

***PILA CONICA* (WOOD, 1828), OR *PILA SCUTATA* (MOUSSON, 1848)?
THE CORRECT NAME FOR THE NATIVE APPLE SNAIL OF SINGAPORE
(GASTROPODA: AMPULLARIIDAE)**

Martyn E. Y. Low^{1*}, S. K. Tan¹ and T. H. Ng²

¹Raffles Museum of Biodiversity Research, National University of Singapore
Block S6, Science Drive 2, Singapore 117546, Republic of Singapore

²Department of Biological Sciences, National University of Singapore
14 Science Drive 4, Singapore 117543, Republic of Singapore

(*Corresponding author: m.low@me.com)

ABSTRACT. — A native ampullariid found in Singapore has been recorded as both *Pila conica* (Wood, 1828) and *Pila scutata* (Mousson, 1848). Both names are generally accepted to be synonyms, but the nomenclature remains confused, with authors generally preferring one over the other. To clarify the confusion, the history of the names is presented to show that *Pila conica* is a rejected junior homonym and that *Pila scutata* is the proper name to apply to this taxon. The earliest records of this apple snail in Singapore are also mentioned as a note of interest and the importance of clarifying the nomenclatural confusion is discussed.

KEY WORDS. — Mollusca, nomenclature, homonym, synonym, earliest record, trematode parasites, host

INTRODUCTION

Several species of ampullariids have been recorded from Singapore, including *Pila ampullacea* (Linnaeus, 1758), *Pila conica* (Wood, 1828), *Pila scutata* (Mousson, 1848), *Pomacea canaliculata* (Lamarck, 1822), *Pomacea insularum* (d'Orbigny, 1835), and *Pomacea lineata* (Spix, in Wagner, 1827) (Maassen, 2001: 47; Hayes et al., 2008: 706; Tan & Woo, 2010: 27; Tan et al., 2012: 126, 127). The actual local species diversity of ampullariids is however probably lower—this discrepancy may be attributed to the confused state of their taxonomy and nomenclature. A recent study by Hayes et al. (2012) has clarified the taxonomy and nomenclature of a few *Pomacea* species, but nomenclatural confusion persists over the local *Pila* species.

The uncertainty surrounding the valid (or accepted) name for the native apple snail in Singapore is owed largely to the confused nomenclature of this taxon. In particular, two are in current use for this species: *Pila conica* (Wood, 1828) (e.g., Bonne et al., 1953: 13, 15; Perera & Walls, 1996: 82, unnumbered fig.; Cowie, 1997: 3, 4; Smith, 2003: 245, 252; Jørgensen et al., 2008: 247; Darrigran & Damborenea, 2009: 19; Hayes et al., 2009a: 51; Hayes et al., 2009b: 65; Joordens et al., 2009: 663, 664; Horgan et al., 2012: 2–5, 7), and *Pila scutata* (Mousson, 1848) (e.g., Benthem Jutting, 1956: 332–336; Purnami et al., 2010: 54; Tan & Woo, 2010: 27; Agrawal, 2012: 58; Tan et al., 2012: 126, 127).

The earliest records of this apple snail in Singapore are also mentioned as a note of interest and the importance of clarifying the nomenclatural confusion is discussed.

***PILA CONICA* (WOOD, 1828) OR *PILA SCUTATA* (MOUSSON, 1848)?**

In 1828, the specific epithet *conica* was proposed by Wood (1828: 22, 29, pl. 7, Fig. 22) for a shell of unknown origin (reproduced as Fig. 1A). The name *conica* was used in conjunction with two genera—*Ampullaria* (on p. 29) and *Helix* (on p. 22). Cowie (1997: 3, 4) accepted the name *Ampullaria conica* and is deemed to have first selected the genus in which *conica* was first described by Wood (1828) under the rules of nomenclature (Article 24.2, ICZN, 1999: 30).

