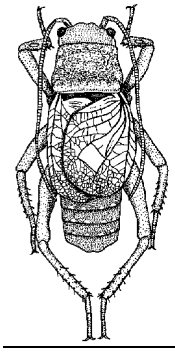

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TAXONOMY OF THE KATYDIDS (ORTHOPTERA: TETTIGONIIDAE) FROM EAST ASIA AND ADJACENT ISLANDS. COMMUNICATION 6

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Two new species of the genus *Viriacca* Ingr. (*V. modesta* **sp. n.**, *V. insignita* **sp. n.**), two new subgenera and a new species of the genus *Oxylakis* Redt. (*Indolakis* **subgen. n.**, *Ocellakis* **subgen. n.**, *O. superocellata* **sp. n.**) (Conocephalinae: Agraeciini) and a new species of the genus *Asiophlugis* Gor. (*A. longiuncus* **sp. n.**) (Meconematinae: Phlugidini) are described from Borneo. These taxa are distinguished from the other relatives mainly by the structure of copulatory organs.

KEY WORDS: Orthoptera, Tettigoniidae, Conocephalinae, Meconematinae, Agraeciini, Phlugidini, *Viriacca*, *Oxylakis*, *Asiophlugis*, new taxa, Malaysia.

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С Борнео описаны 2 новых вида рода *Viriacca* Ingr. (*V. modesta* **sp. n.**, *V. insignita* **sp. n.**), 2 новых подрода и новый вид рода *Oxylakis* Redt. (*Indolakis* **subgen. n.**, *Ocellakis* **subgen. n.**, *O. superocellata* **sp. n.**) (Conocephalinae: Agraeciini), а также новый вид рода *Asiophlugis* Gor. (*A. longiuncus* **sp. n.**) (Meconematinae: Phlugidini). Эти таксоны отличаются от других родственных форм главным образом строением копулятивных органов.

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INTRODUCTION

The present paper is a sixth communication in the series of publications by the same author on taxonomy of Indo-Malayan and Papuan Tettigoniidae. The previous communications contain descriptions of forty new taxa of the subfamilies Phaneropterinae, Conocephalinae and Meconematinae from the following genera: *Elimaea* Stål, *Stictophaula* Heb. and *Euanisous* Heb. (Gorochov, 2011a); *Peracca* Griff. and *Viriacca* Ingr. (Gorochov, 2011b); *Sumatropsis* Gor., *Xiphidiopsis* Redt., *Xizicus* Gor. and *Chandozhinskia* Gor. (Gorochov, 2011c); *Decma* Gor. (Gorochov, 2012a); *Stenophlugis* Gor., *Papuaphlugis* Gor., *Asiophlugis* Gor., *Neophisis* Jin and *Meiophisis* Jin (Gorochov, 2012b). This communication is dedicated to the genera *Viriacca* and *Oxylakis* Redt. from the tribe Agraeciini of the subfamily Conocephalinae and to the genus *Asiophlugis* from the tribe Phlugidini of the subfamily Meconematinae. The material examined here is deposited at the Zoological Institute, Russian Academy of Sciences, St. Petersburg.

