Linzer biol. Beitr.	56/1	3-12	August 2024

Aradidae from Vietnam VI. A new apterous genus and species of Carventinae (Hemiptera, Heteroptera, Aradidae) from Vietnam

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A b s t r a c t : A new apterous genus *Parazimmermania* gen.nov. with the species *P. tamdaoensis* nov.sp. (Heteroptera, Aradidae, Carventinae) are described from Vietnam. The diagnostic morphological features are described and illustrated.

K e y w o r d s : Hemiptera, Aradidae, Carventinae, *Parazimmermania*, Vietnam, new genus, new species.

Introduction

The Aradidae fauna of the subfamily Carventinae from Vietnam is still poorly studied. Only 9 genera are known to date from Vietnam: *Apteraradus* DRAKE, 1957 (*A. vietnamensis* KORMILEV, 1968; PHAM et al. 2011), *Bifurcatoaptera* BAI et al., 2018 (*B. lamdongensis* BAI et al., 2018), *Carventus* STÅL, 1865 (*C. vietnamensis* KORMILEV, 1969; PHAM et al. 2011), *Lissonotocoris* USINGER & MATSUDA, 1959 (*L. membranaceus* USINGER & MATSUDA, 1959; PHAM et al. 2011; *L. glabronotus* HEISS et al., 2014), *Nesoproxius* USINGER & MATSUDA, 1959 (*N. vietnamensis* KORMILEV, 1968); PHAM et al. 2011), *Notoplocaptera* USINGER & MATSUDA, 1959 *(N. sternalis* (VÁSÁRHELYI, 1976); KORMILEV, 1983; PHAM et al. 2011), *Parataiwanaptera* HEISS, 2010 (*P. laevigata* HEISS, 2010; PHAM et al. 2011), *Trichosomaptera* PHAM et al., 2014 (*T. gibbosa* PHAM et al., 2014) and *Vietnamaptera* ZHANG et al., 2010 (*V. bogiessa* ZHANG et al. 2010; PHAM et al. 2011). Of these genera, only *Apteraradus*, *Bifurcatoaptera*, *Notoplocaptera*, *Trichosomaptera* and *Vietnamaptera* include apterous species; the others are micropterous (*Parataiwanaptera*) or macropterous (*Carventus*, *Lissonotocoris* and *Nesoproxius*). Studying a lot of Aradidae from Vietnam we recognized a remarkable undescribed species, which can't be placed in any known genus of Aradidae, for which we therefore propose a new genus.

Material and methods

This study is based on specimens preserved in the Entomological Museum of the Inner Mongolia Normal University, Huhhot (IMNU), the Collection Ernst Heiss at the Tiroler Landesmuseum, Innsbruck (future deposit at the Zoologische Staatssammlung, Munich, Germany) (CEHI) and the Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, Canada (CNC). For the study of body structures the incrustate specimens were cleaned. Photos were taken through Keyence VHX-1000 equipment. Measurements were

obtained using a calibrated micrometer. All measurements are given in millimeters.

Abbreviations:

deltg.....dorsal external laterotergites (connexivum)
mtg.....mediotergites

Taxonomy

Parazimmermania BAI, HEISS & CAI gen. nov.

Type species of the genus: *Parazimmermania tamdaoensis* BAI, HEISS & CAI nov.sp.

Description: Micropterous. Medium sized (6-7.7). Body elongate ovate, reddish brown. Head, antennae and lateral parts of thorax, abdomen and legs beset with brush-like stiff erect apically curved hairs.

Head: About as long as wide across eyes; clypeus and genae short, not produced beyond apex of labial atrium; antenniferous tubercles stout, conical, shorter than clypeus; eyes small, semiglobose, with convex face; postocular borders with dense erect hairs, converging posteriorly to constricted neck; antennae long, first segment stout and clavate, longer than cylindrical second segment, third cylindrical and longest, fourth fusiform and shortest; rostrum arising from a slit-like atrium, shorter than rostral groove.

Thorax: Pronotum attenuated anteriorly, anterolateral lobes not protruding; collar ring-like; pronotal disc with longitudinal deep impression. Mesonotum with distinct scutellum, laterally deeply depressed and bulbous anterolateral wingpads; metanotum fused to mtg I and II into an elongate plate with longitudinal ridge and 4 (2+2) oval glabrous callosities; the fusion line is marked by a thin bisinuate carina; deltg I + II fused, produced forward to mesonotal wingpads.

