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Additional new species of *Diaphera* Albers, 1850 from China, with notes on two species of *Diaphera* previously assigned to *Sinoennea* Kobelt, 1904 (Gastropoda: Stylommatophora: Diapheridae)

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Abstract. *Diaphera bagua* Z.-Y. Chen, sp. nov. is described and illustrated from Guangxi, China. The new species can be distinguished from *Diaphera lini* Z.-Y. Chen & Páll-Gergely, 2020, also known from Guangxi, by its glossy shell and closed umbilicus. Two known species, *Sinoennea atomaria* (Dautzenberg, 1894) from Vietnam and *Sinoennea ziminae* Yang *et al.*, 2012 from Hubei, China, are reassigned to *Diaphera* based on shell morphology.

Key words. Asia, carnivorous snail, morphology, new taxa, taxonomy

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Introduction

Diapheridae Panha & Naggs, 2010 is a family of carnivorous terrestrial snails (Panha & Naggs 2010; Páll-Gergely *et al.* 2020) distinguished by their pupoid to cylindrical shell and body whorl partially detached from the upper whorls (Brown 2023; Páll-Gergely *et al.* 2020, 2023). Only a single *Diaphera* species has been previously recorded from China, namely *Diaphera lini* Z.-Y. Chen & Páll-Gergely, 2020 from central Guangxi, China (Chen & Páll-Gergely 2020).

Herein, we describe and illustrate an additional species of *Diaphera* from northern Guangxi, China. Furthermore, based on the original descriptions and examination of type specimens, *Sinoennea atomaria* (Dautzenberg, 1894) and *Sinoennea ziminae* Yang *et al.*, 2012 are transferred to *Diaphera*.

Materials and Methods

The shells were photographed using a Canon 5D Mark IV camera with a Laowa 25mm f/2.8 2.5–5× ultra macro lens. The final high depth-of-field images were produced by a WeMacro Rail System and stacked from 20–30 single photos using Zerene Stacker v. 1.04. The type materials of the new species were deposited in the Mollusc collection of the Museum of Hebei University, Baoding (HBUMM), Australian Museum, Sydney (AM), private collection of Zhe-Yu Chen, Wuhan (CZYC), and private collection of Li-Wen Lin, Fuzhou (LLW). Specimens from Muséum national d'Histoire naturelle, Paris (MNHN) and Zhejiang Museum of Natural History, Hangzhou (ZMNH) were also studied.

Systematics

Genus *Diaphera* Albers, 1850

Cylindrella (*Diaphera*) Albers 1850: 210.

Type species. *Cylindrella cumingiana* L. Pfeiffer in R.A. Philippi, 1845, by monotypy.

Diaphera bagua Z.-Y. Chen, sp. nov.

Figures 1, 2A, B

ZooBank identifier. urn:lsid:zoobank.org:act:F86C632F-4843-44E8-AD78-DF60FD9C5084

Type locality. Shangyue Mountain [上月山], Xiangshan District [象山区], Guilin City, Guangxi, China, 25°10′58″ N, 110°15′46″E, leg. Hao-Fei Fan, 20 February 2023.

