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New Meconematinae (Ensifera: Tettigoniidae) from Thailand

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Taxonomy, Tettigoniidae, Meconematinae, new genus, new species, Thailand

Abstract. The present paper provides descriptions and diagnoses of three new taxa from Thailand: *Satunia* gen. n., with one species, *S. tassirii* sp. n., and *Alloteratura kuehnelti* sp. n. The hitherto unknown male of *Xiphidiopsis cryptosticta* Hebard, 1922 is described and diagnosed.

INTRODUCTION

The tettigoniids of Thailand were treated recently by Ingrisch (1989), who indicated that numerous new species in the subfamily Meconematinae (sensu Beier, 1972) might be found. The present paper confirms this assumption, because at least all the male specimens collected during visits to Thailand between 1988–1995 by the present authors are hitherto unknown. According to the keys within Jin & Kevan (1992), the specimens belong to the tribe Meconematini. The Meconematini of tropical and subtropical Asia are documented poorly, particularly with regard to the South-East Asian mainland. A revision of some Asian genera of the subfamily (Beier, 1966) was concerned, mainly, with species of the Malesian and Philippine area. Tinkham (1944) and Bey-Bienko (1957) investigated Chinese species, while Yamasaki (1982, 1983a,b,c, 1986, 1987) and Kano & Kawakita (1987) worked on Japanese Meconematini. Ingrisch (1987) described a new genus from Nepal, and Kevan & Jin (1993) investigated the *Xiphidiopsis*-group of the Indian region. In order to treat the Thai specimens it was necessary to refer to the papers of Redtenbacher (1891), Caudell (1912), Karny (1912, 1920, 1923, 1924, 1926a,b, 1931), Hebard (1922) and Kästner (1932).

The present paper provides descriptions of a new genus, two new species, and of the hitherto unknown male of *Xiphidiopsis cryptosticta*.

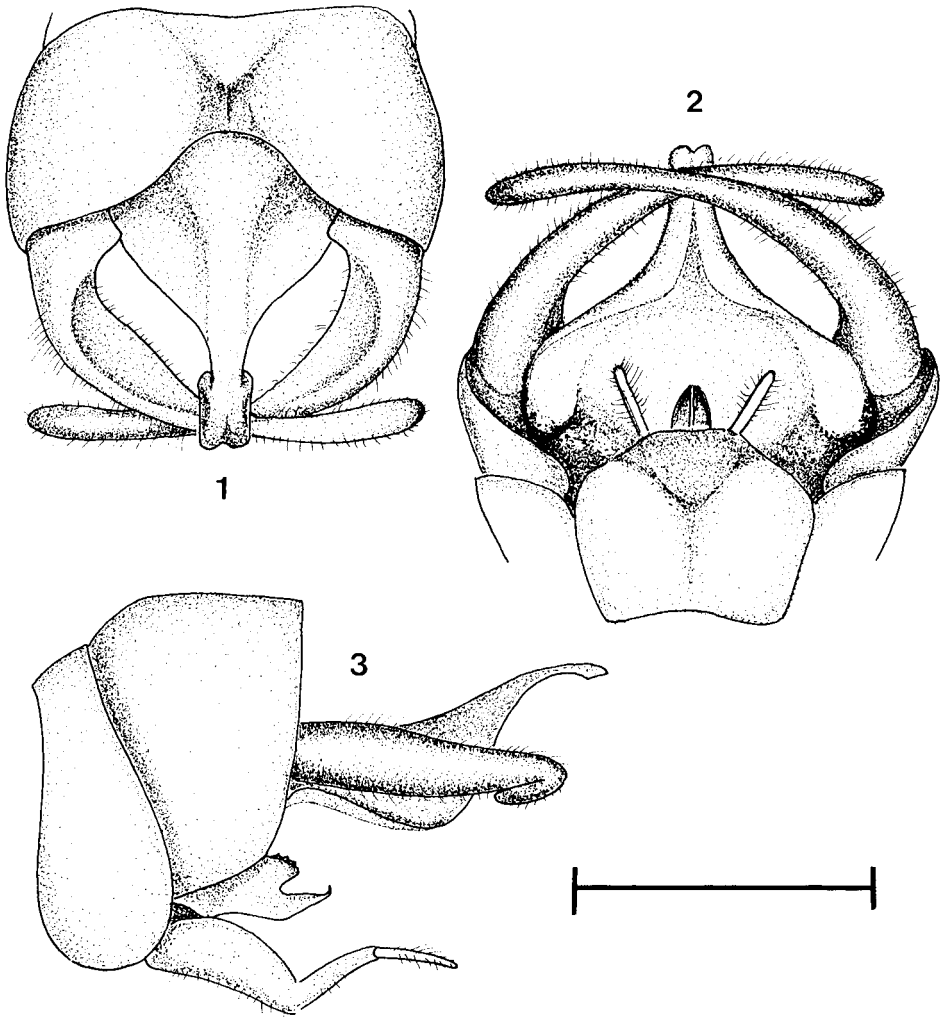
The studied specimens were collected by the authors unless stated otherwise; they are deposited in the Natural History Museum, Vienna.

