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Review of the Asian leafhopper genus *Scaphomonus* Viraktamath (Hemiptera: Cicadellidae: Deltocephalinae: Scaphoideini) with description of a new genus and new species

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Abstract. The Asian leafhopper genus *Scaphomonus* Viraktamath is reviewed, with one new species *S. bispinosus* sp. nov., described from Malaysia (Sabah and Sarawak). A new genus, *Selangomonus* gen. nov., is described for three new species i.e., *S. bruneiensis* gen. et sp. nov. from Brunei, *S. falcatus* gen. et sp. nov. and *S. undulatus* gen. et sp. nov., both from Peninsular Malaysia and for six species, previously placed in *Scaphomonus*, i.e., *Selangomonus flataedeagus* (Li) gen. et comb. nov. from China; *S. furcatus* (Xing & Li) gen. et comb. nov. from China, *S. indicus* (Distant) gen. et comb. nov. from Myanmar, *S. longistyleus* (Li & Wang) gen. et comb. nov. from China; *S. naejangsanus* (Dutta, Kwon, Suh & Kwon) gen. et comb. nov. from Korea and *S. splinterus* (Li & Wang) gen. et comb. nov. from China and Thailand. A key is provided to the *Scaphoideus* group genera which, in addition to *Scaphomonus* and *Selangomonus* treated here, includes *Scaphoideus* Uhler (in part), *Melanetettix* Knight & Fletcher, *Scaphoidella* Vilbaste, *Scaphomonoides* Li, Dai & Xing, *Parascaphoidella* Wei, Fang & Xing. Of these, *Scaphomonoides* is newly assessed, based on a specimen of its type species, *S. redstripeus* (Li & Wang), from Vietnam (new record). In addition, a review of the usage of Scaphoideini in the literature and characters defining the tribe, are provided.

Keywords. *Scaphoideus* group, morphology, taxonomy, paraphyses.

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Introduction

The subfamily Deltocephalinae Fieber, 1869 (Cicadellidae) is the largest leafhopper subfamily including 40 tribes, 980 genera, and 7179 valid species found in all geographical regions (Dmitriev *et al.* 2022).

Members of the group are a major constituent of grass and forest ecosystems and as plant sap feeders are important pests of crops, causing damage by direct feeding and as vectors of plant pathogens. Within the subfamily some genera of the tribe Scaphoideini Oman, 1943, sensu Zahniser & Dietrich (2013), have distinctive red and orange markings on the head and thorax and fine transverse dark lines at the apex of the head (e.g., Fig. 2A) making them a conspicuous element of the Old and New World tropical fauna. This group of genera are referred to here as the *Scaphoideus* generic group following its first usage by Viraktamath & Mohan (2004) (see Taxonomy below).

One of the genera in the *Scaphoideus* group, *Scaphomonus* Viraktamath, 2009 (in Dai *et al.* 2009), was described for ten Oriental species, including nine transferred from S*caphotettix* Matsumura, 1914 and one new species. Subsequently, three new species were described from China (Li *et al.* 2011; Xing & Li 2013) and one new species from Korea (Dutta *et al.* 2020). In the original description of *Scaphomonus*, several unidentified specimens from Asia were noted under *S. indicus* (Distant, 1908), in this paper these specimens are described and figured as three new species of a new genus (*Selangomonus* gen. nov.) together with figures provided of *Selangomonus splinterus* (Li & Wang, 2005) gen. et comb. nov. In addition, a checklist and key to species of *Scaphomonus* and *Selangomonus* are provided and the uncertain identity of *Selangomonus indicus* (Distant, 1908) gen. et comb. nov. is discussed. A key to the *Scaphoideus* group genera is also provided, which includes the newly assessed genus, *Scaphomonoides* Li, 2011, based on a specimen of the type species, *Scaphomonoides redstripeus* (Li & Wang, 2005) from Vietnam (new record).

Material and methods

The male terminalia were removed, treated with a 10% KOH solution for about 24 h, cleaned in distilled water and observed in a droplet of glycerol under a Leica M165 C High Performance Stereo Microscope. Line drawings of male genitalia were drawn using a Leica M165 C High Performance Stereo Microscope and an Olympus ZD 1328 compound microscope with a drawing tube attachment. Images were prepared using Adobe Photoshop 2022 and Adobe Illustrator 2024. External morphology was observed under a Leica EZ4 stereo microscope, habitus photographs were taken using a Canon MF-E 65 mm macro lens with Helicon Remote (ver. 3.9.10 W), the images were stacked using Helicon Focus ver. 7.6.1, then optimized with Adobe Photoshop 2022. Body length was measured in millimeters from the apex of the head to the apex of the forewings. Material examined is deposited in the Natural History Museum, London, UK (BMNH). Morphological terminology used in the study follows Rakitov (1997) and Dietrich (2022) for the legs.

Abbreviations (setae and setal row)

AD = anterodorsal
AM = anteromedial
AV = anteroventral
IC = intercalary setal row
PD = posterodorsal
PV = posteroventral

Results

Taxonomy

Class Insecta Linnaeus, 1758
Order Hemiptera Linnaeus, 1758
Suborder Auchenorrhyncha Duméril, 1805
Family Cicadellidae Latreille, 1825
Subfamily Deltocephalinae Fieber, 1869
Tribe Scaphoideini Oman, 1943

Scaphoideus generic group

Based on overall appearance, i.e., colour pattern and shape of the head etc., the genera *Scaphomonus* and *Selangomonus* gen. nov. (both the subject of the current work) belong to a group of Asian Scaphoideini comprising: *Scaphoideus* Uhler, 1889, *Melanetettix* Knight & Fletcher, 2007, *Scaphoidella* Vilbaste, 1968, *Scaphomonoides* Li, Dai & Xing, 2011, *Parascaphoidella* Wei, Fang & Xing, 2020 and *Coroticus* Distant, 1918. Two other genera, *Afroideus* Linnavuori, 1961 from South Africa and *Diemoides* Evans, 1938 (see Fletcher 2017) from Australia also resemble these genera externally. Dai & Dietrich (2011) had noted that *Scaphoidella* externally resembled species of *Scaphoideus*, *Melanetettix* and *Scaphomonus* and these genera were placed together in recent molecular analyses of the tribe (Cao *et al.* 2022; El-Sonbati 2024), suggesting the group is worthy of group status as first suggested by Viraktamath & Mohan (2004). The inclusion of *Mimotettix* Matsumura, 1914 in the group by Cao *et al.* (2022) and El-Sonbati (2023) needs further study as externally it is distinct as also is *Aeternus* Distant, 1918 included in the group by Cao *et al.* (2022) but considered of uncertain tribal placement by Viraktamath *et al.* (2020). Another genus, *Scaphodhara* Viraktamath & Mohan, 1994, also belongs in the group, as although it has different head and thorax markings typical of the group it is indistinguishable from some Asian species of *Scaphoideus* externally. In addition, it should be noted that a few species of *Scaphoideus* from Europe, Africa and India have different colour markings and a different shaped vertex to typical species of *Scaphoideus* (see Webb & Viraktamath 2007). The Asian genera of the *Scaphoideus* group can be separated by the following key with *Coroticus*, known only from the female, omitted from the key as males are needed for generic identification. See also Remarks under *Scaphomonoides* at the end of Taxonomy, and Discussion.

Key to *Scaphoideus* generic group (males) from Asia

1. Head and thorax with red and orange markings on the head and thorax and fine transverse dark lines at the apex of the head (Fig. 2A–C) 3
– Head and thorax with a longitudinal broad median ivory or yellowish white stripe (see Viraktamath & Mohan 2004: fig. 28), or vertex with brown longitudinal spindle-shaped marks (see Viraktamath & Mohan 2004: fig. 1) 2

2. Connective disassociated from aedeagus, with apical processes; intermediate sclerite between aedeagus and connective absent; dorsal connective in pygofer phragma present ..... ***Scaphoideus*** Uhler, 1889 (in part)
– Connective articulated with aedeagus, without apical processes; intermediate sclerite between aedeagus and connective present or absent; dorsal connective in pygofer phragma absent ..... ***Scaphodhara*** Viraktamath & Mohan, 1994

3. Pygofer with or without a tuft of long macrosetae caudally; connective dissociated from aedeagus, with apical processes; dorsal connective in pygofer phragma present ..... ***Scaphoideus*** Uhler, 1889 (in part)

– Pygofer without tufts of long macrosetae caudally; aedeagus articulated with connective, the latter without apical processes; dorsal connective in pygofer phragma absent 4

4. Aedeagus with processes basal (sometimes articulating with connective) and sometimes with apical and or preapical processes; gonopore apical or apical on ventral surface 5
– Aedeagus with processes apical, preapical or absent; gonopore apical or apical on dorsal surface 8

5. Basal processes of aedeagus arising from a short to long preatrium .....***Scaphoidella*** Vilbaste, 1968
– Basal processes of aedeagus arising from near base of shaft (socle) (Fig. 13E–G) 6

6. Pygofer with caudal process; connective stem moderately long to long ....***Melanetettix*** Knight & Fletcher, 2007
– Pygofer without caudal process; connective stem very short 7

7. Valve short; subgenital plate with outer margin concave and tapered to narrow apex; style preapical lobe digitate ..... ***Parascaphoidella*** Wei, Fang & Xing, 2020
– Valve long; subgenital plate with outer margin convex, not tapered to narrow apex (Fig. 13H); style preapical lobe not digitate (Fig. 13D) .....***Scaphomonoides*** Li, 2011

8. Aedeagus with long apical processes or if processes short then with long basal apodeme; gonopore apical; preatrium absent (Figs 1–2) ..... ***Scaphomonus*** Viraktamath, 2009
– Aedeagus without processes or if with a pair of short apical processes then with short basal apodeme and long preatrium; gonopore apical on dorsal surface ..... ***Selangomonus*** gen. nov.

Genus ***Scaphomonus*** Viraktamath, 2009

Scaphomonus Viraktamath, 2009 in Dai *et al.* 2009: 659.

Type species

Scaphotettix freytagi Viraktamath & Mohan, 1993: 466, figs 21–32.

Description

Anterior margin of head with two dark brown transverse bands on either side of a pale transverse band between ocelli, and a broad transverse brown, orange or reddish band between eyes tinged with brown anteriorly; face pale brown with variable darker brown arcs dorsally. Thorax with a transverse brown, orange or reddish band anteriorly and posteriorly on pronotum and anteriorly on scutellum. Forewings marked with brown apically and on some veins (at least in distal part of wing). Head triangularly produced, similar in width to pronotum, approximately twice as long medially than next to eye; ocelli situated on anterior margin of head close to eye. Forewing with outer subapical cell extending sub-basally towards wing margin and with a reflexed costal vein.

Male genitalia. Pygofer short to long with or without a caudal process, with scattered macrosetae distally. Valve subtriangular. Subgenital plates short to long, evenly tapered to narrowly rounded apex; with several long uniseriate lateral macrosetae sub-basally to subapically and a few long fine setae at least apically. Connective Y-shaped, articulated with aedeagus; stem very short to long with or without a lightly sclerotized lobe-like area on each side. Style with well-developed preapicalal lobe and usually short acute apophysis. Aedeagal shaft short to long with a pair of usually long apical processes, gonopore apical; preatrium absent; basal apodeme usually well developed.

Female genitalia. First valvulae with dorsal sculpture concatenate to strigate. Second valvulae abruptly expanded slightly basad of midlength and gradually tapered to apex (blade-like), with approximately 20 prominent teeth; dorsal sclerotized area and dorsal hyaline area present.

