

MITROMORPHA (MITROLUMNA) DIAOYUENSIS N. SP. (PROSOBRANCHIA: CONIDAE), A NEW SPECIES FROM THE DIAOYU (SENKAKU) ISLANDS, EAST CHINA SEA

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Abstract A new species of *Mitromorpha* Carpenter 1865, subgenus *Mitrolumna* Bucquoy, Dautzenberg & Dollfus 1883 is described from the circalittoral of the East China Sea for the first time.

Key words Conidae, Mitromorphidae, *Mitromorpha* nov. sp., Diaoyu Islands, East China

INTRODUCTION

In a recent revised classification of the superfamily Conoidea Fleming 1822, Puillandre *et al.* (2011) and Bouchet *et al.* (2011) placed the genus *Mitromorpha* Carpenter 1865 in the family Mitromorphidae Casey 1904. Besides morphological characters, their study was based mainly on DNA and the radula of particular species from the different families and genera.

Earlier, the genus had been moved around several times into different families (Cunningham Vaught, 1989; Taylor *et al.*, 1993; Mifsud, 2001; Chang & Wu, 2001; Bouchet & Rocroi, 2005). The family includes only a few genera and subgenera. Puillandre *et al.* (2011) included *Anarithma* Iredale 1917 and *Mitromorpha* Carpenter 1865, while Bouchet *et al.* (2011) included *Anarithma* Iredale 1917, *Lovellona* Iredale 1917, *Mitromorpha* Carpenter 1865, *Maorimorpha* Powell 1939, *Mitrellatoma* Powell 1942, *Arielia* Shasky 1961 and *Scrinum* Hedley 1922.

Mitrolumna Bucquoy, Dautzenberg & Dollfus 1883 was placed in synonymy or as a subgenus of *Mitromorpha* s.s. (Bouchet *et al.*, 2011). Species of *Mitromorpha* s.s., *Lovellona* and *Mitrolumna* have a paucispiral or a direct development type of protoconch with 1½–2 whorls, and usually have a local, restricted distribution, while species of *Anarithma* have a multispiral or pelagic type of protoconch development with 3–4 whorls, and a wide distribution. *Mitrolumna* is provisionally retained herein as a subgenus of *Mitromorpha* for the following reasons.

1. Although its species have a direct development they are represented worldwide, while

species of *Anarithma*, *Lovellona* and the other few obscure genera inhabit only the Indo-Pacific Region.

2. *Mitrolumna* is the major representative of the family on both sides of the Atlantic Ocean and the Mediterranean. Only one described species, *M. dormitor* Sowerby G. B. I 1844 from the SW Atlantic is cited in the literature to belong to *Mitromorpha* s.s. (e.g. Williams, 2006; Mifsud, 2001). However, it is still uncertain as to whether this species should be placed in the Columbellidae (Tryon, 1884: 318).
3. The radula of the species, which is similar to that of *Conus* and other mitromorphid genera, always lacks the characteristic barbs at the distal end (Bouchet *et al.*, 1980; Sysoev, 1990; Rolan *et al.*, 2001; Mifsud, 2001; Bouchet *et al.*, 2011).
4. Two prominent folds are always present on the columella of adult specimens.

MATERIAL STUDIED

The material studied was obtained from trawls from off the Diaoyu Islands, in a gravel and sand substratum in 130–150 m depth, between January 2009 and April 2010. The islands, also known as the Senkaku Islands, are located due East of mainland China, northeast of Taiwan, West of Okinawa Island, and north of the southwestern end of the Ryukyu Islands. The islands are part of Taiwan as part of Toucheng Township in Yilan County. The material was collected by Qing Zhang from trawler fishermen's bycatch.

Typography Holotype: h = 8 mm, w = 2.8 mm, deposited at NHM Number NHMUK 20110339;

paratype 1: h = 7 mm, w = 2.75 mm, deposited at NHM number NHMUK 20120016; paratype 2: h = 7 mm, w = 2.6 mm deposited at the MMNH number 9276; paratype 3: h = 5.5 mm, w = 2.2 mm deposited at the MMNH number 9277; paratype 4: h = 7.5 mm, w = 3 mm in author's collection; paratype 5: h = 7 mm, w = 3 mm in author's collection; paratype 6: h = 6.5 mm, w = 2.5 mm in author's collection.