RESULTS

Alloteratura kuehnelti sp. n.

TYPE MATERIAL: Holotype ♂, Ban Khok Yai, Province Phitsanulok, North-East Thailand, 19.ix.1992. Mixed deciduous forest. Paratype 1 ♀, same data.

DESCRIPTION. Measurements (in mm) male/female: Total length 11.2/12.8. Head length (fastigium verticis to clypeal suture) 2.2/2.1. Median pronotum length 4.0/4.0. Tegmina



Figs 1–3: *Alloteratura kuehnelti* sp. n., male genital segments. 1 – dosal view; 2 – ventral view; 3 – lateral view (scale bar 1mm).

length 17.2/19.4. Metafemur length 10.1/11.0. Metatibia length 10.8/11.9. Ovipositor length –/6.9.

Eyes round, protruding. Fastigium verticis conical, apically rounded, dorsally weakly sulcate. Length and width of fastigium less than half of scapus. Length of scapus more than twice of pedicellus. The final joint of the maxillary palpus blunt, very short and rounded distally. Pronotum moderately long, the anterior margin straight, the posterior margin distinctly convex, discus straight. The transversal sulcus approximately in the middle of the pronotum, longitudinal carina only very weak. Lateral lobes of the pronotum with ventral margin obtuse, humeral sinus weak. Foramen thoracicum concealed partially in both sexes, but visible in latero-caudal view. Alae only slightly longer than tegmina, the

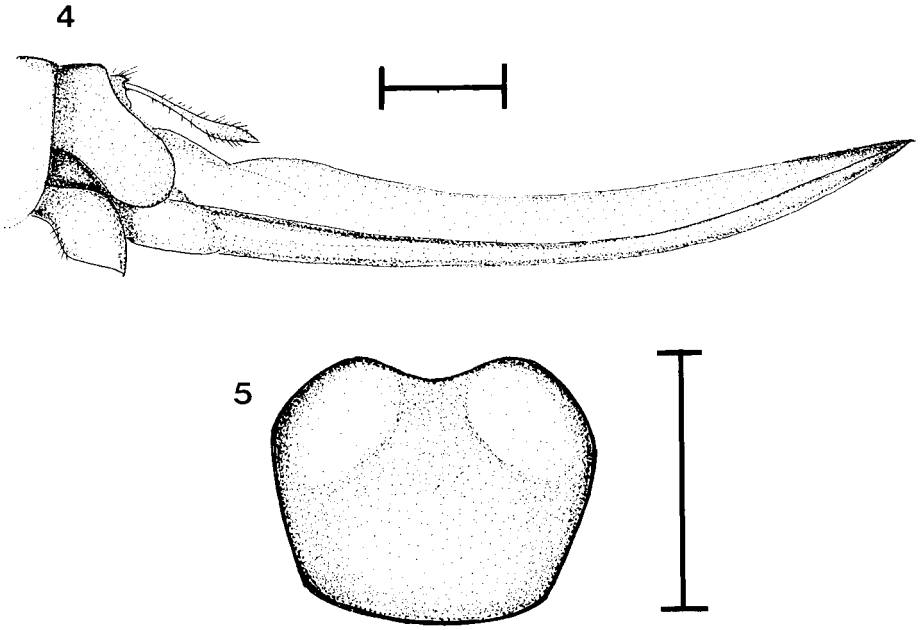
latter extend far beyond the apex of the hind femur. Thoracic sterna unarmed. Procoxae with 1 moderately curved, long spur; all femora unarmed; protibiae distinctly expanded in the tympanal region. Tympana open on both sides. Pro- and mesotibiae with 4 externo- and 4 internoventral spines and 1 pair of small apical spurs. Metatibiae with 28–32 short, strong, externo- and internoventral spines and 3 pairs of apical spurs (1 pair dorsally, 2 pairs ventrally).

