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A NEW GENUS, SPECIES AND SUBSPECIES OF OOCORYTHIDAE (GASTROPODA: TONNACEA) FROM THE WESTERN ATLANTIC

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ABSTRACT

Relationships within the Tonnacea are discussed briefly; the Oocorythidae are confirmed at full family status. Oocorys umbilicata and O. bartschi clericus are described as new. The gross anatomy of O. umbilicata is described. Oocorys bartschi bartschi is now known from throughout the Gulf of Mexico and northeast Florida, and the range of O. caribbaea is extended from south of Cuba to the Bahamas. Hadroocorys, new genus, is proposed for O. verrilli and O. tosaensis.

The deep waters of the Gulf of Mexico, Caribbean Sea and Bahama Islands have been well sampled by the Bureau of Commercial Fisheries (now National Marine Fisheries Service) and the University of Miami. Among the molluscan specimens obtained, the genus *Oocorys* Fischer, 1883, is well represented. Notable among these collections are those from the Tongue of the Ocean (TOTO), Bahamas, in which three species (two new) are represented, two in surprising numbers. This allows more extensive examina-

tion and assessment of intraspecific variations and suprageneric relationships of *Oocorys* than was possible when Turner (1948) published her monograph of the group.

Collections on which this report is based are housed primarily in the U.S. National Museum of Natural History, Washington, D.C., and the Rosenstiel School of Marine and Atmospheric Science, University of Miami. Institutional abbreviations used herein are: National Museum of Natural History (USNM); Rosenstiel School

of Marine and Atmospheric Science, University of Miami (UMML); Museum of Comparative Zoology, Harvard University (MCZ); Academy of Natural Sciences, Philadelphia (ANSP); Marine Research Laboratory, Florida Department of Natural Resources (FSBC D). Holotypes of the new taxa are deposited in the USNM.

Oocorythidae Fischer, 1885

The systematic position of *Oocorys* within the Tonnacea has been unsettled for many years. Fischer (1885), in proposing the family name Oocorythidae, allied *Oocorys* to the Tritonidae (= Cymatiidae), mainly on the basis of opercular characters. Several subsequent authors (Tryon, 1885; Schepman, 1909; Tomlin, 1927; Thiele, 1929; Wenz, 1941; Kuroda and Habe, 1957; Kiliyas, 1962; Bayer, 1971) have also considered the *Oocorys*-group a valid family, usually placing it near the Cassidae. Watson (1886) allocated *Oocorys* to the Doliidae (= Tonnidae) and was followed by Turner (1948), Keen (1971), and Abbott (1974). Dall (1909) discussed at length the relationships of the Cassidae and concluded that *Oocorys* and *Galeodea* Link, 1807, could not be separated from the true cassids. Turner (1948) concluded that neither the presence or absence of an operculum nor difference in radular tooth morphology was sufficient to distinguish groups at the family level, and that shell morphology was the most reliable character for inferring relationships within the Tonnacea. Consequently, she assigned *Oocorys* to the Oocorythinae in the Tonnidae because of the superficial resemblance of some *Oocorys* to *Eudolium* Dall, 1889.

Of all the proposed classifications, that of Thiele (1929) is probably most correct at the family level. He used six families: Oocorythidae, Cassidae (= Cassidae), Cymatiidae, Bursidae, Doliidae (= Tonnidae), and Pirulidae (= Ficidae). The distinctive saddle-shaped rhachidian teeth of the Tonnidae (Fig. 1F) and Bursidae (Fig. 1G) immediately separate these two families from the others. Radulae of the other four tonnacean families have less striking but still diagnostic characters. The Ficidae (Fig. 1D) have a subquadrate rhachidian, a large lateral with denticles along both sides of the cusp, and a large

marginal which is serrate on the outer edge. The Cymatiidae (Fig. 1E) have a laterally excavated, subquadrate rhachidian, a large lateral with the cusp serrate on the outer side and two strong but simple marginals (inner marginal occasionally with denticles). The Cassidae (Fig. 1H) and the Oocorythidae (Fig. 1A-C) have similar radulae, but the cassids have marginals which are denticulate at the tip while the Oocorythidae have simple marginals, the innermost of which may or may not have 1-3 small denticles along its inner side.

In the Oocorythidae there appear to be four or five genera: *Oocorys*, *Hadroocorys* n. gen., *Dalium* Dall, 1889, *Galeoocorys* Kuroda and Habe, 1957, and perhaps *Galeodea*. I have not seen a radula of *Galeodea*, but if the figure in Thiele (1929) (see Fig. 1I) is accurate, the genus is best assigned to the Oocorythidae.

Genus *Oocorys* Fischer, 1883

Diagnosis—Shell medium to large in size (35 to over 120 mm in length), thin but strong, imperforate or umbilicate. Sculpture of strong spiral ridges; axial sculpture reduced or absent. Aperture large, broadly lanceolate to ovate; outer lip thin, usually reflected, occasionally weakly crenulate; parietal area with a thin callosus, often with spiral sculpture showing through. Operculum corneous, paucispiral. Radula taenioglossate; rhachidian quadrangular; lateral large, denticulate; marginals strong, arcuate, with or without denticles. Eyes absent.

Type-species—*Oocorys sulcata* Fischer, 1883; by monotypy.

