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RESEARCH NOTE

Predation of Oligochaeta by the exotic invasive snail *Tanychlamys indica* (Gastropoda, Ariophantidae) and expansion of the invasive species' distribution in Brazil

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The terrestrial snail *Tanychlamys indica* (Godwin-Austen, 1883) (Ariophantidae) is native to South Asia, occurring in northeastern India, Nepal, Bhutan, and Bangladesh (Preece et al. 2022). The genus *Tanychlamys* Benson, 1834 currently comprises 249 species (MolluscaBase 2026), with *T. indica* as its type species. This species has been recorded outside its native range in several regions of the world, including the United States (Revynthi et al. 2022), Japan (Kudo et al. 2022), Saudi Arabia and Qatar (Abobakr et al. 2022), and Brazil (Agudo-Padrón & Luz 2017).

In Brazil, the first records were reported from the states of Paraná and Santa Catarina associated with citrus seedlings, although no voucher material was deposited in scientific collections. Later, Rosa et al. (2022) expanded the known distribution of the species in the country based on photographic observations available on the iNaturalist platform, including records from Amazonas, Acre, Mato Grosso, Goiás, Minas Gerais, and São Paulo. On that platform, 32 observations of the species from the state of Acre currently have "research grade" status, corresponding to the municipalities of Cruzeiro do Sul, Rio Branco, and Xapuri (Appendix 1). On iNaturalist, research-grade status requires a minimum consensus of two-thirds of identifiers agreeing on the taxonomic identification.

The external morphology of *T. indica* is markedly distinct from that of native Brazilian terrestrial snails, allowing reliable identification from photographic records. The species has an elongated body with a greyish-purple reticulated epidermis and a mantle flap that extends posteriorly over or around the shell. The right shell lobe is small, whereas the left lobe is narrowly reflected over the peristome and bears a short, horn-like process at its basal portion. The shell is perforate, depressed, smooth, vitreous, and translucent, amber in color, with a low conoid spire and about 5.5 whorls that are slightly convex dorsally (Raut & Ghose 1984; Revynthi et al. 2022; Tamalas 2020; Mota et al. 2025). The presence of a caudal horn on the posterior portion of the foot is particularly diagnostic and allows the species to be readily distinguished from similar native taxa.

No records of *T. indica* are available in the Brazilian Biodiversity Information System (SiBBr). A search on the speciesLink (Centro de Referência em Informação Ambiental 2026) platform revealed four lots deposited in the mollusk collection of the Oswaldo Cruz Institute (FIOCRUZ), from the

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following Brazilian administrative units: Distrito Federal (FIOCRUZ-CMIOC 13932, 13018), Mato Grosso do Sul (FIOCRUZ-CMIOC 14870), and Paraná (FIOCRUZ-CMIOC 9985). Additional specimens were located in the mollusk collection of the Museu de Ciências Naturais do Rio Grande do Sul (MCN), originating from Minas Gerais (MCN-42105), São Paulo (MCN-41981, 41982), Paraná (MCN-41976, 41980, 42189, 42190, 42311, 42312, 42313, 42314), Santa Catarina (MCN-42179), and Rio Grande do Sul (MCN-42109, 42140, 42176, 42177, 42180, 42191). In the scientific literature, we found only one voucher specimen cited for São Paulo, reported by Mota et al. (2025) (LABFAUNA 40215-1/2023). Therefore, we present the first record of *T. indica* for Western Amazonia (Brazil) based on vouchered collection records (mentioned above) and the first distributional records from vouchered specimens. Although photographic observations exist for Acre, no voucher specimens from Western Amazonia had previously been documented. The present study provides the first vouchered record of *T. indica* for Western Amazonia and for the Brazilian state of Acre. The examined material originates from the municipality of Cruzeiro do Sul (MCN-42316, 42318, 42319, 42320) and from the BR-364 highway connecting Cruzeiro do Sul and Rio Branco (MCN-42317).

According to records available on the iNaturalist platform, the first observations of *T. indica* in Acre occurred in the same year as the first record of the species in Brazil (Appendix 1), suggesting a rapid expansion of the species across the country.

Shell measurements were taken at the greatest diameter in dorsal view. A total of 58 shells were measured, all from Cruzeiro do Sul-AC (MCN-42318), with diameters ranging from 5.9 to 11.1 mm (mean = 7.9 mm; mode = 8.5 mm; standard deviation = 1.0 mm). Specimen orientation in the photographs follows Pholyotha et al. (2020) and Kudo et al. (2022), including frontal (Fig. 1), apical (Fig. 2), and ventral (Fig. 3) views. Additional images document the everted penis (Fig. 4) and the caudal horn and head region (Fig. 5). Images were obtained using a ZEISS Stemi 508 stereomicroscope equipped with an Axiocam 105 color camera. The predation event was photographed with a Xiaomi Redmi Note 10 smartphone using an Apexel 100 mm macro lens (Fig. 6).

Tanychlamys indica is considered a generalist feeder, consuming plant tissues such as tender leaves and moss (Raut & Ghose 1982), as well as fruits and ornamental crops (Revynthi et al. 2022). Additional records include scavenging on dead frogs (Yadav et al. 2021), cannibalism (Tamalas 2020), and predation on other mollusks (Hirano et al. 2023). Despite this broad dietary spectrum, predation on annelids has not previously been documented. The present note, therefore, provides the first record of predation on Oligochaeta by *T. indica*. The specimen was severely damaged by predation and lost, preventing a more precise analysis and identification.

