

## XVIII. NOTES ON TROPICAL AMERICAN TETTIGONOIDEA (LOCUSTODEA).

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The present paper is based on several rather extensive collections of Orthopteroid insects belonging to the Carnegie Museum, which were placed at my disposal for study. These collections were made by different persons and at various times. The majority of the material, however, comes from Brazil, hence this report may be considered a continuation of the series of three reports previously prepared by me and already published. There are still many forms of both Locustoidea and Tettigonoidea that have been put aside for further study, as well as all of the Grylloidea which will be reported upon in future numbers of the ANNALS.

The present paper, as was the case with the series already published, contains descriptions of a number of new genera and species. The types referred to in connection with these descriptions are practically all deposited in the collection of the Carnegie Museum.

### Suborder TETTIGONOIDEA (Locustodea).

Next in numbers and importance to the locusts, or short-horned, are the long-horned grasshoppers. In some of the recent literature dealing with orthopteroid insects the authors have shown a tendency toward considering the group of more than ordinal value, some of them even going so far as to suggest a sub-class comprising several distinct orders and suborders. Two of these writers, Karny and Handlirsch, agree in calling each of the three so-called families, which taken together have been termed the "saltatorial orthoptera," as sub-orders, and the subfamilies, families. To this latter view I myself am inclined to agree, since by so considering them the confusion which has heretofore existed as to their affinities is partially remedied.

The different members of this group vary among themselves to a much greater degree than do the Locustoidea (Acridoidea), although the latter suborder contains a considerably larger number of forms. Possibly this greater variation among the forms is due to the fact that

the majority of the present group are denizens of forests, jungles, etc. as well as of grassed and other open country. The various families, which are represented in South America, may be separated by the accompanying synoptical key.

## SYNOPSIS OF THE S. A. TETTIGONOIDEA.

- A. Tarsi more or less depressed. (Forms largely winged).
- b. Anterior tibiæ provided with auditory apparatus or foramina.
- c. First and second tarsal joints smooth, not sulcate laterally. (Hind tibiæ with an apical spine above on each side) . . . . . *Phaneropteridæ*.
- cc. First and second tarsal joints longitudinally sulcate laterally.
- d. Foramina or ear of anterior tibiæ typically wide open. Prosternum armed with a pair of spines or tubercles . . . . . *Mecopodidæ*.
- dd. Foramina or auditory apparatus either linear or shell-like in its opening.
- e. Anterior tibiæ without terminal spines above.
- f. Antennal scrobes or pits with the margins raised or produced. *Pseudophyllidæ*.
- ff. Antennal scrobes with their margins hardly produced.
- g. Fore, or both front and middle tibiæ armed with long spines decreasing in length towards the apex. *Listroscelidæ*.
- gg. Fore and middle tibiæ armed with short or moderately long spines.
- h. All the femora unarmed beneath, the posterior ones rarely spined on the outer, sometimes on both sides. (Size usually smaller) . . . . . *Conocephalidæ*.  
[*Xiphidiidæ*.]
- hh. All the femora usually spined below, rarely the posterior ones armed only on the outer side, in which case the fastigium of the vertex is either forked or extended considerably beyond the basal joint of the antennæ. (Usually larger).
- i. Fastigium of the vertex generally noticeably narrower than the basal joint of the antennæ, sometimes dorsally sulcate . . . . . *Agracidæ*.
- ii. Fastigium of the vertex usually distinctly broader than the basal antennal joint, never sulcate. *Copiphoridæ*.  
[*Conocephalinæ*.]
- ee. Anterior tibiæ with a terminal spine above on the outer side. First joint of the posterior tarsus provided with a conspicuous free plantula beneath . . . . . *Dectidæ*.
- bb. Anterior tibiæ without foramina or auditory apparatus . . . . . *Gryllacridæ*.
- AA. Tarsi distinctly compressed (forms usually apterous).
- b. Tarsi provided with pulvilli, that on the metatarsus double; inserting angle of the posterior femora situated on the front side . . . . . *Stenopelmatidæ*.

- bb. Tarsi without pulvilli beneath; inserting angle of the posterior femora situated on the inner side. . . . . *Raphidophoridae*.

### Family PHANEROPTERIDÆ.

The family known as Phaneropteridæ is a very large one and is distributed throughout the warmer countries of the globe, where its representatives are among the commoner and more conspicuous orthopterous insects to be met with at almost every turn. In tropical American regions they are especially numerous. Most of these insects are green or greenish in color, and live among the rank growth of vegetation always found in the humid sections. Many of the species are attracted to bright lights after nightfall, hence are quite readily collected. Others may be taken by beating and sweeping the foliage of trees and the herbage growing at the borders of forests, groves, and the margins of streams. Still others live upon the trunks of trees, on ledges of rocks, and the ground, mimicking their surroundings in color. Upwards of seventy-five genera are known from tropical American regions alone. These may be separated as follows:

#### SYNOPSIS OF SOUTH AMERICAN GENERA OF PHANEROPTERIDÆ.

- A. Anterior coxæ not armed externally with a spine.
- b. Pronotum smooth, without a humeral sinus. Tegmina lobate.
- c. Anterior femora slightly more than one-half again as long as the pronotum. Pronotum with the last transverse sulcus situated back of its middle, the hind margin truncate, or broadly emarginate. Left elytron of ♂ with a plicate vein crossing the disc. . . . . *Isophya* Brunner.
- cc. Anterior femora twice as long as, or longer, than the pronotum.
- d. Pronotum without lateral carinæ. Ovipositor moderately compressed, sensibly narrowed at the base, and with both margins acutely serrato-dentate towards the apex.
- e. Plicate vein of the left elytron of the ♂ strongly oblique and subobliterated. . . . . *Odonturella* Bolivar.
- ee. Plicate vein of the left elytron of the ♂ well defined and crossing the disc. Genuiculi lobes of the hind femora acuminate.  
*Angara* Brunner.
- dd. Pronotum with lateral carinæ present. Ovipositor compressed, the margins towards the apex very minutely crenulate.  
*Xenica* Brunner.
- bb. Pronotum provided with a distinct humeral sinus. Tegmina fully developed.
- c. Tegmina narrow, shorter than the wings, when the latter are present. Wings acuminate.

- d. Anterior tibiae above closely armed on their hind margin with strong spines. All of the femora spined beneath. Pronotum sub-cylindrical, the lateral lobes much longer than high. The tegmina much narrowed. . . . . *Tetana* Brunner.
- dd. Anterior tibiae above on the outer margin without spines or rarely spined. Anterior femora unarmed below, the posterior ones spined or unarmed. Pronotum with the lateral lobes either roundly or angulately joined.
- e. Pronotum with its lateral lobes roundly inserted. Hind femora spined beneath. . . . . *Pseudoburgilis* Brunner.
- ee. Pronotum with its lateral lobes joined to the disc by an acute or obtuse angle. Hind femora unarmed beneath.
- f. Wings rudimentary or wanting. Pronotum provided with well-defined lateral carinae. Tegmina as long as the abdomen, acuminate, the median veins widely separated. . . . . *Euxenica*, gen. nov., Bruner.
- ff. Wings present and fully developed, slightly or even greatly longer than the tegmina.
- g. Wings more than one-half longer than the tegmina. The latter attenuated apically. Ovipositor narrow, nearly straight, its disc roughened and with its margins acutely serrato-dentate. . . . . *Burgilis* Stål.
- gg. Wings scarcely one-third or only a trifle longer than the tegmina. Ovipositor strongly curved, compressed, either smooth or rugulose, its margins obtusely serrate.
- h. Tegmina strongly dilated at their base, their anterior margin broadly rounded, apex acuminate, the tympanal field not unusually dilated. Wings a little longer than the tegmina. Ovipositor semi-circularly curved, its disc somewhat roughened. . . . . *Coryphoda* Brunner.
- hh. Tegmina narrow, their apex rounded, and with the tympanal field normal. Wings one-fourth longer than the tegmina. Ovipositor strongly compressed, short, suddenly bent or curved upward at the base, its disc smooth.
- i. Tegmina with the cross-veins in the marginal and radial fields parallel, close together; radial vein beyond the base contiguous. . . . *Aniarella* Bolivar.
- ii. Tegmina with the cross-veins irregular; radial veins separated from the base to their outer extremity. . . . . *Hyperophora* Brunner.
- cc. Tegmina broader, longer than the wings. Latter obtuse or abortive.
- d. Cross-veins of the tegmina much crowded or close together. (Pronotum with the disc plain or flat, the deflexed lobes angulately inserted). . . . . *Engonia* Brunner.
- dd. Cross-veins of the tegmina wanting or very irregular.

- e. Tegmina sublinear or narrow, the apex obtuse, the radial veins separated. (Pronotum with its lateral lobes roundly inserted. Anterior tibiæ spineless above).....*Stenophyllia* Brunner.
- ee. Tegmina ovate, acuminate, the radial veins touching.
- f. Deflexed lobes of the pronotum attached by an acute angle, their posterior margin obliquely truncate, the humeral sinus nearly absent. Wings abortive. Anterior tibiæ nearly spineless above.....*Marenestha* Brunner.
- ff. Deflexed lobes of the pronotum attached by a rounded angle, their posterior margin rounded and the humeral angle distinct. Wings although shorter than tegmina, well developed, subgenital plate of ♂ elongated, narrow.  
*Cosmophyllum* Blanchard.
- AA. Anterior coxæ armed externally with a distinct spine.
- b. Fastigium of the front laminately greatly produced. (Tegmina broad, femora and tibiæ laminately dilated).....*Ægimia* Stål.
- bb. Fastigium of the front not produced, or at most forming a short transverse plate,
- c. Vertex elevated into a tooth or dentiform crest, which is remote from the fastigium. (Femora and posterior tibiæ frequently lobate or lengthily spined.)
- d. Posterior femora spinulose, not lobate, nor lengthily spined.
- e. Antennæ nodose. Fastigium of the vertex compressed, acuminate. Posterior femora with the genicular lobes obtuse.  
*Hammatofera* Brunner.
- ee. Antennæ smooth, annulated with fuscous. Fastigium of the vertex depressed, sulcate. Posterior femora with the genicular lobes lengthily dentate.....*Oxyprorella* Giglio-Tos.
- dd. Posterior femora either lengthily spined or lobate.
- e. Hind femora and tibiæ lengthily spinose.
- f. Pronotum unarmed with spines.....*Machima* Brunner.
- ff. Pronotum armed above both in front and behind with a long, compressed spine.....*Markia* White.
- ee. Hind femora lobate. Hind tibiæ armed with triangular teeth.
- f. Vertex elevated into a spine. Antennæ with their first joint smooth.....*Dysonia* White.
- ff. Vertex elevated into a crest. First joint of the antennæ armed internally with a heavy, robust, obtuse tooth.  
*Paraphidnia* Giglio-Tos.
- cc. Vertex plain or tumescent, not spined.
- d. Middle tibiæ laminately dilated apically, compressed, including a long spine.....*Centrofera* Brunner.
- dd. Middle tibiæ of normal form or slightly dilated basally.
- e. Ovipositor very short, always much less than the pronotum in length, the valves free or separated, rather smooth and without decided marginal teeth. Subgenital plate of ♂ either produced into narrow lobes imitating a stylus or sharpened stick, or subtruncate at apex.