Remarks—Since Turner's (1948) monograph of the western Atlantic species of *Oocorys*, some material with soft parts has been obtained. An examination of the gross anatomy (see *O. umbilicata*) reveals a typically tonnacean organization, agreeing very closely with the arrangement exhibited by the other families (Amaudrut, 1898; Weber, 1927; Houbrick and Fretter, 1969). The operculum of *Oocorys* may be of value in distinguishing between species. Besides the general size and shape, both of which are somewhat variable, the size and shape of the muscle attachment scar may be of specific value. I have illustrated the opercula of those species

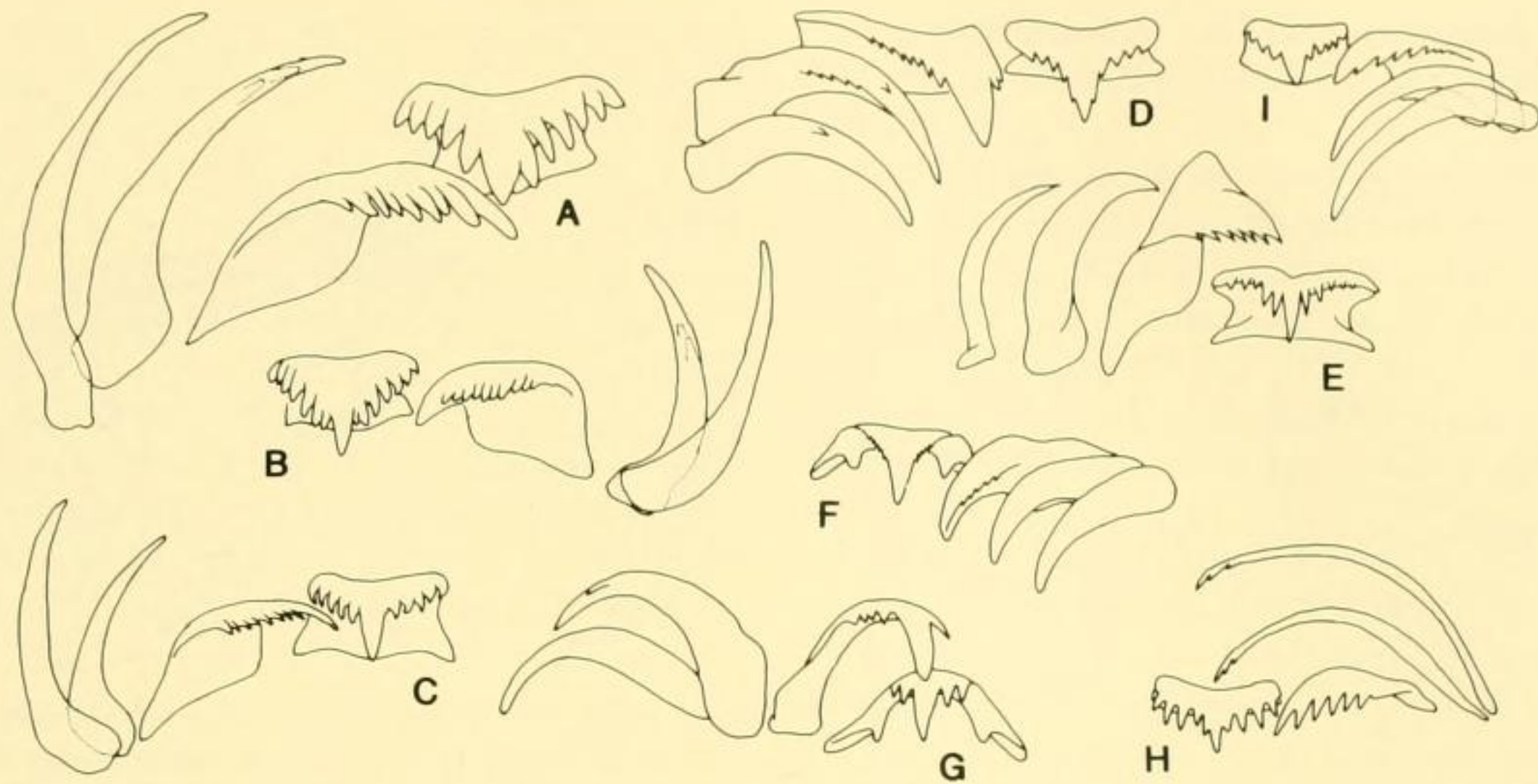


FIG. 1. *Tonnacean radulae*: **A**) *Oocorys bartschi clericus* Quinn, subsp. nov. (P-781, UMML 30-8259); **B**) *Oocorys caribbaea* Clench and Aguayo, 1939 (CI-382, UMML 30-8252); **C**) *Oocorys umbilicata* Quinn, sp. nov. (CI-306, UMML 30-8176); **D**) *Ficidae*, *Ficus reticulata* Lamarck, 1816 (= *Ficus communis* Röding, 1798); **E**) *Cymatiidae*, *Cymatium muricinum* (Röding, 1798); **F**) *Tonnidae*, *Tonna perdux* (Linnaeus, 1758); **G**) *Bursidae*, *Bursa crumena* (Lamarck, 1816); **H**) *Cassidae*, *Cassis cornuta* (Linnaeus, 1758); **I**) *Oocorythidae* (?), *Galeodea echinophora* (Linnaeus, 1758). Figs. D, F, G, H, and I, from Thiele, 1929; Fig. E from Cernohorsky, 1967. Not to scale.

available to me which were not illustrated by Turner (1948) or Bayer (1971) (see Fig. 2).