Abdomen: Deltg III-VII distinctly raised laterally, rather bare on inner half, with stiff erect pilosity on outer half; tergal plate consisting of mtg III to VI fused into a subquadrangular central plate, with a median longitudinal ridge and the basic pattern of large oval callous spots and dots; mtg VII strongly elevated posteriorly in male and slightly depressed in female. Paratergites VIII clavate or dentiform. Dorsal scent gland openings small.

Ventral side: Prosternum raised and with dense erect hairs, disc of meso- and metasternum flattened medially; spiracles II+III lateral, IV sublateral and barely visible from above, V-VII ventral, VIII terminal.

Legs: Long, slender; fore tibiae with preapical spine-like combs.

Distribution: Vietnam (Vinhphuc province).

Etymology: The generic name reflects the similarity to the Oriental flat bug genus *Zimmermania*, >para< (Latin) = near to.

Remarks: The genus resembles *Zimmermania* USINGER, 1948 in general body plan, but differs by the closed labial atrium with slit-like opening (vs. labial atrium open in *Zimmermania*); in the key to genera of the Oriental, Australian and Pacific Carventinae (KORMILEV 1970), it runs to *Chelysosoma* KORMILEV, 1956, but this genus lacks a distinct scutellum and differs by other position of spiracles: II sublateral and visible from above,

III-VII ventral (vs. II+III lateral, IV sublateral but visible from above, V-VII ventral, VIIII terminal in *Parazimmermania*).

***Parazimmermania tamdaoensis* BAI, HEISS & CAI nov.sp.**

Type material examined: Holotype: male, Vietnam, Vinhphuc / Tamdao 1200m / N 21°27', E 109°39'/ 21 VI 2011, Bai, Pham // (IMNU). Paratypes: 4 males, 3 females, same data as holotype (IMNU); 2 males, 1 female, Vietnam, Vinhphuc / Tamdao 1200m / N 21°27', E 109°39' / 3 VII 2009, X. S. Bai // (IMNU); 1 female, Vietnam, Vinhphuc / Tamdao 1200m / N 21°27', E 109°39' / 18 V 2012, M.L.Pham // (IMNU); 2 males, 1 female, N-Vietnam 1200m / 70km nw Hanoi, Tam Dao / 21.2 N, 105.39 E, 8.6.96 / Pacholatko + Dembicky // (CEHI); 1 female, Vietnam, Tam Dao / N 21°27'54" E, 105°38'56" / 14.V.2012, 1237m / sift 04, V. Grebennikov // CNCCOLVG / 00004721 // (CNC); 1 female, same data // CNCCOLVG / 00004722 // (CEHI); 1 female, same data // CNCCOLVG / 00004723 // (CEHI); 1 female, Vietnam, Tam Dao / N 21°27'54", E 105°36'44" / 17.V.2012, 1218m / sift 02, V. Grebennikov // CNCCOLVG / 00004731 // (CNC); 1 male, Vietnam, Tam Dao / N 21°27'05", E 105°38'56" // 11.V.2012, 989m / sift 01 / V. Grebennikov // CNCCOLVG / 00004710 // (CNC). These types are designated and labelled accordingly.

Additional specimen examined: 1 Larval stage V, Vietnam, Tam Dao / N 21°27'42", E 105°38'48" / 15.V.2012, 1240m / sift 05, V. Grebennikov // CNCCOLVG / 00004730 // (CNC).

Description of male holotype. Body reddish brown, incrustation grayish brown. Eyes reddish. Antenna and legs covered with short curving hair.

Head: Slightly longer than wide across eyes (0.85/0.80); covered with stiff erect hairs; clypeus and genae short, not produced beyond apex of labial atrium; antenniferous tubercles short, dilated, apices blunt; eyes small, semiglobose and laterally protruding; postocular lobes without tubercles, strongly constricted posteriorly; vertex with X-shaped sulcus; antennae 3.2 times as long as width of head across eyes, length of antennal segments I to IV: 0.74/0.56/1.03/0.32; labial atrium closed, with a slit-like opening, rostrum short, rostral groove deep, closed posteriorly.