- f. All of the femora sulcate below and armed on the external margin with some small spines; anterior and middle tibiae sulcate above and, with the exception of the apical spine, smooth or provided with only a few spinules.
- g. Middle tibiae noticeably compressed and dilated at base; the hind margin of the disc of the pronotum rounded.
- Uberaba*, gen. nov., Bruner.
- gg. Middle tibiae of usual form, not especially compressed and dilated at base; hind margin of the disc of the pronotum truncate. [Ecuador].....*Polychnodes* Giglio-Tos.
- ff. All of the femora non-sulcate below, the anterior and middle pairs armed on the lateral margins with series of long and slightly curved spines; anterior and middle tibiae rounded above, their lower margins also lengthily spined. [Costa Rica].....*Alogopteron* Rehn.
- ee. Ovipositor not abnormally short, usually as long as, or longer than, the pronotum, its margins towards the apex crenulate or serrulate, very rarely smooth. Subgenital plate of ♂ with or without free styles.
- f. Anterior tibiae on their inner margin with the auditory foramina shell-like or sublinear, externally typically wide open. Ovipositor broad, its apical half convex and covered with flattened squamiform, imbricated tubercles, the edges of which are directed forwards.....*Celophyllum* Scudder.
- ff. Anterior tibiae with one or two exceptions having the auditory foramina on both sides either wide open, or narrow and shell-like.
- \* Anterior and middle tibiae sulcate above, or plain, but acute-angled, on the outer margin either spined or smooth.
- b. Fastigium of the vertex somewhat depressed, acuminate or truncate.
- c. Anterior and middle tibiae, with the exception of the external apical spine, unarmed above. Tegmina narrow, their apex rounded, the radial veins separated at the base. All the femora unarmed beneath. Wings much longer than the elytra.....*Phaneroptera* Serville.
- cc. Anterior, or at least the median, tibiae spined above. Tegmina, wings, and femora variable.
- d. Pronotum strongly saddle-shaped, the disc elevated posteriorly. Tegmina with their hind margin sinuate and the apex either obliquely truncate, or rounded. Auditory openings on both sides of the anterior tibiae linear [Venezuela].....*Sictuna* Walker.
- dd. Pronotum with the disc either plain or saddle-shaped, but not elevated either in front or behind. Tegmina with their posterior margin straight or sinuate. Posterior femora beneath spined or lobate. The auditory foramina wide open.
- e. Tegmina narrower (except in *Dolichocercus*), their posterior margins sinuate. The anterior femora above often compressed at their apex, acuminate. Posterior femora with their genicular lobes lengthily acuminate.

- f. Anterior and middle femora not subcarinate above apically.  
 g. Genicular lobes of all the femora bearing two spines. Tegmina elongate lanceolate, their apex rounded.  
*Callinsara* Rehn.
- gg. Genicular lobes of all the femora bearing a single spine. Tegmina rather broad, with the apex obliquely truncate.  
*Dolichocercus* Rehn & Hebard.
- ff. Anterior and middle femora briefly subcarinated above apically.  
 g. Anterior ulnar vein of tegmina not united with the branch of the posterior median. Ovipositor very prominently serrato-crenulate. Sides of the disc of the pronotum only gently convergent anteriorly, the lateral carinae obtuse. . . . . *Enlhepphion*, gen. nov., Bruner.
- gg. Anterior ulnar vein united with the branch of the posterior median, sometimes appearing as a continuation of the former. Ovipositor minutely serrate. Sides of the disc of the pronotum strongly convergent anteriorly, the lateral carinae more or less acute. . . . *Insara* Walker.
- ee. Tegmina broader, their hind margin straight or rounded. Anterior femora above rounded. Posterior femora with the genicular lobes obtuse or provided with short teeth.  
 f. Subgenital plate of ♂ without styles.  
 g. Anterior and middle femora unarmed with spines beneath, the posterior ones also unarmed or furnished with but few small spinules. Ovipositor obtuse at its apex.  
*Scudderia* Stål.
- gg. Anterior and middle femora spined beneath. Hind femora also spined. Ovipositor acuminate or obtuse.  
*Symmetropleura* Brunner.
- ff. Subgenital plate of ♂ provided with free styles.  
 g. Pronotal carinae acute, or obtuse, or none, never elevated, neither dentate nor crenulated.  
 h. Vertex somewhat flattened. Pronotum with the disc flat, the deflexed lobes more or less angulately inserted. Antennae at their base not enlarged nor hirsute. Tegmina, except in the genus *Theudoria*, green.  
 i. Tegmina with the radial veins more or less separated (very little back of the middle), the radial branch passing out on the posterior margin of the elytra.  
 j. Anterior tibiae above not provided with a spine back of the foramina. (*Ligocatinus olivaceus* has a spine at the base.) Pronotum smooth, shining. Subgenital plate of ♂ short, its posterior border emarginate.  
*Ligocatinus* Rehn.

jj. Anterior tibiae above armed with a small spine back of the foramina. Pronotum smooth, but with the impressions roughened or opaque. The subgenital plate of ♂ longer, attenuate, and fissured.

k. Ovipositor with its apex acuminate.

l. Tegmina with their apex rounded, a little shorter than the wings. Posterior femora unarmed below on the outer margin (except in *Theudoria nigro-lineata*, in which both margins are spined).

m. Subgenital plate of ♂ moderately attenuate. Last ventral segment of ♀ abdomen not different from the others. . . . *Homotoicha* Brunner.

mm. Subgenital plate of ♂ strongly attenuate and elongate, profoundly fissured. Last ventral segment of ♀ abdomen much larger than the rest, trapezoidal. Subgenital plate of ♀ very short, transverse. . . . . *Theudoria* Stål.

ll. Tegmina with their apex obtuse, obliquely truncate. Posterior femora below with both margins spined. (Last ventral segment of ♀ abdomen not different from the rest. Subgenital plate of the ♀ elongate, with the apex truncate and terminating on each side with a narrow appendix) . . . . . *Parascudderia* Brunner.

kk. Ovipositor with its apex rounded. (Hind femora with both margins armed.)

l. Posterior femora simply spined below. Wings with their disc hyaline.

*Ceraia* Brunner.

ll. Posterior femora below lobato-dentate. Wings with their disc red.

*Vellea* Walker.

ii. Tegmina with their radial veins, except at the apex, contiguous, the radial branch running out at the apex, or deflexed into the posterior margin of the elytra.

j. Branch of the posterior radial vein straight, running out in the apex of the elytra. Ovipositor suddenly curved at the base, acuminate, the margins crenulate throughout.



k. Vertex in front margined with a carina, on each side towards the middle of the eyes branching out into an obtuse tooth, the fastigium angulately deflexed. Tegmina with the radial branch not forked, joined to the ulnar vein by an oblique veinlet.

*Ectemna* Brunner.

kk. Vertex in front obtuse, the fastigium roundly deflexed. Tegmina with the radial branch forked, or, in the manner of the genus preceding, joined to the ulnar vein by an oblique veinlet.

l. Size larger. Pronotum with the disc narrowed in front, the lateral lobes obtusely inserted, highest back of their middle. Anterior margin of the tegmina at their base black-bordered. Ovipositor very much roughened, with its apex colored black. . . . . *Plagiopleura* Stål.

ll. Size smaller. Pronotum with the disc of equal width in front and behind, the lateral lobes acutely inserted, highest at their middle. Anterior margin of the tegmina ferruginous. Ovipositor granulose, its apex ferruginous.

*Euthyrrhachis* Brunner.

jj. Branch of the posterior radial vein forked, deflexed to the posterior margin of the elytra. Ovipositor but little curved and somewhat obtuse, the margins entire or subcrenulate at its apex. . . . . *Parableta* Brunner.

hh.<sup>1</sup> Vertex rounded, strongly declivant. Pronotum more or less saddle-shaped, the lateral lobes roundly inserted. Antennæ at base heavy, often hirsute. (Anterior tibiæ above entirely unarmed. Wings provided with a<sup>v</sup> distinct apical triangular field.)

i. Antennæ very heavy at their base and always hirsute. Color blackish, steel-blue, or ferruginous.

*Scaphura* Kirby.

ii. Antennæ less heavy at base and generally smooth, or only sub-hirsute. Color fuscous.

*Gymnocera* Serville.

gg. Pronotal carinæ more or less elevated and dentate, or

<sup>1</sup> Walker's genus *Itarissa* (see Cat. Derm. Salt. Brit. Mus., II, p. 389) is placed in the vicinity of *Posidippus* by Kirby. According to the present table, however it would not fall in section gg because it lacks the lateral pronotal carinæ.

- straight and sometimes crenulated behind. (Species of large size. The tegmina corneous. Ovipositor short, somewhat compressed, attenuate, the margins entire.)
- h.* Anterior branch of the radial fork itself running out at the apex of the tegmina.
- i.* Fastigium of the vertex horizontally produced, sulcate, a little wider than the first antennal joint. Carinæ of the pronotum crenulate only on their posterior fourth. *Microcentrum* Scudder.
- ii.* Fastigium of the vertex deflexed, not sulcate, twice as wide as the first antennal joint. Carinæ of the pronotum amplified and crenulato-dentate throughout. . . . . *Steirodon* Serville.
- hh.* Anterior branch of the radial fork running out on the posterior margin of the tegmina.
- i.* Lateral carinæ of the pronotum cristato-elevated. Anterior tibiæ flattened above. (Posterior tibiæ strongly compressed and dilated. . . *Peucestes* Stål.
- ii.* Lateral carinæ of the pronotum not elevated. Anterior tibiæ sulcate above. Eyes globose, prominent.
- j.* Posterior tibiæ alone compressed, and slightly dilated near the base. . . . . *Posidippus* Stål.
- jj.* Posterior tibiæ as well as the intermediate tibiæ compressed at base and very decidedly dilated. *Steirodonopsis* Scudder.
- bb.* Fastigium of the vertex obtuse, deflexed, much wider than the first joint of the antennæ.
- c.* All the femora and tibiæ simple or plain. Fastigium of the vertex about twice the width of the first antennal joint, sulcate. Mesosternum roundly lobate. Ovipositor suddenly curved at its base, a little longer than the pronotum, its upper margin straight. . . *Sagona* Walker.
- cc.* The femora and likewise the anterior and middle tibiæ foliaceo-lobate. Pronotum with its disc profoundly concave. (Eyes greatly elongate. Tegmina very broadly obovate). . . . . *Agaura* Bruner.
- \*\*.** Anterior and intermediate tibiæ above rounded, often entirely unarmed, very rarely sulcate, in which case, the apical spine is absent (*Viadana*), or when the apical spine is present the meso- and metasternum are lengthily lobate (*Orophus*). Fastigium of the front acuminate, or obtuse.
- b.* Anterior femora often, the middle pair always, rounded beneath, while the hind femora are flattened below. Subgenital plate of male not provided with styles. Ovipositor frequently much longer than the pronotum, somewhat curved, acuminate, smooth.
- c.* Posterior radial vein with its single branch furcate. Lateral lobes of the pronotum, rounded or obtusely inserted.
- d.* Disc of the pronotum somewhat flattened, without a median elevated longitudinal line. Ovipositor very smooth. . . *Anaulacomera* Stål.

