KONTSCHANIA TETRAGYRA N. GEN. & SP. FROM LAOS (GASTROPODA: CYCLOPHOROIDEA: DIPLOMMATINIDAE)

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Abstract Kontschania tetragyra *n. gen. & sp. is described from central Laos, Khammouane Province.* Kontschania *n. gen. differs from the probably most closely related Notharinia by the truncated cone-shaped shell, open umbilicus with all whorls visible inside and the alternating low and high teleoconch ribs.*

Key words *new genus, new species, endemism*

Introduction

The family Diplommatinidae is mainly distributed in Asia, the Indo-Pacific islands and South America (Egorov 2013, Nurinsiyah & Hausdorf, 2017 and references therein). While most genera possess internal lamellae and plicae (e.g. Neubert & Bouchet, 2015; Greķe, 2017), in some others these are strongly reduced or entirely absent. In Southeast Asia, which is probably the most important biodiversity hotspot of this family, the following genera have reduced internal barriers: *Arinia* H. Adams & A. Adams, 1856 (see Zilch, 1953; Vermeulen, 1996b), *Helicomorpha* Möllendorff, 1890, *Niahia* Vermeulen, 1996a, *Notharinia* Vermeulen, Phung & Truong, 2007 (sometimes referred to as a subgenus of *Arinia*, see Vermeulen *et al*., 2007; Páll-Gergely & Hunyadi, 2018; Marzuki & Foon, 2016), *Opisthostoma* W. T. Blanford & H. F. Blanford, 1860 (e.g. Vermeulen, 1991), *Palaina* O. Semper, 1865 (see Egorov, 2013) and *Plectostoma* H. Adams, 1865 (e.g. Liew *et al*., 2014).

A sand sediment sample recently collected on the bank of a cave river in central Laos, contained a few *Arinia*-like shells, which we recognized as a new species at first sight. Close examination suggested that this species cannot be classified into the most similar genus *Notharinia*, and therefore, a new genus must be erected for it.

Materials and Methods

Shells were manually brushed clean of mud using wet, fine, tapered brushes, and were then examined without coating under a low vacuum SEM (Miniscope TM-1000, Hitachi High-Technologies, Tokyo). Shell whorl number was counted to the nearest quarter whorl according to Kerney and Cameron (1979). Measurements were taken using Keyence VHX 5000 Digital microscope.

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Abbreviations

AH	aperture height
AW	aperture width
D	shell diameter
JG	Collection Jozef Grego (Banská Bystrica, Slovakia)
H	Shell height
HNHM	Hungarian Natural History Museum (Budapest, Hungary)

Systematics

Diplommatinidae L. Pfeiffer, 1856

Remarks We place *Kontschania* n. gen. in the Diplommatinidae due to the small shell size, regularly ribbed shell, the constricted body whorl and the absence of any microtunnels, which would be characteristic for the Alycaeidae.

Genus *Kontschania* n. gen.

Type species: *Kontschania tetragyra* n. sp.

Diagnosis As in the type species.

Comparison The most closely related genus to *Kontschania* n. gen. is probably *Notharinia* due to the oblique protoconch and geographic

proximity. *Kontschania* n. gen. differs from that genus and the other two similar diplommatinid genera (*Arinia* and *Plectostoma*) by the truncated cone-shaped shell and the alternating low and high radial ribs on the teleoconch. Furthermore, *Arinia* has a not, or only slightly oblique protoconch and a peristome that is either smeared (adnate) to the penultimate whorl, or discontinuous due to the weak parietal callus; *Notharinia* has a closed umbilicus, and regularly coiled members of *Plectostoma* (see Liew *et al*. 2014: 21, 59) have a normally oriented protoconch.

Palaina (including *Cylindropalaina* Moellendorff, 1897) is characterized by mostly sinistral coiling direction, ovoid or cylindrical shell shape, and a peristome adnate to the penultimate whorl. *Helicomorpha*, which is endemic to the Philippines, differs from *Kontschania* n. gen. by the pointed apex and the uniform radial ribs. *Messageria scalarioides* (Bavay & Dautzenberg, 1904) from northern Vietnam, which was described as a *Helicomorpha* species, possesses an inner breathing tube, which indicates that it belongs to the Alycaeidae (unpublished information).