Pronotum: 1.48 times as wide as long (1.40/0.77), attenuated anteriorly; collar thick, as wide as first antennal segment; separated from pronotum by a transverse furrow; anterolateral angles of pronotum not protruding, reaching to collar; anterior part of disc with deep median longitudinal impression, flanked by 2(1+1) large humps with irregular carinae and conical tubercles, covered by stiff erect hairs; posterior part of disc separated from anterior part by a transverse furrow, surface smooth and sloped to posterior margin, separated from mesonotum by a convex suture.

Mesonotum: Wider than pronotum (1.65/1.40), with distinct scutellum, laterally deeply depressed and bulbous anterolateral wingpads.

Metanotum: Wider than mesonotum (1.89/1.65), fused to mtg I and II into an elongate plate with longitudinal ridge and 4 (2+2) oval glabrous callosities; the fusion line is marked by a thin bisinuate carina; deltg I + II fused, produced forward to mesonotal wingpads.

Abdomen: Deltg III-VII distinctly raised laterally, rather bare on inner half, with stiff erect pilosity on outer half; posterolateral angles of deltg VI to VII progressively protruding, deltg VII with triangular lobes; tergal plate consisting of mtg III to VI, subquadrangular with a longitudinal median ridge and lateral pattern of oval callosities; scent glands distinct; laterad of median ridge with a usual pattern of large and small callous spots; paratergites VIII clavate, produced beyond cordate pygophore,

Ventral side: Sterna III to VI raised along posterior border, depressed along anterior border, and with T-shaped, smooth ridge medially; flanked by 2 (1+1) large, transversely

ovate deep depressions, with transversal broad carina, these bearing 2 (1+1) round callous spots; more laterad 4 (2+2) smaller round callous spots; spiracles II+III lateral, IV sublateral and barely visible from above, V-VII ventral, VIII terminal.

L e g s : Long, slender; fore tibiae with preapical spine-like combs.

F e m a l e : Morphological features basically as of male; head about as long as wide across eyes; mtg VII slightly elevated medially, depressed posteriorly, paratergites VIII dentiform, reaching to basal 1/3 of tergum IX.

M e a s u r e m e n t s (in mm, ♂ (n = 7) / ♀ (n = 5), holotype in parentheses). Body length (6.40) 6.05–6.70 / 6.35–7.70. Maximal width of abdomen (2.50) 2.35–2.70 / 2.60–3.25. Head length (0.85) 0.80–0.90 / 0.85–0.90 width (0.80) 0.80–0.85 / 0.90–0.95. Pronotum length (0.77) 0.77–0.81 / 0.70–0.85, width (1.40) 1.40–1.51 / 1.35–1.5. Mesonotum width (1.68) 1.58–1.75 / 1.65–1.90. Metanotum width (1.89) 1.82–2.03 / 1.90–2.10. Length of antennal segments I–IV (0.74, 0.56, 1.02, 0.32) 0.74–0.77, 0.53–0.56, 0.98–1.02, 0.32–0.35 / 0.74–0.77, 0.53–0.63, 0.95–1.16, 0.32–0.35.

E t y m o l o g y : This specific name refers to the holotype locality Tam Dao.

D i s t r i b u t i o n : Vietnam (Tamdao).

Acknowledgments

This research is supported by the National Natural Science Foundation of China (Nos. 32060121). The second author (EH) thanks his friends V. Grebennikov (Ottawa, Canada), P. Pacholatko and L. Dembicky (Brno, Cech Republic) who donated and made available additional material for the study, and T. Tóth (Innsbruck) for the arrangement of the photo plates. We are also grateful to the editors of Linzer biologische Beiträge, Esther Ockermüller and Karin Traxler for their professional treatment of our manuscript and thank Martin Schwarz (Linz) for review and his thoughtful comments.

Zusammenfassung

Die Aradidenfauna von Vietnam ist immer noch unzureichend erforscht. Nur neun Gattungen der Unterfamilie Carventinae USINGER, 1950 sind bisher nachgewiesen worden, deren Vertreter entweder makropter (*Carventus*, *Lissonotocoris* und *Nesoproxius)* oder apter (*Apteraradus*, *Bifurcatoaptera*, *Notoplocaptera*, *Trichosomaptera* und *Vietnamaptera)* und nur einer (*Parataiwanaptera*) mikropter sind. Das Belegmaterial einer Aradidenausbeute vom Tamdao Nationalpark in Vietnam enthielt mikroptere Exemplare, welche keiner bekannten Gattung zugeordnet werden können. Dafür wird eine neue Gattung *Parazimmermania* gen.nov mit der Typusart *Parazimmermania tamdaoensis* nov.sp. vorgeschlagen, die nachstehend beschrieben und abgebildet werden.