- dd.* Disc of the pronotum rounded, furnished with a median, slightly elevated, longitudinal line.
- e.* Lateral lobes of the pronotum as high as long. Tegmina somewhat pellucid, the transverse veins not prominent, rather poorly expressed. Legs not especially slender. Anterior femora but little longer than the pronotum, the posterior pair not more than four times as long as the pronotum. . . . *Grammadera* Brunner.
- ee.* Lateral lobes of the pronotum longer than high. Tegmina grass-green, opaque, the transverse veins elevated, parallel. Legs very slender. Anterior femora one-half longer than the pronotum, the posterior pair five times as long as the pronotum.  
*Abroidiæta* Brunner.
- cc.* Posterior radial vein emitting several non-forked parallel branches. Lateral lobes of the pronotum angulately inserted. (Fastigium of the vertex more or less laminately compressed. Anterior and middle tibiæ sulcate above, totally unarmed.)
- d.* Tegmina narrow, the branches of the posterior radial vein longitudinal, terminating in the apex of the elytra. Fastigium of the vertex a trifle longer than, or of equal length with, the first antennal joint. Lateral lobes of the pronotum higher than long, their posterior margin more or less angulately produced. Tegmina wider at base, tapering towards the apex. Ovipositor gently curved.  
*Tomeophora* Brunner.
- dd.* Tegmina strongly dilated, ovate or trapezoidal, the radial branches oblique and running out on the posterior margin of the elytra.  
*Viadana* Walker.
- bb.* All the femora sulcate below. The subgenital plate of male provided with styles. Ovipositor rarely longer than the pronotum, generally, but not always, suddenly curved, roughened, acuminate, or smooth with the apex truncate and crenulate, but obtuse.
- c.* Mesosternal lobes triangular, not produced; the metasternal lobes rounded, except in the genus *Diplophyllus*, where they are triangular. Ovipositor acuminate. Fastigium of the vertex also acuminate.
- d.* Fastigium of the vertex not touching the fastigium of the front. (In *Phylloptera peruviana* they touch.) Internal margins of the antennal scrobes when viewed from the front include the fastigium of the front. Front more or less tumescent. (Metasternum roundly lobate.)
- e.* Wings surpassing the tegmina.
- f.* Secondary veins of the tegmina irregularly placed.
- g.* Lateral lobes of the pronotum often higher than long, the anterior margin sinuate. Anterior and middle tibiæ less graceful. These hardly longer than the pronotum. Ovipositor a little shorter than the pronotum, its base and apex equal in width. Cerci of male shorter, curved inwards. . . . . *Phylloptera* Serville.
- gg.* Lateral lobes of the pronotum as long as high, the anterior

- margin straight. Anterior and middle tibiæ slender, exceeding the length of the pronotum by one-half. Ovipositor longer than the pronotum (except in the genus *Cora*) with its apex narrowed. Cerci of male straight, long.
- h.* Fastigium of the vertex advanced a little in front of the eyes. Tegmina ovate, widest at middle, or back of the middle. Wings at apex acuminate, the triangular portion not separated as a distinct field.  
*Hyperphrona* Brunner.
- hh.* Fastigium of the vertex advanced greatly in front of the eyes. Tegmina with their margins nearly parallel. Wings with their apex obtuse and separated into a distinct rounded field. . . . *Cora* Brunner.
- ff.* Secondary veins of the tegmina obliquely and regularly arranged. . . . *Arota* Brunner.
- ee.* Wings not surpassing the tegmina, the apical field prominent. Fastigium of the vertex sulcate. Anterior and middle tibiæ less graceful, a trifle shorter than the pronotum. Lateral lobes of the pronotum highest at middle. . . . *Prosagoga* Brunner.
- dd.* Fastigium of the vertex contiguous with the fastigium of the front. (In *Pycnopalpa bicordata* it is not contiguous, and in this case the margins of the antennal scrobes are rather distant.)
- e.* Anterior femora dentate below on the anterior border. Anterior tibiæ above dilated in the apical portion and provided with an external spine. Tegmina ovate, in their apical third three times as wide as the length of the pronotum.
- f.* Disc of the pronotum ornamented with two roughened heart-shaped areas set off by raised carinæ. Tegmina having the appearance of being corroded. . . . *Pycnopalpa* Serville.
- ff.* Disc of the pronotum without the roughened areas set off by raised carinæ. The tegmina not having the corroded or rusted appearance as in the preceding genus.  
*Topana* Walker.
- ee.* Anterior femora armed beneath with little spinules or unarmed. Anterior tibiæ without a basal spine above. Tegmina lanceolate, or linear, not more than twice the width of the pronotal length.
- f.* Wings plainly longer than the tegmina. Ovipositor only a trifle longer than the pronotum.
- g.* Vertex depressed, contiguous with the front by means of a very obtuse angle. Tegmina with the apex obliquely truncate.
- h.* Tegmina with their posterior margin somewhat sinuate. Pronotum short, truncate behind. . . *Theia* Brunner.
- hh.* Tegmina with their hind margin straight. Pronotum behind lengthily and triangularly produced.  
*Hetaira* Brunner.

- gg. Vertex horizontal, forming a distinct angle with the front.  
Tegmina lanceolate.....*Diplophyllus* Saussure.
- ff. Wings shorter, or but little longer, than the tegmina, the triangular field of their apex prominent. Ovipositor considerably longer than the pronotum.
- g. Ovipositor almost twice as long as the pronotum, broadest in the middle, its apex acuminate.. *Annalomes* Scudder.
- gg. Ovipositor one-half longer than the pronotum, broadest beyond the middle.....*Apocerycta* Brunner.
- cc. Meso- and metasternal lobes both (except in the genus *Ischira* where they are rounded) triangularly produced. Ovipositor obtuse, crenulate, or acuminate, and with the valves very smooth, separated.
- d. Ovipositor suddenly curved upwards at its base, the lower valve with its apex truncate and profoundly crenulate. (Fastigium of the vertex deflexed, equal in width to the first joint of the antennæ, or wider, obtuse. Tegmina lanceolate or ovate, both forks of the radial branch passing out on the dorsal margin.)  
*Orophus* Saussuré.
- dd. Ovipositor either suddenly or only gradually curved, the margins smooth, the lower valve acuminate at its apex, somewhat separated from the upper valve.
- e. Fastigium of the vertex strongly obtuse, four times wider than the first antennal joint (in *Ischyra flaviceps* the fastigium is about twice as wide as the first joint of the antennæ).
- f. Anterior tibiæ with the foramina on both sides shell-like. Posterior femora totally dentate below on the outer margin. Metasternum provided with triangular lobes.  
*Lobophyllus* Saussure.
- ff. Anterior tibiæ provided on both sides with wide-open foramina. Posterior femora spined below on the outer margin towards the apex. Metasternum provided with either triangular or rounded lobes.....*Ischyra* Brunner.
- ee. Fastigium of the vertex lengthily produced, or short, a little wider than the first antennal joint, or acuminate.
- f. Lateral lobes of the pronotum with their margins fringed with hairs. Tegmina membranous or leathery.  
*Syntechna* Brunner.
- ff. Lateral lobes of the pronotum with their margins smooth. Tegmina corneous.
- g. Posterior margin of the elytra nearly straight. Both forks of the branch of the posterior radial vein running out on the posterior border of the elytra. Mesosternal lobes plain, extending over the coxæ.
- h. Fastigium of the vertex wider than the first joint of the antennæ. Tegmina strongly narrowed back of the middle. Anterior tibiæ provided with wide-open foramina on both sides.....*Philophyllia* Stål.

hh. Fastigium of the vertex narrower than the first antennal joint. Tegmina moderately narrowed beyond the middle. The foramina on both sides of the anterior tibiæ linear. . . . . *Phæbolampla* Brunner.

gg. Posterior margin of the elytra rounded, or elevated, roof-like. Both forks of the branch of the posterior radial vein passing out in the apex of the tegmina. Mesosternal lobes strongly compressed. Fastigium of the front bituberculate. Ovipositor obtuse, the valves entire.

*Akra* Brunner.

#### Genus EUXENICA gen. nov.

The present genus is South American. Thus far only the one species, the description of which follows, is known. This insect, as may be seen by referring to the synopsis of genera on a preceding page belongs to the first section of the family Phaneropteridæ, *i. e.*, among those genera in which the anterior coxæ are unarmed with a spine. In the key of genera it falls between *Pseudoburgilis* Brunner and *Burgilis* Stål.

General form of insects moderately graceful. Anterior coxæ unarmed with a spine. Head large, a little wider than the anterior margin of the pronotum, the eyes small, but prominent, slightly elongate; occiput smooth, rounded; fastigium of the vertex roundly depressed, narrow, more or less sulcate, sub-contiguous with the fastigium of the front, which latter is bluntly rounded and does not quite reach the upper extremity of the antennal scrobes. Antennæ somewhat coarse, filiform. Pronotum with its sides parallel, carinated, the humeral sinus distinct, but not prominent; the lateral lobes nearly twice as long as high; the disc gently convex, its anterior margin subtruncate, the hind margin rounded. Tegmina as long as, or longer than, the abdomen, lanceolate, their apex acuminate; the anterior and posterior median veins widely separated throughout. Wings wanting. Anterior and middle legs slender, the femora of the former about one-half longer than the pronotum, the median pair a little more than twice its length; hind femora also slender, longer than the body, all three pairs without spines below. Auditory apparatus wide open. Anterior tibiæ spined above on their hind margin, the intermediate pair spined on both margins. Ovipositor robust, gently falcate, gradually tapering, acuminate, on the apical third crenulate, or serrate.

1. *Euxenica aptera* sp. nov.

General color of body testaceous to ferrugineo-testaceous, the tegmina grass-green; lateral carinæ of the pronotum and the humeral angles of the tegmina vinaceous. Apical portion of all the tibiæ and tarsi infuscated. Antennæ at least basally testaceo-ferruginous.

Length of body, ♀, 16 mm., of pronotum, 4 mm., of tegmina, 15 mm., of hind femora, 20 mm., of ovipositor, 10.5 mm.

*Habitat.*—Chapada, Brazil (H. H. Smith). There are three additional female specimens at hand. These are also from the same locality. The type is in the Carnegie Museum of Pittsburgh.

## Genus ANIARELLA Bolivar.

*Aniarella* BOLIVAR, Bol. Soc. Esp. Hist. Nat., VI, p. 384 (1906).

*Aniara* BRUNNER (*nec* Dejean), Mon. Phaneropt., 16, 123 (1878); *Ib.*, Addit. Monog. Phaneropt., pp. 7, 58 (1891).

The representatives of *Aniarella* are recognizable by the absence of the spine from the anterior coxæ and by the presence of numerous parallel transverse veins on the tegmina. Three species have already been characterized, while a fourth is now added. They may be recognized by the few brief characters as given in the subjoined

## SYNOPSIS OF THE SPECIES OF ANIARELLA.

- A. Mediastin vein of the costal field of the elytra subobsolete or entirely absent.
  - b. Deflexed lobes of the pronotum roundly or obtusely inserted.
    - c. Size larger [♂, 20 mm., tegmina, 36 mm.]. Mediastin vein wanting. *typica* Brunner.
    - cc. Size smaller [♂, 16 mm., tegmina, 26 mm.]. Mediastin vein present, but very short..... *minor* sp. nov.
  - bb. Deflexed lobes of the pronotum acutely inserted, the angle marked by a narrow fuscous line..... *proxima* Brunner.
- AA. Mediastin vein of the costal field present, extending beyond its middle. (Deflexed lobes of the pronotum acutely inserted, the angle marked by a narrow fuscous line)..... *punctulata* Brunner.

2. *Aniarella minor* sp. nov.

As indicated by the synoptic key the present insect is most closely related to the species *typica*, from which it differs in having the posterior border of the tegmina minutely punctulate with fuscous, which results from the veinlets being widely pallid over a fuscous background.

General color pale green, the legs, head, pronotum, and body tes-

taceous. Costal area of the tegmina broad and rounded on their basal half, narrowed beyond. Transverse parallel veins not so prominent as figured for *punctulata* Brunner (see Monog. Phaneropt., pl. II, fig. 23).

Length of body, ♂, 16 mm., of pronotum, 3.5 mm., of tegmina, 26 mm., width of tegmina, 5.25 mm., length of hind femora, 16 mm.

*Habitat.*—The type and another male specimen are at hand. They were collected by J. Steinbach at Puerto Suarez, Bolivia, during November and January. The type is in the Carnegie Museum of Pittsburgh.

### 3. *Aniarella proxima* (Brunner)?

*Aniara proxima* BRUNNER, Addit. Mon. Phaneropt., p. 58 (1891); REHN, Proc. Acad. Nat. Sci. Phila., 1913, p. 360.

Specimens of a second species belonging to the genus *Aniarella* in the present collection are referred with some doubt to Brunner's *proxima*.

### Genus HYPEROPHORA Brunner.

*Hyperophora* BRUNNER, Mon. Phaneropt., pp. 16, 125 (1878); *Ib.*, Addit., Mon. Phaneropt., pp. 7, 58 (1891); REHN, Proc. Acad. Nat. Sci. Phila., 1907, pp. 371-376, figs. 1-8.

The insects, which comprise the genus *Hyperophora*, are rather numerous and confined to the middle portions of South America. They are especially abundant in portions of southern Brazil, Paraguay, eastern Bolivia, and northern Argentina. Specimens are at hand from several localities, but in such numbers that they have been set to one side for later study. This course has been decided upon because of the apparent variation in color, size, width of tegmina, etc., found among the specimens coming from a single locality.

### Genus OXYPRORELLA Giglio-Tos.

*Oxyprorella* GIGLIO-TOS, Boll. Mus. Zool. Anat. Comp. Torin, XIII, no. 311, p. 70 (1898).

