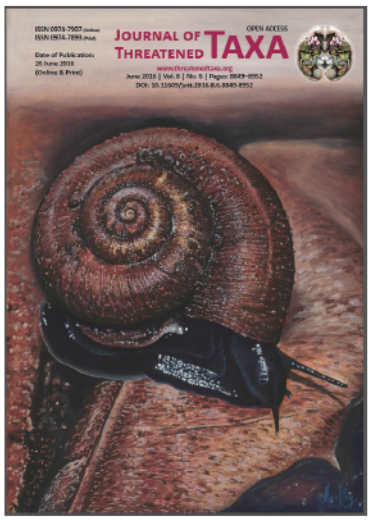

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NOTE

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On the occurrence of *Theobaldius*(?) *tristis* (Blanford, 1869) (Caenogastropoda: Cyclophoridae) in the northern Western Ghats, Maharashtra, India

Amrut R. Bhosale [1], Tejas S. Patil [2], Rupesh B. Yadav [3] & Dipak V. Muley [4]

[1–4] Department of Zoology, Shivaji University, Kolhapur, Maharashtra 416004, India
[1] amrutb18@gmail.com, [2] tsp1989aqua@gmail.com, [3] rupeshyadav7@gmail.com, [4] drdvmuley@gmail.com (corresponding author)

The Western Ghats of India has an evolutionarily diverse land-snail fauna that is dominated by species endemic to this region. A total of 277 species and 29 varieties (belonging to 64 genera in 23 families) have been recorded with 72% of the species being endemic to this region (Raheem et al. 2014). Available evidence indicates that many of these endemic snails are confined to geographically restricted parts of the Western Ghats (Aravind et al. 2005, 2008), with a substantial component of the fauna restricted to the Ghats south of Maharashtra State, i.e., central and southern Western Ghats (sensu Raheem et al. 2014). One such restricted–range species is *Theobaldius*(?) *tristis* (Blanford, 1869). Here, we present new distributional records for *T. tristis*, in effect the first published record for nearly a century, and show that the range of this snail is more widespread than previously thought (Image 1).

The land-caenogastropod genus *Theobaldius* has a distribution centred in the Western Ghats and Sri Lanka, with *T. tristis* and six other species being endemic to the Western Ghats (Gude 1921; Raheem et al. 2014). The adult shell of *T. tristis* is distinguished from other South Asian species in the genus by the notch on the lip of the shell (the notch is located on the dorsal edge of the lip, near the suture, Image 2) and a distinctive operculum, which is figured here for the first time (Image 3). In its fresh, unworn state, the operculum is characterised by raised, finely spinose edges to the whorls. There has been some doubt as to the generic placement of this snail. It was originally placed in *Pterocyclos*, then moved to *Cyclophorus* and subsequently placed in *Theobaldius* (Gude 1921). It's placement in *Theobaldius* is uncertain because although the operculum shares some similarities with other *Theobaldius* species (Raheem et al. 2014), the notched shell superficially resembles *Pterocyclos*. *Pterocyclos* however has a raised operculum that is partly calcified (Gude 1921).

Until recently *T. tristis* had only been known from two localities in the central and southern Western Ghats: the type locality, "South Kanara" and "Tinnevelly" (see Table 1 for further details, Image 1) note that, both these places refer not to point localities, but to geographically extensive political areas of the late colonial period, most likely "South Kanara" District (4021 square miles, Meyer et al. 1908–1931, vol. 14, p. 353) and "Tinnevelly" District (5389 square miles, Meyer et al. 1908–1931, vol. 23, p. 361). The new records of *T. tristis* are from

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Table 1. Historical localities of *T. tristis* and the corresponding modern states and districts. The latitudinal and longitudinal data are from Meyer et al. (1908–1931).