References

BAI X., HEISS E. & W. CAI (2018): Aradidae from Vietnam V. Bifurcatoaptera, a new genus of apterous Carventina (Hemiptera: Heteroptera: Aradidae) from Vietnam. — Zootaxa **4450** (2): 286–290.

DRAKE C.J. (1957): New Apterous Aradids from the East Indies (Hemiptera). — Philippine Journal of Science **85**: 405-412.

HEISS E. (2010): Two new genera of Aradidae from Malaysia and Vietnam (Hemiptera: Heteroptera: Aradidae). — Zootaxa **2619**: 56-62.

HEISS E., BAI X., PHAM M. & W. CAI (2014): Aradidae from Vietnam IV. Review of the Oriental flat bug genus *Lissonotocoris* USINGER & MATSUDA, 1959 (Hemiptera: Heteroptera: Aradidae). — Zootaxa **3881** (6): 576-582.

HEISS E. & S. NAGASHIMA (2008): New Carventinae from Taiwan and Japan I. (Heteroptera, Aradidae). — Linzer biologische Beiträge **40** (1): 287-301.

KORMILEV N.A. (1956): Notes on Aradidae from the Eastern Hemiphere. (Hemiptera). — Philippine Journal of Science **85** (2): 283-294.

KORMILEV N.A. (1968): Aradidae in the Bishop Museum, Honolulu III. (Hemiptera-Heteroptera). — Pacific Insects **10**: 575-597.

KORMILEV N.A. (1969): Aradidae in the Bishop Museum, Honolulu IV. (Hemiptera-Heteroptera). — Pacific Insects **11**: 49-70.

KORMILEV N.A. (1970): Aradidae in the Bishop Museum, Honolulu V. (Hemiptera-Heteroptera). — Pacific Insects **12**: 701-722.

KORMILEV N.A. (1983): New Oriental Aradid Bugs in the collection of the British Museum (Natural History) (Insecta: Hemiptera). — Journal of Natural History **17**: 437-469.

KORMILEV N.A. & R.C. FROESCHNER (1987): Flat bugs of the world. A synonymic list (Heteroptera: Aradidae). — Entomography **5**: 1-246.

PHAM M.L., BAI X., HEISS E. & W. CAI (2011): An annotated checklist of flat bugs (Hemiptera: Aradidae) from Vietnam. — Zootaxa **2967**: 51-60.

PHAM M.L., BAI X., HEISS E. & W. CAI (2014): Aradidae from Vietnam III. *Trichosomaptera gibbosa* n.gen., n.sp., an apterous Carventinae (Hemiptera: Heteroptera: Aradidae). — Zootaxa **3768** (3): 395-400.

USINGER R.L. & R. MATSUDA (1959): Classification of the Aradidae, British Museum (Natural History), London, 410 pp.

VÁSÁRHELYI T. (1976) Aradidae from Vietnam in the Hungarian National History Museum (Heteroptera). — Acta Zoologica Academiae Scientiarum Hungaricae **22**: 407-414.

YANG K., BAI X. & W. CAI (2007): *Lissonotocoris*, the first genus record of Carventinae (Hemiptera: Aradidae) from China. — Entomotaxonomia **29** (2): 131-134.

ZHANG W., BAI X., HEISS E. & W. CAI (2010): *Vietnamaptera*, a new genus of apterous Carventinae (Hemiptera: Aradidae) from Vietnam. — Zootaxa **2530**: 60-64.

