

**FIRST RECORD OF *BABYLONIA SPIRATA* (LINNAEUS) IN SINGAPORE,
WITH NOTES ON CONGENERS IN THE LOCAL SEAFOOD TRADE
(MOLLUSCA: GASTROPODA: BABYLONIIDAE)**

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ABSTRACT. — *Babylonia spirata* (Linnaeus) is recorded from Singapore for the first time based on three specimens collected along the eastern coast of the Singapore Island. A previous record of *Babylonia lutosa* (Lamarck) could not be confirmed, and is considered to be erroneous. Three have thus far been recorded from the seafood trade in Singapore: *Babylonia borneensis* (G.B. Sowerby II), *Babylonia lutosa* (Lamarck), and *Babylonia zeylanica* (Bruguière). *Babylonia spirata* (Linnaeus) is not known from the seafood trade in Singapore.

KEY WORDS. — Mollusca, Babyloniidae, *Babylonia*, new record, Singapore

INTRODUCTION

The genus *Babylonia* Schlüter (1838), is comprised of about 15 recent species of marine snails restricted to the Indo-Pacific region (Gittenberger & Goud, 2003; Fraussen & Stratmann, 2013). The shells of *Babylonia* are typically white to yellow, with orange to brown markings that are usually arranged in a spiral. Most species can be easily diagnosed by shell characters alone as the conchological characteristics of each species are relatively distinct (Fraussen & Stratmann, 2013).

Many species are of economic importance, mainly as seafood and are exploited in many countries (e.g., China, India, Indonesia, Japan, Taiwan, Thailand, and Vietnam) where they are mostly caught by trawlers or in baited pots (Chiu & Liu, 1994; Babu Philip & Appukuttan, 1997; Poutiers, 1998; Swennen et al., 2001; Thach, 2005; Puspito & Suherman, 2012). A few species such as *Babylonia areolata* (Link, 1807), *Babylonia formosae* (G.B. Sowerby II, 1866), and *Babylonia japonica* (Reeve, 1842), are also extensively cultured (Chiu & Liu, 1994; Kritsanapuntu et al., 2007).

Although several species of babyloniids are common in parts of their ranges in Southeast Asia, none have been reported from Singapore since the record of *Babylonia lutosa* (Lamarck, 1816) by Altena & Gittenberger (1981). A second species, *Babylonia spirata* (Linnaeus, 1758), was recently collected, and is determined to be the first record of this species in Singapore. Details of the records and figures are herein provided for documentation. The previous record of *Babylonia lutosa* and observations of other species of *Babylonia* that have been observed in the local shellfish trade are briefly discussed.

MATERIAL AND METHODS

The specimens referred to herein are deposited in the Zoological Reference Collection (ZRC) of the Raffles Museum of Biodiversity Research (RMBR) at the National University of Singapore, where they have been assigned catalogue numbers with the prefix ZRC. The following abbreviations are used: SH (shell height) refers to the distance from the apex to the lowest part of the basal side of the peristome; SW (shell width) refers to the widest part of the body whorl (periphery) perpendicular to the coiling axis. All measurements are in millimetres (mm).

RECORDS AND OBSERVATIONS

Babylonia spirata (Linnaeus, 1758)

(Figs. 1, 2)

Material examined. — Changi (area between Car Parks 6 and 7), Singapore — ZRC.MOL.5448 (1 ex.: SH 49.4 × SW 31.9 mm), partially buried in fine sandy sediment, with its shell exposed, amongst seagrass bed during the evening low spring tide, coll. S. C. Tou, 15 Dec.2012; ZRC.MOL.5505 (1 ex.: SH 49 × SW 31.1 mm), buried in the substrate on

sand flat exposed at low tide, R. K. H. Yeo, 30 Apr.2013; ZRC.MOL.5547, (1 m.: SH 43 × SW 28 mm), coll. R. Tan et al., 24 Jun.2013.

Diagnosis. — Shell broad, ovately conical, moderately short; spire prominent and pointed; sutural canal conspicuous, wide and deep with angulate keel-like shoulder; body whorl somewhat flattened between the shoulder and above the periphery; aperture about half of shell height; umbilicus varying from wide open to completely closed. Ground colour white; blotches of varying shapes and sizes that are generally arranged in spiral bands, ranging from pinkish-orange to dark brown; periostracum thin, brown.