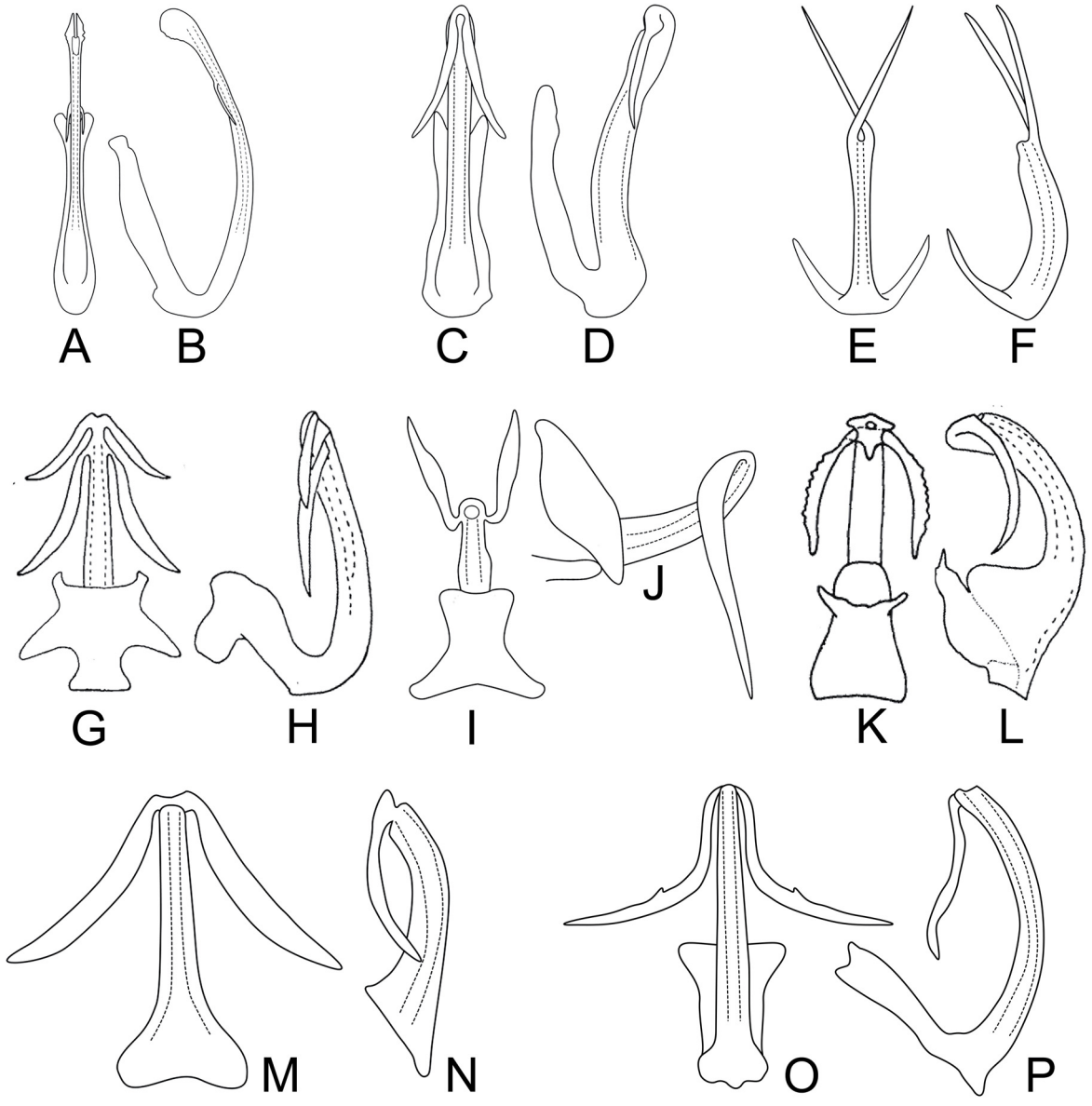

Fig. 1. Aedeagus of species of *Scaphomonus* Viraktamath, 2009. **A–F**, **M–P**. Ventral and lateral view respectively. **G–L**. Dorsal and lateral views respectively. **A–B**. *S. arcuatus* (Viraktamath & Mohan, 1993). **C–D**. *S. vateriae* (Viraktamath, 2009). **E–F**. *S. widestyleus* (Li, 2011). **G–H**. *S. quadrifidus* (Viraktamath & Mohan, 1993). **I–J**. *S. freytagi* (Viraktamath & Mohan, 1993). **K–L**. *S. redundans* (Distant, 1918). **M–N**. *S. malnadicus* (Viraktamath & Mohan, 1993). **O–P**. *S. agumbensis* (Viraktamath & Mohan, 1993). **A–B**, **G–P**. Modified from Viraktamath & Mohan (1993). **C–D**. Modified from Dai *et al.* (2009). **E–F**. Modified from Li *et al.* (2011).

Distribution

Mainland Asia (China, India) and in the Pacific (Sabah and Sarawak).

Remarks

This genus is similar to *Selangomonus* gen. nov. in appearance, but can be distinguished by aedeagus. Aedeagus of *Selangomonus* usually without processes (apical processes present in *S. furcatus* gen. et comb. nov.) and preatrium usually well developed (short in *S. splinterus*).

Checklist of *Scaphomonus* species

Scaphomonus agumbensis (Viraktamath & Mohan, 1993) (Fig. 1O–P)
Scaphotettix agumbensis Viraktamath & Mohan, 1993: 471, figs 42–50.
Scaphomonus agumbensis – Dai *et al.* 2009: 661.
Distribution. India.

Scaphomonus arcuatus (Viraktamath & Mohan, 1993) (Fig. 1A–B)
Scaphotettix arcuatus Viraktamath & Mohan, 1993: 466, figs 14–20.
Scaphomonus arcuatus – Dai *et al.* 2009: 661.
Distribution. India.

Scaphomonus bispinosus sp. nov.
Distribution. Malaysia (Sabah, Sarawak).

Scaphomonus freytagi (Viraktamath & Mohan, 1993) (Fig. 1I–J)
Scaphotettix freytagi Viraktamath & Mohan, 1993: 466, figs 21–32.
Scaphomonus freytagi – Dai *et al.* 2009: 661.
Distribution. India.

Scaphomonus malnadicus (Viraktamath & Mohan, 1993) (Fig. 1M–N)
Scaphotettix malnadicus Viraktamath & Mohan, 1993: 471, figs 51–59.
Scaphomonus malnadicus – Dai *et al.* 2009: 662.
Distribution. India.

Scaphomonus quadrifidus (Viraktamath & Mohan, 1993) (Fig. 1G–H)
Scaphotettix quadrifidus Viraktamath & Mohan, 1993: 472, figs 60–72.
Scaphomonus quadrifidus – Dai *et al.* 2009: 662.
Distribution. India.

Scaphomonus redundans (Distant, 1918) (Fig. 1K–L)
Scaphoideus redundans Distant, 1918: 64.
Scaphotettix redundans – Viraktamath & Mohan 1993: 469, figs 33–41.
Scaphomonus redundans – Dai *et al.* 2009: 662.
Distribution. India.

Scaphomonus vateriae Viraktamath, 2009 (Fig. 1C–D)
Scaphomonus vateriae Viraktamath, 2009 in Dai *et al.* 2009: 662, fig. 9a–h.
Distribution. India.

Scaphomonus widestyleus Li, 2011 (Fig. 1E–F)
Scaphomonus widestyleus Li, 2011 in Li *et al.* 2011: 264, fig. 5–266. — Xing & Li 2013: 60, figs 8–14, 24–25.
Distribution. China.

Key to species (males) of *Scaphomonus*

1. Aedeagus with pair of spine-like apical processes (Fig. 2E–F); style with apophysis longer than section of shank based of lateral lobe (Fig. 2G) (Sarawak, Sabah) .....***S. bispinosus*** sp. nov.
– Aedeagus without pair of spine-like apical processes; style with apophysis shorter than section of shank based of lateral lobe 2

2. Aedeagus with very long and narrow apically bifid shaft (Fig. 1A); basal apodeme long (Fig. 1B) (India) .....***S. arcuatus*** (Viraktamath & Mohan, 1993)
– Aedeagus with shaft and basal apodeme short to long; apex of shaft not bifid 3

3. Aedeagus with shaft long, curved posteriorly; basal apodeme longer than half length of shaft (Fig. 1D) .....***S. vateriae*** (Viraktamath, 2009)
– Aedeagus with shaft short to moderately long, curved dorsally; basal apodeme half or less that half length of shaft 4

4. Aedeagal processes directed caudally (Fig. 1E); basal apodeme comprising two diverging basal arms (Fig. 1F) (China) .....***S. widestyleus*** (Li, 2011)
– Aedeagal processes directed towards base of aedeagus in lateral view; basal apodeme not comprising two diverging basal arms 5

5. Aedeagus with two pair of apical processes (Fig. 1G–H) (India) .... ***S. quadrifidus*** (Viraktamath & Mohan, 1993)
– Aedeagus with a single pair of apical processes 6

6. Pygofer with caudal process absent; connective with stem much longer than arms (India) ....***S. freytagi*** (Viraktamath & Mohan, 1993)
– Pygofer with caudal process present; connective stem shorter to slightly longer than arms 7

7. Pygofer process strongly curved dorsally; connective stem slightly longer than arms (India) .... ***S. redundans*** (Distant, 1918)
– Pygofer process not strongly curved dorsally; connective stem shorter than arms 8

8. Base of aedeagus broad in lateral (Fig. 1N), processes broad in ventral view (Fig. 1D) (India) .....***S. malnadicus*** (Viraktamath & Mohan, 1993)
– Base of aedeagus narrow in lateral view (Fig. 1P), processes narrow in posterior view (Fig. 1O) (India) .....***S. agumbensis*** (Viraktamath & Mohan, 1993)

Scaphomonus bispinosus sp. nov.
urn:lsid:zoobank.org:act:15F3CF7D-E5F7-4154-860A-DB3C17CD275F
Figs 2–3

Etymology

The specific epithet is derived from the New Latin adjective '*bispinosus*, *-a*, *-um*' (= 'two-spined'), referring to the two spine-like apical aedeagal processes.

Type material

Holotype

MALAYSIA • ♂; Sabah, Tawai; 8 Apr. 1977; M.E. Bacchus leg.; BMNH.

Paratypes

MALAYSIA – **Sabah** • 1 ♂, 6 ♀♀; same data as for holotype; BMNH. – **Sarawak** • 2 ♂♂, 11 ♀♀; Gunung Mulu National Park, West Melinau Gorge; 3 Apr. 1978; J.D. Holloway leg.; BMNH.

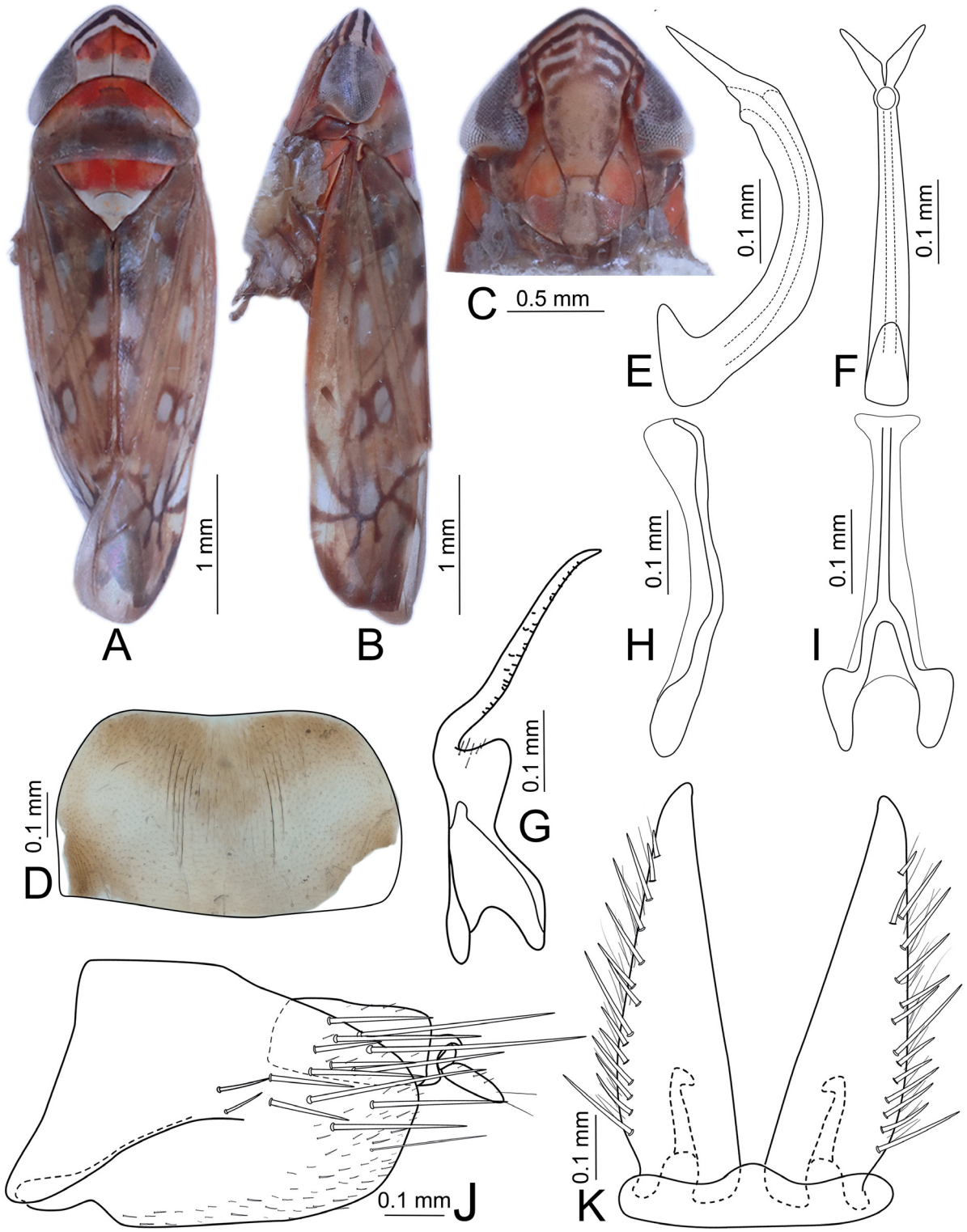

Fig. 2. A–C, E–K. *Scaphomonus bispinosus* sp. nov., holotype, ♂ (BMNH). **D**. Specimen ♀ (BMNH). **A–B**. Habitus, dorsal and lateral views, respectively. **C**. Face, ventral view. **D**. Pregenital (VII) sternite. **E–F**. Aedeagus, lateral and dorsal view respectively. **G**. Style, ventral view. **H–I**. Connective, lateral and ventral view respectively. **J**. Male pygofer and anal tube, lateral view. **K**. Subgenital plates and valve, ventral view.

