

A new species and a new record species of *Megischus* Brullé (Hymenoptera, Stephanidae) from Vietnam

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Abstract

A new crown wasp species, *Megischus shixiangi* Ge & Tan, **sp. nov.** from Vietnam (Hymenoptera: Stephanidae), is described and illustrated. In addition, *M. kuafu* Ge & Tan is first recorded in Vietnam. A distribution map of the Vietnamese species is provided.

Keywords

Crown wasps, Oriental, parasitoids, Taxonomy

Introduction

The genus *Megischus* Brullé, 1846, is the second species-rich genus of the crown wasps family Stephanidae Leach, 1815 which is a clade with the superfamily Evanioidea sister to all other groups of the aculeate Hymenoptera (Branstetter et al. 2017; Peters et al. 2017). The genus *Megischus* consists of 89 extant species up to date, with a worldwide distribution but mainly found in the Oriental regions (Aguiar 2004; Hong et al. 2011; Binoy et al. 2020; Ge et al. 2021a, 2021b, 2022). This genus can be easily recognized by the comparatively large body size, the complete venation with subdiscal cell 1 elongated and 2Cub pigmented, as well as the distinct ivory subapical band on the ovipositor sheath.

van Achterberg (2002) made a revision from the Old World *Megischus* recognizing 42 species belonging to 7 groups. In the world catalog of the Stephanidae by Aguiar,

(2004) a total of 73 *Megischus* species were recorded with 34 of them distributed in Oriental regions. Afterward, more Oriental species of *Megischus* were described in China, India and the Ryukyu Islands (van Achterberg and Yang 2004; Hong et al. 2010; Binoy et al. 2020; Ge et al. 2021a, 2022).

However, as a country located in the hot spot area of species diversity of the crown wasp, up to now, only two species of *Megischus* are recorded in Vietnam, *i.e.* *M. ruficeps* de Saussure and *M. tonkinensis* van Achterberg. Here we describe a new species and report a new record species of *Megischus* in Vietnam. A key to the Vietnamese species of the genus is compiled, as well as a distribution map.

Materials and methods

For identification of the genera of Stephanidae, van Achterberg (2002) and Hong et al. (2011) were used.

Observations, descriptions and photographic images were made with a SONY ILCE-7RM4A a7r4a Alpha 7R IVA mirrorless camera attached with LAOWA 90mm F2.8 CA-Dreamer Macro 2X lens. Morphological terminology follows van Achterberg (2002) including the abbreviations for the wing venation. The types are deposited in the College of Forest Protection, Beijing Forestry University (BFU), China.

Key to species of the genus *Megischus* Brullé from Vietnam

- 1 Lateral view of widened part of hind tibia deeply concave ventrally; Ivory part of ovipositor sheath 1.0–1.5 times as long as its dark apical part ***M. ruficeps* de Saussure**
- Lateral view of the hind tibia below depression nearly parallel-sided or rather weakly concave; Ivory part of ovipositor sheath 2.0 times as long as its dark apical part or longer **2**
- 2 Neck with only interrupted carina before pronotal fold; Forewing with vein 1-M 5.9× as long as vein 1-SR and 0.8× vein m-cu; vein 2-SR 0.9× as long as vein r; vein 1-SR 1.1× as long as parastigmal vein ***M. kuafu* Ge & Tan**
- Neck with both complete and interrupted carina before pronotal fold; Forewing with vein 1-M 6.5–6.7× as long as vein 1-SR and 1.1–1.3× vein m-cu; vein 2-SR about as long as vein r or longer; vein 1-SR 0.5× as long as parastigmal vein **3**
- 3 Vertex reddish brown (in original description chestnut-brown), not distinct contrast to the temple. Rugosity of the vertex comparatively regular with five strong regularly curved lamelliform carinae behind posterior teeth; Pronotum robust, with less than 1.2× its length than maximum width; Propodeum coarsely and densely foveolate ***M. tonkinensis* van Achterberg**
- Vertex blackish, distinct contrast to the dark reddish temple. Rugosity of the vertex more irregular with three or four (the last one rather weak and in-

complete) strong regularly curved lamelliform carinae behind posterior teeth; Pronotum relatively slender, with more than 1.3× its length than maximum width; Propodeum with large foveolate sparsely distributed
*M. shixiangi* Ge & Tan, sp. nov.

Genus *Megischus* Brullé, 1846

Megischus Brullé, 1846: 537. Type species (designated by Viereck 1914): *M. annulator* Brullé, 1846 [= *M. furcatus* (Lepeletier & Serville, 1825)].

Megischus Brullé, 1846: van Achterberg 2002: 53–168; Aguiar and Johnson 2003: 469–482.

Bothriocerus Sichel, 1860: 759. Type species: *Bothriocerus europaeus* Sichel, 1860 (by monotypy) (= *Stephanus anomalipes* Foerster, 1855, according to Madl 1991).