Turner (1948) discussed or listed 18 species and subspecies of *Oocorys* s.l. which she considered valid (there were 22 nominal species-group taxa). Of these, nine were described from the North Atlantic, three from the eastern Pacific, and the other six from Indonesia and the eastern Indian Ocean. Subsequently, a species was described from Japan (*O. tosaensis* Habe and Azuma, 1959), but that species and *O. verrilli* (Dall, 1889) are here treated as generically separate. With the addition of the new species and subspecies described in this paper, there are 19 species and subspecies of *Oocorys*, of which ten are known from the North Atlantic. *Benthodolium* Verrill and Smith, 1884, has been used as a monotypic subgenus of *Oocorys*. The primary distinguishing character, the presence of an umbilicus, is useful only at the species level. *Benthodolium* is here considered a synonym of *Oocorys*.

Oocorys umbilicata sp. nov.

Figs. 1C; 2A, B; 3; 4.

Description—Shell length to about 55 mm,

ovate, inflated, umbilicate, with numerous spiral cords; color white under thin brown periostracum. Protoconch whorls 2–2½, small, smooth. Teleoconch whorls weakly shouldered, with numerous strong, rounded spiral cords, 28–33 on last whorl, 10–14 on penultimate whorl, somewhat more widely spaced at shoulder and near umbilicus, weak or absent near suture. Aperture broadly lanceolate; columella twisted to left anteriorly; parietal area with fairly thick glaze through which spiral sculpture often shows; outer lip flared, thickened, usually weakly crenulate; siphonal canal short, broad. Operculum ovate, subspiral, corneous, brown.

Animal (in alcohol) uniformly cream-colored. Foot truncate anteriorly, tapering gradually to broadly rounded posterior margin. Cephalic tentacles large, stout, evenly tapered to bluntly rounded tips, bases close-set; eyes absent. Osphradium large, broad, brown, bipectinate, lying at base of short siphon. Ctenidium large, whitish. Hypobranchial gland inconspicuous. Pallial sperm duct closed, thin-walled, becoming dorsally open groove distally, continued along anteroventral surface of penis; penis large,

