

REVISION OF THE GENUS *SYMPLANA* KIRBY, 1891 (HEMIPTERA:  
FULGOROMORPHA: CALISCELIDAE), WITH NOTES ON GENITALIC  
MORPHOLOGY OF AUGILINI AND DESCRIPTION  
OF THREE NEW SPECIES FROM VIETNAM AND SUMATRA

VLADIMIR M. GNEZDILOV

Zoological Institute, Russian Academy of Sciences, Saint Petersburg, Russia

E-mails: vmgnezdilov@mail.ru, vgnezdilov@zin.ru, <https://orcid.org/0000-0002-7331-8744>

The caliscelid genus *Symplana* Kirby, 1891 is revised, with the type species *S. viridinervis* Kirby, 1891, is redescribed based on the lectotype. Three new species are described: *Symplana maurici* sp. n. and *S. vieta* sp. n. – from northwestern and central Vietnam and *S. sultana* sp. n. – from eastern Sumatra. *Symplana elongata* Meng, Qin et Wang, 2020 is placed in synonymy under *S. brevisstrata* Chou, Yuan et Wang, 1994. Key to species of the genus is given. Peculiarities of connective structure and its connection with an aedeagus as well as fusion of endogonocoxal lobes in ovipositor are discussed and illustrated for different Augilini taxa and compared with other Caliscelidae.

Key words: Augilini, Ommatidiotinae, larva, morphology, new species, new synonymy, southeastern Asia, taxonomy.

## INTRODUCTION

The genus *Symplana* Kirby, 1891 belongs to the tribe Augilini Baker of the subfamily Ommatidiotinae. The tribe Augilini is mainly Oriental group in its distribution (GNEZDILOV 2021). The genus was erected for a single species, *Symplana viridinervis* Kirby, 1891, described after three females from Pundaloya in Central Sri Lanka (KIRBY 1891).

FENNAH (1963) was the first who revised *Symplana* and designated the lectotype for *S. viridinervis* as well as described another species, *S. major* Fennah, 1963, from southern India, Tamil Nadu State (FENNAH 1963). Since Fennah's study, four more new species from China were added to the genus: *Symplana brevisstrata* Chou, Yuan et Wang, 1994; *S. elongata* Meng, Qin et Wang, 2020 (in ZHANG *et al.* 2020); *S. lii* Chen, Zhang et Chang, 2014; *S. longicephala* Chou, Yuan et Wang, 1994. Below I describe two new species from northwestern and central Vietnam, Hòa Bình and Đắk Lắk Provinces, and one new species from eastern Sumatra, Riau Province, and place *S. elongata* in synonymy under *S. brevisstrata*. Thus currently, the genus *Symplana* comprises eight species distributed in south and southeastern Asia.

Studying of male and female genitalia structure of the genera *Augilina* Melichar, 1914, *Polychornum* Gnezdilov, 2021, *Symplana* Kirby, and *Symplanel-*

*la* Fennah, 1987 revealed two morphological trends of Augilini – reduction of phallobase and fusion of connective with an aedeagus in males and the fusion of endogonocoxal lobes of gonocoxae VIII in a single lobe in females.

## MATERIAL AND METHODS

Morphological terminology generally follows ANUFRIEV and EMELJANOV (1988) for head, thorax and wing venation, with clarification by GNEZDILOV and BARTLETT (2018) for forewings, BOURGOIN (1993) – for female genitalia and GNEZDILOV (2003) – for male genitalia. Taxonomy of the family Caliscelidae follows GNEZDILOV (2013).

The genital segments of male specimens examined were macerated in 10% KOH and figured in glycerine jelly (Brunel Micro Ltd, UK). The drawings were made using Leica MZ9.5 light microscope with camera lucida attached. The photos of external views were taken using Canon EOS 5D Mark IV camera with the lens Canon-MP-E-65 mm f/2,8 1-5× Macro and the flash Canon Macro Twin-Lite MT-26EX-RT. Images were produced using Helicon Focus v. 7.6.4 and Adobe Photoshop CC 2019 software.

The type specimens examined are from the collections of the: BMNH – Natural History Museum, London, United Kingdom; ZIN – Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia.

The label information for old specimens is quoted, with ‘/’ indicating a new line and ‘//’ indicating the next label.

## TAXONOMY

Family Caliscelidae Amyot et Serville, 1843

Subfamily Ommatidiotinae Fieber, 1875

Tribe Augilini Baker, 1915

### Genus *Symplana* Kirby, 1891

*Symplana* Kirby, 1891: 136. Type species: *Symplana viridinervis* Kirby, 1891, by monotypy.

Diagnosis. Head elongate, with bendable apical part (Figs 15, 41). Metope long and narrow, slightly narrowing above the eyes, with distinct median carina running from its upper margin throughout postclypeus and sublateral carinae running from its upper margin, but not reaching metopoclypeal suture, which is convex (Figs 3, 8, 14, 17, 38, 40, 52). Coryphe with rounded apex and acutely angulate posterior margin. Apical part of coryphe (above bend line) as long as its basal part (below bend line) (Figs 39, 41, *bl*) or nearly twice longer (Figs 15, 16, *bl*). Ocelli present. Pedicel elongately cylindrical, without apical projection. Rostrum reaching hind coxae, with cylindrical, not narrowing apically, 3rd segment, 0.5 as long as 2nd one. Pronotum with wide paradiscal fields and paranotal lobes. Each paranotal lobe with a strong carina behind the eye (Fig. 15). Anterior margin of pronotum sharply convex, with

rounded apex, posterior margin widely concave. Tegulae large. Forewings semitransparent (matte), with narrowly oval or elongately triangular basal cell, distinct nodal line and nearly straight or weakly concave costal margin. Forewings long and narrow, 6–7 times as long as wide medially, narrowing apically after the nodal line, with narrow membrane (Figs 18, 42, 62, 63); clavus long, four times as long as whole wing; R and M with short common stem. Forewing vein sequence: R 3, furcating before nodal line, with the anterior branch ( $R_1$ ) furcating shortly and only posterior branch ( $R_2$ ) running after the nodal line; r-m 1; M 3–8, furcating after the nodal line; m-cua 1; CuA 1–3, furcating after the nodal line (Figs 18, 42, 62). Hind wings well developed, 3-lobed, with very weak cubital cleft and deep vannal cleft; anal lobe wide. Hind wing vein sequence: R 2, shortly furcating apically; M 2–3; CuA 2; CuP 1; Pcu 1;  $A_1$  1;  $A_2$  1.  $A_2$  not reaching wing margin. Hind tibia with a single lateral spine above its middle. First metatarsomere as long as second and third ones combined; first and second metatarsomeres without spines. Ventral surface of first metatarsomere with short thick setae. Aedeagus often with rows of denticles dorso-laterally. Gonopore subapical, in shape of long trough ventrally (Figs 22, 23). Connective fused with an aedeagal basement (Fig. 68). Phallobase reduced. Styles attached behind the aedeagal shaft. Style with capitulum and sometimes with additional process. Gonoplacs shortly triangular (in lateral view) (Fig. 28). Endogonocoxal lobes (GxL) of gonocoxae VIII fused in a large single lobe (Figs 30, 32–35).

Composition. Eight species are distributed from Ceylon and southern India to Sumatra, Vietnam, and China.