Diagnosis. Medium to large size. First subdiscal cell comparatively narrow basally, approximately as wide as the first discal cell or narrower; vein M+CU1 with four short, erect, equidistant spiny setae; veins 1-M and 2-SR straight or nearly so. Dorsal tooth of hind coxa absent; hind femur with two distinct teeth; hind tibia narrowed basally and inner side usually with wide sub-medial depression, without oblique striae or rugae on outer side; hind tarsus of females with three tarsomeres. Ovipositor sheath with distinct ivory subapical band.

Distribution. Cosmopolitan.

Megischus shixiangi Ge & Tan, sp. nov.

<https://zoobank.org/1B52BB7E-EEDF-4193-9B3F-3E52AACF923F>

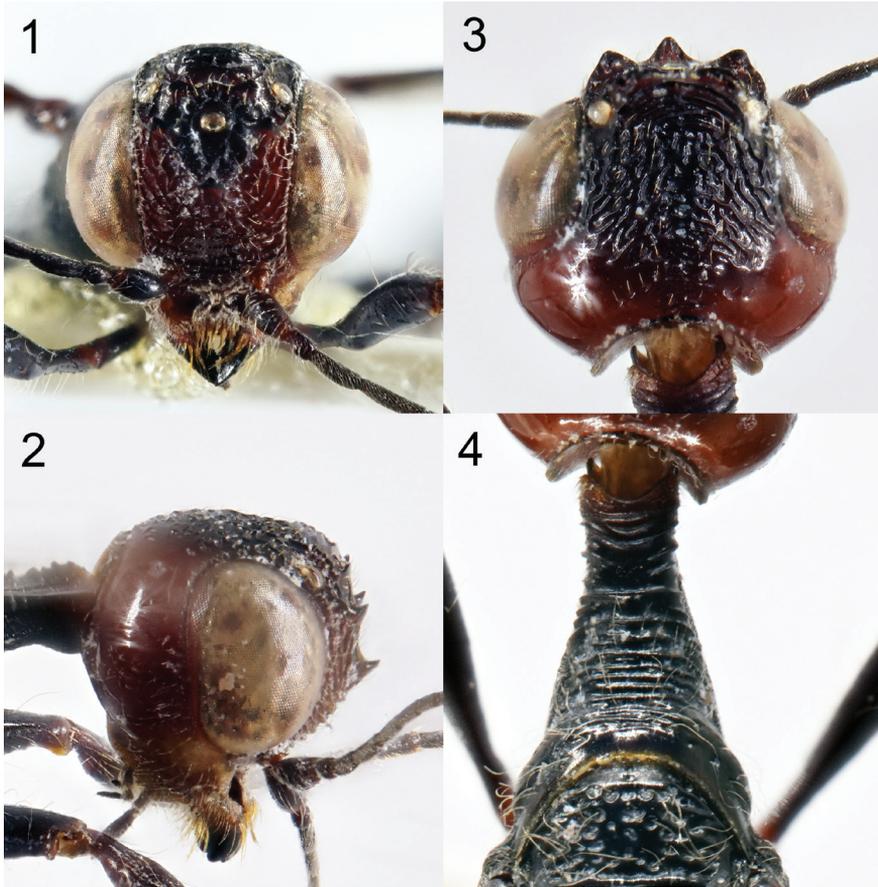
Figs 1–15

Material examined. *Holotype*, ♀ (BFU), Tuong Duong, Nghe An, Vietnam XI. 2021, leg. Local collector.

Etymology. We named the new species after Prof. Shi-Xiang Zong. To thank him for his kind support for the first author's taxonomy research.

Diagnosis. Head with blackish vertex distinctly contrasting with dark reddish temple; Vertex irregular rugosity, with three or four (the last one rather weak and incomplete) strong regularly curved lamelliform carinae behind posterior teeth. Pronotum comparatively slender, pronotal fold distinct developed; neck at distinct lower level than the middle part of pronotum in lateral view; Forewing with vein 2Cub distinctly shorter than vein cu+a; Hind tibia with its widened part rather weakly concaves basally in lateral view.

Description. Holotype. ♀, length of body 22 mm. Forewing 12 mm long; ovipositor sheath 24.5 mm long.



Figures 1–4. *Megischus shixiangi* Ge & Tan, sp. nov. Holotype ♀ **1** head, frontal view **2** head, dorsal view **3** head, lateral view **4** pronotum, dorsal view.

Head. Antenna incomplete; frons strongly reticulate-rugose (Fig. 3); three anterior coronal teeth large and lobe-shaped, while the posterior two relatively small and wide. Three or four (the last one rather weak and incomplete) regularly curved lamelliform carinae behind posterior teeth. Vertex with a large irregularly rugose area almost reaching occipital carina (Fig. 3); temple moderately bulging, smooth and shiny, except for some fine punctures (Fig. 2).

Mesosoma. Neck robust and with both complete and incomplete carina anteriorly (Fig. 4), at lower level than middle pronotum postero-dorsally. Pronotal fold distinct and with its before area rather shallowly concave; middle part of pronotum transversely rugose (Fig. 4); middle part of pronotum weakly differentiated from posterior part; middle and posterior part of pronotum generally with rather sparse and long setosity, propleuron more or less granular to reticulate-rugose; mesopleuron strongly reticulate-rugose with sparsely long setosity (Fig. 6); mesosternum largely smooth (except some fine punctures); scutellum with its margin large foveolae and smooth medially (Fig. 5); propodeum with sparsely large foveolate (Fig. 5).