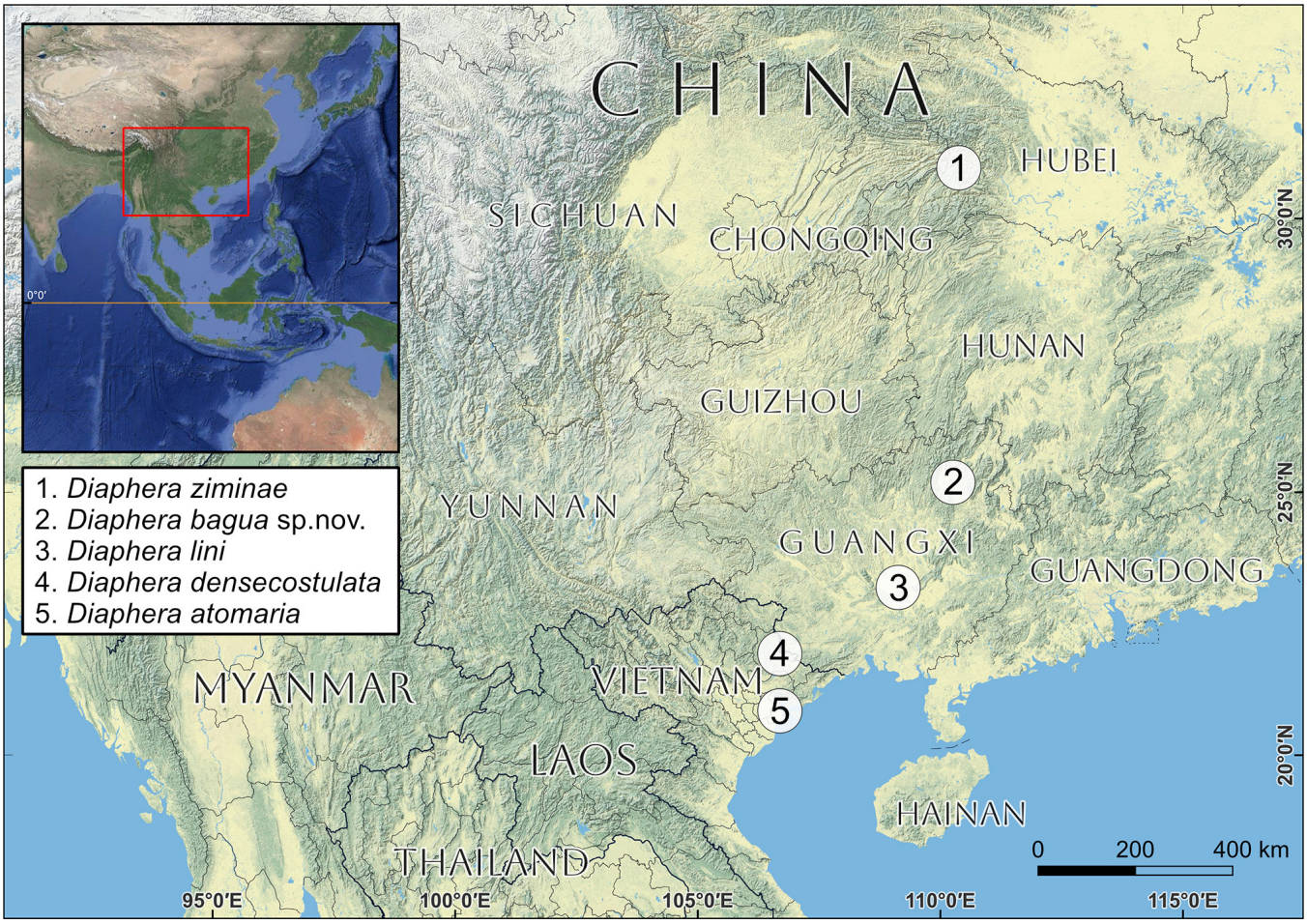

Figure 1. Synoptic view of type localities of *Diaphera* spp from China and northern Vietnam.

Type materials. Holotype: HBUMM10116. Paratypes: AM C.607902 (1 specimen), CZYC 00201–00203 (13 specimens); LLW (5 specimens), same data as holotype. Ex coll. Li-Wen Lin.

Differential diagnosis. The new species is readily distinguished from the *Diaphera* species from China and northern Vietnam by its glossy whorls and closed umbilicus. In addition, *D. bagua* sp. nov. bears a widely open apertural sinulus and an almost vertical apertural axis, in contrast to the narrower sinulus and more oblique aperture of *D. lini*.