Genital segments. Male (Figs 1–3): supra-anal plate produced, tapering, apex curved downwards. Subgenital plate broad proximally, narrower towards the apex. The apex raised slightly and truncate; styli long and straight. Cerci broad basally, apically slightly narrower, curved, the inner side flattened; basal tooth inconspicuous, simple, rounded. Female (Figs 4, 5): Subgenital plate slightly broader than long, posterior margin concave. Ovipositor curved slightly, broadened basally, margins smooth. Cerci long, slender, apically spindle-shaped.

Coloration ex alcohol. Primary colour yellow-ochre (in vivo green). Antennae unicolorous brown. Pronotum with a yellow stripe on both sides of the discus. Tegmina with conspicuous small, dark spots. Ovipositor dark-brown toward the apex.

DIAGNOSIS. Similar to *A. triloba* Karny, 1926, but larger. The supra-anal plate of the male is similar in shape but the apical process is narrower and not trilobate. Unlike *A. kuehnelti*, the cerci of the male of *A. triloba* are less curved and the basal tooth is missing. In the females of both species the ratio of body length to ovipositor length is similar, but the subgenital plate and the cerci have a different appearance: in *A. triloba* the subgenital plate is truncate distally and the cerci are long, slender and tapering toward the apex, whereas in *A. kuehnelti* the plate is concave distally and the cerci are spindle-shaped.

ETYMOLOGY: Named after the late Wilhelm Kühnelt, Viennese ecologist and a keen orthopterologist.



Figs 4, 5: *Alloteratura kuehnelti* sp. n., female. 4 – ovipositor, lateral view; 5 – subgenital plate (scale bar 1mm).

Xiphidiopsis cryptosticta Hebard, 1922

Hitherto only the females of this species are known (Hebard, 1922). The type material was collected in Singapore. Three additional specimens were collected (2♂, 1♀), of which a pair was found at the same time and place. The female was identified as *X. cryptosticta*. As the males share the species characters with the female, it appears correct to assign them to *X. cryptosticta*. The measurements of the specimens and the description of the males are given below.

MATERIAL: 2♂ (25.ix.1993, 7.ii.1995), 1♀ (7.ii.1995), Takua Pa, Province Phangnga, Peninsular Thailand. Moist rainforest (Thai type sensu Whitmore, 1984).

DESCRIPTION.

Measurements (in mm)