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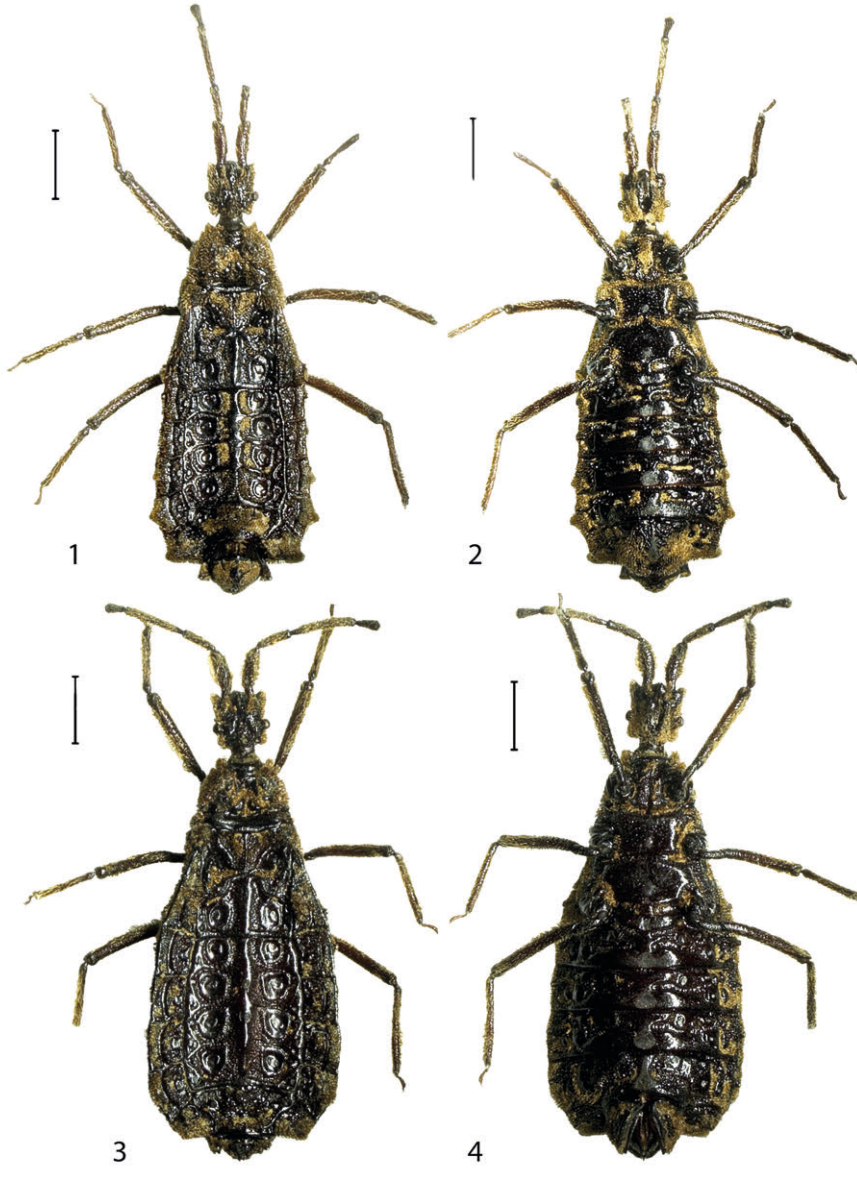