#### Key to species of *Symplana*

- 1 Apical part of coryphe (above bend line) nearly as long as its basal part (below bend line) (Fig. 39, *bl*) 2
- Apical part of coryphe 1.2–2.0 times as long as its basal part (Fig. 16, *bl*) 4
- 2 Pedicel with a black spot. Female sternite VII with widely concave hind margin, fused endogonocoxal lobes widely concave apically (Fig. 35). Sri-Lanka *S. viridinervis* Kirby, 1891
- Pedicel without black spot. Female sternite VII with deeply concave or notched medially hind margin, fused endogonocoxal lobes convex or notched apically (Figs 32–34) 3

- 3 Hind margins of male pygofer with a large nearly triangular process below the anal tube; anal tube elongate, narrowing apically (in dorsal view) (CHEN *et al.* 2014, Figs 2–97 H, G; ZHANG *et al.* 2020, Fig. 42 g, e). Hind margin of female sternite VII semicircularly notched, fused endogonocoxal lobes convex apically (ZHANG *et al.* 2020, Fig. 42k). SE China  
*S. brevisstrata* Chou, Yuan et Wang, 1994
- Hind margins of male pygofer with short and wide process below the anal tube (Fig. 44); anal tube wide, not narrowing apically (in dorsal view) (Fig. 43). Hind margin of female sternite VII trapezoidally concave, fused endogonocoxal lobes notched apically (Figs 32, 33). NW Vietnam  
*S. vieta* sp. n.
- 4 Aedeagus with wide shaft (in lateral and ventral views) (CHEN *et al.* 2014, Figs 2–98 K, L) 5
- Aedeagus with narrow shaft (in lateral and ventral views) 6
- 5 Hind margins of male pygofer convex, without processes (FENNAH 1963, Fig. 2E). Southern India  
*S. major* Fennah, 1963
- Hind margins of male pygofer with distinct process medially (CHEN *et al.* 2014, Figs 2–98 I). Southern China  
*S. lii* Chen, Zhang et Chang, 2014
- 6 Style with massive and long capitulum (Figs 36, 56, *cpt*) 7
- Style with short capitulum (CHOU *et al.* 1994, Fig. 2c, b). Southern China  
*S. longicephala* Chou, Yuan et Wang, 1994
7. Hind margins of male pygofer with a large triangular-shaped process below the anal tube (Fig. 19). Denticles of aedeagal shaft well visible laterally (Fig. 23). Male anal tube nearly truncate apically (in dorsal view) (Fig. 20). Central Vietnam  
*S. maurici* sp. n.
- Hind margins of male pygofer with rounded process below the anal tube (Fig. 55). Denticles of aedeagal shaft weakly visible laterally (Fig. 57). Male anal tube distinctly convex apically (in dorsal view) (Fig. 61). Sumatra  
*S. sultana* sp. n.

*Symplana viridinervis* Kirby, 1891  
(Figs 1–5, 35)

*Symplana viridinervis* Kirby, 1891: 136.

*Symplana viridinervis*: DISTANT 1906: 254, Fig. 112.

*Symplana viridinervis*: FENNAH 1963: 726, Fig. 1a–e.

Supplementary description (Figs 1–5). Generally as mentioned for the genus. Metope with distinct median carina reaching the anteclypeus (Fig. 3). Lateral margins of metope turned to lateral margins of coryphe (in lateral view) (Fig. 1). Coryphe long, four times as long as wide between the eyes, slightly narrowing after bend line, with truncate apex (Fig. 2). Coryphe and metope joined at a very acute angle (in lateral view) (Fig. 1). Pronotum without carinae. Mesonotum twice as long as pronotum at midline, apparently with weak lateral carinae (not well visible because of pin). Forewing vein sequence: R 3; M 3; CuA 1. Arolium of pretarsus not surpassing claw apices, with straight hind margin (in dorsal view).

Coloration. Generally, light brown-yellowish (apparently light green in living specimens). Apices of leg spines and claws dark brown to black. Each pedicel with large black spot near to its apex below the eye. Coryphe, pro- and mesonotum with wide longitudinal red stripe. Claval margins of forewings red.

Male. Unknown.

Female genitalia. Hind margin of sternite VII widely concaved, fused endogonocoxal lobes wide, concave apically (Fig. 35). Anal tube short, cylindrical (Fig. 4).

Total length (from head apex to the apices of forewings): 8.3 mm.

Type material examined. Lectotype, ♀, “*Symplana* / *viridinervis* / Kb. type figd. [one side – hand written] / Ceylon / Green Coll. / 90–115. [other side – print]” // “9 [?] [blue, hand written]” // Pundaloya [weak print] / 5 [hand written] / Ceylon [weak print]” // “*Symplana* / *viridinervis* Kby / Lectotype / det. / R.G. Fennah [print and hand written]” // “Type / H.T. [circle, print]” (BMNH).

Note. CHOU *et al.* (1994) recorded this species from Mengyang in Yunnan Province of China, however, according to Prof. Dr. Yinglun Wang (Northwest A & F University, Yangling, China, pers. comm.) the specimen listed as *S. viridinervis* in this publication has no abdomen, thus species identification was made after some external characters only and accordingly I would not treat it as correct one until the males from Pundaloya and Yunnan are examined and compared. The same is apparently true for Melichar’s record of this species from the Philippines (Luzon Island) (MELICHAR 1914).

### *Symplana brevisstrata* Chou, Yuan et Wang, 1994

*Symplana brevisstrata* Chou, Yuan & Wang, 1994: 46, Fig. 1.

*Symplana brevisstrata*: CHEN *et al.* 2014: 170, Figs 2–97.

*Symplana brevisstrata*: ZHANG *et al.* 2020: 155, Fig. 43, Pl. 8 g–i.

*Symplana elongata* Meng, Qin et Wang, 2020 (in ZHANG *et al.* 2020): 154, Fig. 42, Pl. 8 d–f, syn. n.

Note. The species was described after a female collected at Dinghushan Mt. in Guangdong Province of southeastern China (Prof. Dr. Yinglun Wang, pers. comm.) and no male was examined from the type locality since the original description (CHOU *et al.* 1994). However, 20 years later, CHEN *et al.* (2014) illustrated the material identified as *S. brevisstrata* from the neighbouring areas of Guizhou, Guangdong, and Guangxi Provinces. I accept here CHEN *et al.* (2014) treatment of *S. brevisstrata* and suggest placing *S. elongata* Meng, Qin et

Wang, 2020 (in ZHANG *et al.* 2020), described from Fujian Province of south-eastern China, in synonymy under *S. brevisstrata* according to the identity of male genitalia structure illustrated by CHEN *et al.* (2014, Figs 2–97) and ZHANG *et al.* (2020, Fig. 42).

### *Symplana lii* Chen, Zhang et Chang, 2014

*Symplana lii* Chen, Zhang & Chang, 2014: 170, Fig. 2-98 A–K.

*Symplana lii*: ZHANG *et al.* 2020: 150, Fig. 40, Pl. VII j–l.

Note. The species was described from Yunnan Province in China (CHEN *et al.* 2014).

Comparison. It is closely related to *S. major* Fennah, 1963 by wide aedeagal shaft (in lateral and ventral views), simple style with short and rounded capitulum, and semicircularly notched hind margin of female sternite VII, with rounded apically fused endogonocoxal lobes (Fig. 34), but well differs by hind margins of male pygofer with a process medially (FENNAH 1963, fig. 2E, CHEN *et al.* 2014, figs 2–98 I, L; ZHANG *et al.* 2020, fig. 40j).

### *Symplana longicephala* Chou, Yuan et Wang, 1994

*Symplana longicephala* Chou, Yuan & Wang, 1994: 47, Fig. 2 a–c, e–f.

*Symplana longicephala*: CHEN *et al.* 2014: 173, Figs 2–99 a–k.

*Symplana longicephala*: ZHANG *et al.* 2020: 149, Fig. 39, Pl. VII g–i.

Note. The species is known from Yunnan Province in China (CHOU *et al.* 1994, CHEN *et al.* 2014). It is well distinguished within long-headed species of the genus by its style with very short capitulum, which brings it closer to *S. vieta* sp. n., while in furcating apically fused endogonocoxal lobes the species is close to *S. maurici* sp. n.

