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# New taxa and notes on palm and false-leaf katydids (Orthoptera: Tettigoniidae: Sexavaini; Pseudophyllinae) from Brunei Darussalam

**Running title:** Sexavaini and Pseudophyllinae from Brunei

MING KAI TAN <sup>1\*</sup> & RODZAY BIN HAJI ABDUL WAHAB <sup>2</sup>

<sup>1</sup> Institut de Systématique, Evolution et Biodiversité (ISYEB), Muséum national d'Histoire naturelle, CNRS, SU, EPHE, UA, 57 rue Cuvier, CP 50, 75231 Paris Cedex 05, France

<sup>2</sup> Institute for Biodiversity and Environmental Research, Universiti Brunei Darussalam, Jalan Universiti, BE1410, Brunei Darussalam

\* Corresponding author: orthoptera.mingkai@gmail.com

## Abstract

As many as 72 species were documented when sampling was conducted in Kuala Belalong in Brunei Darussalam between 2016 and 2017 but this remains non-exhaustive and orthopteran species are still awaiting discovery. Based on new material collected in 2019, two new species of katydids are described here: *Segestes nostosalgos* **sp. n.** and *Sathrophylliopsis mentham* **sp. n.** These two discoveries are of particular interest: *Segestes nostosalgos* **sp. n.** represents the first record of the tribe Sexavaini in Borneo; *Sathrophylliopsis mentham* **sp. n.** is drastically different from congeners by the lack of dense fine long hairs around the body.

**Key words:** distribution, Mecopodinae, new species, *Sathrophylliopsis*, *Segestes*, taxonomy

## Introduction

The Borneo island is one of the most biodiverse regions of the world and shared by three countries: Malaysia (Sabah and Sarawak states), Brunei Darussalam and Indonesia (Kalimantan state). Not all groups of Orthoptera are well-sampled and well-studied (Tan *et al.*, 2017a). Many species are still awaiting discovery, including those found in Brunei Darussalam. Orthoptera survey by the authors in 2016 and 2017 reported 72 orthopteran species from around Kuala Belalong Field Studies Centre, of which 25 species were katydids (Tan & Wahab, 2018a). Fourteen species new to science were also discovered so far (Tan *et al.*, 2017b, 2017c, 2019; Tan & Wahab, 2017a 2017b, 2018b–d). Continued surveys in 2019 led to the discovery of previously unreported species. Here, we focus on some significant findings of katydids from the subfamily Mecopodinae and Pseudophyllinae.

Sexavaini of the subfamily Mecopodinae are commonly known as palm katydids because these relatively large and typically slender katydids tend to be found on palm leaves. As many as 24 genera can be found in the Malay Archipelago, Papuaustralian region and oceanic islands in the Pacific (Cigliano *et al.*, 2020). To our best understanding, no record of palm katydids has been reported from Borneo (e.g., Willemse, 1961, 1977; Rentz, 2010; Cigliano *et al.*, 2020). The subfamily Pseudophyllinae, commonly known as false-leaf katydids, has a worldwide distribution and is a speciose group of katydids (de Jong, 1939; Beier, 1954, 1962, 1963; Cigliano *et al.*, 2020). Many species are canopy-dwellers and hence encounters of species in the understory can be rare. As such, faunistic survey focusing on the understory (i.e., Tan & Wahab, 2018a) may easily overlook these species.

Based on new material collected from Kuala Belalong, we describe two new species of katydids, one from Sexavaini and another from Pseudophyllinae, respectively: *Segestes nostosalgos* **sp. n.** and *Sathrophylliopsis mentham* **sp. n.** The former also represents the first record of Sexavaini in Borneo. Both species were also not encountered in previous surveys (Tan & Wahab, 2018a).

## Materials and Methods

Opportunistic collections were conducted during daytime and night-time in the lowland dipterocarp forest of Kuala Belalong and Ulu Temburong National Park in July 2019. Whenever possible, in-situ images were taken using a Canon EOS 500D digital SLR camera with a compact-macro lens EF 100 mm f/2.8 Macro USM and Canon Macro Twin Lite MT-24EX was used for lighting and flash. The specimens were preserved in absolute analytical-grade ethanol and later pinned and dry-preserved. A single hind leg from each specimen was also preserved in absolute analytic-grade ethanol for future molecular work. The newly collected dry-pined specimens were deposited in:

UBDM           Universiti Brunei Darussalam Museum, Brunei Darussalam  
ZRC            Zoological Reference Collection, Lee Kong Chian Natural History Museum,  
                  Singapore

Close-up images of habitus and morphological features were done using a Canon EOS 700D digital SLR camera with a macro photo lens MP-E 65 mm f/2.8 USM (1–5×) with Canon Macro Twin Lite MT-24EX used for lighting and flash.

Measurements of dried-pinned specimen were made using a Vernier caliper. In the measurements, the following abbreviations are used: BL = body length; HL = head length; PL = pronotum length; PW = pronotum width; TL = tegmen length; HFL = hind femur length; HTL = hind tibia length.

Classification and nomenclature of species was based on the OSF (Cigliano *et al.*, 2020).

