

## *Diplommatina azlani*, a new land snail species from Sarawak (Gastropoda: Cyclophoroidea: Diplommatinidae)

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**Abstract.** A new land snail species of the family Diplommatinidae from Sarawak is described. *Diplommatina azlani*, new species, can be distinguished from its congeners in Borneo by a suite of shell characters. It has a sinistral dark ruby red shell with inconspicuous oblique radial ribs, protoconch that is punctate with small pits, and constriction without parietalis and longitudinal palatalis. To date, it is known only from the type locality, Santubong, a recently gazetted national park in Sarawak, Malaysian Borneo.

**Key words.** gastropoda, land snail, Malaysia, sinistral

### INTRODUCTION

*Diplommatina* Benson, 1849, is a very large genus that is widely distributed from eastern and southern continental Asia, Japan, to the Indo-Australian Archipelago (Kobelt, 1902; Greke, 2017). *Diplommatina* species occur in various forest types, from lowland to montane forest. The highest species diversity are located in limestone habitats (Vermeulen, 1993; Nurinsiyah & Hausdorf, 2017). On the island of Borneo alone, some 53 species of *Diplommatina* have been recorded to date (Vermeulen, 1993, 1996; Vermeulen et al., 2015).

Between April 2017 and February 2018, three separate malacological surveys were conducted as part of a project organised by Universiti Malaysia Sarawak (UNIMAS) to investigate the biodiversity in Santubong National Park, a recently gazetted national park in North-west Sarawak. The surveys yielded a total of 51 individuals representing nine land snail species (Marzuki et al., in press). Twelve individuals of an unidentified *Diplommatina* species that could not be assigned to any known species are among the nine species collected. This *Diplommatina* species is herein described.

### MATERIAL AND METHODS

*Diplommatina azlani*, new species, is described based on conchological characters. Shell terminology follow Vermeulen (1993) and Vermeulen et al. (2015). A Leica

DFC495 digital camera mounted on a Leica M205C microscope was used for examination, photography and measurements of the specimens. Shell height (SH) was measured from the highest part of the top whorl to the lowest part of the peristome parallel to the coiling axis. Shell width (SW) was measured at the widest section perpendicular to the coiling axis. Aperture height (AH) was measured at the widest section of the aperture parallel to the coiling axis. All measurements were taken to the nearest 0.01 mm. Counting of the number of whorls include the protoconch. The shell's inner lamellae and folds were observed by properly breaking the tuba of some specimens. Specimens are deposited in the Zoological Museum (MZU) of UNIMAS, Sarawak, Malaysia; Zoological Reference Collection (ZRC) of the Lee Kong Chian Natural History Museum, Singapore; and the private collection of the author (ME).

### SYSTEMATICS

#### Family Diplommatinidae Benson, 1849

#### Genus *Diplommatina* Benson, 1849

#### *Diplommatina azlani*, new species (Fig. 1A–E)

**Material examined.** Holotype (SH 3.38 mm, SW 1.50 mm) (MZU.MOL.17.91), Malaysia, Sarawak, West side of Santubong National Park, approximately 20 kilometers north of Kuching, Kuching Division, 1°44'31.04"N, 110°19'32.20"E, coll. Mohammad Effendi bin Marzuki, 14 April 2017. Paratypes: 2 ex. (MZU.MOL.17.92), 3 ex. (ME0008720), same data as holotype; 2 ex. (ZRC.MOL.13770), 4 ex. (ME0009801), same locality as holotype, coll. Mohammad Effendi bin Marzuki, 25 February 2018.

