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A taxonomic note on *Truncatella guerinii* A. Villa & J. B. Villa, 1841 in India (Mollusca: Littorinimorpha: Truncatellidae)

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Members of the family Truncatellidae Gray, 1840 are widely distributed globally, but their presence in India is unclear. So far, only one species *Truncatella guerinii* A. Villa & J. B. Villa, 1841 has been reported from the Andaman and Nicobar Islands, but most malacologists were unsure of its occurrence due to the lack of appropriate descriptions and proper identification. In this paper, we confirm its presence in the Andaman Islands and also in Pondicherry in Indian waters. In addition, its natural history, distribution and the detailed taxonomy of the species is discussed.

[**Keywords:** Caenogastropoda, Distribution, India, Taxonomy, Truncatelloidea]

Introduction

Truncatella Risso, 1826 is the type genus of the family Truncatellidae Gray, 1840^(ref. 1), and its congeners inhabit supratidal regions in coastal vegetation². Members of this genus are widely distributed across the tropical and semitropical coastal regions of the world, including Europe and North Africa, Central America, West Indies, Japan, India, Sri Lanka, Malaysia, Philippines, Arabia, Morocco, New Caledonia, Australia, and Polynesia²⁻⁹. In the Indian subcontinent, only two species, namely *Truncatella marginata* Küster, 1855 (synonym of *Truncatella ceylanica* Pfeiffer, 1857) and *Truncatella guerinii* Villa & Villa, 1841 have been reported from Sri Lanka and India, respectively^{5,10}. However, Nevill³ catalogued varieties namely *Truncatella guerinii* var. *minor*, *Truncatella valida* var. *minor*, and *T. valida* var. *parvicostata* from Andaman Islands published in the *Hand List of Mollusca in the Indian Museum*, without any detailed description and even illustration of the species and therefore, further it was considered as *nomina nuda*⁸. Additionally, Gude⁴ indicated that the genus *Truncatella* was restricted to the Sri Lanka in the Indian subcontinent and listed only one species *Truncatella ceylanica* Pfeiffer, 1857 from Sri Lanka. In the present study, we have reported new locality for *Truncatella guerinii* in India and confirmed the presence of this species along with a detailed taxonomic description and an account of its natural history.

Materials and Methods

The present study is based on the unsorted collections deposited in National Zoological Collections of Zoological Survey of India from Andaman and Nicobar Islands. The material used for this manuscript was collected during the malacological survey by ZSI in 1964 from Andaman and Nicobar Islands. Detailed shell photographs and morphometric measurements were taken using LEICA M205A multi-focus (Z-Stack) stereomicroscope and photomicrographs of shell structure were obtained without coating in low vacuum on a scanning electron microscope (ZEISS EVO 18). The examined material is housed in the National Zoological Collections of Zoological Survey of India (NZSI).

Abbreviations: AH — height of the aperture; ASL — Above Sea Level; AW — width of the aperture width; coll. — collection; Esq. — Esquire; ex. — From; fig. — figure (in cited publications); Fig. — Figure (in this publication); Figs — Figures (in this publication); H — total height of the shell; N — whorl; OH — height of the operculum; OW — width of the operculum, p(p). page(s); pl(s). plate(s); SEM — scanning electron microscope; var. — variety; W — total width of the shell.

Institutional abbreviations: BORNEENSIS — Institute for Tropical Biology and Conservation at Universiti Malaysia Sabah; ICZN — International Commission on Zoological Nomenclature; MCZ —

Museum of Comparative Zoology, Harvard University, Cambridge (Massachusetts, USA); NHMUK — The Natural History Museum (London, UK); NZSI — National Zoological Collection of Zoological Survey of India (Kolkata, India); ZSI — Zoological Survey of India, Kolkata.

Systematics

Superfamily: Truncatelloidea Gray, 1840

Family: Truncatellidae Gray, 1840

Subfamily: Truncatellinae Gray, 1840

Genus: *Truncatella* Risso, 1826

Truncatella guerinii A. Villa & J. B. Villa, 1841

Truncatella Risso, 1826: p. 124; Type species

Truncatella costulata Risso, 1826 accepted as

Truncatella subcylindrica (Linnaeus, 1767) (type by subsequent designation)

***Truncatella guerinii* A. Villa & J. B. Villa, 1841**

(Figs 1, 2B, D, E, F)

Truncatella guerinii A. Villa & J. B. Villa, 1841: p. 59.