*Oxyprorella* BRUNNER (*nec.* Stål), Mon. Phaneropt., pp. 18, 148 (1878); *Ib.*, Addit. Mon. Phaneropt., p. 9 (1891).

This is also a tropical South American genus. It contains rather small, but more or less mottled and otherwise variegated insects with the characters indicated in the preceding table of genera. Two species have been characterized heretofore, to which a third is now added. They may be separated as follows:



## SYNOPSIS OF THE SPECIES OF OXYPRORELLA.

A. Smaller, with the elytra very short (♀, 10 mm.) [Peru]. . . . . *miseria* Brunner.  
 A.A. Larger, with the elytra longer (♀, 23 mm. or more).

b. Posterior margin of the disc of the pronotum entire. Tegmina a little wider at middle than the length of the anterior femora [Bolivia].

*zebrata* sp. nov.

bb. Posterior margin of the disc of the pronotum incised at middle. Tegmina narrow, less than the length of the anterior femora in width [Ecuador].

*dives* Giglio-Tos.

4. *Oxyprorella zebrata* sp. nov.

Ferrugineo-testaceous, more or less mottled and streaked with fuscous and black. Body hirsute. Head a little wider than the anterior margin of the pronotum; eyes large, prominent, a little longer than wide, alternately streaked lengthwise with fuscous and testaceous; fastigium of the vertex depressed, sulcate, decidedly narrower than the first antennal joints; fastigium of the front prominent, white, almost reaching the upper end of the antennal scrobes. Antennæ annulated with fuscous. Pronotum short, the disc flat above with prominent lateral carinæ. Tegmina somewhat coriaceous, of moderate width, the apex obliquely truncate; anterior and posterior radials separated both near the base and apex, attingent between, the branch of the posterior one given off in advance of the middle, both of the forks running out at the apex. Anterior femora in front provided with a single large tooth-like spine near the apex; intermediate pair with two smaller spines; hind femora with several rather prominent spines; anterior and intermediate tibiæ dilated near their base, the auditory apparatus wide open. Cerci heavy at base, rather long, arcuate, the apical half slender. Sub-genital plate rounded, sub-truncate at apex.

Front infuscated and marmorate with flavous or testaceous and rather closely punctate with fuscous dots from which emanate short pale hairs. Pronotum with the lateral carinæ and hind border black. Tegmina with a few irregular scattered and five regular oblique fuscous blotches,—the latter on the apical half of the costal field. Exposed portion of wings also so marked. Anterior femora and tibiæ basally striped in zebra fashion with black. Hind femora also showing dim bands of fuscous. Cerci for the most part black, the center ferruginous.

Length of body, ♂, 13 mm., of pronotum, 2.85 mm., of tegmina, 21.5 mm., width of same, 5 mm., length of wings, 26.5 mm., of hind femora, 15 mm.

*Habitat*.—The type, a male, and only specimen at hand, bears the label "Province del Sara, Bolivia, 350 meters, J. Steinbach, November, 1913."

The type is in the Carnegie Museum.

#### 5. *Oxyprorella modesta* sp. nov.

*Male*.—About the same size as the preceding, but slenderer and darker colored and with the disc of the thorax beautiful apple-green, occiput short, the vertex also short, excavated anteriorly between the eyes, the fastigium not prominent. Head small, tapering below. Eyes large, prominent. Pronotum moderately elongate, the disc remarkably flat and smooth, bordered throughout with a smooth, slightly elevated ridge or carina. Lateral lobes slightly longer than high, the anterior margin roundly lobate below, lower edge and hind margins also broadly rounded. Tegmina with the margins nearly parallel, the apex obliquely truncate and with the venation something like that in the preceding species. Anterior and middle femora five-spined below, the hind pair seven-spined externally, two-spined internally. Last ventral segment of abdomen of male of moderate size, a little longer than wide, tapering, the apex truncate between short lateral blunt teeth. Cerci curved as in the preceding species, a little flattened from above on their apical half, and terminating in an acute tooth.

General color dull wood-brown more or less mottled with blotches of darker color on the tegmina and exposed portion of the wings. Fastigium of the front and excised portion of the vertex whitish; top of head, disc of pronotum, and immediate base of tegmina above green; border of the disc of the pronotum dull ivory. Dorsum of abdomen tinged with green.

Length of body, ♂, 13 mm., of pronotum, 3.6 mm., of tegmina, 21.5 mm., width of tegmina, 3.5 mm., length of hind femora, 15 mm.

*Habitat*.—Rio de Janeiro, October (H. H. Smith). The type alone is at hand. It is in the collection of the Carnegie Museum, Pittsburgh. It would fall in the table of species between *zebrata* and *dives*.

#### Genus DYSONIA White.

*Dysonia* WHITE, Richardson's Mus. Nat. Hist., II, p. 244 (1862); KIRBY, Syn. Cat.

Orth., II, p. 411 (1906).

*Valna* WALKER, Cat. Derm. Salt. B. M., II, p. 357 (1869).

*Aphidna* STÅL, Recens. Orth., II, pp. 13, 28 (1874).

*Aphidnia* BRUNNER, Mon. Phaneropt., pp. 19, 151 (1878); *Ib.*, Addit. Mon. Phaneropt., p. 9 (1891).

The insects belonging to this genus are exceedingly interesting creatures, because they strongly imitate in their colors bark, twigs, and even stones which are coated with lichens. Several species are known, and all of them inhabit tropical American countries. They are either rare, or so well protected by their imitative colors, as to render their discovery difficult. But few individuals of the known species are found in collections.

#### 6. *Dysonia elegans* (Brunner).

*Aphidnia elegans* BRUNNER, Mon. Phaneropt., pp. 153, 155 (1878).

*Dysonia elegans* KIRBY, Syn. Cat. Orth., II, p. 411 (1906).

*Habitat.*—A single female specimen of a species determined as *elegans* Brunner is at hand. It was taken by H. H. Smith, at Chapada, Brazil, during the month of January.

#### 7. *Dysonia punctifrons* (Brunner)?

*Aphidnia punctifrons* BRUNNER, Mon. Phaneropt., pp. 152, 154, Pl. 3, fig. 40 a, b (1878).

*Dysonia punctifrons* KIRBY, Syn. Cat. Orth., II, p. 412 (1906).

*Habitat.*—A female of another species of this genus is referred to Brunner's *punctifrons* with some doubt. It comes from "Province del Sara, Bolivia," where it was collected at an elevation of 450 meters above sea-level by J. Steinbach.

#### 8. *Dysonia* (?) *lamellipes* sp. nov.

There is also an additional species of katydid at hand, which appears to belong to the genus *Dysonia*. It is represented by a single ♀ nymph also taken by J. Steinbach during November in the "Province del Sara, Bolivia," at an elevation of 350 meters above sea-level. It differs from the imagos of the various described forms to such an extent that it very likely represents a new form. In color this nymph is largely brunneo-ferruginous somewhat varied with grayish testaceous. It has the disc of the pronotum smooth and flat, save that the surface is very finely transversely aciculated, with the hind lobe much amplified, while the lateral lobes are nearly perpendicular and joined to the disc by sharp carinæ which are sinuose. The hind femora are provided internally on their apical third with a single large, flattened, horizontally directed, lobe-like plate the hind margin

of which is bidentate; externally there is a similar, but smaller, lobe and two or three spines. The anterior and middle femora are each armed below on the front margin with three or four spines, the apical one of which is larger and tooth-like. Hind tibiae simply spined. Antennae distantly and narrowly fusco-annulate. Intermediate abdominal segments above and at the sides each provided near their hind margin with five prominent denticles.

Judging from the small size of this nymph the insect when grown must be smaller than is usually the case for the genus. Length of body 9.5 mm., of hind femora, which are slender, 11.5 mm.

I would suggest the name *Dysonia lamellipes* as a suitable name for this insect. It is in the Carnegie Museum.

#### Genus UBERABA gen. nov.

The present genus is erected for an insect with a very short ovipositor, coming from Chapada, Brazil. By referring to the generic synopsis it will be seen that it is most nearly related to *Polichnodes* Giglio-Tos.

Rather graceful, of medium or small stature, reminding one somewhat of the smaller species of *Anaulacomera* Stål, but differing from members of that genus in a number of essential characters.

#### 9. *Uberaba brevicauda* sp. nov.

Head of medium size, about as broad as the front edge of the pronotum, the sides parallel; fastigium of the vertex gently depressed, acuminate, sulcate, its lateral margins strongly divergent behind and continuing as rather blunt ridges well towards the eyes a little back of their middle and opposite a prominent tooth-like spine; fastigium of the front acuminate, separated from the fastigium of the vertex by a considerable distance. Pronotum more or less adorned with small, scattered, pale, dark-centered pimples, most numerous on the disc; the latter flat behind and with the margin evenly rounded, gently convex anteriorly, the front margin truncate, the lateral lobes roundly inserted, about as long as high, the anterior margin straight, lower, and posterior margins evenly rounded. Tegmina and wings fully developed; former coriaceous, the posterior border rounded, apex also rounded, secondary veins rather coarse and irregular; radial veins separated both basally and apically, contiguous mesially, the branch of the posterior one arising from about its middle, the branch forking

much in advance of its middle and both forks reaching the posterior margin before the apex. Tips of the wings extending well beyond the apex of the tegmina, coriaceous. Legs graceful, the femora all provided with a few spines beneath; anterior and middle tibiae sulcate above, the intermediate pair sometimes spined above externally. Auditory apparatus wide open on both margins. Subgenital plate of the male abdomen rather small, tricarinate, gently tapering, the apex truncate, without free styles. Cerci bowed, moderately robust, their apex furnished with a blunt inwardly directed tooth. Ovipositor very short, blunt, almost as wide as long, the upper valve minutely crenulated apically; subgenital plate small and triangular, its apex entire.

Color either pale yellowish green or ferruginous, the tegmina more or less dimly maculate or marmorate with fuscous accordingly as the pallid venation permits of the showing through of the fuscous back-ground of these organs. Pronotum irregularly flecked with dark-colored dots, these flecks varying from vinaceous to fuscous; anterior ulnar vein prominent, greenish even in the ferruginous colored specimens; antennae pale annulated with darker.

Length of body; ♂, 11 mm., ♀, 14 mm.; of pronotum, ♂, 3.25 mm., ♀, 3.50 mm.; of tegmina, ♂, 21 mm., ♀, 24 mm.; width of tegmina, ♂ and ♀, 4.75 mm.; length of hind femora, ♂, 13 mm., ♀, 14 mm., of ovipositor, 1.5 mm.

*Habitat.*—The types, ♂ and ♀, bear the label "Chapada, near Cuyabá, Matto Grosso, Brazil, August." Other specimens are also at hand which contain only the Chapada label. Some of them were taken during the months of June and July (H. H. Smith). The types are in the collection of the Carnegie Museum.

#### Genus CALLINSARIA Rehn.

*Callinsaria* REHN, Proc. Acad. Nat. Sci. Phila., 1913, pp. 361, 362.

The representatives of the present genus are confined to the tropical and subtropical regions of South America. The type of the genus, *C. clupeipennis* Rehn, came from Misiones, Argentina. What appears to be a second species is before me now. It has been given the name

#### 10. *Callinsaria boliviana* sp. nov.

In its general appearance this insect is somewhat similar to the figure and description of *clupeipennis* Rehn, but slightly larger, and some-

what differently shaped and colored. In the present insect, the entire costal margin of the tegmina is rather widely ivory white bordered behind by a conspicuous line of purple, and the costal field has fewer and more regularly arranged oblique white lines, while above or back of the radials the pale oblique marks are very dim or even almost obliterated, and the hind or dorsal margin is narrowly infuscated. The disc of the pronotum has its margin defined by carinæ, which are simply arcuate instead of sinuate, and the lateral lobes are much higher behind than in front. The auditory opening is black with the base of the anterior tibiæ dark vinaceous.

Length of body, ♂, 19 mm., of pronotum, 4.1 mm., of tegmina, ♂, 29 mm., of hind femora, 22 mm.

*Habitat.*—The two males at hand come from Puerto Suarez, Bolivia, where they were collected during November at an elevation of 150 meters above sea-level. (J. Steinbach.) The type is in the Carnegie Museum.

