

***Hispidovelina* gen.n. (Hemiptera: Heteroptera: Veliidae) from Southeast Asia**

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Abstract

Hispidovelina gen.n. is erected for *Geovelia hispida* YE, CHEN & BU, 2014. *Hispidovelina hispida* comb.n. was originally described from Southwestern China (Yunnan) and is newly recorded from North and Northeast Thailand and from North-Central Vietnam. The macropterous morphs are newly described.

Key words: Veliidae, Microveliinae, new genus, taxonomy, wing dimorphism, China, Thailand, Vietnam.

Zusammenfassung

Hispidovelina gen.n. wird für *Geovelia hispida* YE, CHEN & BU, 2014 errichtet. *Hispidovelina hispida* comb.n. wurde ursprünglich aus dem Südwesten Chinas (Yunnan) beschrieben und wird nun aus Nord- und Nordost-Thailand sowie aus Nord-Zentral-Vietnam nachgewiesen. Die makropteren Morphen werden erstmals beschrieben.

Introduction

The knowledge of the Microveliinae of the Southeast Asian mainland is still very fragmentary and scattered (e.g., ANDERSEN 1983, 1989, KOVAC & YANG 2000, ANDERSEN et al. 2002, HECHER & ZETTEL 2006, YE et al. 2013, 2014a, POLHEMUS 2017). With the exception of a few widespread species of *Microvelia* WESTWOOD, 1834 the mainland fauna has very few species in common with the island faunas (e.g., LUNDBLAD 1933, NIESER 1995, ZETTEL & SEHNAL 2000, HECHER 2006, ZETTEL 2014, HECHER & LACINY 2021). Only in a few cases the definition of genera is problematic, e.g., for the world-wide distributed, diverse genus *Microvelia*, and for *Baptista* DISTANT, 1903 that contains some rather distantly related species groups (KOVAC & YANG 2000, ZETTEL 2004).

Geovelia ZIMMERMANN, 1984 is a very small Oriental genus. Its species are minute, live cryptically in wet forests (terrestrially), and are rarely represented in collections. This study treats a very distinct microveliine species that was originally described from China and placed in *Geovelia* (YE et al. 2014b). Our studies on *Geovelia* species from Myanmar and India (ZETTEL 2011, ZETTEL & LACINY, in press) showed that this generic placement is unsupported by morphological characteristics. Although there are some superficial similarities with *Baptista*, "*Geovelia*" *hispida* does not fit the generic definition of this genus either. Therefore, we decided to erect a new genus, *Hispidovelina* gen.n.

Material and methods

This taxonomic study is based on 57 specimens (54 apterous, 3 macropterous) of *Hispidovelia hispida* from Thailand, Vietnam, and China, deposited in the collection of the Natural History Museum, Vienna, Austria (NHMW), the Zoological Collection of the Biological Museum, University of Science, Vietnam National University, Hanoi (ZVNU), and the Zoological Reference Collection (ZRC), Lee Kong Chian Natural History Museum, National University of Singapore (see Taxonomy).

Identification of species was confirmed by comparison with the detailed and richly illustrated original description of the apterous morph by YE et al. (2014b). For this purpose, the genitalia of several males were dissected, including the macropterous male described below.

Measurements were performed with a Leica Wild M10 binocular microscope at magnifications of 50× and 80× and are given in millimetres. They refer to the maximum length or width of the respective structure. Measurements of body length and width were taken in dorsal view of specimens. Synthlipsis is the dorsal minimum eye distance. Protibial comb index is calculated by length of protibial comb divided by total tibia length. The stacked digital image (Fig. 1) was taken with a Leica DFC450 camera attached to a Leica Z16APO optics carrier, using Leica Application Suite V3.8. Images were stacked with ZereneStacker 64-bit and processed with Adobe Photoshop 7.0.

Taxonomy

Hispidovelia gen.n. (Fig. 1)

Type species: *Geovelia hispida* YE, CHEN & BU, 2014.

Etymology: The generic name is deduced from the species epithet, which refers to the dense, long pilosity of the apterous morph.

