

Review of the Neotropical genera *Quiva* and *Yungasacris* (Orthoptera: Tettigoniidae: Phaneropterinae)

Обзор неотропических родов *Quiva* и *Yungasacris* (Orthoptera: Tettigoniidae: Phaneropterinae)

OSCAR J. CADENA-CASTAÑEDA & A.V. GOROCHOV*

ОСКАР Х. КАДЕНА-КАСТАÑЕДА, А.В. ГОРОХОВ*

O.J. Cadena-Castañeda, Universidad Distrital Francisco José de Caldas, Grupo de Investigación en Artrópodos "Kumanguí", Bogotá, Colombia. E-mail: ojccorthoptera@gmail.com

A.V. Gorochov, Zoological Institute, Russian Academy of Sciences, 1 Universitetskaya Emb., St Petersburg 199034, Russia. E-mail: orthopt@zin.ru. *Corresponding author.

The Neotropical genera *Quiva* Hebard, 1927 and *Yungasacris* Rehn, 1950 belonging to the tribe Dysoniini are briefly reviewed. The former genus is divided into two subgenera: *Quiva* s. str. and *Paraquiva* **subgen. nov.** Four species and subspecies are described: *Q. (Q.) sharovi* **sp. nov.**, *Q. (P.) angieae* **sp. nov.**, *Yu. multa* **sp. nov.** and *Yu. grata rara* **subsp. nov.** Keys to subgenera, species and subspecies of these genera are given.

Дан краткий обзор видов неотропических родов *Quiva* Hebard, 1927 и *Yungasacris* Rehn, 1950, принадлежащих трибе Dysoniini. Первый род подразделен на два подрода: *Quiva* s. str. и *Paraquiva* **subgen. nov.** Описаны *Q. (Q.) sharovi* **sp. nov.**, *Q. (P.) angieae* **sp. nov.**, *Yu. multa* **sp. nov.** и *Yu. grata rara* **subsp. nov.** Предложены таблицы для определения подродов, видов и подвидов этих родов.

Key words: katydids, taxonomy, Neotropics, Orthoptera, Tettigoniidae, Phaneropterinae, Dysoniini, *Quiva*, *Yungasacris*, new taxa

Ключевые слова: кузнечики, таксономия, Неотропики, Orthoptera, Tettigoniidae, Phaneropterinae, Dysoniini, *Quiva*, *Yungasacris*, новые таксоны

INTRODUCTION

This paper is the second publication of the authors on taxonomy of Dysoniini (Cadena-Castañeda & Gorochov, 2012). It is also a continuation of the review of Dysoniini started by the first co-author (Cadena-Castañeda, 2011, 2013) and of the series of papers on taxonomy of American Tettigoniidae published by the second co-author (Gorochov, 2012a, 2012b).

The genus *Quiva* Hebard, 1927 was established for two species: *Hammatofera abacata* Brunner-Wattenwyl, 1878 described based on a female from "Brasilien" (Brun-

ner-Wattenwyl, 1878), and *Q. diaphana* Hebard, 1927 described based on a male from Colombia (Hebard, 1927). This genus was revised by Rehn (1950) who briefly described the male characters of a presumed *Q. abacata* from "Guianas", added *Q. pulchella* Rehn, 1950 from Peru, and established the genus *Yungasacris* Rehn, 1950 with two species: *Yu. grata* Rehn, 1950 from Bolivia and *Yu. peruviana* Rehn, 1950 from Peru. Later, the genus *Itauna* Piza, 1967 and a single species of this genus (*I. dorisae* Piza, 1967) were described from Brazil (Piza, 1967); however, these genus and species were re-

cently synonymised with *Quiva* and *Q. abacata*, respectively (Chamorro-Rengifo & Braun, 2010).

Here, five new taxa of these genera are described from Ecuador, Colombia, Peru and Brazil. These taxa are a new subgenus of the genus *Quiva*, two new species of the same genus, and one new species and one new subspecies of the genus *Yungasacris*. Moreover, new geographical and ecological data for some species are recorded, and keys to subgenera and species of *Quiva* as well as to species and subspecies of *Yungasacris* are given.

MATERIAL AND METHODS

This research is based on field observations of the first co-author and on material deposited at the following institutions: Zoological Institute of the Russian Academy of Sciences, St Petersburg, Russia (ZIN); Museo de Historia Natural de la Universidad Distrital Francisco José de Caldas, Bogotá, Colombia (MUD); Museo Javeriano de Historia Natural Lorenzo Uribe Uribe, Bogotá, Colombia (MUJ); Museum of Zoology of the University of Michigan, Ann Arbor, USA (UMMZ). Most of the specimens studied were collected in tropical forests at light, but some specimens were found on leaves of trees and on the canopy near water sources.

The photographs of body parts of these insects were made with Sony α 300 and Canon 40D cameras as well as with Carl Zeiss Stemi 2000-C and Leica M216 stereomicroscopes. Most of the measurements are given in the usual manner (from the base to the apex), but some of them are defined as follows: *length of body*, distance from the frons to the abdominal apex excluding the ovipositor; *length of body with wings*, distance from the frons to the apex of hind wings; *length of pronotum*, maximal distance between the anterior and posterior pronotal margins; *length of ovipositor*, distance from the subgenital plate apex to the ovipositor apex.

TAXONOMIC PART

Order ORTHOPTERA

Family TETTIGONIIDAE

Subfamily PHANEROPTERINAE

Tribe DYSONIINI

Genus *Quiva* Hebard, 1927

Type species: *Quiva diaphana* Hebard, 1927.

Note. This genus is characterised by the following features: a rather small and slender body; contrastingly spotted colouration (almost whitish with dark brown or blackish areas; Figs 1–23); a very narrow epicranial rostrum with the antennal cavities almost touching each other, and with the upper tubercle having a small and rounded (in profile) apical part as well as a weakly convex remaining part; a simple pronotum having narrow humeral notches and lacking spines or tubercles; rather narrow tegmina having a well developed stridulatory apparatus and two branches on *RS* (Figs 2–4, 7–10, 15); long hind wings (distinctly longer than tegmina) with dark areas on the distal part of the costal edge; small spines on all the legs; widened proximal parts of the fore and middle tibiae (this part is strongly widened and with completely open tympanal membranes in fore legs, and slightly widened in middle legs); a weakly specialised last abdominal tergite in the male (Figs 6, 25, 29); bifurcate male cerci (Figs 6, 17, 19, 20, 23, 26, 27, 30, 31); an elongate male subgenital (=genital) plate having a rather narrow distal half with a pair of apical styles and with a notch between them (Figs 18, 21, 24, 28, 32); and membranous male genitalia. This genus consists of two subgenera and five species listed below, in the keys to subgenera and species of *Quiva*.

Key to subgenera of the genus *Quiva*

1. Tegmina with large membranous cells in costal half and with distal part of *MA* shortly fused with *RS* before *RS* bifurcation (Fig. 2,

7–9). Male cerci with outer branch distinctly longer than inner branch (Figs 6, 20, 23, 27, 31); male subgenital plate with very short apical styles and rather deep notch between them (Figs 21, 24, 28, 32) subgenus *Quiva* s. str. [Species included: the type species of this genus; *Hammatofera abacata* Brunner-Wattenwyl, 1878; *Q. pulchella* Rehn, 1950; *Q. (Q.) sharovi* sp. nov.]