DESCRIPTIONS OF NEW TAXA

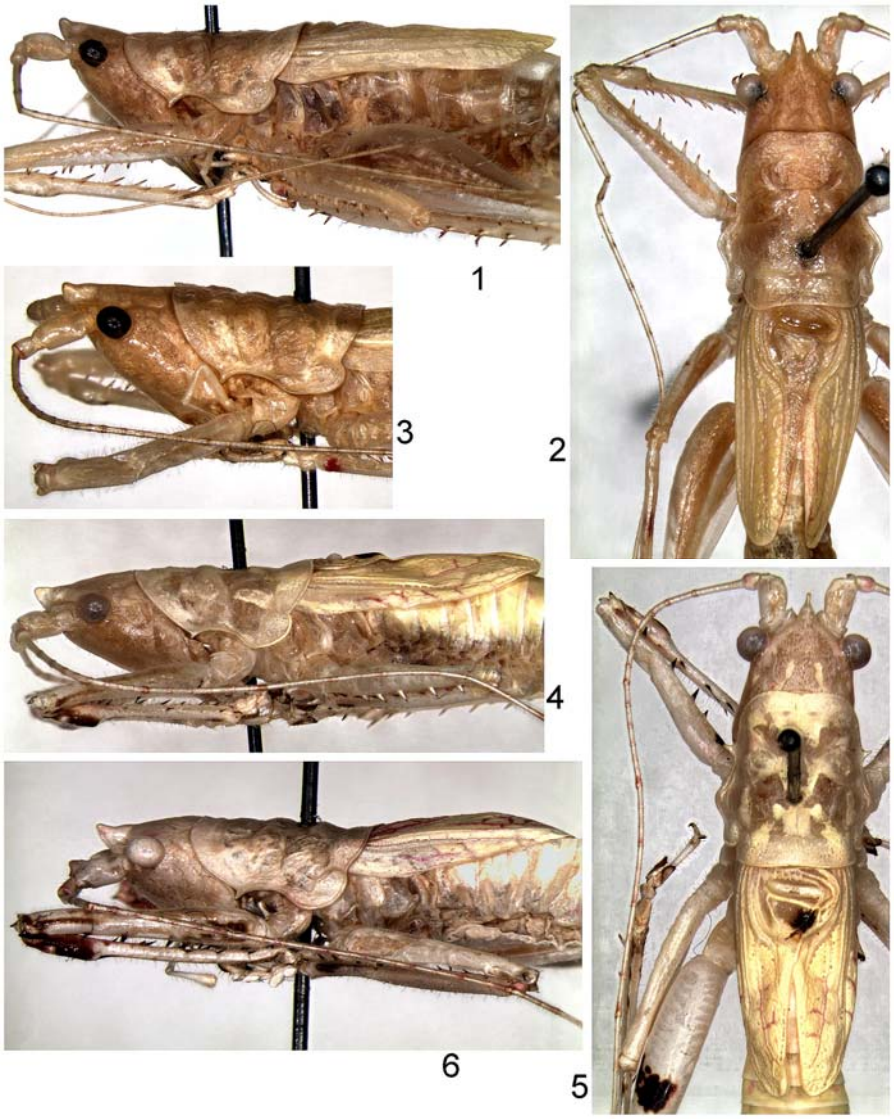
Subfamily Conocephalinae

Tribe Agraeciini

***Viriacca modesta* Gorochov, sp. n.**
Figs 1–3, 7–12, 19, 20

MATERIAL. Holotype – ♂, **Malaysia**: Borneo I., Sarawak State, Mulu National Park not far from borders with Brunei and Indonesia, ~200 m, primary forest, on leaf of tree, at night, 24–27.III 2012, A. Gorochov, M. Berezin, E. Tkatsheva, I. Kamskov. Paratypes: 2 ♂, 3 ♀, same data; 1 ♂, Sarawak State, Lambir Hills National Park in environs of Miri Town, 100-300 m, primary forest, on leaf of tree, at night, 29.III–1.IV 2012, A. Gorochov, M. Berezin, E. Tkatsheva, I. Kamskov.

DESCRIPTION. Male (holotype). General appearance typical of this genus. Coloration yellowish green with sparse and small light brown spots on proximal part of antennal flagellum, a few small marks of same color on dorsal surface of fore tibiae (in proximal third and in apical part), very small reddish marks at apex of middle femora, two reddish spots on middle tibiae (one at middle of inner surface and one at apex), brown dorsal spot on apical part of hind tibiae, brownish distal part of all spines of legs, rose longitudinal veins in medial part of tegmina (behind stridulatory apparatus), and very small brown and light brown marks on middle part of all tarsi. Head strongly opistognathous; upper rostral tubercle of head approximately conical but somewhat depressed laterally (especially in distal half) and with distal part slightly curved upwards (Figs 1, 2); lower rostral tubercle absent; width of scape twice as great as minimal distance between antennal cavities. Pronotum with rather large spinule on anteroventral edges and with moderately short hind lobe (Figs 1, 2); all thoracic sternites without spines. Tegmina approximately reaching middle of hind



Figs 1–6. *Viriacca* Ingr.: 1–3 – *V. modesta* sp. n. (1, 2 – male; 3 – female); 4–6 – *V. insignita* sp. n. (4, 5 – male; 6 – female). Head, pronotum and tegmina from side (1, 4, 6) and from above (2, 5); head and pronotum from side (3).

femora and of sixth abdominal tergite, with apical part rounded and slightly narrowed, with costal area distinctly narrowed, and with stridulatory apparatus as in Fig. 2; rest of tegminal venation with straight longitudinal veins, without *RS*, and with rather numerous and irregular crossveins; hind wings invisible (not exposed). Legs

with inflate tympanal region (typical of *Viriacca*) and following armament: fore femora with two rows of ventral spines; middle and hind femora with only outer row of ventral spines (but middle femora with a few additional small spinules between some spines, and hind femora with a pair of apical spines); fore and middle tibiae with two rows of ventral spines; hind tibiae with two rows of dorsal spines as well as with two rows of sparse and small ventral spinules. Tenth abdominal tergite posteriorly with roundly angular lamellar projection; distal part of this projection strongly curved downwards; cerci short and their apical part with medial hook; apex of this hook directed medially and slightly downwards; genital plate with rather deep and almost angular posteromedian notch and rather long styles (Figs 7–10); sclerites of male genitalia as in Figs 19, 20.