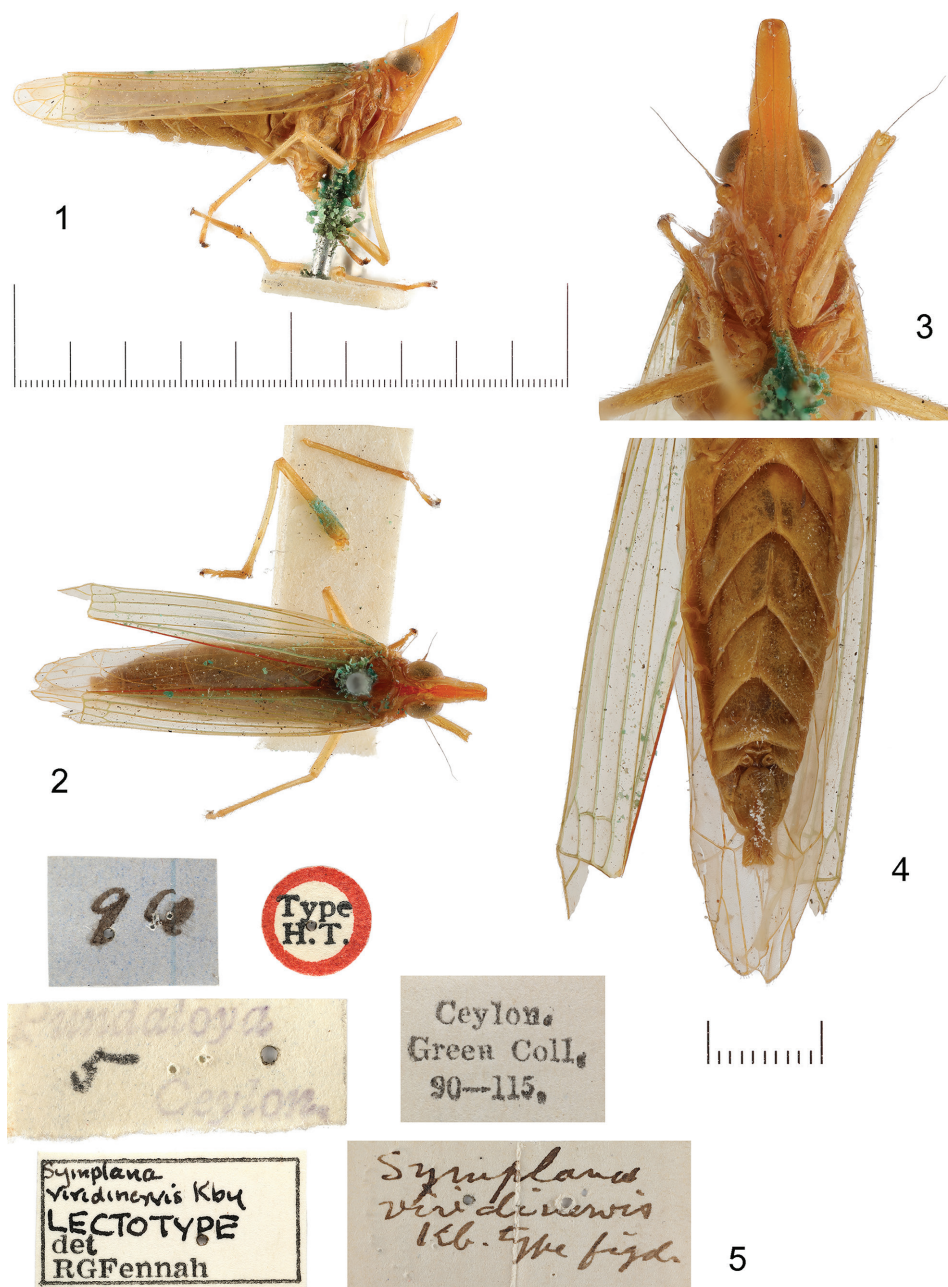
### *Symplana major* Fennah, 1963 (Figs 6–10, 34)

*Symplana major* Fennah, 1963: 726, Fig. 2 a–e.

Supplementary description. Female genitalia. Hind margin of sternite VII sharply concave medially, fused endogonocoxal lobes wide, rounded apically (Fig. 34).

Total length: 11.5 mm.

Type material examined. Holotype, ♀ “Ayur, / North Salem. / F.R.I. Sandal / Insect Survey / 23.X.30 [print and hand written]” // “Pres. by / Imp. Inst. Ent. / Brit. Mus. / 1932-356. [print]” // “508 [hand written]” // “Plot 21 [print]” // “*Symplana* / *major* Fennah / det / RG Fennah Type [print and hand written]” // “Holo- / type [circle, print]” (BMNH).



Figs 1–5. *Symplana viridinerwis* Kirby, 1891, female, lectotype: 1 = lateral view (scale bar: 10 mm); 2 = dorsal view (scale bar: 10 mm); 3 = frontal view (scale bar: 1 mm); 4 = abdomen, ventral view (scale bar: 1 mm); 5 = labels



Figs 6–10. *Symplana major* Fennah, 1963, female, holotype: 6 = lateral view (scale bar: 10 mm); 7 = dorsal view (scale bar: 10 mm); 8 = frontal view (scale bar: 1 mm); 9 = abdomen, ventral view (scale bar: 1 mm); 10 = labels



Note. The species was collected from unspiked sandal (FENNAH 1963). In the original description FENNAH (1963) indicated male as the holotype, however, the female from Ayur is marked as the holotype in the collection of the Natural History Museum in London (Figs 6–10), which I accept here as the holotype.

### ***Symplana maurici* sp. n.**

(Figs 11–31)

**Diagnosis.** Head with long apical part (after bend line), twice as long as the part of the head before this line (Figs 11, 12, 15, 16). Style with long capitulum. Hind margins of male pygofer with large triangular-shaped process below the anal tube. Female sternite VII with sharply concave medially hind margin and large furcating apically fused endogonocoxal lobes (Figs 29–31).

**Description.** Generally, as mentioned for the genus. Coryphe long, more than five times as long as wide between the eyes, grooved at midline, narrow, slightly narrowing at bend line and apically; anterior margin rounded (Fig. 16). Coryphe and metope joint at very acute angle (in lateral view) (Fig. 15). Pro- and mesonotum with distinct lateral carinae. Mesonotum three times as long as pronotum medially. Forewing vein sequence: R 3; M 5; CuA 2 (Fig. 18). Hind tibia with six apical spines. Arolium of pretarsus wide, nearly reaching claw apices (in dorsal view).

**Coloration** (Figs 11–14). Generally light green yellowish. Coryphe with unclear light brown longitudinal stripe medially sometimes invisible. Lateral margins of coryphe before bend line, lateral carinae of pro- and mesonotum, and longitudinal veins of corium light green – fluorescent. Pro- and mesonotum between lateral carina light brown. Forewings with brown-reddish claval margins. Leg spine apices black. Claws dark brown.

**Male genitalia** (Figs 19–27). Anal tube as wide as long (in lateral view), nearly truncate apically (in dorsal view) (Figs 19, 20). Anal column short. Pygofer wide, elongate vertically (in lateral view), with widely concave medially ventral margin (in ventral view) (Figs 19, 21). Hind margins of pygofer with large triangular-shaped process below the anal tube (Fig. 19). Aedeagus strongly curved (in lateral view), with denticles dorso-laterally and with pointed apical bifurcation (in ventral view) (Figs 22, 23). Style with wide plate and long capitulum (Figs 24, 25) and with large and rounded lateral process below the capitulum (Figs 26, 27).

**Female genitalia** (Figs 13, 28–31). Sternite VII with sharply concave medially hind margin, fused endogonocoxal lobes furcating apically. Anal tube short.