- Tegmina with distinctly smaller cells in costal half and with *MA* not fused with *RS* (Fig. 10, 15). Male cerci with outer branch distinctly shorter than inner branch (Fig. 17); male subgenital plate with rather long apical styles and shallow notch between them (Fig. 18) subgenus *Paraquiva* Gorochovet Cadena-Castañeda, subgen. nov. [Etymology: this subgeneric name originates from the Greek prefix “para” (near) and the generic name *Quiva*. Species included: *Q. (P.) angieae* sp. nov. (type species of this subgenus)]

Key to species of the subgenus *Quiva*

1. Male cerci with almost truncate distal part of outer branch having much thinner apical spine; inner branch of these cerci very short, much shorter than outer branch (Figs 26, 27, 30, 31) 2
 - Male cerci with more or less gradually narrowing distal part of outer branch (apical part of this branch insignificantly narrower than its remaining part); inner branch of these cerci diverse in length (Figs 19, 20, 22, 23) 3
2. Short posterodorsal projection of last abdominal tergite of male not very wide and with straight or slightly concave posteromedian edge (Fig. 25); outer branch of male cerci with medial curvature of its distal part located rather far from base of inner branch, and with very thin apical spine (Fig. 27) *Q. pulchella*
 - Short posterodorsal projection of last abdominal tergite of male very wide and with approximately straight posteromedian edge (Fig. 29); outer branch of male cerci with medial curvature of its distal part located not far from base of inner branch, and with moderately thin apical spine (Fig. 31) *Q. diaphana*
3. Outer branch of male cerci with rounded medial convexity at base of dorsally darkened part of this branch and with the rest of this darkened part wide; inner branch of male cerci short (Fig. 23) *Q. abacata*
 - Outer branch of male cerci with acute medial denticle at base of dorsally darkened part of this branch and with the rest of this part thin; inner branch of male cerci much longer (Fig. 20) *Q. sharovi* sp. nov.

Quiva (Quiva) sharovi Gorochov, sp. nov. (Figs 2–6, 19–21)

Holotype. Male; **Ecuador**, Morona Santiago Prov., bank of Rio Morona near border with Peru, environs of Puerto Morona Vill., ~300 m, primary forest, at light, 5–15 Jan. 2010, A. Gorochov (ZIN).

Paratype. Male; **Ecuador**, Napo Prov., Rio Napo, Chambira, 0°51'11''S, 77°15'07''W, 334 m, at light, 10 Nov. 2011, V. Sinyaev, O. Romanov (ZIN).

Description. Male (holotype). General appearance typical of this subgenus (see Figs 1, 7–9). Colouration yellowish white with the following pattern: head with lower part of epicranium, clypeus, labrum and most part of mandibles dark brown (similar to those in Figs 12, 13), with narrow stripes along lower edges of antennal cavities and of eyes as well as areas around lateral ocelli and four spots on posterior part of dorsum brown, with antennae and maxillary palpi blackish but having brownish rose medial half of scape and lateral part of pedicel as well as light (from light brown to yellowish) spots on flagellum, and with maxillae and labium (including their palpi) having brown and light brown spots; pronotum with four pairs of large blackish spots on disc (two middle spots partly fused with each other) as well as with two large blackish spots on upper half of lateral lobes and brownish rose marks on lower half of these lobes; tegmina transparent with several brown spots as well as with rose to brown greatest part of venation (Figs 2–5); hind wings also transparent and with two brown spots in distal part of costal lobe, rose to yellowish venation between these spots and along costal edge, and brown to yellowish grey rest of venation; coxae, femora

and proximal part of fore and middle tibiae with brown and dark brown spots as well as with small rose marks; the rest of these tibiae, hind tibiae and all tarsi blackish but with small light spot near middle of fore tibia, not far from apex of middle tibia, at base and near it in hind tibia (latter tibia also with whitish distal part of dorsal surface), and with partly light brown venter of tarsi; venter of thorax and abdomen uniformly light; the rest of pterothorax spotted; abdominal tergites dark brown with light stripe along posterior edge of each tergite (only posterior tergite without light marks; Fig. 6); cerci and epiproct blackish with light area on dorsal cercal part (Figs 19, 20) and small lightish marks near apex of epiproct; subgenital plate light with a pair of dark lateroproximal spots (Fig. 21) and slightly darkened apical parts (including styles). Structure of body almost identical to that of other representatives of this subgenus (including shape and venation of wings as well as peculiarities of stridulatory apparatus; Figs 2–5) but with the following differences: short posterodorsal projection of posterior abdominal tergite very wide (almost as in *Q. diaphana*) but with distinct posteromedian notch (Fig. 6); cerci very long and rather thin, with long and thin inner branch, distinct medial denticle on middle part of outer branch, and very long and moderately thin apical part gradually widened to middle part of outer branch (Figs 19, 20); genital plate with posterior (narrow) part long and posteromedian notch deep and narrow (Fig. 21).

Variations. Paratype without rose marks on head, pronotum and legs, and with most proximal dark spot on hind wings divided into two dark spots; apical part of its cerci behind medial denticle of outer cercal branch slightly shorter than in holotype, i. e. this part slightly shorter than distance between above-mentioned denticle and base of inner cercal branch (in holotype, length of this part practically equal to this distance; Fig. 20).

Female unknown.

Length in mm. Body 17–19; body with wings 33–35; pronotum 3.5–3.7; tegmen 23–24; tegminal mirror 2–2.3; stridulatory vein 1.7–1.8; hind femur 17–18.

Etymology. The species is named in memory of A.G. Sharov, an outstanding paleontologist-orthopterist who has clarified many questions of the evolution of Orthoptera and related orders of Polyneoptera.

Quiva (Quiva) abacata

(Brunner-Wattenwyl, 1878)

(Figs 7, 11, 22–24)