Historical locality	Latitude (N)	Longitude (E)	Modern districts and states
South Kanara	12°07'–13°59'	74°34'–75°45'	Udupi (Karnataka) Dakshina Kannada (Karnataka) Kasaragod (Kerala)
Tinnevelly	8°09'–9°43'	77°12'–78°23'	Tirunelveli (Tamil Nadu) Virudhunagar (Tamil Nadu) Thoothukudi (Tamil Nadu)

two forested localities in Kolhapur District, southern Maharashtra and thus extend the distribution of *T. tristis* well into the northern Western Ghats. The new records are respectively from: New Karanje, near Radhanagari (16°22'14.5"N & 73°56'51.9"E, elevation 750m) and Wadi Kalakvan, near Amba (16°54'47.3"N & 73°47'31.8"E, elevation 822m). At both the localities, *T. tristis* was found in moist leaf litter on the forest floor. Representative samples were collected, imaged (Image 4) and identification confirmed using the original description by Blanford (1867), Description by Gude (1921) and images of the type material of *T. tristis*

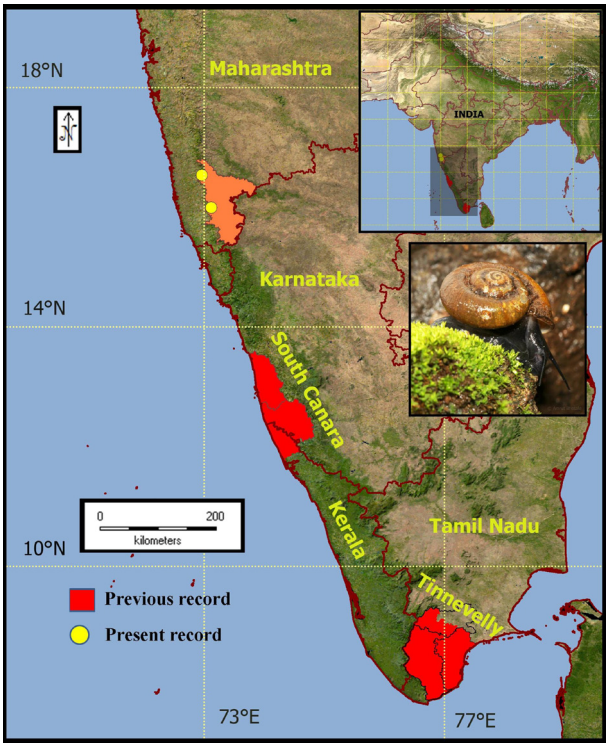