Total length: males – 8.0–9.0 mm, females – 9.0–10.0 mm.

4th instar larva. It was illustrated by EMELJANOV (1999, Fig. 17) as *Symplana* sp.

**Structure.** Metope with seven (3 + 4) sensory pits in two rows above the eye and three pits along sublateral carina in front the eye at each side. Median carina of metope reaching metopoclypeal suture only. Rostrum reaching hind coxae. Coryphe long, more than three times as long medially as wide between the eyes. Disc of pronotum with five (4 + 1) pits on each side. Each paranotal lobe of pronotum with a single pit at basal margin. Anterior wing pads of mesothorax each with four (3 + 1) pits. Posterior wing pads of methatorax each with two sensory pits. Hind tibia with a single lateral spine above its middle and with six spines apically. Tergites IV–VI each with four (two on each side) pits near to its posterior margins.

Tergite VII with four (two on each side) pits near to its posterior margin, one pit in each hind corner dorsally and one pit in each hind corner ventrally (not visible in dorsal view). Tergite VIII with two pits dorsally and one pit ventrally (not visible in dorsal view) in each hind corner. Segment IX with four pits—two dorsal and two ventral ones. Metatarsomeres with two segments, first one with two latero-apical and a single intermediate spines. Body length: 4.0 mm.

Type material. Holotype, ♂, Vietnam, Đắk Lắk Province, Yok Don National Park, 20 km NE of Buôn Dôn village, 12°56.301'N 107°43.471'E, 194 m, 19–20.VI.2014, V. M. Gnezdilov leg. (ZIN). Paratypes: Vietnam, Đắk Lắk Province, Yok Don National Park: 3 ♂, 6 ♀, 20 km NE of Buôn Dôn village, 12°56.301'N 107°43.471'E, 194 m, 18–20.VI.2014, V. M. Gnezdilov leg. (ZIN – 2 ♂, 5 ♀; BMNH – 1 ♂, 1 ♀); 3 ♂, 3 ♀, 1 larva, near Buôn Dôn village, 23.XI.1993, A. V. Gorokhov leg. (ZIN).

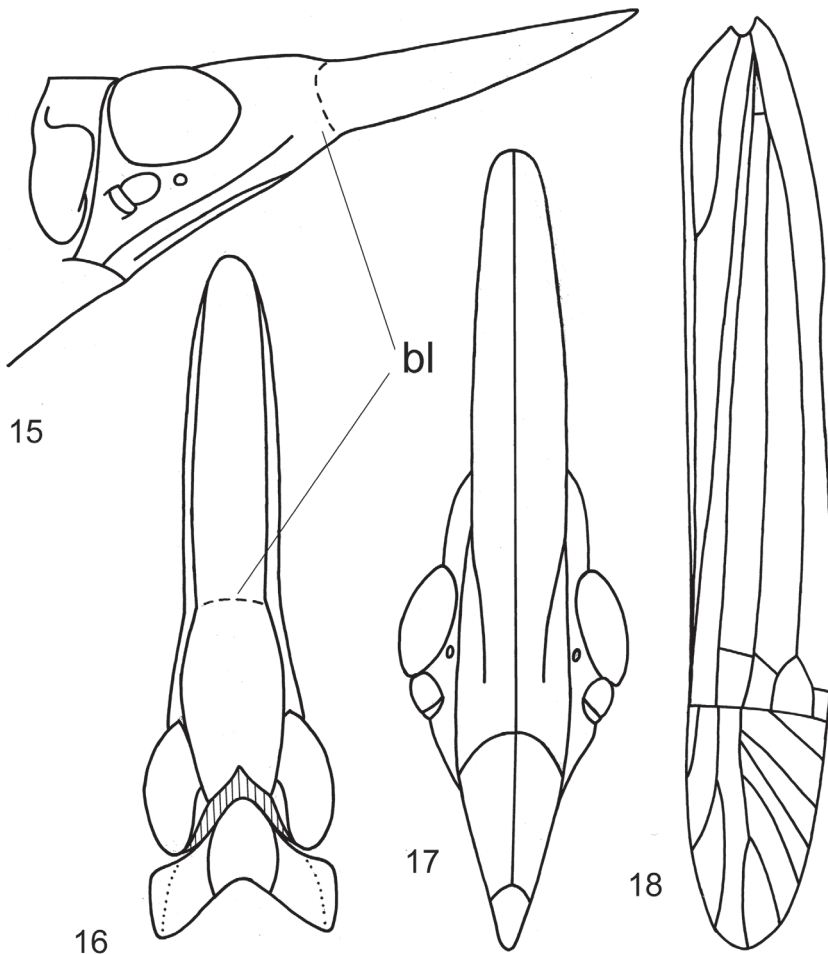


**Figs 11–14.** *Symplana maurici* sp. n., female, paratype: 11 = lateral view; 12 = dorsal view; 13 = abdomen, ventral view; 14 = frontal view. Scale bars: 10 mm for figs 11–12, 1 mm for figs 13–14

**Etymology.** The species is named in honour of the well-known French botanist Dr. Maurice Schmid (1922–2018), who spent his professional life studying Indo-Chinese vegetation and soils. Our meetings with Maurice in his latest lifetime gave me and my family great pleasure.

**Note.** The species is swept from bamboo in dry *Dipterocarpus* forest on a water reservoir bank (Figs 69, 70).

**Comparison.** It is closely related to *S. longicephala* Chou, Yuan et Wang, 1994 by furcated apically fused endogonocoxal lobes (ZHANG *et al.* 2020, Fig. 39m).



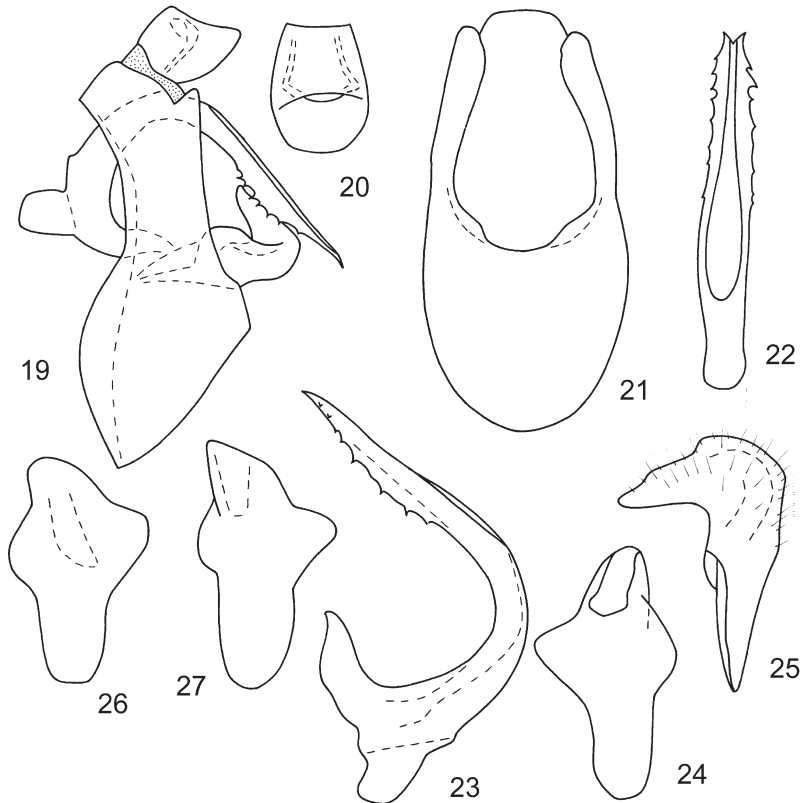
**Figs 15–18.** *Symplana maurici* sp. n., female, paratype: 15 = head and pronotum, lateral view; 16 = same, dorsal view; 17 = face, frontal view; 18 = forewing. Abbreviations: bl = bend line. Out of scale

***Symplana vieta* sp. n.**  
(Figs 32, 33, 36–49)

**Diagnosis.** Head with short apical part (after bend line), 0.8 times as long as the part of the head before the line (Figs 36, 37, 39, 41). Style with short capitulum (Figs 47–49). Female sternite VII trapezoidally concaved medially; fused endogonocoxal lobes notched apically (Figs 32, 33).

