THE RAFFLES BULLETIN OF ZOOLOGY 2010 **58**(2): 245–249
Date of Publication: 31 Aug.2010

ON TWO NEW SPECIES OF *AMPHIDROMUS* (GASTROPODA: CAMAENIDAE) FROM THE LESSER SUNDA ISLANDS, INDONESIA

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***ABSTRACT.* –** Two new species of arboreal camaenid snails in the subgenus *Amphidromus* (*Syndromus*) are described from the islands Sumba and Rotti, the Lesser Sunda Islands, Indonesia. *Amphidromus* (*Syndromus*) *abbasi*, new species, and *Amphidromus* (*Syndromus*) *rottiensis*, new species, can be differentiated from congeners in the same geographical region by shell characters. Morphologically similar species are compared, and the diagnostic differences mentioned. This work validates two previously-named nomina nuda.

***KEY WORDS*. –** Gastropoda, Camaenidae, *Amphidromus*, *Syndromus*, *abbasi*, *rottiensis*, Indonesia.

INTRODUCTION

Members of the land snail genus *Amphidromus* Albers, 1850, are distributed from Assam, India to northern Australia (Laidlaw & Solem, 1961; Solem, 1983; Severns, 2003). There are presently two recognised subgenera, *Amphidromus* Albers, 1850, and *Syndromus* Pilsbry, 1900, which are diagnosable by both external shell morphology and genital morphology (Laidlaw & Solem, 1961; Sutcharit & Panha, 2006). The taxonomy of the *Amphidromus* (*Amphidromus*) from Thailand and its surrounding areas was recently revised by Sutcharit & Panha (2006), but there has been no recent taxonomic revision of the *Amphidromus* (*Syndromus*) or a synoptic revision of the *Amphidromus* sensu lato. Sutcharit et al.'s (2006) molecular phylogeny of the *Amphidromus* suggested disagreement with current taxonomy of *Amphidromus* (*Syndromus*). However, the majority of *Amphidromus* species are still only known from shell characters.

The range of the subgenus *Syndromus* is restricted to Southeast Asia and consists predominantly of species with sinistrally coiled shells. Species diversity is especially high in Indonesia and numerous species and forms have radiated on isolated islands (see Abbott, 1989; Severns, 2003, 2006; Dharma, 2005, 2008). This is particularly so around the Lesser Sunda archipelago where a number of new species and subspecies have been described in recent years (e.g., Severns, 2006; Dharma, 2007; Chan & Tan, 2008; Chan et al., 2008). Recently, it was brought to our attention that there are nomenclatural problems associated with two Indonesian species we recently described (see **Discussion**). As a result, *Amphidromus* (*Syndromus*) *abbasi* Chan & Tan, 2008, and *Amphidromus* (*Syndromus*) *rottiensis* Chan, Tan & Abbas, 2008, are unavailable for nomenclatural purposes, and descriptions of both as new species are now provided in this article to validate these names. As both names are relatively well known among workers, we have chosen to conserve these names to avoid confusion and possible debates on their availability. Henceforth, the authorship and date of authorship of both names are established in this paper.

MATERIALS AND METHODS

Descriptions of both species are based entirely on shell morphology. Even though anatomical characters can be used to differentiate species within the Camaenidae (e.g., Sutcharit & Panha, 2006), such information remains too scarce for viable comparisons to be made. The majority of the *Amphidromus* were described with shell characters and these are sufficient for a positive diagnosis. Until further, and properly preserved material and information on the anatomy of the congeners is made available, descriptions of the morphological characters should suffice. Specimens examined are deposited in the Muzium Zoologicum Bogoriense (MZB), Indonesia; Zoological Reference Collection (ZRC) of the Raffles Museum of Biodiversity Research, Singapore; Muséum national d'Histoire naturelle (MNHN), Paris; Chan

Sow-Yan Collection (CSY) and Natural History Museum (BMNH), London.

TAXONOMIC ACCOUNT

CAMAENIDAE PILSBRY, 1895

Amphidromus ALBERS, 1850

Amphidromus (*Syndromus*) PILSBRY, 1900

Amphidromus (*Syndromus*) *abbasi*, new species
(Figs. 1A–C)

***Material examined.* –** Holotype – 1 ex. (MZB.Gst.14.232), arboreal on low lying bushes and trees along a stream in damp forest just above sea level, about 1.2 km from the coast, Langgaliru (9°45'44"S 119°38'33"E), Southwest Sumba, Indonesia, coll. John Abbas, Sep.2007.