Image 1. Distribution records of *Theobaldius(?) tristis*

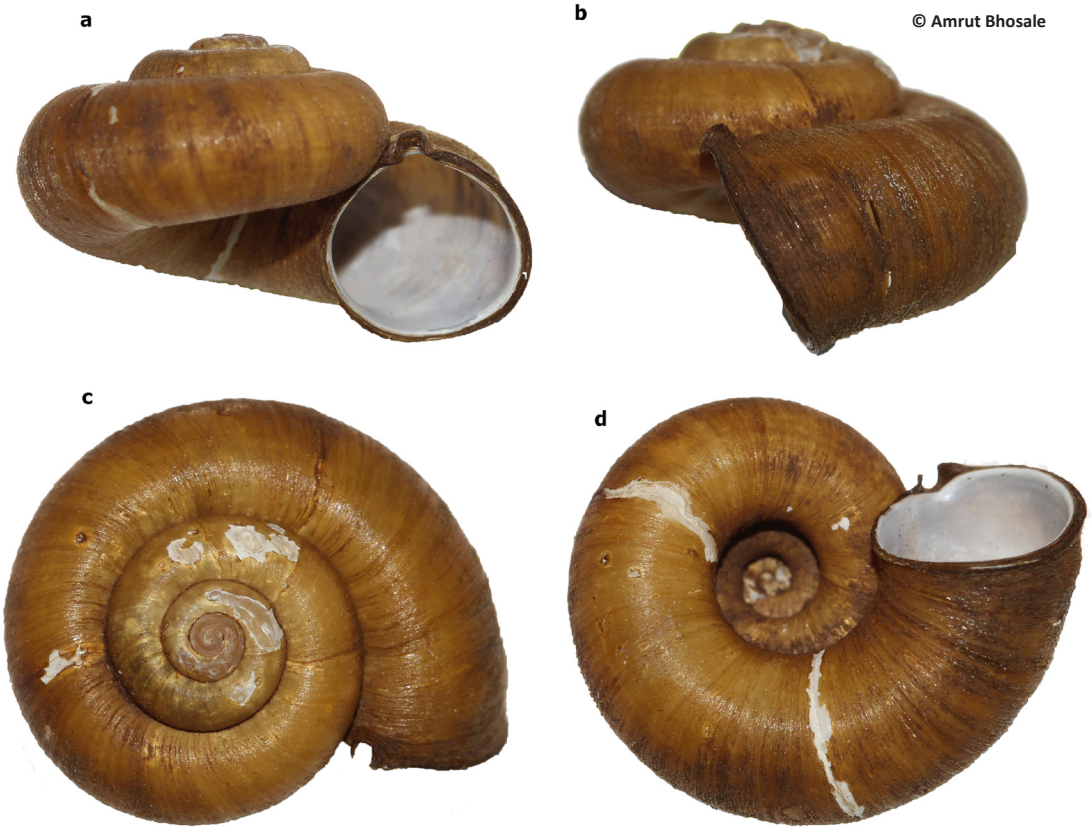

Image 2. Apertural (a), lateral (b), dorsal (c), and ventral (d) views of an adult shell of *Theobaldius(?) tristis* from Wadi Kalakvan. Both the apex and the notched region of the lip are slightly damaged. Scale = 5mm.

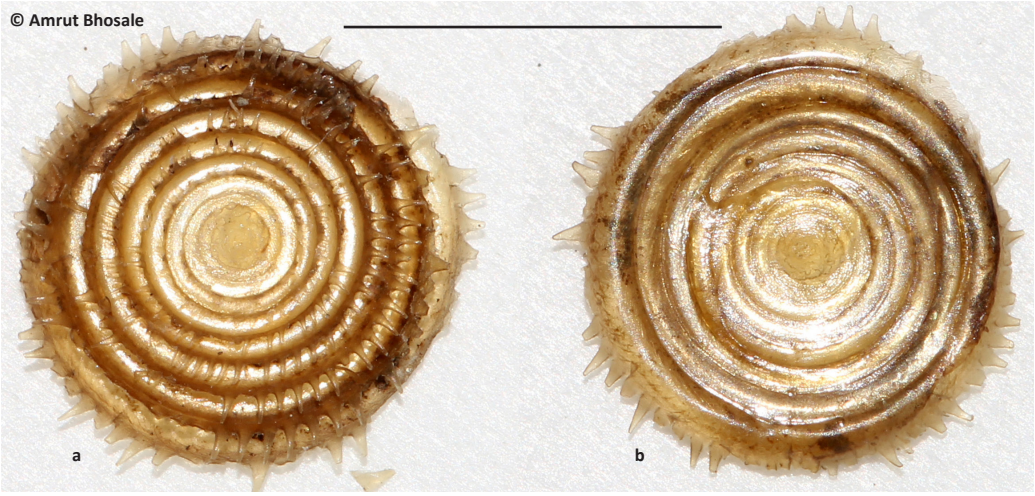

Image 3. Outer (a) and inner (b) surfaces of an operculum of *T. tristis* from Wadi Kalakvan. Note that the raised, finely spinose edges to the whorls of the operculum have been worn down/abraded in some places. Scale = 5 mm.

Image 4. *Theobaldius*(?) *tristis* - in life

(Raheem et al. 2014) and shells were deposited in the National Zoological collection of Zoological Survey of India, WRC, Pune (Reg. No. Moll.1631, 06.x.2015). The average annual rainfall varies from 480–6000 mm across Kolhapur District and New Karanje and Wadi Kalakvan are located on the wet, northwestern edge of the district. The characteristic natural forest type of this area is rainforest.