**Description.** Generally, as mentioned for the genus. Coryphe three times as long as wide between the eyes, slightly narrowing apically, with distinct bend line (Figs 37, 39). Pro- and mesonotum with smooth lateral carinae. Mesonotum twice as long as pronotum medially. Forewing vein sequence: R 3; M 4; CuA 2 (Fig. 42). Hind tibia with six (2 + 4) apical spines. Hind femora and tibiae 10 % longer than middle and fore ones.

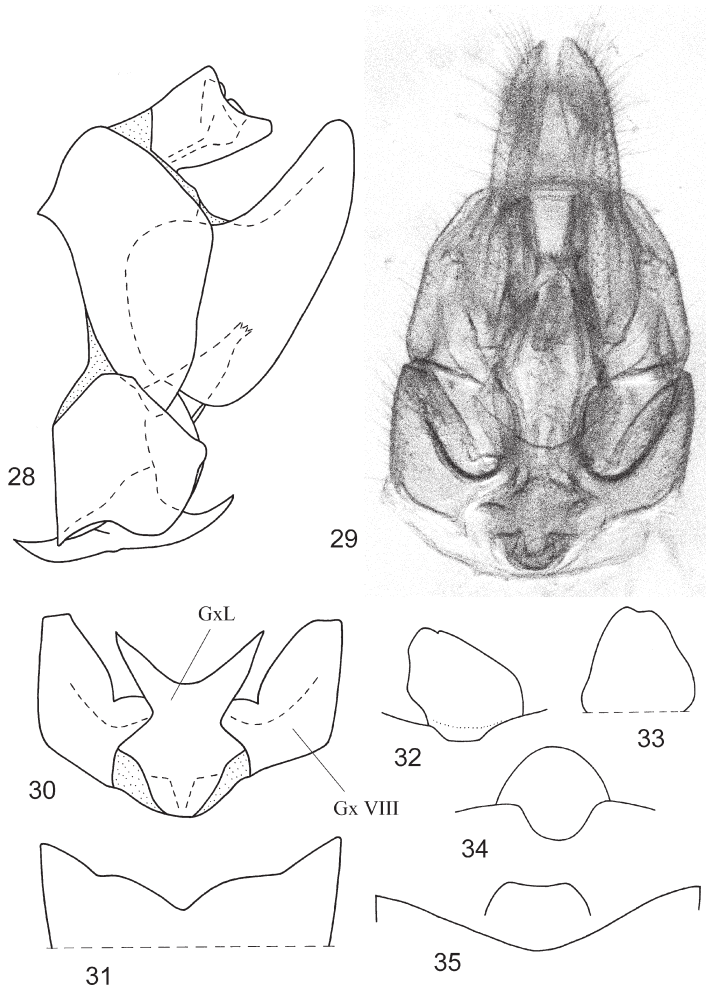
**Coloration** (Figs 36–38). Generally light yellow (apparently light green when alive). In a better pigmented female metope reddish above the clypeus and between the sublateral



**Figs 19–27.** *Symplana maurici* sp. n., male genitalia (19–26 = holotype, 27 = paratype): 19 = genital block, lateral view; 20 = anal tube, dorsal view; 21 = pygofer, ventral view; 22 = aedeagus, ventral view; 23 = aedeagus, lateral view; 24 = style, frontal view; 25 = same, lateral view; 26, 27 = same, caudal view. Out of scale

carinae; median and sublateral carinae brown-reddish. Postclypeus with reddish median line. Coryphe, pro- and mesonotum with wide red median stripe. Paranotal lobes with reddish carinae and lower margins. Tegulae with reddish spots. Forewings with red claval margins. Forewing  $A_1$  with  $Pcu + A_1$  light green – fluorescent. Apices of third tarsomeres, leg spines and claws black. Abdominal tergites with red spots medially and laterally. Female sternites IV–VI slightly orange medially.

Male genitalia (Figs 43–49). Anal tube short, longer than wide (in lateral view) (Fig. 44), truncate apically (in dorsal view) (Fig. 43). Hind margins of pygofer strongly protrud-



**Figs 28–35.** *Symplana* spp., female genitalia (28–31 = *S. maurici* sp. n., paratype; 32, 33 = *S. vieta* sp. n., paratype; 34 = *S. major* Fennah, holotype; 35 = *S. viridinervis* Kirby, lectotype): 28 = ovipositor, lateral view; 29 = same, ventral view (photo); 30 = gonocoxae VIII (Gx VIII) and fused endogonocoxal lobes (GxL); 31 = hind margin of sternite VII, ventral view; 32, 34, 35 = hind margin of sternite VII and fused endogonocoxal lobes, ventral view; 33 = fused endogonocoxal lobes, ventral view. Out of scale

ing in its basal halves, with wide and rounded process below the anal tube (in lateral view) (Fig. 44). Ventral margin of pygofer below the styles widely concave medially (Fig. 43). Aedeagus strongly curved, with two rows of denticles dorso-laterally and rounded apical furcation (in ventral view) (Figs 45, 46). Style with vertically elongate and narrow plate and short capitulum, with deep spoon-shaped concavity below it (Figs 47–49). Capitulum of style with fine curved lines dorsally (Fig. 47).

Female genitalia (Figs 32, 33). Hind margin of sternite VII trapezoidally concaved medially, fused endogonocoxal lobes slightly narrowing apically, notched.

Total length: male – 8.0 mm, female – 9.2 mm.

Type material. Holotype, ♂, Vietnam, Hòa Bình Province, Mai Châu, Pa Co, Xa Linh, 22–24.IV.2002, S. A. Belokobylskij leg. (ZIN). Paratype: ♀, Vietnam, Hòa Bình Province, Mai Chau, Pa Co, Xa Linh, 22–24.IV.2002, S. A. Belokobylskij leg. (ZIN).

Etymology. The species is named after “việt” – the most numerous nationality in Vietnam.

*Symplana sultana* sp. n.  
(Figs 50–63)

Diagnosis. Head with long apical part (after bend line), 1.2 times as long as its basal part (before bend line) (Fig. 50). Style with large capitulum and large process below it (Figs 55, 57).

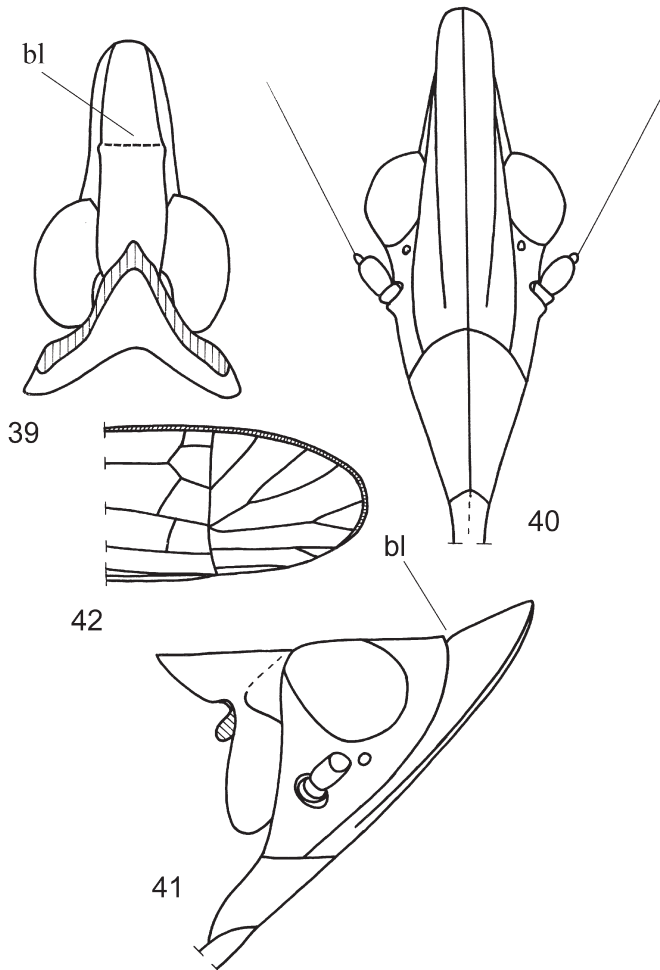


**Figs 36–38.** *Symplana vieta* sp. n., holotype: 36 = lateral view; 37 = dorsal view; 38 = frontal view. Scale bars: 10 mm for figs 36–37, 1 mm for fig. 38

