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The genus *Stiphroneura* GERSTAECKER, 1885 from the Oriental realm (Neuroptera: Myrmeleontidae)

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Abstract: The endemic species *Stiphroneura inclusa* (WALKER, 1853) and *Vellassa maunieri* NAVÁS, 1924 occurring in the Oriental realm were compared. We identified that the original designation and monotypic genus *Vellassa* NAVÁS, 1924 **syn. n.** is a junior synonym of *Stiphroneura* GERSTAECKER, 1885, so *Stiphroneura maunieri* (NAVÁS, 1924) **comb. n.** is a new combination. The genus *Stiphroneura* GERSTAECKER, 1885 is redescribed. The recognition characters and distribution of the two species are given. Morphological characters are illustrated with several photos. *Stiphroneura inclusa* (WALKER, 1853) is a new species in the local fauna of Laos and Nepal.

Key words: taxonomy, new synonymy, new combination, Acanthaclisini, *Vellassa*, Oriental region.

INTRODUCTION

The family of Neuroptera (lacewings) with the largest number of species is the Myrmeleontidae (antlions). In recent years, morphological studies supplementing genetic examination have significantly transformed the higher-level taxonomy of antlions (JONES 2019, MACHADO *et al.* 2019). According to MACHADO *et al.* (2019) antlions have been classified into 4 subfamilies: Ascalaphinae, Myrmeleontinae, Dendroleontinae, and Nemoleontinae, of which the Myrmeleontinae subfamily contains the most species. One of its tribes is Acanthaclisini NAVÁS, 1912 with 16 genera and approx. with 100 species (STANGE 2004 (99 sp.), MACHADO *et al.* 2019 (104 sp.)). The number of genera has not changed significantly in recent decades (MARKL 1954, STANGE 2004). At the species level, there were no major revision works in the genera.

The tribe is spread all over the Earth. Nine genera occur in the Oriental and adjacent realms. Of these, species of the genera *Acanthaclisis* RAMBUR, 1842 (1 sp.), *Centroclisis* NAVÁS, 1909 (9 sp.), *Synclisis* NAVÁS, 1919 (2 sp.), and *Syngenes* KOLBE, 1897 (2 sp.) can be found in the Palearctic, Afrotropical, and Oriental realms in overlapping areas. In the Australian and

Oriental realms, the species of *Heoclis* NAVÁS, 1923 (2 sp.) is documented in the eastern half of the Oriental. The genera *Madrastra* NAVÁS, 1912, *Stiphronera* GERSTAECKER, 1885 and *Vellassa* NAVÁS, 1924 are monotypic and endemic in the Oriental realm (STANGE 2004).

The number of Acanthaclisini species occurring in the Oriental is not high, currently: 19 (STANGE 2004, OSWALD 2023).

During the digitization of the museum collections, species are reidentified and taxonomic changes are published. This paper is based on the comparison of species of the genera *Stiphronera* GERSTAECKER, 1885, and *Vellassa* NAVÁS, 1924.

MATERIAL AND METHODS

The studied material is based on the data of three collections. The data of the specimens are listed in the material examined paragraph. We also used the data published in the annotated literature for the distribution map of the species.

The new habitus photos were taken by Canon EOS 400 digital camera equipped with a flashlight system (Sigma EM140 DM) and a Nikon D700 camera with a macro lens (AF-S Micro Nikkor lens 60 mm). The genital structures of both species were imaged using a binocular Nikon SMZ1500 equipped with a Microscopic photographic system and a Nikon digital DS Fi1 camera.

According to traditional methods, the caudal part of the abdomen was removed, and treated with a 10% KOH solution for 48 hours at room temperature. Then it was rinsed in distilled water. For taking the photo, the genitalia were placed in glycerine in a Petri dish. Finally, each genitalia was transferred into glycerine in a microvial for preservation.

The terminology for male and female genitalia follows ASPÖCK *et al.* 1980, ASPÖCK U. & ASPÖCK H. 2008 and BADANO *et al.* (2017).

Abbreviations of the collections:

SCMK – Rippl-Rónai Museum, (former Somogy County Museum), Kaposvár, Hungary,

USMB – Upper Silesian Museum, Bytom, Poland,

ZPPCB – Zoltán Papp private collection, Budapest, Hungary.