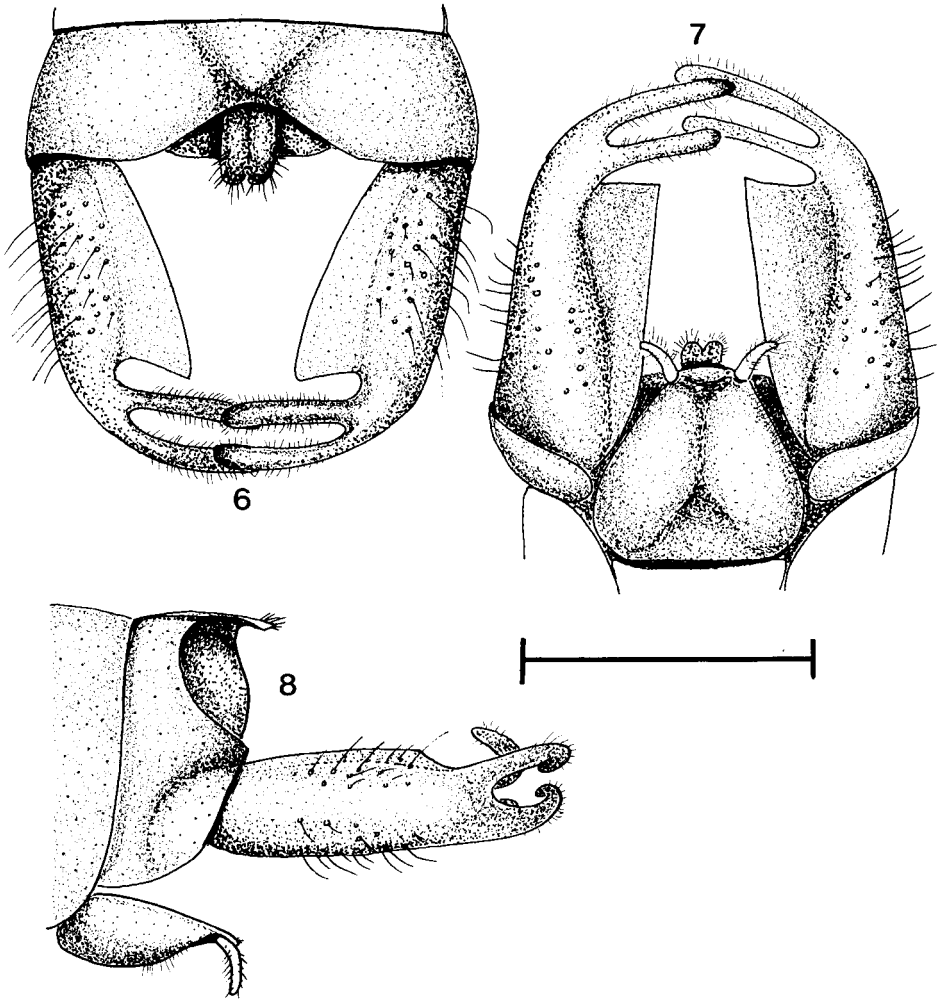
	♂/♂	♀
Body length	11.9/9.8	11.0
Head length (fastigium verticis to clypeal suture)	2.1/2.0	2.0
Median pronotum length	4.0/3.7	3.8
Tegmina length	17.4/18.1	18.5
Metafemur length	11.1/10.0	11.4
Metatibia length	11.3/10.8	11.8
Ovipositor length	—	9.4

DESCRIPTION OF THE MALES. Eyes round, protruding; fastigium verticis triangular, with rounded apex, weakly sulcate dorsally. Length of scapus more than twice of pedicellus. Fourth and fifth joint of the palpus maxillaris equally long, elongate, the latter with blunt, rounded apex. Pronotum as typical for the genus, humeral sinus lacking. Foramen thoracicum open, slightly pyriform. Alae slightly longer than tegmina, the latter extend beyond the apex of the hind femur. The proximal third of the tegmina bears a dark spot of velvet-like, dark-brown hair on the posterior margin. Procoxal spur straight, directed ventrally. Femora unarmed. Pro- and mesotibiae with 5 externo- and 4 internoventral spines and 1 pair of very small distal spurs. Metatibiae with 26 externo- and 28 internoventral short spines and 3 pairs of apical spurs (1 pair dorsally, 2 pairs ventrally). Tympana open on both sides.

Genital segments (Figs 6–8): Tenth tergum produced, embracing cercal bases. Supraanal plate small, narrow, weakly sulcate dorsally. Styli of the subgenital plate slender, bent downwards, with short and stiff setae. Cerci large, tridendate. Basal tooth triangular, flat, pointed. Apical teeth slender, with rounded tips. Cerci curved distinctly in the distal third, resulting in inter-locking of the apical teeth; cerci covered with long, stiff setae basally and apically with short, soft hairs.

Coloration ex alcohol: primary colour yellow-ochre. Eyes dark-brown, flagellum weakly suffused with brown. Dark brown spot in the proximal third of the tegmina. A row of small, brown dots on the tegmina.