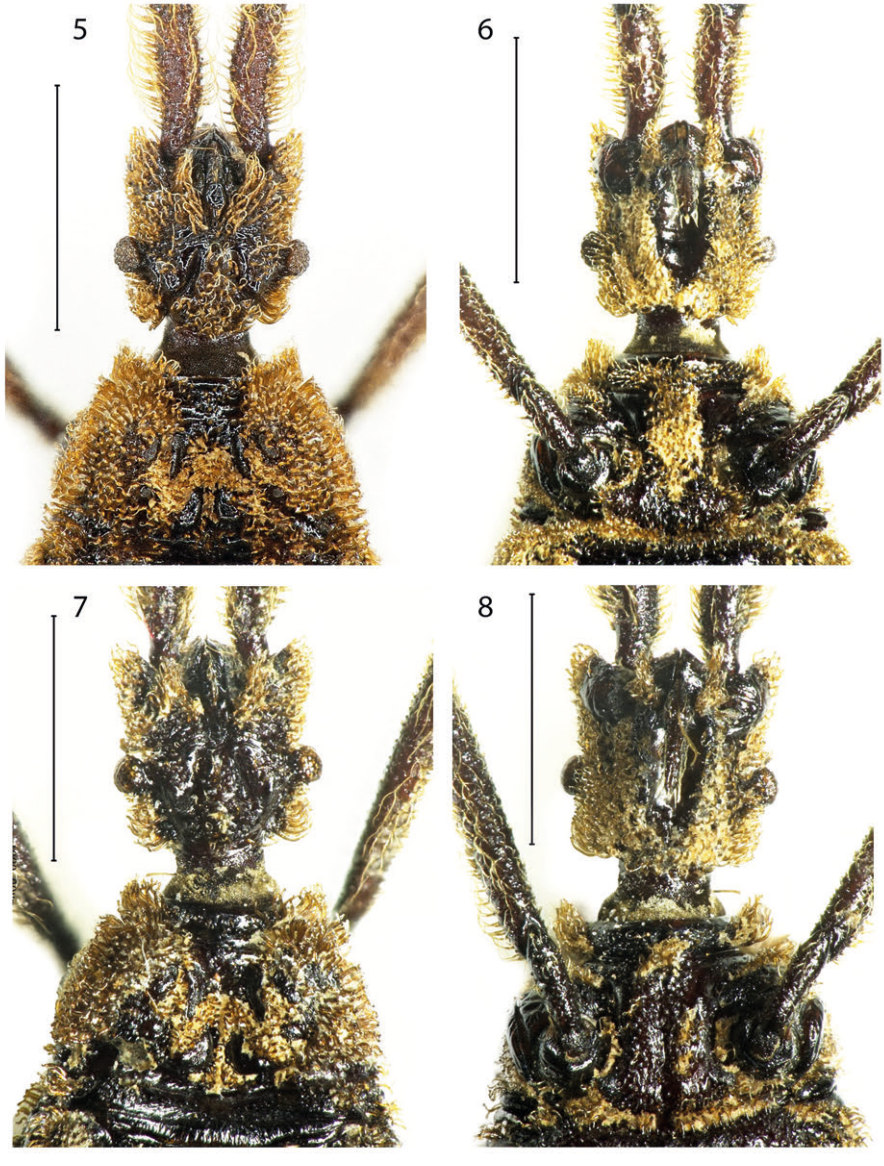
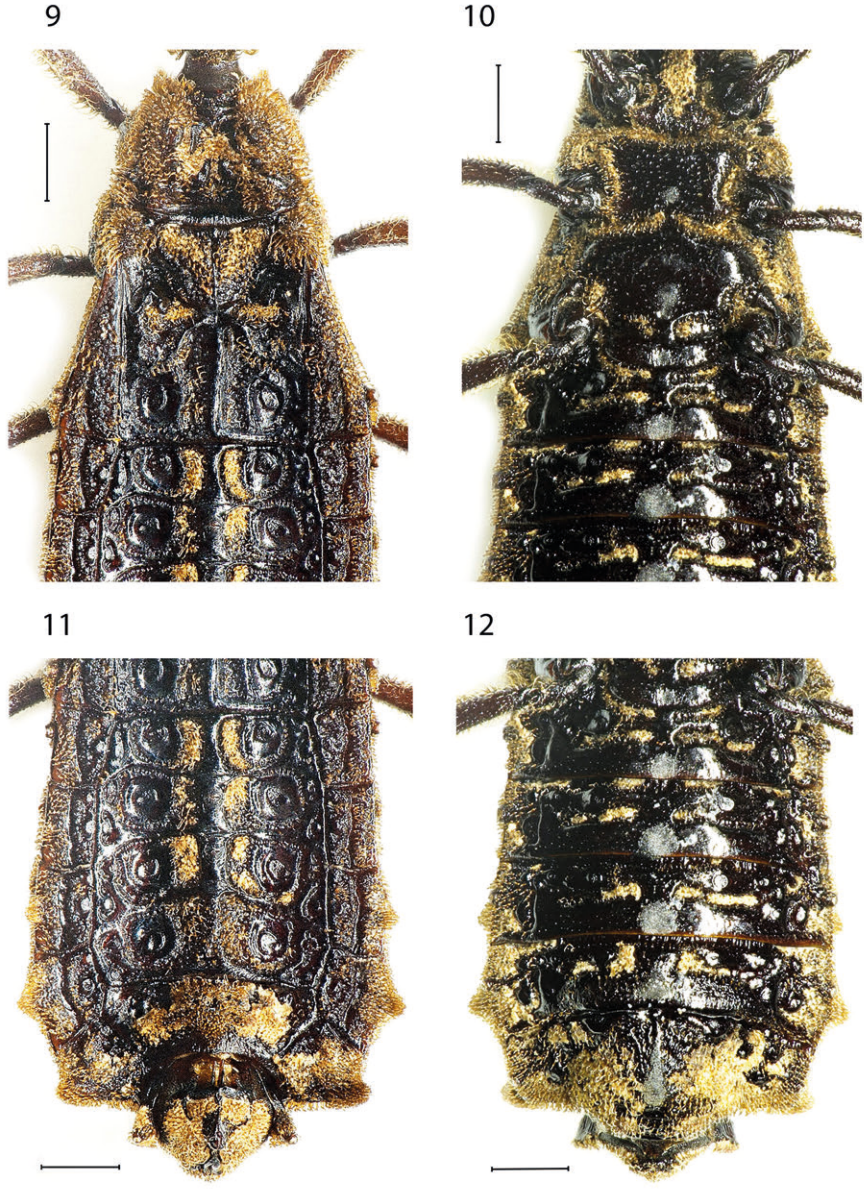