Abbreviations of the annotation:

Chlist – Checklist; Comb – New combination; Com – Comment; Dist – Distribution; Key – Key for genera; List – Faunal list; Mon – Monograph; Nom – Nomenclature; Odescr – Original description; Redescr – Redescription; Syn – Synonym.

Abbreviations of the figures:

adv – additional vein, ep – ectoproct, T8 and T9 – tergite 8 and 9, S8 and S9 – sternite 8 and 9; gx – gonocoxites, gx9 – gonocoxites 9 (parameres) gx11 – gonocoxites 11 (gonarcus) in male; gx9 – gonocoxites 9 (lateral gonapophysis), gx8 (posterior gonapophysis), gp8 – gonoapophysis 8 (gonapophysal plate) in female

RESULTS AND DISCUSSION

Taxonomy

STANGE (2004) listed one species each from the Oriental in the genera *Stiphronera* GERSTAECKER, 1885, and *Vellassa* NAVÁS, 1924. *Stiphronera inclusa* (Walker, 1853) is a species with a spectacular, and wide distribution, which is why it was redescribed in numerous monographs and publications (GHOSH 1984, 2000, WANG *et al.* 2018). In contrast,

the also large *Vellassa maunieri* NAVÁS, 1924, with a narrow distribution area, is a little-known species, listed only by STANGE (2004) and OSWALD (2023).

During the study of specimens of the two species, we found that the genus *Vellassa* NAVÁS, 1924 **syn. n.** is a junior synonym of *Stiphroneura* GERSTAECKER, 1885.

***Stiphroneura* GERSTAECKER, 1885**

Type species: *Myrmeleon inclusus* WALKER, 1853.

Stiphroneura GERSTAECKER, 1885 – (Odescr), GHOSH 1984, 2000 (Redescr), STANGE & MILLER 1985 (Key), OSWALD & PENNY 1991 (Mon), NEW 2003 (Com), WANG *et al.* 2018 (Redescr).

Neriga NAVÁS 1926 – (Odescr), MARKL 1954 (Syn.)

Type species: *Neriga oculata* NAVÁS, 1926 (Odescr – mislabelled, incorrect collecting site from Belga Kongo [today: Democratic Republic of the Congo]).

Stiphroneuria STANGE & MILLER 1985 (misspelling).

Vellassa NAVÁS, 1924 **syn. n.**

Diagnosis: Strikingly large antlions. Length of forewing: 65-75 mm, length of hind wing same as length of forewing. Body powerful, and wings cover it entirely at rest position. Antenna clavate, long, equal to length of thorax. Vertex slightly raised. Eyes large. Palpimacula mace-shaped with opening oval-shaped, located medially. Pronotum usually somewhat longer than wide. Wings strongly elongated, apex rather rounded, basal area blunt. Venation dense, cross-veins in costal area divided except for basal part, and roughly rectangular shaped, number of irregular cells increases towards pterostigma in forewing. Anterior and posterior Banksian lines clearly visible in forewing. Presectoral veins of hindwing in first third of basal part connect to radial vein with short parallel additional vein.

Membrane patterned with larger and smaller spots. Legs short and strong. Tibial spurs bent at 90 degrees, twice as long as claw. Tibial segments 1-4 very short, and equal length, their combined length as long as length of tibial segment 5. Male ectoproct oval with post-ventral lobe in lateral view. Genital membrane without setae. Female ectoproct oval in lateral view, gonocoxites 9 (lateral gonapophysis) hemispherical with short strong spines, gonocoxites 8 (posterior gonapophysis) twice longer than length of gonocoxites 8 part (anterior gonapophysis) in ventral view.

Larva: Unknown (STANGE & MILLER 1985, STANGE 2004).

Distribution: Only in the Oriental region.

Comments: The genus was described by GERSTAECKER (1885) as a comparison with the genus *Acanthaclisis* RAMBUR, 1842. The description of the genus by GHOSH (1984, 2000) is inaccurate in several characters. The genus diagnosis and key of STANGE & MILLER (1985) and WANG *et al.* 2018 are similar but short, so we considered it important to redescription the genus.

***Stiphroneura inclusa* (WALKER, 1853) (Fig. 1 and 2)**

Myrmeleon inclusus WALKER, 1853 – (Odescr), NAVÁS 1930 (List).