Colouration in vivo: primary colour light-green. Vertex with V-shaped, dark-green lines. Eyes brown dorsally, green-white ventrally. Antennae olive brown, the flagellum irregularly dark-brown annulated. Pronotum with 3 (1 median and 2 lateral) dark-brown longitudinal stripes. Terga green, thoracic and the first abdominal sterna white, the following grass-green. Tegmina green with a dark-brown spot in the proximal third and a median



Figs 6–8: *Xiphidiopsis cryptosticta*, male genital segments. 6 – dorsal view; 7 – ventral view; 8 – lateral view (scale bar 1mm).

row of brown dots, anal margin dark-brown. Alae grey. Legs green, only tarsus olive green, all femora with dark-green longitudinal lines.

DIAGNOSIS OF THE MALE. Karny (1926) states that *X. cryptosticta* closely resembles *X. siamensis* Karny, 1926. However, this cannot be verified, because no male of *X. siamensis* has yet been found. Some resemblance exists between *X. cryptosticta* and *X. sumatrensis* Karny, 1924, particularly with regard to the shape of the genital segments. *X. sumatrensis* is smaller, the posterior margin of the lateral lobes of the pronotum nearly straight, slightly undulating above the foramen thoracicum. Foramen thoracicum pointed ventrally. The male cerci are also three-toothed, but unlike *X. cryptosticta* the basal tooth is considerably

more pointed and its base is narrower distinctly. The second tooth is appreciably smaller than the first.

Genus *Satunia* gen. n.

DESCRIPTION. Fastigium verticis extending in a process, apically rounded, dorsally weakly sulcate, length approximately one-third of scapus. Inner margin of the antennal fovea vaulted. Palpus maxillaris long; the fourth and fifth joint of equal length, the palpus broadened distinctly distally. Eyes hemispherical, considerably protruding. Pronotum extending backwards so that it covers the base of the tegmina. Anterior margin of the pronotum straight, posterior margin convex, discus slightly arched, rounded toward the lateral lobes of the pronotum. Humeral sinus very weak. Foramen thoracicum only visible in latero-caudal view. Tegmina and alae fully developed. Prosternum smooth, meso- and metasternum distally with a pair of protuberances. Procoxae with one spine. Femora sulcate, unarmed. Protibiae sulcate, with 4 externo- and internoventral spines. Distal spines longer, length approximately half of tibia width in tympanal region. Tympana open on both sides. Mesotibiae sulcate, with 4 interno- and externoventral spines. Metatibiae with 30–33 short internoventral and 30–36 short externoventral spines, 1 pair of apical spines ventrally and 2 pairs dorsally. Knee lobes of the metatibiae rounded, unarmed. Posterior margin of the tenth tergum slightly concave. Subgenital plate subtrapezoidal. Cerci long, slightly bending inwards toward the apex.

ETYMOLOGY: Named after the Province of Satun, Peninsular Thailand. Gender: Femininum.

TYPE SPECIES: *Satunia tassirii* sp. n.

DIAGNOSIS. Some features of *Satunia,* such as the shape of the pronotum and the tibial spines, resemble *Alloteratura* Hebard, 1922; it differs distinctly from the species of this genus in the shape of the palpus maxillaris and mainly in the shape of the genital segments: the cerci are long, the tenth tergum lacks the characteristic yoke-like structures of *Alloteratura.* In particular the long cerci resemble *Thaumaspis* Bolivar, 1900, but the members of this genus are squamipterous with considerably or totally reduced alae. Unlike *Thaumaspis, Satunia* has fully developed tegmina and alae.

Satunia tassirii sp. n.

TYPE MATERIAL: Holotype ♂, Thale Ban, Province Satun, Peninsular Thailand, moist lowland rainforest (Malaysian type sensu Whitmore, 1984), 17.ix.1993. Paratype 1 ♂, Takua Pa, Province Phangnga, Peninsular Thailand, moist lowland rainforest (Thai type sensu Whitmore, 1984), 8.ii.1995.

DESCRIPTION. Measurements (in mm), paratype in parentheses: Body length 10.2 (14.2). Head length (fastigium verticis to clypeal suture) 1.9 (1.9). Median pronotum length 4.0 (4.0). Tegmina length 14.0 (14.2). Metafemur length 12.5 (12.4). Metatibia length 14.9 (14.2).