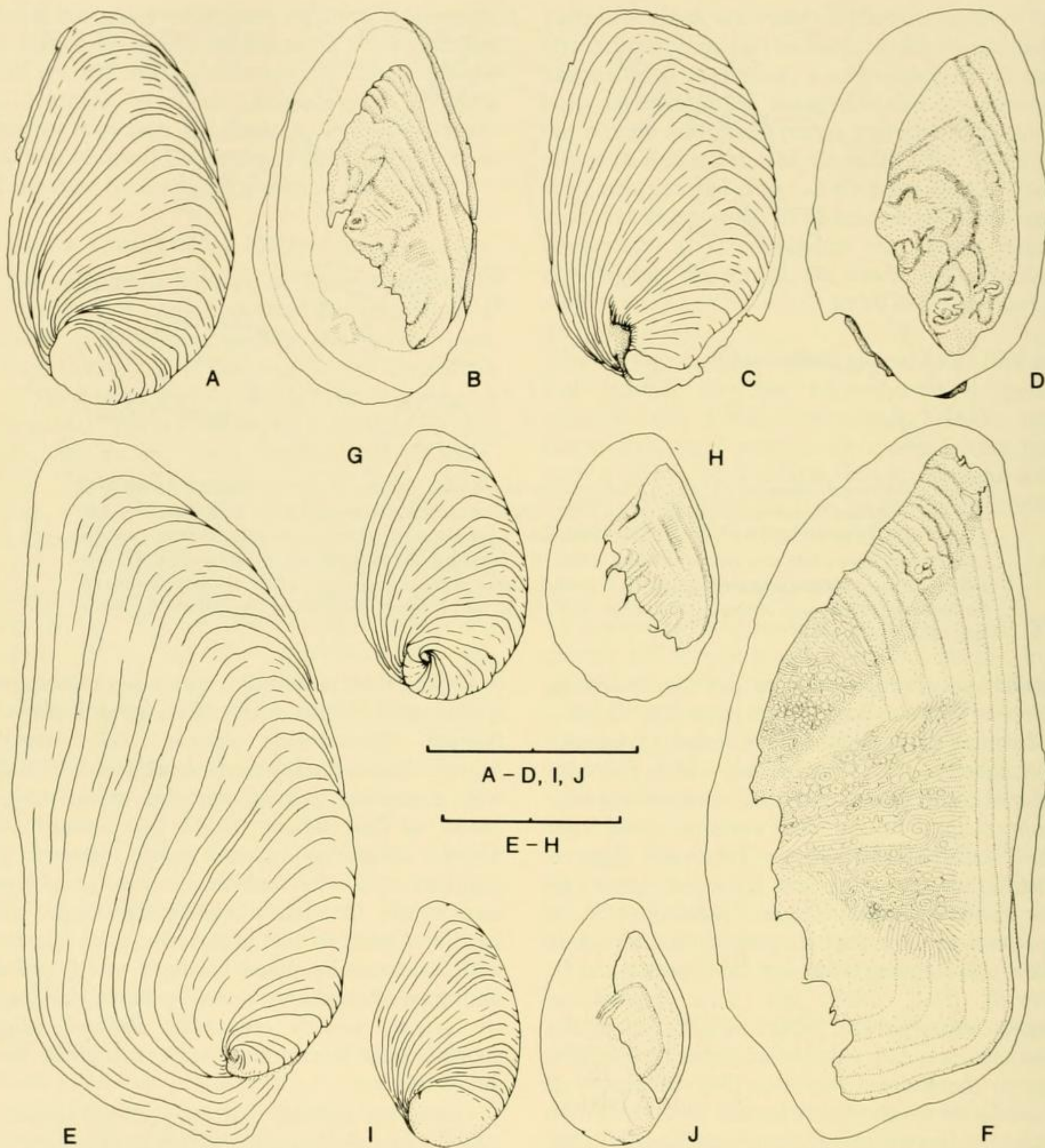


FIG. 2. Opercula of *Oocorys* species: A, B) *Oocorys umbilicata* Quinn, *sp. nov.* (paratype, CI-306); C, D) *Oocorys bartschi clericus subsp. nov.* (paratype, P-781, UMML 30-8259); E, F) *Oocorys bartschi bartschi* Rehder, 1943 (ANTILLAS sta., UMML 30-481); G, H) *Oocorys sulcata* Fischer, 1883 (P-18, UMML 30-8287); I, J) *Oocorys caribbaea* Clench and Aguayo, 1939 (CI-382, UMML 30-8252). Scale lines are 10 mm.

somewhat spatulate, with area of low (glandular?) folds on distal $\frac{1}{4}$, abutting sperm groove (Fig. 3). Organization of cephalic cavity typically tonnacean. Proboscis pleurembolic, long, with

small buccal mass at tip; in fully contracted state, mouth lies just inside opening of proboscis sheath. Odontophore very small; pair of chitinous jaws present, each roughly triangular in

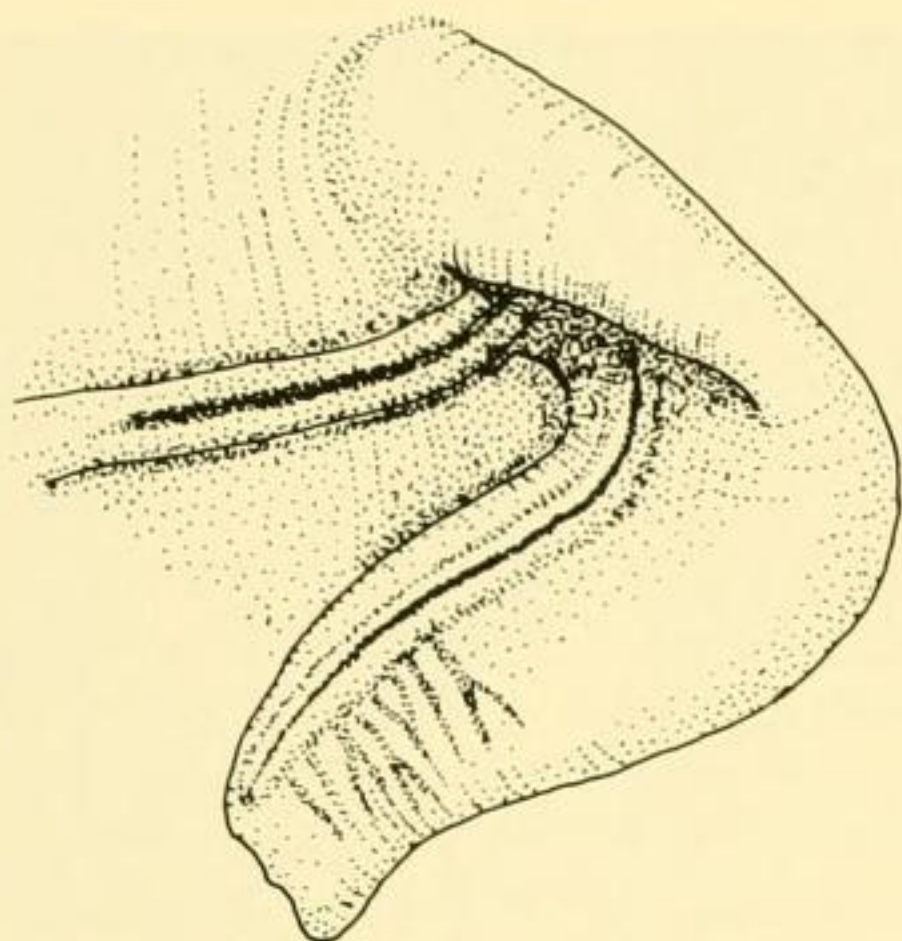


FIG. 3. Penis of *Oocorys umbilicata* Quinn, sp. nov., as seen from right side of body. Note open sperm groove and glandular (?) area near tip. Enlarged by approximately 10 \times .

shape, covered by numerous scales. Salivary glands very large, occupying most of cephalic cavity, covering mid-esophagus dorsally and laterally; left salivary gland larger than and mostly lying posterior to right; salivary ducts prominent, attached to anterior esophagus, passing through nerve ring and entering respective glands subterminally. Esophagus lying along floor of proboscis, passing through nerve ring and along floor of cephalic cavity to posterior end; mid-esophagus with large esophageal gland along right side; gland brown, transversely folded internally. Organs of visceral mass not examined due to poor preservation.