Acanthaclisis inclusa (WALKER, 1853) – HAGEN 1866 (Comb, Dist), McLACHLAN 1868 (Comb).

Stiphroneura inclusa (WALKER, 1853) – NEEDHAM 1909 (Dist), GHOSH 1977 (Dist), 1984 (Redescr), GHOSH & SEN 1977 (Chlist), KRIVOKHATSKY 1997 (Dist), GHOSH 2000 (Redescr, Dist), WHITTINGTON 2002 (Dist), NEW 2003 (Dist), BAO & WANG 2004 (Redescr, Dist), STANGE 2004 (Mon), CHANDRA & SHARMA 2010 (Chlist), CHANDRA *et al.* 2011 (Redescr, Dist), WANG *et al.* 2018 (Mon), YANG *et al.* 2018 (Chlist), HALDER *et al.* 2018 (List).

Neriga oculata NAVÁS 1926 – (Odescr – mislabelled, incorrect collecting site from Belga Kongo [today: Democratic Republic of the Congo]), NAVÁS 1930 (Syn).

Neriga inclusa WALK. – NAVÁS 1932. (Comb, Dist).

Neriga limoiana C.-K. YANG IN C.-K. YANG & X.-L. WANG, 2002 – Odescr, BAO & WANG 2004 (Syn), WANG *et al.* 2018 (Mon).

Stiphronera limoiana (C.-K. YANG IN C.-K. YANG & X.-L. WANG, 2002) – BAO & WANG 2004 (Comb).

Material examined:

In coll. SCMK: 1♀ – Nepal Ganesh Himal Paidobesy 3 km N of Betrawati 700m 11-12.09.1995 leg. P. Gyulai-A. Garai (NeuMyr665); 1♂ – Laos, Plateau des Boloven 5 km W Ban Nong Mek, Pakxe 07.09.2003. leg. local collector (NeuMyr666); 1♂ – Vietnam, Axan Mts. Tay Giang, Quang 1300m 05/2017. leg. local collector (NeuMyr2213; 1♂ – Vietnam, Axan Mts. Tay Giang, Quang Nam. 1300m 05.2018. leg. local collector (NeuMyr2284); 1♂ – Vietnam, Axan Mts. Tay Giang, Quang Nam 1300m 10.2019. leg. local collector (NeuMyr2939); 1♂ – Vietnam Axan Mts, Tay Giang, Quang Nam 1300m 09.2019. leg. local collector (NeuMyr8470); 1♀ – Vietnam Axan Mts, Tay Giang, Quang Nam 1300m 09.2019. leg. local collector (NeuMyr8471).

In coll. USMB: 4♂♂ – Vietnam, Kon Tum province, Ngoc Linh Nature Reserve, 1800 m, IX 2016, leg. Thanh Luong Le + local collectors (USMB 5858/15326-15329); 1♂1♀ – Vietnam, Quang Nam Province, Tay Giang District, Axan Mt., 1300 m, IX 2017, leg. Thanh Luong Le + local collectors (USMB 5858/23382, 5858/22959); 1♀ – Vietnam, Quang Nam Province, Tay Giang District, Axan Mt., 1300 m, IX 2019, leg. Thanh Luong Le + local collectors (USMB 5858/24007).

In coll. ZPPCB: 2♂ – NW Laos, Nam Kat, 770 m. V-VI/2021. leg. local collector; 2♂ – Central Vietnam, Bana Hills, Mt. Troung Son, Da-Nong, 1450 m. IX/2015. leg. local collector; 1♂ 1♀ – Central Vietnam, Axan Mts., Tay Giang, Quang Nam, 1300m, V/2018. leg. local collector; 1♂ – Central Vietnam, Axan Mts. Tay Giang, Quang Nam, 1300 m, VI/2018. leg. local collector; 1♀ – Central Vietnam, Axan Mts., Tay Giang, Quang Nam, 1300 m, VIII/2018. leg. local collector; 1♂ 1♀ – Central Vietnam, Axan Mts, Tay Giang, Quang Nam, 1300 m, VI/2019. leg. local collector; 2♂ 4♀ – Central Vietnam, Axan Mts., Tay Giang, Quang Nam, 1300 m, VI/2019. leg. local collector; 2♂ 1♀ – Central Vietnam, Axan Mts, Tay Giang, Quang-Nam, 1300 m, IX/2020. leg. local collector.