Variations. One male with rose dot at rostral apex, with reddish marks on median part of pronotal disc (near anterior and posterior edges) and at base of middle femora. Two other males with rose or reddish marks at apex of middle tibiae only. Sometimes hind femora also with a few additional small spinules between ventral spines.

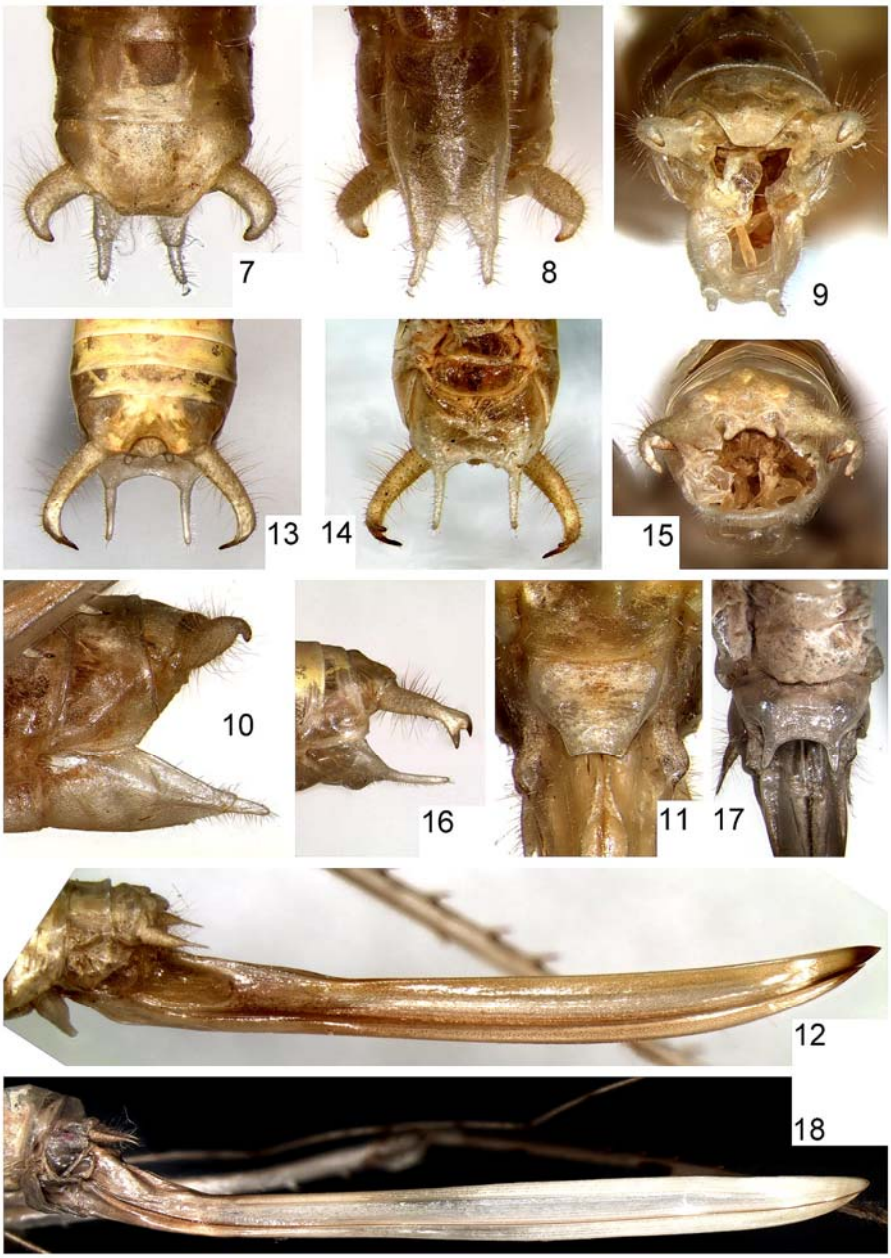
Female. Coloration and structure of body similar to those of male, however rose and reddish marks as in two latter males or absent, pronotum with clearly shorter hind lobe (Fig. 3), tegmina slightly shorter (reaching fifth abdominal tergite), and upper half of abdominal apex unspecialized (tenth tergite without hind projection, and cerci cylindrical with thin distal part). Genital plate not long, narrowed to apex, and with almost truncate (hardly notched) apical part (Fig. 11); ovipositor as in Fig. 12.

Length (in mm). Body: ♂ 17–19, ♀ 16–20; pronotum: ♂ 4.4–4.6, ♀ 4.7–4.9; visible part of tegmina: ♂ 7–7.5, ♀ 7.2–7.7; hind femora: ♂ 11–12, ♀ 13.5–14.5; ovipositor 14.5–16.