Holotype—USNM 784592. Height 48.8 mm; maximum width 33.5 mm.

Type locality—COLUMBUS ISELIN sta. CI-306, 24°06.2'N, 77°17.9'W to 24°07.2'N, 77°18.2'W, 1379-1408 m, 4-5 Apr. 1975. (Tongue of the Ocean, east of Andros Island, Bahamas).

Paratypes—COMBAT sta. 356, 33°31'N, 76°35'W, 366 m, 1 spec., USNM 715016.—COLUMBUS ISELIN sta. CI-306 with same data as holotype, 2 spec., USNM 795646; 1 spec., MCZ 288820; 1 spec., ANSP A8345; 20 spec., UMML 30-8176.—COLUMBUS ISELIN sta. CI-14, 23°35'N, 77°11'W to 23°33'N, 77°09'W, 1246 m, 2 spec., FSBC I 23779; 19 spec., UMML 30-8177.—TOTO, Northeast

Providence Channel and Exuma Sound, 1234-2780 m, 55 lots, 223 spec., UMML 30-8178 to 30-8233.

Distribution—This species is known from off Charleston, South Carolina, and the deep-water basins of the northern Bahamas; depth range is from 366 m (off Charleston, South Carolina) to 2780 m in the Northeast Providence Channel, Bahamas. *O. umbilicata* appears from our collecting records to be most abundant in depths of 1300-1400 m.

Remarks—Superficially, *O. umbilicata* resembles *O. sulcata* Fischer, 1883, and *O. abyssorum* (Verrill and Smith, 1884). *O. umbilicata* is more strongly shouldered than either *O. sulcata* or *O. abyssorum*. *O. sulcata* is not umbilicate, and *O. abyssorum* has a much thinner shell with much narrower spiral cords. *O. umbilicata* is the most common species of prosobranch in the TOTO collections. Most of the specimens obtained were dead shells, but at least 25-30 were collected with soft parts. The gross anatomy shows the species to be typically tonnacean. The feeding habits of *O. umbilicata* may be similar to those of species in other tonnacean families which feed on echinoderms, polychaetes, sipunculans, or other mollusks (see Houbrick and Fretter, 1969). Although all of these food types were available, *O. umbilicata* was most often collected with sabellariid and onuphid (*Hyalinoecia* sp.) polychaetes and a large sipunculan which inhabited dead *Oocorys* shells (pers. observations), suggesting that *Oocorys* eats worms. Unlike species of *Bursa*, which are vermivores (Houbrick and Fretter, 1969), species of *Oocorys* possess a pair of strong jaws and probably bite off pieces of the prey rather than swallowing the whole animal.

Oocorys caribbaea Clench and Aguayo, 1939

Figs. 1B; 2I, J; 5.

Oocorys sulcata caribbaea Clench and Aguayo, 1939: 192, pl. 29, fig. 3.

Oocorys (Oocorys) caribbaea: Turner, 1948: 184, pl. 83, figs. 3, 4; Abbott, 1974: 169, fig. 1791.

Description—See Clench and Aguayo (1939) and Turner (1948).

Material examined—Tongue of the Ocean, Bahamas, (TOTO), COLUMBUS ISELIN stations:

- CI-309, 23°45.1'N, 76°46.7'W, 1319–1313 m, 1 spec., UMML 30-8234.
 CI-368, 23°43.2'N, 76°50.5'W, 1352–1342 m, 2 spec., UMML 30-8235.
 CI-307, 23°30.5'N, 76°55.5'W, 1321–1307 m, 2 spec., UMML 30-8236.
 CI-14, 23°33'N, 77°09'W, 1246 m, 3 spec., UMML 30-8237.
 CI-311, 23°39.2'N, 77°34.4'W, 1353–1360 m, 2 spec., UMML 30-8238.
 CI-314, 23°46.5'N, 77°18.8'W, 1374–1360 m, 2 spec., UMML 30-8239.
 CI-40, 23°46'N, 76°58'W, 1317 m, 1 spec., UMML 30-8240.
 CI-9, 23°50'N, 77°04'W, 1318 m, 2 spec., UMML 30-8241.
 CI-326, 23°53.8'N, 76°16.8'W, 1383 m, 2 spec., UMML 30-8242.
 CI-306, 24°07.2'N, 77°18.2'W, 1379–1408 m, 1 spec., UMML 30-8243.
 CI-61, 24°33'N, 77°28'W, 1463 m, 2 spec., 30-8244.
 Exuma Sound, Bahamas:
 CI-275, 24°38.8'N, 76°23.8'W, 1632–1637 m, 9 spec., UMML 30-8245.
 CI-68, 24°25'N, 76°09'W, 1664 m, 14 spec., UMML 30-8246.
 CI-70, 24°27'N, 76°16'W, 1673 m, 3 spec., UMML 30-8247.
 CI-274, 24°30.8'N, 76°18.8'W, 1701 m, 1 spec., UMML 30-8248.
 CI-192, 24°20.8'N, 76°21'W, 1760 m, 1 spec., UMML 30-8249.
 CI-278, 23°54.6'N, 75°57.3'W, 1779–1771 m, 3 spec., UMML 30-8250.
 CI-284, 23°54.3'N, 75°57.8'W, 1781–1772 m, 3 spec., UMML 30-8251.
 CI-382, 23°55.4'N, 75°59.3'W, 1763 m, 1 spec., UMML 30-8252.
 CI-338, 24°00.8'N, 75°49.5'W, 1899–1880 m, 2 spec., UMML 30-8253.
 CI-383, 23°49.8'N, 75°51'W, 1844–1817 m, 1 spec., UMML 30-8254.
 CI-381, 24°22.1'N, 76°10.5'W, 1758–1767 m, 2 spec., UMML 30-8255.