Genus ENTHEPHIPPION gen. nov.

Related to *Insara* Walker (*Hormilia* Stål) in its structural features as shown by the synopsis of genera given on preceding pages of the present paper. It also bears some resemblance to *Gymnocera* Serville, especially in colorational features and in the structure of the ovipositor.

The representatives of the present genus are rather small to medium in size. The head is a little wider than the anterior margin of the pronotum, the front perpendicular, sides parallel, the occiput short, rounded; fastigium of the vertex somewhat depressed, sulcate, blunt at apex and not quite touching the fastigium of the front; eyes moderately prominent, a little longer than wide. Pronotum with the disc somewhat narrowed anteriorly, the lateral angles blunt, anterior margin truncate, rounded behind, lateral lobes roundly inserted, the lower and posterior margins evenly rounded. Tegmina narrow, considerably longer than the abdomen and hind femora, their apex rounded; wings reaching beyond the tegmina by at least the width of the latter. Anterior and middle, as well as posterior femora, spineless beneath; anterior and middle tibiæ sulcate above, the latter spined on the inner margin near its middle. Ovipositor moderately robust, curved, and strongly dentate both above and below, as well as on the carinæ of the lateral disc. Antennæ filiform, not robust. The type of the genus is the species

11. *Enthephippion obscuripenne* sp. nov.

General color brunneo-ferruginous, varied on the tegmina and hind tibiae and femora with a tinge of green. Front with four fuscous spots above the base of the clypeus and the same number of inconspicuous dashes of the same color above the spots. Eyes castaneous. Antennæ ferruginous, apex of second joint piceous, beyond this the antennæ at intervals are fasciate with fuscous. Tegmina more or less fuscous along the disc, the costal and dorsal areas pallid, with a tinge of greenish. Wings infuscated. Legs of the general color, modified as follows: auditory apparatus fuscous, hind femora medially and hind tibiae, except basally and at extreme apex, greenish; all the tarsi beneath infuscated. Abdomen above with a rather wide longitudinal band of black, this color including the supra-anal plate.

Length of body, ♀, 11 mm., of pronotum, 3.4 mm., of tegmina, 20 mm., width of tegmina, 2.75 mm., length of hind femora, 16 mm., of ovipositor, 5 mm.

*Habitat*.—Chapada, Brazil, in April, a single female specimen, the type. (H. H. Smith.) In the collection of the Carnegie Museum.

## Genus SCUDDERIA Stål.

*Scudderia* STÅL, Bih. Svenska Akad., XXX (4), p. 41 (1873); *Ib.*, Recens. Orth. II, p. 14 (1874); BRUNNER, Mon. Phaneropt., pp. 25, 236 (1878); *Ib.*, Addit. Mon. Phaneropt., p. 16 (1891); SAUSSURE & PICTET, Biol. Cent.-Amer., Orth., I, p. 327 (1898).

The representatives of the genus *Scudderia* are rather widely distributed over North and Central America and also to a limited extent in the extreme northern parts of South America.

12. *Scudderia mexicana* (Saussure)?

*Phaneroptera mexicana* SAUSSURE, Rev. et Mag. Zool. (2), XIII, p. 129 (1861).

*Scudderia mexicana* SCUDDER, Proc. Amer. Acad. Arts. Sci., XXXIII, pp. 274, 276, 280, f. 5 (1898).

*Scudderia farculata* BRUNNER, Mon. Phaneropt., pp. 238, 239, Pl. 5, fig. 72b (1878); SAUSSURE & PICTET, Biol. Cent.-Amer., Orth., I, pp. 328, 329, 331, Pl. 15, fig. 21 (1897).

*Habitat*.—This insect is represented by material coming from the Island of Jamaica.

There are also specimens of *Scudderia furcata* in the collection. These latter bear no locality labels. They are very likely from some point in Pennsylvania, or nearby.

## Genus SYMMETROPLEURA Brunner.

*Symmetropleura* BRUNNER, Mon. Phaneropt., pp. 25, 245 (1878); *Ib.*, Addit. Mon. Phaneropt., p. 16 (1891).

The genus *Symmetropleura* of Brunner is found in both hemispheres, but seems most characteristic of the Occident. Five species have been described heretofore. The collection now being studied by me contains specimens of what appear to be two more. The American forms can be separated as follows:

## SYNOPSIS OF THE AMERICAN SPECIES OF SYMMETROPLEURA.

- A. Elytra narrower (6 mm.), their posterior margin straight. [North America.]  
*modesta* Brunner.
- AA. Elytra broader (10 mm. or more), their posterior margin rounded [South America].
- b. Tegmina with the anterior border of the basal part black margined.  
*levicauda* Brunner.
- bb. Tegmina with the anterior border concolorous.
- c. Posterior fork of branch of the hind radial confluent with the posterior ulnar vein.
- d. Subgenital plate of the male abdomen rather short, truncate at its apex and with the hind angles lengthily produced, style-like [Ecuador].....*fausta* Giglio-Tos.
- dd. Subgenital plate of the male abdomen somewhat longer, the apex roundly emarginate, the angles produced into very heavy blunt, clubbed, finger-like projections [Bolivia]...*boliviana* sp. nov.
- cc. Posterior fork of the branch of the hind radial not confluent with the posterior ulnar, although sometimes it may be joined to it by an oblique cross-vein [Bolivia].....*abnormis* sp. nov.

13. *Symmetropleura boliviana* sp. nov.

Related to *S. fausta* Giglio-Tos from Ecuador. The main differences between this new form and the insect to which compared are in the male genitalia.

Size medium, color grass-green. Fastigium of the vertex strongly depressed in front, shallowly sulcate, the apex blunt and widely separated from the fastigium of the front. Pronotum with its disc strongly flattened and longitudinally sulcate at middle, the lateral carinae acute, rather evenly convergent anteriorly, the front margin broadly and roundly emarginate, the hind margin evenly rounded; lateral lobes as described in *fausta*. Tegmina evenly rounded both in front and behind, the posterior ulnar vein straight and united with the upper fork of the branch of the radial which runs out at the apex,



the junction of the posterior oblique veins and the ulnar nodulose, pale; branch of the posterior radial originating near its middle, itself forking near its basal fourth. Anterior and middle legs graceful, rather numerously spined beneath; the tibiae sulcate and spined above. Hind femora spined below on both margins. Mesosternal lobes angulate behind, those of the metasternum rounded. Subgenital plate of male with the sides rather strongly convergent, the apex roundly emarginate between two robust finger- or club-like continuations of the lateral angles. Cerci moderately robust at base, strongly bowed and tapering, the apical portion provided with two or three small piceous spines or teeth.

Length of body, 23 mm., of pronotum, 5.5 mm., of tegmina, 38 mm., width of tegmina, 12.5 mm., length of hind femora, 26.5 mm.

*Habitat*.—The only specimen in color, a male and the type, comes from "Quatro Ojos, Department of Santa Cruz, Bolivia," where it was taken at an elevation of 300 meters above sea-level by J. Steinbach. It is in the Carnegie Museum.

A second specimen, also a male, is at hand. While not typical, it has nearly the same dimensions, but approaches the next species in the characters of the venation. It is apparently faded from immersion in spirits. The locality-label for this specimen is "Prov. del Sara, Bolivia, 350 m. J. Steinbach, 11-1913."

#### 14. *Symmetropleura abnormis* sp. nov.

As indicated in the synopsis of species above, the present insect is abnormal in the venation of the tegmina. Otherwise it is quite similar to both *fausta* and *boliviana*.

General color yellowish green, becoming testaceous on the head, legs, and lower side of body. Antenna infuscated apically, though with a magnifier showing minute pallid annulations. Subanal plate of abdomen of male similar to that of the above described form, but relatively smaller and with the prolongations of its lateral angles slenderer. Ovipositor short, strongly curved, both margins towards the apex minutely crenulate or serrate.

Length of body, ♂, 19 mm., ♀, 23 mm., of pronotum, ♂ and ♀, 5 mm., of tegmina, ♂, 33.5 mm., ♀, 38 mm.; width of tegmina, ♂, 11 mm., ♀, 12 mm.; length of hind femora, ♂, 23.5 mm., ♀, 27 mm.; of ovipositor, 5.5 mm.

*Habitat*.—1♂, 1♀, the types, both from the "Prov. del Sara, Bo-

livia, 350 m., J. Steinbach, 11-1913." These insects belong to the Carnegie Museum.

#### Genus LIGOCATINUS Rehn.

*Ligocatinus* REHN, Can. Ent., XXXIII, p. 272 (1901); KIRBY, Syn. Cat. Orth., II, p. 449 (1906).

*Amaura* BRUNNER (*nec* Moll.) Mon. Phaneropt., pp. 25, 247 (1878); *Ib.*, Verh. Zool.-bot. Ges. Wien, XLI, pp. 17, 122 (1891); SAUSS. & PICT., Biol. Cent.-Amer., Orth., I, p. 321 (1897).

The representatives of the genus *Ligocatinus* are few in number, but have a rather wide distribution, species occurring from Mexico to Central Argentina.

#### 15. *Ligocatinus spinatus* (Brunner)?

*Amaura spinata* BRUNNER, Mon. Phaneropt., p. 248, pl. 5, fig. 74 *a, b* (1878); *Ib.*, Addit. Mon. Phaneropt., p. 122 (1891); SAUSS. & PICT., Biol. Cent.-Amer., Orth., I, p. 322 (1897).

*Ligocatinus spinatus* KIRBY, Syn. Cat. Orth., II, p. 449 (1906).

*Habitat.*—Specimens of both sexes of what I take to be *L. spinatus* Brunner are at hand. They come from Corumbá, Brazil, (H. H. Smith), Puerto Suarez, and Province del Sara, Bolivia (J. Steinbach).

#### Genus HOMOTOICHA Brunner.

*Homotoicha* BRUNNER, Verh. Zool.-bot. Ges. Wien, XLI, pp. 17, 124 (1891).

This genus is rather closely related to the preceding, and contains five recognized forms. They are all South American in their distribution.

#### 16. *Homotoicha fuscopunctata* Caudell.

*Homotoicha fuscopunctata* CAUDELL, Proc. U. S. Nat. Mus., XXX, p. 236 (1906).

*Habitat.*—There are a number of specimens of both sexes at hand. They were taken at Chapada, Brazil (H. H. Smith) and Santa Cruz de la Sierra, Bolivia (J. Steinbach).

Although the series examined varies a little in size, they agree well with a type specimen which is in the writer's collection.

#### Genus THEUDORIA Stål.

*Theudoria* STÅL, Recens. Orth., II, p. 15 (1874); BRUNNER, Mon. Phaneropt., pp. 25, 249 (1878); *Ib.*, Addit. Mon. Phaneropt., pp. 17, 126 (1891).

This genus is confined to South America, and contains but few representatives.

17. *Theudoria pyrrhocnemis* Brunner?

*Theudoria pyrrhocnemis* BRUNNER, Mon. Phaneropt., p. 250 (1878); *Ib.*, Addit. Mon. Phaneropt., p. 126 (1891).

*Habitat.*—A single male specimen of the genus *Theudoria* is referred with some doubt to Brunner's *pyrrhocnemis*. It bears the locality label "Chapada, Brazil (H. H. Smith)."

## Genus PARASCUDDERIA Brunner.

*Parascudderia* BRUNNER, Addit. Mon. Phaneropt., pp. 18, 126 (1891). \*

The genus *Parascudderia* was created for a species of katydid coming from Fonteboa on the Upper Amazon, only the female of which was described. There is before me in the present collection a single male specimen, which runs to the genus in the synoptic table by a number of characters. It may be the opposite sex of Brunner's *dohrni*, but it is difficult to believe this, because it differs from Brunner's description in several respects. The following characterization of the specimen is offered.

18. *Parascudderia abnormalis* sp. nov.