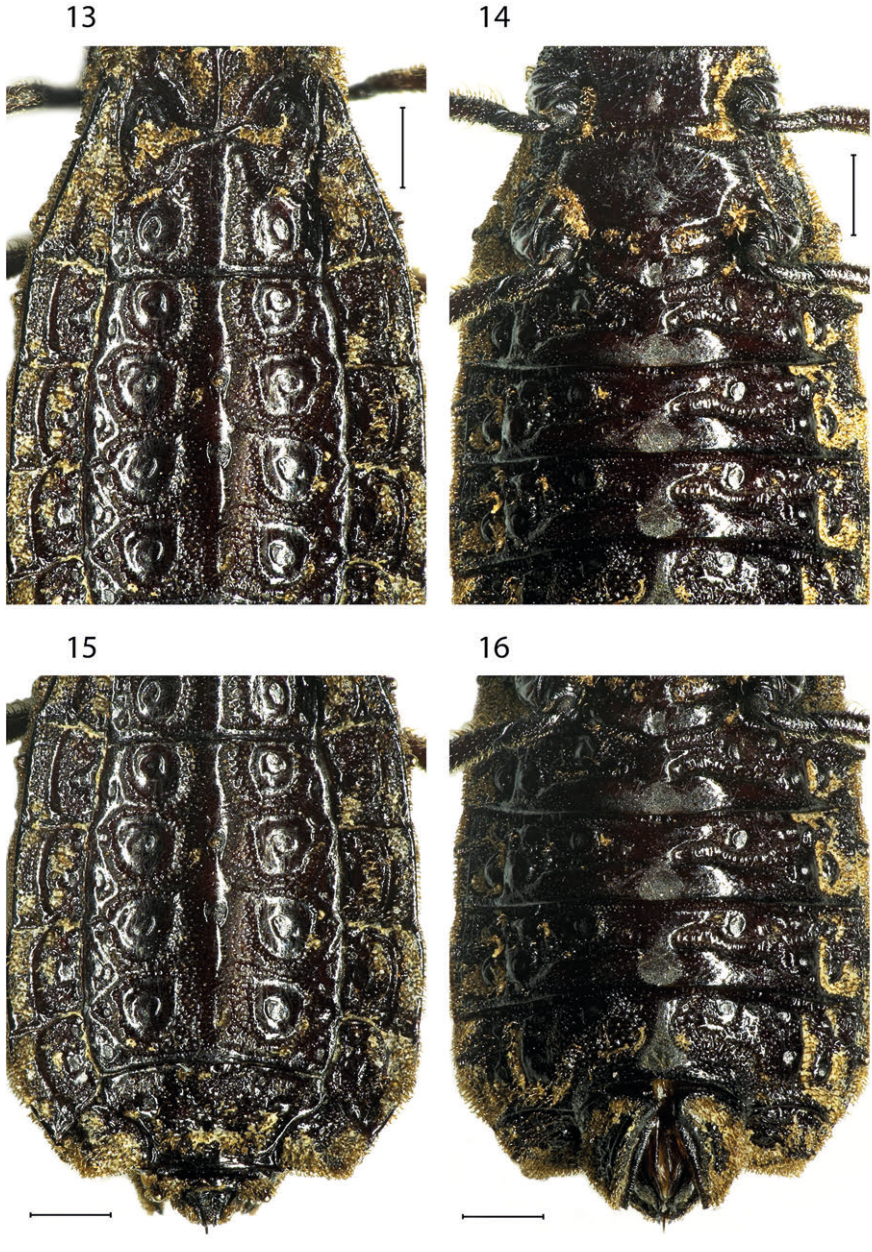
Figs 1-4: *Parazimmermania tamdaoensis* nov.sp. (**1-2**) Holotype male. Habitus. (**3-4**) Paratype female. Habitus. 1, 3, dorsal view. 2, 4, ventral view. Scale bar = 1 mm.