(Type locality: "Bourbon [Réunion Island, Indian Ocean]").

Truncatella valida — Pfeiffer, 1846: p. 182. (Type locality: "Philippine Islands").

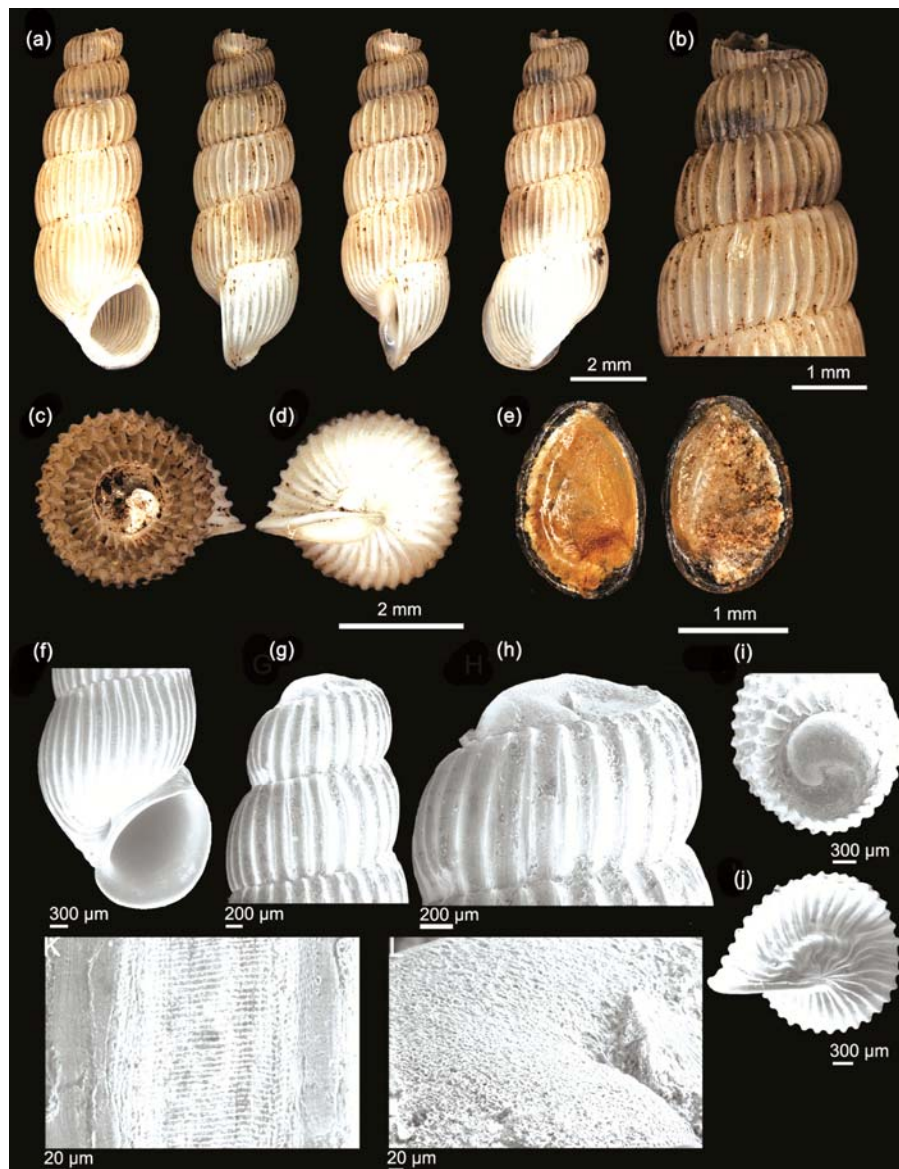


Fig. 1 — Details of shell and operculum of *Truncatella guerinii* A. Villa & J. B. Villa, 1841 from Andaman Island. (A–D, F–L) Shell; (A) Ventral, side and dorsal views of a shell of *Truncatella guerinii*; (B) detail, apical half of shell; (C) apical view; (D) basal view; (E) operculum, external (right) and internal (left) surfaces; (F) detail, body whorl; (G, H) Apical whorl and; (I, J) Apical and basal sculpture, (K) reticulated sculpture between two axial ribs; (L) Zoomed in image of protoconch sculpture of figure 1I (NZSI M.33248/9)