## Systematic Parts

### Subfamily Mecopodinae Walker, 1871

### Tribe Sexavaini Karny, 1924

### Genus *Segestes* Stål, 1877

Stål, 1877: 45; Redtenbacher, 1892: 197; Bolívar, 1903: 165; Kirby, 1906: 359; Caudell, 1916: 3; Hebard, 1922: 176; Karny, 1924a: 150; Karny 1931: 71; Willemse, 1957: 42; Willemse, 1961: 107; Beier, 1966: 311; Willemse, 1977: 227; Otte, 1997: 102

**Remarks.** 11 species are currently known:

- S. beieri* Kästner, 1934—Philippines
- S. brevipennis* Willemse, 1977—New Guinea
- S. celebensis* Karny, 1931—Sulawesi
- S. cornelii* Willemse, 1977—New Guinea
- S. decoratus* Redtenbacher, 1892—New Guinea
- S. frater* Hebard, 1922—Maluka
- S. fuscus* Redtenbacher, 1892—Philippines
- S. punctipes* Redtenbacher, 1892—Philippines
- S. tibicki* Willemse, 1977—New Guinea
- S. unicolor* Redtenbacher, 1892—North-western Pacific
- S. vittaticeps* Stål, 1877—Philippines

Here, we describe a new species from Borneo.

### *Segestes nostosalgos* sp. n.

(Figs. 1–3)

**Material examined. Holotype**, 1 male (KB.19.14), **Brunei Darussalam**, Temburong District, Kuala Belalong Field Studies Centre, along Ashton Trail, N4.54563, E115.15696, 148.1±6.6 m.a.s.l., 2031 hours, on foliage, 13 July 2019, coll. M. K. Tan & H. Yeo (UBDM).

**Genus status.** Our specimen does not possess a small, posterior, dorso-apical spine on fore and middle tibiae, a character Willemse (1977) used to separate *Segestes* from other genera of the genus group *Sexavae* Karny, 1924. Cu1 of tegmen is running obliquely toward anal margin “hind margin” at a short distance from base of tegmen, distinguishing our specimen from *Sexava* Walker, 1870.

**Diagnosis.** This species differs from all known congeners as well as species from *Segestidea* Bolívar, 1903 by smaller size and slender habitus; fastigium verticis with apex somewhat obtuse; knee-lobes with one spine; subgenital plate deeply and narrowly excised at apex and by the presence of very stout styli; tegmen very elongated and narrow; stridulatory file of left tegmen short and with few long teeth.

**Comparison with congeners.** This new species from Borneo appears more similar to species from the Philippines, Maluka/ Sulawesi and Java than those from Papua New Guinea and Bismarck Archipelago. It differs from *S. beieri* Kästner, 1934 from Philippines by the mirror on right tegmen more elongated, male subgenital plate with slightly deeper excision at apex and stouter styli; from *S. celebensis* Karny, 1931 from Sulawesi, it differs by the presence of a spine on outer knee lobe of hind femur and posterior margin of subgenital plate narrowly and deeply excised instead of triangularly excised; from *S. frater* Hebard, 1922 from Maluka, it differs by the tegmen slenderer and appearing more rugose rather than smooth and shiny and Rs producing nearer to the apex, inner basal area of hind femur with a black stripe in the dorsal half and brownish ventral of this stripe instead of being pale, abdominal sternites whitish instead of red brown; from the female of *S. fuscus* Redtenbacher, 1892 from Philippines, it differs by the hind femur being distinctly paler coloured with dark brown stripes and patterns, but not unicolourous brown; from *S. vittaticeps* Stål, 1877 from Philippines, it differs by smaller habitus (PL = 4.6 vs. 5.5 mm) but with longer tegmen extending well beyond apex of subgenital plate (TL = 40.7 vs. 39 mm), the brown rather than green colouration, longer fastigium, and by the excision at the apex of the subgenital plate being narrow instead of broad triangular.

We could not compare our specimen with *S. punctipes* Redtenbacher, 1892 from the Philippines, which is only known from a female.

The new species differs from all New Guinean and Bismarck Archipelago species (i.e., *S. brevipennis* Willemse, 1977, *S. cornelii* Willemse, 1977, *S. decoratus* Redtenbacher, 1892 and *S. stibicki* Willemse, 1977) by the combination of these characters: fastigium verticis at apex somewhat obtuse, with excision in the middle (similar to *S. decoratus*), but not spine-like as in *S. brevipennis* and *S. stibicki*; apex of tegmen rounded instead of narrow or truncated; knee-lobes with one spine; smaller in size. It also differs distinctly from *S. unicolor* Redtenbacher, 1892 from Caroline Islands by brown colouration and more slender habitus.

**Distribution.** Currently known only from Brunei Darussalam. This is the first record of the tribe Sexavaini from Borneo. Sexavaini are previously known from the Philippines, Sulawesi, Maluka, Java, Papua New Guinea and Bismarck Archipelago, parts of Australia and Pacific oceanic islands.

**Description.** Habitus typical for genus, shown in Fig. 1. Fastigium of vertex elongated, surpassing antennal scapus; tapering into subacute apex, minutely excised at apex; with longitudinal groove (Fig. 2A). Frons oblique, smooth; without lateral carinae (Figs. 2B, 2C). Maxillary palps elongated and slender; apical segment about as long as third segment, longer than subapical segment; apical segment slightly curved, with apex slightly more bulbous. Eyes very weakly protruding, oblong in dorsal view (Figs. 2A, 2B); median ocellus reduced, indicated only by lighter spot (Fig. 2C); lateral ocelli absent.

Pronotum rugose, 0.76 times as long as head; disc 1.04 times as wide as long, broadly rounded into paranota, apical area not raised and faintly shouldered (Fig. 2A); anterior margin slightly angularly convex in middle; posterior margin angularly convex (Fig. 2A). Lateral lobe about 1.59 times as long as high; lower margin angular; marginal fold of pronotum very narrow, smooth (Fig. 2B). Thoracic auditory spiracle slender-elongated, higher than long, not covered by paranota (Fig. 2B). Prosternum with two large acute spines diverging from one another ventrad. Mesosternal and metasternal lobes blunt (Fig. 2D).