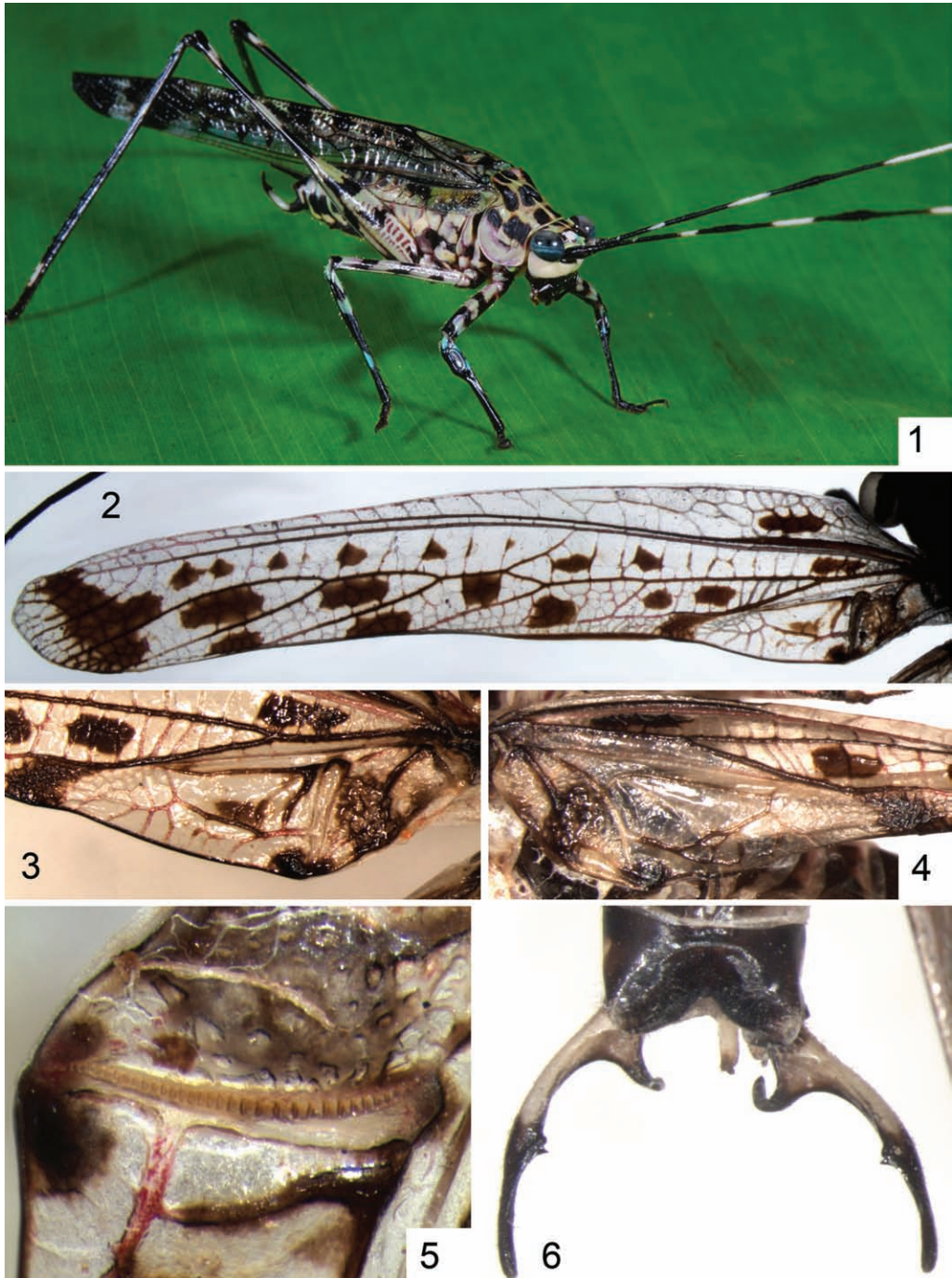
Note. The locality of the unique type (female) of this species is not very clear (Brunner-Wattenwyl, 1878: “Brasilien”). Brazil includes several zoogeographical regions which are characterised by somewhat different composition of species. Moreover, the above-mentioned type has the lower part of its head (including the mandibles and the lower part of genae) very dark, similar to that of three other species of *Quiva* s. str. (Figs 12, 13; Eades et al, 2013); but in syntypes of *I. dorisae* (males) from eastern Brazil, synonymised with *Q. abacata* by Chamorro-Rengifo & Braun (2010), the mandibles and the lower part of genae are distinctly lighter, not characteristic of all the other species of this subgenus (Fig. 11). Therefore it is necessary to indicate that our data about the male characters of *Q. abacata* are based on *I. dorisae*, and that this synonymy is in need of examination.

Quiva (Quiva) diaphana Hebard, 1927

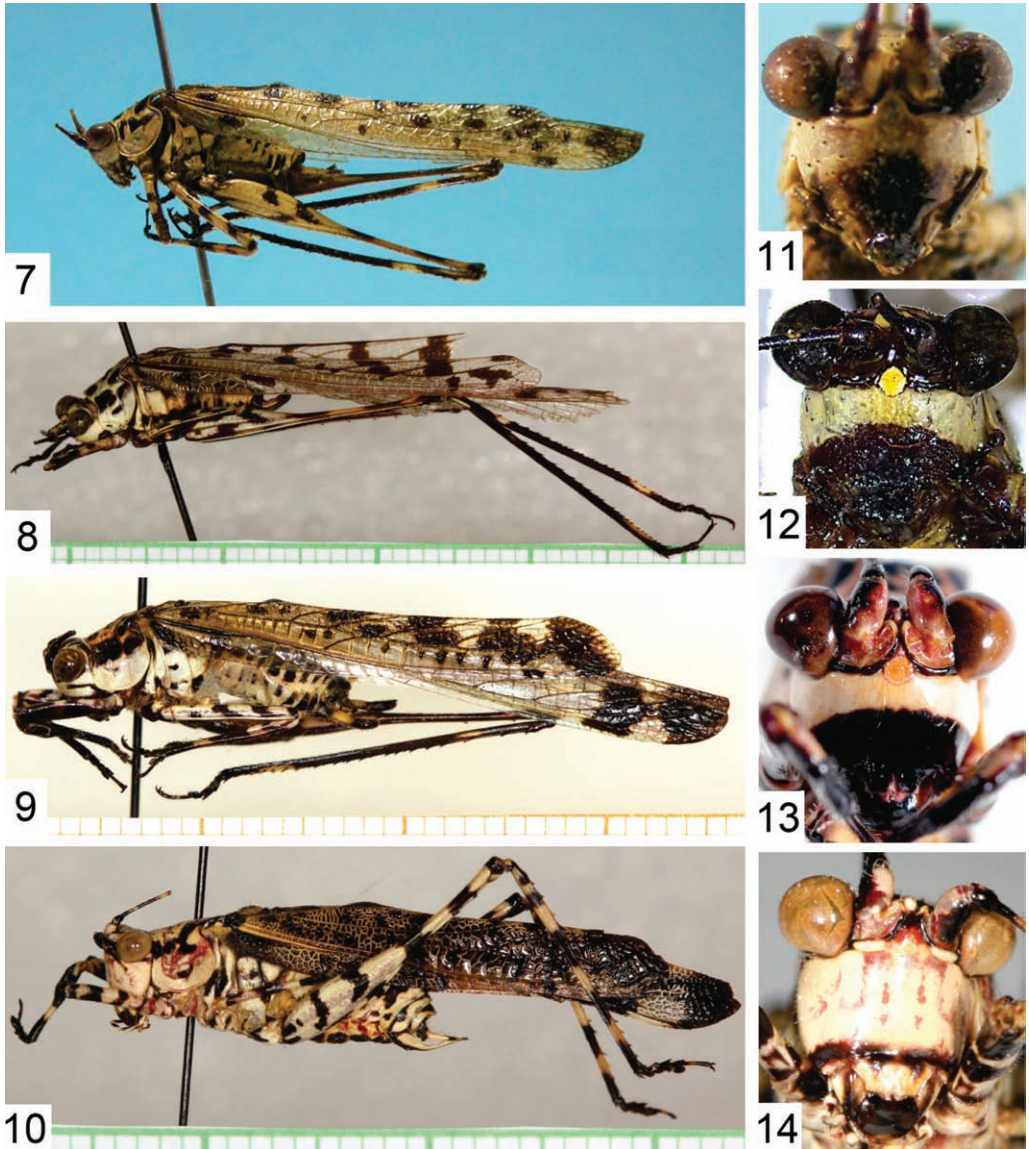
(Figs 8, 12, 29–32)

Material examined. **Colombia**, Santander, Velez: male, Gualilo, Río Quirata, Betania, 430 m, 6 Jan. 2011, O. Cadena-Castañeda (MUD); male, Cimitarra, 200 m, 10 Jan. 2011, O. Cadena-Castañeda (MUD).

Note. This species was described by Hebard (1927) from Colombia (holotype: Cundinamarca, Aguadita near Fusagasugá, 1900–2000 m; deposited in ANSP; unstudied). Here, *Q. diaphana* is recorded from some other localities of Colombia. The specimens collected were found on the can-



Figs 1–6. Male: 1, *Quiva* sp.; 2–6, *Q. sharovi* sp. nov. Living specimen from Ecuador in nature (1); left tegmen (2); stridulatory apparatus of left (3) and right (4) tegmina; stridulatory vein of left tegmen from below (5); abdominal apex from above and slightly from behind (6). [1, photograph by A. Anker.]