General color sordid olivaceous, the secondary veins quite regular, sanguineous. Pronotum smooth, the disc somewhat convex, somewhat similar to that in *Ceraia*. Head medium or small, the occiput smooth, rounded; eyes globular, prominent; fastigium of the vertex somewhat flattened, gently depressed, blunt, and not touching the fastigium of the front. Pronotum with the lateral lobes roundly inserted, higher than long, anterior margin of the disc nearly straight, the hind margin broadly rounded. Tegmina translucent, rather scantily veined, the longitudinal veins greenish and testaceous, the cross-veins sanguineous, the minor veinlets pallid. Exposed portion of wings sordid olive, the remainder hyaline. Anterior femora below spineless, intermediate one-spined externally and hind pair many-spined on both margins. Anterior tibiae sulcate and provided externally above, just beyond the foramina, with a minute spine; middle tibiae also spined above. Last dorsal segment of abdomen of male rather large, on each side tumid; the supra-anal plate, or what seems to be a modification of it, divided above the bases of the cerci, into two widely separated long sickle-like appendages which are nearly twice as long as the cerci and somewhat flattened and smooth; the cerci moderately robust at base, bowed, tapering, and ending in a

dusky inwardly directed tooth. Subgenital plate elongate, attenuate, curved upward and truncate at its apex, the lateral angles provided with short, blunt, free styles.

Occiput and pronotum above dark brunneo-ferruginous, almost castaneous, the latter infuscated just above the humeral sinus, the disc of the lower portion of the lateral lobes marked with a large pallid area. Face, legs, and body below, testaceous.

Length of body, ♂, 20 mm., of pronotum, 5 mm., of tegmina, 31 mm., greatest width of same, 6.5 mm., length of hind femora, 21.5 mm.

*Habitat*.—Chapada, Brazil, in April (H. H. Smith). The type is in the Carnegie Museum.

#### Genus CERAIA Brunner.

*Ceraia* BRUNNER, Addit. Mon. Phaneropt., pp. 18, 127 (1891).

The present genus has been separated from the old *Scudderia* to accommodate several moderately large insects with the apex of ovipositor blunt or rounded. The described forms are in their distribution tropical American. At least a dozen species have been recognized.

#### 19. *Ceraia punctulata* Brunner?

*Scudderia punctulata* BRUNNER, Mon. Phaneropt., pp. 238, 243 (1878).

*Ceraia punctulata* BRUNNER, Addit. Mon. Phaneropt., pp. 128, 129 (1891).

Specimens coming from Chapada, Brazil, and Santa Cruz de la Sierra, Bolivia, are referred here with some doubt owing to a few slight differences from the description. The Bolivian specimens were taken by J. Steinbach, the Brazilian by H. H. Smith.

#### 20. *Ceraia cornutoides* Caudell.

*Ceraia cornutoides* Caudell, Proc. U. S. Nat. Mus., XXX, p. 237 (1906).

The present species is represented by specimens coming from Corumbá and Chapada, Brazil (H. H. Smith) and Puerto Suarez, Bolivia (either J. D. Haseman, or J. Steinbach).

#### 21. *Ceraia atrosignata* Brunner?

*Ceraia atrosignata* BRUNNER, Addit. Mon. Phaneropt., pp. 128, 130 (1891).

A single female specimen of the genus *Ceraia* is referred with a little doubt to Brunner's *atrosignata*. It was taken at "Las Juntas, Dept. Sta. Cruz, Bolivia," by J. Steinbach.

## Genus VELLEA Walker.

*Vellea* WALKER, Cat. Derm. Salt. B. M., II, p. 359 (1869); KIRBY, Syn. Cat. Orth., II, p. 451 (1906).

Only a single species of this genus has been thus far recognized from South America. The present writer had, at one time, a couple of nymphs bearing the locality label "Central America." Whether or not they belonged to another species I cannot say. These insects are now in the collection of Morgan Hebard, Philadelphia, Pennsylvania.

22. *Vellea cruenta* Burmeister.

*Phaneroptera cruenta* BURMEISTER, Handb. Ent., II, p. 691 (1838).  
*Scudderia cruenta* BRUNNER, Mon. Phaneropt., pp. 238, 244 (1878).  
*Ceraia cruenta* BRUNNER, Addit. Mon. Phaneropt., pp. 128, 131 (1891).  
*Vellea rosea* WALKER, Cat. Derm. Salt. B. M., II, p. 360 (1869).

A specimen is at hand from Rio de Janeiro, while another comes from Bonda, Dept. Magdalena, Colombia (H. H. Smith).

## Genus ECTEMNA Brunner.

*Ectemna* BRUNNER, Mon. Phaneropt., pp. 26, 251 (1878); *Ib.*, Addit. Mon. Phaneropt., p. 18 (1891); SAUSS. & PICT., Biol. Cent.-Amer., Orth., I, p. 323 (1897).

Another small genus of tropical American katydids, the insects comprised in which are related to *Scudderia*, *Ceraia*, etc.

23. *Ectemna carinata* Brunner?

*Ectemna carinata* BRUNNER, Mon. Phaneropt., p. 251, Pl. 5, fig. 76 a-c (1878); SAUSS. & PICT., Biol. Cent.-Amer. Orth., I, pp. 323, 324 (1897).

*Habitat.*—A single male katydid from Rio de Janeiro is referred here with some doubt. It was taken by H. H. Smith.

## Genus PARABLETA Brunner.

*Parableta* BRUNNER, Mon. Phaneropt. pp. 26, 253 (1878); Addit. Mon. Phaneropt., pp. 18, 133 (1891).

This genus is confined to South America, where the known species are all tropical in their distribution. Two species have been described heretofore, while a third is now added. They may be separated as follows:

## SYNOPSIS OF THE SPECIES OF PARABLETA.

- A. Posterior femora seven- to nine-spined on the internal margin. Ovipositor with the margins entire, smooth, the apex somewhat obtuse.
- b. Size larger (♂ tegmina 38 mm., ♀, 41 mm.) [Bolivia]... *boliviana* sp. nov.
- bb. Size smaller (♂ tegmina 33 mm., ♀, 33 mm.) [Ecuador].

*integricauda* Brunner.

AA. Posterior femora four- to five-spined on the internal margin. Ovipositor obtuse, the apex crenulate on both margins [Upper Amazon, Brazil].

*soror* Brunner.

24. *Parableta boliviana* sp. nov.

Related to *integricauda* of Brunner, from which it differs in its larger size.

Pale green, the eyes dark ferruginous, or brown. Fastigium of the vertex depressed, the apex subacute, sulcate, touching the fastigium of the front. Pronotum with the disc very slightly convex, its front margin shallowly and roundly emarginate, the hind margin evenly rounded; lateral lobes angulately inserted, perpendicular, higher than long, in front straight, below and behind evenly rounded. Tegmina scarcely subpellucid, though not opaque; the posterior fork of the branch of the hind radial approaching quite closely to the ulnar, to which it is joined by a short transverse veinlet. There are three infuscated spots located along the ulnar vein at the points where it emits branches and where it is joined with the fork of the posterior radial branch. Anterior and middle femora four- to five-spined below, hind pair seven- to nine-spined on both margins; anterior and middle tibiae one- to three-spined above. Last ventral abdominal segment moderately large, tapering but little, the sides carinated, fissured almost to the base, the styles elongate. Cerci similar to those in *integricauda*. Ovipositor smooth, subacuminate; the subgenital plate short, triangular, the middle carinated, the apex entire, blunt.

Length of body, ♂, 17 mm., ♀, 25 mm.; of pronotum, ♂ and ♀, 6 mm.; of tegmina, ♂, 38 mm., ♀, 41 mm.; width of same, ♂, 10 mm., ♀, 11 mm.; length of hind femora, ♂, 23 mm., ♀, 24 mm.; of ovipositor, 10 mm.

*Habitat*.—There are specimens at hand from "Province del Sara," and Quatro Ojos and Las Juntas, Department of Santa Cruz, Bolivia. The types, ♂ and ♀, are from the first named locality. They were taken during December. All the specimens were taken by J. Steinbach. The types are in the Carnegie Museum.

25. *Parableta soror* Brunner?

*Parableta soror* BRUNNER, Addit. Mon. Phaneropt., p. 134 (1891).

A single male katydid bearing the labels "Corumbá, high land," and "April" is referred doubtfully to this species. It was taken by H. H. Smith.

## Genus SCAPHURA Kirby.

*Scaphura* KIRBY, Zoöl. Journ. I, p. 432 (1825); II, p. 9 (1825); WESTWOOD, Zoöl. Journ. IV, p. 227 (1828); SERVILLE, Encl. Méth., Ins. X, p. 345 (1825)—and many others, see Kirby, Syn. Cat. Orth. II, p. 453 (1906).

*Aganacris* WALKER, Cat. Derm. Salt. B. M., V, suppl. p. 41 (1871).

Representatives of the genus *Scaphura* are confined to South American countries south of the equator, where they are most abundant in middle and southern Brazil.

26. *Scaphura nigra* (Thunberg).

*Gryllus niger* THUNBERG, Mém. Acad. Petersb. IX, p. 415 (1824).

*Scaphura nigra* STÅL, Recens. Orth., II, p. 15 (1874), for synonymy see KIRBY, Syn. Cat. Orth. II, p. 454 (1906).

*Habitat.*—Specimens are at hand from Rio de Janeiro and Chapada, Brazil, from Puerto Suarez and the Province del Sara, Bolivia, and from Rio Bermejo, Prov. of Salta, Argentina.

At least six varieties of this interesting species have been recognized and described.

## Genus GYMNOCERA Brullé.

*Gymnocera* BRULLÉ, Hist. Nat. Ins., IX, p. 145 (1835); BURMEISTER, Handb. Ent., II, p. 687 (1838); SERVILLE, Ins. Orth., p. 425 (1839); BLANCHARD, Hist. Nat. Ins., III, p. 24 (1840); KIRBY, Syn. Cat. Orth., II, p. 454 (1906).

*Scaphura* PERCHERON (*nec* Kirby) Gen. Ins. Orth., pl. 4 (1836).

The present genus is related to *Scaphura* in so far as its members are varicolored, but the basal portion of their antennæ lacks the hairs which are so prominent on the basal antennal joints in the representatives of that genus.

27. *Gymnocera elegans* Serville.

*Gymnocera elegans* SERVILLE, Hist. Ins. Orth., p. 427 (1839); KIRBY, Syn. Cat. Orth., II, p. 455 (1906).

*Scaphura elegans* BRUNNER, Mon. Phaneropt., pp. 256, 258, Pl. 5, fig. 79 a-c (1878).

Var. *Scaphura bicolor* BLANCHARD, D'Orbigny, Voy. Amer. Merid. VI, (2), p. 215, pl. 26, f. 7 (1844).

*Habitat.*—Several specimens, male and female, coming from Puerto Suarez, Bolivia, seem to belong here. They were taken by J. D. Haseman.

28. *Gymnocera fasciata* (Brunner)?

*Scaphura fasciata* BRUNNER, Mon. Phaneropt., pp. 257, 260 (1878).

*Gymnocera fasciata* KIRBY, Syn. Cat. Orth., II, p. 455 (1906).

*Habitat.*—A single imperfect female specimen coming from Rio de Janeiro has been referred here.

29. *Gymnocera infuscata* (Brunner).

*Scaphura infuscata* BRUNNER, Mon. Phaneropt., pp. 257, 262 (1878).  
*Gymnocera infuscata* KIRBY, Syn. Cat. Orth., II, p. 455 (1906).

*Habitat.*—Specimens are before me coming from Corumbá, Brazil, Puerto Suarez, Bolivia, and Rio Bermejo, Province of Salta, Argentina.

These latter specimens are much smaller than the typical form, and have much narrower tegmina than Brunner mentions in his description. Otherwise the description fits fairly well.

## Genus MICROCENTRUM Scudder.

*Microcentrum* SCUDDER, Bost. Journ. Nat. Hist., VII, p. 446 (1862) (*nec* Stål);  
 KIRBY, Syn. Cat. Orth., II, p. 455 (1906).

*Stilpnochlora* Stål, Öfv. Vet.-Akad. Förh. XXX (4), p. 40 (1873); *Ib.*, Recens. Orth., II, p. 19 (1874); BRUNNER, Mon. Phaneropt. pp. 32, 358 (1878); *Ib.*, Addit. Mon. Phaneropt., p. 18 (1891); SAUSSURE & PICTET, Biol. Cent. Amer., Orth., II, p. 367 (1898).