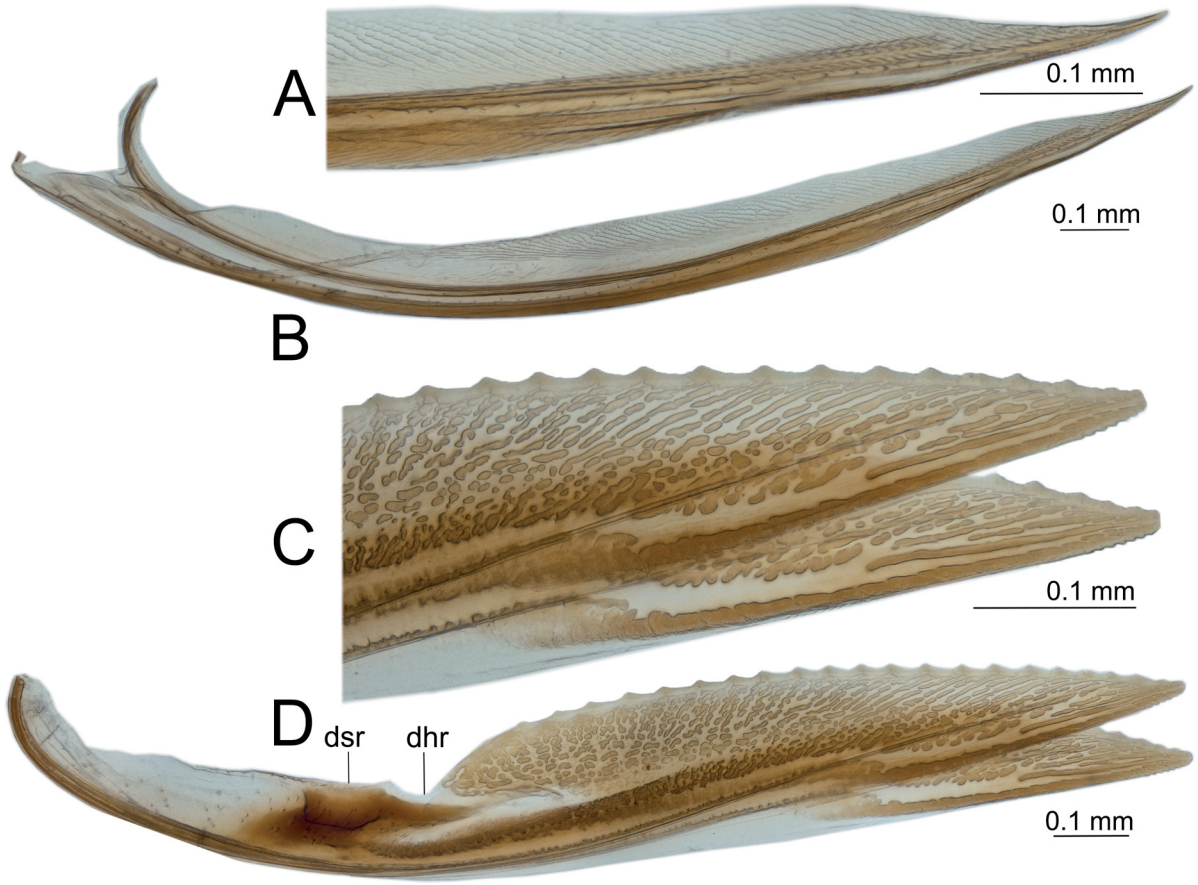

Fig. 3. *Scaphomonus bispinosus* sp. nov., paratype, ♀ (BMNH), ovipositor valvulae, lateral view. **A–B**. First valvulae. **C–D**. Second valvulae. Abbreviations: dhr = dorsal hyaline region; dsr = dorsal sclerotized region.

Description

Measurements (mm). Body length. ♂: 4.6–4.7; ♀: 4.7–4.8.

Colouration. Colour and external characters as in generic diagnosis with forewings with whitish hyaline patches.

Male genitalia. Pygofer side longer than basal width in lateral view, without processes. Subgenital plates very long, approximately 4 times as long as basal width, bearing 14 long macrosetae. Style with apophysis very long and sinuate. Connective stem long approximately twice as long as arms, arms divergent; a lightly sclerotized area on each side. Aedeagal shaft moderately long approximately equal in length to connective, in lateral view evenly curved dorsally and similar in width throughout length, slightly tapered to apex in dorsal view, with a pair of spine-like apical processes, gonopore apical; basal apodeme very short; preatrium absent.

Distribution

Malaysia (Sabah, Sarawak).

Remarks

This new species can be distinguished by the spine-like apical processes of the aedeagus, long connective and long apophysis of the style.

Genus ***Selangomonus*** gen. nov.
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Type species

Selangonomus bruneiensis gen. et sp. nov.

Diagnosis

Resembling other *Scaphoideus* group genera in general appearance and colour marking. Head triangularly produced, similar in width to pronotum, approximately twice as long medially as next to eye; ocelli situated on anterior margin of head close to eye. Forewing with outer subapical cell extending sub-basally to near wing margin and with a reflexed costal vein. Hind tibia with row PD setae very long, more than half length of foretibia.

Male genitalia. Pygofer usually without caudal process (present in *S. furcatus*), with scattered macrosetae distally. Subgenital plate moderately long to long, evenly tapered to narrowly rounded apex; with several long uniseriate lateral macrosetae sub-basally to subapically and a few long fine setae at least apically. Connective Y-shaped, articulated with aedeagus; stem short usually with a lightly sclerotized lobe-like area on each side (absent in *S. furcatus*). Style with well-developed preapical lobe and usually short acute apophysis (long in *S. furcatus*). Aedeagal shaft elongate usually without processes (apical processes present in *S. furcatus*); gonopore apical on dorsal surface; preatrium usually well developed (short in *S. splinterus*); basal apodeme poorly developed.

Female genitalia. First valvulae with dorsal sculpture concatenate to strigate. Second valvulae abruptly expanded slightly basad of midlength and gradually tapered to apex (blade-like), with approximately 20 prominent teeth; dorsal sclerotized area present.

Etymology

The genus name is derived from the place name Selangor (Peninsular Malaysia), the type locality of two of its included species.

Description

Colouration. Anterior margin of head with two dark brown transverse bands on either side of a pale transverse band between ocelli, and a broad transverse brown, orange or reddish band between eyes tinged with brown anteriorly. Face pale brown with variable darker brown arcs. Thorax with a transverse brown, orange or reddish band anteriorly and posteriorly on pronotum and anteriorly on scutellum. Forewings marked with brown apically and on some veins (at least in distal part of wing).

Head and thorax. Head triangularly produced, similar in width to pronotum, approximately twice as long medially than next to eye; ocelli situated on anterior margin of head close to eye. Face slightly flattened, with width (including eyes) almost equal to length; antennae located near mid-height of eye, antennal pit deep and expanded onto frontoclypeus; frontoclypeus narrow, longer than width between eyes; anteclypeus flat and slightly broadened at apex, apical margin of anteclypeus slightly exceeding the face margin; lora large.

Tegmen. Forewing with three subapical cells; outer subapical cell extended sub-basally to near wing margin and with a reflexed costal vein.

Leg. Fore femur with IC setae long and fine, row AM with 1 stout seta, and row AV with several short stout setae in basal half; AV1 slightly more elongate and near AM1. Fore tibia rounded with one seta in row AD and four in row PD. Hind femur apical setal formula 2+2+1. Hind tibia laterally flattened and

nearly straight; row AD with approximately 10 ± 1 long stout setae and 1–5 short setae between two long seta; row PD with 16 ± 1 macrosetae alternating moderately long to very long, the latter more than half length of foretibia; row AV with few long distal macrosetae and several moderately long more basal setae; row PV with several moderately long stout setae distally and numerous short fine and soft setae from midlength to sub-basally; pecten with medial seta much longer than seta on either side. Basal hind tarsomere long, pecten with three medial platellae and a tapered setae on each side; plantar surface with one row of five and one row of four stout setae.

Male genitalia. Valve short, triangular. Pygofer usually without caudal process (present in *S. furcatus*), with scattered macrosetae distally. Subgenital plate moderately long to long, evenly tapered to narrowly rounded apex; with several long uniseriate lateral macrosetae sub-basally to subapically and a few long fine setae at least apically. Connective Y-shaped, articulated with aedeagus; stem short usually with a lightly sclerotized lobe-like area on each side (absent in *S. furcatus*). Style with well-developed preapical lobe and usually short acute apophysis (long in *S. furcatus*). Aedeagal shaft elongate usually without processes (apical processes present in *S. furcatus*); gonopore apical on dorsal surface; preatrium usually well developed (short in *S. splinterus*); basal apodeme poorly developed.

Female genitalia. First valvulae with dorsal sculpture concatenate to strigate. Second valvulae abruptly expanded slightly basad of midlength and gradually tapered to apex (blade-like), with several (18–20) prominent teeth; dorsal sclerotized area present.

Distribution

Mainland Asia (China, India, Korea, Myanmar, Nepal, Thailand and Peninsular Malaysia) and in the Pacific (Philippines, Sarawak and Brunei).

Remarks

The new genus is similar to *Scaphomonus* in appearance, but can be distinguished by aedeagus. Aedeagus of *Scaphomonus* have one or two pairs of processe and not developed preatrium.

Checklist to species of *Selangomonus* gen. nov.

Selangomonus bruneiensis gen. et sp. nov.
Distribution. Brunei.

Selangomonus falcatus gen. et sp. nov.
Distribution. Peninsular Malaysia.

Selangomonus flataedeagus (Li, 2011) gen. et comb. nov. (Fig. 2A–B)
Scaphomonus flataedeagus Li, 2011 in Li *et al.* 2011: 263, fig. 5–265.
Scaphomonus flataedeagus – Xing & Li 2013: 59, figs 1–7, 22–23.
Distribution. China.

Selangomonus furcatus (Xing & Li, 2103) gen. et comb. nov. (Fig. 2C–D)
Scaphomonus furcatus Xing & Li, 2013: 61, Figs 15–21, 26–27.
Distribution. China.

Selangomonus indicus (Distant, 1908) gen. et comb. nov. Identity uncertain (see species entry below)
Scaphoideus indicus Distant, 1908: 374–375.
Distribution. Myanmar.

Selangomonus indicus (Distant, 1908) sensu Viraktamath & Mohan 1993
Scaphotettix indicus – Viraktamath & Mohan, 1993: 464, figs 1–13.
Distribution. India.

Selangomonus indicus (Distant, 1908) sensu Dai *et al.* 2009
Scaphomonus indicus – Dai *et al.* 2009: 661, fig. 6a–h.
Distribution. China.

Selangomonus indicus (Distant, 1908) sensu Li *et al*. 2011
Scaphomonus indicus – Li *et al.* 2011: 261, fig. 5–262.
Distribution. China.

Selangomonus indicus(?) (Distant, 1908). See species entry below
Distribution. Nepal, Philippines.

Selangomonus longistyleus (Li & Wang, 2005) gen. et comb. nov. (Fig. 2E–F)
Scaphotettix longistyleus Li & Wang, 2005: 190, figs 13–17.
Scaphomonus longistyleus – Dai *et al.* 2009: 661, fig. 7a–h. — Li *et al*. 2011: 262, fig. 5–263. — Xing & Li 2013: 60.
Distribution. China.

Selangomonus naejangsanus (Dutta, Kwon, Suh & Kwon, 2020) gen. et comb. nov. (Fig. 2G–H)
Scaphomonus naejangsanus Dutta, Kwon, Suh & Kwon, 2020:194, figs 1–4, 5–12.
Distribution. Korea.

Selangomonus splinterus (Li & Wang, 2005) gen. et comb. nov. (Fig. 8)
Scaphoideus festivus – Ishihara 1961: 252, figs 77–78, 83–84, misidentification.
Scaphotettix splinterus – Li & Wang 2005: 189, figs 8–12.
Scaphomonus splinterus – Dai *et al.* 2009: 662, fig. 8a–h. — Li *et al.* 2011: 263, fig. 5–264. — Xing & Li 2013: 60.
Distribution. China, Thailand.

Selangomonus undulatus gen. et sp. nov.
Distribution. Peninsular Malaysia.

Key to species of *Selangomonus* gen. nov.

Selangomonus indicus, of uncertain identity (from Myanmar), is omitted from the key and replaced with tentatively identified specimens from elsewhere in Asia. See Remarks under *Selangomonus indicus* and *S. indicus*(?) for explanation.

1. Apex of aedeagal shaft compressed and broad in lateral view (Fig. 9G) 2
– Apex of aedeagal shaft evenly tapered to acute apex in lateral view (Fig. 5H) 3

2. Aedeagal shaft abruptly tapered subapically in ventral view (Fig. 4A) (China) .....
..... ***S. flataedeagus*** (Li, 2011) gen. et comb. nov.
– Aedeagal shaft gradually tapered to apex in ventral view (Fig. 9H) (Asia) .....
..... ***S. indicus***(?) (Distant, 1908) gen. et comb. nov.