Paratypes. – 10 ex. (MZB.Gst.14.233); 5 ex. (ZRC.MOL.2832–2836), 1 ex. (ZRC.MOL.2960); 8 ex. (CSY409.003amph048.00/01–08); 2 ex. (MNHN); 3 ex. (BMNH20080623) – same data as holotype.

***Description.* –** Shell thin, sinistral, smooth with somewhat silky lustre; shell height up to 41.3 mm, width to 16 mm, aperture height to 21.2 mm in examined specimens; sinistral and slender ovately conical, covered with a thin periderm; whorls (6.5–7) rather flat, giving the shell a generally straight sided profile; outer lip thin and slightly expanded outwardly but not reflected; columella white, thin, slightly curved, without folds; umbilicus perforated or nearly closed; aperture large, about half of shell height, oblique, peristome basally rounded ("tear-drop" shaped); tip of apex faintly pinkish-brown, some individuals with a brown-black spot; parietal wall thin and transparent; ground colour light yellow or light to dark brown, decorated with variegated radial streaks or flames in the antepenultimate and penultimate whorls and an alternately blotched (somewhat checkered) subsutural spiral band; colour in aperture light yellow to brown.

***Distribution.* –** Known thus far only from the type locality, probably endemic.

***Etymology.* –** This species is named after Mr. John Abbas who collected, and kindly donated the specimens for our study.

***Remarks.* –** No distinct dark axial bands marking interruptions in shell development (resting stage or varix) were observed in all examined specimens of *Amphidromus* (*Syndromus*) *abbasi*, new species. The alternately blotched subsutural band appears most prominently on the last whorl just above the periphery. The radial bands and patterns are consistent in most specimens examined, but are faintly marked or relatively monotonous in some. According to Laidlaw & Solem (1961), only *Amphidromus* (*Syndromus*) *latestrigatus* Schepman, 1892, and *Amphidromus* (*Syndromus*) *floresianus* Fulton, 1897 are known from Sumba Island. However, in terms of external morphology, *Amphidromus* (*Syndromus*) *contrarius* (Müller, 1774) (Fig. 1, D), and *Amphidromus* (*Syndromus*) *filozonatus* von Martens, 1867 (Fig. 1E) resemble *Amphidromus* (*Syndromus*) *abbasi*, new species, more. Some individuals of *Amphidromus* (*Syndromus*) *abbasi*, new species, with a light yellow ground colour may resemble similarly coloured *Amphidromus* (*Syndromus*) *contrarius* (Müller, 1774), while light brown forms are reminiscent of *Amphidromus* (*Syndromus*) *filozonatus* von Martens, 1867. Despite the suggested similarities with these congeners, the profile and peculiar teardrop-shaped aperture of *Amphidromus* (*Syndromus*) *abbasi*, new species, easily distinguishes it from other known *Amphidromus* (*Syndromus*) species.

Amphidromus (*Syndromus*) *rottiensis*, new species
(Figs. 1G–I)

***Material examined.* –** Holotype – 1 ex. (MZB.Gst.15.047, Ex BMNH20080621), arboreal on shrubs and trees in mesic hilly forest, southwestern central plateau portion (Busalangga) of Rotti Island (Pulau Rote), Indonesia, coll. John Abbas, Apr.2008.

Paratypes. – 2 ex. (MZB.Gst.15.048); 3 ex. (ZRC.MOL.2837–2839); 2 ex. (MNHN); 8 ex. (CSY409.003amph049.00/01–08); 3 ex. (BMNH20080622) – same data as holotype.

***Description.* –** Shell sinistral, rather solid and robust, opaque, smooth with glossy lustre and oblong-conic; whorls (5.5–6) rather rounded; apex black, appearing as a spot at tip of spire; outer lip thin and slightly reflected; columella white and reflected over, and partially covering the umbilicus; aperture relatively large, slightly less than half that of total shell height; peristome white; outer lip profile straight when viewed from the side; parietal wall very thin and transparent, the underlying colours and bands visible; colour and patterns variable; ground colour light yellow or white. Three main colour morphs have been observed, the predominant form is with disjunct black radial streaks or variegated dashes in the antepenultimate and penultimate whorls that are crossed or bisected by a yellow spiral band; a black spiral line above the suture and a pinkish subsutural spiral band (which may fade with age) is present in most examined specimens; patterns clearly visible on the inside of the aperture.

