Proceedings of the Zoological Institute RAS
Vol. 321, No. 1, 2017, pp. 25–31

УДК 595.753

CLYPEOSMILUS CENTRODASUS GEN. ET SP. NOV., A NEW GENUS AND SPECIES OF THE FAMILY ISSIDAE (HEMIPTERA: FULGOROIDEA) FROM NORTHERN VIETNAM

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ABSTRACT

Clypeosmilus centrodasus gen. et sp. nov. is described from Northern Vietnam. The genus is closely related to *Eusudasina* Yang, 1994 and *Tapirissus* Gnezdilov, 2014 according to fore wing reticulate venation and flattened laterally postclypeus.

Key words: Hemisphaeriini, new genus, new species, Vietnam

CLYPEOSMILUS CENTRODASUS GEN. ET SP. NOV., НОВЫЙ РОД И ВИД СЕМЕЙСТВА ISSIDAE (HEMIPTERA: FULGOROIDEA) ИЗ СЕВЕРНОГО ВЬЕТНАМА

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РЕЗЮМЕ

Clypeosmilus centrodasus gen. et sp. nov. описан из Северного Вьетнама. Новый род близок к родам *Eusudasina* Yang, 1994 и *Tapirissus* Gnezdilov, 2014 в соответствии с сетчатым жилкованием передних крыльев и латерально уплощенным постклипеусом.

Ключевые слова: Hemisphaeriini, новый род, новый вид, Вьетнам

INTRODUCTION

Vietnames Issidae were recently reviewed by Gnezdilov et al. (2014a) with 14 genera and 25 species recorded. Recently one more genus was newly recorded from the country and 6 new species were added by Constant and Pham (2014, 2015, 2016) and Gnezdilov (2015).

The new genus described below is closely related to the genus *Eusudasina* Yang, 1994 (see the discussion) which was erected in the tribe Issini Spinola *sensu* Gnezdilov (2013), but according to recently published molecular phylogeny of the family Issidae (Wang et al. 2016) this genus as well as *Euxaldar* Fennah, 1978 should be included in the tribe Hemisphaeriini Melichar (subtribe Mongolianina Wang, Zhang et Bourgoin, 2016) and accordingly *Clypeosmilus* gen. nov. may be placed in this tribe and subtribe as

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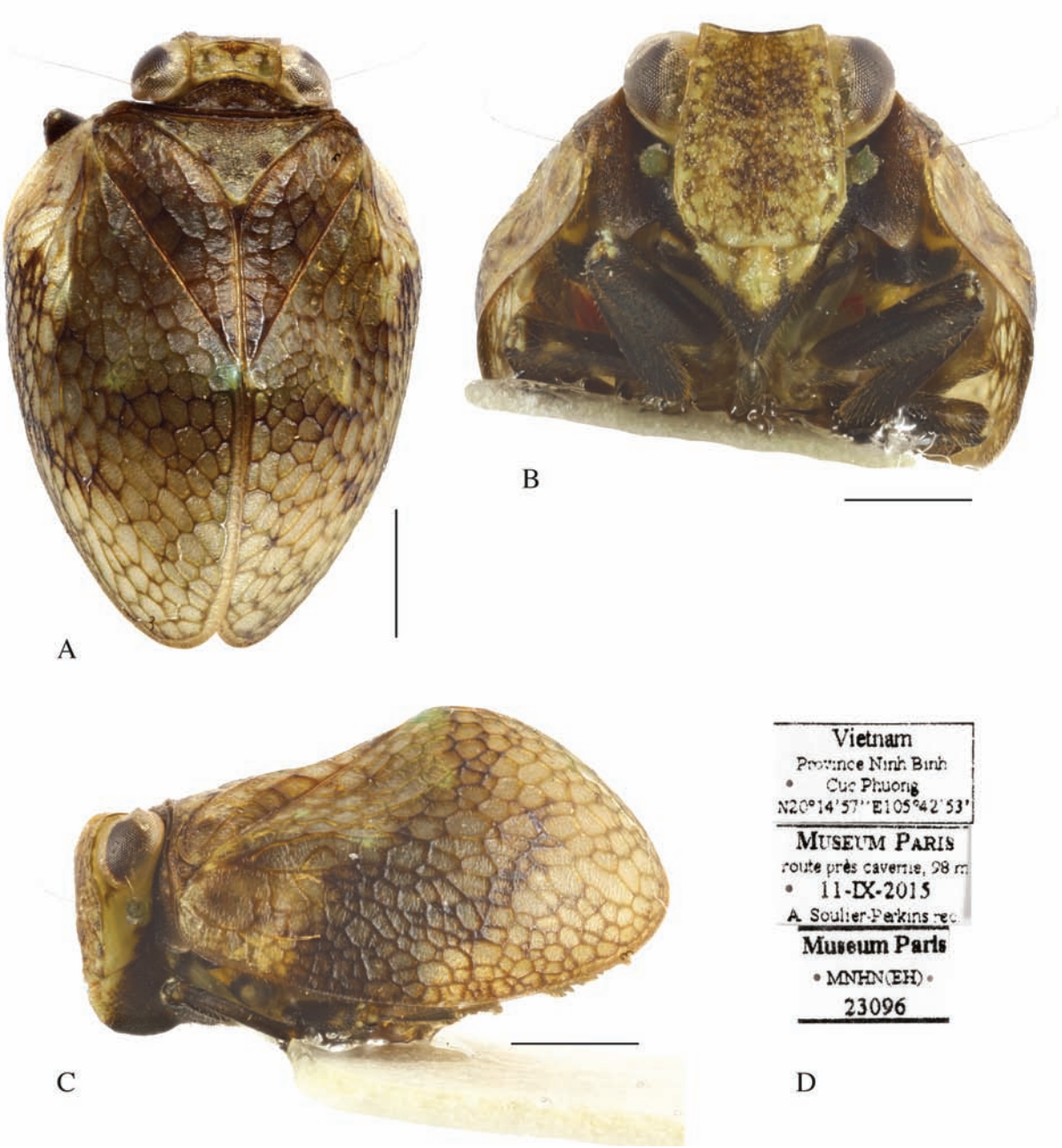