Anterior coxa with a long spine pointing externally, apex acute (Fig. 2D). Anterior tibia with inner tympanum open and oval-shaped, outer tympanum conchate, with slit fairly wide and conchate cover slightly swollen. Femora with following number of robust spines on ventral margins: anterior femur 1

to 3 inners near knees, 0 outer; middle femur without spines; posterior femur with 8 outer and 8 to 11 inner spines. Knee lobes of anterior and middle femora with one short spine externally and internally; of posterior femur with 2 inner spines and 1 outer spine. Tibiae with following number of spines: anterior tibia 6 to 7 subapical ventral spines, 2 apical smaller ventral ones; middle tibia 6 ventral spines and on outer margin with 5 dorsal spines; posterior tibia with row of dorsal and ventral spines on both inner and external margins, ventral spines more numerous on outer than inner margins, dorsal spines regular.

Male. Macropterous, tegmen well surpassing abdominal apex and hind femur, apex rounded (Fig. 1). Stridulatory file on CuPb on underside of left tegmen straight; 2.33 mm long; with teeth evenly distributed; with circa 50 well developed teeth, teeth length becomes increasingly larger from anal to basal end, then becomes distinctly smaller at basal end (Fig. 2E). Mirror on left tegmen underdeveloped, with veins net-like (Fig. 2F). Mirror on right tegmen fully developed, rectangular, 1.29 times longer than wide, anterior margin rounded, slightly narrower than posterior margin (Fig. 2A). R and Sc diverge apically, Rs produced near the apex, R<sub>1</sub> produced just before apex. Hind wings completely concealed under tegmina.

Tergites with median carina, posterior margin produced into stout median lobe with rounded apex (Fig. 3B). Tenth abdominal tergite simple, with posterior end broadly and faintly excised in middle (Fig. 3B). Epiproct tongue-shaped with apex excised in middle (Fig. 3B). Cercus typical of genus, elongated, slender, very faintly curved internally (more obvious apically), apex produced into a small acute sclerotized tooth (Fig. 3C). Subgenital plate elongated, shaft-like, posterior margin narrowly excised in middle, lateral lobes gently tapering to truncated apex; styli short, stout and conical, apex obtuse (Fig. 3D).

Female. Unknown.

Colouration. Dorsal half pale brown, ventral half whitish; with numerous dark brown stripes and patterns when alive; generally brown when dry-pinned (Fig. 1). Face white, with dark curved stripe beneath scapus (Fig. 2C); gena also white, faintly pale brown behind eye, with longitudinal horizontal band extending from posterior margin of eye (just ventral of the middle) to posterior end of head; with thinner brown band extending from behind eye to posterior end of head above the thick band; with a thin dark stripe extending from ventral margin of eye and then posteriorly; with another thicker irregular horizontal dark band above base of mandible (Fig. 2B). Mouthparts white; maxillary palps whitish, with apices of segments very pale brown. Fastigium verticis with darkened at apex (Figs. 2A, 2B). Scapus dorsally brown, ventrally pale brown; antennae yellow brown. Dorsum of head pale brown, in midline darkened (including vertex), with narrow dark stripes extending from behind antennal scapus and eyes to posterior end of head (Fig. 2A). Pronotum with dorsal disc pale brown, along midline darkened especially in pronzona around median carina and extending laterally, longitudinal carina pale, metazona with a darkened lateral strip near shoulder (Fig. 2A). Lateral lobe of pronotum in dorsal half pale yellow with fissures dark, ventral half brown; margins pale yellow (Fig. 2B). Tegmen generally with cells infumated, some black; veins yellow or faintly coloured. Coxae white to very pale yellow. Femora generally whitish, dorsally very pale brown; outer surface with dark brown longitudinal stripe and spots; knee pale brown with dark marmoration, usually dark along ventral margin of genicular lobe, spine with apex darkened. Posterior femur pale brown with numerous small black spots especially on dorsal surface; inner basal area of hind femur with a black stripe in dorsal half and brownish ventral of this stripe. Spines on legs generally black at base and apex, red brown in middle (sometimes very dark red). Thoracic and abdominal tergites pale brown, with faint black patterns; thoracic and abdominal sternites generally white.

Measurements (in mm). BL = 30.5, PL = 4.6, PW = 4.8, TL = 40.7, HFL = 29.9, HTL = 29.0.

**Natural history.** Although species of the tribe Sexavaini are known as palm katydids because of the tendency to be found on palm leaves, the specimen collected from Kuala Belalong was found on the foliage of a tree in the understory.

**Etymology.** The species name refers to homecoming (nostos = homecoming in Greek) and pain (algos = pain, grief or distress in Greek). This species is dedicated to those who are far away from home during the Covid-19 pandemic and any difficult times.

## Subfamily Pseudophyllinae

## Tribe Cymatomerini Brunner von Wattenwyl, 1895

### Genus *Sathrophylliopsis* de Jong, 1939

de Jong, 1939: 82; Beier, 1954: 246; Beier, 1962: 209; Beier, 1963: 66; Bresseel & Vermeersch, 2017: 5

**Remarks.** Two species is currently known: *S. longepilosa* (Brunner von Wattenwyl, 1895) from Borneo and Sumatra and *S. truncatipennis* Beier, 1944 from Borneo. Here, we describe another species from Borneo.