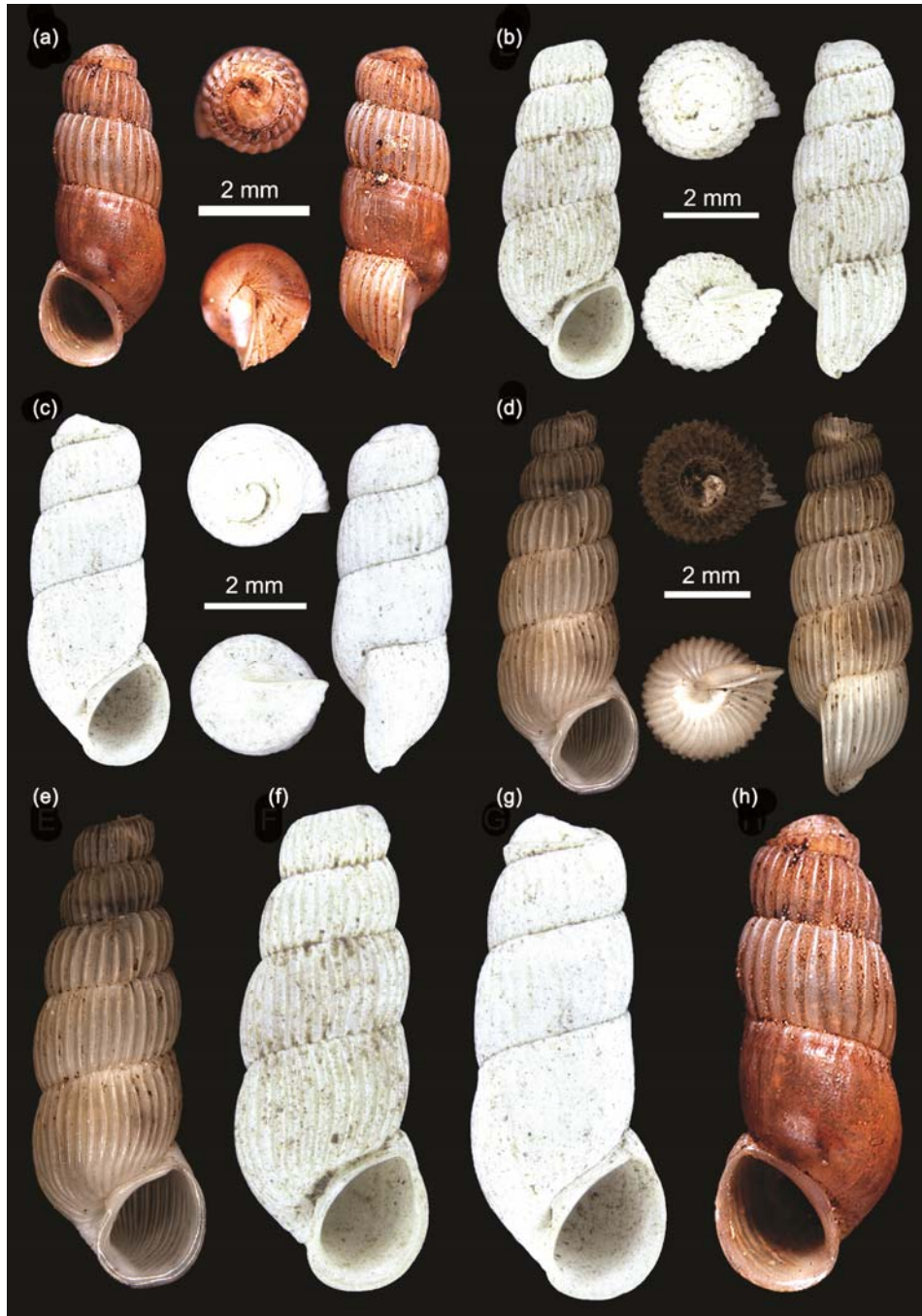


Fig. 2 — Shells of *Truncatella*. A, H. *Truncatella ceylanica*, Ceylon [Sri Lanka] (NHMUK 1906.4.4.8), B, F. *Truncatella guerinii* A. Villa & J. B. Villa, 1841, Borneo, Malaysia (BOR/MOL 12333); C, G. *Truncatella marginata*, Pulau Burong, Malaysia (BORMOL12445); D, E. *Truncatella guerinii* A. Villa & J. B. Villa, 1841, Andaman (NZSI M.33248/9)

Truncatella aurantia — Gould, 1847: p. 208. (Type locality: "Mangsi Id., Borneo [Mangsee Islands, Philippines]").