Figs 7–14. Male: 7–10, body from side; 11–14, head in front. *Quiva abacata*, syntype of *Itauna dorisae* (7, 11); *Q. diaphana* (8, 12); *Q. pulchella* (9, 13); *Q. angieae* sp. nov. (10, 14). [Photographs: 7, 11, by J. Chamorro-Rengifo; 8–10, 14, by H. Braun; 13, by M. O'Brien.]

opy near water sources; the behavior and movement of living individuals simulate the movement of wasps from the family Ichneumonidae; the movements of these katydids were fast, hindering their collection.

Species of *Quiva* as well as of some other genera from the tribe Dysoniini (*Lichenomorphus* Cadena-Castañeda, 2011 and *Paraphidnia* Giglio-Tos, 1898) are mainly collected during night work on the canopy or at light, and they are rarely observed in the understory. Apparently, wasp mimicry is common in the genus *Quiva*, because similar observations were made by A. Anker (pers. comm.) in Ecuador (Fig. 1). This species is distributed in localities with very different altitudes (from 200 m to 1900–2000 m). Unfortunately, females of this genus are much more difficult to collect, and we had no possibility to study any female.

***Quiva (Quiva) pulchella* Rehn, 1950**
(Figs 9, 13, 25–28)

Material examined. **Peru:** 12 males, Junin Department, Satipo Prov., ~25 km SE of Satipo Town, environs of Rio Venado Vill., ~1200 m, partly primary / partly secondary forest, at light, 20–23 Oct. 2008, A. Gorochov, M. Berezin, L. Anisyutkin, E. Tkatsheva, V. Izersky (ZIN); 9 males, Ucayali Department, Atalaya Prov., ~35 km NWW of Atalaya Town on Ucayali River, environs of Sapani Vill., ~300 m, partly primary / partly secondary forest, at light, 26–31 Oct. 2008, A. Gorochov, M. Berezin, L. Anisyutkin, E. Tkatsheva, V. Izersky (ZIN); male, Cusco Department, 7 km NE of Mandor, 13°18.7'S, 70°49.5'W, 1–3 Dec. 2010, 890 m, V. Sinyaev, S. Sinyaeva, Yu. Bezverkhov (ZIN).

Note. This species was described from Huanuko Department in Peru (Rehn, 1950). The above-listed specimens correspond to the original description and are recorded here from some other localities of Peru.

Quiva (Paraquiva) angieae
Cadena-Castañeda, **sp. nov.**

(Figs 10, 14–18)

Holotype. Male; **Colombia**, Amazonas, Leticia, 12 Oct. 2002, Suarez et al. leg (MUJ).

Description. **Male** (holotype). General appearance rather different from that of other congeners. Size of body somewhat smaller. Colouration (Figs 10, 15) more or less similar to that of *Q. sharovi*, but with the following differences: head (Fig. 14) light with a few slight rose spots on face, rather narrow dark stripe on epicranium along fronto-clypeal suture and along dorsal edges of subgenae, obscure stripe on clypeus along its dorsal edge, blackish labrum, narrow dark stripe on dorsum running from eyes to rostrum, and two dark ovoid spots at middle of dorsum; pronotum with pair of dark bands running along dorsal edges of lateral lobes from their anterior edge but ending somewhat short of their posterior edge, and with transverse dark band on metazona of disc laterally fused with posterior parts of previous bands and interrupted in median part by very narrow light area (the rest of pronotum more or less light with less distinct darkish marks; Fig. 10); tegmina black with yellow venation; hind wings with two blackish spots on distal part of costal lobe (Fig. 10); fore and middle femora light with three dark transverse bands; hind femora also light but with five dark bands, three smaller dark spots (partly fused with each other) at base, and distinct dark dot near these spots; fore tibiae black with one whitish transverse band in middle part (Fig. 15); other body parts also contrastingly spotted (see Figs 15–18). Structure of body more or less similar to that of other congeners, but median ocellus less distinct, pronotum with more ovoid disc (*vs.* with almost rectangular disc), tegmina with much denser veinlets between longitudinal veins and with *MA* not fused with *RS*; legs clearly less thin and with hind femora somewhat shorter (hind femora 4 times as long as pronotum; *vs.* 4.6–4.9 times), posterior abdominal tergite without distinct posterodorsal projection, cerci with short and hook-like outer branch and with long inner branch (inner branch distinctly longer than outer branch; Figs 16, 17), and subgenital plate with proximal part comparatively short and widened as well as

with remaining part rather long and narrow but having slightly bifurcate apical part and long styles (Fig. 18).

Female unknown.

Length in mm. Body 15; body with wings 28; pronotum 3.8; tegmen 20.5; tegminal mirror 1.9; stridulatory vein 1.7; hind femur 12.5.

Etymology. The species is named after the first author's sister, Angie Layton Castañeda.

Genus *Yungasacris* Rehn, 1950

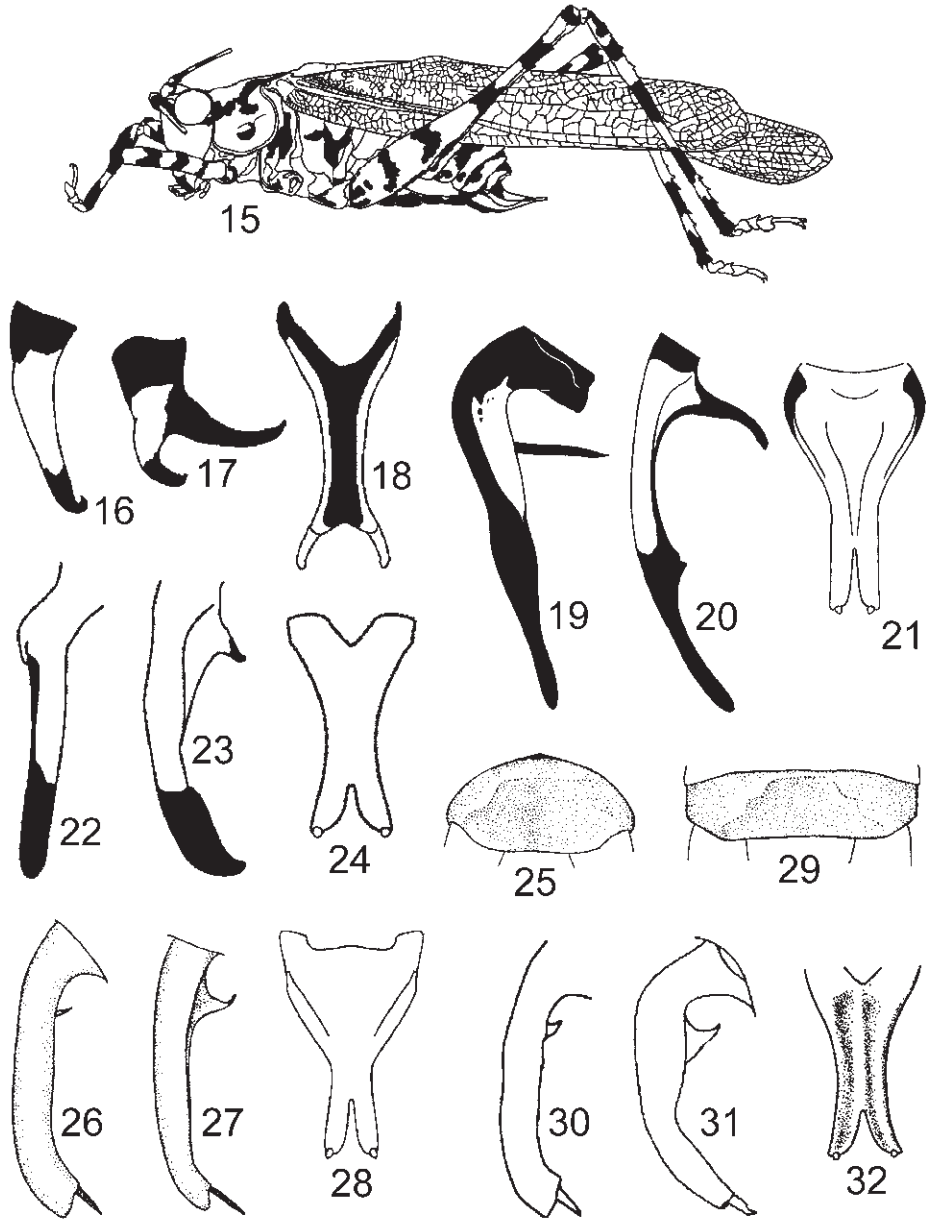
Type species: *Yungasacris grata* Rehn, 1950.

