



## A new species of *Chama* (Bivalvia, Chamidae) from Mexico

PAUL VALENTICH-SCOTT & EUGENE V. COAN

Santa Barbara Museum of Natural History 2559 Puesta del Sol Road Santa Barbara, California 93105, USA

E-mail: pvscott@sbnature2.org, genecoan@gmail.com

While preparing a review of the bivalve mollusk fauna of the Panamic Province, we encountered a conspicuous, colorful species of the genus *Chama* Linnaeus, 1758, that could not be identified with any named species. After examining type specimens at The Natural History Museum, London (BMNH), the United States National Museum of Natural History (USNM), the Academy of Natural Sciences, Philadelphia (ANSP), the California Academy of Sciences (CAS), the Natural History Museum of Los Angeles County (LACM), and the Santa Barbara Museum of Natural History (SBMNH), we have concluded that this species is new to science.

### Genus *Chama* Linnaeus, 1758

*Chama* Linnaeus, 1758. Type species (subsequent designation Children, 1823); Opinion 484 (ICZN, 1957): *Chama lazarus* Linnaeus, 1758. Recent, Indo-Pacific.

**Diagnosis:** Shell irregular, very inequivalve, with cupped left or right valve attached to substratum and opposite valve flattened; umbones recurved, prosogyrate, unequal; attached valve frequently with deep subumbonal chamber; sculpture frequently with foliaceous commarginal frills; top valve commarginal lamellae or spines, frequently eroded; adult hinge plate strong with ponderous teeth.

### *Chama hicksi* Valentich-Scott & Coan, new species

Figures 1A–E.

*Chama sordida* Broderip, *auctt. non* Broderip, 1835.

Bernard (1976: 20–21, in part, figure 6b); Keen (1971: 149, in part, figure 350, right specimen).

**Description: Shell shape:** subovate; inequivalve, left valve larger; attached by left valve; attachment area moderate in size; right valve sculpture of large, long, irregular spines with commarginal striae, and with dense, short sharp spines over entire surface; left valve sculpture of large, long, irregular spines (with commarginal striae), and fine radial ribs.

**Sculpture and color:** exterior color variable with shades orange, red and pink; interior color cream, most with exterior color showing through; inner shell margin finely crenulate.

**Hinge:** hinge plate strong, thick; left valve with one thick, elongate cardinal tooth with roughened surface dorsally, one small elongate posterior lateral tooth with fine tubercles; right valve with one low, elongate cardinal tooth, lateral tooth absent; ligament deeply sunken on a nymph (Figures 1B, E).

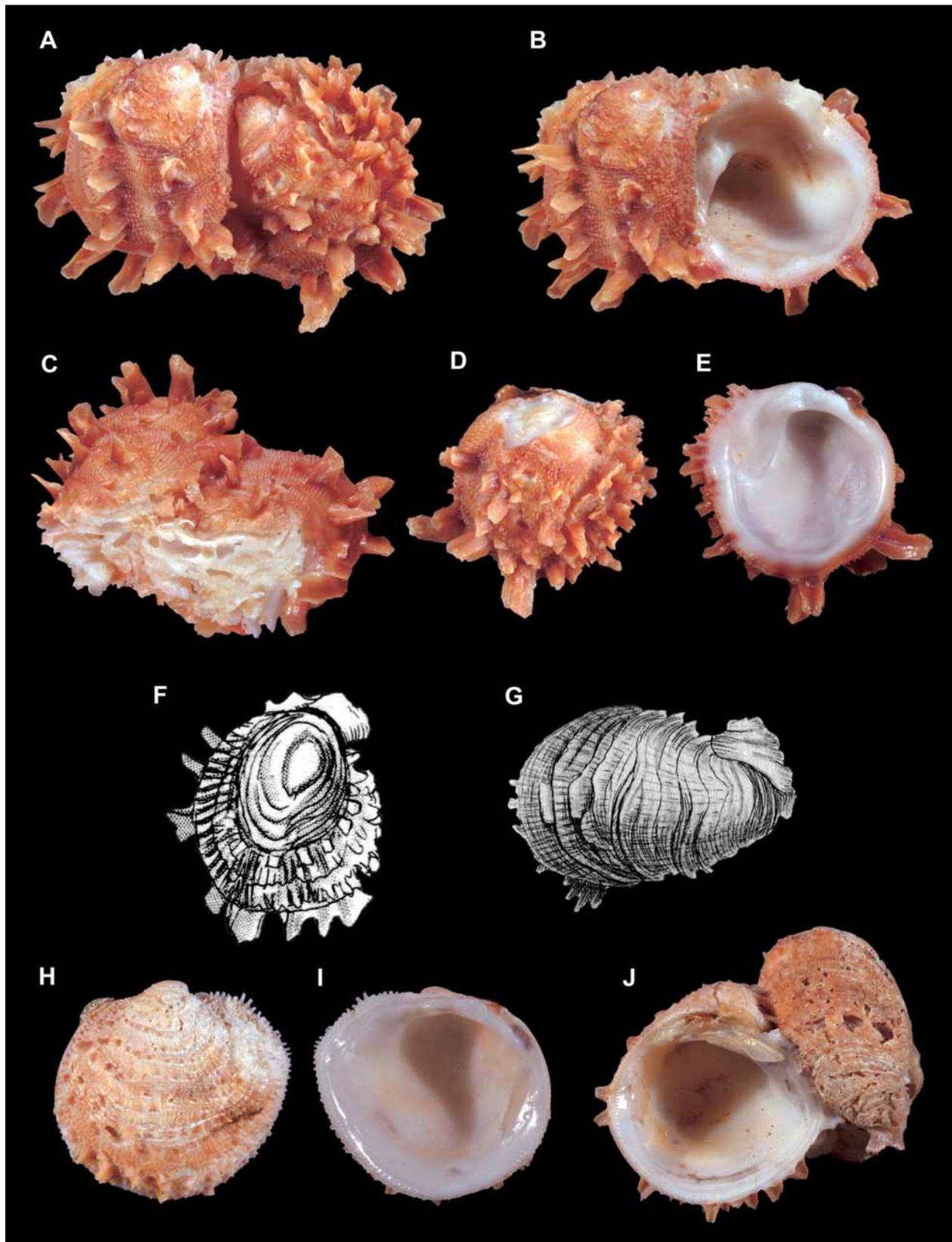
**Adductor muscle scars:** large, subequal, ovate (Figure 1E).

