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**Cypraeidae from Makatea Island,
Tuamotu Archipelago**

By **WILLIAM M. INGRAM**

DEPARTMENT OF ANATOMY, CORNELL UNIVERSITY

Makatea Island, sometimes referred to as Aurora Island, is situated in the Tuamotu Archipelago in 14° 54' South Latitude and 148° 13' West Longitude. Unlike most of the 78 islands in this group it is not an atoll; formerly one, it has been raised by upheaval of the earth's crust. The highest peak on the island, Mount Putiare, is 358 feet above sea level. The island is about 5 miles long, lying east and west. A fringing reef borders all but the eastern side. The growth of the reef has been most prolific on the northern shore where it extends in some localities 500 feet to seaward. Thus a very favorable habitat is available to the cowries in the reef waters about Makatea. During low tide much of the reef platform is exposed, and mollusks may be found in abundance in the tide pools (Alvin Seale, Director of Steinhart Aquarium in San Francisco, personal communication).

The data included here are based upon material gathered by Alvin Seale in 1902 and stored in Bernice P. Bishop Museum, Honolulu, and upon specimens in my own collection.

Of the 24 species represented in the collections seven are fairly abundant. Apparently the most common species is *Cypraea arenosa* Gray, which seems to be found in greater numbers in the Tuamotus than in any other island group. Likewise *C. scurra* Chemnitz and *C. irrorata* Solander seem to have found there the best environment for production of individuals. Other common species are *C. isabella* Linnaeus, *C. helvola* Linnaeus, *C. carneola* Linnaeus, and *C. intermedia* Gray.

Several of the cowries listed here are used by the natives for ornamental purposes. *C. irrorata* Solander, *C. arenosa* Gray, and *C. moneta* Linnaeus are strung on wire, cloth, or fiber to be worn as beads or as hatbands. The shells used in such strings are usually beach-worn. Frequently there are as many as 500 shells in a single strand of beads.

The purpose of this paper is to further the work begun by the writer in making clear the distribution of the Cypraeidae in the Pacific Ocean,¹ and to present information concerning the use of cowries by native islanders.

LISTED SPECIES

Cypraea arenosa Gray, Zool. Jour., 1:147, pls. 7, 12, fig. 6, 1824.

This is the most common species in the collections. A large specimen is 35 mm. long.

Cypraea caput-serpentis Linnaeus, Syst. Nat., 1175, 1767.

The shells are light brown; the marginal filling is extremely broad. The anterior and posterior canal extremities are generally marked with a dull orange-brown blotch.

Cypraea carneola Linnaeus, Syst. Nat., 1174, 1767.

The shells are elongate; none approaches the so-called variety *propinqua* Garr. The largest specimen is 78 mm. long.

Cypraea cicercula Linnaeus, Syst. Nat., 1181, 1767.

Cypraea helvola Linnaeus, Syst. Nat., 1180, 1767.

This is the typical South Seas form with broad orange marginal fillings and purple blotches on the dorsal surface of the anterior and posterior canal extremities. The largest specimen is 24 mm. long.

Cypraea goodali Gray, Desc. Cat. Cyp., 10, 1832.

This rare cowry is represented by one specimen in my collection.

Cypraea intermedia Gray, Zool. Jour., 1:77, 1824.

The developmental stages of the shell from the small bulla to the adult are present in the collections. The marginal fillings and the reticulated dorsal color pattern are light brown.

Cypraea irrorata Solander, Zool. Jour., 4:80, 1828.

Most specimens are beach shells. The small size of this species apparently makes it difficult to find when concealed in the fissures in coral rock.

Cypraea isabella Linnaeus, Syst. Nat., 1177, 1767.

The dashes on the dorsal surface range in color from light brown to black. Several species approach the Hawaiian form in that the anterior and

¹ The family Cypraeidae in the Hawaiian islands: *Nautilus*, 50:77-82, 1937.
Cypraeidae from Christmas, Palmyra, Washington, Fanning Islands: *Nautilus* 51:1-4, 1937.

posterior dorsal canal extremities have a brownish black blotch over the orange dorsal canal extremities.

Cypraea lynx Linnaeus, Syst. Nat., 1176, 1767.

The ground color ranges from gray blue to brown.

Cypraea mauritiana Linnaeus, Syst. Nat., 1176, 1767.

The dorsal reticulated pattern is quite distinct. The dorsal anterior and posterior canal extremities are orange brown.

Cypraea margarita Solander, Zool. Jour., 4:87, 1828.

Cypraea moneta Linnaeus, Syst. Nat., 1178, 1767.

The shell color varies from deep orange to slate gray. The annular ring on the dorsal surface may or may not be present.

Cypraea nucleus Linnaeus, Syst. Nat., 1181, 1767.

Cypraea obvellata Lamarck, An. sans Vert., 7:401, 1822.

Some specimens of this species seem to intergrade with *C. annulus* Linnaeus.

Cypraea poraria Linnaeus, Syst. Nat., 1180, 1767.

The scarcity of specimens of this species apparently indicates that it is quite rare in the waters about Makatea.

Cypraea punctulata Gmelin, Syst. Nat., 3404, 1790.

The specimens in the collections are all immature.

Cypraea reticulata Martyn, Universal Conch., pl. 15, 1782.

The reticulated pattern on the dorsal surface is not always distinct. The individuals are small, mostly less than 60 mm. long.

Cypraea scurra Chemnitz, Conch. Cab., 10:103, pl. 144, fig. 1338, 1788.

The dorsal reticulated color pattern may or may not be perfectly formed. A large specimen is 38 mm. long.

Cypraea talpa Linnaeus, Syst. Nat., 1174, 1767.

The color of the marginal fillings varies from a light to a dark brown. A large individual is 78 mm. long.

Cypraea tigris Linnaeus, Syst. Nat., 1176, 1767.

Cypraea ventriculus Lamarck, An. du Mus., 16:452, 1810.

In all the specimens the dorsal color pattern is lacking where the mantle lobes unite. This imperfection in color may be a sign of shell immaturity.

Cypraea vitellus Linnaeus, Syst. Nat., 1176, 1767.

All the specimens are bulbous. The color pattern in the mature individuals is broken where the mantle lobes join on the dorsal surface leaving a band about 3 mm. wide which lacks the normal brown color.

