PANAMA AND FIJI

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Recently we identified a series of marine mollusks collected by Dr. James Zetek, of the Institute for Research in Tropical America, at Barro Colorado Island Biological Laboratory in the Panama Canal Zone. In this series we observed about 25 specimens of *Mytilopsis* found at Miraflores Locks, Canal Zone, Panama. The shells in this lot are remarkably constant in general features. They differ from any described species in outline as well as in other details, therefore we describe this Panamanian form as a new species.

Along with the type lot there is a small piece of wood in which there are rounded holes approximately 10 mm. in diameter. In the holes there are well-formed, uneroded shells of *Mytilopsis*. It appears then, that the species nestles in holes already made such as mentioned regarding *M. sallei* by von Martens (Biol. Centrali-Americana, Moll., 1900, p. 478).

Another species, apparently undescribed, also has come to our attention. This species is represented by four specimens all with both valves intact. These were present in a collection of shells from "Viti Isles" presented by the Misses E. and L. Allyn to the California Academy of Sciences in 1929.

FAMILY DREISSENSIDÆ

Several authors have discussed the members of this family. Among these are Fischer¹, Andrussow,² Crosse & Fischer³ and Brusina⁴. Crosse & Fischer gave a review of the literature dealing with the family, referred to previously described American species and clearly explained the many changes in orthography which the genus name *Dreissensia* has undergone. The genus, according to Dewalque, and Crosse & Fischer, was named for Henri Dreissens who lived in Limbourg, Belgium.

¹Fischer, P., Journ. de Conchyl., Vol. 7, 1858, pp. 123-134.

²Andrussow, N., Verhandl. Russ.-Kais. Min. Gesell. (St. Petersburg), Ser. 2, Bd. 26, 1890, pp. 223-240; Les Dreissensidæ fossiles et vivants d'Eurasie (St. Petersburg), 1897, 683 pp., 15 figs. in text, atlas with 20 plates, also resumé of this paper in the German language, (Jurjev) 1898 [according to Brusina, 1906].

³Crosse, H., and Fischer, P., Miss. Sci. au Mexique et Amér. Centrale, Zool. Pt. 7, Moll., Vol. 2, 1890, pp. 497-505.

⁴Brusina, S., Journ. de Conchyl., Vol. 53, No. 3, 1906, pp. 272-297.

GENUS MYTILOPSIS Conrad

Mytilopsis Conrad, Proc. Acad. Nat. Sci. Philadelphia, Vol. 9, for June, 1857, p. 167 [apparently issued between January 7 and May 1, 1858]. Species cited: *Mytilus leucophæatus* Conrad and *Dreissena domingensis* Recluz.—Dall, Trans. Wagner Free Inst. Sci., Vol. 3, Pt. 4, 1898, p. 808. "Type *M. leucophæatus* Conr., 1831" [Jour. Acad. Nat. Sci. Philadelphia, Vol. 6, April, 1831, p. 263, pl. 11, fig. 13. "Inhabits the southern coast of the U. S."].

Praxis H. & A. Adams, Gen. Rec. Shells, Vol. 2, December, 1857, p. 522. Not *Praxis* Guenée, 1852. Lepid.

Mytiloides Conrad, Proc. Acad. Nat. Sci. Philadelphia, Vol. 26, May 19, 1874, p. 29. Err. for *Mytilopsis* according to Conrad, p. 83. Not *Mytiloides* Brongniart, 1822.

Shell mytiliform, attached by a byssus; hinge with a septum, beneath which on the cardinal side is a triangular cup-shaped process; cartilage groove rather deep. (Original description).

The genera *Mytilopsis* and *Congeria* differ from *Dreissensia* in that a triangular process (myophore) is present on the under side of the septum within the beaks.

The genus *Mytilopsis* is represented by a number of species in the tropical American region. It occurs in waters which are slightly brackish or entirely fresh. It is known to occur at least as early as the lower Miocene or upper Oligocene.

