

SHORT COMMUNICATION

NOTES ON EGG-LAYING BEHAVIOUR OF *AMPHIDROMUS GLOBONEVILLI* SUTCHARIT ET PANHA, 2015 (GASTROPODA: EUPULMONATA: CAMAENIDAE) IN BANGLADESH

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ABSTRACT: The genus *Amphidromus* is a predominantly arboreal group of significant interest to the field of malacology. However, ecological data for this genus remain limited. We document egg-laying behaviour of *A. globonevilli*, in Bangladesh. Our observations indicate that this species deposits many eggs in tree hollows during September and early October, and that the life-cycle can be assumed to be fully arboreal. This behaviour is different from the leaf-bound egg deposits previously reported but aligns with reports for subspecies of *A. inversus*. Further ecological information is required to clarify the ecological and evolutionary meaning of differences in egg-laying behaviour among *Amphidromus*.

KEY WORDS: behavioural ecology; oviposition; reproduction; tree snails

The genus *Amphidromus* Albers, 1850, exhibits high phenotypic diversity, particularly in shell colour and chirality, which has attracted malacologists' attention for many years (e.g., FULTON 1896, LAIDLAW & SOLEM 1961). Over 400 morphological species have been described (MOLLUSCABASE 2021), and the taxonomy has recently been revised based on genetic and anatomical data (SUTCHARIT & PANHA 2006, SUTCHARIT et al. 2015, INKHAVILAY et al. 2017, JIRAPATRASILP et al. 2024). Furthermore, the phenotypic diversity, including chirality dimorphism, offers insights into evolutionary and ecological studies (e.g., SCHILTHUIZEN et al. 2007, LEE et al. 2022). Its habitat dependency on tropical forests has raised conservation concerns (KLORVUTTAMONTARA et al. 2017).

Despite the broader research focus, ecological information on *Amphidromus* remains limited (LAIDLAW & SOLEM 1961). Most species are usu-

ally found on trees (LAIDLAW & SOLEM 1961), and they are considered predominantly arboreal species (e.g., SUTCHARIT & PANHA 2006). However, it is unclear whether their entire life cycle occurs arboreally. Evidence of arboreal egg-laying exists for some species: *Amphidromus atricallosus atricallosus* (A. Gould, 1843) and *A. leucoxanthus* (E. von Martens, 1864) from Thailand (SUTCHARIT & PANHA 2006), and *Amphidromus palaceus purus* (Mousson, 1849) from West Java (PARAVICINI 1921) construct "nests" with leaves for egg-laying on trees. On the other hand, *A. inversus annamiticus* (Crosse et P. Fischer, 1863) from Thailand (SUTCHARIT et al. 2013) and *A. inversus albulus* Sutcharit et Panha, 2006 from Malaysia (SCHILTHUIZEN & LOOIJESTIJN 2009) lay eggs directly in tree hollows.

Here, we report novel observations of egg-laying behaviour in *A. globonevilli* Sutcharit et Panha, 2015



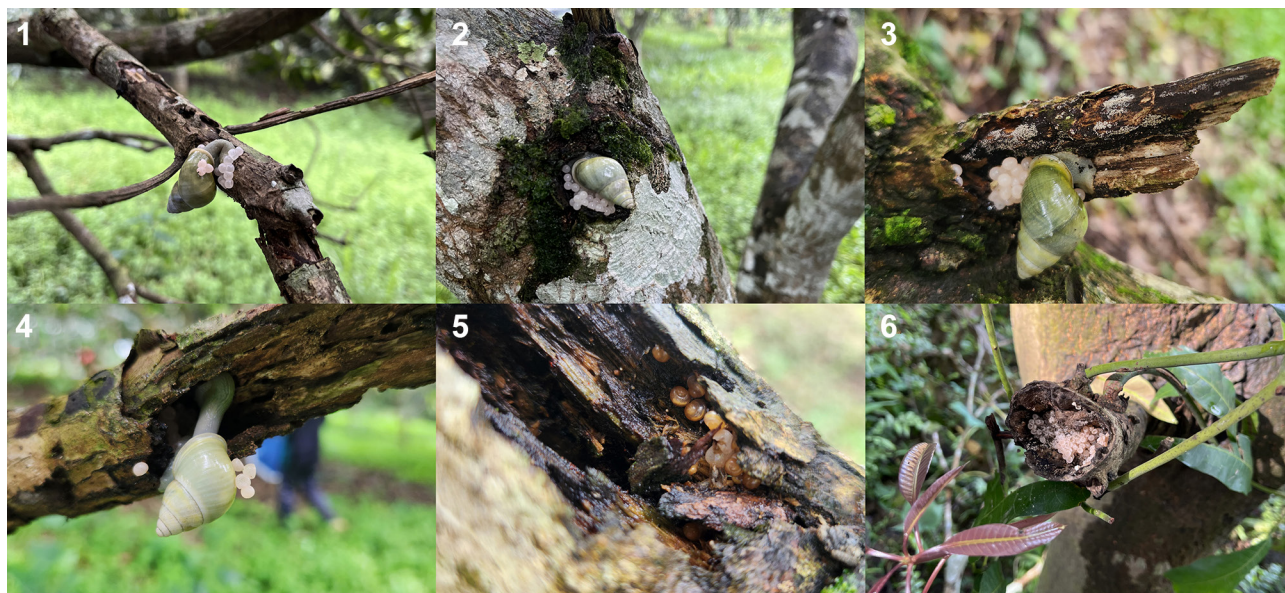
from eastern Bangladesh. This species, originally described from Thailand, is distributed across India, Myanmar, and Bangladesh in addition to Thailand (SUTCHARIT et al. 2015, SAITO et al. 2024). However, ecological information – including egg-laying behaviour – was previously lacking for this species.