Remarks—Prior to the University of Miami expeditions to the Bahamas, *O. caribbaea* was known only from six specimens collected at three localities off the southern coast of Cuba

(Turner, 1948). The collections from the Bahamas contain 60 specimens from 22 localities making it one of the more common species in TOTO and Exuma Sound, occurring at depths of 1300–1800 meters. These specimens exhibit remarkably little variation in shell characters, varying slightly in spire height, strength of axial sculpture and number of spiral cords. The ovate operculum (Fig. 2I, J) is rather thin and flexible, with a muscle scar of the same general size and shape as those of *O. sulcata* (Fig. 2G, H) and an *Oocorys* species from the Caribbean tentatively identified by Bayer as *O. sulcata* (Baker, 1971: p. 42, figs. 18, 22B). One live-collected specimen retained the periostracum on the 3-whorled protoconch, exhibiting fairly strong axial riblets and weak spiral threads.

Oocorys bartschi bartschi Rehder, 1943

Figs. 2E, F; 6.

Oocorys bartschi Rehder, 1943: 197, pl. 10, fig. 16; 1954: 472.

Oocorys (Oocorys) bartschi: Turner, 1948: 182, pl. 82, figs. 1, 2; Abbott, 1974: 168, fig. 1789.

Material examined—Gulf of Mexico: W. L. Schmidt coll., S. of Tortugas, Florida, 144–256 m, 1 spec., USNM 535689 (holotype).

Henderson coll., Florida, 1 spec., USNM 417859 (paratype).

W. L. Schmidt coll., Tortugas, Florida, 238–205 m, 1 spec., USNM 709509.

ANTILLAS sta., upper Gulf of Mexico, 1 spec., UMML 30-481.

OREGON sta. 4945, 29°39'N, 86°48'W, 219 m, 1 spec., USNM 751945.

OREGON II sta. 11195, 29°20'N, 86°52'W, 662 m, 2 spec., USNM 751944.

OREGON II sta. 10404, 29°17'N, 87°03'W, 755 m, 1 spec., USNM 751936.

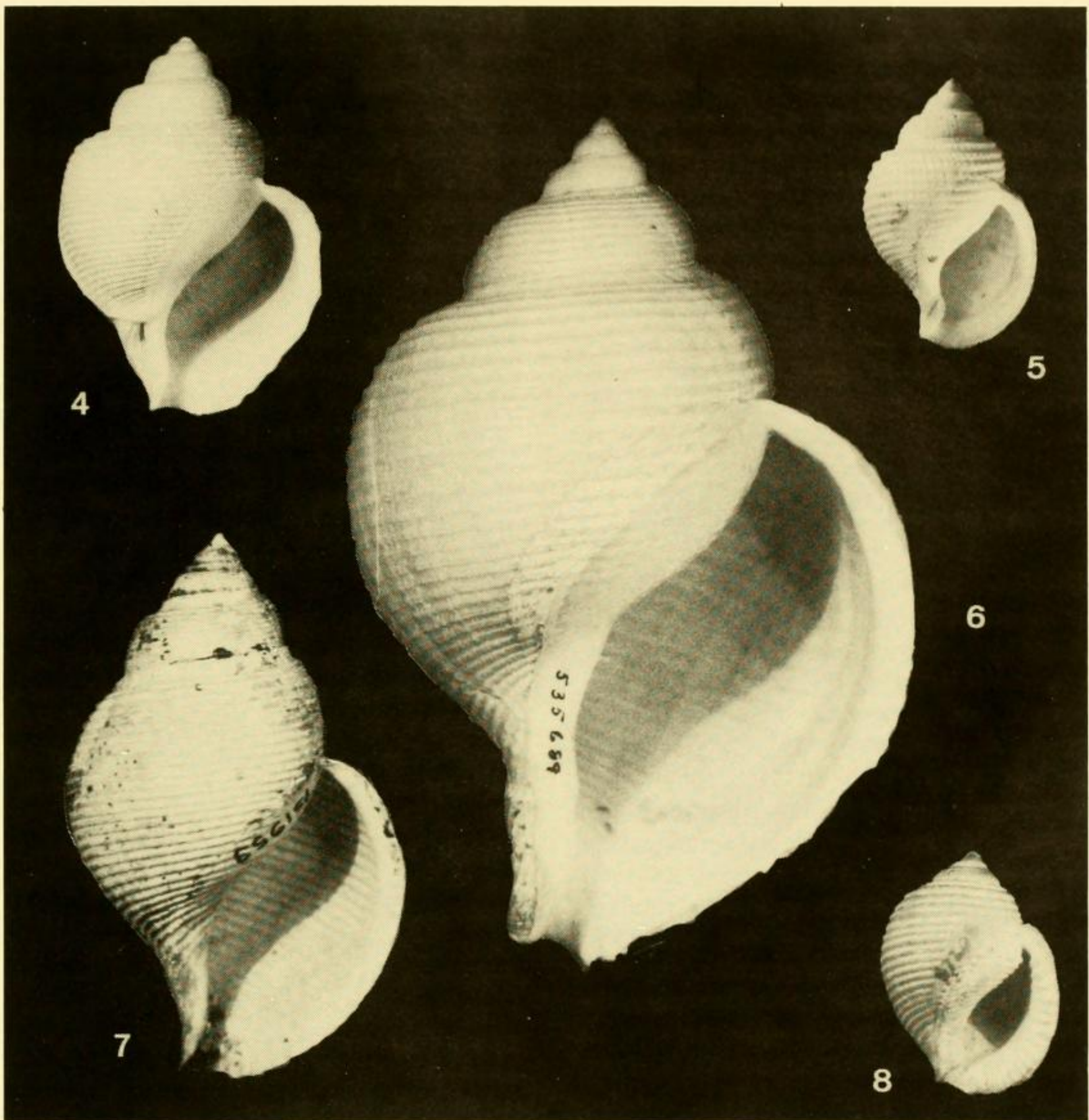
OREGON II sta. 13474, 29°33'N, 87°09'W, 327 m, 1 spec., USNM 751939.