### *Sathrophylliopsis mentham* sp. n.

(Figs. 4–6)

**Material examined.** Holotype, 1 male (KB.19.18), **Brunei Darussalam**, Temburong District, Kuala Belalong Field Studies Centre, along Ashton Trail, N4.54555, E115.15691, 176.0±6.0 m.a.s.l., 2018 hours, on rattan leaf feeding on dead leaf, 14 July 2019, coll. M. K. Tan & H. Yeo (UBDM).

**Genus status.** Our specimen belongs to *Sathrophylliopsis* for the striking characters of this genus: femora with margins smooth and carinate, not lobate or dentate; pronotum nearly smooth; radial vein of tegmen forms two deep angular curves towards the radial branch vein in its apical half; fully developed hind wings (de Jong, 1939).

**Diagnosis.** This new species differs from congeners by the body being not covered with dense long hairs, and the anterior margin of tegmen not undulated and anterior and posterior margins are not diverging apically.

**Comparison with congeners.** In addition to the diagnostic differences, this species differs from *S. longepilosa* (Brunner von Wattenwyl, 1895) by the male epiproct being triangular instead of tongue-shaped and the subgenital plate has the apical lobes much shorter than the stylus instead of the lobes longer than the stylus; from *S. truncatipennis* Beier, 1944 it differs by the tegmen distinctly tapering apically instead of widening apically, and the stridulatory area on left tegmen is **more elongated**.

**Description.** Habitus typical for the genus, albeit lacking dense long hairs around body, as shown in **Figs. 4, 5A**. Fastigium of vertex stout, triangular; tapering into an acute apex; not surpassing antennal scapus (**Fig. 6A**). Frons oblique, smooth; without lateral carinae. Maxillary palps elongated and slender; apical segment almost twice the length of subapical and third segments; apical segment with apex slightly swollen and faintly bent. Eyes protruding, rounded to slightly oval (**Figs. 6B**); median and lateral ocelli absent.

Pronotum weakly rugose, 2.06 times as long as head; disc 1.06 times as wide as long, anterior part broadly rounded into paranota, apical area not raised but shouldered (**Fig. 6A**); anterior margin nearly straight; posterior margin broadly curved, straight in middle (**Fig. 6A**). Lateral lobe about 1.95 times as long as high; lower margin straight; marginal fold of pronotum very narrow, smooth (**Fig. 6B**). Thoracic auditory spiracle very small, rounded, not covered by paranota (**Fig. 6B**). Prosternum without spine. Mesosternal lobe broad and metasternal lobes narrow, apices obliquely truncated.

Anterior coxa without spine. Anterior tibia with both tympana conchate, very swollen, opening oval, very similar in size. Femora with following number of robust spines on ventral margins: anterior femur without ventral spines; middle femur with 3 to 4 external spines at apical half, 0 internal spine; posterior femur with 5 to 6 external spines at apical half, 0 internal spine. All knee lobes lobular, without spine externally and internally. Tibiae with following number of spines on ventral margins: anterior tibia 3 external, 4 very small internal; middle tibia 3 external, 3 slightly larger internal. Middle tibia with 3 to 5 nodule-like dorsal spines on internal and external margins.

Male. Tegmen macropterous, surpassing abdominal apex, anterior and posterior margins of tegmen not diverging apically, anterior margin very faintly undulating, apex obliquely truncated (**Fig. 5B**). Stridulatory file on CuPb underside of left tegmen crescent-shaped, basal end more strongly curved than anal end; circa 6.8 mm long; with many teeth densely and evenly distributed (**Fig. 6C**). Mirror areas on tegmina asymmetrical. Mirror on left tegmen 1.17 as long as wide, with posterior end

rounded (Fig. 6D). Mirror on right tegmen more developed, rectangular, with anterior margin more rounded, 1.50 times longer than wide, area net-like especially at distal end (Fig. 6E). Hind wings completely concealed under tegmina.

Tenth abdominal tergite strongly and angularly excised in middle, lateral lobe with apex rounded (Fig. 6G). Epiproct triangular, wider than long, apex obtuse; furrowed longitudinally in middle. Cercus conical, stout, tapering to a subacute apex bearing a small tooth pointing internally (Fig. 6F). Subgenital plate elongated, shaft-like, lateral margins narrow in basal half, widens a little then tapers towards posterior end; posterior margin narrowly excised in middle, lateral lobes short with truncated apex; styli long, circa 2.3 longer than lateral lobe of subgenital plate, oblong to pyriform, posterior end with apex rounded (Fig. 6H).

Female. Unknown.

Colouration. Generally pale brown with white and darker brown patterns, with tint of greyish-green; somewhat mimicking lichens when alive; brown when dry-pinned (Figs. 4, 5A). Face white, with a dark curved stripe extending from beneath of scapus; genae pale brown. Mouthparts pale brown. Fastigium verticis with apex brown. Scapus brown, antennae yellow brown. Dorsum of head generally brown (Fig. 6A). Pronotum with dorsal disc and lateral lobe generally pale brown with tint of greyish-green; dorsal disc with a faint dark longitudinal stripe in anterior half; posterior margin darker brown (Fig. 5A). Tegmen mottled red brown, pale brown and grey; radial field distinctly pale mint green with oblique white stripe (Figs. 4, 5). Coxae dirty green dorsally and pale ventrally. Anterior and middle femora and tibiae pale brown with tint of green and yellow, with carinae pale (Fig. 4). Posterior femur and tibia pale, with dorsal part brown. Thoracic and abdominal tergites pink brown dorsally, pale brown laterally; thoracic sternites pale brown, mesosternite and metasternite at posterior end with a dark transverse stripe, lobes darkened; abdominal sternites pink.