Description. Generally, as mentioned for the genus. Median carina of metope reaching basal half of anteclypeus. Coryphe five times as long as wide between the eyes. Pro- and mesonotum with distinct lateral carinae. Forewing vein sequence: R 3; M 6; CuA 2–3 (Fig. 62). Hind wings slightly shorter than forewings (Fig. 63). Hind femora 20 % and hind tibiae 10 % longer than middle and fore ones.

Coloration (Figs 50–53). Generally light yellow (apparently light green when alive). Coryphe, pro- and mesonotum with wide light red median stripe. Forewings with light red claval margins.

Male genitalia (Figs 55–63). Anal tube short (in lateral view) (Fig. 55), convex apically (in dorsal view) (Fig. 61). Pygofer elongate vertically, wide, hind margins with short and rounded process below the anal tube (Fig. 55), ventral margin concave medially (Fig. 56).



**Figs 39–42.** *Symplana vieta* sp. n., holotype: 39 = head and pronotum, dorsal view; 40 = face, frontal view; 41 = head and pronotum, lateral view; 42 = apex of right forewing (membrane is shaded). Abbreviations: bl = bend line. Out of scale

Aedeagus strongly curved, with two rows of denticles dorso-laterally and pointed apical furcation (Figs 57, 58). Style with large and wide capitulum and large process below it (Figs 57, 59, 60).

Female. Unknown.

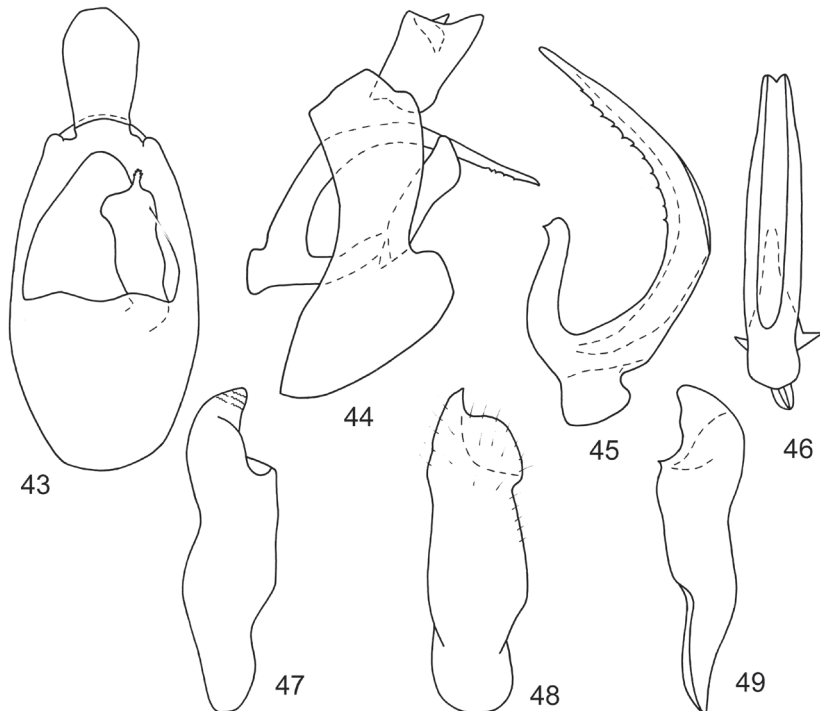
Total length: 8.5 mm.

Type material. Holotype, ♂, "Sumatra Siak / 13.V.907 / E. Brüggem. [hand written]" (ZIN).

Etymology. The species name is derived from "Sultan" as the holotype was collected in the territory of former Sultanate Siak Sri Indrapura – a kingdom that was located in the Siak Regency of Riau Province of Eastern Indonesia from 1722 to 1946.

## DISCUSSION

The distribution of the genus *Symplana* Kirby covers a large territory of south and southeastern Asia from Sri Lanka and southern India to southern China via Vietnam and Indonesia where the species of the genus occur on bamboo (Figs 69, 70) widely distributed in Old World tropics and subtropics. The habitually similar *Quizqueiplana alexbrowni* Bourgoïn et Gnezdilov, 2016 is



**Figs 43–49.** *Symplana vieta* sp. n., holotype, male genitalia: 43 = genital block (without aedeagus), ventral view; 44 = genital block, lateral view; 45 = aedeagus, lateral view; 46 = aedeagus, ventral view; 47–49 = style. Out of scale



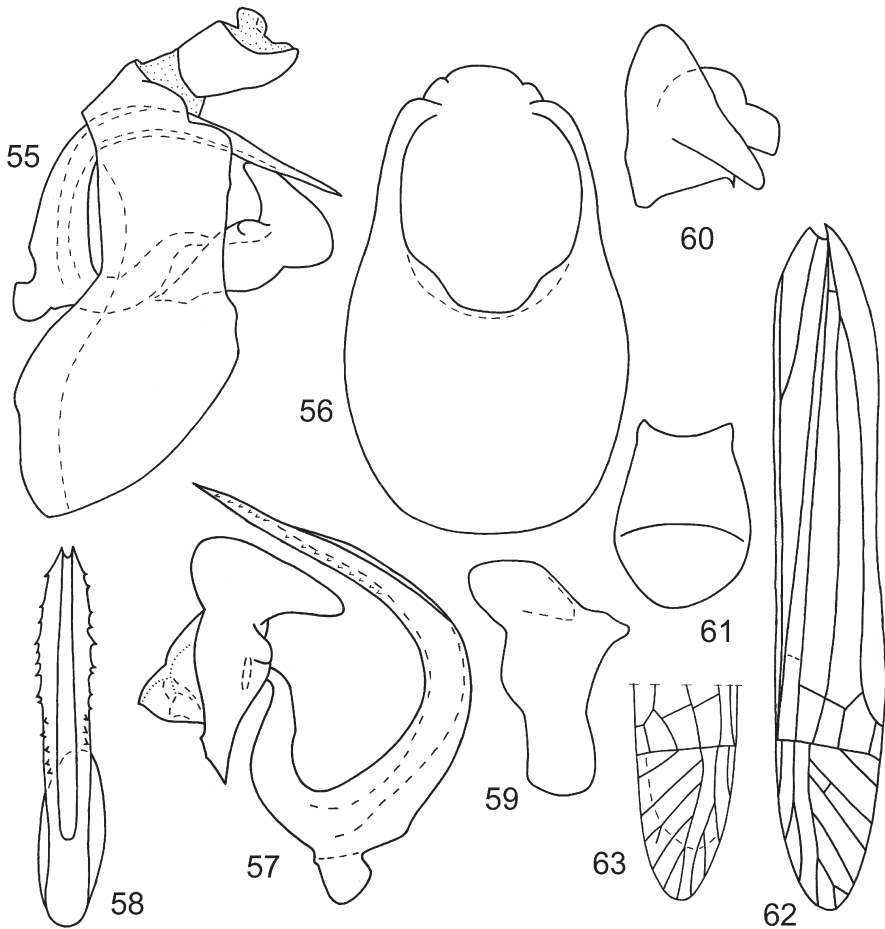
the only known fossil caliscelid taxon described from the Miocene Dominican amber in New World (BOURGOIN *et al.* 2016). The latter is close to *Symplana* species by long coryphe, however, well differs by the pedicel with an apical projection, wider forewing apices, and the presence of two latero-apical spines on first metatarsomere (BOURGOIN *et al.* 2016, Figs 2A, C, E, 3C, E).