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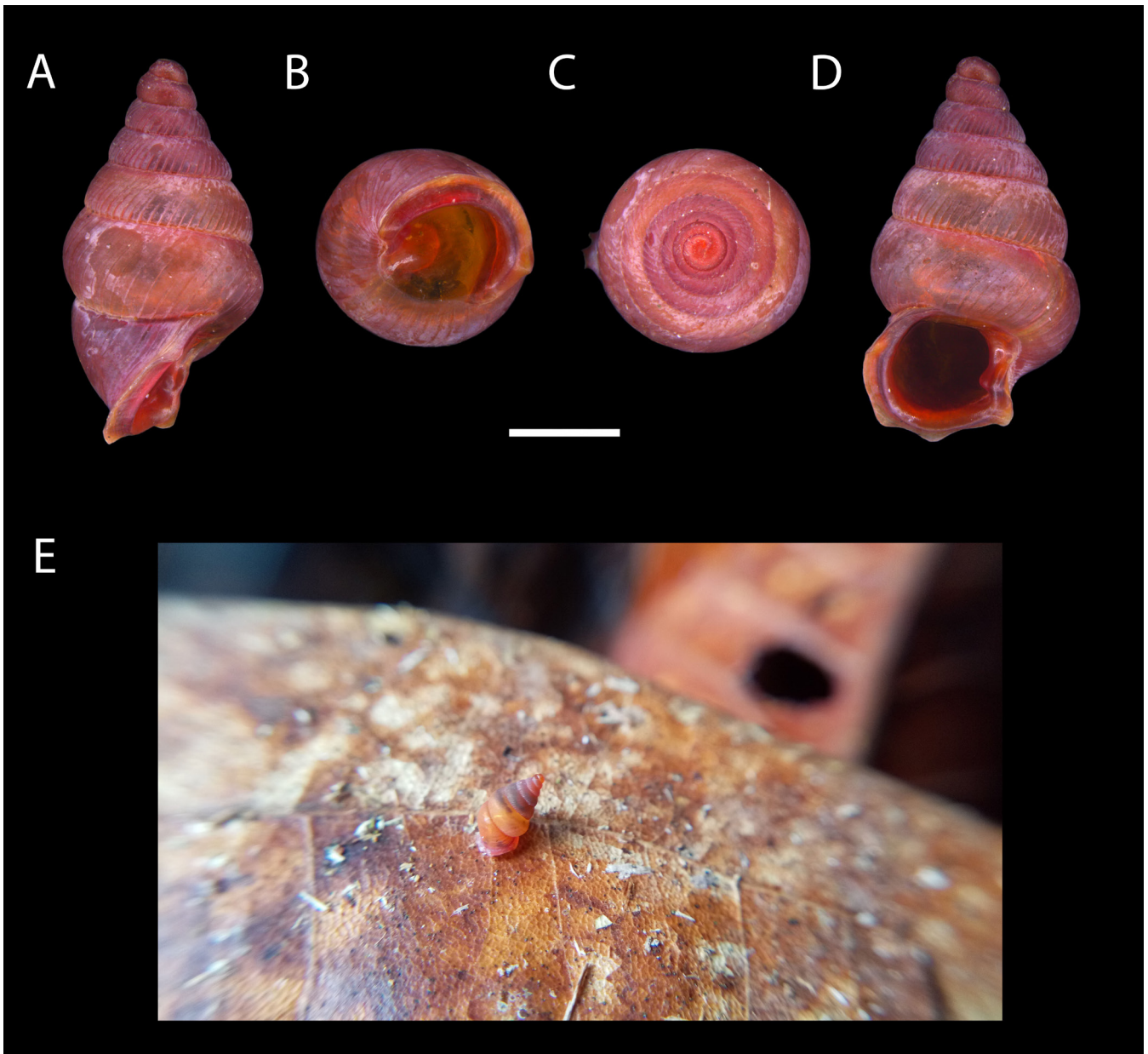


Fig. 1. *Diplommatina azlani*, new species. A–D, holotype (MZU.MOL.17.91) (Scale bar = 1 mm): A, left lateral view; B, ventral view; C, apical view; D, apertural view; E, live animal of paratype (MZU.MOL.17.92) in natural habitat.

**Description.** Shell sinistral, fusiform to moderately conical, dark ruby red, moderately shiny and translucent (SH 3.23–3.68 mm, SW 1.83–1.90 mm; AH 0.87 mm). Six whorls, last whorl widest, top whorls almost flat, others convex, well rounded. Suture impressed. Protoconch with 1½ whorls, punctate with small pits, without radial and spiral lines. Constriction level with angular edge of peristome, with one long transversal palatalis and one columellaris. Tuba approximately ¾ whorl. Radial ribs oblique, inconspicuous, not sinuous, and rather densely placed (6–8 ribs/0.5 mm on the penultimate whorl). Spiral striation present, inconspicuous (visible only under 40x magnification). Aperture tilted about 45° relative to the coiling axis. Columellaris distinct, slightly directed downwards. Peristome double, thickened, expanding; palatal side sinuous, without edge; basal side sinuous with sharp edge. Umbilicus closed. Living animal observed with creamy white head and a pair of black tentacles.

**Cross diagnosis.** The main shell characters differentiating *Diplommatina azlani*, new species, from other sinistral Bornean *Diplommatina* species are the lack of parietalis and longitudinal palatalis in the shell constriction, and its dark ruby red shell colour. In addition, this species differs from *Diplommatina riedeli* Maassen, 2007, *Diplommatina mongondowensis* Maassen, 2007, and *Diplommatina soputensis* Sarasin & Sarasin, 1899, from Sulawesi, and *Diplommatina kakenca* Nurinsiyah & Hausdorf, 2017, from Java by the lack of longitudinal palatalis in shell constriction and by the presence of inconspicuous radial ribs on the body whorl. This new species has more densely placed radial ribs compared to *Diplommatina tardigrada* Benthem-Jutting, 1959, *Diplommatina strophosa* Benthem-Jutting, 1959, and *Diplommatina tweediei* Laidlaw, 1949, from Sumatra, *Diplommatina laidlawi* Sykes, 1903 from Peninsular Malaysia, and *Diplommatina busanensis* Godwin-Austen, 1889 from Sarawak.