OREGON sta. 281, 29°38'N, 87°16'W, 205 m, 1 spec., USNM 637429.

OREGON sta. 1450, 29°17'N, 87°41'W, 439 m, 1 spec., USNM 714929.

OREGON II sta. 11580, 29°11'N, 87°55'W, 640 m, 1 spec., USNM 751938.

OREGON sta. 3652, 29°13'N, 87°57'W, 457 m, 1 spec., USNM 758937.



FIGS. 4-8. Shells of *Oocorys* and *Hadroocorys*: 4) *Oocorys umbilicata* Quinn, *sp. nov.* (CI-306, USNM 784592, holotype); 5) *Oocorys caribbaea* Clench and Aguayo, 1939 (CI-309, UMML 30-8234); 6) *Oocorys bartschi bartschi* Rehder, 1943 (South of Tortugas, Florida, USNM 535689, holotype); 7) *Oocorys bartschi clericus* Quinn, *subsp. nov.* (OREGON sta. 3601, USNM 751953, holotype); 8) *Hadroocorys verrilli* (Dall, 1889) (ALBATROSS sta. 2120, USNM 87208, holotype). All figures life size.

OREGON sta. 1571, 29°10'N, 88°07'W, 457 m,
1 spec., USNM 751932.

OREGON II sta. 11202, 29°12'N, 88°08'W, 356
m, 1 spec., USNM 751933.

OREGON sta. 4157, 29°10'N, 88°12'W, 347 m,
1 spec., USNM 751931.

OREGON sta. 3221, 29°09'N, 88°11'W, 466 m,
1 spec., USNM 751940.

OREGON sta. 482, 28°57'N, 88°42.5'W, 384 m,
1 spec., USNM 637431.

OREGON II sta. 10441, 26°05'N, 96°14'W, 137
m, 4 spec., USNM 751947.

OREGON sta. 4807, 23°30'N, 97°11'W, 731 m,
4 spec., USNM 751952.

East Florida:

COMBAT sta. 190, 29°55'N, 80°11'W, 329 m, 1 spec., USNM 714995.

Remarks—Collections made by the Bureau of Commercial Fisheries over the last twenty years contain many specimens of this species. This new material shows that *O. bartschi bartschi* is found throughout the Gulf of Mexico, in the Straits of Florida, and off northeast Florida, usually in about 200–500 meters. It attains a length of over 130 mm and varies considerably in the elevation of the spire, inflation of the whorls, and number of spiral cords on the last whorl (36–46). (See Remarks under *O. bartschi clericus*).

Oocorys bartschi clericus subsp. nov.

Figs. 1A; 2C, D; 7.

Description—Shell large, to 91.9 mm, thin but solid, moderately inflated, non-umbilicate, sculptured by numerous spiral cords; color white under moderately thick, brown periostracum. Protoconch small, smooth, about 2 whorls. Teleoconch of about 6–6½ weakly shouldered whorls; last whorl with 32–41 strong spiral cords, strongest near shoulder; subsutural area constricted and appressed to preceding whorl, slightly concave, with 1–4 weak cords. Aperture ovate, weakly lirate within; columella arcuate, rather strongly twisted to left anteriorly; parietal area with thin wash of callus. Outer lip flared, slightly thickened, weakly crenulate. Siphonal canal short, broad, open. Operculum ovate, subspiral, muscle-attachment scar fairly large.

Holotype—USNM 751953. Height 69.3 mm, maximum width 43.4 mm.

Type locality—OREGON sta. 3601, off Santa Catalina, Panamá, 9°07'N, 81°10'W, 731 m, 31 May 1962, 40' otter trawl.

Paratypes—TOTO:

COLUMBUS ISELIN sta. CI-16, 23°37'N, 77°18'W, 732 m, 2 spec., UMML 30-8256.