This genus also occurs in Africa and a new species, *Mytilopsis allyneana*, described in the present paper, came from Fiji. The occurrence of this species is in harmony with the past history of Fiji which, according to Ladd,⁵ appears to have once formed a portion of a continental area. Dall⁶ mentioned the occurrence of "*Congeria*" in the Viti Isles. However, *Mytilus leucophæatus* Conrad and other species now referred to *Mytilopsis* were placed by Dall in *Congeria* Partsch. The type of '*Congeria*' is *Congeria subglobosa* Partsch.

MYTILOPSIS ALLYNEANA Hertlein & Hanna, new species

Plate 4, Figures 5-8

Shell small, mytiliform, gently sloping dorsally, rather steeply sloping ventrally; dorsal outline forming a very broad curve, widest anterior to the center where it becomes subangulate and then slopes posteriorly in nearly a straight line rounding into the broadly elliptical posterior end; ventral margin slightly curved and slightly but decidedly incurved below the beaks where a well

⁵See Ladd, H. S., Bernice P. Bishop Mus., Bull. 119, 1934, p. 51, fig. 6 (p. 50).

⁶Dall, W. H., Trans. Wagner Free Inst. Sci., Vol. 3, Pt. 4, April, 1898, p. 809.

⁷See Pilsbry, H. A., Nautilus, Vol. 25, No. 8, December, 1911, p. 95.

developed byssal gape is present; umbos rounded, slightly eroded, smooth, beaks terminal; interior septum and muscular impressions are characteristic of the genus; fine radial striæ are present on the central and posterior portions of the interior of the shell; exterior of shell whitish, covered with a thin, corneous periostracum which is finely concentrically ridged in harmony with the lines of growth; interior bluish-white with dark concentric markings. Dimensions of holotype: beak to base, 23.5 mm.; dorso-ventral, 12.6 mm.; convexity (both valves together), 10.6 mm.

Holotype, No. 9452 and Paratype, No. 9453 (Calif. Acad. Sci. Dept. Paleo. Type Coll.), from "Viti Isles" [Fiji].

This new species bears a general resemblance to *Mytilopsis africanus* van Beneden from Africa. It differs from that African species in that it is wider in proportion to the length and the beaks are less attenuated. The less attenuated beaks and greater incurving below the beaks are features which assist in separating this new species from the shell described by Reeve as *Mytilus tenebrosus*.

MYTILOPSIS ZETEKI Hertlein & Hanna, new species

Plate 4, Figures 1-4

Shell small, mytiliform, flattened dorsally, sloping rather steeply ventrally; dorsal outline forming a broad curve, widest slightly anterior to the center, continuing around the posterior end which is obliquely elliptically pointed; ventral margin very slightly curved except where it is distinctly incurved just below the beaks; umbos rounded, smooth, beaks terminal; interior with a narrow septum which ventrally bears a sharp triangular process (myophore) which extends down and somewhat posteriorly; internal muscular impressions characteristic of the genus; fine radial striæ are present on the interior of the central and posterior portions of some shells; shell white, covered with a thin, corneous periostracum which is finely concentrically ridged in harmony with the lines of growth; a dark byssus is present; interior white often with bluish concentric markings. Dimensions of holotype: beak to base, 25 mm.; dorso-ventral, 13 mm.; convexity (both valves together), 14 mm.

Holotype, No. 9445 and Paratypes, Nos. 9446-9451 (Calif. Acad. Sci. Dept. Paleo. Type Coll.), from Miraflores Locks, Panama Canal Zone; James Zetek, collector, 1937.

