

Four new species of door snail from China (Gastropoda: Stylommatophora: Clausiliidae: Phaedusinae)

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Abstract. Four new species of Clausiliidae (Phaedusinae) are described from China, namely *Atractophaedusa lui* sp. nov. from Hunan, *Euphaedusa qiuying* sp. nov. and *Probosciphaedusa gongjini* sp. nov. from Hubei, and *Synprosphyra xihuashida* sp. nov. from Sichuan, based on comparative morphology. *Atractophaedusa lui* sp. nov. is most similar to *A. takagii* (H. Nordsieck, 2005), but it can be distinguished by its more slender shell, shallower palatal plicae, and the distant position of the peristome insertions. *Euphaedusa qiuying* sp. nov. is the first species of the genus with a dextral shell and can be distinguished from the congeners by the dextral, slender-fusiform, ribbed shell. *Probosciphaedusa gongjini* sp. nov. is the second species in its genus and can be distinguished from the type species by its more slender shell having more whorls and less prominent inferior and subcolumellar lamellae. *Synprosphyra xihuashida* sp. nov. is the first species of its genus with strong ribs and can be distinguished from its congeners by its small, ribbed shell with a straight lunella, which is separate from the lower palatal plica.

Key words. Taxonomy, land snails, clausiliids, new taxon, morphology

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INTRODUCTION

The subfamily Phaedusinae A.J. Wagner, 1922 is one of the most diverse groups within the family Clausiliidae J.E. Gray, 1855 and exhibits a disjunct distribution across two regions of Eurasia. The western range includes southeastern Europe, Anatolia, the Caucasus, and the mountainous areas of northern Iran, while the eastern range encompasses East Asia, Southeast Asia, and South Asia (Uit de Weerd & Gittenberger 2013; Uit de Weerd *et al.* 2023; Magonyi *et al.* 2024). China harbours the richest diversity of Phaedusinae, comprising more than 300 species and subspecies, with new species continuing to be discovered (Nordsieck 2012; Hunyadi & Szekeres 2016; Nordsieck 2016; Grego & Szekeres 2017; MolluscaBase 2026). In this study, we describe four new species of Phaedusinae from China.

MATERIALS AND METHODS

Specimens were collected in China during a land-snail survey in April 2025. Measurements of shells were taken point-to-point with digital callipers and recorded to the nearest

0.1 mm. Whorls were counted as described by Kerney & Cameron (1979). Photographs were taken by Sony A7CII digital camera.

Institutional and collection abbreviations. IZCAS = National Zoological Museum of China, Institute of Zoology, Chinese Academy of Sciences (Beijing, China); NCUMB = Museum of Biology, Nanchang University (Nanchang, China); SNHM = Shanghai Natural History Museum (Shanghai, China); SZ = collection of Miklós Szekeres (Budapest, Hungary); ZGC = collection of Zhong-Guang Chen (Chengdu, China); ZYC = collection of Zhe-Yu Chen (Wuhan, China).

SYSTEMATICS

Family Clausiliidae J.E. Gray, 1855

Subfamily Phaedusinae A.J. Wagner, 1922

Genus *Atractophaedusa* Ehrmann, 1927

Type species. *Phaedusa* (*Oospira*) *rhopaloides* Möllendorff, 1901, type by original designation.



Figure 1. Shells of the newly described and similar species. **A**, *Atractophaedusa lui* sp. nov., NCUMB YG 2601001, holotype. **B**, *A. takagii*, ZGC. **C**, *E. qiuying* sp. nov., NCUMB YG 2601002, holotype. **D**, *Euphaedusa qiuying* sp. nov., ZGC, paratype, with shells of young snails within the adult shell, indicating ovoviviparous reproduction.