Measurements (in mm). BL = 28.1, PL = 7.4, PW = 7.0, TL = 31.7, HFL = 15.2, HTL = 14.0.

**Etymology.** The species name refers to the characteristics pale mint green colouration on the radial field (mentham = mint in Latin).

## Tribe Phylloimini Brunner von Wattenwyl, 1895

### Genus *Lacipoda* Brunner von Wattenwyl, 1895

Brunner von Wattenwyl, 1895: 66; Kirby, 1906: 302; Beier, 1954: 162; Beier, 1962: 144; Beier, 1963: 47; Otte, 1997: 216

**Remarks.** This is a monotypic genus known only from Borneo.

### *Lacipoda immunda* Brunner von Wattenwyl, 1895

(Fig. 7)

*Lacipoda immunda*—Brunner von Wattenwyl, 1895: 66; Kirby, 1906: 302; Beier, 1954: 162; Beier, 1962: 144; Beier, 1963: 47; Otte, 1997: 216

**Material examined.** 1 male (syntypes, images on Orthoptera Species File online, Cigliano *et al.*, 2020), **Brunei Darussalam** “Bruni”, det. Beier, deposited Polish Academy of Science, Museum of the Institute of Zoology. 1 male (images from the Natural History Museum, London), **East Malaysia**, Sarawak, Beram, Gunung Mulu National Park, 4°3'N, 114°56'E, 29 January 1978, coll. N. M. Collins, det. J. A. Marshall, 1979. 1 male (KB.17.40), **Brunei Darussalam**, Temburong District, Kuala Belalong Field Studies Centre, along Ashton Trail, N4.54669, E115.15695, 154.9±8.5 m.a.s.l., 8 January 2017, 1916 hours, on leaf of climber, coll. M. K. Tan (ZRC).

**Remarks.** Tan & Wahab (2018a) incorrectly identified the specimen from Kuala Belalong as *Tympanophyllum* (Tan & Wahab, 2018a: 141, Fig. 17C). The male from Kuala Belalong and the male syntype are nearly identical in habitus, wing venation including stridulatory area on left and right tegmina an abdominal apex.

## Genus *Promeca* Brunner von Wattenwyl, 1895

Brunner von Wattenwyl, 1895: 52; Kirby, 1906: 299; Karny, 1923: 170; Karny, 1924b: 187; Karny 1925: 34; de Jong, 1939: 39; Beier, 1954: 83; Beier, 1962: 64; Beier, 1963: 24; Otte, 1997: 219

**Remarks.** Nine species from Borneo, Malay Peninsula, Sumatra and Java for this genus:

*P. borneana* Beier, 1954—Borneo

*P. brachyptera* Beier, 1954—Java

*P. fuscescens* (Haan, 1843)—Java

*P. nobilis* Beier, 1954—Borneo

*P. ornata* Beier, 1954—Borneo

*P. perakana* Beier, 1954—Malay Peninsula, Sumatra

*P. pulcherrima* de Jong, 1939—Sumatra

*P. quadripunctata* Brunner von Wattenwyl, 1895—Java

*P. sumatrana* Beier, 1954—Malay Peninsula, Sumatra

### *Promeca borneana* Beier, 1954

(Figs. 8, 9)

**Material examined.** 1 female (KB.19.25), **Brunei Darussalam**, Temburong District, Ulu Temburong National Park, Ulu Ulu Resort, along Air Terjun Trail, N4.55711, E115.15468, 108.5±8.1 m.a.s.l., 1936 hours, on foliage, 15 July 2019, coll. M. K. Tan & H. Yeo (ZRC).

**Remarks.** Our specimen resembles the female holotype of *Promeca nobilis* Beier, 1954 from north Borneo by dark abdominal apex (including ovipositor), base of ovipositor with a large yellow oval patch and subgenital plate with a distinct excision at the apex; but differs by the absence of a median pale stripe stretching from the dorsum of head to the pronotum dorsal disc; the absence of oblique brown stripes on tegmen; and the absence of a median pale strip on last abdominal tergite and epiproct. Our specimen also shows slight differences to *P. borneana* Beier, 1954 described from Brunei Darussalam in the shape of the meso- and meta-sterna as well as by the subgenital plate having a deeper excision at the apex. Our specimen resembles *P. ornata* Beier, 1954 from north Borneo by the shape of the subgenital plate but **seemingly differs by the shape of the epiproct**.