Description. Shell small (holotype: height 3.18 mm, width 1.55 mm; paratypes, *n* = 5: height 2.96–3.14 mm, width 1.53–1.70 mm), pupilliform, entire shell consisting of 6¼–6¾ whorls, last whorl partially detached. Protoconch smooth to glossy, hemispherical, with 1½–2¼ whorls. Teleoconch with only dense, irregular growth lines. Suture depressed. Aperture rounded with conspicuous incision on parietal due to a deep suture, corresponding to parietal lamella. Aperture slightly oblique to shell axis, vertical or slightly downward sloping. Peristome slightly thickened and expanded. Parietal lamella strong, elevated, perpendicular to parietal; interior part slowly descending and ending in front of detached whorls (laterally). A very inconspicuous palatal bulge sits on palatal lip; another, more pointed palatal tooth is deeper and lower in position. Two palatal teeth not contacting each other. Columellar lamella strongly oblique, long, and relatively sharp, with outer end close to peristome. Detached whorl accounts for a quarter of last whorl, with vallecular depression corresponding to parietal, palatal, and columellar lamellae. Umbilicus closed.

Etymology. The name *bagua* [八卦] originally refers to a Daoist concept, the Eight Trigrams, which also means "gossip" in contemporary Chinese slang. This name commemorates the happy hours of the daily lunch break among our friends in the Chinese Naturalists Club, London, founded in The Natural History Museum common room by Prof. Dr Guanglin Xie. The name is treated as noun in apposition.