3. Aedeagus with preatrium very short about ⅛ length of shaft (Fig. 11H) (China, Thailand) .....
..... ***S. splinterus*** (Li & Wang, 2005) gen. et comb. nov.
– Aedeagus with preatrium long, ⅓ to ½ length of shaft (Fig. 8G) 4

4. Aedeagal shaft sinuate distally (Fig. 12F) .....***S. undulatus*** gen. et sp. nov.
– Aedeagal shaft evenly curved distally 5

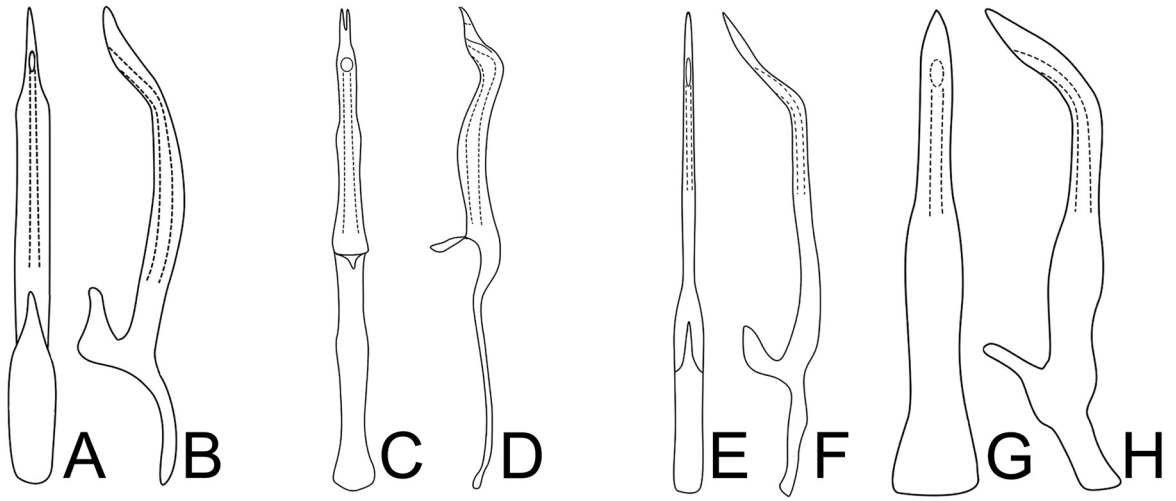

Fig. 4. Aedeagus of species of *Selangomonus* gen. nov. **A–F**. Dorsal and lateral view, respectively. **G–H**. Ventral and lateral view, respectively. **A–B**. *S. flataedeagus* (Li, 2011) gen. et comb. nov., modified after Li *et al.* (2011). **C–D**. *S. furcatus* (Xing & Li, 2013) gen. et comb. nov., modified after Xing & Li (2013). **E–F**. *S. longistyleus* (Li & Wang, 2005) gen. et comb. nov., modified after Dai *et al*. (2009). **G–H**. *S. naejangsanus* (Dutta, Kwon, Suh & Kwon, 2020) gen. et comb. nov., modified after Dutta *et al*. (2020).

5. Pygofer with caudal process; style apophysis longer than rest of style; aedeagus with apex bifid (Fig. 4D) (China) ..... ***S. furcatus*** (Xing & Li, 2013) gen. et comb. nov.
– Pygofer without caudal process; style apophysis moderately long, length much less than rest of style 6

6. Subgenital plate approximately 4 times as long as basal width (Fig. 5K) 7
– Subgenital plate less than 4 times as long as basal width 8

7. Anal tube not exceeding pygofer caudal margin (Fig. 8I); aedeagal shaft strongly bent dorsally at midlength (Fig. 8G) (Peninsular Malaysia) ..... ***S. falcatus*** gen. et sp. nov.
– Anal tube exceeding pygofer caudal margin (Fig. 5J); aedeagal shaft weakly bent dorsally at about distal one-third (Fig. 5G) (Brunei) ..... ***S. bruneiensis*** gen. et sp. nov.

8. Aedeagal shaft filamentous, sinuate distally in lateral view (Fig. 4F) (China) .....
..... ***S. longistyleus*** (Li & Wang, 2005) gen. et comb. nov.
– Aedeagal shaft robust, evenly curved distally in lateral view (Fig. 4G) (Korea) .....
..... ***S. naejangsanus*** (Dutta, Kwon, Suh & Kwon, 2020) gen. et comb. nov.

Selangomonus bruneiensis gen. et sp. nov.
urn:lsid:zoobank.org:act:EB39CE62-A0D4-448B-8722-1E645CB3F793
Figs 5–7

Etymology

The new species is named after the type locality, Brunei.

Type material

Holotype

BRUNEI • ♂; Labi, Bukit Teraja; 21–28 Aug. 1979; S.L. Sutton leg.; BMNH.

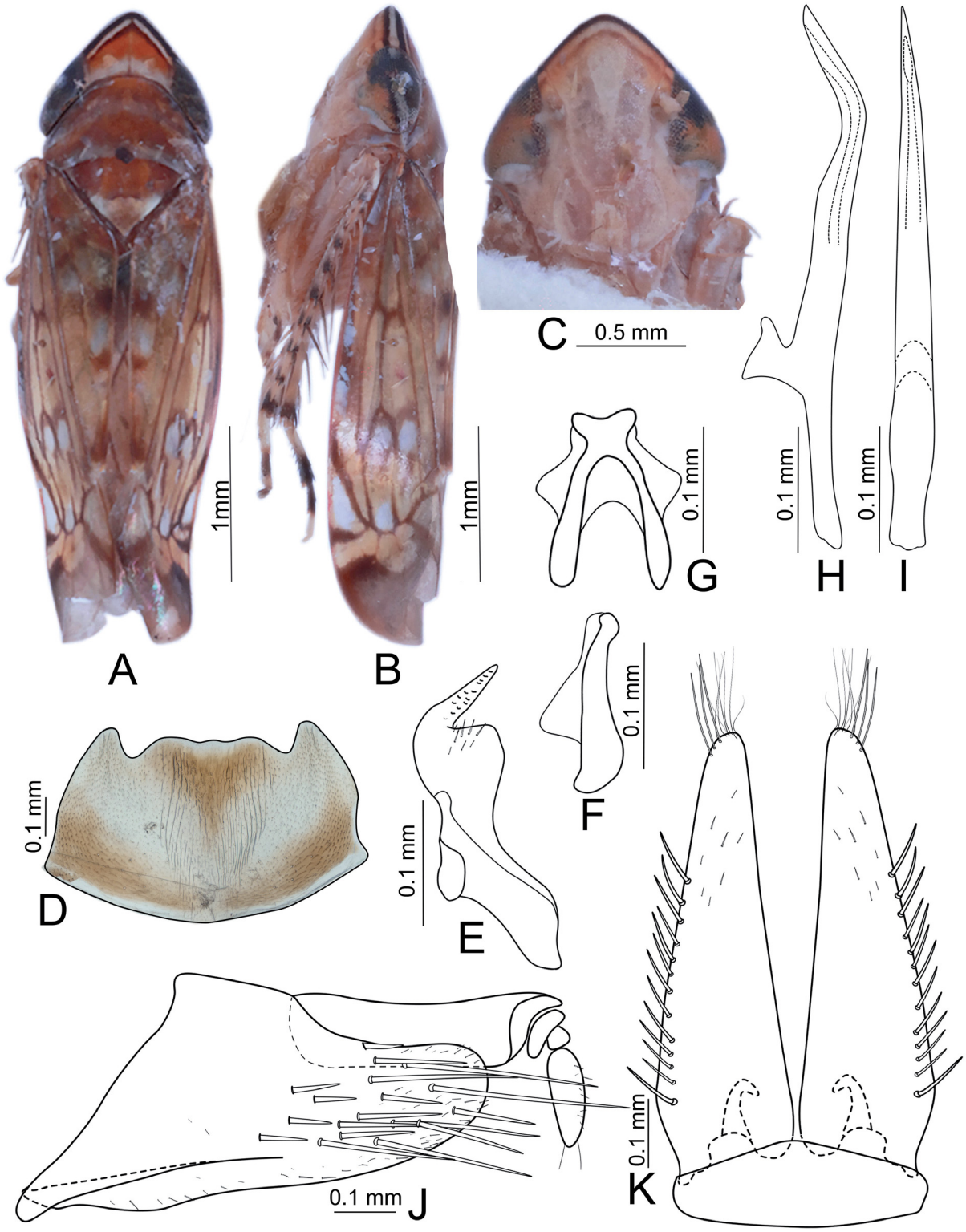

Fig. 5. A–C, E–K. *Selangomonus bruneiensis* gen. et sp. nov., holotype, ♂ (BMNH). **D**. Specimen ♀ (BMNH). **A–B**. Habitus in dorsal and lateral view, respectively. **C**. Face, ventral view. **D**. Pregenital (VII) sternite. **E**. Style, ventral view. **F–G**. Connective, lateral and ventral view respectively. **H–I**. Aedeagus, lateral and ventral view respectively. **J**. Male pygofer and anal tube, lateral view. **K**. Valve and subgenital plates ventral view.

Paratypes

BRUNEI – **Labi** • 1 ♂, 2 ♀♀; same data as for holotype; BMNH. – **Temburong District** • 3 ♀♀; Belalong; Oct. 1992; J.H. Martin leg.; BMNH.

Description

Measurements (mm). Body length. ♂: 4.2–4.3; ♀: 4.3–4.4.

Colouration. Colour and external characters as in generic diagnosis with forewings with whitish hyaline patches.

Male genitalia. Pygofer side longer than basal width in lateral view, without processes. Subgenital plates very long, approximately 4 times as long as basal width, bearing 13 long uniseriate lateral macrosetae. Connective with very short stem, arms divergent, approximately 3 times as long as stem; a lightly sclerotized lobe on each side. Aedeagal shaft elongate, approximately 5 times as long as connective, evenly tapered to pointed apex and gently angularly curved at distal ⅓ in lateral view, gonopore apical on dorsal surface; basal apodeme very short; preatrium long.

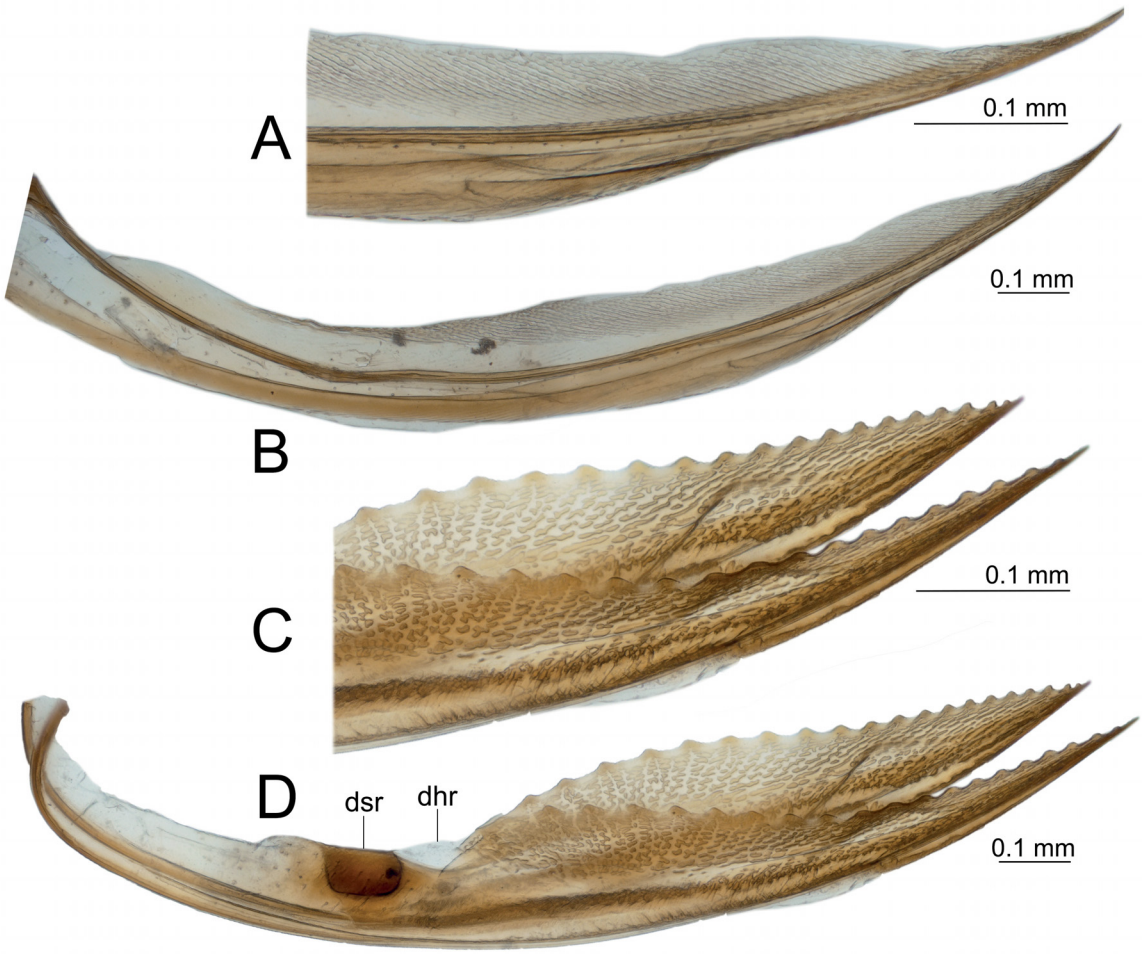

Fig. 6. *Selangomonus bruneiensis* gen. et sp. nov., paratype, ♀ (BMNH), ovipositor valvulae, lateral view. **A–B**. First valvulae. **C–D**. Second valvulae. Abbreviations: dhr = dorsal hyaline region; dsr = dorsal sclerotized region.