***Distribution.* –** Known so far only from the type locality.

***Etymology.* –** This species is named after the type locality with Latin suffix *-ensis* denoting place.

***Remarks.* –** Rensch (1932), and Laidlaw & Solem (1961), mentioned only *Amphidromus* (*Syndromus*) *contrarius* (Müller, 1774) from Rotti Island. *Amphidromus* (*Syndromus*) *contrarius* (Müller, 1774) (Fig. 1D) with the black apical spot and pinkish subsutural spiral band is morphologically most similar to *Amphidromus* (*Syndromus*) *rottiensis*, new species. However, the relatively shorter and stouter *Amphidromus* (*Syndromus*) *rottiensis*, new species, can be easily distinguished by the lack of a calloused nodule/subtriangular tubercule on the posterior end of the parietal wall which is a distinctive character of *Amphidromus* (*Syndromus*) *contrarius* (Müller, 1774) (see Laidlaw & Solem, 1961; Fig. 1D). The presence of a black line above the suture is also

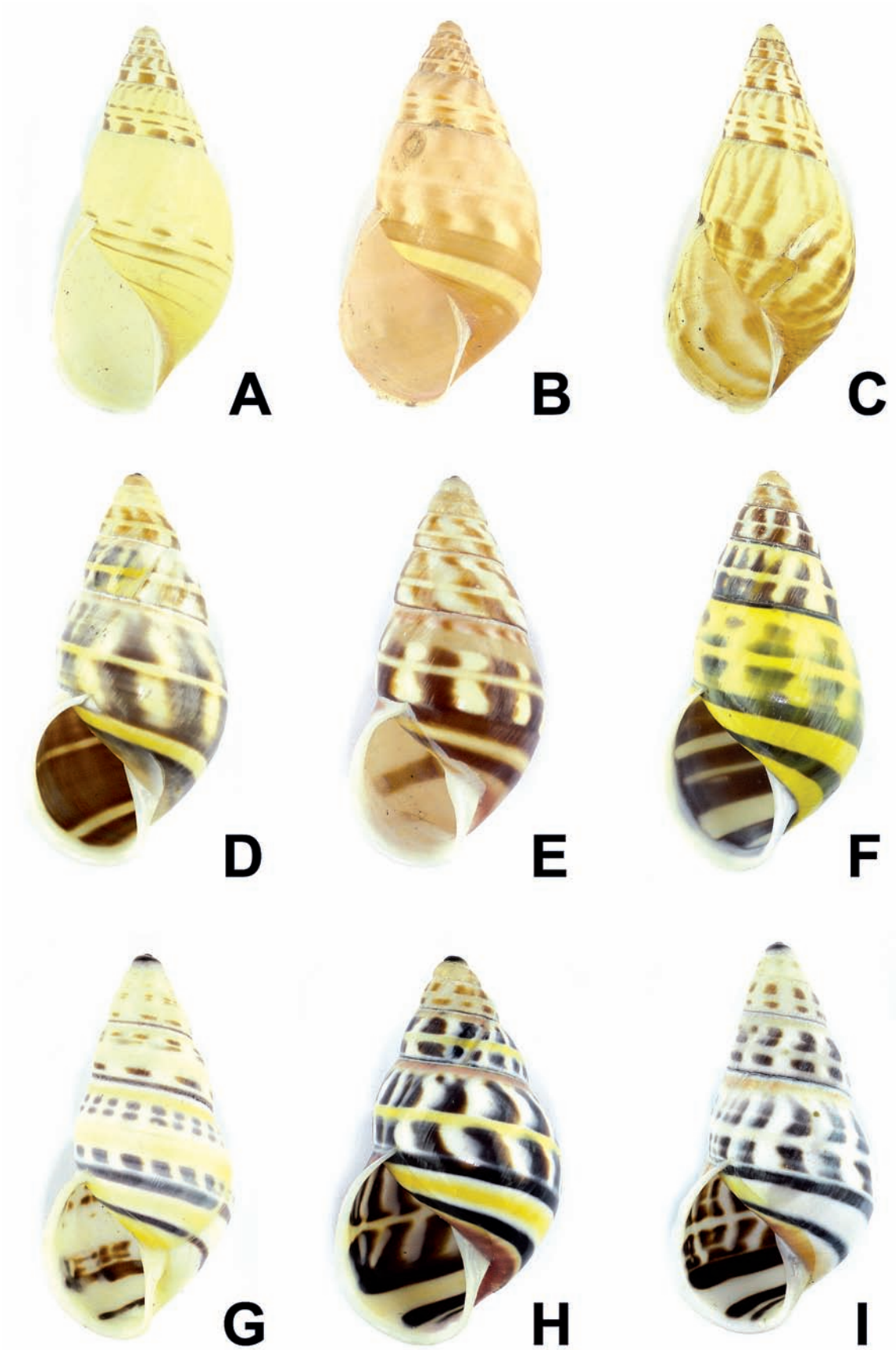

Fig. 1. A–C, *Amphidromus* (*Syndromus*) *abbasi*, new species, Langgaliru, Southwest Sumba, Indonesia: paratype (ZRC.MOL.2832) (37.6 x 18.0 mm); paratype (ZRC.MOL.2834) (34.4 x 18.3 mm); paratype (ZRC.MOL.2835) (36.0 x 17.4 mm); D, *Amphidromus* (*Syndromus*) contrarius (Müller, 1774) (CSY409.3.2.8) (37.0 x 19.2 mm), Samau Island, Indonesia; E, *Amphidromus* (*Syndromus*) *filozonatus* von Martens, 1867 (CSY409.3.44.0) (28.7 x 14.5 mm), Madura Island, off Java, Indonesia; F, *Amphidromus* (*Syndromus*) *poecilochrous* Fulton, 1898 (CSY409.3.28.6) (34.6 x 17.8 mm), Adonara Island, off east Flores Island, Indonesia; G–I, *Amphidromus* (*Syndromus*) *rottiensis*, new species, Rotti Island, Indonesia: paratype (ZRC.MOL.2837) (30.1 x 15.0 mm); paratype (ZRC.MOL.2838) (26.4 x 15.5 mm); paratype (ZRC.MOL.2839) (29.0 x 15.0 mm).

diagnostic of *Amphidromus* (*Syndromus*) *rottiensis*, new species. Dark axial bands marking interruptions in shell development (varices) were absent in all examined specimens. *Amphidromus* (*Syndromus*) *rottiensis*, new species, differs in having black apical whorls, white ground colour and total absence of dark axial bands as compared to another similar looking species, *Amphidromus* (*Syndromus*) *poecilochrous* Fulton, 1898 (Fig. 1F) which is distributed in the islands of