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The Eastern Pacific Species of *Niso* (Mollusca: Gastropoda)

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INTRODUCTION

The present review was undertaken as a result of my finding a large, live-taken specimen of the rare species *Niso splendidula* (Sowerby) in the collections obtained by the Puritan-American Museum of Natural History Expedition to Western Mexico in 1957 (Emerson, 1958). The most recent monographic study of the eastern Pacific species of these interesting mesogastropods, which are believed to be parasitic in habit on echinoderms, was published more than 45 years ago. Bartsch (1917), in a review of the west American species of the Eulimidae (Melanellidae), recognized six Recent species of *Niso*, three of which were described as new. He also questionably referred a Tertiary fossil, *Niso* (?) *antiselli* Anderson and Martin (1914), from the Miocene of California, to this genus. The placement of this taxon in the genus *Niso* is here rejected because of the apparent lack of a nisoid umbilicus in the type specimens. Bartsch did not cite in his report *Niso polita* Gabb (1864), a species occurring in the Eocene of California and Washington. *Niso pistiliformis* Anderson and Hanna (1925) was subsequently described from the Eocene of California.

In the present study, seven Recent, west American species of *Niso* are

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recognized, including one new species. One of Bartsch's taxa, *Niso lomana*, however, is only provisionally retained in the genus, pending the discovery of better-preserved specimens. Bathymetric and geographic range data are recorded for each species, and related east American species are discussed. A new name, *Neovolusia*, is proposed to replace the homonym *Volusia* A. Adams (1861), and it is afforded subgeneric status to include the weakly varicose species *Niso imbricata* (Sowerby, 1834a).

The following abbreviations are used to designate institutional collections cited in this paper:

A.M.N.H., the American Museum of Natural History
C.A.S., the California Academy of Sciences
S.D.N.H.M., San Diego Natural History Museum

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Drs. Harald A. Rehder and Joseph Rosewater of the United States National Museum of the Smithsonian Institution, Dr. Leo George Hertlein of the California Academy of Sciences, Mr. Emery P. Chace of the San Diego Natural History Museum, and Mr. James H. McLean of the Los Angeles County Museum kindly permitted the writer access to the collections in their respective institutions or provided specimens on loan. Mrs. Ethelyn Woodlock of Ridgewood, New Jersey, generously lent the author pertinent specimens from her collection.

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SYSTEMATIC ACCOUNT

SUPERFAMILY EULIMACEA

FAMILY EULIMIDAE

GENUS *NISO* RISSO, 1826

TYPE SPECIES: *Niso eburnea* Risso (1826, p. 218), Pliocene of Italy, by monotypy.

Niso (*Niso*) *splendidula* (Sowerby, 1834)

Figures 1, 2

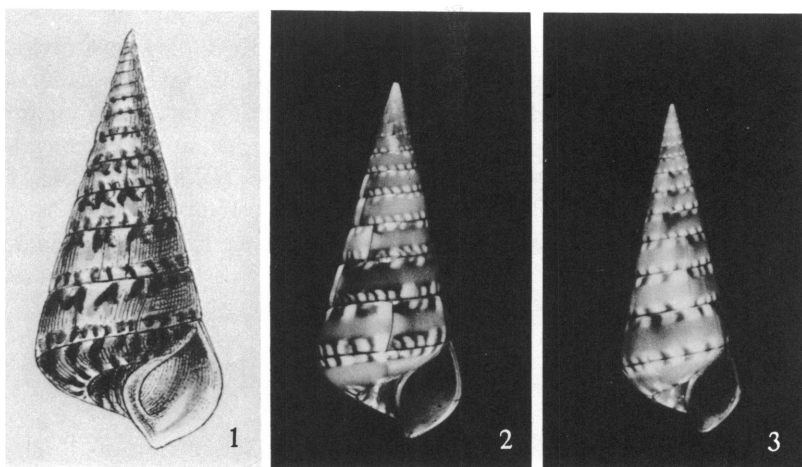
Eulima splendidula G. B. SOWERBY, I, 1834a, pp. 6, 7, "Hab. ad Sanctam Elenam Americae Meridionalis" [Santa Elena, Ecuador], in 6-8 fathoms; 1834b, p. 2, fig. 7.

Niso splendidula Sowerby, ADAMS, 1854, p. 801, pl. 170, fig. 8. REEVE, 1866,

Niso pl., fig. 7. TRYON, 1886, p. 287, pl. 71, fig. 24 (copy of Reeve's figure). BARTSCH, 1917, p. 348, pl. 48, fig. 5 (copy of Adams' figure), Bay of Panama, in 18 fathoms. ZETEK, 1918, p. 26, west Panama. KEEN, 1958, p. 268, fig. 89 (copy of Bartsch's figure), "Panama to Ecuador in depths of 6 to 18 fathoms."