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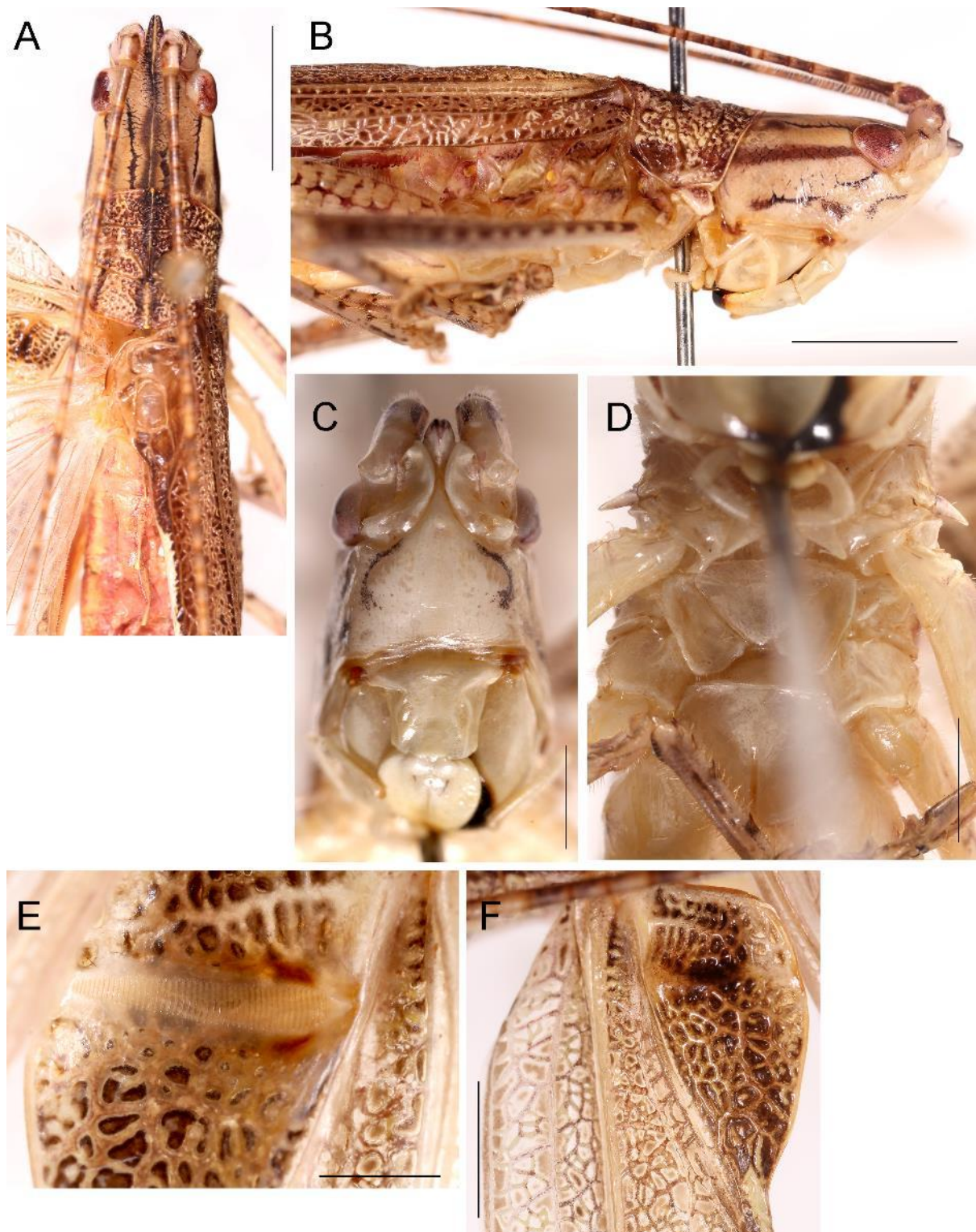
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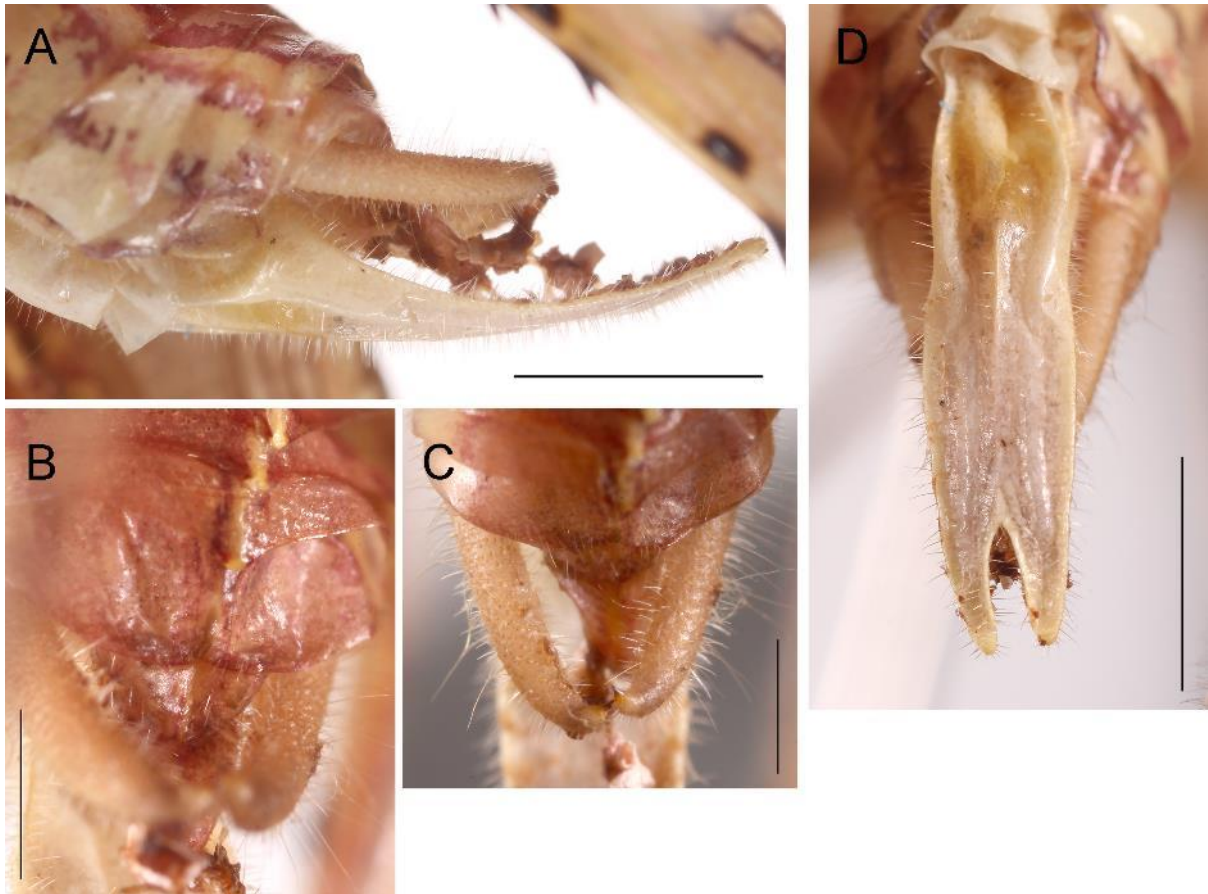
### Figure captions