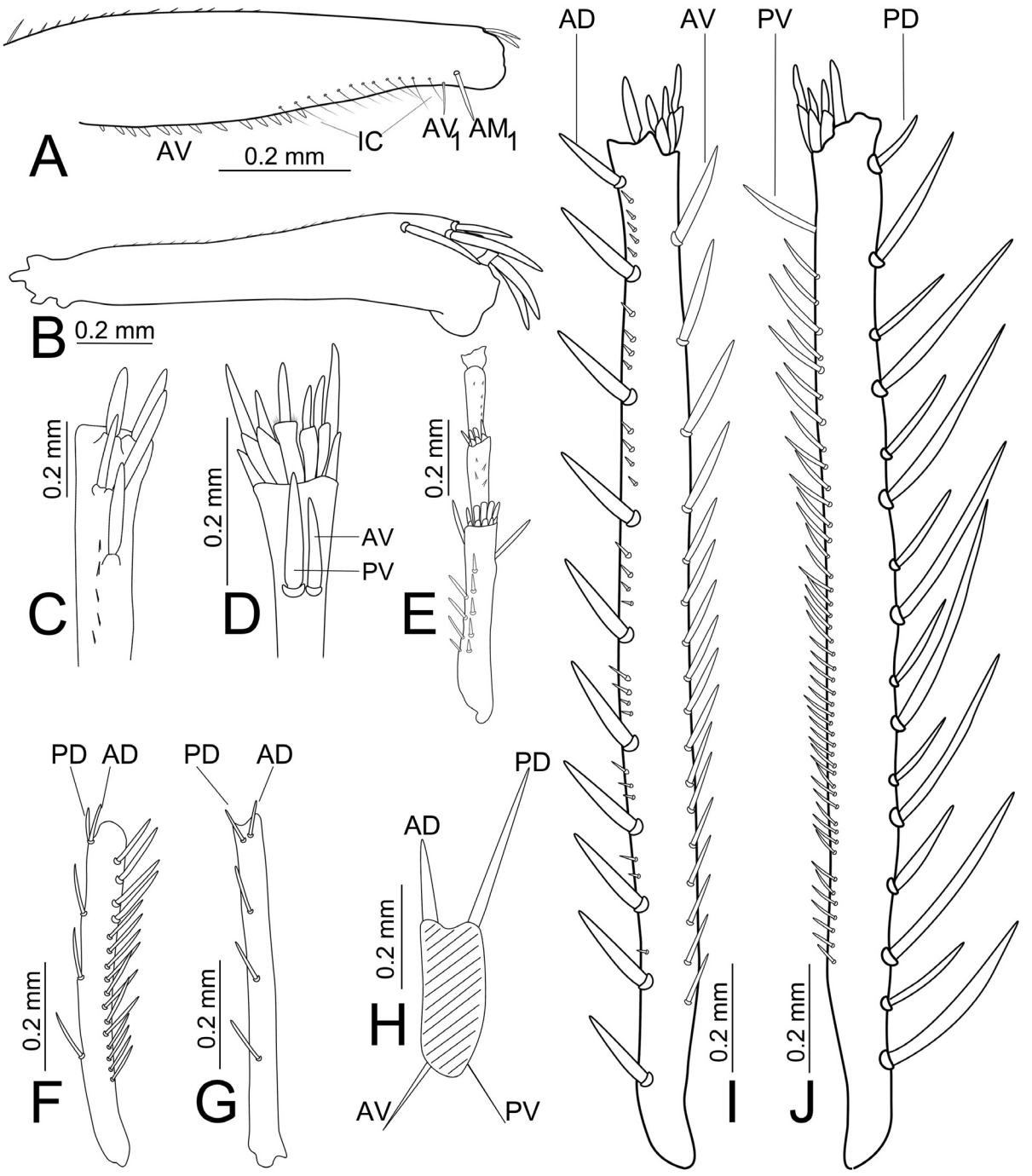

Fig. 7. *Selangomonus bruneiensis* gen. et sp. nov., holotype, ♂ (BMNH), left legs. **A**. Fore femur, anterior view. **B–C**. Hind femur, anterior lateral and dorsal view respectively. **D–E**. Fore tibia, lateral anterior and dorsal view respectively. **F**. Diagrammatic cross section of hind tibia. **G**. Apex of hind tibia, ventral view. **H**. Hind tarsomeres, ventral view. **I–J**. Hind tibia, anterior lateral and posterior lateral view respectively. Abbreviations: see Material and methods.

Distribution

Brunei.

Remarks

This new species can be distinguished by long pygofer with long anal tube exceeding caudal pygofer margin, while the pygofer is nearly the same length as subgenital plates; and by the gently angled and tapered aedeagal shaft distally in lateral view.

Selangomonus falcatus gen. et sp. nov.
urn:lsid:zoobank.org:act:00B1F1E5-81C3-4721-8205-2F1C0825B13B
Fig. 8

Etymology

The specific epithet is derived from the Latin adjective '*falcatus*, *-a*, *-um*' (= 'sickle-shaped'), referring to the shape of the aedeagal shaft in lateral view.

Type material

Holotype

MALAYSIA • ♂; Selangor, Bangi, forest; 24 Jun.–1 Aug. 1980; M.R. Wilson leg.; BMNH.

Paratype

MALAYSIA • 1 ♂; same data as for holotype; BMNH.

Description

Measurements (mm). Body length. ♂: 4.6.

Colouration. Colour and external features as in generic diagnosis.

Male genitalia. Pygofer side longer than basal width in lateral view, without processes. Subgenital plates very long, approximately 4 times as long as basal width, bearing 11 long uniseriate lateral macrosetae. Connective with stem very short, arms widely separated, approximately 4 times as long as stem; a lightly sclerotized lobe on each side. Aedeagal shaft elongate, approximately 5 times as long as connective, evenly tapered to pointed apex and strongly angularly curved at midlength in lateral view. gonopore apical on dorsal surface; basal apodeme very short; preatrium long.

Distribution

Peninsular Malaysia.

Remarks

This new species can be distinguished by the long subgenital plates and sickle shaped aedeagal shaft in lateral view.

Selangomonus indicus (Distant, 1908) gen. et comb. nov.

Scaphoideus indicus Distant, 1908: 374–375.

Scaphotettix indicus – Viraktamath & Mohan 1993: 464, figs 1–13.

Remarks

Although the male genitalia of this species were figured by Viraktamath & Mohan (1993) these figures cannot be considered reliable as the lectotype from Myanmar designated by Viraktamath & Mohan

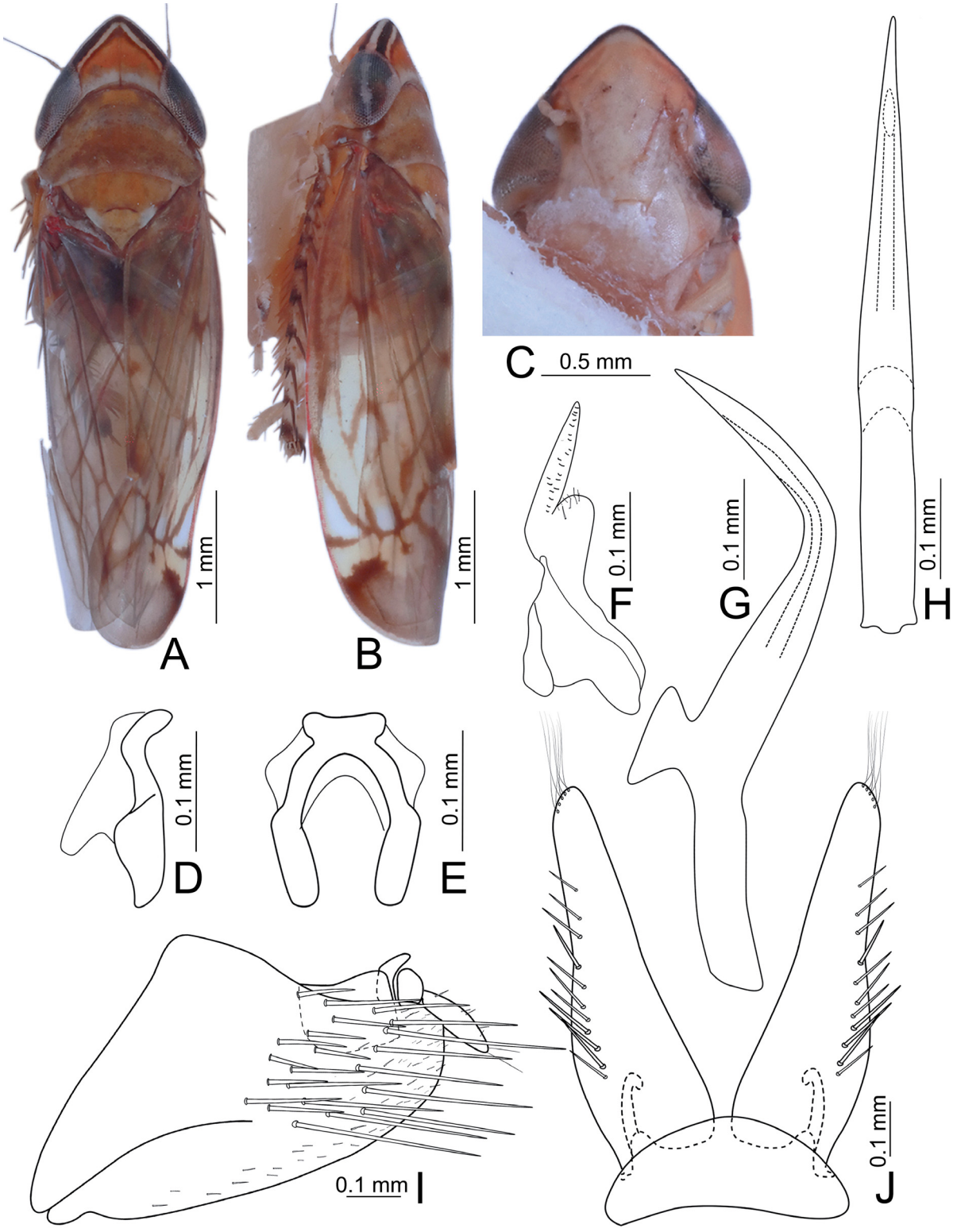

Fig. 8. *Selangomonus falcatus* gen. et sp. nov., holotype, ♂ (BMNH). **A–B**. Habitus, dorsal and lateral view respectively. **C**. Face, ventral view. **D–E**. Connective, lateral and ventral view respectively. **F**. Style, ventral view. **G–H**. Aedeagus, lateral and ventral view respectively. **I**. Male pygofer and anal tube, lateral view. **J**. Valve and subgenital plates, ventral view.

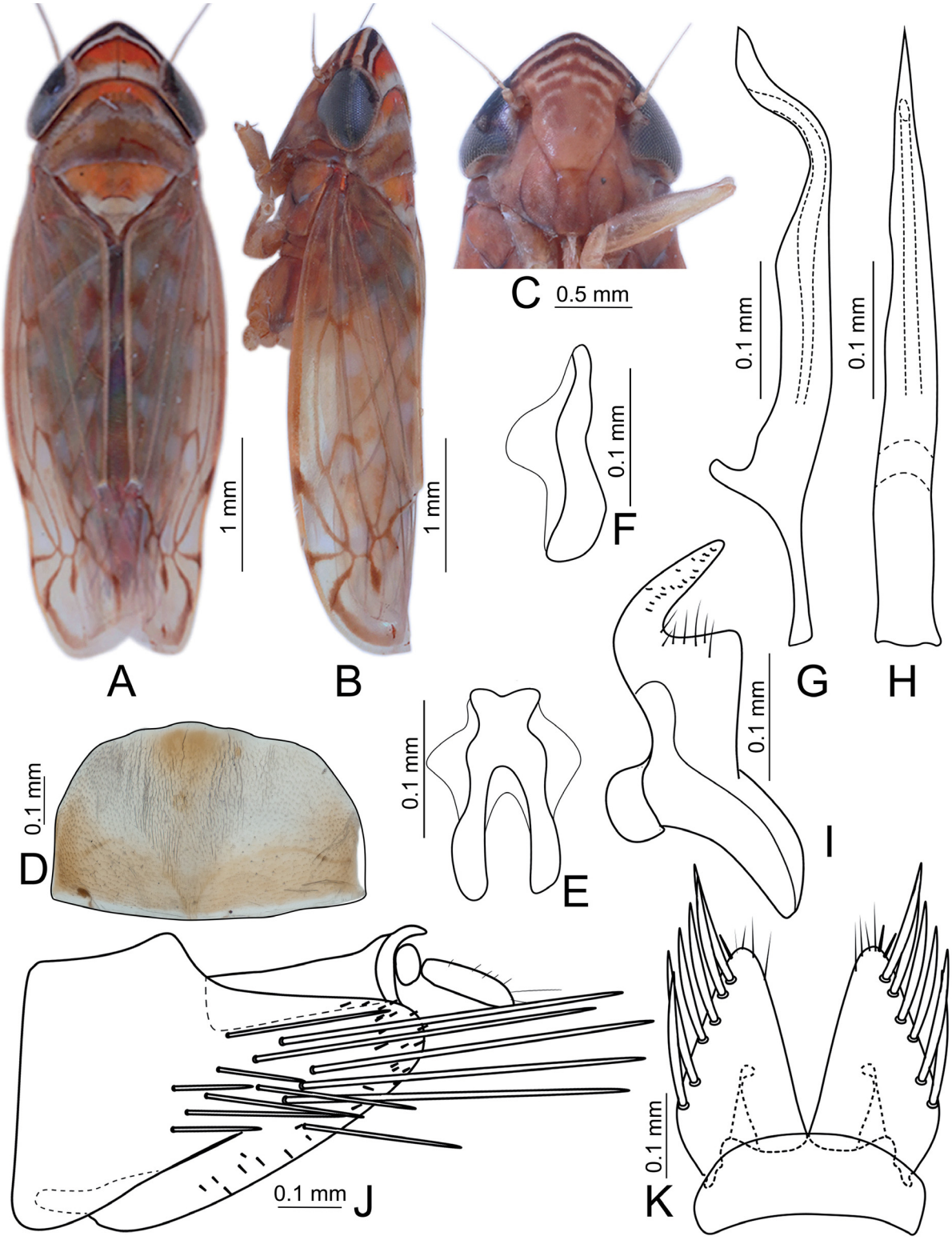

Fig. 9. *Selangomonus indicus*(?) (Distant, 1908) gen. et comb. nov., Philippines (BMNH). **A–B**. Habitus, dorsal and lateral view respectively. **C**. Face, ventral view. **D**. Female pregenital (VII) sternite. **E–F**. Connective, ventral and lateral view respectively. **G–H**. Aedeagus, lateral and ventral view, respectively. **I**. Style, ventral view. **J**. Male pygofer and anal tube, lateral view. **K**. Valve and subgenital plates ventral view.