COMPARISON. The new species differs from *V. viridis* Ingr. (Malacca; Ingrisch, 1998) and *V. insularis* Gor. (Tioman I. near Malacca; Gorochov, 2011b) in a distinctly shorter hind pronotal lobe of male, much longer tegmina lacking any dark spot, clearly longer styles of male genital plate, the anteromedian sclerite of male genitalia with distinctly shorter anterolateral parts (Fig. 19, 20), fusion of this sclerite with a pair of middle plate-like sclerites (having a few denticles of different size) and with a pair of posterior semisclerotized ribbons usually having a distinct apical denticle on each of these ribbons (*vs*. this anteromedian sclerite not fused with the middle sclerites, genitalia without posterior sclerotized or semisclerotized ribbons and with numerous small denticles on the apical membranous lobes), and longer and almost straight ovipositor.

***Viriacca insignita* Gorochov, sp. n.**
Figs 4–6, 13–18, 21, 22

MATERIAL. Holotype – ♂, **Malaysia**: Borneo I., Sarawak State, 80–90 km WWN of Kuching City, Gunung Gading National Park, 100–400 m, primary forest, on leaf of bush, at night, 8–9.III 2012, A. Gorochov, M. Berezin, E. Tkatsheva, I. Kamskov. Paratypes: 3 ♀, Sarawak State, environs of Kuching City, Kubah National Park, Matang Mt, 200–500 m, primary forest, on leaves of bushes, at night, 10–17.III 2012, A. Gorochov, M. Berezin, E. Tkatsheva, I. Kamskov.



Figs 7–18. *Viriacca* Ingr.: 7–12 – *V. modesta* sp. n.; 13–18 – *V. insignita* sp. n. Male abdominal apex from above (7, 13), from below (8, 14), from behind (9, 15), and from side (10, 16); female genital plate from below (11, 17); ovipositor from side (12, 18).

DESCRIPTION. Male. Coloration and structure of body similar to those of *V. modesta*, but with following differences: antennal pedicel with small rose marks; tegmina reaching seventh abdominal tergite and distal part of proximal third of hind femora, with brown spot on medial part of stridulatory apparatus (Figs 4, 5) and rose some veinlets in costal area; fore legs lacking outer row of ventral spines on femora, with all spines and inner spots at base of femora brown, and with light brown marks on dorsal part of tibiae larger and somewhat darker (Fig. 4); middle femora without small spinules between ventral spines, completely light; middle tibiae with brownish marks on apical part only; hind femora with rather large and distinct brown spot in proximal half of dorsal surface (Fig. 5); hind tibiae with sparse and small brownish spots on ventral surface and with slight light brown marks in dorsoapical part; tenth abdominal tergite with rather large angular posteromedian notch (Fig. 13); cerci clearly longer and bifurcate in apical part (this part curved medially and somewhat downwards; Figs 13–16); genital plate short (transverse), with wide and not deep posteromedian notch, and with very long styles (Figs 14, 16); anteromedian V-shaped sclerite of genitalia (Fig. 21) with longer anterolateral parts as well as with longer and narrower posteromedian part (this part with more strongly S-shaped posterior half in profile; Fig. 22); this sclerite fused with only a pair of longer ribbon-like sclerites (plate-like middle sclerites undeveloped or completely fused with ribbon-like ones) having rather large hook at apex (Figs 21, 22).

Female. General appearance similar to that of male, however structure of both pronotum and tegmina almost as in female of *V. modesta* (Fig. 6), and coloration of body slightly different: tegmina in all females almost uniformly greenish but with some veins more or less rose; one female also without any darker spot on hind femora; other females with rose or light brown spot near middle part of hind femora (instead of dark spot characteristic of male) and with additional brownish mark on outer surface of fore femora; and one of latter females with rather numerous rose marks on dorsum of head, on pronotum, at apex of fore femora, at base of middle and hind femora, and on abdominal tergites and cerci. Genital plate shorter than in female of *V. modesta* and with wider apical part having a pair of lateral spines (Fig. 17); ovipositor as in Fig. 18.

Length (in mm). Body: ♂ 17, ♀ 17–19; pronotum: ♂ 4.5, ♀ 4.6–4.8; visible part of tegmina: ♂ 6.8, ♀ 5.7–6; hind femora: ♂ 14, ♀ 16–17; ovipositor 19–22.

COMPARISON. The new species is distinguished from *V. modesta* by the characters listed above. From *V. viridis* and *V. insularis*, it differs in the same characters of tegmina and of male pronotum as *V. modesta*, as well as in the presence of large apical sclerotized hooks in the male genitalia and of apical spines in the female genital plate.