**FIGURE 1.** *Segestes nostosalgos* sp. n. male holotype in its natural environment.



**FIGURE 2.** *Segestes nostosalgos* sp. n. male holotype: anterior half of body in dorsal (A) and lateral (B) views; face in anterior view (C); thoracic segments in ventral view (D); stridulatory file on the left tegmen in ventral view (E); basal part of left tegmen in dorsal view (F). Scale bars: 5 mm (A, B); 2 mm (C, D, F); 1 mm (E).



**FIGURE 3.** *Segestes nostosalgos* sp. n. male holotype: abdominal apex in lateral view (A), apical tergites in dorsal view (B); cercus in dorsal view (C); subgenital plate in ventral view (D). Scale bars: 2 mm (A, D); 1 mm (B, C).



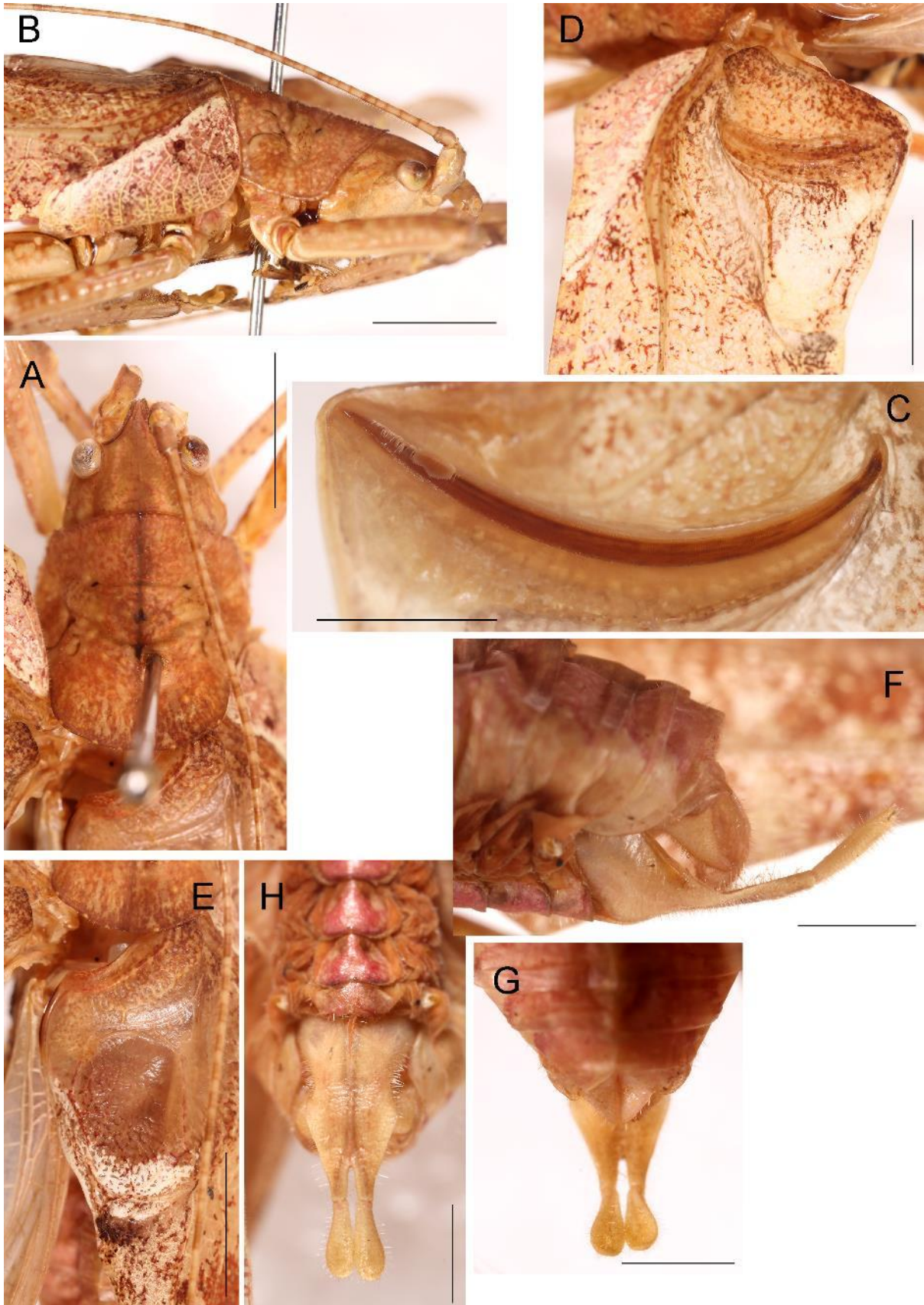
**FIGURE 4.** *Sathrophylliopsis mentham* **sp. n.** male holotype in its natural environment.