Fig. 2. Type locality of *Diplommatina azlani* indicated by red dot, and its relative position in Borneo Island (Google Earth Pro, 2018).

**Etymology.** The specific epithet honours the zoologist Mohd. Azlan Jayasilan of Universiti Malaysia Sarawak (UNIMAS) for his contributions to Bornean wildlife conservation and his interest in ecological studies of the terrestrial snails of Sarawak.

**Geographic distribution and habitat.** *Diplommatina azlani*, new species, is thus far known only from the type locality (Fig. 2). The animals were observed living among leaf litter and plant debris near a rocky stream in lowland mixed dipterocarp forest.

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#### LITERATURE CITED

Benson WH (1849) Characters of *Diplommatina*, a new genus of terrestrial mollusks belonging to the family Carychidae,

- and of a second species contained in it: also of a new species of *Carychium* inhabiting the Western Himalaya. *Annals and Magazine of Natural History*, 2(4): 193–195.
- Bentham-Jutting WSS van (1959) Catalogue of the non-marine mollusca of Sumatra and of its satellite islands. *Beaufortia*, 7(83): 41–191, pls. 1–2.
- Godwin-Austen HH (1889) On a collection of Land-Shells made in Borneo by Mr. A. Everett, with Descriptions of supposed new Species. Part 1. Cyclostomacae. *Proceedings of the Zoological Society of London*: 332–355, pls. 35–39.
- Google Earth Pro, Inc. (2018) V 7.1.7.2606. Borneo, [map]. Retrieved from <http://www.earth.google.com>. (Accessed 25 April 2018).
- Greke K (2017) Taxonomic review of Diplommatinidae (Caenogastropoda: Cyclophoroidea) from Wallacea and the Papuan Region. In: Telnov D et al. (eds.) *Biodiversity, Biogeography and Nature Conservation in Wallacea and New Guinea*, III. Pp. 151–316, pls. 19–47.
- Kobelt W (1902) *Cyclophoridae*. Das Tierreich, 16. R. Friedländer und Sohn, Berlin, i–xxxix, 663 pp.
- Laidlaw FF (1949) The Malayan species of *Diplommatina* (Cyclophoridae). *Bulletin of the Raffles Museum*, 19: 199–215.
- Marzuki ME, Khalik MZ, Liew TS & Mohd-Azlan J (in press.) Land Snails and Slugs. In: Mohd-Azlan J, Tuen AA, Tisen OB & Das I (eds.) *Life from Headwaters to the Coast: Gunung Santubong*. Natural History Publication and in association with Universiti Malaysia Sarawak & Sarawak Forestry Corporation Sdn. Bhd. Pp. 75–77.
- Maassen WJM (2007) Notes on terrestrial molluscs of the island of Sulawesi. The genus *Diplommatina* (Gastropoda, Caenogastropoda, Diplommatinidae). *BASTERIA*, 71: 189–208.
- Nurinsiyah AS & Hausdorf B (2017) Revision of the Diplommatinidae (Gastropoda: Cyclophoridae) from Java. *Zootaxa*, 4312(2): 201–245.
- Sarasin P & Sarasin F (1899) Die Land-Mollusken von Celebes. *Materialien zur Naturgeschichte der Insel Celebes*, 12: 1–248, pls. 1–24.

- Sykes ER (1903) On the Land Operculate Mollusca collected during the "Skeat Expedition" to the Malay Peninsula in 1899-1900. Proceedings of the Zoological Society of London, volume 1: 194-199, pl. 20.
- Vermeulen JJ (1993) Notes on the non-marine mollusks of the island of Borneo 5. The genus *Diplommatina* (Gastropoda Prosobranchia: Diplommatinidae). BASTERIA, 57: 3-69.
- Vermeulen JJ (1996) Notes on the non-marine mollusks of the island of Borneo 8. The genus *Arinia*; Additions to the genera *Diplommatina* and *Opisthostoma* (Gastropoda Prosobranchia: Diplommatinidae). BASTERIA, 60: 87-138.
- Vermeulen JJ, Liew TS & Schilthuizen M (2015) Additions to the knowledge of the land snails of Sabah (Malaysia, Borneo), including 48 new species. ZooKeys, 531: 1-139.