

***Pseudobuliminus xihuashida*, an additional camaenid new species with detached last whorl from the border of Sichuan and Gansu, China (Gastropoda: Stylommatophora: Camaenidae)**

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Abstract. *Pseudobuliminus xihuashida* Z.-G. Chen & Z.-Y. Chen, **n. sp.**, a new species with a detached last whorl, is described from the border of Sichuan and Gansu, China. It can be distinguished from all congeners by the cylindrical shell with last 0.5 to 1 whorl detached, the smooth, initially keeled and gradually rounded teleoconch, and the protoconch with small tubercles.

Key words. Land snails, taxonomy, dry-hot river valley, new species, biodiversity

Introduction

The camaenid genus *Pseudobuliminus* Gredler, 1886, characterized by its cylindrical-conical shell, is widely distributed in East Asia (Chen & Zhang, 2004; Hirano *et al.*, 2014). It exhibits considerable species diversity, currently comprising 27 accepted species (MolluscaBase eds, 2025). While some studies have raised doubts about the monophyly of the genus (Hirano *et al.*, 2014; Wu *et al.*, 2023, 2024), no comprehensive systematic revision has been undertaken to date. In this study, we describe a new species of *Pseudobuliminus* with a detached last whorl from the border of Sichuan and Gansu, China.

Materials and methods

The shells were measured with a digital Vernier calliper to the nearest 0.1 mm. Whorls were counted as described by Kerney and Cameron (1979). Photos of the shell were taken using a Canon® 5D Mark IV and modified in Adobe Photoshop® CC 2018. A shell was air-dried in a clean environment and then sputter-coated with gold. It was subsequently imaged using a Thermo Scientific® Quattro Environmental Scanning Electron Microscope. Maps were made in ArcGIS® Pro.

Abbreviations. NCUMB: Museum of Biology, Nanchang University (Nanchang, China);

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<http://zoobank.org/urn:lsid:zoobank.org:pub:AF553401-07EA-4990-B12F-5990148C6250>

ZGCC: Collection of Zhong-Guang Chen (Chengdu, China); CZYC: Collection of Zhe-Yu Chen (Wuhan, China); At: atrium; BC: bursa copulatrix; BCD: bursa copulatrix duct; DS: dart sac; Ep: epiphallus; FO: free oviduct; MG: mucous glands; P: penis; PR: penial retractor muscle; Va: vagina; VD: vas deferens.

Systematics

Family **Camaenidae** Pilsbry, 1895

Subfamily **Bradybaeninae** Pilsbry, 1934 (1898)

Genus ***Pseudobuliminus*** Gredler, 1886

Type species. *Helix pseudobuliminus* (Heude, 1882), by absolute tautonomy.

***Pseudobuliminus xihuashida* Z.-G. Chen & Z.-Y. Chen, n. sp.**

西华师大假拟锥螺 (Pinyin: xī huá shī dà jiǎ nǐ zhūi luó)

(Figures 1–4)

Type materials. *Holotype.* NCUMB JN2503010 (matured shell with genitalia fixed in alcohol separately), Guoyuan Township [郭园乡], Jiuzhaigou County [九寨沟县], Aba Tibetan and Qiang Prefecture [阿坝藏族羌族自治州], Sichuan Province [四川省], China, 104.329876°E, 33.125506°N, leg. Zhong-Guang Chen, July 2021. *Paratypes.* NCUMB JN2503011–JN2503018 (8 matured shells with genitalia fixed in alcohol separately), NCUMB JN2503019–JN2503030 (12 matured shells with genitalia fixed in alcohol together), ZGCC JN1–JN100 (100 dried matured shells with genitalia), CZYC 00306 (6 matured shells with genitalia fixed in alcohol together), other information same as holotype.

Diagnosis. A *Pseudobuliminus* species with cylindrical shell; the last 0.5–1.0 whorl detached; teleoconch smooth, initially keeled and gradually rounded; protoconch with small tubercles.

Description. *Shell* (Fig. 1) small, cylindrical with apex blunt; shell most swollen (broadest) at body whorl; dextral; fragile; opaque; sub-glossy to matte; uniform brown; with 8.5–9.5 whorls. Whorls inflated. Protoconch (Fig. 2A–B) with small tubercles, with 1.5–1.75 whorls. Teleoconch smooth, initially keeled and gradually rounded; growth lines distinct. Suture well impressed. The last 0.5–1.0 whorl detached, distance between peristome and penultimate whorl is 0.25–1.0 whorl wide. Aperture in a slightly wavy; rounded; oblique. A mound-like parietal tubercle weakly present. Peristome brown and reflexed; sharp. Umbilicus open, small and deeply cavernous.