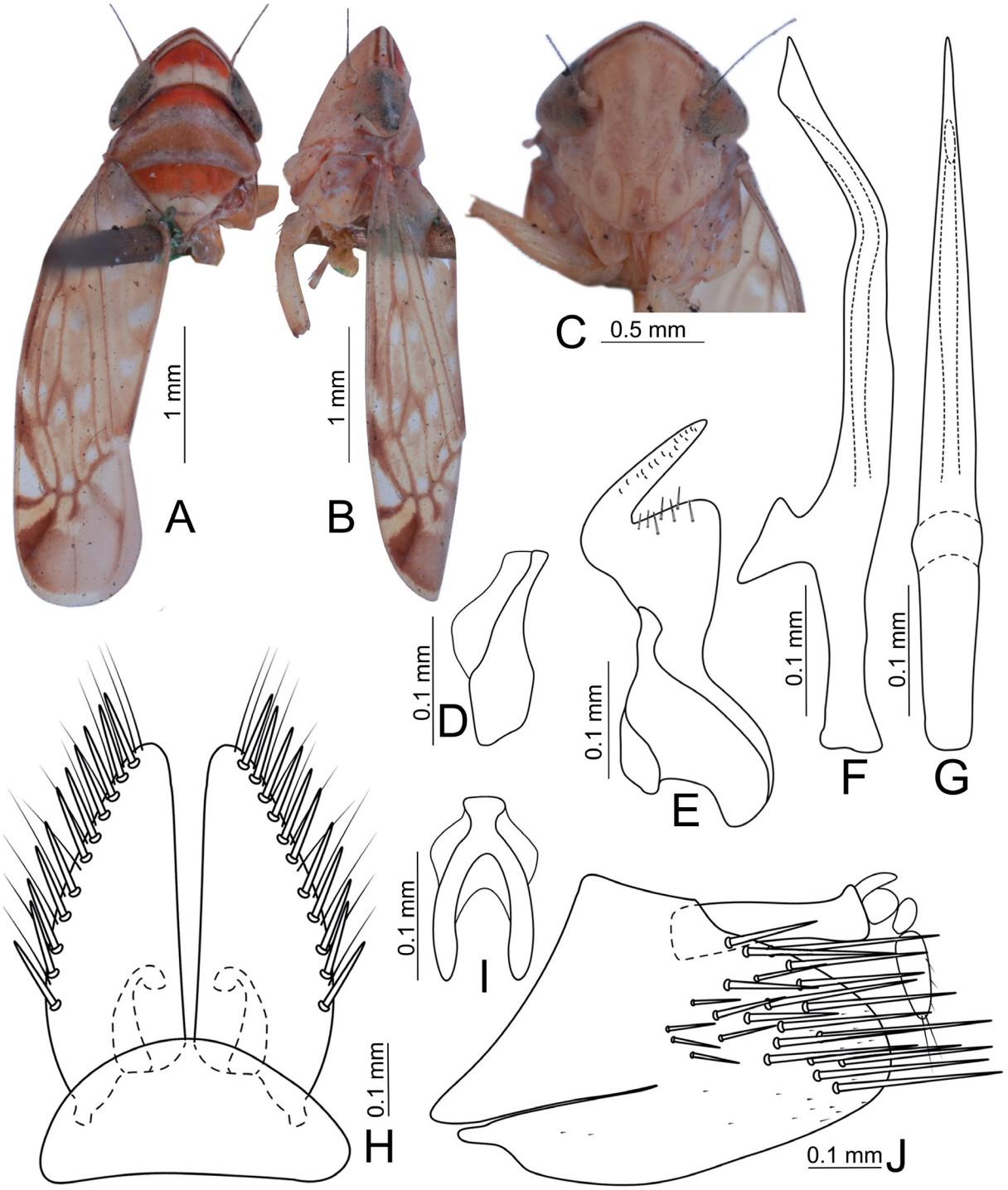

Fig. 10. *Selangomonus indicus*(?) (Distant, 1908) gen. et comb. nov., Nepal (BMNH). **A–B**. Habitus, dorsal and lateral view respectively. **C**. Face, ventral view. **D**. Connective, lateral view. **E**. Style. **F–G**. Aedeagus, lateral and ventral view respectively. **H**. Valve and subgenital plates, ventral view. **I**. Connective, ventral view. **J**. Male pygofer and anal tube, lateral view.

(1993) and paralectotype from India are both female and males are needed for identification. Also, there are some differences in the figures given here and in two other publications for the species (see below), therefore all identifications for the species must be considered tentative. In addition, the placement of the species in *Selangomonus* gen. nov. is also tentative as there are no external features to separate the *Scaphoideus* group genera.

Distribution

Myanmar.

Selangomonus indicus(?) (Distant, 1908)
Figs 9–10

Scaphotettix indicus(?) – Viraktamath & Mohan 1993: 464, figs 1–13 (India). — Dai *et al.* 2009: 661, fig. 6a–h (China). — Li *et al.* 2011: 261, fig. 5–262 (China).

Material examined

NEPAL • 1 ♂; Dahawangahary Hill; 16 Feb. 1908; BMNH, B.M 1983-171.

PHILIPPINES • 1 ♂, 1 ♀; Laguna, Los Baños, Mt Makiling; 18 Oct. 1979; M.R. Wilson leg.; BMNH.

Distribution

China, India, Nepal, Philippines.

Remarks

The identification of the Nepal and Philippine specimens here and previous records from India and China of *S. indicus*, must be regarded as tentative (see Remarks under previous species). Only the two males from Nepal (one here figured) of the material examined by Dai *et al.* (2009) from the BMNH (including the Distant types of *S. indicus*), could be found at the present time.

Selangomonus splinterus (Li & Wang, 2005) gen. et comb. nov.
Fig. 11

Scaphotettix splinterus Li & Wang, 2005: 189, figs 8–12.

Scaphomonus splinterus – Dai *et al.* 2009: 662, fig. 8a–h. — Li *et al.* 2011: 263, fig. 5–264. — Xing & Li 2013: 60.

non *Scaphoideus festivus* Matsumura – Ishihara 1961: 252, figs 77–78, 83–84, misidentification.

Material examined

THAILAND • 1 ♂; K.A. Spencer leg.; no further data; BMNH.

Distribution

China, Thailand.

Remarks

In Dai *et al.* (2009) this species was newly recorded from Thailand based on Ishihara's (1961) misidentified record of *Scaphoideus festivus* and on a specimen from Thailand in the BMNH. The latter specimen, here figured (Fig. 11), shows a slightly longer shaft than Chinese material figured by Dai *et al.* (2009).

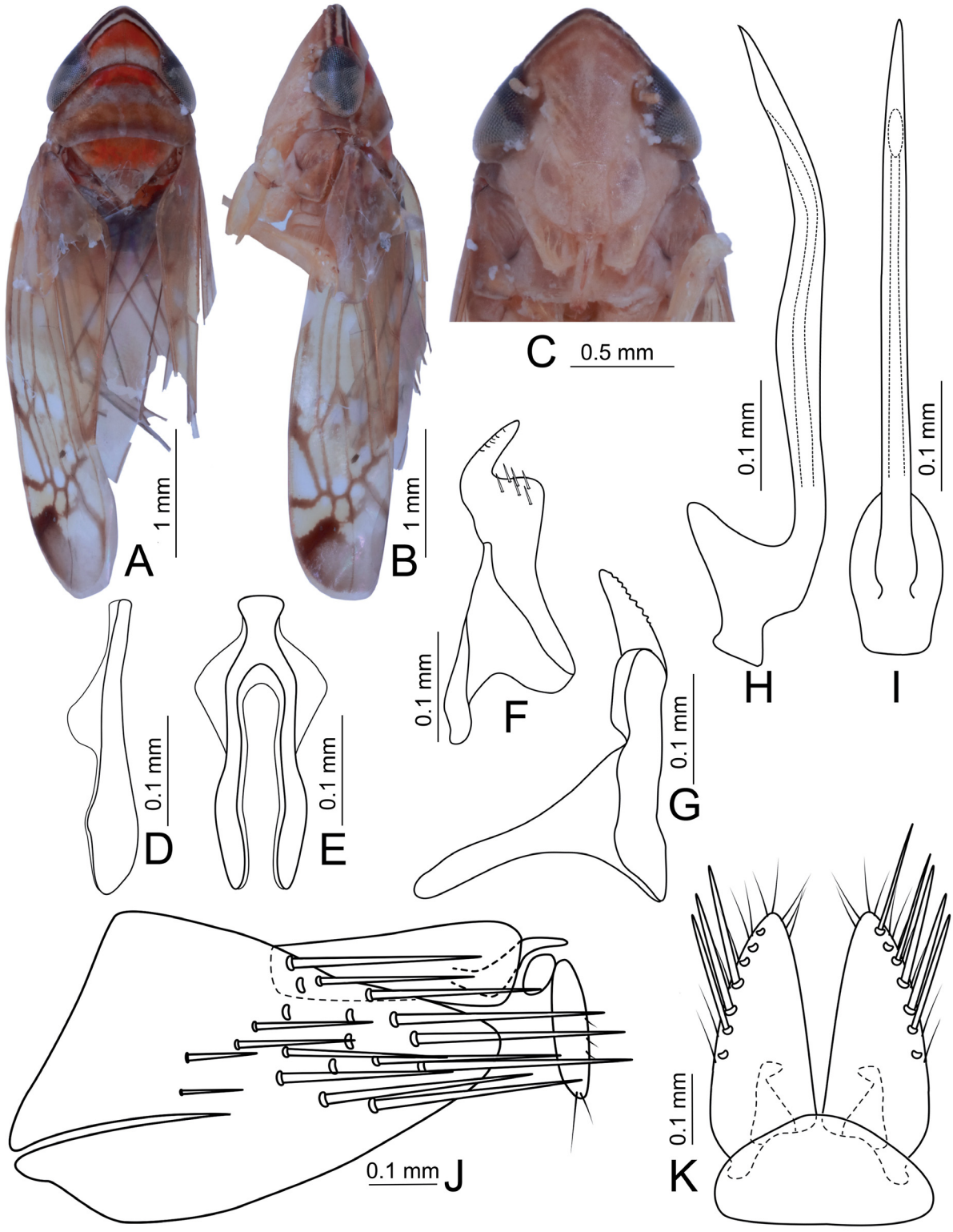

Fig. 11. *Selangomonus splinterus* (Li & Wang, 2005) gen. et comb. nov. (BMNH). **A–B**. Habitus, dorsal and lateral view respectively. **C**. Face, ventral view. **D–E**. Connective, lateral and ventral view respectively. **F–G**. Style, ventral and lateral view respectively. **H–I**. Aedeagus lateral and ventral view respectively. **J**. Male pygofer and anal tube, lateral view. **K**. Valve and subgenital plates, ventral view.

Selangomonus undulatus gen. et sp. nov.
urn:lsid:zoobank.org:act:4C88A533-ABB4-4A82-AB64-6E315EA61974
Fig. 12

Etymology

The specific epithet name is derived from the Latin adjective '*undulatus*, *-a*, *-um*' (= 'wavy'), referring to the apically sinuate aedeagal shaft.

Type material

Holotype

MALAYSIA • ♂; Selangor, Bangi, forest; 24 Jun.–1 Aug. 1980; M.R. Wilson leg.; BMNH.

Paratypes

MALAYSIA • 1 ♂, 5 ♀♀; same data as for holotype; BMNH.

Description

Measurements (mm). Body length. ♂: 4.4; ♀: 4.4–4.5.

Colouration. Colour and external features as in generic diagnosis.

Male genitalia. Pygofer side longer than basal width in lateral view, without processes. Subgenital plates moderately long, approximately 3 times as long as basal width, bearing 9 long uniseriate lateral macrosetae. Connective with stem short, arms divergent, approximately twice length of stem; a lightly sclerotized area on each side basally. Aedeagal shaft elongate, approximately 4 times as long as connective, evenly tapered to acute apex and sinuate distally, in lateral view; gonopore apical on dorsal surface; basal apodeme very short; preatrium long.

Distribution

Peninsular Malaysia.

Remarks

This new species can be distinguished by its moderately long subgenital plates and aedeagal shaft evenly tapered to acute apex and sinuate distally, in lateral view.

Genus ***Scaphomonoides*** Li, Dai & Xing

Scaphomonoides Li, Dai & Xing, 2011: 259–260.

Type species

Scaphotettix redstripeus Li & Wang, 2005.