***Atractophaedusa lui* sp. nov.**

Figures 1A, 2B

ZooBank registration. urn:lsid:zoobank.org:act:8AA9B5C5-FA59-42BE-9FEC-3D1C4B64A306

Type locality. Dalupu Town [大路铺镇], Jianghua Yao Autonomous County [江华瑶族自治县], Yongzhou City

[永州市], Hunan Province [湖南省], China, 25° 01' 50" N, 111° 31' 08" E, collected by Zhong-Guang Chen, April 2025.

Type material. Holotype: NCUMB YG 2601001. Paratypes: 20 shells, IZCAS TM 202986 (1 specimen), SNHM 17577 (1 specimen), ZGC (15 specimens), ZYC (1 specimen), SZ (2 specimens); collected with the holotype.

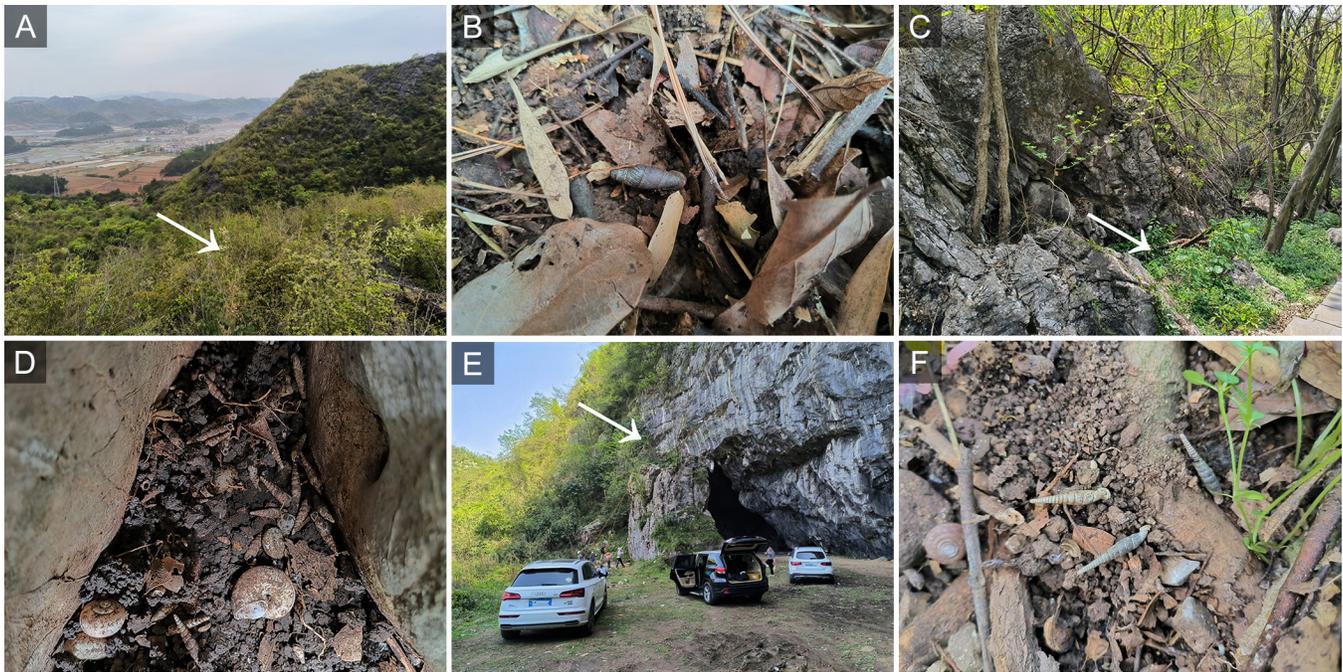


Figure 2. Habitats of the three the newly described species. **A, B**, *Atractophaedusa lui* sp. nov. **C, D**, *Euphaedusa qiuying* sp. nov. **E, F**, *Probocephaedusa gongjini* sp. nov. Arrows show the specific locations.

Shell measurements. Holotype: shell height 19.3 mm, width 5.5 mm; aperture height 5.2 mm, width 4.2 mm. Paratypes: shell height 16.4–20.2 mm, width 5.3–5.6 mm; aperture height 5.0–5.3 mm, width 3.9–4.2 mm.