Unfortunately, the name *Ampullaria conica* had already been used twice for different species. *Ampullaria conica* Lamarck, 1804, is now *Ampullina conica* (Lamarck, 1804), a valid fossil species (see Brigantini, 1985: 410). *Ampullaria conica* Swainson, 1823, is considered to be identical to *Pila virens* (Lamarck, 1822) (see Cowie & Thiengo, 2003: 52).

The junior homonym (i.e., *Ampullaria conica* Wood, 1828) was permanently rejected by Benthem Jutting (1956: 332) who realised that it was preoccupied by its earlier use by Lamarck (1804: 31). This permanent rejection of

Ampullaria conica as used by Wood (1828: 22, 29) means that the binomial name *Ampullaria conica* Wood, 1828 is no longer available for use (Article 57.2, ICZN, 1999: 59; also see the remarks by Cowie, in Coan & Petit, 2011: 31).

Even if Cowie (1997: 3, 4) had selected *Helix* over *Ampullaria* as the correct genus in which *conica* (Wood, 1828) was described, the name would still be preoccupied—Schlotheim (1818: 340) and Draparnaud (1801: 69) had earlier used the name *Helix conica*. The use of the name *Helix conica* by Renier (1804: xi) is not an available one (ICZN, 1954: 1956).

The authorship of the name *Ampullaria conica* (as used in Wood, 1828: 22, 29) has been attributed to “Gray” (e.g., Sowerby III, 1910: 57; Preston, 1915: 100; Benthem Jutting, 1937: 105; Cowie, 1995: 63) or “Gray in Wood” (e.g., Nevill, 1885: 5). As discussed in Petit (2012: 18), the names in the “Supplement to Index Testaceologicus” (i.e., Wood, 1828) cannot be attributed to Gray, and must be attributed to Wood alone (see also Coan & Petit, 2011: 31). The putative holotype of *Pila conica* (Wood, 1828) is in the Natural History Museum (London) (see Prashad, 1925: 79).

Being a preoccupied (and unavailable) name, the species denoted by *Ampullaria conica* Wood, 1828, needs to be substituted with the next available name or given a new name (Article 60, ICZN, 1999: 62). *Ampullaria scutata* Mousson, 1848, has been widely accepted as junior synonym of *Ampullaria conica* Wood, 1828 (see Hanley, 1854: unnumbered caption to *Ampullaria* pl.; Benthem Jutting, 1956: 332, 333; Brandt, 1974: 52, 53; Maassen, 2001: 46, 47; Tan & Woo, 2010: 27; Tan et al., 2012: 127). Hanley (1854: unnumbered caption to *Ampullaria* pl.) was the first author to consider *Ampullaria conica* Wood, 1828, and *Ampullaria scutata* Mousson, 1848, to be conspecific when he wrote: “*A. conica* of Gray (in Wood’s Suppl. Ind. Test.) ... [s]eems *scutata* of Mousson”.

A year before his 1849 book “Die Land- und Süßwasser-Mollusken von Java” appeared, Mousson (1848) published a short summary of the contents of his forthcoming book. This summary by Mousson (1848) included many new names, including “*Ampullaria scutata*”, which was used on p. 268, together with the brief diagnosis “änliche Form wie die vorige, stets viel kleiner, unregelmässiger” [= like the previous form, always a lot smaller, irregular]. This makes the name *Ampullaria scutata* available from Mousson, 1848. The “previous form” referred to by Mousson (1848: 268) is *Ampullaria celebensis* (Quoy & Gaimard, 1834), which is considered a synonym of *Ampullaria ampullacea* Linnaeus, 1758 (see Alderson, 1925: 60). *Ampullaria scutata* Mousson, 1848, was described in detail and figured in Mousson (1849: pl. 8, Fig. 2; reproduced as Fig. 1B).