Truncatella vitiana — Gould, 1847: p. 208. (Type locality: "Fiji Island").

Truncatella pacifica — Pease, 1868: p. 230. (Type locality: "Insula Oualan [= Ovalau, Fiji]").

Truncatella cristata — Crosse, 1868: p. 177. (Type locality: unknown).

Truncatella yorkensis — Cox, 1868: p. 93, pl. 15, fig. 11. (Type locality: "Cape York [Queensland] Australia").

Truncatella ferruginea — Cox, 1868: p. 94. (Type locality: "Cape York [Queensland] Australia").

Truncatella concinna — Pease, 1871: p. 468. (Type locality: "Apaiang [Abaiang, in Northern Gilbert Islands, west-central Pacific Ocean]").

Truncatella semperi — Kobelt, 1884: p. 52. (Type locality: "Pangongon, Philippine islands")

Truncatella fasciata — Tapparone-Canefri, 1886: p. 193, 194, pl. 2, fig. 24. (Type locality: "Wokan Island [Wokam], Aru Island, Indonesia").

Truncatella amamiensis — Kuroda & Habe in

Habe, 1961: p. 21, pl. 10, fig. 7. (Type locality: "Amami Islands, Okinawa, Japan").

Material examined

NZSI M.33248/9, (7 shells), Near Humphrygunj, Lower Andaman, Andaman and Nicobar Island, 11°34.5479' N, 92°38.4325' E, altitude 7 m, coll. B.S. Lamba, 1964, on high tide region of the rocky shore; NZSI M.17986/3 (8 shells), Mauritius, coll. (?); NZSI