Note. This genus is characterised by a rather large body with the following features: colouration is yellowish white with rose or cream tinge and numerous brown and dark brown spots, but the hind wings are with whitish yellow and non-transparent (or almost non-transparent) proximal two thirds or three quarters and with a darkened distal part having a lighter (whitish grey) subapical spot in the costal lobe (Figs 33–53); the head rostrum is with narrow (clearly narrower than half of scape) and more or less rounded apices of the upper and lower tubercles, the upper tubercle consisting of two denticles (a small anterior denticle, almost as small as the lower tubercle, and a posterior denticle located above or sometimes slightly behind the anterior denticle and forming in profile a rather high and more or less rectangular projection), and with the dorsal edge of vertex and of the upper tubercle (behind the apex of its posterior denticle) almost straight or slightly arcuate (Fig. 33); the pronotum is weakly saddle-shaped, lacking spines or tubercles (Figs 34, 38, 51, 52); the tegmina are with *RS* and *MA* not fused with each other, having a well developed stridulatory apparatus (Figs 36, 39–42, 47–49, 51); the hind wings are longer than the tegmina (Figs 36, 37, 52); the fore and middle legs are rather robust and with both tympana completely open; the hind legs are rather slender, with

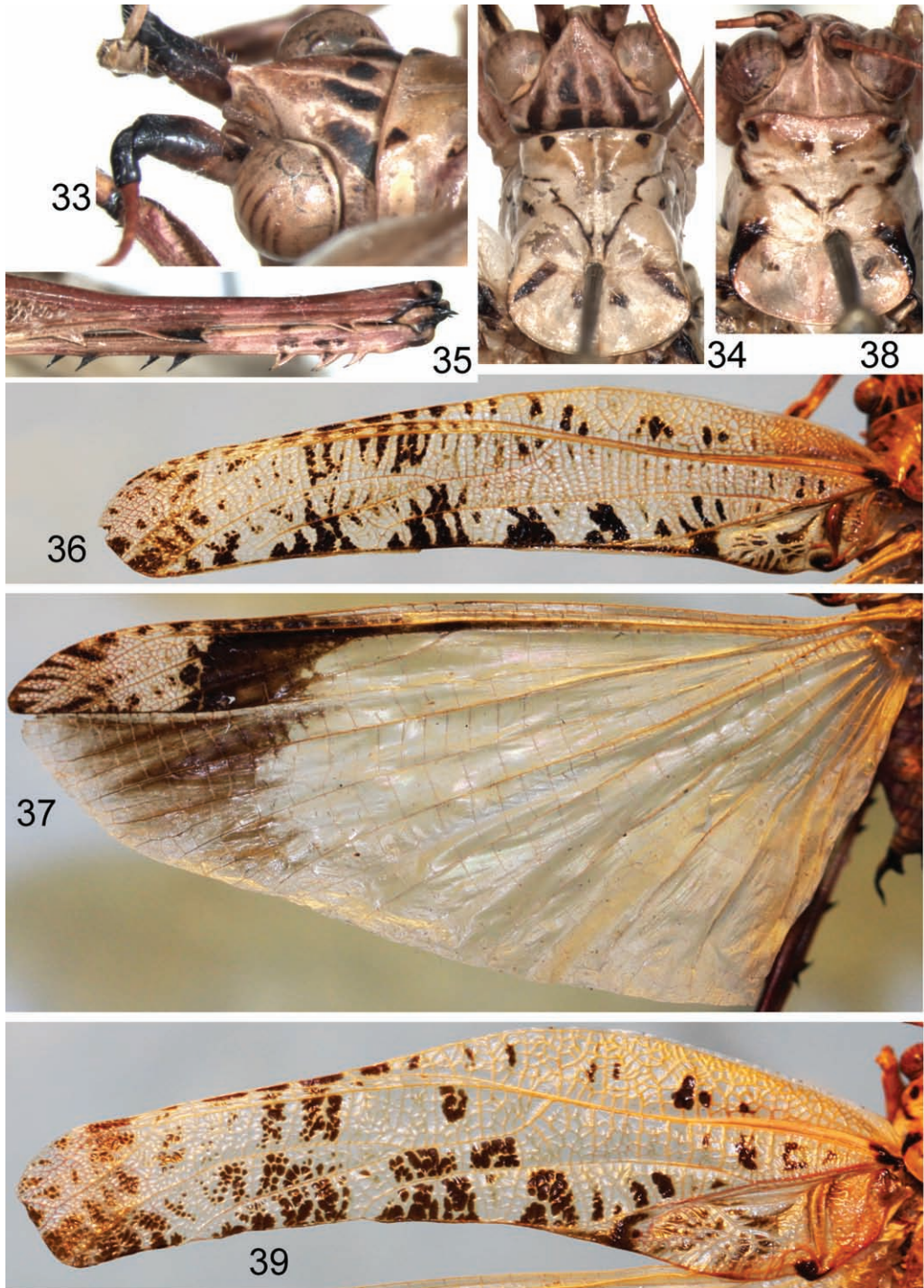
a pair of moderately small apical femoral spines, with not numerous, widened and lamellar (triangular) spines on the ventral femoral keels (one outer and one inner spines, located not very far from the apex of femur, are rather strongly widened, almost lobe-like; all the other spines are not large), and with somewhat more numerous similar (but not large) spines on the dorsal tibial keels (three proximal pairs of these spines are situated near each other; the rest of the spines are usually sparser; Fig. 35, 51, 52); the posterior abdominal tergite is simple, with a straight posterior edge and without any projection; the male cerci are with a cylindrical basal part, a widened and dorsally concave middle part, a short inner branch located near the basal part, and a long and rather narrow outer branch having a more or less hook-like apical part (Figs 43, 44, 50, 53–60); the male subgenital plate is elongate but not long, with a narrower distal part having a pair of distinct styles (sometimes they are indistinct, fused with this plate) and a notch between them (Figs 43, 44, 50, 53); the female subgenital plate is simple, more or less triangular (Fig. 45); the male genitalia are membranous; the ovipositor is moderately curved, with a narrowly rounded apex in profile and numerous rather large denticles on the dorsal and ventral edges as well as on the lateral surfaces (Fig. 46). The genus includes 4 species and subspecies listed in a key below.