Distribution: Burma [Myanmar] (WALKER 1853, NAVÁS 1932), China (YANG & WANG 2002, BAO & WANG 2004), India (NEEDHAM 1909, GHOSH 1984, CHANDRA *et al.* 2011), Thailand and Vietnam (KRIVOKHATSKY 1997). New for Laos and Nepal. (Fig. 5).

Comments: There are only two easily recognizable species in the genus, so we do not consider it necessary to provide a new morphological description of the species (See: WALKER, 1853, GHOSH 1984, 2000, BAO & WANG 2004, CHANDRA *et al.* 2011, 2014, WANG *et al.* 2018), instead we provide photos.

Stiphronera maunieri (NAVÁS, 1924) **comb.n.** (Fig. 3 and 4)

Vellassa maunieri NAVÁS, 1924 – (Odescr), STANGE 2004 (Mon).

Material examined:

In coll. SCMK: 1♀ – Vietnam, Lâm Thủy, Lê Thủy District, Quang Binh Province, 800-1200 m, 05. 2023, local collector. (NeuMyr9050).

In coll. USMB: 1♂ – Vietnam, Nghe An Province, Tuong Duong District, Tam Thai Mt., 400 m, IV/2019, leg. Thanh Luong Le + local collectors (USMB 5858/23356); 1♀ – Vietnam, Quang Nam Province, Tay Giang District, Axan Mt., 1300 m, III 2019, leg. Thanh Luong Le + local collectors (USMB 5858/24020).

In coll. ZPPCB: 1♀ – Vietnam, Lâm Thủy, Lê Thủy District, Quang Binh Province, 800-1200 m, 05. 2023, local collector; 1♀ – Central Vietnam, Axan Mts, Tay Giang, Quang-Nam, 1300 m, VI/2020. leg. local collector.

Distribution: Vietnam. (Fig. 5).

Differential characters: The genus *Stiphronera* can be easily separated from the other genera of the tribe Acanthaclisini: *Acanthaclisis*, *Centroclisis*, *Heoclisis*, *Madrastra*, *Synclisis*, *Syngenes* (STANGE & MILLER 1985) in the Oriental realm.

The two species belonging to the genus *Stiphronera* can be recognized based on the pattern of the wings (Compare: Fig. 1 and Fig. 3). The thorax of *S. maunieri* is dominantly brown with larger yellow spots, while that of *S. inclusa* is almost entirely dark brown. The number of cross-veins in the presectoral area of *S. maunieri* forewing is 9-10, while that of *S. inclusa* has 14-16 cross-veins.