B



**FIGURE 5.** *Sathrophylliopsis mentham* **sp. n.** male holotype dry-pinned in dorsal view (A); left tegmen in dorsal view (B). Scale bars: 10 mm.



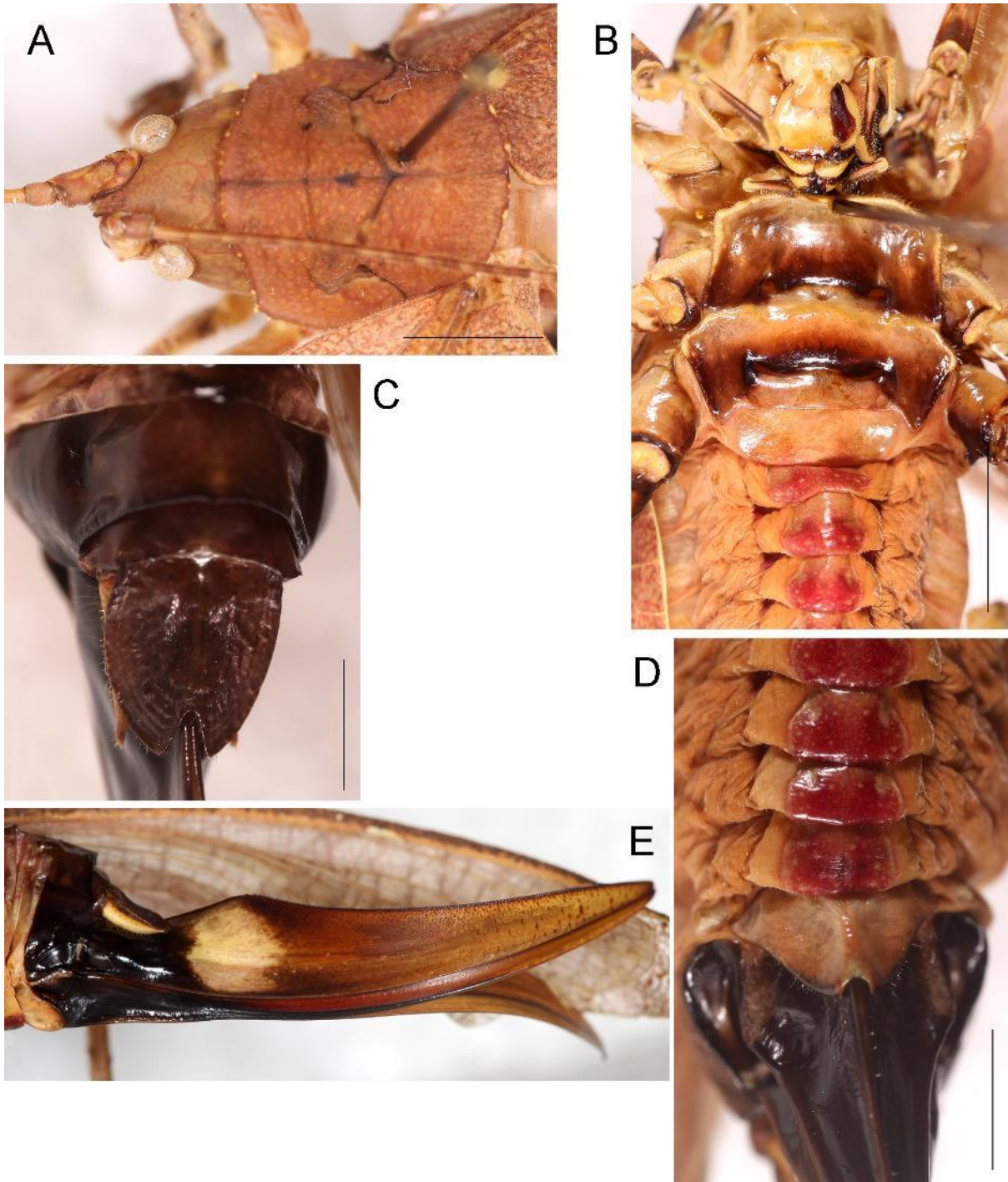
**FIGURE 6.** *Sathrophylliopsis mentham* sp. n. male holotype: head and pronotum in dorsal (A) and lateral (B) views; stridulatory file on the left tegmen in ventral view (C); stridulatory area on left (D) and right (E) tegmina in dorsal view; abdominal apex in lateral (F), dorsal (G) and ventral (H) views. Scale bars: 5 mm (A, B, D, E); 2 mm (C, F–H).



**FIGURE 7.** *Lacipoda immunda* male: habitus in dorsal view (A); left (B) and right (C) tegmina in dorsal view; abdominal apex in dorsal (D) and ventral (E) views. Scale bars: 2 mm.



**FIGURE 8.** *Promeca borneana* female (A) and nymph (B) in its natural environment.



**FIGURE 9.** *Promeca borneana* female: head and pronotum in dorsal view (A); thoracic sternites in ventral view (B); abdominal apex in dorsal (C) and ventral (D) views; ovipositor in lateral view (E). Scale bars: 5 mm (A, B); 2 mm (C, D).