Remarks. — The specimens of *Babylonia spirata* were all collected from the same general area at the eastern coast of Singapore Island (ca. 1.383°N 104.003°E), and were subsequently deposited as vouchers in the ZRC (RMBR) as ZRC.MOL.5448 (Fig. 1), ZRC.MOL.5505 (Fig. 2), and ZRC.MOL.5547, respectively. The discovery of these three specimens confirms the presence of *Babylonia spirata* in Singapore waters and represents the first record of this species.

DISCUSSION

Babylonia spirata is widely distributed from the Western Indian Ocean to Bali, Indonesia, in the east (Altena & Gittenberger, 1981; Fraussen & Stratmann, 2013). Known localities nearest to Singapore are the Straits of Malacca (Penang; Malaysia; and Sumatra, Indonesia) and Java, Indonesia. The discovery of a few specimens of this hitherto unrecorded species within a relatively short period of time is quite surprising. There is, however, no evidence of a human-mediated introduction, and because Singapore is within the known native distribution of this species, the occurrence of this species there is regarded as natural.

The genus *Babylonia* was previously represented in Singapore by a single record of *Babylonia lutosa* (Lamarck, 1816) (see Altena & Gittenberger, 1981). The same record was reiterated in a checklist by Tan & Woo (2010), and by Fraussen & Stratmann (2013) who added that the record requires confirmation. The remark by Fraussen & Stratmann (2013) is understandable considering that Singapore is an unusual range extension from the confirmed distribution of this species, which is from the Chinese coast to Taiwan and Vietnam (Altena & Gittenberger, 1981; Fraussen & Stratmann, 2013). Our attempt to verify the collecting data of the purported specimen(s) from Singapore was unsuccessful. The specimen lot supposedly deposited in the Museum of Zoology of the University of Michigan at Ann Arbor (UMMZ) could not be traced. To further confound matters, there is apparently no entry of this lot in the catalogues of the UUMZ (T. Lee, in litt., 20 Mar.2013).

Babylonia spirata and *Babylonia zeylanica* (Bruguière, 1789) have apparently been exported from India to Singapore since 1994 (Chidambaram, 1997; Mohan et al., 2012), but it is unclear if they are destined for the local market. No information is available on the species imported as seafood into Singapore, but babyloniids in general do not seem to be popular as a seafood item there and are seldom available in local markets and restaurants (pers. obs.). It is thus possible that Singapore is only a transit point for Indian babyloniids. From the early 1990s to the present, *Babylonia borneensis* (G.B. Sowerby II, 1864), *Babylonia lutosa*, and *Babylonia zeylanica* have been recorded in the local markets and restaurants (S.Y. Chan, unpub. data; S.K. Tan, pers. obs.; see also Dharma & Dharma, 2010). These records, however, do not include shelled meat, which would have been unidentifiable. *Babylonia spirata*, sold frozen as seafood worldwide; mainly in India, Sri Lanka, Thailand, Malaysia, China, Taiwan, and Japan (Fraussen & Stratmann, 2013), has thus far not been recorded from the seafood trade in Singapore.

Trade activities have given rise to a lot of confusion regarding the origins of commercially fished or farmed species. It is common to see imported shellfish originating from outside Southeast Asia being sold together with local species in Singapore markets. Cultivation of foreign species in farms is also a common practice in the shellfish industry. The confounding effect of frequently misleading locality information on labels of species in the seafood trade (the place of importation rather than origin), was also highlighted by Fraussen & Stratmann (2013). Since *Babylonia lutosa* is incidentally one of the three babyloniid species recorded in the local seafood trade, it is possible that material from Singapore seen by Altena & Gittenberger (1981) may have been incorrectly localised.

Babylonia spirata is herein regarded to be the only confirmed species of the family Babyloniidae found in Singapore. As there have been no subsequent records of *Babylonia lutosa* from Singapore or its immediately adjacent areas, we are of the opinion that the earlier record of this species from Singapore is most likely erroneous.