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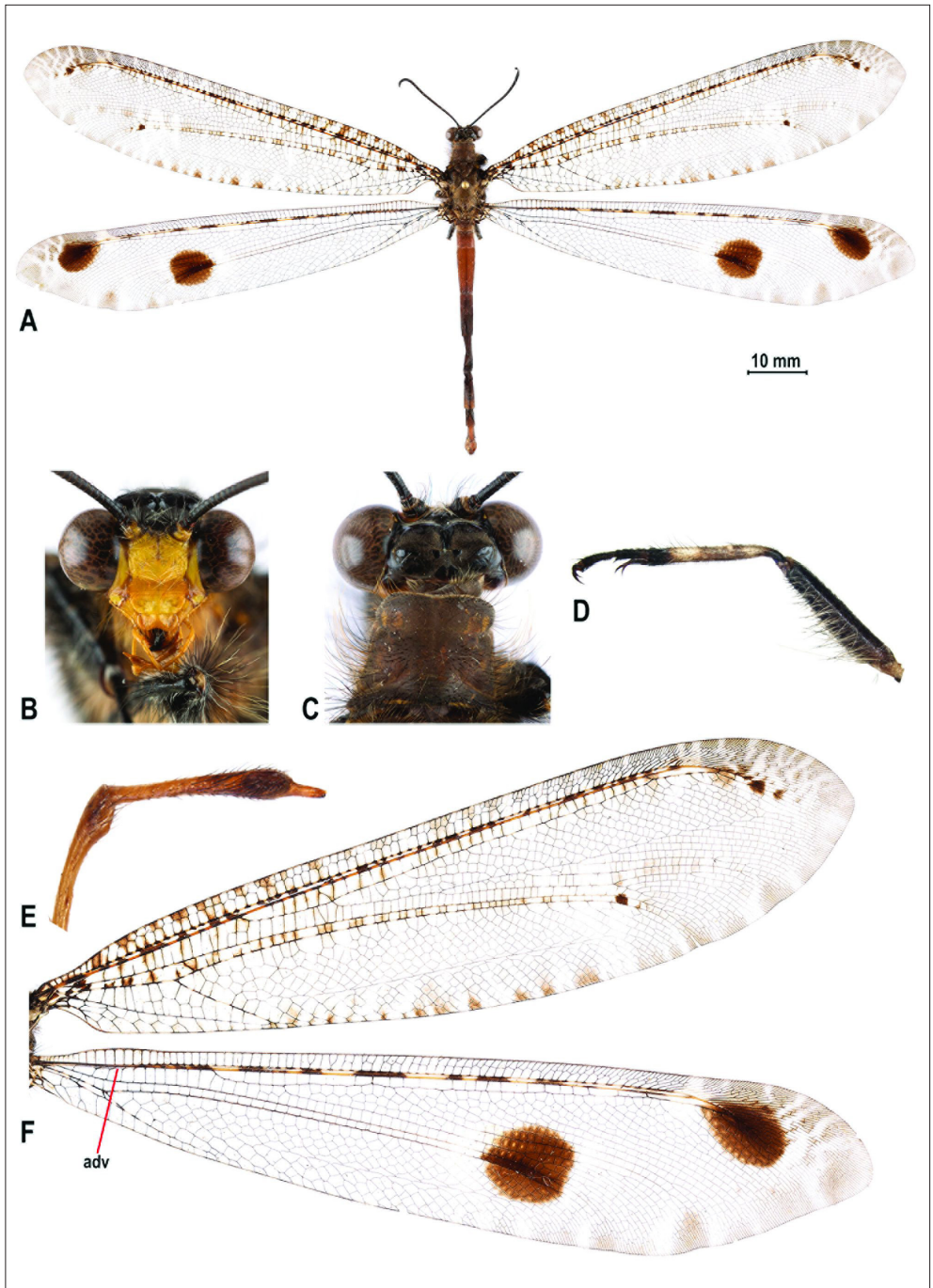


Fig. 1. *Stiphronera inclusa* (WALKER, 1853): A – habitus in dorsal view, (scale: 10 mm), B – head in frontal view, C – thorax in dorsal view, D – hind leg, E – labial palp, F – wing venation (in different scales).