The shells of some of the species described in this group appear to differ from each other chiefly in their outlines. The species here described as new resembles in general features *Mytilopsis adamsi* Morrison, described from San José Island in Panama Bay. It differs from that species in that the posterior dorsal outline is

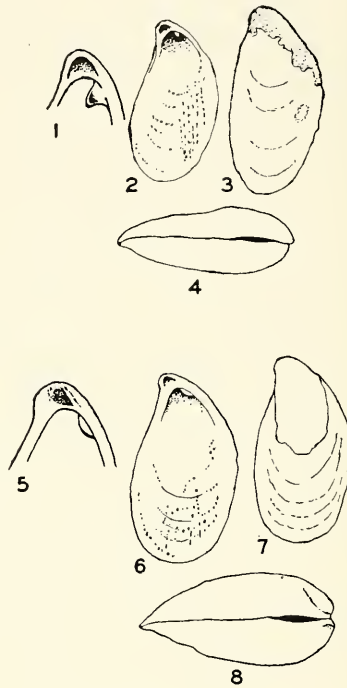


PLATE 4

FIGS. 1-4. *Mytilopsis zeteki* Hertlein & Hanna, new species. 1-2. Paratype, No. 9446 (Calif. Acad. Sci. Dept. Paleo. Type Coll.). Beak to base, 23.5 mm. 3. Paratype, No. 9447 (Calif. Acad. Sci. Dept. Paleo. Type Coll.). Beak to base, 26.5 mm. 4. Holotype, No. 9445 (Calif. Acad. Sci. Dept. Paleo. Type Coll.). Beak to base, 25 mm.

FIGS. 5-8. *Mytilopsis allyneana* Hertlein & Hanna, new species. 5-7. Holotype, No. 9452 (Calif. Acad. Sci. Dept. Paleo. Type Coll.). Beak to base, 23.5 mm. 8. Paratype, No. 9453 (Calif. Acad. Sci. Dept. Paleo. Type Coll.). Beak to base, 24.9 mm.

straighter and the posterior end of the shell is more obliquely elliptical.

This species is named for Dr. James Zetek who collected the type specimens.

References to a number of Cenozoic species of *Mytilopsis* have been consulted by us during our study of the present species. We have brought these together here for the convenience of other workers. The arrangement is alphabetic by species under the genus as originally described.

Mytilopsis adamsi Morrison, Smithson. Miscell. Coll., Vol. 106, No. 6, (Publ. 3850), September 12, 1946, p. 46, pl. 1, figs. 4, 7. "collected in the upper end of the lagoon at the mouth of Mussel-shell Creek, which is the largest of the streams in the southeastern part of San José Island. They were principally found attached by the byssus to the underside of rocks in the uppermost end of this (fresh-water) lagoon in the lowermost part of the stream proper, in situations where there was plenty of stream current remaining."

Dreissena africana Van Beneden, Bull. Acad. Roy. Sci. Bruxelles, Vol. 2, 1835, p. 167. ". . . habite le haut du Sénégal". With fluviatile mollusks.—Reeve, Conch. Icon., Vol. 10, *Mytilus*, 1858, sp. 47, pl. 10, fig. 47 (as *Mytilus africanus*). "Hab. Senegal."

Mytilopsis cira Pilsbry & Olsson, Rev. Acad. Colombiana de Cienc. Exact., Fis. y Nat., Vol. 4, Nos. 15-16, August-December, 1941, p. 416. "Formación de la Cira: Rio Oponcito, inmediaciones de Guanábanas, Colombia." Upper Oligocene or lower Miocene.

Dreissena cyanea Van Beneden, Bull. Acad. Roy. Sci. Bruxelles, Vol. 4, 1837, p. 41, pl. [unnumbered], figs. 1, 2, 3. "Nous ne connaissons rien de certain sur la localité de cette espèce, M. d'Orbigny, qui a eu l'obligeance de me la communiquer, l'a reçue d'un de ses amis, qui la croit du Sénégal."

Dreissensia dalli Joukowski, Mem. Soc. Phys. et Hist. Nat. Genève, Vol. 35, Fasc. 2, October, 1906, p. 171, pl. 6, figs. 1-5. "Localité: Ruisseau de Bombacho, au S. de Macaracas, 1^m. audessous de la couche de lignite." Panama. Tertiary. [Probably Miocene or Pliocene according to Woodring].