COLUMBUS ISELIN sta. CI-21, 24°28'N, 77°25'W, 1554 m, 1 spec., UMML 30-8257.

COLUMBUS ISELIN sta. CI-309, 23°45.1'N, 76°46.7'W, 1319–1313 m, 1 spec., UMML 30-8258.

Southwestern Caribbean Sea:

PILLSBURY sta. P-781, 11°34.5'N, 73°20'W, 567–531 m, 2 spec., UMML 30-8259.

OREGON sta. 4859, 11°09'N, 74°27'W, 329–356 m, 2 spec., USNM 751955.

OREGON sta. 4841, 11°10'N, 74°29'W, 411 m, 9 spec., USNM 751954.

OREGON sta. 4854, 11°11'N, 74°29'W, 548 m, 2 spec., USNM 751957.

OREGON II sta. 10260, 11°03'N, 75°18'W, 366 m, 1 spec., USNM 751956.

OREGON sta. 4880, 10°24'N, 75°50'W, 347–356 m, 3 spec., USNM 751958.

PILLSBURY sta. P-445, 9°02'N, 81°24'W, 342–346 m, 2 spec., UMML 30-3667.

Distribution—This subspecies occurs in the Tongue of the Ocean, Bahamas, and the southwestern Caribbean from off Santa Marta, Colombia, westward to Golfo de los Mosquitos, Panamá.

Remarks—The shell of *O. bartschi clericus* is very similar to that of the nominate subspecies, but is generally smaller, less inflated, has fewer spiral cords, and has the subsutural “collar”. However, since there are specimens intermediate between the two taxa (e.g., *O. bartschi bartschi*, USNM 751944; *O. bartschi clericus*, UMML 30-3667) and there is apparent geographical segregation, I am treating *clericus* as a subspecies of *O. bartschi*. There appear to be some differences in the relative size and shape of the muscle scar of the operculum between the subspecies, but too few examples of opercula are known (three of each) to draw strong conclusions (see Fig. 2). The published figure of the radula of *O. bartschi s.s.* (Turner, 1948) does not correspond to that of *O. b. clericus* (Fig. 1A), differing in having a rhachidian with a rounded base, laterals denticulate on the inner edge of the cusp, and marginals lacking denticles. A future investigation with more live-collected specimens may well prove that *O. bartschi clericus* is a separate species, but such separation is not warranted by the present material.

Hadroocorys gen. nov.

Eudolium: Dall, 1889: 233 (*partim*); Kiliyas, 1962: 16 (*partim*).

Oocorys: Turner, 1948: 185 (*partim*); Habe and Azuma, 1959: 116; Abbott, 1974: 169 (*partim*).

Diagnosis—Oocorythidae with thick, heavy shell; outer lip varicose, denticulate; columellar lip with heavy, strongly ridged callus; aperture constricted posteriorly to form "anal notch"; anterior canal short, narrow, constricted by callus.

Type-species—*Dolium (Eudolium) Verrilli* Dall, 1889; herein designated.

Gender—Feminine.

Remarks—In view of the overall conservatism of the Oocorythidae, *Hadroocorys* is a very distinctive group. Although the spiral sculpture is typically oocorythid, the heavy shell and apertural crenulation separate it from all other genera of Oocorythidae. *Hadroocorys* is represented by only two known species, *H. verrilli* (Dall, 1889) and *H. tosaensis* (Habe and Azuma, 1959).

Hadroocorys verrilli (Dall, 1889)

Fig. 8.

Dolium (Eudolium) verrilli Dall, 1889: 233, pl. 35, fig. 12.

Oocorys (Oocorys) verrilli: Turner, 1948: 185, pl. 84, figs. 1, 2; Abbott, 1974: 169, fig. 1792.

Tonna (Eudolium) verrilli: Kilius, 1962: 16, fig. 12-2.

Description—See Dall (1889) and Turner (1948).

Material examined—ALBATROSS sta. 2120, 11°07'N, 62°14'30"W, 133 m, 1 spec., USNM 87208 (holotype).

Hadroocorys tosaensis (Habe and Azuma, 1959)

Oocorys tosaensis Habe and Azuma, 1959: 116, pl. 12, fig. 3; Habe, 1964: 67, pl. 20, fig. 2.

Description—See Habe and Azuma (1959).

Remarks—The holotype is presumably in the National Science Museum, Tokyo, Japan. To my knowledge, it is the only specimen of this species. *H. tosaensis* is very similar to *H. verrilli*, differing only in having a distinct umbilicus.

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SUBSPECIES OF THE GASTROPOD, *LITTORINA SCABRA*

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Although the subspecies concept presents a number of problems which must be overcome by the systematist in arriving at a defensible classification, it may be very useful in expressing the characteristics of a polytypic species (Mayr, 1969). It was with that objective in mind that I suggested that *Littorina scabra* (Linné, 1758) is a pantropical, polytypic species consisting of 3 subspecies: *L. scabra scabra*, (Indo-Pacific), *L.*

scabra aberrans (Philippi, 1846) (east Pacific), and *L. scabra angulifera* (Lamarck, 1822) (east and west Atlantic) (Rosewater, 1963, 1967, 1970, 1972a, 1972b, 1978, 1979 and 2 papers in press). The three subspecies are very close in morphology, ecology, and in what is known of their life history, and I believe there is little doubt they are, in fact, related specifically.