Genitalia (Fig. 2C). Penis short and thin, externally simple. Epiphallus thick, longer and thicker than penis. Penial retractor muscle short and thin. Flagellum absent. Vas deferens long and thin. Dart sac apparatus large. Mucous gland with one common peduncle, simply branched. Vagina short and thick, slightly shorter than penis. Free oviduct cylindrical, longer and thicker than vagina. Bursa copulatrix large, oblong. Bursa copulatrix duct long and thin, thickened basally.

Measurements. Holotype: shell height 10.5 mm, shell width 3.7 mm; aperture height 2.8 mm, aperture width 2.9 mm. Paratypes: shell height 9.3–10.8 mm, shell width 3.6–3.8 mm; aperture height 2.7–2.8 mm, aperture width 2.7–3.0 mm ($n = 20$).

Variation in specimens. Among all examined specimens (100+), only a single individual (Fig.

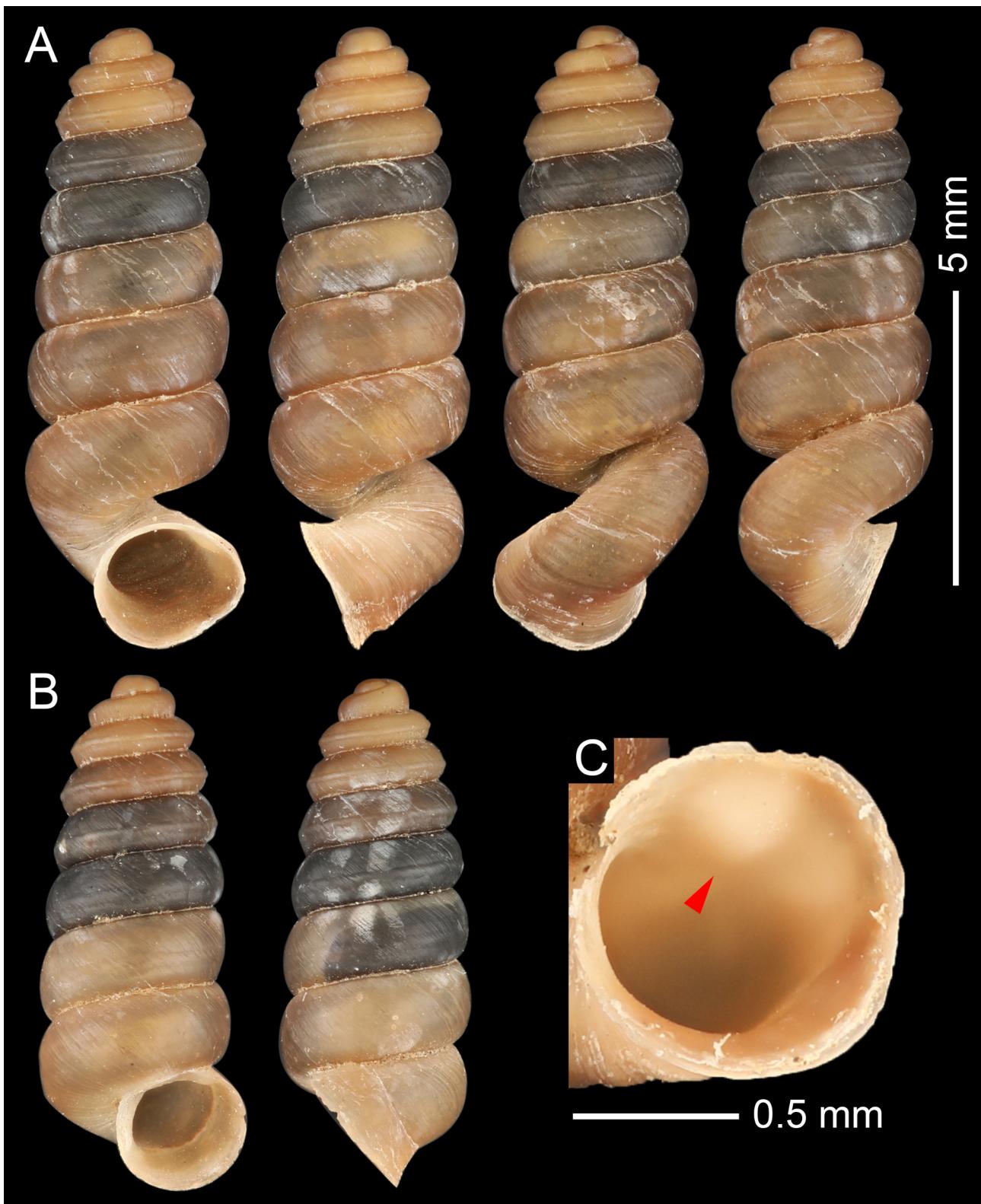


FIGURE 1. Shells of *Pseudobuliminus xihuashida* n. sp. **A.** Normal form. **B.** Aperture-attached form. **C.** Aperture details. Arrow shows the parietal tubercle.

1B, CZYC 00306B) possesses an attached body whorl. Given the distinct demarcation visible behind the aperture, such variation may have resulted from rapid post-diapause growth or from injury.

Etymology. The specific name is made from the Pinyin form for China West Normal University

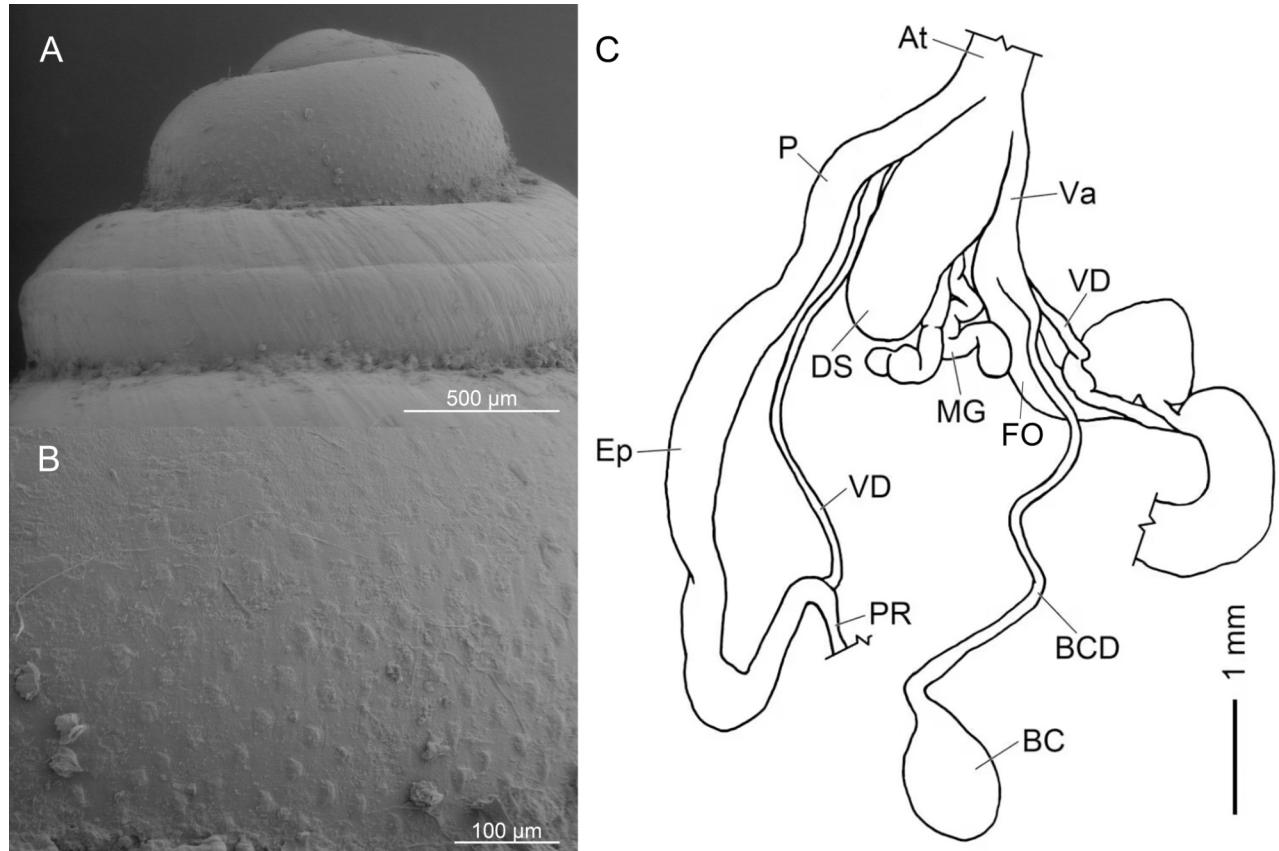


FIGURE 2. Morphological details of *Pseudobuliminus xihuashida* n. sp. A–B. Protoconch. C. Genitalia.