Komodo, Sumbawa, Flores, Adonara, and Lemabata. Certain forms of *Amphidromus* (*Syndromus*) *rottiensis*, new species, may also be mistaken for similarly-coloured specimens of *Amphidromus* (*Syndromus*) *poecilochrous jaeckeli* Laidlaw, in Butot, 1954, which however, lacks the black apical spot. The holotype was designated BMNH 20080621 in Chan et al., 2008, but has since been reassigned to MZB.Gst.15047.

DISCUSSION

The two new species we validate in this paper were previously described in separate papers in a Singapore journal, "Occasional Molluscan Papers". However, the means in which this journal was published and distributed contravenes the International Code of Zoological Nomenclature (hereafter, the Code; ICZN, 1999), and as such, the new names proposed in it are not nomenclaturally available. Despite possessing a print ISSN (1793-8708), being registered with the National Library of Singapore, having a limited number of printed hardcopies, deposition with the National Library of Singapore and distributed to colleagues, it does not fully satisfy the criteria of a published work in a strict reading of Article 8.1.3 of the Code which requires "an edition containing simultaneously obtainable copies" (ICZN, 1999: 6). Firstly, the journal was produced entirely via electronic methods that did not assure numerous identical and durable copies. Secondly, dissemination was done via electronic means and as such, the "Occasional Molluscan Papers" must therefore be regarded an electronic publication. Due to the journal's electronic nature (i.e., "a method that does not employ printing on paper", ICZN, 1999: 7), compliance with Article 8.6 would have been required. As the only "publicly accessible librar[y]" was the National Library of Singapore, Article 8.6 (ICZN, 1999: 7) was not fulfilled and journal was not a valid publication in the sense of the Code. Consequently, the new specific names *Amphidromus* (*Syndromus*) *abbasi* and *Amphidromus* (*Syndromus*) *rottiensis* as established in the "Occasional Molluscan Papers" are nomina nuda as the publication failed to conform to Article 11.1 (ICZN, 1999). This paper thus validates and makes available the names *Amphidromus* (*Syndromus*) *abbasi* and *Amphidromus* (*Syndromus*) *rottiensis*, and the authorship and date of authorship follow those of this paper.