RANGE: Off Angel de la Guarda Island, Baja California, Mexico ("Puritan" expedition), in the Gulf of California, and south to Santa Elena, Ecuador (Sowerby, 1834a); in 6-45 fathoms.

REMARKS: This handsome species was based on a single specimen that was dredged by Hugh Cuming off Santa Elena, Ecuador. A second



FIGS. 1, 2. *Niso (Niso) splendidula* (Sowerby). 1. Copy of figure of Adams (1854, pl. 170, fig. 8). 2. Specimen from off Angel de la Guarda Island, Baja California, Mexico, "Puritan" Station 167 (A.M.N.H. No. 77131). Both $\times 1\frac{1}{2}$.

FIG. 3. *Niso (Niso) hendersoni* Bartsch, from off Crystal River, Florida, in 30 fathoms (Ethelyn Woodlock private collection). $\times 1\frac{1}{2}$.

specimen was reported by Bartsch (1917) from a dredge haul made by the steamer "Albatross" in the Bay of Panama. This specimen probably forms the basis for the record from Panama cited by Zetek (1918).

A beach specimen of this species from Acapulco, Guerrero, Mexico, is in the E. W. Wilson collection of the San Diego Natural History Museum (S.D.N.H.M. No. 38238). A bleached specimen, which was drilled by a predator, was dredged by the Templeton Crocker expedition in 45 fathoms on Arena Bank in the southern part of the Gulf of California (Station 136-D-26; Beebe, 1937) and is deposited in the collection of the California Academy of Sciences (C.A.S. No. 17714). The specimen figured in this report from the "Puritan" collection (A.M.N.H. No.

77131) was dredged in 15-17 fathoms off the southwest end of Angel de la Guarda Island in the northern part of the Gulf of California (Station 167; Emerson, 1958). Inasmuch as it was found loose in the dredge sample, a host relationship could not be determined. The specimen compares favorably with Adams' (1854) well-executed illustration of *N. splendidula* (cf. figs. 1 and 2 of the present paper). These specimens represent major range extensions for this species, which was not previously known to occur north of Panama Bay.

Until recently, *Niso splendidula* was believed to occur on both of the American coasts (Dall, 1890; Smith, 1944) and was recorded to range in the western Atlantic from off Cape Fear, North Carolina, to the Gulf of Mexico, in 15-111 fathoms (Johnson, 1934). In 1953, the east American populations were afforded specific recognition and named *Niso hendersoni* Bartsch (1953, p. 38, pl. 5, fig. 4; Abbott, 1954, pl. 4, fig. P). Compared with *N. splendidula*, the western Atlantic species has a more elongate, slender shell with fewer brown flecks at the sutures (cf. fig. 2 and fig. 3). *Niso willcoxiana* Dall (1889, p. 331; Dall, 1890, p. 160, pl. 5, figs. 5, 5b; Olsson and Harbison, 1953, pl. 59, fig. 1), a fossil occurring in the Caloosahatchee marl of Florida, appears to be a Pliocene precursor of these twin species.

Niso (Niso) interrupta (Sowerby, 1834)

Figures 4, 5

Eulima interrupta G. B. SOWERBY, I, 1834a, p. 7, Gulf of Nocoioy [Gulf of Nicoya, Costa Rica], in 11-13 fathoms; 1834b, p. 2, fig. 11.

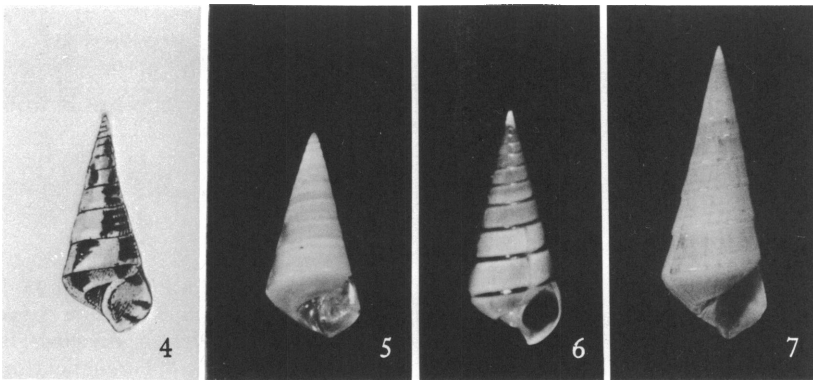
Niso interrupta Sowerby, ADAMS, 1854, p. 801, pl. 170, fig. 9. REEVE, 1866, *Niso* pl., figs. 8a, b. TRYON, 1886, p. 288, pl. 71, figs. 22, 23 (copy of Reeve's figures). BARTSCH, 1917, pp. 349, 350, pl. 48, figs. 1 (copy of Adams' figure), 3, Bay of Panama, in 29.5-51.5 fathoms. ZETEK, 1918, p. 26, west Panama. KEEN, 1958, p. 268, fig. 88 (copy of Bartsch's fig. 3), "Costa Rica to Panama in depths of 11 to 51 fathoms." PARKER, 1963, p. 152, Gulf of California, latitude 28° 20.9' N., longitude 111° 58.0' W., in 57 fathoms.