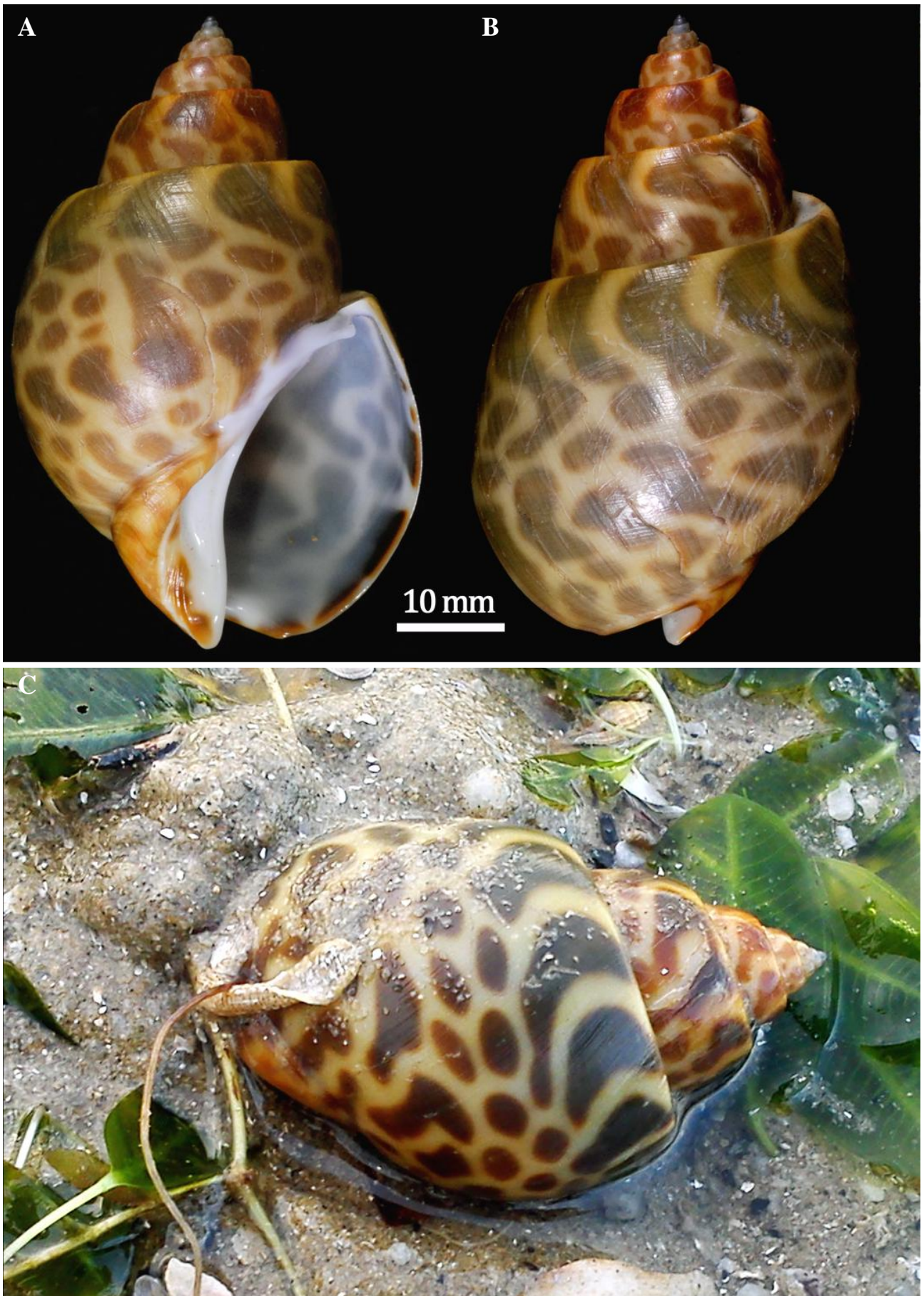


Fig. 1. *Babylonia spirata* (ZRC.MOL.5448): A–B, apertural and dorsal views, respectively, of dry specimens with periostracum intact, SH 49.4 × SW 31.9 mm; C, in situ, 15 Dec.2012, Changi, Singapore. (Photographs by: Siong Kiat Tan [A,B], Soon Chuan Tou [C]).



Fig. 2. Second specimen of *Babylonia spirata* (ZRC.MOL.5505), SH 49 × SW 31.1 mm, collected on 30 Apr.2013 at Changi, Singapore. (Photograph by: Ron Yeo).

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