Genus *Oxylakis* Redtenbacher, 1891

NOTES. This genus, redescribed and revised by Ingrisch (1998) and Ingrisch & Tan (2012), is not very uniform, because copulatory structures in one of its representatives (*O. truncatipennis* Bol.) significantly differ from those of the rest congeners.

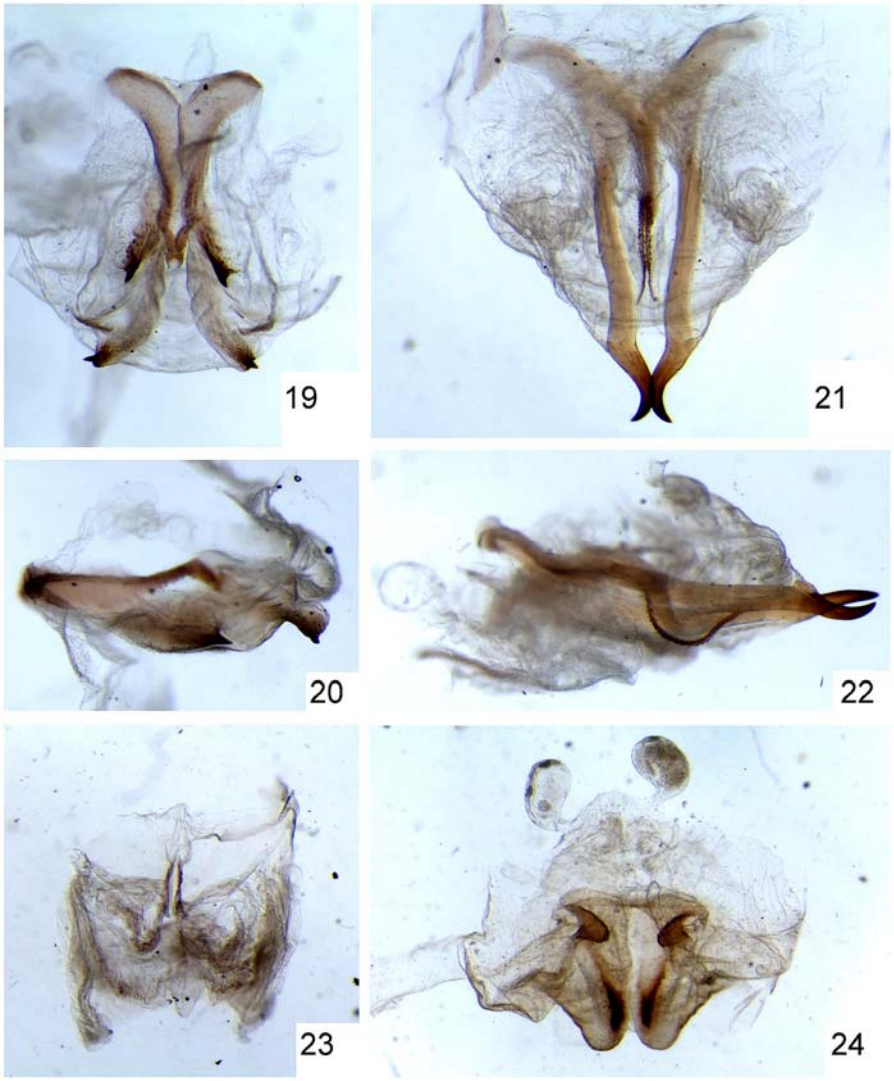
Moreover in the latter congeners, these structures look more similar to those of the related genus *Tabangacris* Willemse than to those of *O. truncatipennis*. This evidence as well as a new remarkable species described below allows me to divide *Oxylakis* s. l. into three subgenera; their diagnoses are given in the following key:

1. Male cerci short (length and width almost equal), with medial lobe located in distal part; male genitalia with a pair of distinct sclerotized hooks ..…….…… ……..……..……..……. ***Indolakis*** Gorochov, **subgen. n.** [Included species: type species *Oxylakis truncatipennis* Bolivar, 1900 from India only.]
– Male cerci long (length distinctly or much greater than width), with process (often divided into 2-3 lobules or hook-like spines) located at base; male genitalia without distinct sclerotized hooks 2
2. Median ocellus indistinct or very small, grayish, situated at middle of space between lower parts of antennal cavities and rather far from base of rostral tubercle (Fig. 25). Male cerci without any distinct widening near apex (Fig. 26); male genitalia without large semiscleritized lobes posteriorly (Fig. 23) …… ……..…..... ***Oxylakis*** s. str. [Included species: type species *Oxylakis punctipennis* Redtenbacher, 1891 from Borneo; *O. sumatranus* Ingrisch, 1998, *O. titillatus* Ingrisch, 1998 and *O. karnyi* Ingrisch, 1998 from Sumatra; *O. javanicus* Ingrisch, 1998 and *O. rugosa* Ingrisch, 1998 from Java; *O. magna* Ingrisch, 1998 from Thailand; *O. singaporensis* Ingrisch et Tan, 2012 from Singapore.]
– Median ocellus very large, whitish, completely occupied space between antennal cavities and reaching base of rostral tubercle (Fig. 27). Male cerci with rather large lamellar widening near apex (Fig. 32); male genitalia with large semisclerotized lobes posteriorly (Fig. 24) …… ……..……..…….. ***Ocellakis*** Gorochov, **subgen. n.** [Included species: type species *Oxylakis superocellata* **sp. n.** from Borneo only.]

***Oxylakis* (*Ocellakis) superocellata* Gorochov, sp. n.**
Figs 24, 27–43

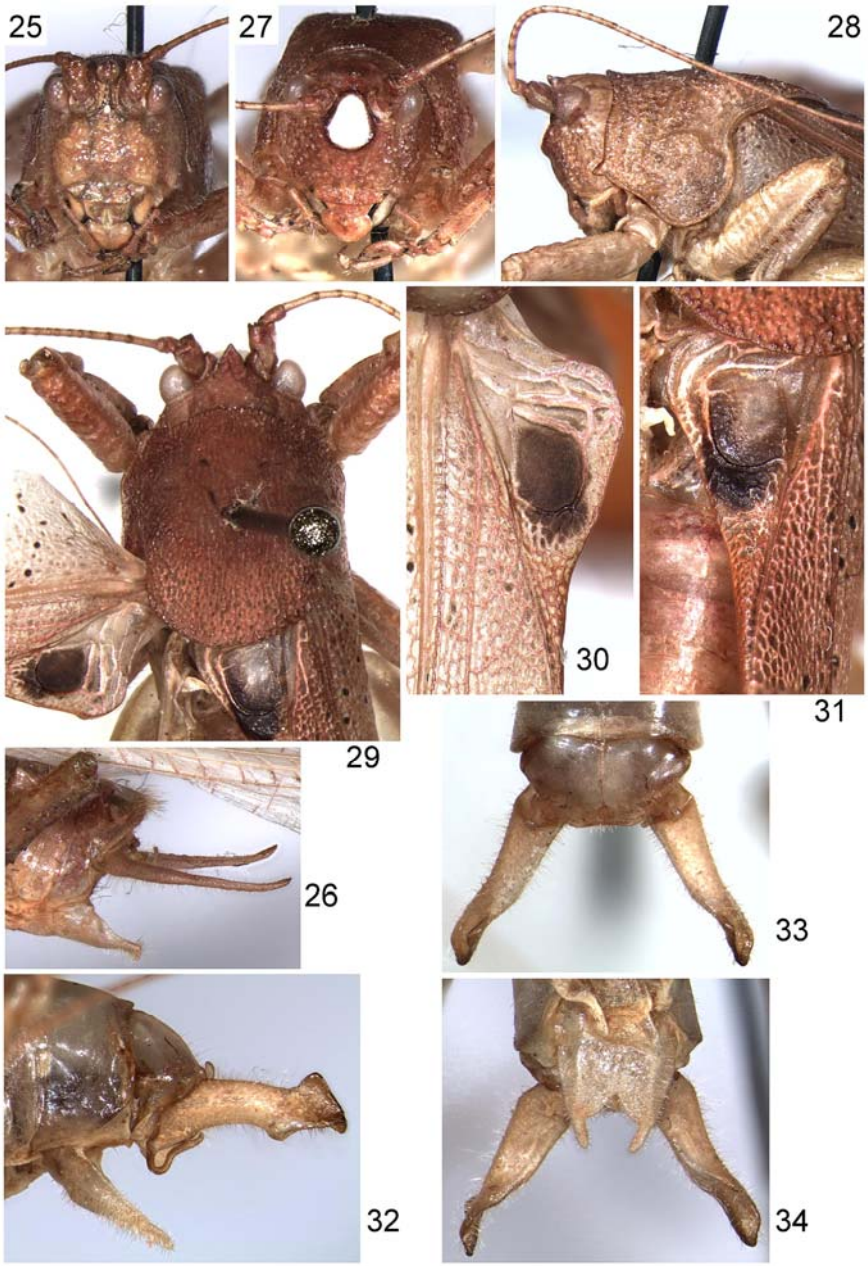
MATERIAL. Holotype – ♂, **Malaysia**: Borneo I., Sabah State, Trus Madi Mt., ~1000 m, partly primary / partly secondary forest, at light, 13–25.V 2007, A. Gorochov. Paratypes: 2 ♂, same data.