Fig. 1. *Clypeosmilus centrodasus* gen. et sp. nov., paratype, habitus: A – dorsal view; B – frontal view; C – lateral view; D – labels. Scale bars 1 mm.

well. Thus total number of genera and species of the Hemisphaeriini known from Vietnam rises to 8 genera with 21 species.

Newly proposed phylogeny and classification of the Issidae by Wang et al. (2016) raised the problem of morphological delimitation of the groups of tribal (subtribal) and subfamilic levels in the family Issidae and cannot be treated as final classification of the family as world list of issid genera is covered just partly in this study. Further research is in need to develop and confirm proposed groups on wider material. That is why here we do not use subfamilic names proposed

by Wang et al. (2016) until the complete revision of the family system will be finished. We currently follow Gnezdilov's (2013) scheme with one nominative subfamily.

MATERIAL AND METHODS

The terminology of the head and pronotum follows Anufriev and Emeljanov (1988) and for the genitalia Gnezdilov (2003) and Gnezdilov et al. (2014b). Photographs of the specimen were made with Canon EOS 6 D camera with macrolens Canon MP-E 65 mm f/2.8 1-5X, images are produced using the software Helicon Focus ver. 5 and Adobe Photoshop. The drawings of male genitalia were produced using light microscope Leica MZ 16 with camera lucida attached. The holotype and paratypes of the species described below are deposited in the Muséum national d'Histoire naturelle, Paris, France (MNHN), in the Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia (ZIN), and in the Zoological Museum of Moscow State University, Moscow, Russia (ZMUM).

SYSTEMATICS

Family Issidae Spinola, 1839

Tribe Hemisphaeriini Melichar, 1906

Subtribe Mongolianina Wang, Zhang et Bourgoin, 2016

Genus *Clypeosmilus* gen. nov.

Type species: *Clypeosmilus centrodasus* sp. nov. By monotypy.

Etymology. The generic name is derived from the combination of "clypeus" and Greek "σμιλη" which means chisel and refers to the peculiar flattened laterally postclypeus.