Praxis ecuadoriana Clessin, Malakozool. Blätter, N. F., Bd. 1. 1879, p. 180, pl. 15, fig. 8 (a, b). "Hab. in superiori parte fluminis Cayapas in prov. Esmeraldas, Wolf legit." P. 181 "Die Muschel wird von den Indianern gegessen, und findet sich stellenweise massenhaft an Felsen und alten, im Wasser liegenden Baumstämmen. (Wolf)."

Praxis milleri Clessen, Malakozool. Blätter, N. F., Bd. 1, 1879, p. 179, pl. 15, fig. 7 (a, b). "Habitat. Rio Verde in prov. Esmeraldas; Wolf legit." On p. 180 "Die Muschel sitzt in grosser Menge an von Wasser überflutheten Felsen, Buamenstämmen, etc."

Dreissensia ornata Morelet., Journ. de Conchyl., Vol. 33, (Ser. 3, Vol. 25), No. 1, 1885, p. 32, pl. 2, figs. 10, 10a. "Le *D. ornata* vit dans la rivière Mayumba." Equatorial Africa.

Dreissena sallei Recluz, Journ. de Conchyl., Vol. 3, December, 1852, p. 255, pl. 10, fig. 9. "Habite le Rio dulce (république de Guatemala), dans les pierres qu'elle perfore et où on la trouve agglomérée."—Crosse & Fischer, Miss. Sci. Mexique et Amer.

Centrale, Zool., Pt. 7, Moll., Vol. 2, 1890, p. 504, pl. 62, figs. 4, 4a, 5, 6. [Referred to subgenus *Mytilopsis*].

Dresseina scripta Conrad, Proc. Acad. Nat. Sci. Philadelphia, Vol. 26, May 19, 1874, p. 29, pl. 1, figs. 12, 16. "Pebas Group." "On the upper Amazon." Peru.—Pilsbry, Proc. Acad. Nat. Sci. Philadelphia, Vol. 96, 1944, p. 152 (as *Mytilopsis scripta*). Pebas Group, Peru. Probably Pliocene.

Mytilopsis singerwaldi Pilsbry, Proc. Acad. Nat. Sci. Philadelphia, Vol. 96, August 11, 1944, p. 147, pl. 11, figs. 35, 36. Station 154." "About one-half mile upstream from San Antonio Pachitea River." [As cited for Station 154 under *Corbicula* sp. p. 146. This differs in wording from that cited for Station 154 under *Hemisinus (Longiverena) avus*. p. 145]. Peru Upper Oligocene or lower Miocene.

Mytilus tenebrosus Reeve, Conch. Icon., Vol. 10, *Mytilus*, January, 1858, sp. 46, pl. 10, fig. 46. "Hab. Mississippi." [*Dreissena cumingiana* Recluz, Ms., cited in synonymy].

Septifer trautwineana Tryon, Amer. Jour. Conch., Vol. 2, Pt. 4, October 1, 1866, p. 302, pl. 20, fig. 8. "Habitat.—River San Juan, New Granada." . . . "in the Rio San Juan, a small stream emptying into the Pacific in latitude 4°."

Crosse & Fischer mentioned that all the American species which they had examined were referable to *Mytilopsis*. They considered it to be a subgenus of *Dreissensia*. They stated that *Mytilopsis* is represented by a large number of species now living in the Americas and in Africa and by a number of species in the Tertiary of eastern Europe.

In addition to the species which we have cited above there are several others, chiefly in the Caribbean region, cited by Crosse & Fischer under *Dreissensia*. These included: *Dreissensia americana* Recluz, Florida; *D. cumingiana* Dunker, Mississippi; *D. domingensis* Recluz, Santo Domingo; *D. gundlachi* Dunker, Cuba; *D. leucophaeta* Conrad, Virginia; *D. mörchiana* Dunker, Island of St. Thomas; *D. pfeifferi* Dunker, Cuba; *D. rüsci* Dunker, Island of St. Thomas; *D. rossmässleri* Dunker, (?) Brazil.