DESCRIPTION. Male (holotype). Head and pronotum reddish brown, moderately light but with darker (brown) ring around whitish median ocellus, almost yellowish antennal flagellum having a few small light brown rings in proximal part, yellowish mandibles having blackish medial and distolateral parts, and orange labrum (Fig. 27); tegmina light brown with rather numerous brown dots, yellowish basal and basomedial parts of dorsal field, and rather large dark brown spot on stridulatory apparatus (Figs 29–31); hind wings, legs, abdomen and rest of thorax yellowish with light brown femora and tibiae of fore and middle legs, areas on dorsal surface of all



Figs 19–24. *Viriacca* Ingr. and *Oxylakis* Redt., male: 19, 20 – *V. modesta* sp. n.; 21, 22 – *V. insignita* sp. n.; 23, *O. singaporensis* Ingr. et Tan; 24, *O. superocellata* sp. n. Genitalia from above (19, 21, 23, 24) and from side (20, 22).

tarsi, ventroproximal hook of cerci, and cercal apex. Structure of body normal for this genus but with following features: rostral apex shortly angular, acute; space between antennal cavities almost equal to scape in width and completely occupied by very large median ocellus; this ocellus reaching base of rostral tubercle superiorly and almost middle of space between antennal cavities and clypeus inferiorly, with



Figs 25–34. *Oxylakis* Redt., male: 25, 26 – *O. singaporensis* Ingr. et Tan; 27–34, *O. superocellata* sp. n. Head in front (25, 27); abdominal apex from side (26, 32), from above (33) and from below (34); head and pronotum from side (28) and from above (29); stridulatory apparatus of left tegmen (30) and of right tegmen (31).

lower part slightly projected forwards (Figs 27–29); wings very long, strongly extending behind apex of hind tarsi; tegmina hardly longer than hind wings, with stridulatory apparatus as in Figs 30, 31; fore femur with two rows of small and sparse ventral spines; middle and hind femora with only outer row of such spines; fore tibia with inner row of very small and dense ventral spinules as well as with one similar spinule at middle of its outer ventral edge; middle tibia with outer row of small and dense ventral spinules and with one similar spinule at apex of its inner ventral edge; hind tibia with not numerous short spines on dorsal inner edge as well as with somewhat smaller and sparser spines on outer dorsal and outer ventral edges; tenth abdominal tergite narrowing to truncate apex; paraprocts longitudinal, not large, lobule-like; cerci elongate, more or less cylindrical, with thin (spine-like) and strongly S-shaped ventroproximal hook contacting in distal part with main cercal body, with shorter dorsoproximal hook practically pressed to main cercal body, and with characteristic lamellar widening near apex (Figs 32, 33); genital plate as in Fig. 34; genitalia with a pair of rather large semisclerotized lobes having smaller sclerotized lobules (curved more or less medially) at base (Fig. 24).

Variations. Fore tibia sometimes without outer ventral spinule; hind tibia sometimes with only one outer ventral spine.

Female unknown.

Length (in mm). Body 19–21; body with wings 34–36; pronotum 5.8–5.9; tegmina 30–31; hind femora 8.8–9.

COMPARISON. Differences of the new species from all the other congeners are given above, in the key to subgenera of the genus *Oxylakis*.