RANGE: Off San Pedro Martir Island, Baja California, Mexico (Parker, 1963), in the Gulf of California, and south to the Bay of Panama (Bartsch, 1917); in 11-57 fathoms.

NEW WEST AMERICAN RECORDS: *Mexico*: Off María Madre Island, Tres Marías Islands, Nayarit, in 13-15 fathoms ("Puritan" Station 71; Emerson, 1958), one living specimen (A.M.N.H. No. 75352); off Manzanillo, Colima, in 20-30 fathoms, two specimens, H. N. Lowe collection (C.A.S. No. 17815; S.D.N.H.M. No. 34800). *Nicaragua*: Off Corinto, 6-15 fathoms, "Zaca" expedition, two specimens (C.A.S. No. 17902; A.M.N.H. No. 90773; Station 203-D-1, Beebe, 1938). *Costa Rica*: Off

Port Parker, shore to 12 fathoms, "Zaca" expedition, two specimens (C.A.S. No. 17926; A.M.N.H. No. 90774; beach drift, Beebe, 1938). *Panama*: Off Toboquilla Island, 5 fathoms, H. N. Lowe collection, one specimen (S.D.N.H.M. No. 34799).

REMARKS: This species was based on mature specimens that were dredged by Hugh Cuming in the Gulf of Nicoya, Costa Rica (fig. 4). It has been subsequently recorded from the Bay of Panama (Bartsch, 1917; Zetek, 1918) and the Gulf of California (Parker, 1963).



FIGS. 4, 5. *Niso (Niso) interrupta* (Sowerby). 4. Copy of figure of Adams (1854, pl. 170, fig. 9). 5. Specimen from off María Madre Island, Tres Marías Islands, Nayarit, Mexico, in 13-15 fathoms, "Puritan" Station 71 (A.M.N.H. No. 75352). Both $\times 1\frac{1}{2}$.

FIG. 6. *Niso (Niso) aeglees* Bush, from 110 miles southwest of Egmont Key, Florida (ex Jim Moore collection, A.M.N.H. No. 99661). $\times 1\frac{1}{2}$.

FIG. 7. *Niso (Niso) excolpa* Bartsch, off south end of Angel de la Guarda Island, Baja California, Mexico, in shallow water, "Albatross" Station (ex U.S.N.M. No. 268590; A.M.N.H. No. 113426). $\times 1\frac{1}{2}$.

As was the case for *Niso splendida*, the present species was cited as occurring on both coasts of America (Dall, 1889) and as ranging in the western Atlantic from off Cape Hatteras, North Carolina, to the Gulf of Mexico, in 7-107 fathoms (Johnson, 1934), including Texas (Pulley, 1952, pl. 4, fig. 1; Parker, 1959, pp. 2136, 2164, pl. 5, fig. 18). It also was reported in the Caribbean Sea from off Barbados and Santa Lucia in the Windward Islands (Dall, 1889) and from Bahía Honda, Colombia (Dautzenberg, 1900). Although Dall (1889, p. 330, pl. 18, figs. 5, 6) recognized and named several forms from populations occurring in eastern American waters, the earliest name for the extremely variable, Atlantic-Caribbean species appears to be *Niso aeglees* Bush (1885a, p. 83;

1885b, pp. 465, 466, pl. 45, figs. 10, 10a).

The Panamic species, however, is readily distinguished from *Niso aeglees* by its bluish white surface which is marked with irregularly disposed varicial streaks of rust brown (figs. 4 and 5). On the other hand, the east American species is characterized by having the sutures outlined with a narrow, chestnut-brown band that is commonly bordered, above and below, by white bands, which are less distinctly defined on the early whorls (fig. 6).