Etymology This new genus is named after the friend of the first author, Jenő Kontschán, acarologist, agrozoologist.

Kontschania tetragyra n. sp.
Fig. 1

Holotype (1 shell, HNHM 104400, D: 1.46mm, H: 1.48mm), Laos, Khammouane Province, Tham Nam Dôn Cave, Earthquake Dome, sand sediments at bank of cave river, 160m a.s.l., 17.56358°N, 104.871635°E (locality code: 2B), leg. J. Grego, 11 ii 2017.

Paratypes 2 shells, coll. JG, same data as holotype.

Type locality Laos, Khammouane Province, Tham Nam Dôn Cave, Earthquake Dome, sand sediments at bank of cave river, 160m a.s.l., 17.56358°N, 104.871635°E.

Measurements D=1.34–1.46mm, H=1.48–1.53mm, AH=0.6–0.72mm, AW=0.67–0.7mm (n=2).

Diagnosis Shell truncated cone-shaped, consisting of 4 strongly bulging whorls, colourless; protoconch sunken and oblique; teleoconch with thick and elevated, and thin and lower ribs alternating; aperture rounded, outer peristome slightly expanded on the palatal, basal and columellar side; no inner lamellae or plicae present; umbilicus deep and relatively wide, with all whorls visible inside.

Description Shell dextral, colourless (chalk white), truncated cone shaped; the 4 whorls are separated by a deep suture, whorls strongly bulging, rounded; protoconch consisting of slightly more than one whorl, sunken, distinctly oblique compared to the general coiling axis of the shell, smooth, its last half whorl finely pitted; teleoconch with strong, equidistant primarily radial ribs that alternate with similarly sharp, slimmer and lower secondary radial ribs; dense spiral striation discernible between ribs; aperture very slightly oblique to shell axis, round; peristome continuous, double, boundary between inner and outer peristome clearly visible; inner peristome thin, sharp, slightly expanded; outer peristome thickened, with 5–6 recognisable ribs; umbilicus open, wide, its width occupies ca. 25% of shell width, with all whorls visible inside; a slight constriction is recognisable a little less than a quarter whorl behind the aperture (shown with an arrow on Fig. 1B); operculum unknown. One of the paratypes had a broken body whorl, which allowed examination of the inner shell surface. No internal lamellae were found in inside the body whorl.

Derivation of name The specific epithet "tetragyra" (Greek: 4 whorls) refers to the few whorls, which are characteristic for this species.

Differential diagnosis So far, no *Arinia*-like species was known from Laos (Inkhavilay *et al*. 2019). *Plectostoma panhai* (Maassen, 2001) (Thailand, Yala Province) and *P. jensi* (Maassen, 2011) (Kelantan, Malay Peninsula) were originally described as *Arinia* species (Maassen, 2001; Liew *et al*., 2014). Their shells are conical with narrower umbilicus and consist of much more whorls. The two Vietnamese *Arinia* species (*A. angduensis* Maassen, 2006 and *A. loumboensis* Maassen, 2006) both possess cylindrical shells with more whorls and closed umbilicus.

Arinia maolanensis Zhang, Chen & Zhou, 2013 and *A. mirifica* Li, Zhou & Luo, 2005 are both known from Guizhou Province, China, and are