Figures 5–7. *Megischus shixiangi* Ge & Tan, sp. nov. Holotype ♀ **5** mesosoma, dorsal view **6** mesosoma, lateral view **7** wings.

Wings. Fore wing: wing membrane subhyaline (Fig. 7), and surface evenly bristly; vein 1-M straight, $6.5\times$ as long as vein 1-SR and $1.2\times$ vein m-cu; vein 2-SR $1.05\times$ as long as vein r; vein r ends $0.5\times$ length of pterostigma behind the level of apex of pterostigma; vein 1-SR $0.52\times$ as long as parastigmal vein; vein 2-CU_b distinctly pigmented and curved apically; vein 2-1A straight, basally sclerotized, distinctly extended beyond Cu-a.



Figures 8–11. *Megischus shixiangi* Ge & Tan, sp. nov. Holotype ♀ **8** hind coxa **9** hind femur **10** hind tibia **11** hind tarsi.



Figures 12–14. *Megischus shixiangi* Ge & Tan, sp. nov. Holotype ♀ **12** tergite I, dorsal view **13** tergite II– VIII, dorsal view **14** distal part of ovipositor and sheath, lateral view.

Legs. Hind coxa strong, annular, sparsely transverse striate, with long whitish setosity (Fig. 8); hind femur robust, largely smooth to coriaceous with long whitish setosity (Fig. 9), hind femur ventrally with two large teeth and six-minute teeth behind large posterior tooth; hind tibia robust, distinctly curved basally (Fig. 10), basal narrow part 0.7× as long as apical widened part; apical widened part of hind tibia rather weakly concave basally in lateral view; hind basitarsus parallel-sided, bristly setose ventrally, ventral length 5.8× its maximum width (Fig. 11).

Metasoma. Tergite I (TI) finely reticulate to transversely-rugose (Fig. 12), ca 14× as long as its maximum width, 2.5× as long as TII; remaining tergites largely coriaceous (Fig. 13); pygidial area coriaceous dorsally, medially moderately convex and distinctly punctate medially; Ovipositor sheath with length of subapical whitish band 2.6× as long as dark apical part (Fig. 14).

Colour. Generally blackish to brownish; frons dark reddish to blackish; vertex blackish (Fig. 3), temple ventrally dark reddish along compound eye, distinctly contrasting with frons and vertex; wing membrane slightly brownish, subhyaline (Fig. 7), wing veins dark brownish to blackish; hind femur, hind tibia and metasoma largely dark brownish to blackish; ovipositor sheath largely black and with whitish subapical band.



Figure 15. Habitus of *Megischus shixiangi* Ge & Tan, sp. nov. Holotype ♀.

Distribution. Vietnam.

Biology. Collected in November. Host is unknown.

Note. The new species resembles the sympatric *M. tonkinensis* van Achterberg, 2002, but differs from the color and sculpture on the vertex (in the new species with vertex blackish, more or less reticulate, while in *M. tonkinensis* reddish and more



Figures 16, 17. Habitus of *Megischus kuafu* Ge & Tan, collected in Vietnam **16** habitus without ovipositor sheath **17** ovipositor sheath.

regular); the pronotum (in the new species slender but in *M. tonkinensis* comparatively strong and short); the venation (the new species with vein 2Cub distinct shorter than vein cu+a, while in *M. tonkinensis* vein 2Cub about as long as vein cu+a); as well as the pronodum (sparsely large foveolate in *M. shixiangi* but coarsely and densely foveolate in *M. tonkinensis*).

New recorded species in Vietnam

Megischus kuafu Ge & Tan, 2021

Figs 16, 17

Material examined. ♀ (BFU), Tuong Duong, Nghe An, Vietnam IX. 2022, leg. Local collector.

Diagnosis. Large size; head dark reddish brown, temples slightly bulging behind eyes; ocellar area transversely rugose; vertex reticulate-rugose medially, followed by weakly transverse rugae posteriorly almost reaching occipital carina; neck robust with incomplete carina before pronotal fold; scutellum almost glabrous; vein 1-M ca 5.9× as long as vein 1-SR; hind tibia comparatively slender; hind basitarsus densely setose and parallel-sided, ventral length 7.4× maximum width.



Figure 18. Distribution map of *Megischus* species of Vietnam (map from: <https://cn.bing.com/maps>).

Distribution. China (Guizhou); Vietnam.

Biology. Collected in November. Host is unknown.

Note. The specimen reported here is the second specimen of this species after the holotype. In terms of body size, specimen collected in Vietnam are smaller than the holotype (this specimen with length of body 36.5 mm, forewing 19 mm and ovipositor sheath 46 mm; while the holotype with length of body 39.1 mm, forewing 21.3 mm and ovipositor sheath 59 mm). In addition, the new specimen was collected in November (holotype in May), thus we speculate the species may be at least bivoltine.

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