FIGURE 3. Distribution of *Pseudobuliminus xihuashida* n. sp.

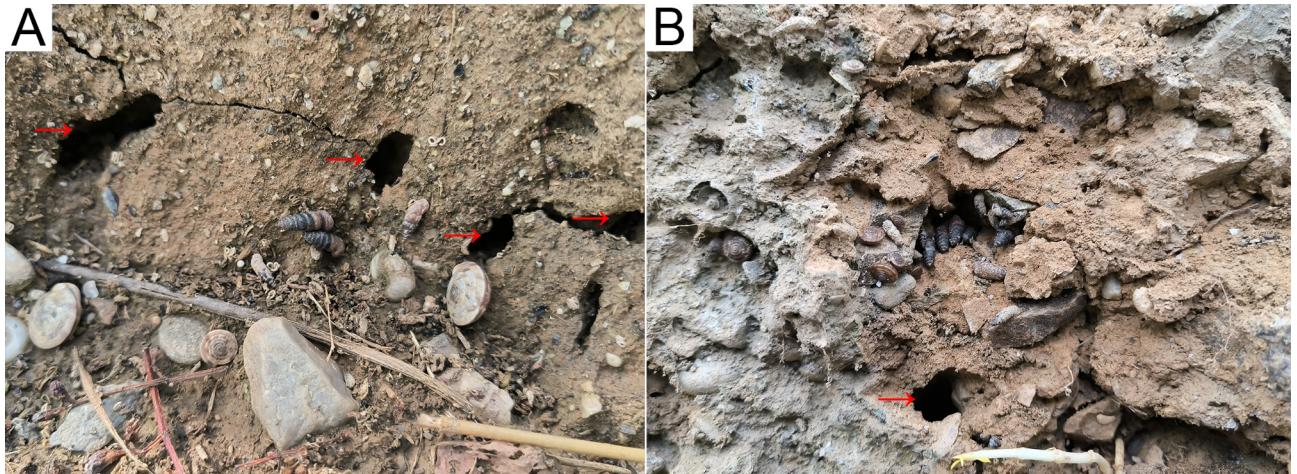


FIGURE 4. Habitats and living individuals of *Pseudobuliminus xihuashida* n. sp., with arrows showing the burrows. **A.** Individuals emerging from the burrows after rainfall. **B.** Individuals aestivating within the burrows.

[西华师范大学], the alma mater of the first author. Next year will be the 80th anniversary of the university's founding and the first author wishes to commemorate this with the species name.

Distribution and ecology. Restricted to an area of roughly ten square kilometres from eastern Jiuzhaigou County (Sichuan) to western Wenxian (Gansu) (Fig. 3). During the dry season, individuals are found hibernating in small burrows, which are presumed to be created by other soil animals rather than by this species. During the rainy season, they occur on muddy ground, along with other enids and camaenids (Fig. 4).

Remarks. The new species can be easily distinguished from all congeners by the detached last whorl. Among the family, only *Stenogyropsis chorismenostoma* Chen, Huang & Pál-Gergely, 2022, has the detached body whorl (Chen *et al.*, 2022). The new species can be easily distinguished from the former by its rather smooth shell (vs. ribbed).

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四川与甘肃交界地区发现具游离体螺层坚螺的又一新种： 西华师大假拟锥螺（腹足纲：柄眼目：坚螺科）

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摘要

本文描述了产自中国四川与甘肃交界地区的具游离末轮的新种：西华师大假拟锥螺 *Pseudobuliminus xihuashida* Z.-G. Chen & Z.-Y. Chen, n. sp. 该物种可依据以下特征与所有同属种区分：贝壳呈圆柱形，表面光滑，末端0.5至1个壳层游离；螺层初期具弱龙骨，随后逐渐变圆润；胎壳具有细小结节。

关键词：陆生贝类，分类学，干热河谷，新物种，生物多样性