**Length:** to 40 mm in maximum dimension [SBMNH].

**Distribution:** In the Gulf of California from Isla Danzante (25.8°N) [SBMNH] to Bahía de los Angeles (29.0°N) [SBMNH], Baja California, and Algodones, Sonora (26.5°N) [SBMNH], to Gulf of Tehuantepec, Oaxaca (16.0°N) [SBMNH], Mexico, 12–75 m [SBMNH]; attached to *Spondylus* and other shells [SBMNH].

**Type specimens and type locality:** **Holotype** SBMNH 358523, length – 28.8 mm, height – 29.5 mm. Type locality: Mexico, Baja California, NE end of Isla Danzante, 60–90 m, attached to *Spondylus crassisquama* Lamarck, 1819; 25°48'15"N, 111°14'57"W; collected by Hal and Charlotte Norrid, October 1980. **Paratype**, SBMNH 149294, length – 21.6 mm, height – 29.5 mm, attached to the posterodorsal side of holotype. **Paratype**, SBMNH 149295, in original type lot (but not attached to other types), length – 14.8 mm, height – 17.0 mm.

**Additional paratypes.** 8 paratype specimens SBMNH 149297, from Mexico, Baja California, off Punta la Gringa, 20–40 m, attached to mussels; 29°01'56"N, 113°31'11"W; collected by Paul and Carol Skoglund. 2 paratype specimens from same locality BMNH 20100182.



**FIGURE 1.** A–E. *Chama hicksi* new species, holotype (SBMNH 358523) length = 28.8 mm, paratype (SBMNH 149294) length = 21.6 mm. A. Exterior of right valves of paratype (left valve) and holotype (right valve). B. Interior of left valve of holotype. C. Bottom view of paratype (left) and holotype (right). D. Exterior view of right valve of holotype. E. Interior view of right valve of holotype. F–G. Original figures of *Chama sordida* Broderip, 1835. F. Exterior view of right valve (original figure 8). G. bottom view of left valve (original figure 9). H–J. *Chama sordida* Broderip, 1835, **neotype herein**, length = 20.3 mm. H. Exterior of right valve. I. Interior of right valve. J. Interior of left valve (left).

5 paratype specimens SBMNH 83526, Mexico, Baja California Sur, Bahía San Nicolas, 27–29 m; 26°34'42"W, 111°32'18"W; collected by John Fitch, 12 April 1964. 2 paratype specimens from same locality USNM 1135997.

10 paratype specimens SBMNH 83525, Mexico, Baja California, Isla Smith, 31 m; 29°04'30"W, 113°31'00"W; collected by Carl and Laura Shy, May 1976. 2 paratype specimens from same locality CAS 182322.

**Etymology:** Named in honor of Stephen M. Hicks, for his contributions as Chairman of the Board at the Santa Barbara Museum of Natural History, 2008–2010.

**Comparisons:** *Chama hicksi* new species has long been confused with *C. sordida* Broderip, 1835 (Figure 1 F, G). The later species has a greatly produced, cornucopia-shaped lower (left) valve that is only moderately attached to the substratum, and has short, even spines on the upper valve, along with a few sporadic wider spines (Figure 1 F–J). By contrast, *C. hicksi* has a short, flattened left valve that is usually fully attached to the substratum, and has a combination of short, dense spines and broad, long, flattened spines.