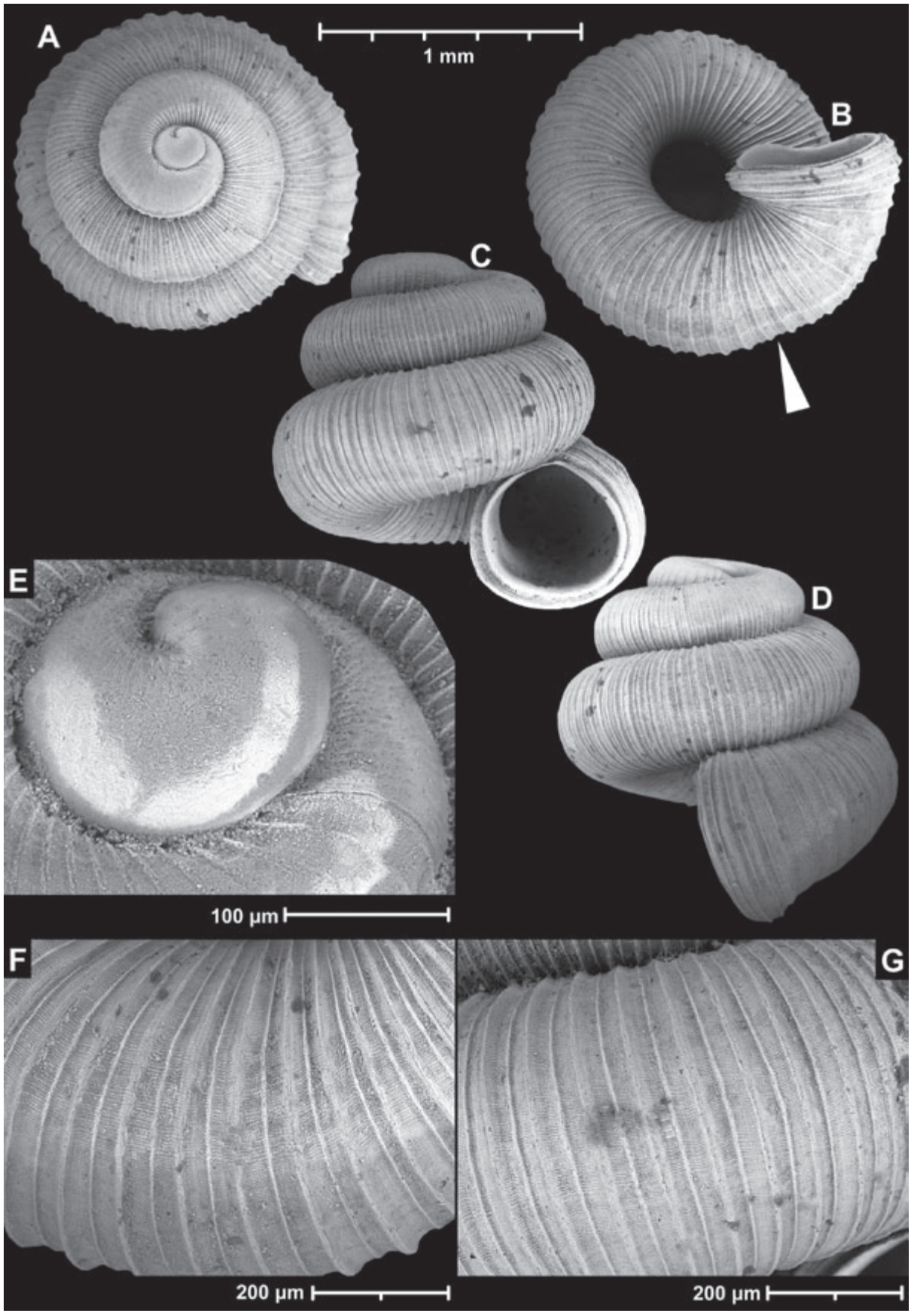

Figure 1 Holotype of *Kontschania tetragyra* n. sp. Arrow indicates the constriction.

similar to the Vietnamese *Diplommatina aesopus* Bavay & Dautzenberg, 1904 in last whorl that obliquely runs around the penultimate whorl. In general shape these are different from *K. tetragyra* n. sp., and might deserve a genus of their own. *Arinia cathaicola* Pilsbry, 1934, which was described from Sichuan (China), rather looks like a typical *Diplommatina* due to the conspicuously narrowed body whorl.

Habitat The three shells of this species were found in sand sediment collected in a cave, which indicates that this might be a subterranean species.

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