Diagnosis: Body stout, ovate, posteriorly pointed; male smaller and more slender than female. Dorsum of body and abdominal sterna in apterous morph with numerous long, standing, black setae, except on mediotergites 4–8 of female; in macropterous morph restricted to head, sides of pronotum, connexival margins, and sterna. Posterior of head only slightly protruded posteriorly; anterior margin of pronotum only slightly concave. Eyes moderately large. Antenna long and slender, about two thirds of body length; antennomere 1 shorter than head length (0.8); relative length of antennomeres: $4 > 3 > 1 > 2$. Pronotum of apterous morph convexly rounded posteriorly, medially reaching base of mediotergite 1. Lateral evaporatorium small, situated in ventral half of metapleuron. Legs slender. Claws preterminal, their apices just reaching apex of tarsus. Puncturation of sterna normal-sized. Forewing with four closed cells reaching distal quarter of wing. – Male: Femora as slender as in female, unmodified. Protibia unmodified, except for a short protibial grasping comb (about one seventh of tibial length). Mesotibia without grasping comb. Pregenital abdomen without projections. Segment 8 moderately elongated, slender. Pygophore subcylindrical, slender, more than twice as long as broad. Proctiger basally narrow, distally rounded. Parameres symmetrical, moderately long, very slender, gently curved. – Female: Genitalia situated in a strictly posterior opening of segment 7. Proctiger small, knob-shaped.

Comparative notes: *Hispidovelia hispida* was originally placed in *Geovelia*. However, it does not fit most of the characteristics of *Geovelia* (listed below). Furthermore, being connected to aquatic habitats, it shows a different ecology.



Fig. 1: *Hispidovelia hispida*, habitus of macropterous male, dorsal aspect. © NHM Hemiptera Image Collection / Alice Laciny.

The long antennae strongly resemble some species of *Baptista*. The genus *Baptista* connects some well-defined clades of Microveliinae whose close relationship, however, still requires verification. The male of *H. hispida* does not fit into any of these clades by structures of legs, abdominal segments, or genitalia. The type species of *Baptista*, *B. gestroi* DISTANT,

1903 from Myanmar, shows strong modifications of the males' profemur (see redescription by ANDERSEN 1989). This character connects *B. gestroi* with the species of the *B. femoralis* group, who, in addition, possess strong modifications of the males' abdominal segments 6 and 7 (definition by KOVAC & YANG 2000). Finally, species of the *Baptista collaris* group – which all have simple femora and abdomina, differ from *Hispidovelina* gen.n. by the following characters (comp. ZETTEL 2004): protibia in both sexes with row of stout, spine-like setae; sternum 7 of male angularly incised in middle; segment 8 of male posterodorsally distinctly emarginate; paramere distally more or less dilated.

Lathriovelina KOVAC & YANG, 2000 has a broader body shape than *Hispidovelina*, eyes that are set apart from pronotum, a strongly concave anterior margin of pronotum, and last but not least a strongly different lifestyle by inhabiting water-filled bamboo internodes (KOVAC & YANG 2000).

Notes on *Geovelia*: Species of *Geovelia* inhabit moist leaf litter in forests and are not associated with streams (ZIMMERMANN 1984, 2014, ZETTEL 2011). They were described from Nepal (five species, all known only in apterous morph; ZIMMERMANN 1984, 2014), India (one species, known only in apterous morph; ZETTEL & LACINY, in press), and Myanmar (one species, known only in macropterous morph; ZETTEL 2011). Main characters of *Geovelia* are a short and very stout body, a short and wide head that is posteriorly hardly protruded in a very shallow concavity of the pronotal foremargin, large globular eyes, a heavily punctured pronotum, a very short protibial grasping comb of the male, and subterminal claws surpassing the apex of tarsus. ZIMMERMANN (1984) mentioned the short and moderately dense pubescence of *Geovelia*, which immediately distinguishes it from the hairy *Hispidovelina*.