Niso interrupta also was erroneously reported living and fossil from Japan (Adams, 1861; Dunker, 1882; Yokoyama, as a Pliocene fossil, 1926). *Niso yokoyamai* Kuroda and Habe, 1952, was proposed for *N. interrupta* Yokoyama, 1926, not Sowerby, 1834. MacNeil (1960, p. 45, pl. 7, fig. 19, pl. 12, fig. 8) questionably referred Neogene fossils from Okinawa to *N. yokoyamai*.

Niso (Niso) excolpa Bartsch, 1917

Figure 7

Niso excolpa BARTSCH, 1917, p. 348, pl. 48, fig. 4, from 10 localities in the Gulf of California, Mexico; Concepción Bay, Baja California, in 3 fathoms (type locality). LOWE, 1935, p. 31, off Punta Peñasco, Sonora, Mexico, dredged (10 fathoms). KEEN, 1958, p. 268, fig. 87 (copy of Bartsch's fig. 4), "Throughout the Gulf of California, in depths to 26 fathoms." PARKER, 1963, p. 152, Gulf of California, latitude 28° 30.0' N., longitude 110° 59.5' W., in 16 fathoms; latitude 28° 45.8' N., longitude 112° 04.0' W., in 24 fathoms. KEEN, 1964, p. 199, off Isla Partida, Gulf of California, in 14-25 fathoms.

RANGE: Magdalena Bay, Baja California (San Diego Natural History Museum collection); off Punta Peñasco, Mexico (Lowe, 1935), to La Paz, Baja California, Mexico (Bartsch, 1917), in the Gulf of California; in 3-26.5 fathoms.

NEW RECORDS: *Mexico*: Baja California, west coast, Magdalena Bay, in 10 fathoms, one specimen, H. N. Lowe collection (S.D.N.H.M. No. 34794); Magdalena Bay, one specimen, T. Sefton collection (S.D.N.H.M. No. 8950); Gulf of California, off Angel de la Guarda Island, in 20 fathoms, one specimen, H. N. Lowe collection (S.D.N.H.M. No. 34796); Concepción Bay, in 15 fathoms, 10 specimens, H. N. Lowe collection (S.D.N.H.M. No. 34795).

Niso (Niso) baueri, new species

Figure 8

DIAGNOSIS: Shell similar to that of *Niso hipolitensis* Bartsch, but proportionally stouter, with a more prominent umbilicus.

DESCRIPTION: Shell less than 4 mm. in length, elongate-conic, moderately umbilicated. Apex white; later whorls brownish tan; body whorl with a narrow whitish band below suture and wider whitish band at periphery; interior of aperture white. Surface polished, with faint growth lines. Sutures weakly impressed. Periphery of body whorl slightly angulated; base short, rounded. Aperture elongately ovate; outer lip thin, curved; inner lip slightly revolute, but not obscuring deeply incised

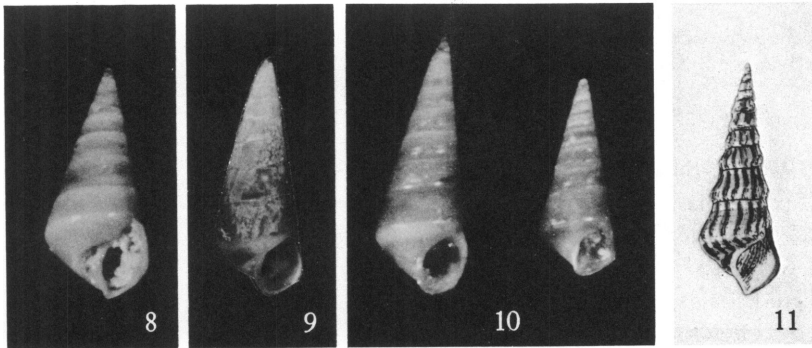


FIG. 8. *Niso* (*Niso*) *baueri*, new species, holotype, Los Frailes Bay, Baja California, Mexico, in 20-40 fathoms, "Puritan" Station 89 (A.M.N.H. No. 113002); umbilicus is partially obscured by foreign matter. $\times 10$.

FIGS. 9, 10. *Niso* (*Niso*) *hipolitensis* Bartsch. 9. Holotype, San Hipolito Point, Baja California, Mexico, from shell washings (U.S.N.M. No. 127544); photograph by Perfecto Mary, courtesy of J. H. McLean. 10. Two specimens from Asunción Island, Baja California, Mexico (C.A.S. No. 27245). All $\times 10$.