Diagnosis. An *Atractophaedusa* species characterised by an entire (not decollate), cylindrical shell, with the peristome strongly doubled and the palatal plicae lateral.

Description. Shell entire, cylindrical, sinistral, thick-walled, solid, reddish brown, with $6\frac{1}{4}$ –7 whorls. Whorls translucent, with narrow, dense growth lines. Apex broad. Aperture projecting, narrow, oblong. Peristome strongly doubled, thick, expanded, and reflexed, without palatal serration. Superior lamella strong, highest near its outer end, extending to peristome margin. Inferior and subcolumellar lamella weak, descending to near peristome margin. Principal plica long, beginning ventrally and ending near aperture. Palatal plicae 4 or 5, short, lateral, nearly straight or slightly curved. Clausilium plate not visible within aperture in oblique view.

Etymology. The species is named after Jin-Cheng Lu, the discoverer of this species. The vernacular name is 鹿氏箭管螺 (Pinyin: lù shì jiàn guǎn luó).

Distribution and habitat. This species is only known from the type locality (Fig. 3). It inhabits leaf litter in bamboo forests in karst mountains (Fig. 2A, B).

Remarks. The new species can be assigned to the genus *Atractophaedusa* owing to the doubled peristome, the 4 or

5 short palatal plicae, and the inflated shell. It can be distinguished from its congeners by having an entire (not decollate), cylindrical shell. It is most similar to *A. takagii* (H. Nordsieck, 2005) but differs by its more slender shell, more shallowly placed palatal plicae, and distant peristome insertions (Fig. 1A, B).

Genus *Euphaedusa* O. Boettger, 1877

Type species. *Clausilia shanghiensis* L. Pfeiffer, 1853, type by subsequent designation (Lindholm 1924).

Euphaedusa qiuying sp. nov.

Figures 1C, D, 2D

ZooBank registration. urn:lsid:zoobank.org:act:0A0CF753-70C9-4D01-AB55-A2D133A0E599

Type locality. Wangjiaao [王家坳], Xisaishan District [西塞山区], Huangshi City [黄石市], Hubei Province [湖北省], China, 30° 10' 21" N, 115° 03' 28" E, collected by Jun-Jie Xu, Zhong-Guang Chen & Chen-Yu Fei, May 2025.

Type material. Holotype: NCUMB YG 2601002. Paratypes: 61 shells, IZCAS TM 206988–206989 (2 specimens), SNHM 17579–17580 (2 specimens), ZGC (50 specimens), ZYC (2 specimens), SZ (5 specimens); collected with the holotype.

Shell measurements. Holotype: shell height 18.7 mm, width 3.3 mm; aperture height 3.4 mm, width 2.7 mm. Para-



Figure 3. Type localities of the newly described species in southern China. ▲: *Atractophaedusa lui* sp. nov.; ■: *Euphaedusa qiuying* sp. nov. ★: *Probosciphaedusa gongjini* sp. nov.; ◆: *Synprosphyra xihuashida* sp. nov.

types: shell height 16.4–18.6 mm, width 3.2–3.5 mm; aperture height 3.2–3.6 mm, width 2.6–2.8 mm.

Diagnosis. A *Euphaedusa* species characterised by having a dextral, slender-fusiform, ribbed shell.

Description. Shell slender fusiform, dextral, thin-walled, fragile, brownish grey, with 10½–12 whorls. Whorls opaque, with narrow, dense ribs. Apex narrow. Aperture projecting, narrow, oblong. Peristome thin, expanded, and reflexed, without palatal serration. Superior lamella weak, highest at position near its outer end, extending to peristome margin. Inferior lamella weak, close to inferior lamella, descending to near peristome margin. Principal plica long, beginning ventrally and ending near aperture. Palatal plicae one, short, lateral, slightly curved, close to principal plica. Clausilium plate not visible within aperture in oblique view.