Subfamily Meconematinae

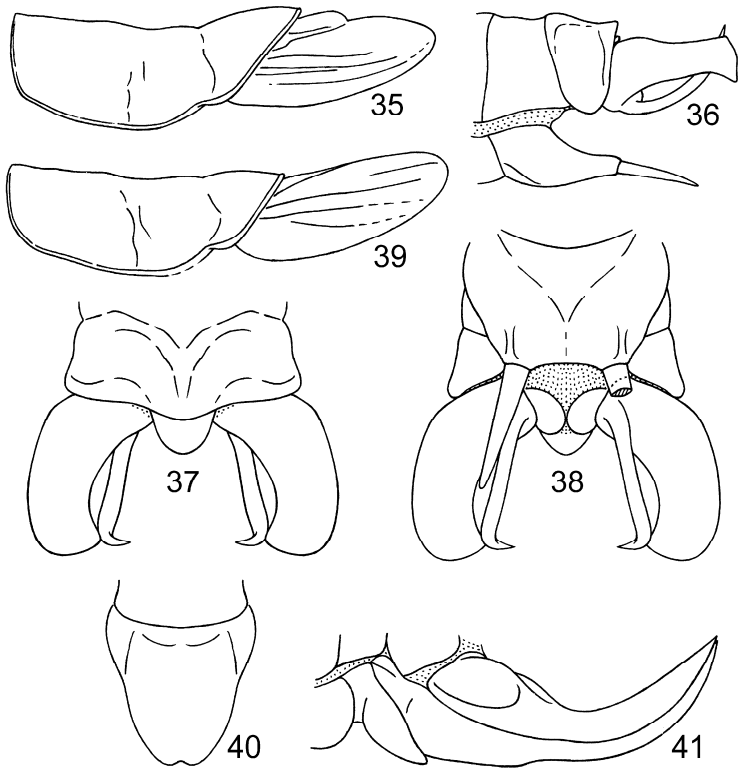
Tribe Phlugidini

Asiophlugis longiuncus Gorochov, sp. n.

Figs 35–41

MATERIAL. Holotype – ♂, **Malaysia**: Borneo I., Sarawak State, Mulu National Park not far from borders with Brunei and Indonesia, ~200 m, primary forest, on leaf of small tree, at night, 24–27.III 2012, A. Gorochov, M. Berezin, E. Tkatsheva, I. Kamskov. Paratypes: 1 ♀, same data; 1 ♂, 2 ♀, Sarawak State, Lambir Hills National Park in environs of Miri Town, 100–300 m, primary forest, on leaves of bushes, at night, 29.III–1.IV 2012, A. Gorochov, M. Berezin, E. Tkatsheva, I. Kamskov.

DESCRIPTION. Male (holotype). General appearance typical of short winged specimens of this genus. Coloration light greenish with several very narrow light brown rings on proximal part of antennal flagellum, brownish other parts of this flagellum, one small rose spot on head dorsum near right eye, a pair of similar spots on anterior part of pronotal disc, light reddish median area on 9th and 10th abdominal tergites, small brown marks on lateral lobes of 3rd segment of fore and middle tarsi, and brown 3 proximal segments of hind tarsi. Pronotum rather long; its hind lobe moderately inflate and covering proximal half of tegminal stridulatory apparatus (Fig. 35); mesosternum with a pair of short spines slightly shorter than distance between



Figs 35–41. *Asiophlugis longiuncus* sp. n.: 35–38 – male; 39–41 – female. Pronotum and tegmina from side (35, 39); abdominal apex from side (36), from above (37), and from below (38, one style cut off); genital plate from below (40); ovipositor from side (41).

their apices. Tegmina reaching distal part of 3rd abdominal tergite, with developed stridulatory apparatus and narrowly rounded apex (Fig. 35); hind wings invisible (not exposed). Fore coxae with very long spine; fore femora with 4 pairs of ventral spines; fore tibiae with 5 pairs of ventral spines (inner ones slightly longer than others). Last abdominal tergite with slightly sinuate hind edge having low keels along dorsolateral parts of this edge (Figs 36, 37); epiproct rather small and rounded (Fig. 37); main body of cerci moderately short, somewhat widened, and arcuate (Fig. 37); proximal cercal hook situated ventromedially, long, thin, arcuately curved upwards, and with small apical part strongly curved medially (Figs 36–38); genital plate wide, not long, with almost straight posterior edge between long styles (bases of these styles located rather far from each other; Fig. 38).

Variations. Paratype without rose spots on head and pronotum, but with almost reddish 7th–10th abdominal tergites (artefact?); its tegmina reaching 4th abdominal tergite.

Female. Coloration and external structure of body as in male, but rose and reddish marks absent, pronotum slightly shorter (with hind lobe distinctly shorter and less

inflate; Fig. 39), tegmina without stridulatory apparatus and with wider apical part (Fig. 39), last abdominal tergite simple, cerci thin (usual for female) and approximately reaching middle of ovipositor; genital plate somewhat elongate, having distal part roundly truncate or with very small apical notch (Fig. 40); ovipositor as in Fig. 41.

Length (in mm). Body: ♂ 10–11, ♀ 10.5–11.5; pronotum: ♂ 3.3–3.4, ♀ 3.2–3.3; visible part of tegmina: ♂ 2.5, ♀ 2.5–2.7; hind femora: ♂ 10.5–11.5, ♀ 11–12; ovipositor 3.7–3.9.

COMPARISON. The new species distinctly differs from all the other congeners with the male cerci studied by the shape of cerci (especially by a clearly longer proximal hook directed mainly backwards, not mainly medially). From the other congeners, it differs in distinctly shorter wings (from *A*.? *malacca* Gor. and *A*? *dubia* Karny), a clearly longer spine of the fore coxae (from *A*.? *philippina* Jin), or somewhat longer tegmina with the male stridulatory apparatus completely covered by pronotum (from *A*.? *borneoensis* Jin; for its male, proximal cercal hook is not indicated).

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