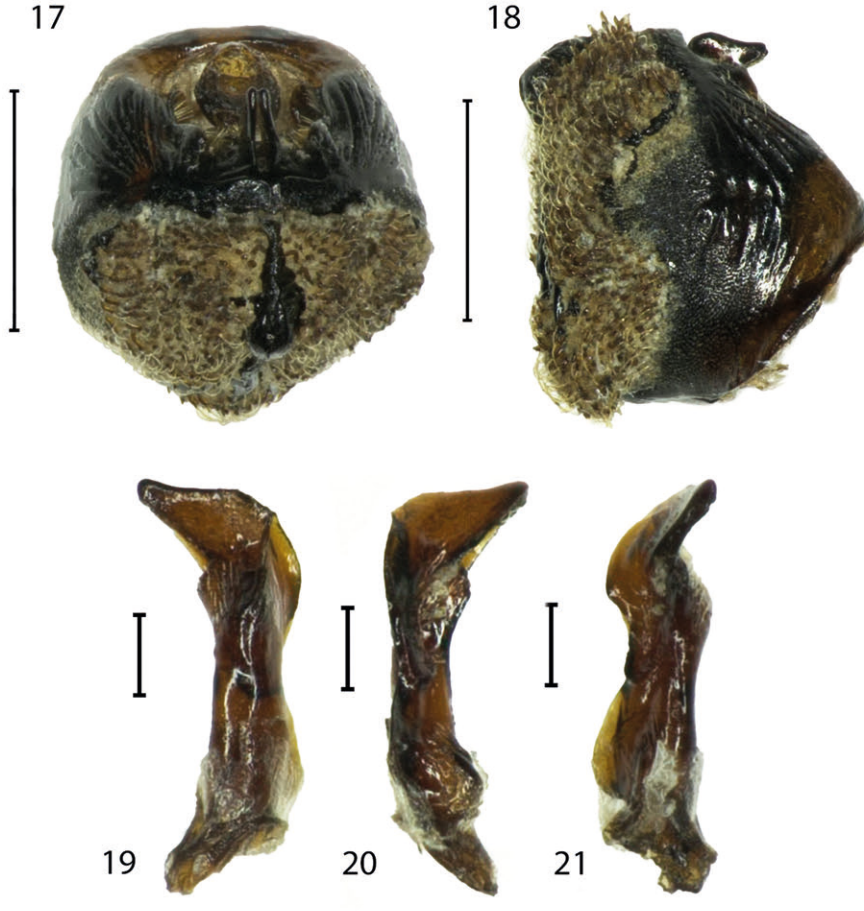
Figs 5-8: *Parazimmermania tamdaoensis* nov.sp. Head and Thorax. (**5-6**) male. (**7-8**) female. 5, 7, dorsal view. 6,8, ventral view. Scale bar = 1 mm.



Figs 9-12: *Parazimmermania tamdaoensis* nov.sp. Male, thorax and abdomen. (**9-10**) thorax and part of central plate, (**11-12**) mtg II and central plate. 9,11, dorsal view. 10, 12, ventral view. Scale bar = 1 mm.



Figs 13-16: *Parazimmermania tamdaoensis* nov.sp. Female, thorax and abdomen. (**13-14**) Meso-metanota, mtgI+ II and part of central plate; (**15-16**) mtg II and central plate. 13, 15, dorsal view. 14, 16, ventral view. Scale bar = 1 mm.



Figs 17-21: *Parazimmermania tamdaoensis* nov.sp. Pygophore and right paramere. (**17-18**) pygophore, 17, dorsal view, 18, lateral view. Scale bar = 0.5 mm. (**19-21**) right paramere. Scale bar = 0.1 mm.

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Zeitschrift/Journal: Linzer biologische Beiträge

Jahr/Year: 2024

Band/Volume: 0056_1

Autor(en)/Author(s): Bai Xiaoshuan, Heiss Ernst, Cai Wanzhi

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