Diagnosis. Metope elongate, with tiny median carina (Fig. 1B). Metope and coryphe joined at almost right angle (in lateral view) (Fig. 1C). Coryphe transverse (Fig. 1A). Postclypeus large, "chisel-shaped", laterally flattened, bearing median carina (Fig. 1B, C). Fore wings with reticulate venation and without hypocostal plate (Fig. 2A). Hind wings one-lobed (Fig. 2B). Metatibiae with 2 lateral spines. First metatarsomere with 2 latero-apical and 6–7 intermediate spines. Phallobase with pair of long and narrow subapical processes directed apically. Aedeagus without ventral hooks. Female sternum VII distinctly convex medially.

Description. Metope elongate, with tiny median carina, and with row of pustules along each lateral margin. Metopoclypeal suture transverse. Postclypeus large, flattened laterally, bearing thick median carina and looks like a chisel. Ocelli absent. Pedicell elongately cylindrical. Metope and coryphe joined at almost right angle (in lateral view). Coryphe transverse – 2.5 times as wide as long medially; anterior margin straight; posterior margin concave. Pronotum 3 times shorter than mesonotum. Paradiscal fields very narrow behind eyes. Mesonotum without carinae. Fore wings wide, exceeding the abdomen, without hypocostal plate (Fig. 2A). Venation reticulate, cubitus posterior (CuP) distinct. Hind wings one-lobed, exceeding the abdomen, but shorter than fore ones; R 3 M 3 CuA 5 CuP 3 Pcu 1 (Fig. 2B), with many transverse veins. Metatibiae with 2 lateral and 8 apical spines. First metatarsomere with 2 latero-apical and 6–7 intermediate spines in intire row.

Distribution. Northern Vietnam.

Composition. Currently includes single species.

Taxonomic relationships. Closely related to the genera *Eusudasina* Yang, 1994 and *Tapirissus* Gnezdilov, 2014 according to reticulate venation of fore wings missing hypocostal plate, but new genus clearly differs from these genera by the structure of male genitalia and combination of other morphological characters (see the discussion below).

Clypeosmilus centrodasus sp. nov.

(Figs 1–3)

Holotype. Male, **Vietnam**, Ninh Binh Province, Cuc Phuong, 20°21′03′′N 105°35′50′′E, chemin forestier, 279 m, 14 September 2015, MNHN(EH)23117, A. Soulier-Perkins rec., MNHN.

Paratypes. Vietnam: 1 female, Ninh Binh Province, Cuc Phuong, 20°14′57′′N 105°42′53′′E, route près caverne, 98 m, 11 September 2015, MNHN(EH)23096, A. Soulier-Perkins rec., MNHN; 4 males, Hoa Binh Province, Son Binh, Ky Son, Cao Phong, 27–29 October 1990, S.A. Belokobylskij leg., ZIN; 1 male and 3 females, Hoa Binh Province, Son Binh, Ky Son, Cao Phong, 27 October 1990, S.A. Belokobylskij leg., ZIN; 1 male, Cat Ba Island, near to Haiphong, 7 January 1989, copse among tall grasses, V. Yanushev leg., ZMUM.