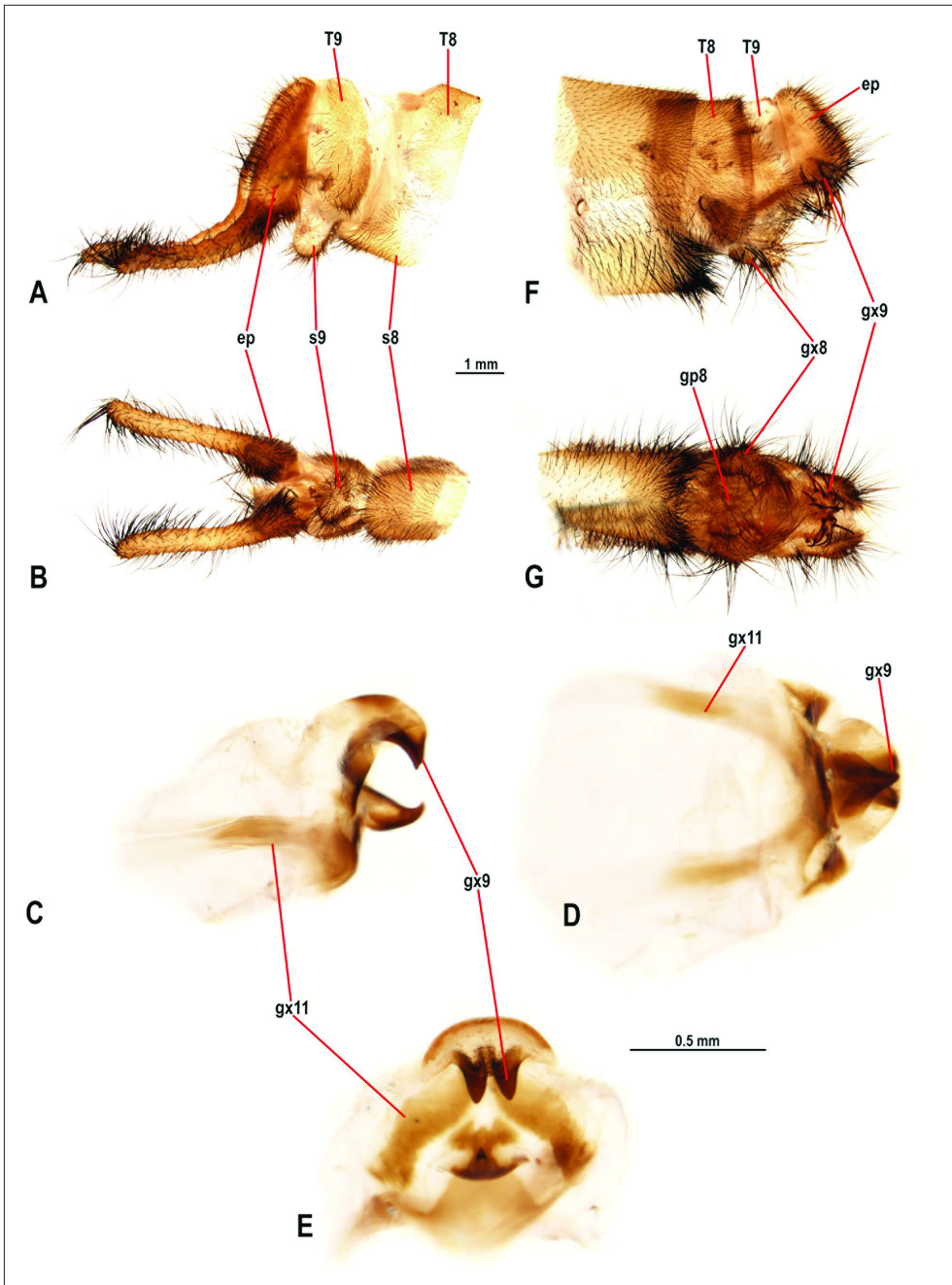


Fig. 2. *Stiphoneura inclusa* (WALKER, 1853) terminalia and genitalia: A – male terminalia in lateral view, B – the same in ventral view (scale: 1 mm), C – male genitalia in lateral view, D – the same in ventral view, E – the same in caudal view (scale: 0.5 mm), F – female terminalia in lateral view, G – the same in ventral view, (scale: 1 mm).