Remarks

The examination of a specimen of the type species of *Scaphomonoides*, has enabled a reassessment of the genus and its inclusion in the *Scaphoideus* generic group based on external appearance and colour pattern (see above key). The genus can be distinguished by: subgenital plates short with convex outer margin (Fig. 13H), connective short (Fig. 13F–G) and aedeagus with a pair of basal processes and with a long apically bifurcate basal apodeme (Fig. 13G). The following single species is included.

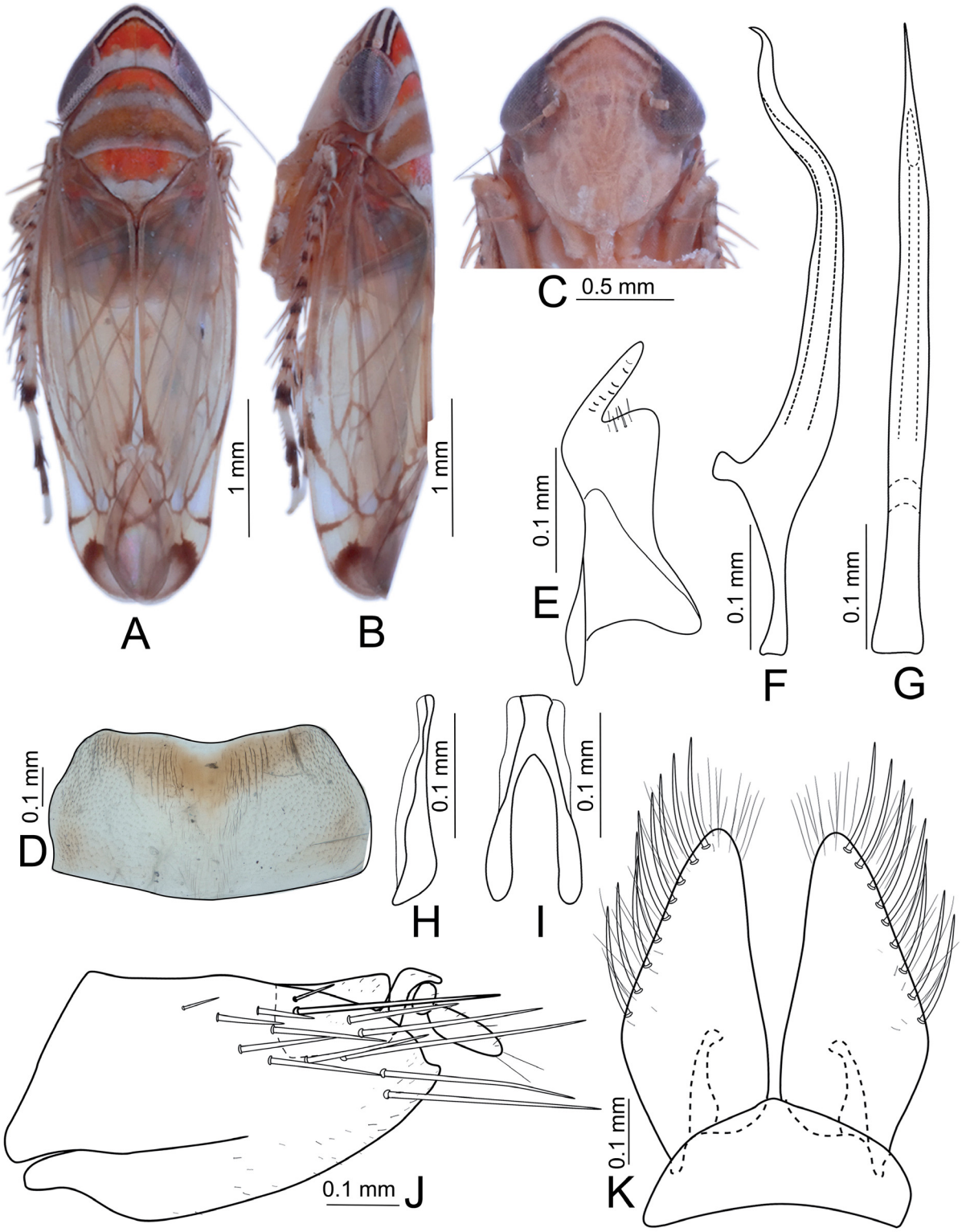

Fig. 12. A–C, E–K. *Selangomonus undulatus* gen. et sp. nov., holotype, ♂ (BMNH). **D**. Specimen ♀ (BMNH), **A–B**. Habitus, dorsal and lateral views respectively. **C**. Face, ventral view. **D**. Pregenital (VII) sternite. **E**. Style, ventral view. **F–G**. Aedeagus and connective, lateral and ventral view respectively. **H–I**. Connective, lateral and ventral view respectively. **J**. Male pygofer and anal tube, lateral view. **K**. Subgenital plates and valve, ventral view.

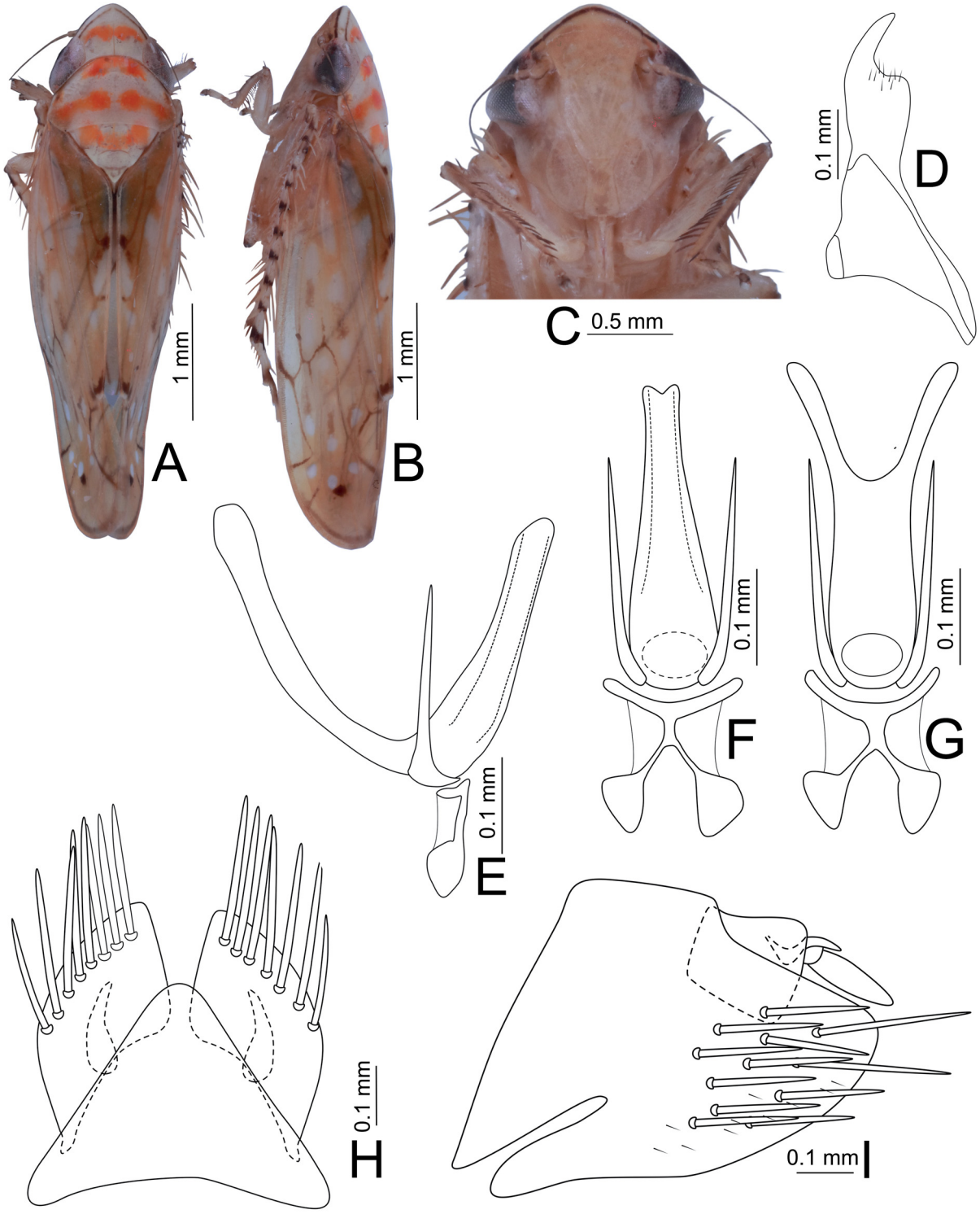

Fig. 13. *Scaphomonoides redstripeus* (Li & Wang, 2005) (BMNH). **A–B**. Habitus, dorsal and lateral views respectively. **C**. Face, ventral view. **D**. Style. **E–G**. Aedeagus and connective, lateral, ventral and dorsal view, respectively. **H**. Valve and subgenital plates, ventral view. **I**. Male pygofer and anal tube, lateral view.

Scaphomonoides redstripeus (Li & Wang, 2005)
Fig. 13

Scaphotettix redstripeus Li & Wang, 2005: 194, figs 1–7.

Scaphomonoides redstripeus – Li, Dai & Xing 2011: 260, fig. 261.

Material examined

VIETNAM • 1 ♂, Tam Dao Mts; Apr. 1989; V. Novotny leg.; BMNH. New record.

Remarks

In their review of *Scaphotettix*, Dai *et al.* (2009) noted that *S. redstripeus* from China was inaccurately figured and that it belonged to another (as-yet) undecided genus. Subsequently, *S. redstripeus* was placed in a new genus *Scaphomonoides* by Li *et al.* (2011). Although the original figures of *S. redstripeus* are very poor (possibly drawn from a slide), they, and additional images seen of a type specimen, have been sufficient for us to identify a specimen from Vietnam (new record). The species is distinctive in the male genitalia in having the valve relatively long, subgenital plates short, and aedeagus with a pair of basal processes (similar to *Melanetettix*) and basal apodeme longer than the shaft with apex bifurcate.

Discussion

Literature review of Scaphoideini

The name and group Scaphoideini has had a chequered history. It was first used for three Nearctic genera (*Scaphoideus*, *Osbornellus* Ball, 1932 and *Prescottia* Ball, 1932) by Oman (1941) in an unpublished Ph.D. thesis. Later, Oman (1943), used the name in a published abstract of his thesis but, unaccountably, did not use it in his Nearctic leafhopper revision (Oman 1949), where *Scaphoideus* was placed in an expanded concept of Deltocephalini Fieber, 1869. In 1967, three references to the tribe were given in Metcalf's (1967) catalogue, i.e., Oman (1943), Evans (1947) and Metcalf (1954), including 32 genera of which 21 genera came from Evans (1947) where they were placed in Platymetopiini Haupt, 1929. No reference to tribe was given in Nast's (1972) catalogue of European leafhoppers, where *Scaphoideus* was placed in Athysanini Van Duzee, 1892. However, 13 genera were included in the tribe in Oman *et al.*'s (1990) World cicadellid generic catalogue but only seven of these were subsequently included in a revised definition of Scaphoideini by Zahniser & Dietrich (2013), together with 54 more genera, 49 of which were not from Evans (1947), Metcalf (1967) or Oman *et al* (1990). Zahniser & Dietrich (2013) concluded, "the phylogenetic analyses showed relatively high support for a group of genera including *Scaphoideus*, and the group is related to Drabescini. Preliminary searches of the literature and an examination of specimens suggest that there are at least 40 genera that are quite similar to *Scaphoideus*, whereas several of the genera placed in 'Scaphoideini' by Oman *et al.* (1990) do not appear to be related to *Scaphoideus*". Prior to Zahniser & Dietrich (2013), few mentions of Scaphoideini appear in the Old World literature but since Zahniser & Dietrich (2013), seven new genera have been included in the tribe: *Advikus* Viraktamath & Yeshwanth, 2020, *Changbaninus* Fang & Xing, 2019, *Kengundia* Viraktamath, 2023, *Paramelanetettix* Hu, Wei & Xing, 2024, *Paranataretus* El-Sonbati, 2023, *Parascaphoidella* Wei, Fang & Xing, 2020 and *Swetarekha* Viraktamath, 2023 (Dmitriev *et al.* 2022 onward).

Characters defining Scaphoideini

In Zahniser & Dietrich (2013) revised classification, the treatment of Scaphoideini in a phylogenetic analysis of the subfamily, tribal key and diagnosis left the tribe rather poorly defined morphologically as it is recognized only by a combination of characters, some of which may be absent in some members of the tribe (see below) or occur in other tribes. Also, only eight of the 61 genera listed in the tribe were included in the above phylogenetic analysis (based on morphological characters and partial sequences

of two genes), including three Asian genera (*Mimotettix*, *Phlogotettix* Ribaut, 1942 and *Scaphoideus*), although many other genera were examined (Jamie Zahniser pers. com.).