Key to species and subspecies of the genus *Yungasacris*

1. Male tegmina wide in proximal half, with long stridulatory vein and rather wide mirror (Figs 39, 47–49). Male cerci long, with short basal part (before base of inner branch), with short widened part (behind base of inner branch), and with very long remaining part (this part narrow and longer than previous parts together; Figs 50, 56) 2
- Male tegmina clearly narrower in proximal half, with distinctly shorter stridulatory vein and narrower mirror (Figs 36, 40–42). Male cerci diverse in length, with clearly longer basal or middle (widened) parts, and with re-



Figs 15–32. *Quiva*, male: 15–18, *Q. angieae* sp. nov.; 19–21, *Q. sharovi* sp. nov.; 22–24, *Q. abacata*; 25–28, *Q. pulchella*; 29–32, *Q. diaphana*. Body from side (15); left cercus from side (16, 19, 22, 26, 30) and from above (17, 20, 23, 27, 31); subgenital plate from below (18, 21, 24, 28, 32); posterior abdominal tergite from above (25, 29). [25–27, 29, after Rehn (1950); 31, 32, after Hebard (1927)].



Figs 33–39. *Yungasacris*, male: **33–37**, *Yu. multa* sp. nov.; **38, 39**, *Yu. grata rara* subsp. nov. Upper part of head from side and slightly from above (33); head and pronotum from above (34, 38); distal half of hind femur and proximal half of hind tibia, outer side (35); left tegmen (36, 39); left hind wing (37).

- maining (narrow) part shorter (Figs 43, 44, 54, 58) 3
2. Pronotal disc with a pair of dark oblique posterior stripes reaching middle of this disc. Male tegmina with chords of stridulatory apparatus in left tegmen short (approximately as in Figs 36 and 40). Male cerci in profile with widened subbasal part longer than more distal part (Fig. 57); male subgenital plate with short but well developed styles and shallow notch between them *Yu. grata grata* stat. nov.
- Pronotal disc with a pair of dark oblique posterior stripes clearly not reaching middle of this disc (Fig. 38). Male tegmina with chords of stridulatory apparatus in left tegmen less short (Figs 39 and 47). Male cerci in profile with widened subbasal part not longer than more distal part (Fig. 60); male subgenital plate without distinct styles and with rather deep posteromedian notch (Fig. 50) *Yu. grata rara* subsp. nov.
3. Pronotum without distinct traces of dark pattern. Male cerci with basal part (before base of inner branch) shorter than middle (widened) part, with distal (narrow) part almost equal to middle part in length, and in profile with dorsal subbasal convexity (Figs 58, 59) *Yu. peruviana* Rehn, 1950
- Pronotum with distinct dark marks (Figs 34, 51, 52). Male cerci with basal part (before base of inner branch) longer than middle (widened) part, with distal (narrow) part distinctly longer than middle part (Figs 43, 44, 53, 54), and in profile without any dorsal convexity in subbasal part (Fig. 55) *Yu. multa* sp. nov.

Yungasacris multa Cadena-Castañeda

et Gorochov, sp. nov.

(Figs 33–37, 40–46, 51–55)

Holotype. Male; **Peru**, Junin Department, Satipo Prov., ~25 km SE of Satipo Town, environs of Rio Venado Vill., ~1200 m, partly primary / partly secondary forest, at light, 20–23 Oct. 2008, A. Gorochov, M. Berezin, L. Anisyutkin, E. Tkatsheva, V. Izersky (ZIN).

Paratypes. **Peru**: 12 males, same locality as for holotype (ZIN); 1 male, same department and province, environs of Satipo Town, ~800 m, secondary forest near waterfall, at light, 4–5 Nov. 2008, A. Gorochov, M. Berezin, L. Anisyutkin,

E. Tkatsheva, V. Izersky (ZIN); 15 males and 1 female, Ucayali Department, Atalaya Prov., ~35 km NWW of Atalaya Town on Ucayali River, environs of Sapani Vill., ~300 m, partly primary / partly secondary forest, at light, 26–31 Oct. 2008, A. Gorochov, M. Berezin, L. Anisyutkin, E. Tkatsheva, V. Izersky (ZIN). **Brazil**: 7 males, Mato Grosso, Vila Vera, 12°46'S, 55°30'W, Oct. 1973, M. Alvarenga (6 males, UMMZ; 1 male, MUD); 92 males, Mato Grosso, Sinop, 12°31'S, 55°37'W, Oct. 1974, M. Alvarenga (89 males, UMMZ; 3 males, MUD); 6 males, same data but Oct. 1975 (UMMZ); 22 males, same data but Oct. 1976 (21 males, UMMZ; 1 male, MUD); 1 male, Rondonia, Vilhena, Nov. 1973, M. Alvarenga (UMMZ).

Description. Male (holotype). Size of body and colouration typical of this genus but with the following peculiarities: head light with light brownish vertical stripes on face and genae, rose marks on clypeus, four dark brown longitudinal stripes on posterior half of dorsum, dark brown pedicel and distal part of scape, large brown dorsomedial spots on rest of scape, and reddish antennal flagellum having large yellowish spots (Figs 33, 34); pronotum very light but with dark brown lines forming V-shaped mark on disc, with a pair of rather short brown oblique stripes and a pair of brown dots on posterior part of disc, with a pair of dark brown dots on anterior part of disc (Fig. 34), and with a few small brownish marks on central part of lateral lobes; tegmina light yellowish grey (almost transparent) with numerous brown and dark brown marks (Figs 36, 40, 41); hind wings with colouration typical of *Yungasacris* (see note about this genus here and Fig. 37); legs cream-coloured with light brown areas on outer surface of fore femur, light brown distal half of hind femur having dark brown and almost whitish spots on spines, blackish apex of hind femur, brown tympanal membranes and marks on distal part of fore and middle tibiae as well as on proximal and middle parts of hind tibia, blackish some spines of hind tibia, and dark brown ventral spines of middle tibia and areas on all tarsi; other body parts very light but with two pairs of brown vertical stripes on pterothoracic pleurites, dark brown

greatest part of dorsal surface of cerci and some marks on ventral cercal surface (Figs 43, 44), and somewhat darkened styles of subgenital plate (Figs 43, 44). Posterior denticle of upper rostral tubercle of head rather high and situated above its anterior denticle; dorsal edge of this tubercle (behind apex of posterior denticle) and of vertex almost straight in profile (Fig. 33); scape very long (Fig. 33). Pronotum with disc as in Fig. 34 and with lateral lobes very similar to those in Fig. 52. Tegmina comparatively narrow; their dorsal field rather small, having short stridulatory vein in left tegmen and more or less narrow mirror in both tegmina (Figs 36, 40–42). Cerci comparatively short, with rather long basal part (before inner branch), with this part and middle (widened) part together almost equal to narrower distal part (more distal than inner branch), with short both middle (widened) part and inner cercal branch, with almost hooked apical part of outer cercal branch, and without dorsal convexity in subbasal part of cercus in profile (Figs 43, 44, 54, 55); subgenital plate with rather long styles and moderately deep notch between them (Fig. 43, 44).

Variations. Paratypes sometimes with head darker (with most part of rostrum reddish) or lighter (with only a pair of very small brown spots on posterior part of vertex), pronotal disc with less distinct (light brown) marks or with additional brownish rose areas, dark spots on tegmina larger or smaller, proximal half of hind femur in some Brazilian specimens darkened; length and shape of cerci as well as depth of postero-medial notch of subgenital plate somewhat varied (for Brazilian males see Figs 51–53).