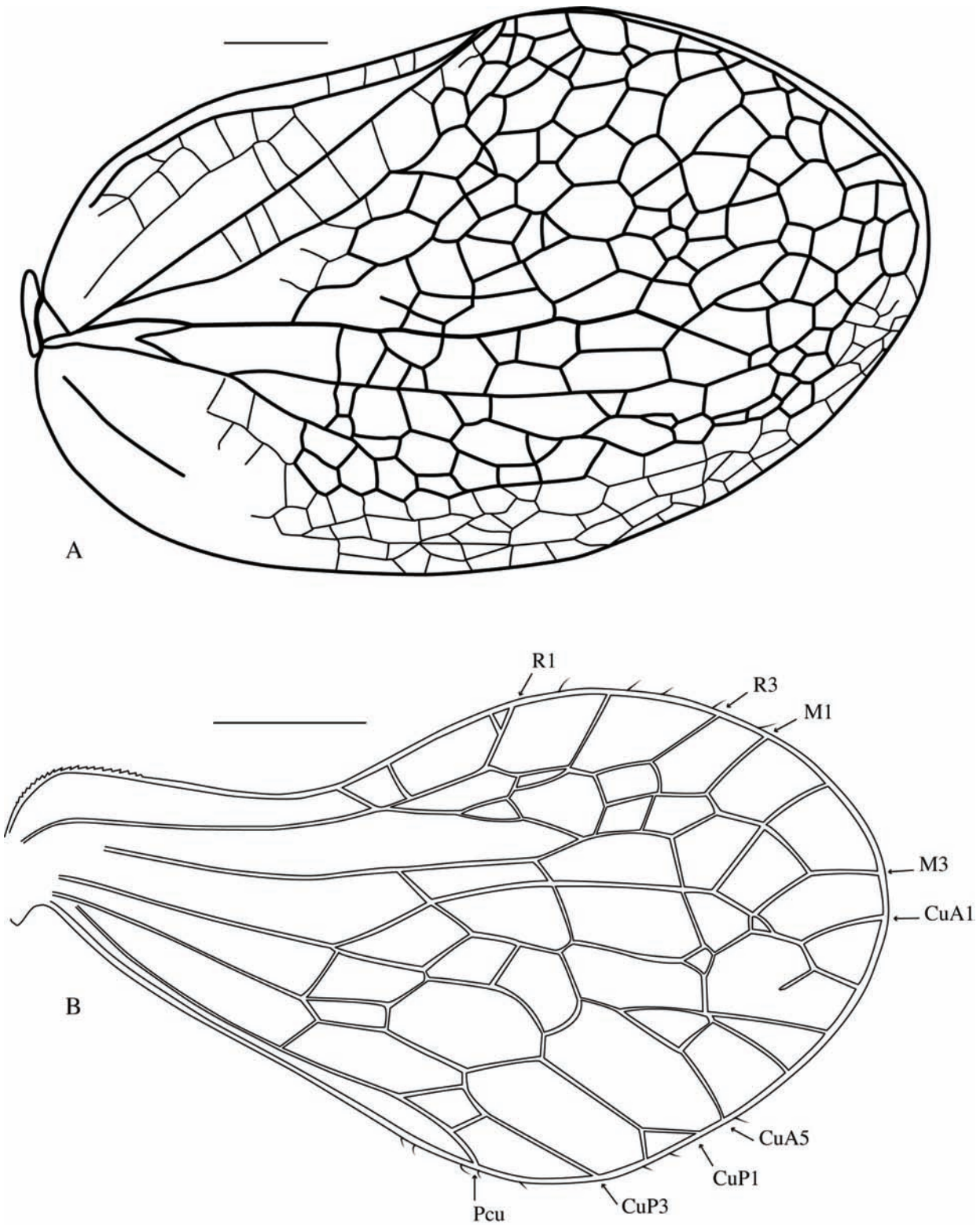

Fig. 2. *Clypeosmilus centrodasus* gen. et sp. nov., holotype: A – fore wing; B – hing wing. Scale bars 0.5 mm.