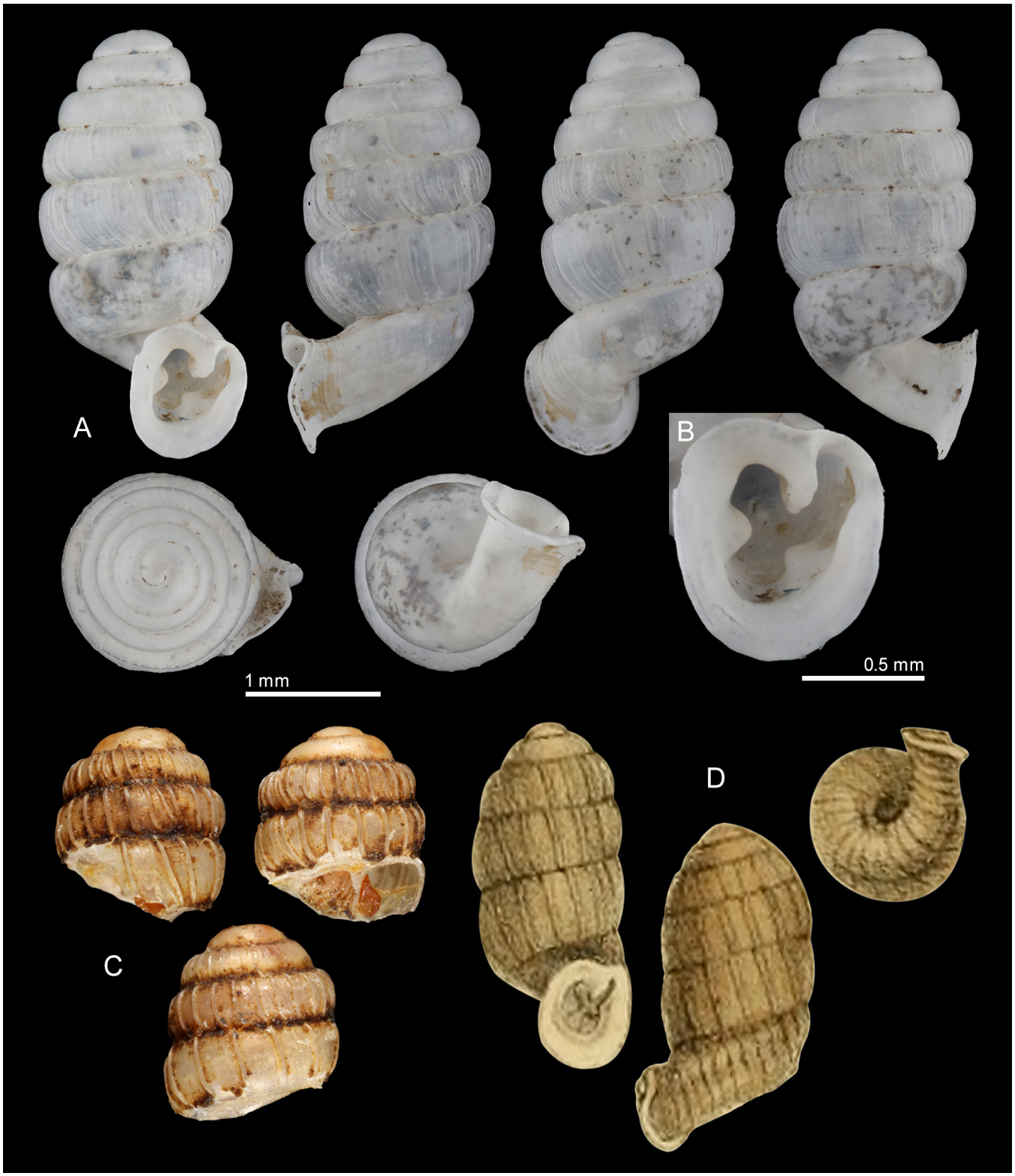

Figure 2. *Diaphera* spp. **A, B,** *Diaphera bagua* sp. nov., holotype, HBUMM10116. **C, D.** *D. atomaria* (Dautzenberg, 1894): (**C**): holotype, MNHN-IM-2000-30895; (**D**) original illustration from Dautzenberg (1894: 159, pl. 7, fig. 2). A and C to the same scale; D is not to scale.

Figure 3. *Diaphera ziminae* Yang *et al.*, 2012, holotype, ZMNH AIMS 1695.

Distribution. South China: Guangxi. This species is known only from the type locality (Fig. 1).

Chinese common name. 八卦扭钻螺

***Diaphera atomaria* (Dautzenberg, 1894) comb. nov.**
Figures 1, 2C, D

Ennea atomaria Dautzenberg 1894: 159, pl. 7, fig. 2.
Ennea atomaria—Fischer & Dautzenberg 1904: 2.
Ennea atomaria—Fischer-Piette 1950: 160.
Sinoennea atomaria—Schileyko 2011: 27.

Type materials. Holotype, MNHN-IM-2000-30895 (Fig. 2C), Haïphong, leg. Dorri.

Remarks. The examined holotype is now broken, with only the upper whorls remaining. However, it can be readily realised from the original description and illustrations that this species has a partially detached body whorl, which indicates it belongs to the genus *Diaphera*. From the remaining part of the holotype specimen and the original description, it is known that the teleoconch of this species has strong, distinct, widely-spaced ribs, which are different from congeners in northern Vietnam and adjacent southern China. The apertural barriers of *D. atomaria* are similar to those of *D. densecostulata* (Möllendorff, 1901) (see Chen & Páll-Gergely 2020, Fig. 1).

Distribution. Northern Vietnam: Hải Phòng (Fig. 1).

***Diaphera ziminae* (H.-F. Yang, Z.-Y. Fan, D.-D. Qiao & J. He, 2012) comb. nov.**
Figures 1, 3

Sinoennea ziminae Yang *et al.* 2012: 32, fig. 3.

Type materials. Holotype, ZMNH AIMS 1695 (Fig. 3), Badong, Hubei Province, China. Paratype in a private collection was not examined.

Remarks. The original description of this species is extremely brief and lacks adequate comparative information. The partially detached body whorl supports the placement of this species within *Diaphera*, and its large size, absence of an internal palatal tooth, and somewhat vertical columellar lamella distinguish it from other Chinese species of this genus.

Distribution. Central China: Hubei. This species is known only from the type locality (Fig. 1).

Chinese common name. 孜皎扭钻螺

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