The egg-laying behaviour, eggs, and hatched juveniles of *A. globonevilli* were observed during field surveys in Chittagong, Bangladesh (29 September and 1 October 2024), in a mango (*Mangifera indica* L.) garden (22°54'22"N, 92°01'49"E). The morphologically identified *A. globonevilli* deposited pinkish-white egg capsules (more than 10–50 per clutch based on visible egg capsules) in small hollows of mango trees (Figs 1–4). Interestingly, a few egg capsules were attached to the shell (Figs 1 & 4) and some of the clutches were exposed outside from the hollows (Figs 1–3). In a village forest (22°58'50"N, 92°00'59"E), sinistral *Amphidromus* hatched juveniles were found in a hollow of a mango tree (Fig. 5). Juveniles of *Amphidromus* do not have enough diagnostic features in general (LAIDLAW & SOLEM 1961) and are difficult to identify; nevertheless, we assumed that these juveniles are *A. globonevilli*, because *A. globonevilli* is the only *Amphidromus* species recorded in most localities in Bangladesh (SAITO et al. 2024) and we also only observed *A. globonevilli* in

this site. We also found similar eggs on a small hollow in a mango tree (Fig. 6). This site (22°11'17"N, 92°09'37"E) is a mango forest, where numerous *A. globonevilli* individuals were observed. Accordingly, these eggs are assumed to be *A. globonevilli*.

These findings suggest that *A. globonevilli* completes its life cycle arboreally, utilizing tree hollows rather than leaves as “nests”. Although eggs were exclusively observed in mango trees during our surveys, *A. globonevilli* is found on other trees, such as the jackfruit tree (*Artocarpus heterophyllus* Lam.). Accordingly, *A. globonevilli* might use hollows of other tree species, but it has not yet been observed.

Although we conducted field surveys for land snails in other seasons in Bangladesh, we could not find any further examples of egg-laying behaviour of *A. globonevilli*. The egg-laying of *A. globonevilli* we observed occurred in late September to early October, and this seasonality aligns with reports for other *Amphidromus* species (PARAVICINI 1921, SUTCHARIT & PANHA 2006, SUTCHARIT et al. 2013). However, regional climatic differences complicate interpretations: September–October marks the end of the rainy season in Chantaburi, Thailand, and Chittagong, Bangladesh, but the start of the rainy season in West Java (JAPAN METEOROLOGICAL AGENCY 2025).



Figs 1–6. Egg-laying behaviour, juveniles and eggs of *Amphidromus globonevilli* Sutcharit et Panha, 2015: 1 – egg-laying individual in a mango garden, 1 October, 2024; 2–4 – another egg-laying individual from the same site; 5 – hatched and undispersed juveniles in a village forest, 1 October, 2024; 6 – egg clutch in a mango forest, 29 September, 2024. All sites in Chittagong, Bangladesh. These photographs were taken at sites without any manipulations. Photos: TAKUMI SAITO (1–2, 6) and MD. RAHIM BADSHA (3–5)