Pila scutata (Mousson, 1848) is also known by several synonyms (different names applied by different authors), including *Ampullaria borneensis* Philippi, 1852, *Ampullaria conica* Reeve, 1856, *Pachylabra javanica* var. *fruhstorferi* Kobelt, 1913, *Ampullaria javanica* Reeve, 1856, *Ampullaria orientalis* Philippi, 1849, *Ampullaria perakensis* de Morgan, 1885, *Pachylabra stoliczkana* Nevill, 1877, and *Ampullaria wellesleyensis* de Morgan, 1885 (Alderson, 1925: 78–80; Benthem Jutting, 1956: 332–336; Brandt, 1974: 52, 53; Maassen, 2001: 46, 47; Prashad, 1925: 79–81). It should be noted that this is not an exhaustive list of all known synonyms (and wrongly applied names).

DISTRIBUTION OF *PILA SCUTATA* AND ITS EARLIEST RECORD FROM SINGAPORE

Pila scutata is known to be found in Indonesia, Peninsular Malaysia, Myanmar, the Philippines (Benthem Jutting, 1956: 332–336; Pagulayan & Remigio, 1992: 1–32; Maassen, 2001: 46, 47), Cambodia (JICA, 2007), Laos (Giboda et al., 1991: 59), Singapore (Tan et al., 2012: 126, 127), Vietnam (Vermeulen & Maassen, 2003: 20; Jørgensen et al., 2008: 247; Campbell, 2012: 303), and doubtfully from China (Prashad, 1925: 80). Although recorded from Thailand (e.g., Brandt, 1974: 52, 53), its presence there seems doubtful as no examples were identified in a survey by Keawjam (1990: 11). This species is also an alien or invasive species on the Pacific islands of Guam (Smith, 2003: 245, 252), Hawai‘i (Cowie, 1997: 3, 4), and Palau (Cowie, 2002: 169).

In his checklist of molluscs from “Singapore and its vicinity”, Traill (1847: 240) recorded an unidentified species of *Ampullaria* which may be the earliest record of *Pila scutata* from Singapore. However, this cannot be determined with certainty as Traill’s coverage was not strictly confined to Singapore, and the whereabouts of the material he collected is unknown. The next author to have recorded *Pila scutata* from Singapore was Nevill (1885: 5, as “*Ampullaria conica* var. *borneensis*”), who received specimens from C. J. Irving (a British Resident-Councillor). The veracity of this record by Nevill (1885: 5) is supported by specimens of *Ampullaria scutata* collected by S. Archer in 1885 from Singapore, which are now deposited in the Academy of Natural Sciences of Drexel University (ANSP, 2012). One of these specimens was figured by Perera & Walls (1996: 82, unnumbered fig.) as *Pila conica* (Wood, 1828).

DISCUSSION

The valid name for the native apple snail of Singapore is not purely an academic question. The species is known to be a host of trematode parasites (Bonne et al., 1953: 13, 15; Agrawal, 2012: 58). The continued confusion in nomenclature