Our discovery of *T. tristis* from the northern Western Ghats parallels those for other taxa. For example, both the toad *Duttaphrynus scaber* (Padhye et al. 2013) and the wasp *Megacampsomeris cochinensis* (Jadhav & Gaikwad 2014) have only been very recently reported from the northern Western Ghats. These findings underline the need for extensive surveys of the lesser known fauna of the northern Western Ghats. Given the highly threatened status of the biota of the Western Ghats (Cincotta et al. 2000; Bawa et al. 2007; Sloan et al. 2014) this is an urgent priority.

References

Aravind, N.A., R.K. Patil & N.A. Madhyastha (2008). Micromolluscs of the Western Ghats, India: diversity, distribution and threats. *Zoosymposia* 1: 281–294.

Aravind, N.A., K.P. Rajashekhar & N.A. Madhyastha (2005). Species diversity, endemism and distribution of land snails of the Western Ghats, India. *Records of the Western Australian Museum* Supplement 68: 31–38.

Bawa, K.S., A. Das, J. Krishnaswamy, K.U. Karanth, N.S. Kumar & M. Rao (2007). Ecosystem Profile (Western Ghats & Sri Lanka Biodiversity Hotspot) - Western Ghats Region. A report prepared by the Critical Ecosystems Partnership Fund, final version, May 2007. Available at:
http://www.cepf.net/where_we_work/regions/asia_pacific/western_ghats/Pages/default.aspx [accessed 21 February 2014].

Blanford, W.T. (1869). Contributions to Indian Malacology, No.

X. Descriptions of new species of Cyclophoridae, of Ennea and Streptaxis from the hills of Southern and South-western India. *Journal of the Asiatic Society of Bengal* 38(2): 125–143.

Cincotta, R.P., J. Wisnewski & R. Engelman (2000). Human population in the biodiversity hotspots. *Nature* 404: 990–992.

Gude, G.K. (1921). The Fauna of British India including Ceylon and Burma. Land Operculates (Cyclophoridae, Truncatellidae, Assimineidae, Helicinidae). Taylor and Francis, London.

Jadhav, M. & S.M. Gaikwad (2014). *Megacampsomeris cochinensis* (Betrem, 1928) (Insecta: Hymenoptera: Scoliidae): First record from North Western Ghats of Maharashtra, India. *Journal of Entomology and Zoology Studies* 2(6): 261–263.

Meyer, W.S., R. Burn, J.S. Cotton & H.H. Risley (1908–1931). The Imperial Gazetteer of India. New edition, published under the authority of His Majesty's Secretary of State for India in Council. 26 volumes. Clarendon Press, Oxford. Available for reference online through the Digital South Asia Library: http://dsal.uchicago.edu [accessed 21 February 2014].

Padhye, A., R. Pandit, R. Patil, S. Gaikwad, N. Dahanukar & Y. Shouche (2013). Range extension of Ferguson's Toad *Duttaphrynus scaber* (Schneider) (Amphibia: Anura: Bufonidae) up to the northern most limit of Western Ghats, with its advertisement call analysis. *Journal of Threatened Taxa* 5(11): 4579–4585; http://dx.doi.org/10.11609/JoTT.o3345.4579–85

Raheem, D.C., H. Taylor, J. Ablett, R.C. Preece, N.A. Aravind & F. Naggs (2014). A systematic revision of the land snails of the Western Ghats of India. *Tropical Natural History* Supplement 4(1–13): 1–285.

Sloan, S., C.N. Jenkins, L.N Joppa, D.L.A. Gaveau & W.F. Laurance (2014). Remaining natural vegetation in the global biodiversity hotspots. *Biological Conservation* 177: 12–24; http://dx.doi.org/10.1016/j.biocon.2014.05.027

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