REFERENCES

- FULTON H. 1896. XI. A list of the species of *Amphidromus*, Albers, with critical notes and descriptions of some hitherto undescribed species and varieties. *Annals and Magazine of Natural History* 17(97): 66–94.
<https://doi.org/10.1080/00222939608680326>
- INKHAVILAY K., SUTCHARIT C., PANHA S. 2017. Taxonomic review of the tree snail genus *Amphidromus* Albers, 1850 (Pulmonata: Camaenidae) in Laos, with the description of two new species. *European Journal of Taxonomy* 330: 1–40.
<https://doi.org/10.5852/ejt.2017.330>
- JAPAN METEOROLOGICAL AGENCY 2025. ClimatView – World Climate Monthly Statistics. Available online at <https://www.data.jma.go.jp/cpd/monitor/climatview/frame.php?&e=7> (accessed 16 March 2025).
- JIRAPATRASILP P., HUANG C.-W., SUTCHARIT C., LEE C.-T. 2024. The arboreal snail genus *Amphidromus* Albers, 1850 (Eupulmonata, Camaenidae) of Southeast Asia: 1. Molecular systematics of some Vietnamese species and related species from Cambodia, Indonesia, and Laos. *ZooKeys* 1196: 15–78.
<https://doi.org/10.3897/zookeys.1196.112146>
- KLORVUTTIMONTARA S., TUMPEESUWAN C., TUMPEESUWAN S. 2017. Distribution range and extinction risk of tree snail subgenus *Amphidromus* (Pulmonata: Camaenidae) in Thailand. *Raffles Bulletin of Zoology* 65: 189–197.
- LAIDLAW F. F., SOLEM A. 1961. The land snail genus *Amphidromus*: a synoptic catalogue. *Fieldiana, Zoology* 41: 505–677.
<https://doi.org/10.5962/bhl.title.2832>
- LEE C.-T., HUANG C.-W., HWANG C.-C., SUTCHARIT C., JIRAPATRASILP P. 2022. Arboreal snail genus *Amphidromus* Albers, 1850 of Southeast Asia: Shell polymorphism of *Amphidromus cruentatus* (Morelet, 1875) revealed by phylogenetic and morphometric analyses. *PLoS ONE* 17: e0272966.
<https://doi.org/10.1371/journal.pone.0272966>
- MOLLUSCABASE (eds) 2021. MolluscaBase: *Amphidromus* Albers, 1850. Available online at <http://molluscabase.org/aphia.php?p=taxdetails&id=818112> (accessed 14 March 2025).
- PARAVICINI E. 1921. Die Eiablage zweier Javanischer Landschnecken. *Archiv für Molluskenkunde* 53: 113–116, pl. 2.
- SAITO T., HIRANO T., TANCHANGYA T. S. R., BADSHA R., ISHII Y., SHARIAR S. M. 2024. Molecular and morphological examinations show diversity in the genus *Amphidromus* (Camaenidae: Stylommatophora) in Bangladesh. *Systematics and Biodiversity* 22: 2338076.
<https://doi.org/10.1080/14772000.2024.2338076>
- SCHILTHUIZEN M., CRAZE P. G., CABANBAN A. S., DAVISON A., STONE J., GITTENBERGER E., SCOTT B. J. 2007. Sexual selection maintains whole-body chiral dimorphism in snails. *Journal of Evolutionary Biology* 20: 1941–1949.
<https://doi.org/10.1111/j.1420-9101.2007.01370.x>
- SCHILTHUIZEN M., LOOIJESTIJN S. 2009. The sexology of the chirally dimorphic snail species *Amphidromus inversus* (Gastropoda: Camaenidae). *Malacologia* 51: 379–387.
<https://doi.org/10.4002/040.051.0210>
- SUTCHARIT C., ABLETT J., TONGKARD P., NAGGS F., PANHA S. 2015. Illustrated type catalogue of *Amphidromus* Albers, 1850 in the Natural History Museum, London, and descriptions of two new species. *ZooKeys* 492: 49–105.
<https://doi.org/10.3897/zookeys.492.8641>
- SUTCHARIT C., PANHA S. 2006. Taxonomic review of the tree snail *Amphidromus* Albers, 1850 (Pulmonata: Camaenidae) in Thailand and adjacent areas: subgenus *Amphidromus*. *Journal of Molluscan Studies* 72: 1–30.
<https://doi.org/10.1093/mollus/eyi044>
- SUTCHARIT C., TONGKARD P., PANHA S. 2013. First record on chiral dimorphic population of *Amphidromus inversus annamiticus* (Crosse and Fischer, 1863) from Thailand. *Tropical Natural History* 13: 53–57.

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