FIG. 11. *Niso* (*Neovolusia*) *imbricata* (Sowerby), type species of *Neovolusia*, new name for *Volusia* Adams, 1861; copy of original figure of Adams (1854, pl. 170, fig. 10). $\times 1\frac{1}{2}$.

umbilicus. Holotype having eight postnuclear whorls and measuring 3.1 mm. in length.

TYPE LOCALITY: Los Frailes Bay, Baja California, Mexico, in 20-40 fathoms, fine sand, "Puritan" dredge (Station 89; Emerson, 1958).

TYPE DEPOSITORY: The American Museum of Natural History, holotype (A.M.N.H. No. 113002). Two paratypes (A.M.N.H. No. 113001), from off the west side of Coronados Island, in 40-45 fathoms, coarse sand, "Puritan" dredge (Station 145; Emerson, 1958).

RANGE: Known only from the type locality and off Coronados Island, in the Gulf of California; in 20-45 fathoms.

REMARKS: This species superficially resembles *Niso hipolitensis* Bartsch in its small size and general coloration, but has a more deeply excavated

umbilicus, flatter whorls, and a darker-colored body whorl (cf. fig. 8 with figs. 9, 10).

This species is dedicated to the memory of Harry John Bauer, an avid collector of shells, whose interest and generosity made the Puritan-American Museum Expedition to Western Mexico, in 1957, a reality.

Niso (*Niso*) *hipolitensis* Bartsch, 1917

Figures 9, 10

Niso hipolitensis BARTSCH, 1917, pp. 350, 351, pl. 49, fig. 5, San Diego, California, and San Hipolito Point, Baja California (type locality), beach drift. DALL, 1921, p. 120. OLDROYD, 1927, pp. 84, 85. McLEAN, 1961, p. 464, Los Angeles Bay, Baja California, beach drift.

RANGE: San Diego, California to San Hipolito Point, Baja California, Mexico (Bartsch, 1917); Los Angeles Bay, Baja California (McLean, 1961), in the Gulf of California.

NEW RECORD: *Mexico*: Baja California, off west coast, Asunción Island, two specimens (C.A.S. No. 27245).

REMARKS: This species undoubtedly has been overlooked by collectors owing to its small size (length less than 5 mm.).

Niso ? *lomana* Bartsch, 1917

Niso lomana BARTSCH, 1917, p. 350, pl. 49, fig. 4, off Point Loma, California, in 71-75 fathoms (type locality); and off Santa Rosa Island, California, in 48 fathoms. DALL, 1921, p. 120. OLDROYD, 1927, p. 84.

RANGE: Known only from off Point Loma and Santa Rosa Island, California; in 48-75 fathoms.

REMARKS: This species was described on the basis of two fragmental specimens. The holotype lacks the early whorls and the base. The basal part of the second specimen is missing. Without knowledge of the nature of the umbilical region of this species, generic placement of this taxon is questionable.

SUBGENUS *NEOVOLUSIA*, NEW NAME

Volusia ADAMS, 1861, p. 306. Monotype: *Niso* (*Volusia*) *imbricata* (Sowerby), 1834. Not *Volusia* Robineau-Desvoidy, 1830, p. 674, for insects.

TYPE SPECIES: *Niso* (*Volusia*) *imbricata* (Sowerby), 1834, Recent, eastern Pacific, by monotypy.

Niso (*Neovolusia*) *imbricata* (Sowerby, 1834)

Figure 11

Eulima imbricata SOWERBY, 1834a, p. 7, "Hab. ad Sanctam Elenam Americae Meridionalis" [Santa Elena, Ecuador], in 6-8 fathoms; 1834b, p. 2, fig. 4.

Niso imbricata SOWERBY, ADAMS, 1854, p. 802, pl. 170, fig. 10. REEVE, 1866, *Niso* pl. fig. 3. BARTSCH, 1917, p. 351, pl. 48, fig. 6 (copy of Adams' figure). SMITH, 1940, p. 22, fig. 316. KEEN, 1958, p. 268, illus. on p. 241.

Niso (*Volusia*) *imbricata* SOWERBY, TRYON, 1886, p. 289, pl. 71, fig. 31 (copy of Reeve's figure). WENZ, 1939, p. 839, fig. 2447 (copy of Sowerby's figure).

RANGE: Known living only from the type locality; also reported from the Pliocene of Ecuador (Pilsbry and Olsson, 1941).

REMARKS: This very distinctive species was based on material that was stated to have been dredged by Hugh Cuming off Santa Elena, Ecuador (fig. 11). Although no Recent specimens have been subsequently reported from the eastern Pacific, Pilsbry and Olsson (1941) recorded this species from the Pliocene Canoa formation at Punta Blanca, Ecuador.

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