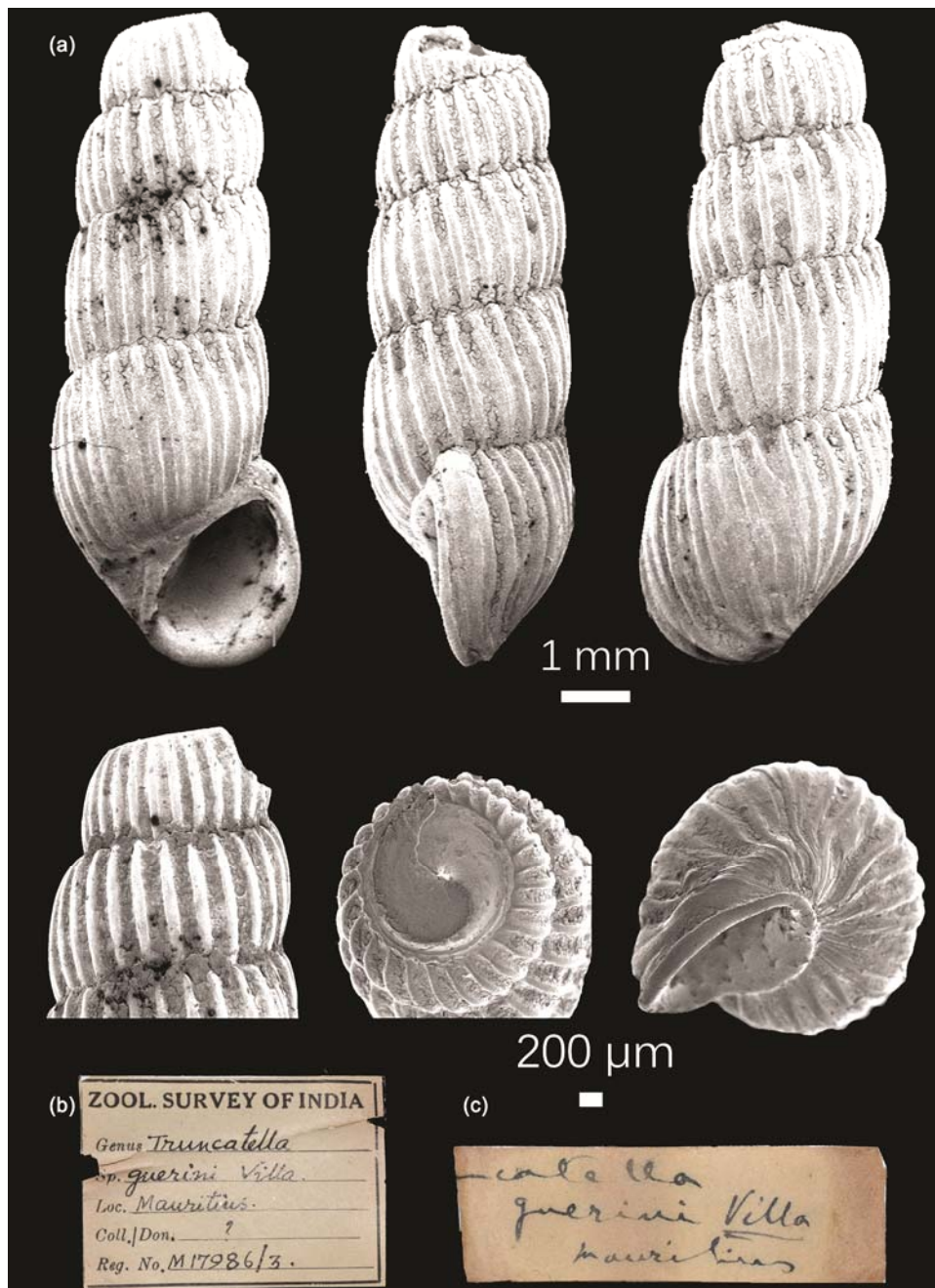


Fig. 3 — Shell of *Truncatella guerini* A. Villa & J. B. Villa, 1841 from "Mauritius" (NZSI M.17986/3). A. *Truncatella guerini*; B, C. Label and original handwritten tag

M.33419/9 (1 shell) (Fig. 3), Seychells, coll. G. Nevill, Esq.; NZSI M.33420/9 (12 Adult shells, 4 juveniles), Mahebourg, coll. G. Nevill, Esq.; NZSI M.33421/9 (6+1 shells), Scheck-Said, near Massaua [Massawa], ex.c. Arturo Issel Esq.; BOR/MOL 12333, (1 shell), Pulau Burong near Labuan in East Malaysia, coll. BORNEENSIS; BOR/MOL 12445, Pulau Burong near Labuan in East Malaysia, coll. BORNEENSIS; NHMUK 1906.4.4.8 (6 shells), Ceylon [Sri Lanka], Ex. Godwin-Austen, William T. Blanford Collection.

Diagnosis

Shell small, ranging between 6 – 10 mm in length and 3 – 3.5 mm in width, regularly costate, rather dull and solid. Whorls 4 – 4½ and convex. Shell colour ranging from brown to dull reddish brown; a few specimens were greyish. Spire truncated and suture somehow impressed. Shell imperforate or only minutely rimate; sculpture consisting of numerous axial costae, with reticulated sculpture between two adjacent axial ribs, there are about 30 – 35 axial costae on the body whorl. Aperture ovate and holostomatous, whereas the inner margin is attached to the parietal wall, outer lip simple and somewhat thickened. Basal ridge well developed; Operculum paucispiral, corneous and generally with a thin calcareous plate on the outer surface and the protoconch sculpture is rough (pore like structure) without any significance pattern on the surface.

Habitat

In general, *T. guerinii* inhabits the coastal areas near offshore vegetation. In Andaman, this species was collected from rocky substratum and dead vegetation at the high tide region on the shoreline at the elevation ranges 4 – 10 m ASL.

Dimensions

H: 7.681–9.042 mm, W: 3.069–3.442 mm, AH: 2.091–2.507 mm, AW: 2.019–2.257 mm, OH: 1.815 mm, OW: 1.218, N: 4–4½.

Distribution

India: Pondicherry⁵; Nicobar Island⁵; near Humphrygunj, Lower Andaman (current locality).

Elsewhere: Australasia, East Indies, Melanesia, Micronesia, Polynesia, the Philippines, Japan and west to Portuguese East Africa⁵⁻⁹

Discussion

Members of the family Truncatellidae Gray, 1840 are cosmopolitan in distribution, mostly found throughout the tropical and subtropical regions of the

planet, both in marine and terrestrial environments (intertidal zone). Due to their broad distribution, adaptation capability and the radiation among the family from marine to terrestrial biomes, they display characters that are convergent to habituation in terrestrial and colonized in such environment^{5,11}. Clench and Turner⁵ revised the family and grouped the members into four genera namely *Truncatella* Risso, *Geomelania* Pfeiffer, *Blandiella* Guppy and *Taheitia* H. and A. Adams, among which *Truncatella* Risso, 1826 is most diverse group and widely distributed.