Fastigium verticis triangular in dorsal view. Antennae very long, scapus considerably broadened. Last joint of the palpus maxillaris broadened distinctly in the distal fourth, the apex cut obliquely. Pronotum median only very weakly carinate, transverse sulcus slightly beyond the middle, also very weak. Discus slightly arched. Lateral lobes of the pronotum with ventro-cephalic angles weakly indicated by broad convexities. Tegmina and alae

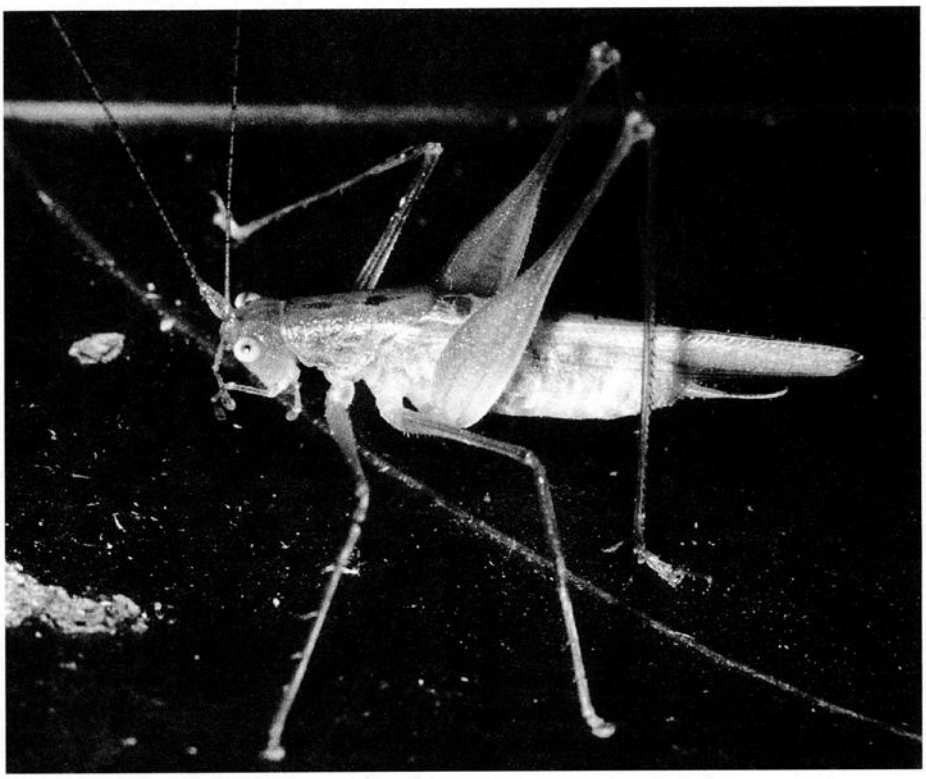


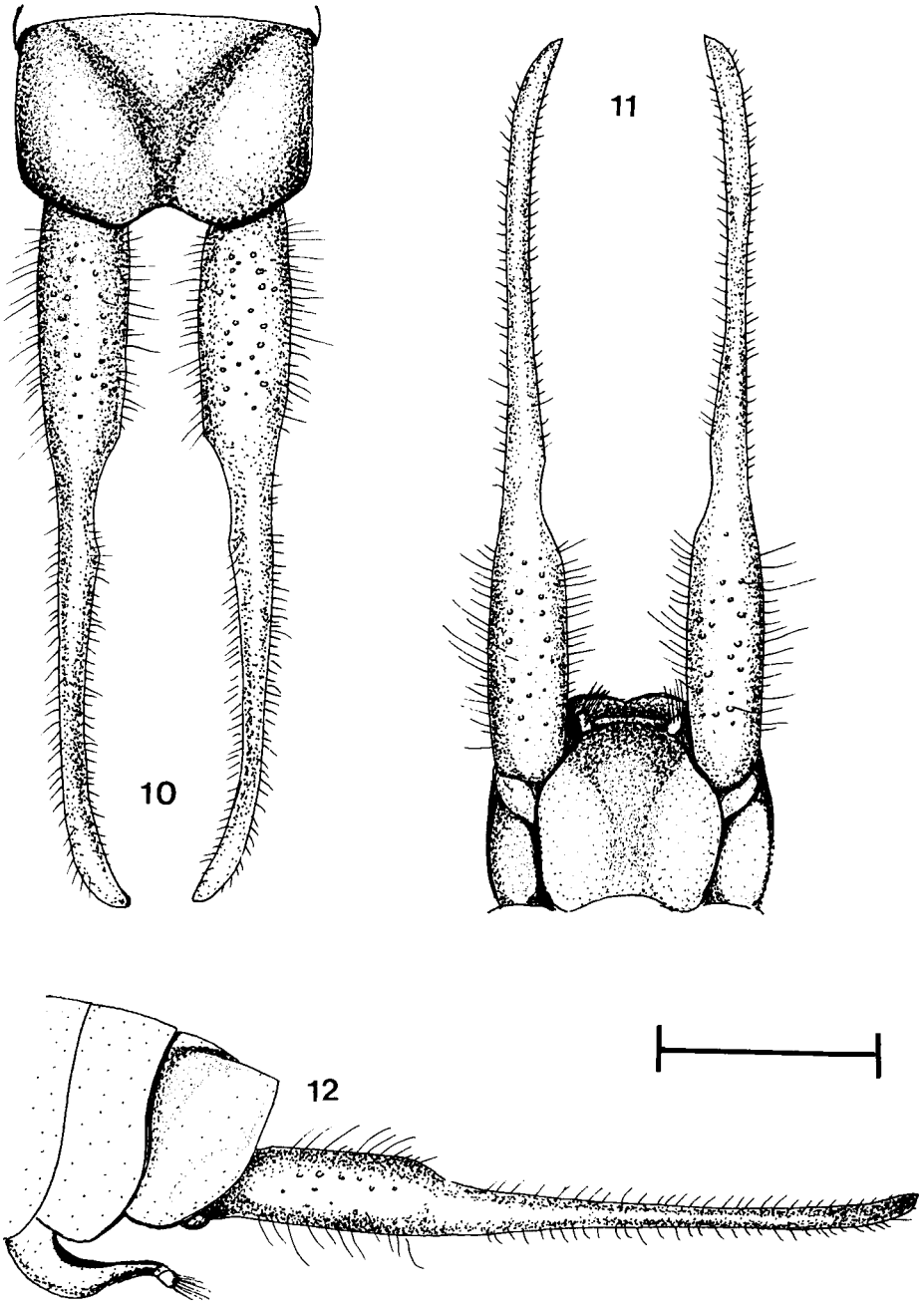
Fig 9: *Satunia tassirii* gen. n. et sp. n., male.

developed fully, tegmina extend to the apex of the hind femur, alae slightly shorter than tegmina (Fig. 9).

Genital segments (Figs 10–12): Tenth tergum extending far ventrally, posterior margin slightly concave, the lateral margins cover the bases of the cerci. Subgenital plate trapezoidal, with short styli rounded apically. Styli covered with stiff setae. Cerci long, the proximal half slightly thicker, the distal half slender, straight; only the last fourth bent inwardly, apex rounded.

Coloration ex alcohol: primary colour white-yellow. Flagellum dark-grey annulated, eyes dark-brown. Pronotum median with ochre markings. Posterior margin of tegmina light-brown. Setae on styli ochre.

Coloration in vivo: primary coloration light-green. Scapus green, pedicellus grey, flagellum light-grey, dark-grey annulated. Eyes olive green. Vertex with 2 indistinct, green longitudinal lines. Pronotum light-green with striking median markings; the markings being intensively green in the proximal third, light-brown in the median and dark-green in the distal third. Lateral lobes of the pronotum with dark-green spots. Terga light-green, sterna white. Fore and middle legs white-green, coxa and trochanter of hind legs white, hind femur green, hind tibia and hind tarsus white-brown. Tegmina light-green, alae hyaline. Cerci green basally, brown distally. Hair of the styli light-brown.



Figs 10–12: *Satunia tassirii* gen. n. et sp. n., male genital segments. 10 – dorsal view; 11 – ventral view; 12 – lateral view (scale bar 1 mm).

Female unknown.

ETYMOLOGY. Named after Mr Amnuay Tassiri, a great hunter of "takataen" and the collector of the holotype.

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