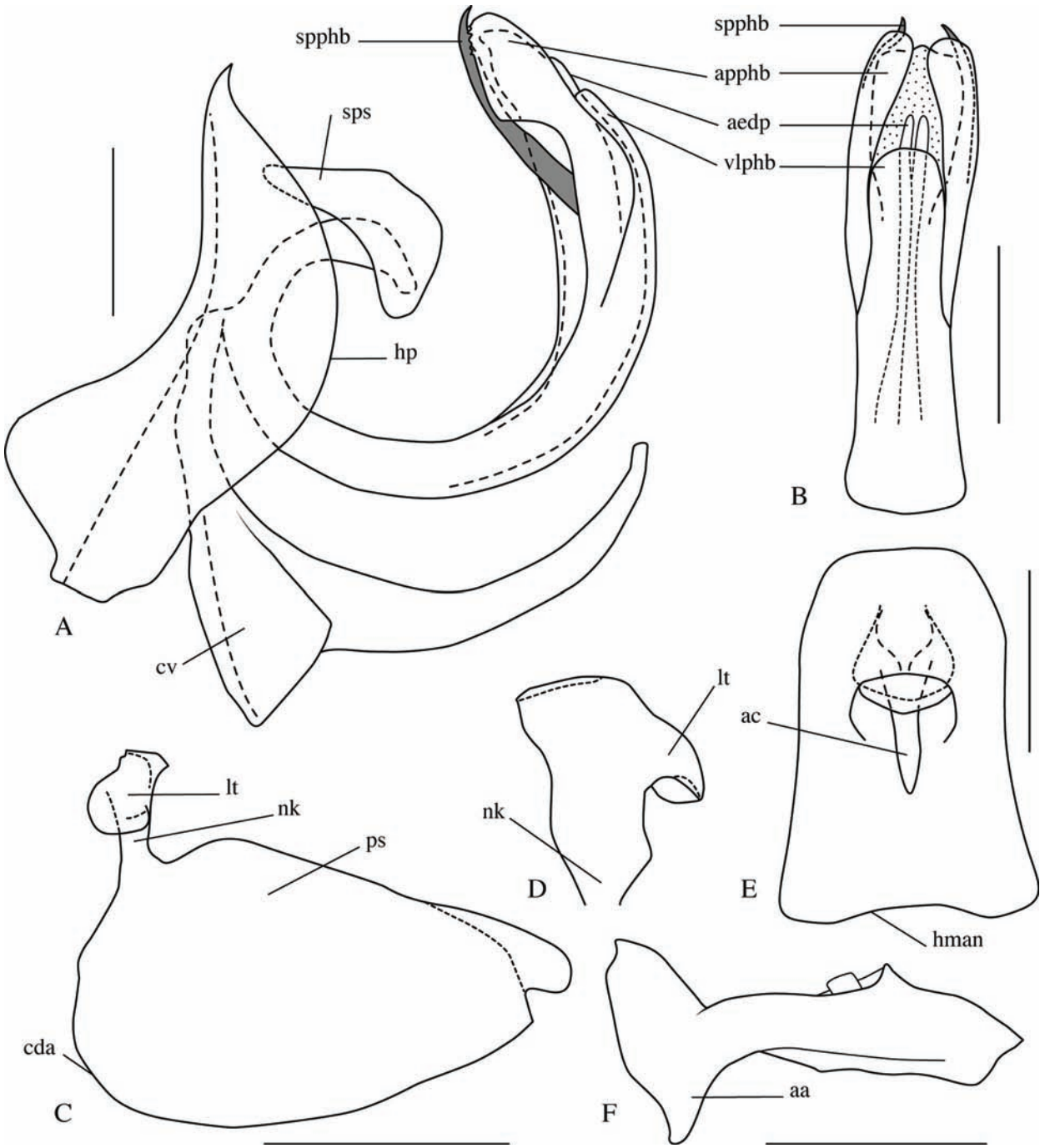

Fig. 3. *Clypeosmilus centrodasus* gen. et sp. nov., holotype, male genitalia: A – pygofer (hp: hind margin of pygofer), suspensorium (sps), connective (cv) and penis: apical aedeagal process (aedp), apical process of phallobase (apphb), subapical process of phallobase (spphb) and ventral phallobase lobe (vlphb), left lateral view; B – penis, ventral view; C – style: caudo-dorsal angle (cda), lateral tooth (lt), neck (nk) and plate (ps), right lateral view; D – capitulum of style, dorsal view; E – anal tube: anal column (ac) and hind margin (hman), dorsal view; F – anal tube: apical angle (aa), right lateral view. Scale bars 0.5 mm.

Etymology. Since the species was found in the middle of Cuc Phuong forest (holotype), its name derives from the concatenation of two Greek words "κέντρο" and "δάσος" meaning respectively center and forest.

Diagnosis. Phallobase narrow, with pair of long and narrow subapical process (Fig. 3A, B). Anal tube wide (in dorsal view) (Fig. 3E), with apical part turned up and apical angles in shape of narrowing apically processes (in lateral view) (Fig. 3F).

Description. External morphology as mentioned for the genus above.

Male coloration. Light greenish brown. Scapus and pedicel light green. Mesonotum with pair of dark brown dots. Fore wing veins mostly light green. Fore femora and tibiae, and middle femora dark brown to black. Middle tibiae light brown to dark brown. Styles with yellowish plate and dark brown margins.