Truncatella guerinii was described from “Insulas Bourbon” [Réunion Island] of Western Indian Ocean in 1841 and is now known to be widely distributed in tropical and subtropical regions^{2,5-8}. According to Clench and Turner⁵, *Truncatella valida*, *T. aurantia*, *T. vitiana*, *T. pacifica*, *T. cristata*, *T. yorkensis*, *T. ferruginea*, *T. concinna*, *T. semperi*, *T. fasciata*, and *T. amamiensis* are synonyms of the *T. guerinii* and that leads the extension of the geographical range of the species. Nevertheless, *T. guerinii* in India is not well accepted among malacologists due to variable size and axial ribs, which are prominent characters for *T. guerinii*⁴. This species was previously reported from Pondicherry and Nicobar Island, and the materials are housed in the MCZ⁵. In the present study, we have examined the Andaman lots present in the NZSI. However, we could not trace the Nevill’s materials in NZSI except *Truncatella guerinii* var. *minor* Nevill (1878) (Fig. 4). The shell characters is almost similar to *Truncatella guerinii*, but the size and penultimate whorl with less axial costae could be the probably reason to conclude the variety as *minor*. However, the published information by Nevill³ reveal lack of description and any illustration, which lead to the conclusion that *Truncatella guerinii* var. *minor*, *Truncatella valida* var. *minor*, and *T. valida* var. *parvicostata* accepted as *nomina nuda*. Nevertheless, *T. guerinii* when compared with the specimens from Sri Lanka and Malaysia as well as old collections present in ZSI confirmed to be occurring in India. The other species *T. ceylanica* and *T. marginata* are small in size and lacks prominent axial costae on the body whorl as compared with *T. guerinii*, thus Griffiths & Florens¹² synonymised *T. ceylanica*, L. Pfeiffer, 1857 with *T. marginata* Küster, 1855. Moreover, in these species, the protoconch sculpture is rough (pore like structure) without any significant pattern on the surface as compared to *T. guerinii*. Available literature indicate that the destruction of the habitats and modification of the

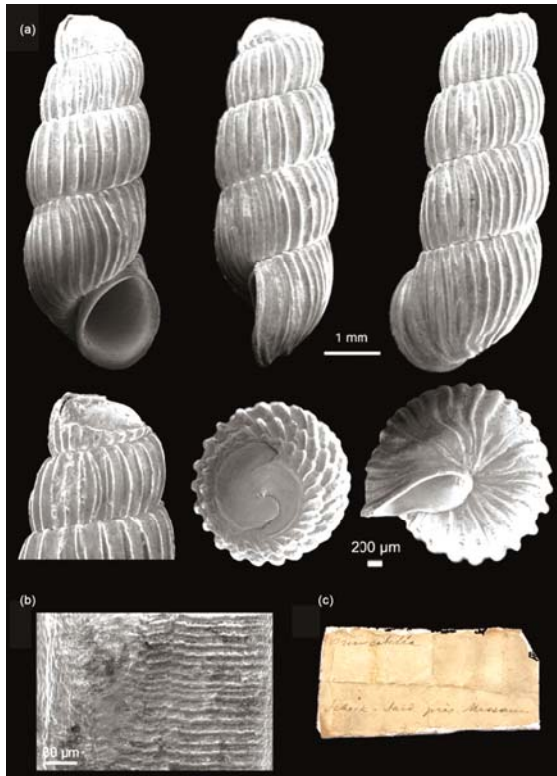


Fig. 4 — Shell of *Truncatella guerinii* var. *minor* Nevill, 1878 from “Scheck-Said, Massaua [Massawa], ex. c. Arturo Issel Esq. (NZSI M.33421/9). A. *Truncatella guerinii* var. *minor*; B. reticulated sculpture between two axial ribs; C. Original handwritten tag

coastal stretches due to urbanisation and alteration in the land-use pattern considered to have had a major impact on the population of *T. guerinii* in Singapore⁸. Observations by the senior author during his visit to Andaman and Nicobar Islands noted the changes in land-use pattern, ocean acidification and development activities near coastal stretches and presumed that it could have also possible impact on the population of the species in the islands and therefore, it is suggested that an in-depth natural history study of *Truncatella guerinii* including phylogeny for the south and southeast Asia region is needed to develop suitable conservation and management strategies for such poorly known fauna from India.

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Conflict of Interest

The authors declare that they have no conflict of interest.

Author Contributions

SKS examined, identified the specimens, compiled the information, and prepared the initial manuscript; whereas, BT supervised and edited the manuscript. Both the authors revised the drafts and approved the final draft of the manuscript.

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