Female. General appearance as in male with darker head, but a pair of dark dots on posterior part of pronotal disc light brownish and weakly distinct. Dorsal field of tegmina cream-coloured, with reticular venation, brown dots in many cells, and two dark brown spots in distal part. Cerci dark brown, simple, rather small, with thin and acute apical part. Subgenital plate light

and with a pair of brown spots near base (its shape as in Fig. 45); ovipositor yellowish with brown distal part, brown denticles in middle part, and dark brown areas in proximal part (Fig. 46).

Length in mm. Body: male 19–22, female 26; body with wings: male 50–54, female 55; pronotum: male 5–5.6, female 5.8; tegmen: male 36–38, female 39; tegminal mirror 3–4; stridulatory vein 2–2.5; hind femur: male 24–26, female 27.5; ovipositor 10.

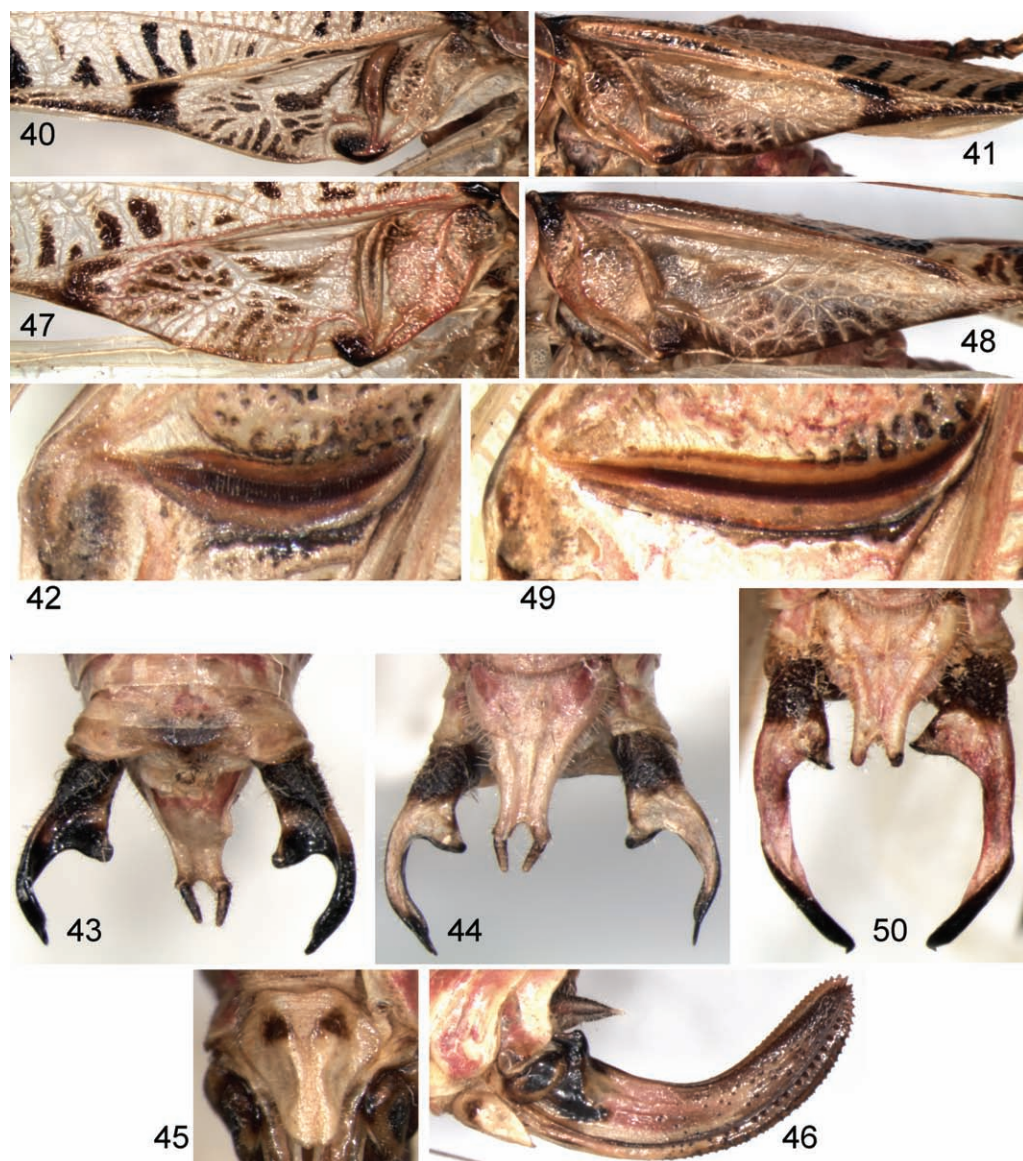
Etymology. The species name is the Latin word “multa” (numerous).

***Yungasacris grata rara* Gorochov, subsp. nov.**
(Figs 38, 39, 47–50, 60)

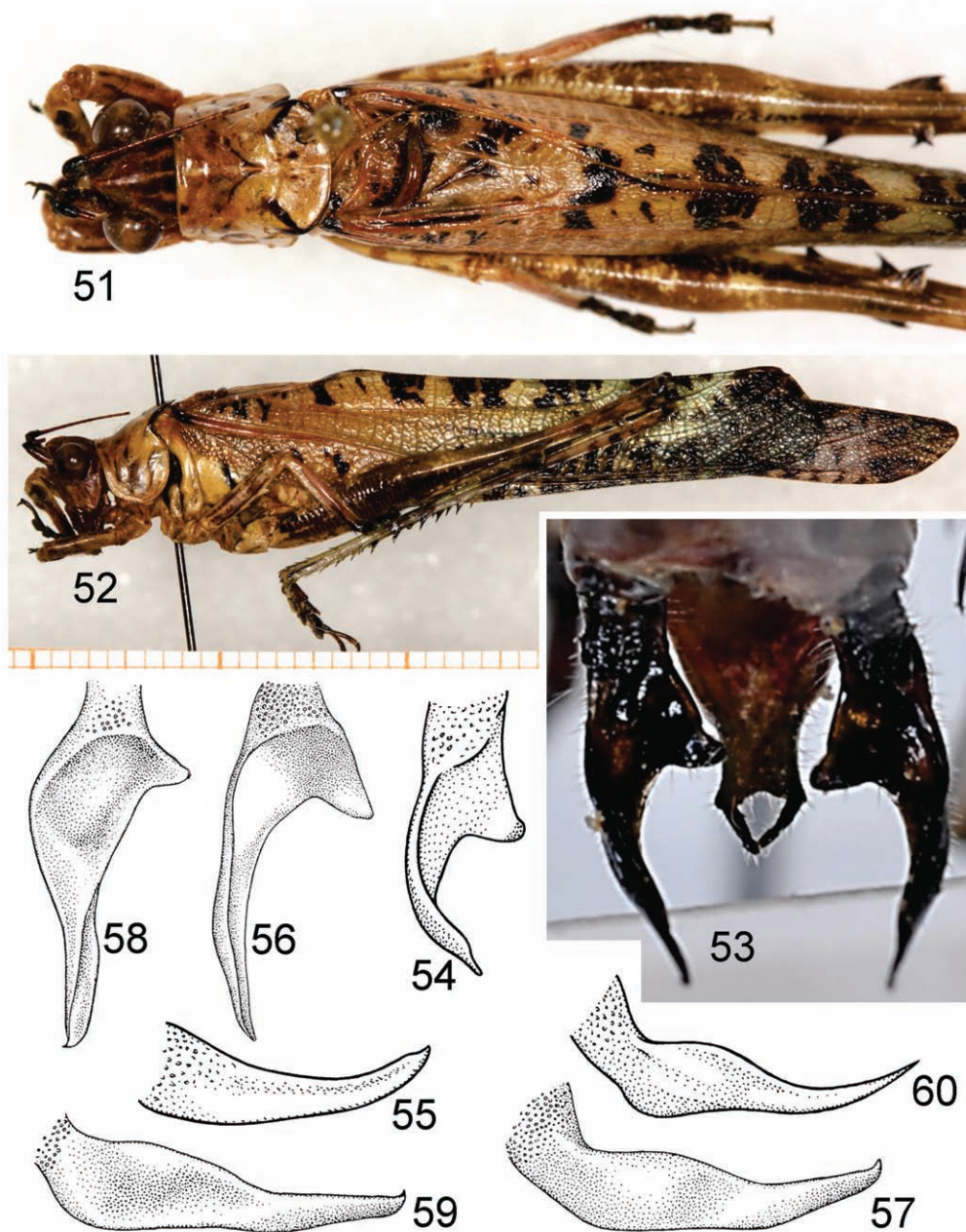
Holotype. Male; **Peru**, Junin Department, Satipo Prov., ~25 km SE of Satipo Town, environs of Rio Venado Vill., ~1200 m, partly primary / partly secondary forest, at light, 20–23 Oct. 2008, A. Gorochov, M. Berezin, L. Anisyutkin, E. Tkatsheva, V. Izersky (ZIN).