Male genitalia. Pygofer strongly narrowing apically, with hind margin distinctly convex (in lateral view) (Fig. 3A). Anal tube wide, twice as long as wide medially, widely concave apically (in dorsal view) (Fig. 3E), with apical part turned up and apical angles in shape of apically narrowing processes (in lateral view) (Fig. 3F). Anal column (paraproct) long (0.3 times as long as anal tube). Suspensorium well sclerotized, plate-shaped. Phallobase narrow, strongly curved (in lateral view). Each dorso-lateral lobe of phallobase with triangularly rounded, spatula-shaped, apical process, and with a narrow and long, apically pointed, subapical process directed upwards (Fig. 3A). Dorsal parts of dorso-lateral phallobase lobes completely fused and weakly sclerotized. Ventral phallobase lobe relatively long, rounded apically, not narrowing apically (Fig. 3B), far not reaching upper margin of dorso-lateral lobes. Apical aedeagal processes well sclerotized, narrow, far not reaching upper margin of phallobase (in lateral view), well visible above ventral phallobase lobe (in ventral view). Connective with long and narrow cup. Style with wide plate, caudo-dorsal angle widely rounded. Capitulum of style on long neck, wide, not narrowing apically (in dorsal view), with wide lateral tooth (Fig. 3C, D).

Female coloration. Light yellowish brown (Fig. 1A, C). Metope with dark brown dots. Genae light greenish yellow. Scapus and pedicel light green. Postclypeus dark brown to black excluding its frontal part just below the metopoclypeal suture which is light yellowish brown. Paranotal lobes below the scapus dark brown to black. Fore wing veins usually dark brown. Mesonotum with pair of dark brown dots. Episternae and epimerae dark brown to black. Fore legs entirely and middle and hind femorae nearly black. Middle tibiae and tarsi dark brown to black. Hind tibiae and tarsi light yellowish brown. Apices of spines black. Abdominal sternites dark brown.

Female genitalia. Anal tube twice as long as wide, widely rounded apically (in dorsal view). Anal column short. Gonoplacs rounded, without carinae.

Total length. From the anterior margin of coryphe to the apex of fore wing. Males: 4.0–4.9 mm, females: 4.5–5.2 mm.

Comparison. As shown for the genus.

Distribution. Northern Vietnam.

DISCUSSION

Clypeosmilus centrodasus gen. et sp. nov. is closely related to the genera *Eusudasina* Yang, 1994 and *Tapirissus* Gnezdilov, 2014 according to reticulate venation of fore wings which are without hypocostal plate. However *Clypeosmilus* gen. nov. clearly differs from both genera by the structure of male genitalia and combination of other external morphological characters. It differs from *Eusudasina nantouensis* Yang, 1994 by one-lobed hind wing (rudimentary in *Eusudasina*), a narrower metope (slightly wider than long in *Eusudasina*), roundly convex median carina of postclypeus in lateral view (angularly convex in *Eusudasina*), absence of ventral hooks of aedeagus (pair of short hooks directed upward present in *Eusudasina*). It differs from *Tapirissus guilberti* Gnezdilov, 2014 by the absence of clypeal proboscis, different pattern of hind wing venation, and presence of 2 lateral spines on hind tibia (*Tapirissus* has one spine). Externally *Clypeosmilus centrodasus* gen. et sp. nov. is also similar to the members of the genus *Euxaldar* Fennah, 1978 (particularly *E. jehucal* Fennah in the shape of style), however, *Euxaldar* species are very distinctive by the fore wings with poorly recognizable venation and asymmetrical phallobase with two pairs of subapical processes of different shape and direction (Gnezdilov et al. 2017).

Eusudasina nantouensis and *T. guilberti* are present in Laos (Gnezdilov 2014) and the first one is originally described from Taiwan (Chan and Yang 1994). Thus we have one more confirmation of close relationships of Southern Chinese (including Taiwan and Hainan) and Northern Vietnamese and Laotian issid faunas,

which were already showed before (Gnezdilov 2014; Gnezdilov and Constant 2012; Gnezdilov et al. 2014a, Constant and Pham 2015, 2016).

ACKNOWLEDGEMENTS

We thank Mr. Laurent Fauvre (Paris, France) for the photos and Mr. Jérôme Constant (Bruxelles, Belgium) for his valuable comments of the manuscript. VMG is supported by the Muséum national d'Histoire naturelle (Paris, France) as invited scientist and the Russian Foundation for Basic Research (grant 16-04-01143), his study is performed in the framework of the state research project No. 01201351189 (Russian Federation). The collecting trip of ASP was supported by the association Cafotrop.

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Submitted January 28, 2017; accepted February 20, 2017.