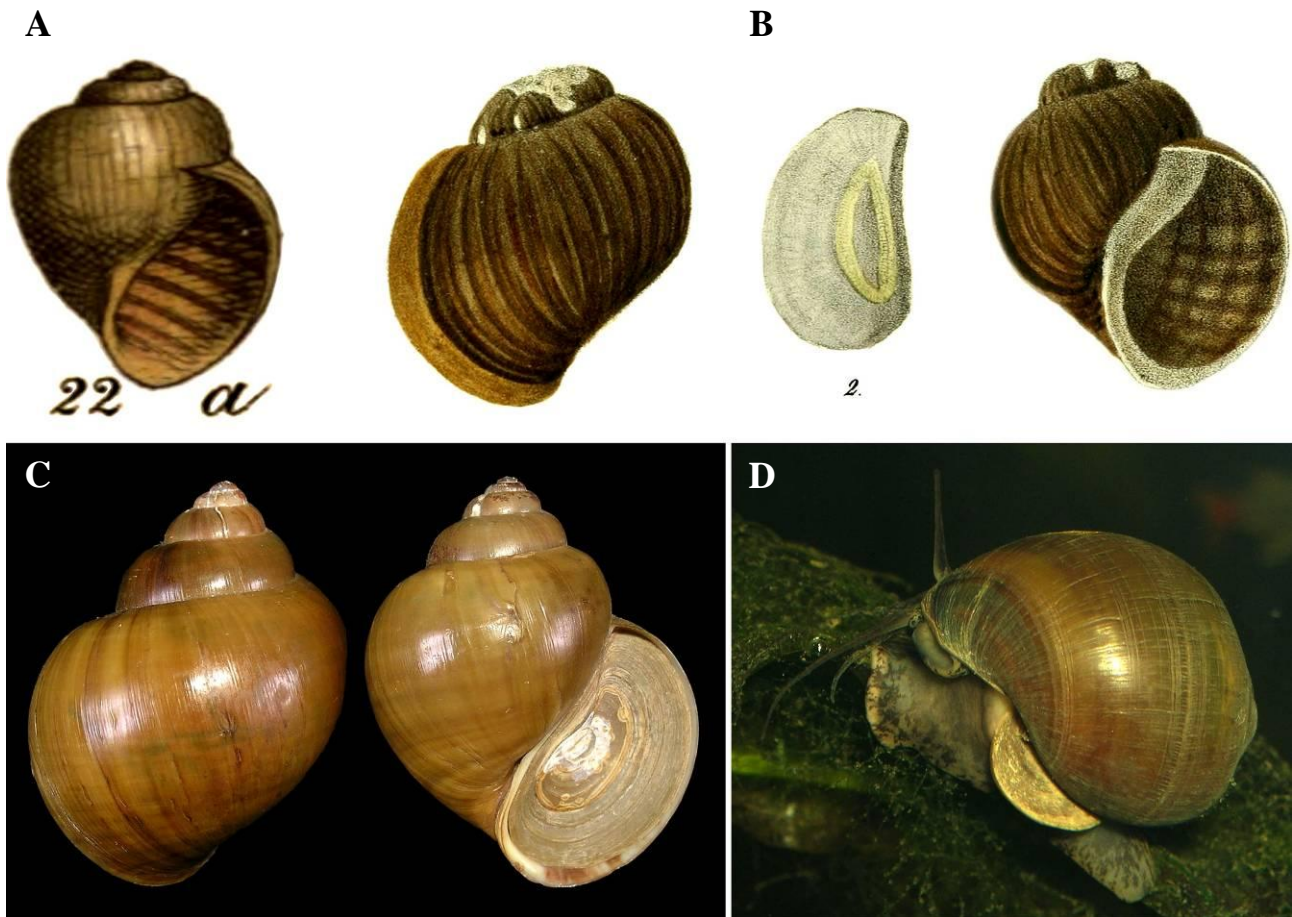


Fig. 1. *Pila scutata* (Mousson, 1848): A, the figure of *Ampullaria conica* taken from Wood, 1828 (pl. 7: Fig. 22); B, the figure of *Ampullaria scutata* taken from Mousson (1849: pl. 8, Fig. 2); C, specimens of *Pila scutata* (Mousson, 1848), from Punggol Port Road, Singapore (SH 40.9 × SW 31.5 mm, SH 41.3 × SW 32.4 mm); D, a live specimen of *Pila scutata* (Mousson, 1848), from Lorong Tawas, Singapore. (Photographs by: Tan Siong Kiat [C, D]).

means that the invalid name [i.e., *Pila conica* (Wood, 1828)] is often used in parasitological publications (Agrawal, 2012: 58). Adding to this confusion, some authors cite both *Pila conica* (Wood, 1828) and *Pila scutata* (Mousson, 1848) as two distinct species (e.g., Chai, 2009: 151, 154, 165). This nomenclatural confusion has consequence for the study of the trematode parasites which *Pila scutata* plays host to.

In the fields of conservation and ecology, the nomenclature of *Pila scutata* is important as it presents an ecological quandary. It appears to be threatened within its native ranges (Guerrero, 2002: 13; Horgan et al., 2012: 4) but is a known invasive species outside of this native range (Cowie, 1997: 3, 4; 2002: 169; Smith, 2003: 245, 252). The application of the correct scientific name for the apple snail known as *Pila scutata* is essential for its conservation inside, and its control outside, of its native range.

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