Within the Augilini there are two groups of genera according to the presence or absence of spines on first and second metatarsomeres in imago. The presence of spines is a character of already mentioned fossil *Quizqueiplana*



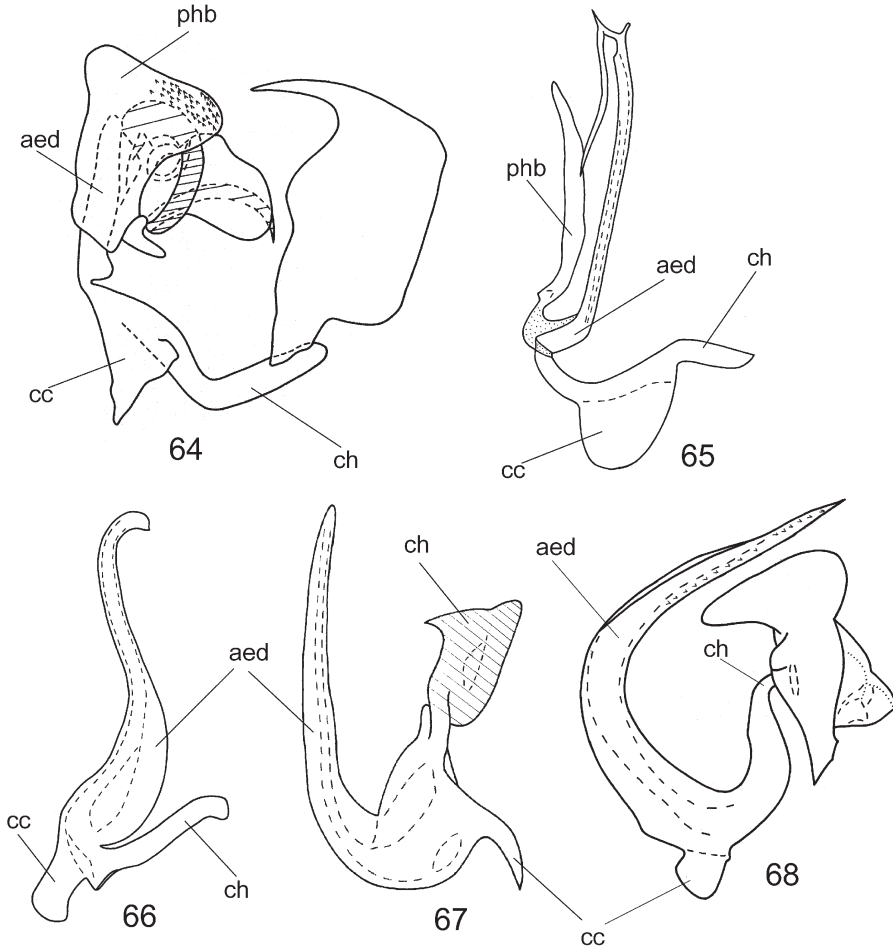
**Figs 50–54.** *Symplana sultana* sp. n., holotype: 50 = lateral view; 51 = dorsal view; 52 = frontal view; 53 = abdomen, ventral view; 54 = labels. Scale bars: 10 mm for figs 50–51, 1 mm for figs 52–53

Bourgoin et Wang, 2016, with the spines only on first metatarsomere, and Madagascan *Signoreta* Gnezdilov et Bourgoin, 2009 and *Cano* Gnezdilov, 2011 and Asian *Tubilustrium* Distnat, 1916 and *Symplanodes* Fennah, 1987, having spines on both metatarsomeres. These five genera may be treated as primitive taxa of the tribe as was already suggested for *Symplanodes* and *Signoreta* missing forewing nodal line (GNEZDILOV 2011). Other genera of Augilini have no spines on first and second metatarsomeres in imago, but as mentioned above, 4th instar larva of *Symplana maurici* sp. n. has two latero-apical and one intermediate spines on first larval metatarsomere still not divided into first



**Figs 55–63.** *Symplana sultana* sp. n., holotype (55–61 = male genitalia; 62, 63 = forewing): 55 = genital block, lateral view; 56 = pygofer, ventral view; 57 = aedeagus, connective, and style, lateral view; 58 = aedeagus, ventral view; 59 = style, caudal view; 60 = style, dorsal view; 61 = anal tube, dorsal view; 62 = right forewing; 63 = apex of left forewing, with apical margin of hind wing marked by dotted line. Out of scale

and second imaginal ones. The same spine pattern of the first larval metatarsomere was discovered during our study in 5th instar larva of *Discote scutifer* (Fennah, 1963). Thus, the absence of spines on the metatarsomeres in the imago of most Augilini genera in the modern fauna may be treated as an advanced condition of this character compared to spiny metatarsomeres in the fossil Miocene genus and few other genera discussed above.



**Figs 64–68.** Caliscelidae, male genitalia: 64 = *Calampocus sphaeroides* Gnezdilov et Bourgoïn, 2009, penis, connective and style, lateral view (after GNEZDILOV & BOURGOÏN 2009, modified); 65 = *Augilina longipes* Melichar, 1914, penis and connective, lateral view (after GNEZDILOV 2021); 66 = *Symplanellella yokdona* Gnezdilov, 2020, aedeagus and connective, lateral view (after GNEZDILOV 2020, modified); 67 = *Polychorum namboinum* (Gnezdilov, 2013), aedeagus and connective, lateral view (after GNEZDILOV 2021); 68 = *Symplana sultana* sp. n., aedeagus, connective, and style, lateral view. Abbreviations: aed = aedeagus, cc = connective cup, ch = connective handle, phb = phallobase. Out of scale

Within currently known Augilini *Symplana* species are close to the members of the genus *Polychorum* Gnezdilov, 2021. *Symplana* species are distinguished by peculiar subapical gonopore in the shape of a long trough on the aedeagal shaft ventrally, the presence of denticles on the aedeagal shaft, and style with capitulum and an additional process while *Polychorum* species have the aedeagal shaft smooth, without denticles, short apical gonopore, and style with several large processes.

The species of the genera *Symplana* Kirby, *Symplanella* Fennah, 1987, and *Polychorum* Gnezdilov are characterized by connective fused with an aedeagal basement and reduced phallobase (Figs 65–68). Thus, in *Symplanella yokdona* Gnezdilov, 2020 connective handle is still in shape of a stick, while in *Symplana* and *Polychorum* species, it became wider and not easily recognizable. In *Augilina longipes* Melichar, 1914 the phallobase is still recognized as two long processes near to the aedeagal basement, and the connective is still separate structure with a cup and handle (Fig. 65, *cc*, *ch*). In other caliscelid tribes, such as Caliscelini, Peltonotellini, Adenissini, and Ommatidiotini, the phallobase and connective are well developed and separate structures (ANUFRIEV & EMELJANOV 1988, Figs 390-1, 394-2, GNEZDILOV 2017, Figs 9, 10) (Fig. 64).

