

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

BARNA PÁLL-GERGELY¹ & JOZEF GREGO²

¹Plant Protection Institute, Centre for Agricultural Research, Herman Ottó Street 15, Budapest H-1022, Hungary

²Horná Mičiná, SK-97401 Banská Bystrica, Slovakia

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; Greke, 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.

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. *Messengeria 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

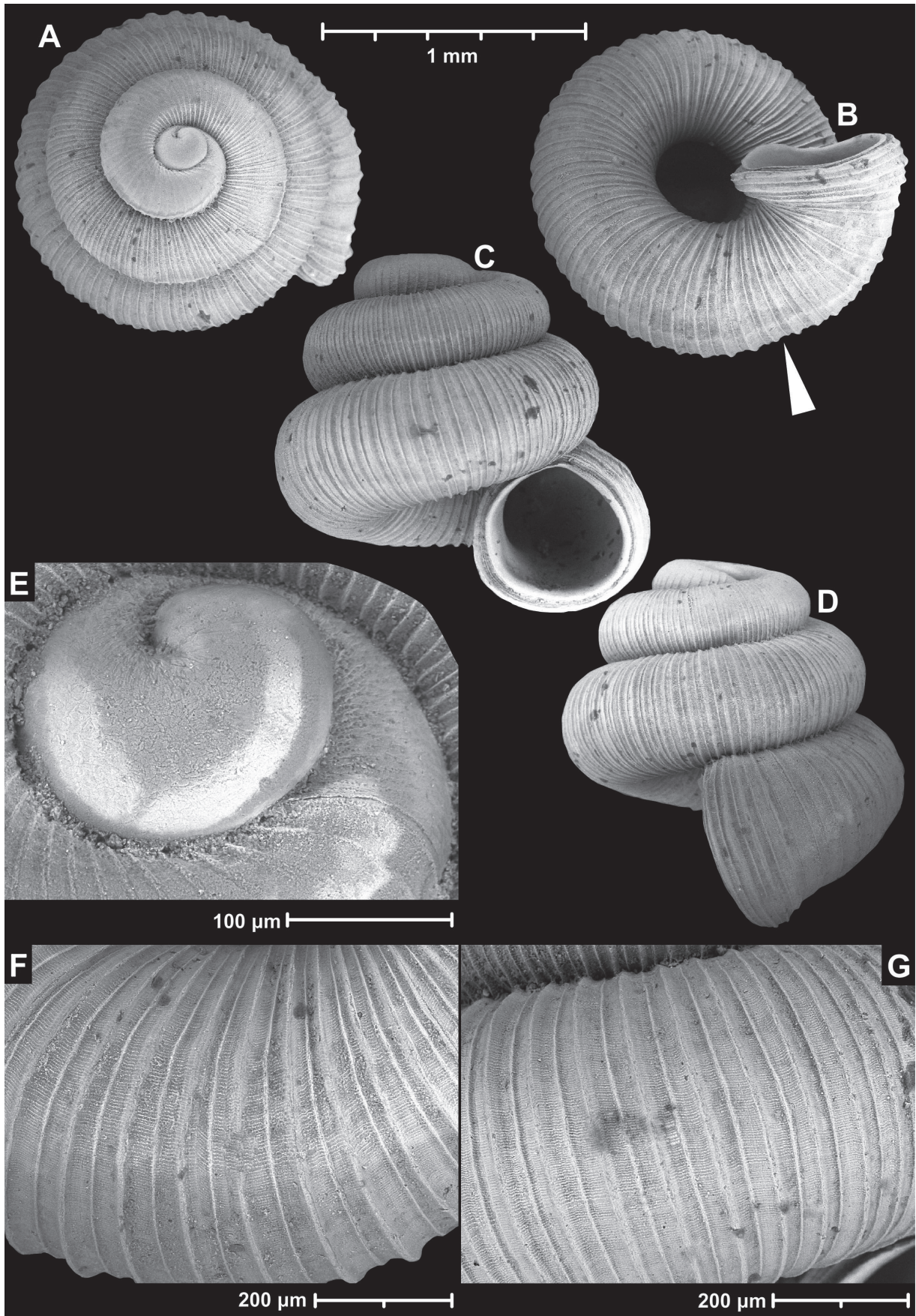


Figure 1 Holotype of *Kontschania tetragyra* n. sp. Arrow indicates the constriction.

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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REFERENCES