Ovoviparous, 1 or 2 unborn juveniles were found in each of three pregnant adult individuals.

Etymology. The species is named after Celeste Qiuying

(Qiuying Ziqing), a fictional character created by Jun-Jie Xu, the discoverer of this species. The name is used as a noun in apposition. The vernacular name is 湫澌真管螺 (Pinyin: qiū yíng zhēn guǎn luó).

Distribution and habitat. The new species is only known from the type locality (Fig. 3). It was found under fallen leaves on limestone (Fig. 2C, D). Hundreds of empty shells were found, but none were living or even fresh. Local residents indicate that the severe decline in the groundwater level in this area is attributable to mining activities (Fig. 4). This has resulted in extreme desiccation across this mountainous region, ultimately leading to the relocation of the local community. The type locality is a narrow mountainous zone surrounded by plains, lakes, the Changjiang River (Yangtze), and urban areas. Given the complete degradation of its habitat, we are pessimistic about the future of this species and consider it likely to have gone extinct prior to its formal description.

Remarks. The closely placed superior and inferior lamella and the ovoviparous reproductive mode both support its



Figure 4. A huge mine next to type locality of *Euphaedusa qiuying* sp. nov.

placement in *Euphaedusa*. It is the first dextral species of the genus and can be distinguished from the congeners by its dextral, slender-fusiform, ribbed shell.

Genus *Probosciphaedusa* Z.-Y. Chen, 2021

Type species. *Probosciphaedusa mulini* Z.-Y. Chen in Z.-Y. Chen & K.-C. Ouyang, 2021, type by original designation.

Probosciphaedusa gongjin sp. nov.

Figures 2F, 5A, B

ZooBank registration. urn:lsid:zoobank.org:act:748D57C8-6733-43E9-A403-4C235F8FFAED

Type locality. Yushan Cave [雨扇洞], Xianan District [咸安区], Xianning City [咸宁市], Hubei Province [湖北省], China, 29°45'17"N, 114°18'46"E, collected by Zhong-Guang Chen & Chen-Yu Fei, April 2025.

Type material. Holotype: NCUMB YG 2601003. Paratypes: 42 shells, IZCAS TM 202980–202985 (6 specimens), SNHM 17571–17576 (6 specimens), ZGC (20 specimens), ZYC (5 specimens), SZ (5 specimens); collected with the holotype.

Shell measurements. Holotype: shell height 26.2 mm, width 4.3 mm; aperture height 4.1 mm, width 3.2 mm. Paratypes: shell height 25.0–30.1 mm, shell width 4.0–4.5 mm; aperture height 3.9–4.2 mm, width 3.1–3.3 mm.

Diagnosis. A *Probosciphaedusa* species characterised by having a slender shell with more whorls and a less prominent subcolumellar lamella than the type (and only other) species.

Description. Shell slender-fusiform, sinistral, thick-walled, solid, reddish brown in juveniles and younger adults, purplish black in mature adults, with 18–19½ whorls. Basal crest strong. Whorls opaque, with narrow, dense growth

lines. Apex broad. Aperture projecting, narrow, oblong. Peristome strongly doubled, thick, expanded and reflexed, without palatal serration. Superior lamella strong, highest at near its outer end, extending to peristome margin. Strong inferior and subcolumellar lamellae closely positioned, descending to peristome margin. Principal plica short, beginning laterally and ending near aperture. Lunella lateral, slightly curved. Clausilium plate not visible within aperture in oblique view.

Etymology. This species is named after Gongjin, the courtesy name of Yu Zhou [周瑜], a renowned military strategist of the Three Kingdoms period (220–280 AD), famous for his decisive victory over the forces of Cao Cao at the Battle of Chibi in Xianning. The type locality of this species, Yushan Cave, is phonetically reminiscent of the poetic phrase “yǔshàn guānjīn”, which is often used to evoke the elegant and resourceful image of Yu. The name is used as a noun in apposition. The vernacular name is 公瑾象管螺 (Pinyin: gōng jīn xiàng guǎn luó).