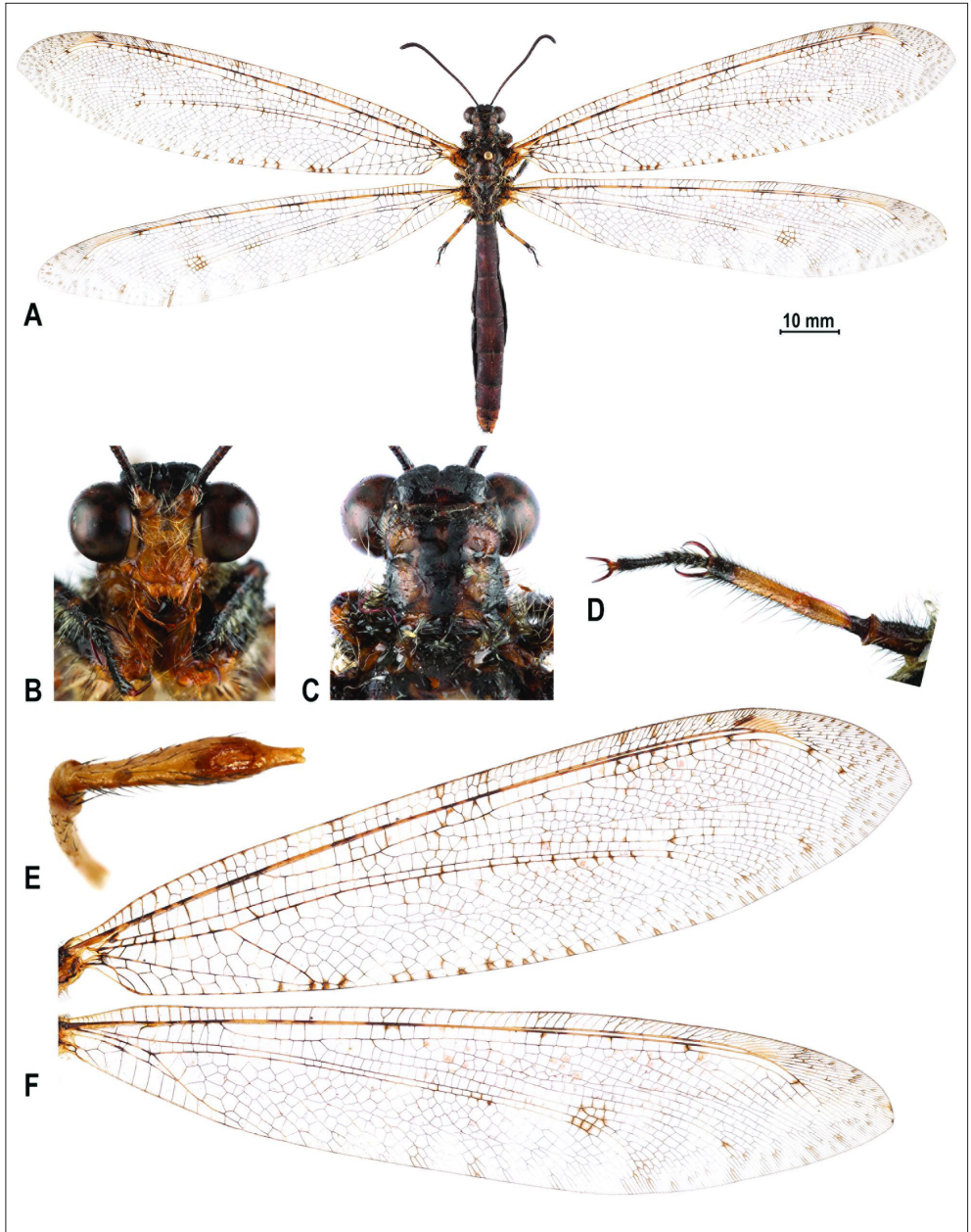


Fig. 3. *Stiphronera maunieri* (NAVÁS, 1924) A – habitus in dorsal view, (scale: 10 mm)
B – head in frontal view, C – thorax in dorsal view, D – hind leg, E – labial palp,
F – wing venation (in different scales).