***Hispidovelina hispida* (YE, CHEN & BU, 2014) comb.n. (Fig. 1)**

Material examined (apterous, if not mentioned otherwise): China: 1 male, 1 female, 2 macropterous females, Yunnan, Xishuangbanna, Mengle, stream, 4.VI.2002, leg. C.M. Yang & Gao Lei (#YCM319; ZRC, NHMW); 1 female, Yunnan Province, Xishuangbanna, Mengka, power station, channel from stream, 31.V.2002, leg. C.M. Yang & P. Chew (#YCM304; ZRC); 1 male, 2 females, China, Yunnan, Xishuangbanna, Mengle, stream next to rubber plantation, 4.VI.2002, leg. C.M. Yang & Gao Lei (#YCM320; ZRC). – Thailand: 3 males, 3 females, Chiang Mai Province, Doi Suthep National Park, Mon Tha Than Falls, 750–800 m a.s.l., 2.XI.1995, leg. H. Zettel (#4; NHMW); 1 male, Chiang Mai Province, Doi Suthep National Park, Doi Suthep, near Ruesse Cave, 900–1000 m a.s.l., 5.XI.1995, leg. H. Zettel (#7; NHMW); 1 macropterous male, Chiang Mai Province, Doi Inthanon National Park, Mae Klang Falls, 4.XI.1995, leg. H. Zettel (#6; NHMW); 1 female, Chiang Mai Province, Chiang Dao, Ban Yang Thung Pong, 500 m a.s.l., 8.XI.1995, leg. H. Zettel (#10; NHMW); 1 male, 1 female, Chiang Mai, Chiang Mai to Pai, stream near waterfall, 7.IX.1998, leg. C.M. Yang & T.B. Lim, (#YCM201B; ZRC); 1 male, 1 female, Chiang Mai, New Waterfall, fast flowing stream with boulders, 7.IX.1998, leg. C.M. Yang & T.B. Lim (#YCM203A; ZRC); 7 males, 3 females, Kamphaeng Phet Province, Kamphaeng Phet, side stream to waterfall, 12.IX.1998, leg. C.M. Yang & T.B. Lim (#YCM223; ZRC, NHMW); 1 female, Sakhon Nakhon Province, Phu Pan National Park, 480–520 m a.s.l., 7–8.XII.1995, leg. P. Schwendinger (NHMW); 5 males, Phetchabun Province, 36 km SE Sila, N Ban Nam Nao, Ban Pala Yai, 25.XI.1995, leg. H. Zettel (#27; NHMW); 5 males, 5 females, Phetchabun Province, Nam Nao National Park, Huai Ya Krua, 14.III.1994, leg. W.D. Shepard (#1039; NHMW; uncounted additional specimens in alcohol from this locality in W.D. Shepard collection, not examined in detail); 1 male, Phetchabun Province, 36 km SE Sila, Huai Nam Phang, 2.III.1994, leg. W.D. Shepard (#1024; NHMW); 3 males, 3 females, Chaiyaphum Province, Phu Khiao National Park, tributary to Huai Prom, Mai, 5.IV.1994, leg. W.D. Shepard (#1054; NHMW). – Vietnam: 1 male, Nghe An Province, Con Cuong, near

Tung Huong, Khe Num stream, 21.XII.2012, leg. Ngo Q.H. (NQH1211; ZVNU); 1 male, Thanh Hoa Province, Ben En National Park, Nhu Xuan, Tan Binh, stream 300 m behind Xuan Ly ranger station, 26.II.2013, coll. Pham T.D. (# BE1302; ZVNU); 1 female, Thanh Hoa Province, Ben En National Park, Nhu Xuan, Son Binh, Khe Trai Cao stream, 4.III.2013, coll. Pham T.D. (# BE1308; ZVNU).