The following were the more significant characters stated as defining Scaphoideini in Zahniser & Dietrich (2013), but not necessarily found in all genera and with exceptions found in the current work for *Scaphomonus* and *Selangomonus* gen. nov. in square brackets: head narrower than pronotum [same width in *Scaphomonus* (Fig. 2A) and *Selangomonus* (Fig. 5A)]; forewing with one or more reflexed veins in vicinity of outer anteapical cell; frontoclypeus long and narrow; antennae long, longer than width of head; profemur row AV setae absent or reduced (without stout setae) [with stout setae in *Scaphomonus* and *Selangomonus* (Fig. 7A)]; hind tibia row PD macrosetae long, as long as or longer than half length of fore-tibia (Fig. 7J); hind basitarsomere long (Fig. 7E); male or female pygofer with dense tufts of long fine or regular setae [absent in *Scaphomonus* and *Selangomonus*]; subgenital plate apex membranous or long, digitate, and somewhat membranous or weakly sclerotized [absent in *Scaphomonus* and *Selangomonus*]; processes present at apex of connective or base of aedeagus [apical processes sometimes present in *Scaphomonus* (Fig. 1) and processes absent in *Selangomonus*]; valvula I dorsal sculpturing pattern often concatenate [concatenate to strigate in *Scaphomonus* and *Selangomonus* (Fig. 3A)]; male or female pygofer sometimes with dense tufts of long macrosetae [absent in *Scaphomonus* and *Selangomonus*]. To these characters, Fletcher (2017) considered the apically expanded anteclypeus, as worth including in the tribal definition as it separates the tribe from Paralimnini in Zahniser & Dietrich's (2013) key.

Only two of the above characters, the long hind tibia PD macrosetae and dense tufts of long setae, were stated by Zahniser & Dietrich (2013) as possibly unique to the group and the former character is found in the genera treated here and in the *Monobazus* generic group (see Viraktamath *et al*. in prep.). Also, the origin of the basal aedeagal processes (noted above) is sometimes difficult to establish as sometimes they appear closely associated with the apex of the connective, e.g., as figured for *Melanetettix* by Knight & Fletcher (2007). Sometimes, these processes are referred to as paraphyses but our understanding of paraphyses is that they are processes between the aedeagus and connective, but not fused to either (see discussion by Dai & Dietrich 2011: 459). If this interpretation is followed, then paraphyses do not occur in Scaphoideini but an intermediate sclerite (rather than processes) was described as present in the original description of *Scaphodhara*.

The shape of the connective and its connection to the aedeagus has traditionally been used to define some Deltocephalinae tribes, e.g., Y-shaped or linear (Oman 1949: fig. 1). However, Zahniser & Dietrich (2013) noted its variability in their definition of Scaphoideini, where although the connective usually articulates with the aedeagus and is Y-shaped, it can sometimes be linear or with anterior arms closely appressed and rarely fused with the aedeagus, and such a variation can be found even in one genus, i.e., *Diemoides* (see Fletcher 2017). In addition, in *Scaphoideus* species the connective bears a pair of apical processes and the aedeagus either articulates at the base of the processes (New World species) or is disassociated from the connective and separated from it by a membrane (Old World species). The latter situation is also found in Paraboloponina Ishihara, 1953 (Deltocephalinae: Drabescini) where the disassociated connective has a pair of processes in *Tenompoella* Zhang & Webb, 1996 and a single process (or extension) in *Parabolopona* Matsumura, 1912 (see Webb 1981). In this context, it should be noted that Scaphoideini was considered paraphyletic with respect to Drabescini by Zahniser & Dietrich (2013) and considered polyphyletic in two recent phylogenies (Cao *et al.* 2022; El-Sonbati 2023).

In conclusion, it is clear there has been some confusion and disagreement on the composition and definition of Scaphoideini in the early literature. This situation has only partly been resolved by Zahniser & Dietrich's (2013) revised definition (see above). However, so far molecular phylogenies using many of the genera placed in the tribe by these authors have shown these genera to be related to *Scaphoideus* but the close relationship of Scaphoideini to Drabescini shown in the same phylogenies is

unexpected. This tribe is well defined, although two of its genera, *Dryadomorpha* Kirkaldy, 1906 and its current synonym *Paganalia* Distant, 1917 were included in a group containing *Scaphoideus* by Evans (1947) and followed by Metcalf (1967).

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References

Cao Y., Dietrich C.H., Zahniser J.N. & Dmitriev D.A. 2022. Dense sampling of taxa and characters improves phylogenetic resolution among deltocephaline leafhoppers (Hemiptera: Cicadellidae: Deltocephalinae). *Systematic Entomology* 47: 430–444. https://doi.org/10.1111/syen.12540

Dai W. & Dietrich C.H. 2011. Review of the Old World leafhopper genus *Scaphoidella* Vilbaste (Hemiptera: Cicadellidae: Deltocephalinae), with description of ten new species from Thailand and Vietnam. *Annales de la Société entomologique de France (N.S.)* 47 (3–4): 457–473. https://doi.org/10.1080/00379271.2011.10697737

Dai W., Viraktamath C.A., Zhang Y.L. & Webb M.D. 2009. A review of the leafhopper genus *Scaphotettix* Matsumura (Hemiptera: Cicadellidae: Deltocephalinae),with description of a new genus. *Zoological Science* 26: 656–663. https://doi.org/10.2108/zsj.26.656

Dietrich C.H., Dmitriev D.A., Takiya D.M., Thomas M.J., Webb M.D., Zahniser J.N., Zhang Y.L. & Yoshizawa K. 2022. Morphology-based phylogenetic analysis of Membracoidea (Hemiptera: Cicadomorpha) with placement of fossil taxa and description of a new subfamily. *Insect Systematics and Diversity* 6 (5): 1−30. https://doi.org/10.1093/isd/ixac021

Distant W.L. 1908. Rhynchota Vol. IV, Homoptera and Appendix (Pt.). *In*: Bingham C.T. (ed.) *The Fauna of British India Including Ceylon and Burma*: 374–375. Taylor and Francis, London. https://doi.org/10.5962/bhl.title.48423

Distant W.L. 1918. Rhynchota. Vol. VII. Homoptera: Appendix Heteroptera: Addenda. *In:* Shipley A.E. & Marshall G.E.K. (eds) *The Fauna of British India Including Ceylon and Burma*: 64–65. Taylor and Francis, London. https://doi.org/10.5962/bhl.title.48423

Dmitriev D.A., Anufriev G.A., Bartlett C.R., Blanco-Rodríguez E., Borodin O.I., Cao Y.-H., Deitz L.L., Dietrich C.H., Dmitrieva M.O., El-Sonbati S.A., Evangelista de Souza O., Gjonov I.V., Gonçalves A.C., Hendrix S., McKamey S., Kohler M., Kunz G., Malenovský I., Morris B.O. & Zahniser J.N. 2022. (onward). World Auchenorrhyncha Database. TaxonPages.
Available from https://hoppers.speciesfile.org [accessed 6 Jul. 2024].

Dutta N.K, Kwon J.H, Suh S.J & Kwon Y.J. 2020. First record of the leafhopper genus *Scaphomonus* Viraktamath from Korea, with description of one new species (Hemiptera: Cicadellidae: Deltocephalinae). *Zootaxa* 4747 (1): 191–195. https://doi.org/10.11646/zootaxa.4747.1.9

El-Sonbati S.A. 2023. *Taxonomic and Phylogenetic Studies of the Leafhopper Subfamily Deltocephalinae (Hemiptera: Cicadellidae) of the Arabian Peninsula, with Emphasis on the Tribe Scaphoideini of Saudi Arabia*. PhD Dissertation, King Saud University, Riyadh.

Evans J.W. 1947. A natural classification of leaf-hoppers (Jassoidea, Homoptera). *Transactions of the Entomological Society of London* 98: 105–271. https://doi.org/10.1111/j.1365-2311.1947.tb01054.x

Fletcher M.J. 2016. Revision of the genus *Diemoides* Evans with description of eight new species (Hemiptera: Auchenorrhyncha: Cicadellidae: Deltocephalinae). *Entomologica Americana* 122 (3): 311–325. https://doi.org/10.1664/1947-5144-122.3.311

Hu S.M., Wei X.T. & Xing J.C. 2024. A new Scaphoideini leafhopper genus from China (Hemiptera: Cicadellidae: Deltocephalinae). *Zootaxa* 5446 (2): 281–287. https://doi.org/10.11646/ZOOTAXA.5446.2.10

Ishihara T. 1961. Homoptera of Southeast Asia collected by the Osaka City University Biological Expedition to Southeast Asia 1957–58. *Nature Life in Southeast Asia* 1: 225–257.

Knight W.J. & Fletcher M.J. 2007. A new deltocephaline leafhopper genus, *Melanetettix*, from Melanesia (Hemiptera: Cicadellidae: Deltocephalinae). *Systematics and Biodiversity* 5 (2): 199−222. https://doi.org/10.1017/s1477200006002027

Li Z.Z. & Wang L.M. 2005. A taxonomic study on the genus *Scaphotettix* Matsumura (Hemiptera: Cicadellidae: Euscelinae). *Entomotaxonomia* 27: 187–194. [In Chinese with English summary.]

Li Z.Z., Dai R.H. & Xing J.C. 2011. *Deltocephalinae from China (Hemiptera: Cicadellidae)*. Popular Science Press, Beijing.

Metcalf Z.P. 1954. Homoptera from the Bahama Islands. *American Museum Novitates* 1698: 1–46. Available from https://www.biodiversitylibrary.org/page/63364339 [accessed 6 Jul. 2024].

Metcalf Z.P. 1967. *General catalogue of the Homoptera. Fascicle VI. Cicadelloidea. Part 10. Euscelidae. Section III*. Agricultural Research Service, United States Department of Agricultuire, Washington D.C. https://doi.org/10.5962/bhl.title.6822

Nast J. 1972. *Palaearctic Auchenorrhyncha (Homoptera). An Annotated Check List*. Polish Scientific Publishers, Warszawa.

Oman P.W. 1941. *A Generic Revision of the Nearctic Cicadellidae* (*Homoptera*). PhD thesis, George Washington University, Washington D.C.

Oman P.W. 1943. A generic revision of the Nearctic Cicadellidae (Homoptera). [Summary of Doctoral thesis]. *The George Washington State University Bulletin* 1941–43: 14–17.

Oman P.W. 1949. The Nearctic leafhoppers. A generic classification and check list. *Memoirs of the Entomological Society of Washington* 3: 1–253.

Oman P.W., Knight W.J. & Nielson M.W. 1990. *Leafhoppers* (*Cicadellidae*)*: A Bibliography, Generic Check-list, and Index to the World Literature 1956–1985*. CAB International Institute of Entomology, Wallingford.

Rakitov R.A. 1997. On differentiation of cicadellid leg chaetotaxy (Homoptera: Auchenorrhyncha: Membracoidea). *Russian Entomological Journal* 6 (3–4): 7–27.

Viraktamath C.A. & Mohan G.S. 1993. Indian species of the Deltocephaline leafhopper genus *Scaphotettix* Matsumura (Homoptera: Cicadellidae). *The Journal of Bombay Natural History Society* 90: 463–474.

Viraktamath C.A. & Mohan G.S. 1994. Description of *Scaphodhara*, a new genus related to *Scaphoideus* (Hemiptera: Cicadellidae) and five new species from south India. *Entomon* 19: 13–22.

Viraktamath C.A. & Mohan G.S. 2004. A revision of the deltocephaline leafhopper genus *Scaphoideus* (Hemiptera: Cicadellidae) from the Indian subcontinent. *Zootaxa* 578: 1–48. https://doi.org/10.11646/zootaxa.578.1.1

Viraktamath C.A., Yeshwanth H.M. & Webb M.D. 2020. Leafhopper tribe Stegelytrini (Hemiptera: Cicadellidae: Deltocephalinae) of the Indian subcontinent, with a note on *Aeternus hieroglyphicus* Distant (Cicadellidae: Athysanini). *Zootaxa* 4822: 551–566. https://doi.org/10.11646/zootaxa.4822.4.5

Viraktamath C.A., Webb M.D. & Yeshwanth H.M. (in prep.). Review of the *Monobazus*-group of leafhopper genera (Hemiptera: Cicadellidae: Deltocephalinae) from the Indian subcontinent with description of new genera and species.

Webb M.D. 1981. The Asian, Australasian and Pacific Paraboloponinae (Homoptera: Cicadellidae). A taxonomic revision with a key to all known genera of the subfamily. *Bulletin of the British Museum (Natural History), Entomology Series* 43 (2): 39–76.
Available from https://www.biodiversitylibrary.org/page/2330448 [accessed 6 Jul. 2024].

Webb M.D. & Viraktamath C.A. 2007. Three new Old World species of the leafhopper genus *Scaphoideus* Uhler (Hemiptera: Auchenorrhyncha: Cicadellidae). *Zootaxa* 1457: 49–55.
https://doi.org/10.11646/ZOOTAXA.1457.1.3

Wei X.T., Fang Y.Q. & Xing J.C. 2020. *Parascaphoidella*, a new leafhopper genus from China (Hemiptera: Cicadellidae: Deltocephalinae: Scaphoideini). *Zootaxa* 4810 (2): 328–334.
https://doi.org/10.11646/zootaxa.4810.2.5

Xing J.C. & Li Z.Z. 2013. Review of Chinese species of genus *Scaphomonus* Viraktamath, 2009 (Hemiptera: Cicadellidae: Deltocephalinae), with description of a new species. *Zootaxa* 3637 (1): 58–64. https://doi.org/10.11646/zootaxa.3637.1.6

Zahniser J.N. & Dietrich C.H. 2013. A review of the tribes of Deltocephalinae (Hemiptera: Auchenorrhyncha: Cicadellidae). *European Journal of Taxonomy* 45: 1–211.
https://doi.org/10.5852/ejt.2013.45

Zhang Y. & Webb M.D. 1996. A revised classification of the Asian and Pacific selenocephaline leafhoppers (Homoptera: Cicadellidae). *Bulletin of the Natural History Museum, Entomology Series* 65: 1–103. Available from https://www.biodiversitylibrary.org/page/40877356 [accessed 6 Jul. 2024].

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