As indicated by the above synonymy there seems to have been some confusion concerning the large insects which comprise the present genus. At least seven species are recognized by recent writers.

30. *Microcentrum marginellum* (Serville).

*Phylloptera marginella* SERVILLE, Ins. Orth., p. 405 (1839).

*Microcentrum marginellum* KIRBY, Syn. Cat. Orth., II, p. 455 (1906). For a rather full synonymy of this insect see Kirby, *l. c.*

*Habitat.*—This insect is credited to Central and South America as well as to several of the West Indian islands. Specimens in the present collection come from Rio de Janeiro, Brazil, and the Isle of Pines, West Indies.

31. *Microcentrum incisum* (Brunner).

*Stilpnochlora incisa* BRUNNER, Mon. Phaneropt., pp. 359, 361 (1878); SAUSSURE & PICTET, Biol. Cent.-Amer., Orth., I, pp. 368, 369 (1898).

*Microcentrum incisum* KIRBY, Syn. Cat. Orth., II, p. 456 (1906).

*Habitat.*—Although this insect is credited to Peru a male specimen in the collection now under consideration comes from the Province del Sara, Bolivia, where it was collected by J. Steinbach.

## Genus PEUCESTES Stål.

*Peucestes* STÅL, Recens. Orth., II, p. 20 (1874); BRUNNER, Mon. Phaneropt., pp. 32, 363 (1878); *Ib.*, Addit. Mon. Phaneropt., pp. 18, 181 (1891); SAUSSURE & PICTET, Biol. Cent.-Amer., Orth., I, p. 370 (1898).



The genus *Peucestes* Stål is tropical and subtropical American in its distribution, and is made up of large showy insects. Eight species are known.

32. *Peucestes dentatus* Stål.

*Peucestes dentatus* STÅL, Recens. Orth., II, p. 45 (1874); BRUNNER, Mon. Phaneropt., pp. 364, 365 (1878); SAUSS. & PICT., Biol. Cent.-Amer., Orth., I, pp. 370, 371, Pl. 18, figs. 3-5 (1898).

*Phaneroptera citrifolia* BLANCHARD (*nec* Linnaeus), Hist. Ins., III, p. 24, Pl. 7 (1840).

*Habitat.*—There are two specimens of this species in the collection, a male and female. The former comes from Villa Bella, Bolivia, and the latter from El Calloa, Venezuela. Both specimens are quite typical.

33. *Peucestes unidentatus* Brunner.

*Peucestes unidentatus* BRUNNER, Addit. Mon. Phaneropt., pp. 182, 183 (1891).

*Habitat.*—A single female specimen bearing the locality label "Santa Cruz de la Sierra, Bolivia," is referred here. It was probably taken by J. Steinbach.

34. *Peucestes striolatus* Brunner.

*Peucestes striolatus* BRUNNER, Mon. Phaneropt., pp. 365, 366 (1878); BOLIVAR, Viaje al Pacifico, Ins., p. 58 (1884); SAUSSURE & PICTET, Biol. Cent.-Amer., Orth., I, pp. 370, 372 (1898).

*Habitat.*—There are in the collection two specimens of this interesting katydid from eastern Bolivia.

Genus POSIDIPPUS Stål.

*Posidippus* STÅL, Recens. Orth., II, p. 20 (1874); BRUNNER, Mon. Phaneropt., pp. 32, 36 (1878); *Ib.*, Addit. Mon. Phaneropt., pp. 19, 183 (1891); KIRBY, Syn. Cat. Orth., II, p. 453 (1906).

*Frontinus* STÅL, Recens. Orth., II, p. 20 (1874).

The insects which comprise the genus *Posidippus* Stål are all rather large and showy. They are tropical American and with a single exception are confined to South America. Including the species described herewith, there are an even dozen known to science.

35. *Posidippus flavolineatus* sp. nov.

Related to *P. stali* and *P. lineatus* and in size about midway between them. The costa, humeral angle, and posterior margin of the tegmina are flavous.

Front rounded, the fastigium of the front bituberculate, the margins

of these tubercles crenulate, touching the fastigium of the vertex, which also terminates in two smaller tubercles, sulcate. Pronotum widely, shallowly, and roundly emarginate in front, without a median denticle; carinae multidentate, somewhat arcuate. Anterior femora below on the front margin three-spined, middle four-spined, the hind pair ten- to twelve-spined externally, eight-spined internally; intermediate tibiae above externally four-spined, behind or internally five-spined.

Length of body, ♂, 38 mm., ♀, 40 mm.; of pronotum, ♂, 9.75 mm., ♀, 10.5 mm.; width of pronotum, ♂, 8 mm., ♀, 8.85 mm.; length of tegmina, ♂, 59 mm., ♀, 67 mm.; width of tegmina, ♂, 19 mm., ♀, 21 mm.; length of hind femora, ♂, 31 mm., ♀, 35 mm.; of ovipositor, 5.5 mm.

*Habitat.*—There is a large series of this insect in the collection. They come from Chapada and Corumbá, Brazil, where they were taken during June, July, and August by H. H. Smith. The types belong to the Carnegie Museum.

### 36. *Posidippus fastigosus* Brunner.

*Posidippus fastigosus* BRUNNER, Mon. Phaneropt., pp. 368, 370 (1878); *Ib.*, Addit. Mon. Phaneropt., p. 184 (1891); KIRBY, Syn. Cat. Orth., II, p. 459 (1906).

*Habitat.*—A single male coming from the Province del Sara, Bolivia, belongs here. It was taken by J. Steinbach.

### Genus STEIRODONOPSIS Scudder.

*Steiroduonopsis* SCUDDER, Proc. Bcst. Soc. Nat. Hist., XVII, p. 259 (1875); KIRBY, Syn. Cat. Orth. Brit. Mus., II, p. 458 (1906).

The present genus was established for an insect coming from the Peruvian Marañon. A second species is now added, based also on a single male specimen from Bolivia.

#### SYNOPSIS OF THE SPECIES OF STEIRODONOPSIS.

- A. Size larger (male, with tegmina 46 mm. long). Occiput and pronotum with a median longitudinal pink or reddish line..... *bilobata* Scudder.  
 A.A. Size smaller (male, with the tegmina 40 mm. long). Occiput and pronotum without a differently colored median longitudinal line..... *scudder* sp. nov.

### 37. *Steiroduonopsis scudder* sp. nov.

In many respects like *S. bilobata*, but decidedly smaller. Head short and rather broad, the occiput smooth and bulging

fastigium of the vertex rather prominent, but short, depressed, sulcate, tapering anteriorly, the two sides terminating in rounded tubercles, touching the two much larger, widely rounded, and elevated tubercles of the fastigium of the front; eyes large, globular, widely separated. Pronotum flat above, or even a little concave, its lateral carinæ prominent, crenulate; anterior margin roundly emarginate, behind rounded; lateral lobes about as long as high. Tegmina coriaceous, smooth. Hind femora compressed, not robust, hind and intermediate tibiæ compressed and rather strongly dilated basally. Anterior tibiæ with the auditory opening on the front side sub-linear, behind wide open. Subgenital plate rather small and tapering, tricarinate, the middle keel sharp, the lateral ones heavy and blunt, apex truncate, the styles short, conical; cerci heavy at their base, evenly tapering, bowed upwards, the apex terminating in a piceous tooth, or hook.

General color yellowish green, the lower side and limbs paler. Tubercles of the front and upper margin of the lateral lobes of the pronotum, base of anterior and middle tibiæ and tips of their femora lavender-tinted, two basal antennal joints and eyes ferruginous; pronotal carinæ, shoulders, basal portion of costal border, and posterior radial vein of tegmina testaceous. There are also scattered over the tegmina a number of small, inconspicuous, raised papillæ, which are likewise testaceous.

Length of body, ♂, 24 mm., of pronotum, 6.5 mm., width, 5.5 mm., length of tegmina, 40 mm., width, 12 mm., length of hind femora, 18 mm.

*Habitat.*—The only specimen available, the type, comes from the Province del Sara, Bolivia, where it was taken by J. Steinbach during December at an elevation above sea-level of 350 meters. It is the property of the Carnegie Museum.

#### Genus ANAULACOMERA Stål.

*Anaulacomera* STÅL, Vet.-Akad. Förh. XXX, (4) pp. 41, 43 (1873); *Ib.*, Recens. Orth., II, pp. 16, 35 (1874); BRUNNER, Mon. Phaneropt., pp. 27, 277 (1878); *Ib.*, Addit. Mon. Phaneropt., pp. 20, 140 (1891); SAUSS. & PICT., Biol. Cent.-Amer., Orth. I, p. 340 (1897).

*Æcella* KIRBY, Journ. Linn. Soc. Lond., Zool. XX, p. 535 (1890).

The present genus without doubt is the most extensive of the family Phaneropteridæ. Most of its representatives are tropical South American and seem to be well represented in the present collections. Only a portion of the specimens at hand have been studied with the

following result: *i. e.*, ten of the described forms have been determined provisionally, and three others have been set aside as possibly representing new species.

38. *Anaulacomera brevicauda* Brunner?

*Anaulacomera brevicauda* BRUNNER, Addit. Mon. Phaneropt., pp. 140, 144 (1891); KIRBY, Syn. Cat. Orth., II, p. 466 (1906).

*Habitat.*—A large series of an insect which appears to be this species is at hand. Both sexes are represented. They were taken at Chapada, Brazil. (H. H. Smith).

39. *Anaulacomera intermedia* Brunner.

*Anaulacomera intermedia* BRUNNER, Mon. Phaneropt., pp. 278, 283 (1878); *Ib.* Addit. Mon. Phaneropt., p. 140 (1891); KIRBY, Syn. Cat. Orth., II, p. 466 (1906).

*Habitat.*—A male *Anaulacomera* coming from Rio de Janeiro, Brazil, is referred to Brunner's *intermedia*. It was also taken by H. H. Smith.

40. *Anaulacomera nodulosa* Stål.

*Anaulacomera nodulosa* STÅL, Vet.-Akad. Förh. XXX (4) p. 43 (1873); *Ib.*, Recens. Orth. II, p. 35 (1874); BRUNNER, Mon. Phaneropt., pp. 279, 291 (1878); *Ib.* Addit. Mon. Phaneropt., p. 141 (1891).

*Habitat.*—A female specimen which agrees with Stål's *nodulosa* is among the material collected by H. H. Smith at Chapada.

41. *Anaulacomera unicolor* Brunner?

*Anaulacomera unicolor* BRUNNER, Addit. Mon. Phaneropt., pp. 142, 147 (1891); KIRBY, Syn. Cat. Orth., II, p. 467 (1906).

*Habitat.*—Among the material taken at Benevides, Brazil, is a female specimen which is doubtfully referred to Brunner's *unicolor*. It was taken by H. H. Smith.

42. *Anaulacomera chelata* Brunner.

*Anaulacomera chelata* BRUNNER, Mon. Phaneropt., pp. 280, 293 (1878); *Ib.*, Addit. Mon. Phaneropt., p. 143 (1891); KIRBY, Syn. Cat. Orth., II, p. 467 (1906).

*Habitat.*—Both sexes of the present species are before me. They were collected at Rio de Janeiro, Brazil, by H. H. Smith.

43. *Anaulacomera cornucervi* Brunner.

*Anaulacomera cornucervi* BRUNNER, Mon. Phaneropt., pp. 279, 290 (1878); *Ib.* Addit. Mon. Phaneropt., p. 143 (1891); KIRBY, Syn. Cat. Orth., II, p. 468 (1906)

*Habitat.*—A couple of specimens, male and female, from Santa Cruz de la Sierra, Bolivia, are referred here. They were taken by J. Steinbach.

44. *Anaulacomera dama* Rehn.

*Anaulacomera dama* REHN, Proc. Acad. Nat. Sci. Phila., 1913, p. 369, figs. 31, 32.

*Habitat.*—A female specimen coming from the "Province del Sara, Bolivia," is referred to Rehn's *A. dama*. It was taken by J. Steinbach during the month of October, 1913, at an elevation of 350 meters above sea-level.