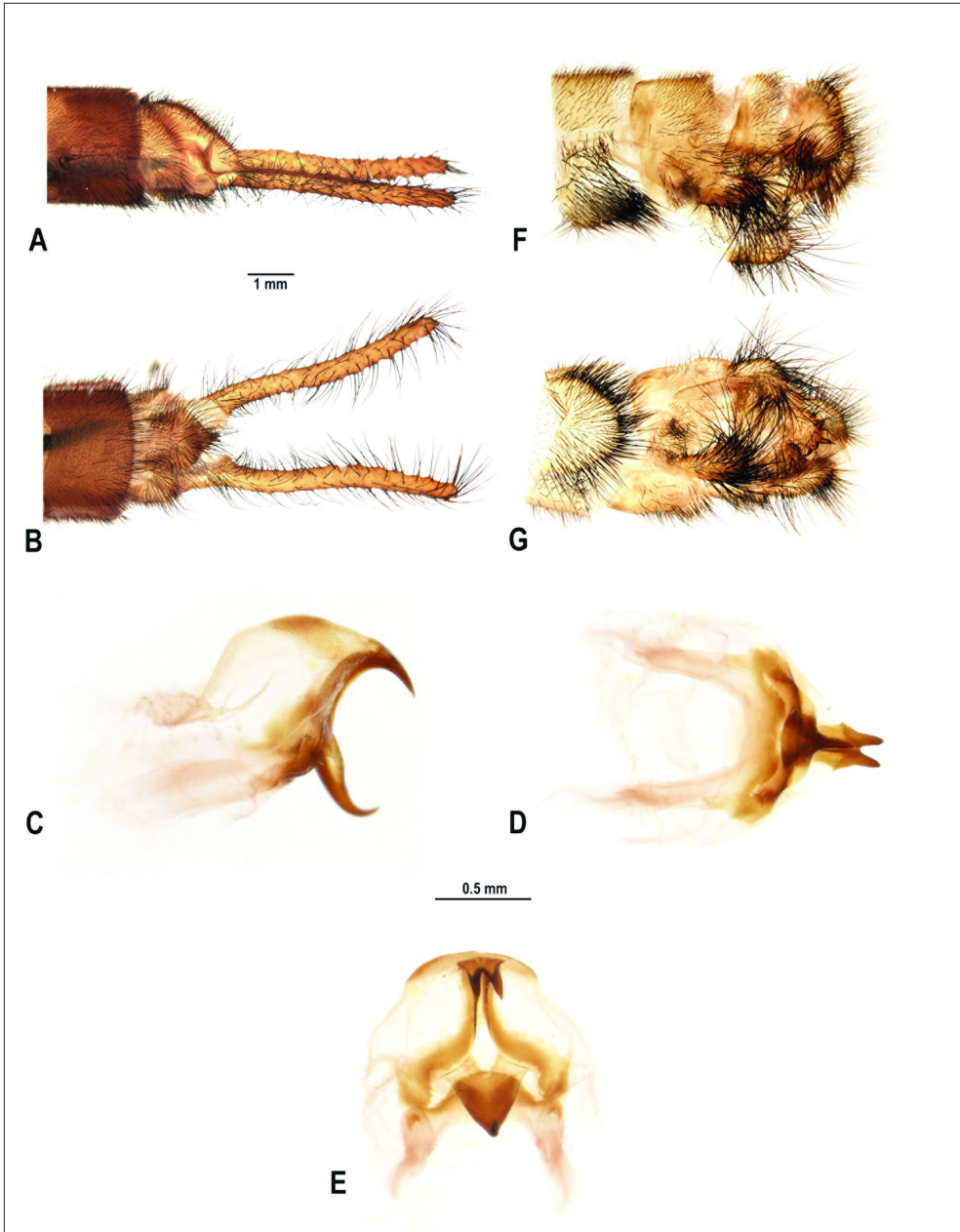


Fig. 4. *Stiphroneura maunieri* (NAVÁS, 1924) terminalia and genitalia: A – male terminalia in lateral view, B – the same in ventral view (scale: 1 mm), C – male genitalia in lateral view, D – the same in ventral view, E – the same in caudal view (scale: 0.5 mm), F – female terminalia in lateral view, G – the same in ventral view, (scale: 1 mm).

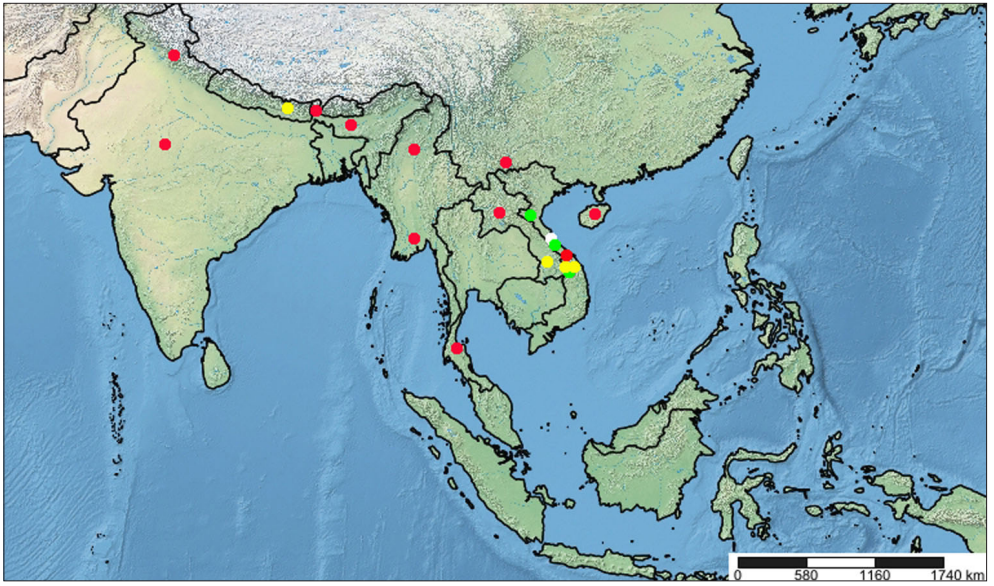


Fig. 5. Distribution of *Stiphoneura* species, *S. inclusa* data from literature in red circle, new data yellow circle, *S. maunieri* data from literature white circle, new data green circle.

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