*Chama hicksi* new species is closest in shell morphology to *C. tinctoria* Bernard, 1976. The latter species has shorter spines, the left valve with an interior color of from deep coral red to purple, and a much stronger cardinal tooth in the left valve.

**Remarks:** Reeve (1846: species 23) illustrated specimens of *Chama sordida* that do not match Broderip's original illustrations or description (1835a, b) (Figure 1 F–G). This has led to the confusion as to the identity of this species for over 160 years. Broderip's original specimens have not been located at BMNH, and Reeve's illustrated specimens have been incorrectly segregated as syntypes of *C. sordida* (BMNH 1950.11.1.52–53). Bernard (1976: figure 6a) illustrated the Reeve specimens. Even though the Reeve specimens are from the correct locality, they do not match Broderip's illustrations (1835b), and are not conspecific with *C. sordida*. These specimens might represent juvenile *C. buddiana* Adams, 1852, but further study is necessary to identify the heavily eroded shells.

In order to stabilize nomenclature, we **herein designate a neotype** for *Chama sordida* Broderip, 1835 as SBMNH 136149 (Figure 1 H–J), with a type locality of Mexico, Sinaloa, Mazatlán, offshore. We feel that this specimen, and the original specimens in the lot (SBMNH 149296), come close to matching Broderip's illustration and description. We were unable to find specimens from the original type locality of Isle of Cuna, Panama. *Chama sordida* is similar to and may be conspecific with *Chama corallina* Olsson, 1971, but further study, beyond the scope of this paper, is necessary to finalize this hypothesis.

## Acknowledgements

We appreciate the advice and assistance of Markus Huber, Zoological Museum of the University of Zurich. We thank Carol Skoglund who provided many specimens for comparison from her collection and gave us useful information on the new species. We deeply thank the curators and staff at BMNH, USNM, ANSP, CAS and LACM for allowing us access to their collections, without which the present study would have been impossible. We thank Patricia Sadeghian (SBMNH) for all photographs in Figure 1. We appreciate the support of SBMNH patrons Nini and Peter Seaman, and Sandra and Sam Tyler.

## Literature cited

- Adams, C.B. (1852) Catalogue of shells collected at Panama, with notes on synonymy, station and habitat, .... *Lyceum of Natural History of New York, Annals* 5, 229–549.
- Bernard, F.R. (1976) Living Chamidae of the eastern Pacific (Bivalvia: Heterodonta). *Natural History Museum of Los Angeles County, Contributions in Science* 278, 43 pp.
- Broderip, W.J. (1835a) Description of some species of *Chama*. *Zoological Society of London, Proceedings* for 1834[2], 148–151.
- Broderip, W.J. (1835b) On the genus *Chama*, Brug., with descriptions of some species apparently not hitherto characterized. *Zoological Society of London, Transactions*, 1, 301–306, pl. 38.
- Children, J.G. (1822–1823) Lamarck's genera of shells. *The Quarterly Journal of Science, Literature, and the Arts* 14(27), 64–87, pls. 3, 4 (Oct. 1822); 14(28), 298–322, pls. 5, 6 (Jan. 1823); 15(29), 23–52, pls. 2, 3 (April 1823); 15(30), 216–258, pls. 7, 8 (July 1823); 16(31), 49–79, pl. 5 (Oct. 1823); 16(32), 241–264, pl. 6 ("Jan. 1824", but probably Dec. 1823).
- ICZN [International Commission on Zoological Nomenclature] (1957) Opinion 484, addition to the "Official List of Generic Names in Zoology" and to the "Official List of Family-Group Names in Zoology" respectively of the generic name "*Chama*" Linnaeus, 1758, and the family-group name "Chamidae" (correction of "Camacea") Blainville, 1825 (Class Pelecypoda). *Opinions and Declarations Rendered by the ICZN*, 17, 73–86.
- Keen, A.M. (1971) Sea shells of tropical west America; marine mollusks from Baja California to Peru, 2nd edition. Stanford, California (Stanford University), xiv + 1064 pp.

- Linnaeus, C. (1758) *Systema naturae per regna tria naturae ... editio decima, reformata*, vol. 1 (Regnum animale). Stockholm (Salvii), 824 + iii pp.
- Olsson, A.A. (1971) Mollusks from the Gulf of Panama collected by R/V *John Elliott Pillsbury*, 1967. *Bulletin of Marine Science*, 21, 35–92.
- Reeve, L.A. (1846) Monograph of the genus *Chama*. *Conchologia iconica; or, illustrations of the shells of molluscos animals* 4, 19 pp, 9 pls.