- ADAMS H 1865 Description of a new genus of land-shells from the Island of Labuan, Borneo *The Annals and Magazine of Natural History*, including Zoology, Botany and Geology **3**(15): 177.
- ADAMS H & ADAMS A 1853–1858 *The genera of Recent Mollusca; arranged according to their organization*. van Voorst, London. Vol. 1: xl + 484 pp.; vol. 2: 661 pp.; vol. 3: 138pls.
- BAVAY A & DAUTZENBERG P 1904 [1903] Description de Coquilles Nouvelles de l'Indo-Chine *Journal de Conchyliologie* **57**: 201–236.
- BLANFORD WT & BLANFORD HF 1860 Contributions to Indian malacology, No. I. *The Journal of the Asiatic Society of Bengal* **29**(2): 117–127.
- EGOROV RV 2013 *Treasure of Russian Shells*. Supplement 3. A review of the genera of the terrestrial pectinibranch molluscs (synopsis mainly based on published data). Part III. Littoriniformes: Liareidae, Pupinidae, Diplommatinidae, Alycaeiidae, Cochlostomidae. Roman Egorov, Moscow, 62 pp.
- GREKE K 2017 Taxonomic review of Diplommatinidae (Caenogastropoda) from Wallacea and the Papuan Region. In: Telnov D., Barslay M.V.L. & Pauwels O.S.G. (eds) *Biodiversity, Biogeography and Nature Conservation in Wallacea and New Guinea*, III: 151–316, plates 19–47.
- INKHAVILAY K, SUTCHARIT C, BANTAOWONG U, CHANABUN R, SIRIWUT W, SRISONCHAI R, PHOLYOTHA A, JIRAPATRASILP P, PANHA S 2019 Annotated checklist of the terrestrial molluscs from Laos (Mollusca, Gastropoda) *ZooKeys* **834**: 1–166.
- KERNEY MP & CAMERON RAD 1979 *A Field Guide to the Land Snails of Britain and North-west Europe*. Collins, London, 288 pp.
- LI Y, ZHOU W-C & LUO T-C 2005 A new species of Cyclophoridae from Guizhou Province, China, (Prosobranchia: Mesogastropoda: Cyclophoridae) *Acta Zootaxonomica Sinica* **30**(1): 67–69.
- LIEW T-S, VERMEULEN JJ, MARZUKI ME BIN, SCHILTHUIZEN M 2014 A cybertaxonomic revision of the microlandsnail genus *Plectostoma* Adam (Mollusca, Caenogastropoda, Diplommatinidae), from Peninsular Malaysia, Sumatra and Indochina *ZooKeys* **393**: 1–107.
- MAASSEN WJM 2001 Four new Diplommatinidae (Gastropoda, Prosobranchia, Diplommatinidae) from southern Thailand and northern Peninsular Malaysia *Basteria* **65**: 51–56.
- MAASSEN WJM 2006 Four new species of terrestrial gastropods from Tonkin, North Vietnam (Gastropoda, Diplommatinidae, Strobilopsidae and Ariophantidae) *Basteria* **70**: 13–18.
- MARZUKI ME, BIN & FOON JK 2016 A new land snail, *Arinia* (Notharinia) *micro* (Caenogastropoda: Cyclophoroidea: Diplommatinidae), from a limestone karst in Perak, Peninsular Malaysia *Raffles Bulletin of Zoology* **64**: 313–318.
- MÖLLENDORFF OF VON 1890 *Die Landschnecken-Fauna der Insel Cebu*. Bericht über die Senckenbergische Naturforschende Gesellschaft, Frankfurt am Main **1890**: 189–292.
- MÖLLENDORFF OF VON 1897 Diagnosen neuer und kritischer Landdeckelschnecken. *Nachrichtsblatt der Deutschen Malakozoologischen Gesellschaft* **29**: 31–45.
- NEUBERT E & BOUCHET P 2015 The Diplommatinidae of Fiji – a hotspot of Pacific land snail biodiversity (Caenogastropoda, Cyclophoroidea) *ZooKeys* **487**: 1–85.
- NURINSYAH AS & HAUSDORF B 2017 Revision of the Diplommatinidae (Gastropoda: Cyclophoroidea) from Java *Zootaxa* **4312**(2): 201–245.
- PÁLL-GERGELY B & HUNYADI A 2018 Four new cyclophoroid species from Thailand and Laos (Gastropoda: Caenogastropoda: Alycaeiidae, Diplommatinidae, Pupinidae) *Zoosystema* **40**(3): 59–66.
- PFEIFFER L 1856 Verzeichniss der bisher bekannt gewordenen gedeckelten Landschnecken von Cuba *Malakozoologische Blätter* **3**: 118–150.
- PILSBRY HA 1934 Zoological results of the Dolan West China expedition of 1931, Part II, Mollusks *Proceedings of the Academy of Natural Science of Philadelphia* **86**: 5–28.
- SEMPER O 1865 Notice préliminaire sur la famille des Diplommatinacées. *Journal de Conchyliologie* **13**: 289–294.
- VERMEULEN JJ 1991 Notes on the non-marine molluscs of the island of Borneo 2. The genus *Opisthostoma* (Gastropoda Prosobranchia: Diplommatinidae) *Basteria* **55**: 139–163.

- VERMEULEN JJ 1996a Notes on the non-marine molluscs of the island of Borneo 7. The genus *Niahia* gen. nov. *Basteria* **60**(3): 67–69.
- VERMEULEN JJ 1996b Notes on the non-marine molluscs of the island of Borneo 8. The genus *Arinia* additions to the genera *Diplommatina* and *Opisthostoma* *Basteria* **60**: 87–138.
- VERMEULEN JJ, PHUONG LC & TRUONG QT 2007 New species of terrestrial molluscs (Caenogastropoda, Pupinidae & Pulmonata, Vertiginidae) of the Hon Chong – Ha Tien limestone hills, Southern Vietnam *Basteria* **71**: 81–92.
- ZHANG W–H, CHEN D–N & ZHOU W–C 2013 A new species of the genus *Arinia* H. & A. Adams from China (Prosobranchia: Caenogastropoda: Diplommatinidae) *Acta Zootaxonomica Sinica* **38**(4): 773–775.
- ZILCH A 1953 Die Typen und Typoide des Natur-Museums Senckenberg, **9**: Mollusca, Cyclophoridae, Diplommatininae *Archiv für Molluskenkunde* **82**(1/3): 1–47, plates 1–13.