Another character discovered in *Symplana* species is the fusion of endogonocoxal lobes of gonocoxae VIII in a single large lobe (Figs 28, 30, 32–35). Within the tribe Augilini such lobe is known also for *Symplanella yokdona* (GNEZDILOV 2020, Fig. 7), *Polychorum namboinum* (Gnezdilov, 2013) (GNEZDILOV 2013, Fig. 17), and *Anthracidium albosignatum* Emeljanov, 2013 (EMELJANOV 2013, Fig. 13). In other studied Augilini species, e.g. *Discote scutifer*, *Pseudosymplanella nigrifasciata* Che, Zhang et Webb, 2009, *Tubilustrium typicum* Distnat, 1916, and *Augila angulata* Baker, 1915, as well as in the tribes Caliscelini and Adenissini the endogonocoxal lobes are separate (GNEZDILOV 2003, Figs 13, 14). In *Ommatidiotus acutus* Horváth, 1905 of the tribe Ommatidiotini



**Figs 69–70.** Yok Don National Park, water reservoir bank, type locality of *Symplana maurici* sp. n.

the endogonocoxal lobes are weakly sclerotized and apparently fused, but without distinct lobe visible.

\*

Acknowledgements – I am grateful to Mr. Michael D. Webb (London, United Kingdom) for an opportunity to examine the type specimens of *Symplana viridineris* and *S. major*, Prof. Dr. Yinglun Wang (Yangling, China) for his information on *S. viridineris* and *S. brevisstrata* from China, and Dr. Vladimir V. Neimorovets (Saint Petersburg, Russia) for taking most of the photos. I would like to thank the anonymous reviewers for their valuable comments. My field trip to Vietnam was provided by the Russian–Vietnamese Tropical Centre, Southern branch (Hồ Chí Minh, Vietnam). My study is performed in the framework of the Russian State Research project № 1021051302540-6.

## REFERENCES

- ANUFRIEV, G. A. & EMELJANOV, A. F. (1988): Suborder Cicadinea (Auchenorrhyncha). In: LER, P. A. (ed.): *Opređelitel' nasekomykh Dal'nego Vostoka SSSR*, 2: 12–495. Nauka, Leningrad.
- BOURGOIN, T. (1993): Female genitalia in Hemiptera Fulgoromorpha, morphological and phylogenetic data. – *Annales de la Société entomologique de France (N.S.)* **29**(3): 225–244.
- BOURGOIN, T., WANG, R. R. & GNEZDILOV, V. M. (2016): First fossil record of Caliscelidae (Hemiptera: Fulgoroidea): a new Early Miocene Dominican amber genus extends the distribution of Augilini to the Neotropics. – *Journal of Systematic Palaeontology* **14**(3): 211–218. <https://doi.org/10.1080/14772019.2015.1032376>
- CHEN, X.-S., ZHANG, Z.-G. & CHANG, Z.-M. (2014): *Issidae and Caliscelidae (Hemiptera: Fulgoroidea) from China*. – Guizhou Science and Technology Publishing House, Guiyang. 242 pp.
- CHOU, L., YUAN, F. & WANG, Y. (1994): A newly recorded genus and three new species of Lophopidae from China (Homoptera: Fulgoroidea). – *Journal of Northwest Forestry College* **9**(1): 44–51. [In Chinese with English summary]
- DISTANT, W. L. (1906): *Rhynchota (Heteroptera–Homoptera). The fauna of British India, including Ceylon and Burma, Vol. 3*. – Taylor and Francis, London, 503 pp.
- EMELJANOV, A. F. (1999): Notes on delimitation of families of the Issidae group with description of a new species of Caliscelidae belonging to a new genus and tribe (Homoptera, Fulgoroidea). – *Zoosystematica Rossica* **8**: 61–72.
- EMELJANOV, A. F. (2013): New genera and new species of the tribe Augilini (Homoptera: Caliscelidae). – *Caucasian Entomological Bulletin* **9**(2): 217–221. [In Russian, with English summary]. <https://doi.org/10.23885/1814-3326-2013-9-2-217-221>
- FENNAH, R. G. (1963): A new genus and two new species of Lophopidae from South-East Asia (Homoptera: Fulgoroidea). – *Annales and Magazine of Natural History (Ser. 13)* **5**: 725–730. <https://doi.org/10.1080/00222936208651308>
- GNEZDILOV, V. M. (2003): Review of the family Issidae (Homoptera, Cicadina) of the European fauna, with notes on the structure of ovipositor in planthoppers. – *Chteniya pamyati N.A. Kholodkovskogo (Meetings in memory of N.A. Cholodkovsky)*, St. Petersburg **56**(1): 1–145. [In Russian with English summary]

- GNEZDILOV, V. M. (2011): New and little known planthoppers of the subfamily Ommatidiotinae (Homoptera, Fulgoroidea, Caliscelidae) from Madagascar and South Asia. – *Entomologicheskoe obozrenie* **90**(2): 329–334, 1 plate of photos. [English translation published in *Entomological Review* **91**(6): 750–754.]  
<https://doi.org/10.1134/S001387381106008X>
- GNEZDILOV, V. M. (2013): Modern system of the family Caliscelidae Amyot et Serville (Homoptera, Fulgoroidea). – *Zoologicheskyy Zhurnal* **92**(10): 1309–1311. [English translation published in *Entomological Review*, 2014, **94**(2): 211–214.]  
<https://doi.org/10.1134/S0013873814020092>
- GNEZDILOV, V. M. (2017): A new species of the genus *Adenissus* (Hemiptera, Fulgoroidea, Caliscelidae) from United Arab Emirates. – *Proceedings of the Zoological Institute RAS* **321**(3): 320–325.
- GNEZDILOV, V. M. (2020): First record of the genus *Symplanella* Fennah, 1987 (Hemiptera, Auchenorrhyncha, Fulgoroidea: Caliscelidae) from Vietnam, with description of a new species from Yok Don National Park. – *Entomological Review* **100**(1): 91–94.  
<https://doi.org/10.1134/S001387382001008X>
- GNEZDILOV, V. M. (2021): Revision of the genus *Augilina* Melichar, 1914 (Hemiptera, Fulgoroidea, Caliscelidae), with description of a new genus. – *Annales Zoologici (Warszawa)* **71**(4): 693–700. <https://doi.org/10.3161/00034541ANZ2021.71.4.001>
- GNEZDILOV, V. M. & BARTLETT, C. R. (2018): A new genus and two new species of the family Issidae (Hemiptera, Auchenorrhyncha: Fulgoroidea) from Amazonian Ecuador. – *Proceedings of the Entomological Society of Washington* **120**(1): 62–75.  
<https://doi.org/10.4289/0013-8797.120.1.62>
- GNEZDILOV, V. M. & BOURGOIN, T. (2009): First record of the family Caliscelidae (Hemiptera: Fulgoroidea) from Madagascar, with description of new taxa from the Afrotropical Region and biogeographical notes. – *Zootaxa* **2020**: 1–36.  
<https://doi.org/10.11646/zootaxa.2020.1.1>
- KIRBY, W. F. (1891): Catalogue of the described Hemiptera Heteroptera and Homoptera of Ceylon, based on the collection formed (chiefly at Pundaloya) by Mr. E. Ernest Green. – *Journal of the Linnean Society, Zoology* **24**: 72–176 + pls. 4–6.  
<https://doi.org/10.1111/j.1096-3642.1891.tb02479.x>
- MELICHAR, L. (1914): Neue Fulgoriden von den Philippinen: I. Theil. – *The Philippine Journal of Science* **9D**(3): 269–283 + 1 Taf.
- ZHANG, Y., CHE, Y., MENG, R. & WANG, Y. (2020): *Hemiptera. Caliscelidae. Issidae. Insecta. Vol. 70. Fauna Sinica*. – Science Press, Beijing, 655 pp. + 43 photo plates.

Received October 20, 2021, accepted December 18, 2021, published February 14, 2022