ACKNOWLEDGEMENTS

We would like to thank two commissioners of the International Commission for Zoological Nomenclature (ICZN): Philippe Bouchet (for bringing this matter to our attention), and Peter K. L. Ng for discussion and advice. We would also like to express our gratitude to Peter K. L. Ng and S. H. Tan for guidance on the application of the ICZN Code. We are indebted to J. Abbas for providing the specimens used for our study.

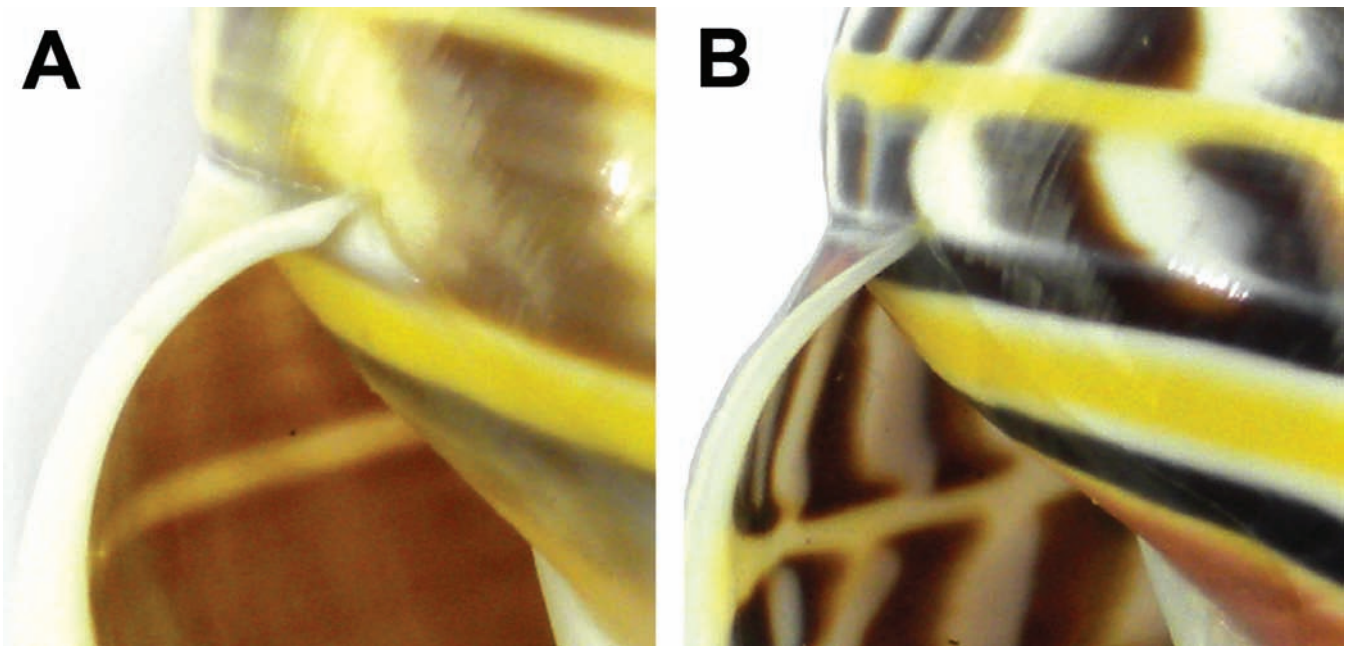

Fig. 2. A, *Amphidromus* (*Syndromus*) *contrarius* (Müller, 1774), showing the calloused nodule/subtriangular tubercule,which is a diagnostic character of this species; B, *Amphidromus* (*Syndromus*) *rottiensis*, new species, lacks the calloused nodule/subtriangular tubercule.

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