ABBREVIATIONS

NHM Natural History Museum London, England;
MMNH Malta Museum of Natural History in Mdina, Malta.

SYSTEMATICS

Superfamily Conoidea Rafinesque 1815

Family Mitromorphidae Casey 1904

Genus *Mitromorpha* Carpenter 1865

Subgenus *Mitrolumna* Bucquoy, Dautzenberg & Dollfus 1883

Type species *Mitromorpha (Mitrolumna) olivoidea* Bucquoy, Dautzenberg & Dollfus 1883 from the Mediterranean Sea.

Diagnosis for the subgenus Mitrolumna Bouquoy, Dautzenberg & Dollfus 1853 Shell small, biconical, with 3 to 6 post nuclear whorls. Protoconch paucispiral, consisting of 1½ to 2 whorls. Sculpture primarily of spiral chords, but axial ribs may also be present, especially at the top whorls. Columella always with two prominent folds. Anal sinus present. Siphonal canal short and open. Last whorl takes up 60% to 70% of the total shell height. The radula is similar to that of *Conus*. This has a weak basal membrane with hollow marginal teeth which are slightly constricted medially, with an expanded spatulate base and no terminal barbs (Bouchet *et al.*, 1980; Sysoev, 1990; Mifsud, 2001; Rolan, 2001; Bouchet *et al.*, 2011). There is no operculum. Species from the subgenus are littoral to circalittoral, and are distributed worldwide.

Mitromorpha (Mitrolumna) diaoyuensis n. sp.

Fig. 1

Shell Biconical, tall and narrow. Protoconch consists of two white whorls, h = 0.5 mm, w =



Figure 1 *Mitromorpha (Mitrolumna) diaoyuensis* nov. sp.: left – holotype, 8 mm×2.8 mm, specimen with 5 post-nuclear whorls; right – paratype 1, 7 mm×2.75 mm, specimen with 4 post-nuclear whorls.

0.6 mm. There are up to five, slightly rounded, post-nuclear whorls (holotype). Sculpture consists of four tubercular, spiral chords on earlier whorls and up to five on penultimate. Chords crossed by indistinct orthocone axial ribs, indicated only by forming tubercles when they cross chords. Other narrower similar chords can develop between chords on enultimate whorl (holotype). Tubercles on chords diminish in size at the ultimate whorls and vanish near top of the aperture. Basal chords are marked only by very fine growth lines. Suture is well marked. Primary interspace between the spiral chords is always slightly wider than the rest. Chord interspaces are decorated with fine, orthocone, close-set axial growth lines. Internally, on the columella, are two shallow, white folds. Anal sinus is shallow. Outer lip is sharp and crenulated, with no internal teeth or thickening. Aperture is narrow with a short, open canal. Last whorl takes up 60% of the total shell height. Colour is white, sometimes with scattered brown longitudinal streaks and irregular patches (holotype).

Animal Unknown.

Etymology Named for the type locality, the Diaoyu Islands.

Distribution This species is presently only known from the type locality, in the East China Sea, off the Diaoyu Islands in a gravel and sand substratum in 130–150 m depth.

CONCLUSION

This is the first record of a mitromorphid species of the subgenus *Mitrolumna* from the East China Sea. The species therefore cannot be compared with any other similar subgeneric species from the region.

Chang & Wu (2001) list these nine species of Mitromorphidae from the shallow waters of Taiwan: *Mitromorpha* (*Mitromorpha*) *lachryma* (Reeve 1845), *Anarithma metula* (Hinds 1843), *A. subglobosa* (Hervier 1897), *A. sublachryma* (Hervier 1897), *A. alba* (Pallard 1889), *A. stepheni* (Melville & Standen 1896), *A. drivasii* Chang 1995, *Lovellona atramentosa* (Reeve 1849) and *L. fischeri* (Hervier 1881).

The mitromorphid species described from nearby Japanese waters also inhabit shallow waters. These include *Anarithma dorcas* Kuroda & Oyama 1971, *A. fischeri* Hervier 1899, *A. flammulata* Chino & Stahlschmidt 2009, *A. pinguis* Hervier 1899, *Lovellona atramentosa* Reeve 1849, *L. elongata* Chino & Stahlschmidt 2009, *L. grandis* Chino & Stahlschmidt 2009, and *Mitromorpha spreata* A. Adams 1864.

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