Description of macropterous male: Size clearly larger than in apterous male. Body length 2.42 (measured without wings), 2.58 (with wings); maximum body width (at pronotal humeri) 1.05; body width at abdomen 0.85. Head length 0.40, width 0.56. Synthlipsis 0.26. Pronotum length 0.85. Lengths of antennomeres, I 0.34, II 0.24, III 0.42, IV 0.59. Lengths of leg segments: profemur 0.65, protibia 0.64, protarsus 0.28, mesofemur 0.79, mesotibia 0.74, mesotarsus 0.14 + 0.23, metafemur 0.88, metatibia 0.97, metatarsus 0.18 + 0.26; protibial comb length 0.09; comb index 0.14.

Colour: Body chiefly black. Pronotum with a narrow transverse yellow stripe near foremargin. Lateral parts of sterna and laterotergites orange coloured. Antenna brown. Rostrum yellow. Legs chiefly yellow, apical parts of all femora and of protibia brown. Mesotibia, metatibia, and all tarsi yellowish brown. Wings including venation brown; base of forewing with two distinct white stripes; distal part with very diffuse whitish spots.

Pilosity: Standing setae on dorsum much fewer than in apterous morph: head with few standing setae; pronotum with standing setae restricted to anterolateral areas between anterior corners and humeri. Forewing with single rows of setae on basal veins, posteriorly reaching approximately end of white patches. Lateral connexival margins with two irregular rows of standing setae. Setae on sterna approximately as in apterous morph.

Structures: Similar to apterous morph. Anterior margin of pronotum very shallowly concave; humeri of pronotum very prominent, humeri and disc between them slightly elevated; outline of sides in front of humeri gently concave. Forewing with four large cells, the distal two reaching distal quarter of wing, plus an apically open apical cell. Abdomen much broader than in apterous morph, sides subparallel in anterior half, posteriorly moderately converging. Genitalia exactly as in apterous morph.

Description of macropterous female: Measurements: Body length 2.68–2.73 (proctiger exceeding wings); maximum body width (at pronotal humeri) 1.05–1.10; body width at abdomen 0.96–1.00. Head length 0.47–0.48, width 0.58–0.60. Synthlipsis 0.29–0.30. Pronotum length 0.78–0.85. Lengths of antennomeres ($n = 1$), I 0.30, II 0.24, III 0.40, IV 0.59. Lengths of leg segments ($n = 1$): profemur 0.61, protibia 0.54, protarsus 0.28, mesofemur 0.77, mesotibia 0.72, mesotarsus 0.14 + 0.25, metafemur 0.80, metatibia 0.99, metatarsus 0.19 + 0.24.

Colour, pilosity, and structure of pronotum as in macropterous male. Abdomen wider than in male, laterally broadly surpassing wing margin; shape of abdomen in dorsal view ovate, not constricted posteriorly as in apterous female.

Ecology: Specimens collected by the first author were found at the edges of streams in forested areas. The specimen from Nghe An Province in Vietnam was collected from the shaded edges of a small, slow-flowing stream.

Distribution: China (Yunnan) (YE et al. 2014b; this study), Thailand (Chiang Mai, Kamphaeng Phet, Sakhon Nakhon, Phetchabun, Chaiyaphum; this study), Vietnam (Nghe An, Thanh Hoa; this study).

Acknowledgements

Thanks are due to Prof. Dr. William D. Shepard, Dr. Peter Schwendinger, and Yang Chan Man (ZRC) for the donation of specimens to the Natural History Museum Vienna, also to Ms. Pham Thi Diep and Mr. Ngo Quang Hiep, former students of the Faculty of Biology, VNU University of Science, for collecting the specimen from Thanh Hoa and Nghe An provinces, Vietnam. Fieldwork in Thailand by the first author was kindly supported by Dr. T. Jamjanya, Dr. Y. Hanboonsong, and Dr. N. Sangpradub (all Khon Kaen University), and Prof. Dr. S. Wongsiri (Chulalongkorn University, Phitsanulok). Study visits of the first author to ZRC were kindly supported by the National University of Singapore. Christine Hecher kindly reviewed the manuscript.

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Jahr/Year: 2021

Band/Volume: [73](#)

Autor(en)/Author(s): Zettel Herbert, Laciny Alice, Tran Anh Duc

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