Paratype. Male, same data as for holotype (ZIN).

Description. Male (holotype). General appearance more or less similar to that of holotype of *Yu. multa* but with the following differences: colouration with rose area on labrum also, without dark stripes on dorsum of head, with light scape and pedicel having rose marks on scape and two brown longitudinal bands on pedicel, with four brown dots on anterior part of pronotum, with dark oblique stripes situated along lateral edges of posterior part of pronotal disc (*vs.* near these edges), almost without dark dots between these stripes (Fig. 38), with pattern on tegmina as in Fig. 39, with large reddish spot on dorsal surface of widened part of cerci, and with darkened apices of subgenital plate (Fig. 50); upper rostral tubercle of head with somewhat narrower posterior part and with posterior denticle located slightly behind anterior denticle of this tubercle; dorsal edge of this tubercle (behind apex of posterior denticle) and of vertex slightly arcuate in profile; scape almost 1.5 times



Figs 40–50. *Yungasacris*: 40–46, *Yu. multa* sp. nov.; 47–50, *Yu. grata rara* subsp. nov. Stridulatory apparatus of left (40, 47) and right (41, 48) tegmina; stridulatory vein of left tegmen from below (42, 49); male abdominal apex from above (43) and from below (44, 50); female subgenital plate from below (45); ovipositor from side (46).



Figs 51–60. *Yungasacris*, male: 51–55, *Yu. multa* sp. nov.; 56, 57, *Yu. grata grata*; 58, 59, *Yu. peruviana*; 60, *Yu. grata rara* subsp. nov. Body without posterior part from above (51); body from side (52); abdominal apex from above (53); left cercus from above (54, 56, 58) and from side (55, 57, 59, 60). [51, 52, photographs by H. Brown; 56–59, after Rehn, 1950].

shorter; tegmina clearly wider in proximal half (Fig. 39), with larger dorsal field, distinctly longer stridulatory vein in left tegmen and somewhat wider mirror in both tegmina (Figs 47–49); cerci distinctly longer, with much longer outer branch and slightly shorter proximal part (before base of inner branch), and in profile with rather short dorsal convexity in subbasal part (this convexity almost as long as more distal part of cercus; Figs 50, 60); subgenital plate lacking styles (which strongly reduced and fused with this plate) and with rather deep posteromedian notch (almost as deep as its distal width; Fig. 50).

Variations. Paratype without traces of dark dots between oblique dark stripes on posterior part of pronotal disc, with more distinct rose spots on abdominal tergites, and with traces of styles of subgenital plate (looking as a pair of very small convexities separated from genital plate by thin interrupted and slight grooves).

Female unknown.

Length in mm. Body 21–24; body with wings 47–49; pronotum 4.7–4.9; tegmen 35–36.5; tegminal mirror 3.7–4.3; stridulatory vein 3.2–3.4; hind femur 20–21.

Etymology. The species name is the Latin word “rara” (rare).

ACKNOWLEDGMENTS

The authors thank Mark O’Brien (UMMZ), Giovanni Fagua and Dimitri Forero (MUJ) for loaning the useful material, Holger Braun, Juliana Chamorro-Rengifo and M. O’Brien for photographs of some insects, and Arthur Anker for his interesting observation and photograph. The first co-author is also thankful to Alexander García García (MUD) for his constant support. The work of the second co-author is supported by the Presidium of the Russian Academy of Sciences (Program “Biosphere Origin and Evolution of Geo-biological Systems”).

REFERENCES

- Brunner-Wattenwyl C.** 1878. *Monographie der Phaneropteriden*. Wien: F.A. Brockhaus. 401 p., 8 Tab.
- Cadena-Castañeda O.J.** 2011. La tribu Dysoniini Parte I: el complejo *Dysonia* (Orthoptera: Tettigoniidae) y su nueva organización taxonómica. *Journal of Orthoptera Research*, **20**(1): 51–60.
- Cadena-Castañeda O.J.** 2013. The tribe Dysoniini part II: The genus *Markia* (Orthoptera: Tettigoniidae; Phaneropterinae), new species and some clarifications. *Zootaxa*, **3599**(6): 501–518.
- Cadena-Castañeda O.J., Gorochov A.V.** 2012. Review of the Neotropical genus *Paraphidnia* (Orthoptera: Tettigoniidae: Phaneropterinae). *Zoosystematica Rossica*, **21**(2): 204–233.
- Chamorro-Rengifo J., Braun H.** 2010. The Tettigoniidae (Orthoptera) described by Salvador de Toledo Piza Jr. and deposited in the collection of the University of São Paulo, Escola Superior de Agricultura “Luiz de Queiroz”, Brazil. *Zootaxa*, **2635**: 41–66.
- Eades D.C., Otte D., Cigliano M.M., Braun H.** 2013. *Orthoptera Species File. Version 5.0/5.0*. Visited 6 November 2013. Available from: < <http://Orthoptera.SpeciesFile.org> >
- Gorochov A.V.** 2012a. Systematics of the American katydids (Orthoptera: Tettigoniidae). Communication 1. *Proceedings of the Zoological Institute RAS*, **316**(1): 3–21.
- Gorochov A.V.** 2012b. Systematics of the American katydids (Orthoptera: Tettigoniidae). Communication 2. *Proceedings of the Zoological Institute RAS*, **316**(4): 285–306.
- Hebard M.** 1927. Studies in the Dermaptera and Orthoptera of Colombia, fourth paper. *Transactions of the American Entomological Society*, **52**(4), 1926: 275–354, pl. 18–22.
- Piza Jr.S.T.** 1967. Eine neue Gattung der Phaneropteriden (Orthoptera). *Studia Entomologica, N.S. (Petrópolis)*, **10**(1–4): 491–492.
- Rehn J.A.G.** 1950. Studies in the Group Dysoniinae (Aphidniinae of Authors) (Orthoptera: Tettigoniidae: Phaneropterinae) Part I. *Transactions of the American Entomological Society*, **75**(3–4), 1949: 271–319, pl. 17–19.

Received October 20, 2013 / Accepted November 19, 2013