Distribution and habitat. This species is only known from the type locality (Fig. 3). It inhabits leaf litter in the broad-leaf evergreen forest above the cave entrance (Fig. 2E, F).

Remarks. The placement of this new species in *Probosciphaedusa* is supported by having an aperture and lunella, similar to other species of this genus, a strong basal crest, and a broad apex, and in having adjacent distributions. The new species can be easily distinguished from *P. mulini* by its more slender shell with more whorls and a less prominent subcolumellar lamella (Fig. 5A–C). The two species are geographically separated by the Junshui River, with *P. mulini* occurring on the left bank and the new species found on the right bank.

Genus *Synprosymma* A.J. Wagner, 1920

Type species. *Clausilia suilla* Bavay & Dautzenberg, 1909, type by subsequent designation (Loosjes & Loosjes-van Bemmelen 1973).

Synprosymma xihuashida sp. nov.

Figure 5D

ZooBank registration. urn:lsid:zoobank.org:act:946AD849-2597-4CF7-A3B7-4A49B6468768

Type locality. Kehe Village [可河村], Huidong County [会东县], Liangshan Yi Autonomous Prefecture [凉山彝族自治州], Sichuan Province [四川省], China, 26°25'02"N, 102°34'52"E, collected by local people, April 2025.

Type material. Holotype: NCUMB YG 2601004. Paratypes: 25 shells, IZCAS TM 206987 (1 specimen), SNHM 17578 (1 specimen), ZGC (20 specimens), ZYC (1 speci-



Figure 5. Shells of the newly described and similar species. **A, B**, *Probosciphaedusa gongjini* sp. nov.: **(A)** NCUMB YG 2601003, holotype; **(B)** ZGC, paratype, showing lunella and colour of young adults. **C**, *P. mulini*, ZGC. **D**, *Synprosphyra xihuashida* sp. nov., NCUMB YG 2601004, holotype.

men), SZ (2 specimens); collected with the holotype.

Shell measurements. Holotype: shell height 17.5 mm, width 4.7 mm; aperture height 4.3 mm, width 3.8 mm. Paratypes: shell height 16.3–18.8 mm, width 4.3–4.7 mm; aperture height 4.1–4.3 mm, width 3.3–3.8 mm.

Diagnosis. A *SynprospHYma* species characterised by having a ribbed shell, with a straight lunella, which is separate from the lower palatal plica.

Description. Shell fusiform, sinistral, thick-walled, solid, light brown, with a strong basal crest; whorls 9½–10½. Whorls translucent, with narrow, dense ribs. Apex broad. Aperture projecting, narrow, oblong. Peristome thick, expanded and reflexed, without palatal serration. Superior lamella strong, highest at near its outer end, extending to peristome margin. Weak inferior and subcolumellar lamella close, descending to near peristome margin. Principal plica short, beginning laterally and ending near aperture. Lunella short, dorsal, straight, with a separate lower palatal plica. Clausilium plate not visible within aperture in oblique view.

Etymology. The specific name is derived from the Pinyin spelling of the China West Normal University (xī huá shī dà), the alma mater of the first author. It is used as a noun in apposition. This year is the 80th anniversary of the university's founding, and the first author wanted to celebrate this occasion naming this species after the university. The vernacular name is 西华师大瘤管螺 (Pinyin: xī huá shī dà liú guǎn luó).

Distribution and habitat. This species is known only from the type locality, where it was found in forests in karst mountains. No live specimens were found; however, the heavily eroded shells suggest that this species likely inhabits leaf litter or moss on limestone surfaces.

Remarks. The placement of this new species in *SynprospHYma* is supported by its light-coloured shell having a strong basal crest and lunella. This new species is the only member of its genus with strong ribs and can additionally be distinguished from its congeners by its small shell having a straight lunella, which is separate from the lower palatal plica.

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