The observation was made opportunistically (Suppl. 1) by A. S. Brito *in situ* at approximately 20:00 h (GMT −5), about two hours after sunset, on 17 February 2025 in the João Alves neighborhood, municipality of Cruzeiro do Sul, Acre, Brazil. Following rainfall, both snails and oligochaetes emerged from their shelters, resulting in intense activity of both groups. Specimens of *Tanychlamys indica* were found aggregated in humid microhabitats near walls and bricks, typically in areas with moss growth. Both adult and juvenile individuals were present. Juveniles were also observed feeding on the cotyledons of a germinating seed of *Aspidosperma* sp. and on floral structures of *Costus* sp., indicating a potential for herbivory on native plant species.

The predation event involved a specimen positioned beneath the body of an earthworm on the concrete floor of an outdoor domestic area. The snail immobilized the prey while feeding, and the movements of the radula were clearly visible during consumption. This observation highlights a potentially relevant ecological impact of *T. indica* as an invasive species, as earthworms play an important role in soil nutrient cycling and soil structure maintenance.

Figures 1-5: Specimens of *Tanychlamys indica*. 1. shell, apertural view; 2. shell, apical view; 3. shell, umbilical view; 4. everted penis (arrow indicates the basis); 5. horntail process and head (arrow indicates the process); 6. predation event, live specimens; scale bars = 2 mm.

Brazil currently harbors approximately 748 species of terrestrial mollusks, of which 33 are non-native (Salvador et al. 2024), including *T. indica*. Most introductions are thought to be associated with global trade (Kudo et al. 2022, Mota et al. 2025). The record of a specimen beside the BR-364 highway, which connects Cruzeiro do Sul to Rio Branco, suggests that road transport networks may represent an important dispersal pathway for this species, particularly because no phytosanitary inspection station exists between these municipalities. Similar dispersal routes have been suggested by previous authors (Kudo et al. 2022; Mota et al. 2025). In addition, the municipality of Cruzeiro do Sul has both

air and river transport connections, which may also facilitate accidental dispersal of mollusks through the transport of goods such as food products and plant seedlings.

Although some papers report the occurrence of *T. indica* in certain areas of Brazil, they do not indicate voucher specimens. We emphasize the importance of such materials as permanent records and as a basis for future studies, e.g., on the species' biology and genetics.

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APPENDIX

Appendix 1: Records of *Tanychlamys indica* (Godwin-Austen, 1883) from Acre, extracted from the iNaturalist platform on January 21, 2026.

	iNaturalist Code	Locality	Observation Date
1	https://www.inaturalist.org/observations/34414085	Rio Branco	23/03/2017
2	https://www.inaturalist.org/observations/21604012	Rio Branco	29/09/2018
3	https://www.inaturalist.org/observations/31842193	Rio Branco	31/09/2019
4	https://www.inaturalist.org/observations/100635142	Rio Branco	31/10/2021
5	https://www.inaturalist.org/observations/105980076	Rio Branco	28/01/2022
6	https://www.inaturalist.org/observations/106694227	Rio Branco	13/02/2022
7	https://www.inaturalist.org/observations/109165127	Rio Branco	19/03/2022
8	https://www.inaturalist.org/observations/154617163	Rio Branco	11/03/2023
9	https://www.inaturalist.org/observations/154743753	Rio Branco	18/03/2023
10	https://www.inaturalist.org/observations/195875212	Rio Branco	27/11/2023
11	https://www.inaturalist.org/observations/195875243	Rio Branco	27/11/2023
12	https://www.inaturalist.org/observations/195875247	Rio Branco	27/11/2023
13	https://www.inaturalist.org/observations/195875250	Rio Branco	27/11/2023
14	https://www.inaturalist.org/observations/195870976	Rio Branco	30/11/2023
15	https://www.inaturalist.org/observations/197057491	Rio Branco	19/01/2024
16	https://www.inaturalist.org/observations/249417879	Rio Branco	24/10/2024
17	https://www.inaturalist.org/observations/249418928	Rio Branco	24/10/2024
18	https://www.inaturalist.org/observations/319857571	Rio Branco	04/11/2024
19	https://www.inaturalist.org/observations/253417492	Rio Branco	28/11/2024
20	https://www.inaturalist.org/observations/254755646	Rio Branco	07/12/2024
21	https://www.inaturalist.org/observations/260052057	Rio Branco	30/01/2025
22	https://www.inaturalist.org/observations/278781890	Rio Branco	05/05/2025
23	https://www.inaturalist.org/observations/285252605	Xapuri	29/05/2025
24	https://www.inaturalist.org/observations/321330206	Rio Branco	16/10/2025
25	https://www.inaturalist.org/observations/321445211	Rio Branco	17/10/2025
26	https://www.inaturalist.org/observations/334119770	Cruzeiro do Sul	21/10/2025
27	https://www.inaturalist.org/observations/324659545	Rio Branco	27/10/2025
28	https://www.inaturalist.org/observations/323755259	Rio Branco	28/10/2025
29	https://www.inaturalist.org/observations/326890551	Rio Branco	16/11/2025
30	https://www.inaturalist.org/observations/328042272	Rio Branco	24/11/2025
31	https://www.inaturalist.org/observations/329632392	Rio Branco	05/12/2025
32	https://www.inaturalist.org/observations/330459402	Rio Branco	12/12/2025