45. *Anaulacomera inversa* Brunner.

*Anaulacomera inversa* BRUNNER, Mon. Phaneropt., pp. 278, 284 (1878); *Ib.*, Addit. Mon. Phaneropt., p. 143 (1891).

*Habitat.*—There is a male specimen of the genus *Anaulacomera* at hand which seems to be *A. inversa* Brunner. It was taken by H. H. Smith at either Chapada, or Rio de Janeiro, Brazil.

46. *Anaulacomera biramosa* Brunner?

*Anaulacomera biramosa* BRUNNER, Addit. Mon. Phaneropt., pp. 143, 148 (1891); KIRBY, Syn. Cat. Orth., II, p. 468 (1906).

*Habitat.*—A male specimen of still another species of the genus *Anaulacomera* is referred doubtfully to *biramosa* Brunner. It comes from Rio de Janeiro, Brazil, where it was collected by H. H. Smith.

47. *Anaulacomera sulcata* Brunner?

*Anaulacomera sulcata* BRUNNER, Mon. Phaneropt., pp. 279, 289 (1878); *Ib.*, Addit. Mon. Phaneropt., p. 143 (1891).

*Habitat.*—Male and female specimens of an *Anaulacomera* from Rio de Janeiro, Brazil, seem to fit the description of *sulcata* Brunner, better than any other of the tabulated species. (H. H. Smith, collector.)

Genus GRAMMADERA Brunner.

The genus *Grammadera* is composed of medium-sized insects, all of which are confined to tropical and sub-tropical South America, where they are distributed from the Guianas and Ecuador to Buenos Aires, Argentina. Their center of abundance, however, seems to be southern Brazil. Altogether ten species have been recognized. Three of these are herewith described as new.

48. *Grammadera albida* Brunner?

*Grammadera albida* BRUNNER, Mon. der Phaneropt., p. 298 (1878); REHN, Proc. Acad. Nat. Sci. Phila., 1907, p. 377.

Specimens which I am inclined to regard as Brunner's species

*albida*, though doubtfully, bear the labels "Chapada, Brazil," (H. H. Smith) and "Province del Sara, 350 meters, Bolivia" (J. Steinbach). The species has been recorded heretofore from Misiones, Argentina, and Sapucay, Paraguay, by Rehn, and simply "Brazil" by Brunner.

49. *Grammadera chapadensis* sp. nov.

Somewhat closely related to *albida* Brunner and *rostrata* Rehn, but a little larger than both of them. The chief characteristics seem to be in the structure of the supra-anal plate, which in this species has the vertical compressed apical portion very large, smooth, and formed like the blade of a broad hatchet, which when viewed laterally gives the impression of a short ovipositor instead of a male appendage. The male cerci are much as described for this sex of *albida*, as is also the subgenital plate. The venation is similar to that of *rostrata* as figured by Rehn (Proc. Acad. Nat. Sci. Philad., 1907, p. 378), while the ovipositor is slightly more falcate and somewhat tapering instead of noticeably broadened at the apical third.

The general color of this insect is pale grass-green with a moderately large, circular, sub-basal, dark brown maculation on the external area of the stridulating field of each elytron of the male, and a narrow, more or less strongly infuscated edge, on the dorsal margin in both sexes.

Length of body, ♂ and ♀, 20 mm.; of pronotum, ♂, 4.1 mm., ♀, 4.5 mm.; of tegmina, ♂, 31 mm.; ♀, 33 mm., width of tegmina ♂ and ♀, 7 mm.; length of hind femora, ♂, 18 mm., ♀, 19.5 mm.

*Habitat*.—A number of specimens are at hand from Chapada, near Cuyabá, Matto-Grosso, Brazil. Types are in the Carnegie Museum. There are no variations in the form of the apical portion of the supra-anal plate in the ten or a dozen males examined, nor in the ovipositors of the seven females at hand.

50. *Grammadera clara* Brunner?

*Grammadera clara* BRUNNER, Mon. der Phaneropt., p. 298 (1878).

A male specimen of the genus *Grammadera* coming from Corumbá, Brazil, is referred here with some doubt. It was taken by H. H. Smith.

51. *Grammadera janeirensis* sp. nov.

Related to both *pellucida* Giglio-Tos and *forcipata*, so far as the structure of the male genitalia are concerned, but having the elongate

fastigium of the vertex of *hastata* Brunner. Like both *pellucida* and *forcipata* this insect has the sulcate pronotum.

Moderately robust, body compressed; head small, depressed, the fastigium of the vertex prominent, projecting beyond the front, its sides parallel, in the male plane, in the female broadly and shallowly sulcate. Pronotum smooth, the disc ridged in center anteriorly, becoming flat posteriorly, where it is depressed, so that when viewed laterally it appears somewhat arcuate, the middle provided with a longitudinal depressed line. Tegmina coriaceous, the veining a little irregular, the hind margins evenly rounded. Anterior and middle femora four-spined below; hind femora three-spined on exterior margin. Supra-anal plate of male triangular, rather plain, cerci as in *forcipata*. subgenital plate moderately long, tapering, tectate, and carinated below, the apical third slender, deeply fissured, the parts finger-like, Ovipositor somewhat sickle-shaped, widest beyond its middle, acuminate, its lower margin somewhat crenulate on apical half; subgenital plate tapering rather deeply, and angulately emarginate.

General color chrome-green. Front whitish, pronotum, legs, and lower side somewhat testaceous. Stridulating area of male tegmina embrowned basally and centrally.

Length of body, ♂, 16 mm., ♀, 19 mm.; of pronotum, ♂ and ♀, 5 mm.; of tegmina, ♂, 25 mm., ♀, 28 mm.; width of tegmina, ♂, 6.5 mm., ♀, 7.25 mm.; length of hind femora, ♂, 14.5 mm., ♀, 15.5 mm.; of ovipositor, ♀, 9.5 mm.

*Habitat.*—The types and only specimens at hand are labeled "Rio de Janeiro, Oct." and were taken by H. H. Smith. They are the property of the Carnegie Museum.

#### 52. *Grammadera steinbachi* sp. nov.

A third apparently new form is before me. It belongs to the same section of the genus and is quite closely related to the preceding as well as to *albida* and possibly also to *rostrata*. It, like *chapadensis*, has quite a distinct structure of the vertical apical portion of the supra-anal plate. In the present form it is scarcely a hatchet-blade, but is rounded from above, has the lower side deeply and widely emarginate, followed by a long slender tooth which is directed downwards. On the upper side and just at the base of the vertical portion is located a prominent tooth with its apex directed anteriorly. Cerci and subgenital plate very similar to that of *albida*. Ovipositor as

figured for *rostrata* Rehn. General color much as in *chapadensis*, but a little paler.

Length of body, ♂, 21 mm., ♀, 22 mm.; of pronotum, ♂, 3.85 mm., ♀, 4.15 mm.; of tegmina, ♂, 29 mm., ♀, 31 mm.; width of tegmina, ♂, ♀, 6.5 mm.; length of hind femora, ♂, 18.5 mm., ♀, 19.5 mm., of ovipositor, ♀, 13.5 mm.

*Habitat.*—The types male and female, come from Puerto Suarez, Bolivia, where they were taken by J. Steinbach during the months of November to January. They are in the Carnegie Museum.

Other individuals are also at hand from the same locality. The male genitalia are the same in all the specimens, as is likewise the ovipositor in the various females at hand.

#### Genus TOMEOPHORA Brunner.

*Tomeophora* BRUNNER, Mon. Phaneropt., pp. 28, 299 (1878).

This genus of katydids is entirely confined to South America, where the known species seem to be more or less restricted in their distribution. Judging from their peculiar tegminal venation I surmise that they are either found among bamboos, or infest grass rather than arboreal and herbaceous vegetation. Three species have previously been described, while two are now characterized. Possibly still others remain undiscovered. The subjoined table will materially assist in separating the forms:

#### SYNOPSIS OF THE SPECIES OF TOMEOPHORA.

- A. Fastigium of the vertex laminately compressed, greatly surpassing the first antennal joint.....*gladiatrix* Brunner.
- AA. Fastigium of the vertex not greatly surpassing the first antennal joint, usually obtuse.
  - b. Tegmina with their median width about twice the length of the pronotum.
    - c. Tegmina with their posterior margin distinctly rounded. Fastigium of the vertex equal to the first antennal joint in length, sulcate. [Peru].....*pungiunculata* Brunner.
    - cc. Tegmina with their hind margin straight. Fastigium one-half the length of the first antennal joint, scarcely sulcate. [Bolivia].  
*brevirostris* sp. nov.
  - bb. Tegmina with their median width less than twice the length of the pronotum.
    - c. Posterior margin of the pronotal disc angulate, the hind margin of the tegmina rounded. (Veins of the tegmina prominent, parallel).  
*ovatifennis* sp. nov.
    - cc. Posterior margin of pronotal disc rounded, the hind margin of tegmina straight. Veins of the tegmina not prominent...*modesta* Brunner.



53. *Tomeophora brevirostris* sp. nov.

*Male*.—This insect can best be compared with *T. pungiunculata* of Brunner from Peru, to which species it is most nearly related. In the accompanying synoptical table the former species is described as having the fastigium of the vertex sulcate and equal in length to the first antennal joint. The present species has the fastigium much shorter and scarcely sulcate. The former also has the posterior edge of the tegmina plainly rounded, while in *brevirostris* they are straight. The apex of the tegmina of the latter is also much more broadly rounded than in that of the former. The coloration and type of venation is somewhat similar in both.

Length of body, 18 mm., of pronotum, 4.2 mm., of tegmina, 29.5 mm., width of tegmina, 8.5 mm., length of hind femora, 16 mm.

*Habitat*.—"Province del Sara, Bolivia, 350 m." J. Steinbach, collector, February, 1913. Only the type is at hand. It is deposited in the Carnegie Museum of Pittsburgh.

54. *Tomeophora pungiunculata* Brunner.

*Tomeophora pungiunculata* BRUNNER, Mon. Phaneropt., p. 300 (1878).

*Tomeophora pungiunculata* BRUNNER, Addit. Mon. Phaneropt., p. 152 (1891).

A female from Chapada, Brazil, is placed here. It was taken by H. H. Smith.

55. *Tomeophora ovatipennis* sp. nov.

A medium-sized insect with rather roughened leathery tegmina, the color of which is greenish-yellow, tinged at base and along the anterior and posterior borders with ruddy lavender.

Fastigium of the vertex somewhat compressed, almost reaching the apex of the first antennal joint, not in the least sulcate above. Pronotum with its median carina quite prominent throughout, the hind margin of the disc rounded or subangulate; lateral lobes about as long as high, their lower margin oblique, the lower posterior angle rounded. Tegmina less than twice as wide at middle as the length of the pronotum, coriaceous, opaque, the longitudinal veins heavy and parallel, transverse veins few and also parallel apically, the apex rather broadly rounded. Wings acuminate, the exposed portion leathery; the stridulating vein heavy, smooth, preceded by a deep oval pit. Supra-anal plate triangular, the last ventral segment tapering and roundly and moderately deeply emarginate. Cerci

strongly hirsute, elongate, bent a trifle downwards at middle and bowed, the apex a little enlarged.

General color yellowish green, the tegmina tinged at base and along the anterior and posterior margins with vinaceous or ruddy lavender.

Length of body, 17 mm., of pronotum, 4.15 mm., of tegmina, 17.5 mm., width of tegmina, 6 mm., length of hind femora, 16 mm.

*Habitat.*—A single male, the type, was taken by J. Steinbach during the month of October. It came from the "Prov. del Sara, Bolivia," where it occurred at an elevation above sea-level of 350 meters. Like the former, this specimen is the property of the Carnegie Museum.

#### Genus PHYLLOPTERA Serville.

*Phylloptera* SERVILLE, Ann. Sci. Nat., XXII, p. 142 (1831); *Ib.*, Hist. Orthopt., p. 402 (1839); BURMEISTER, Handb. Ent., II, p. 691 (1838); BRUNNER, Monog. Phaneropt., pp. 28, 307 (1878); *Ib.* Addit. Monog. Phaneropt., pp. 21, 156 (1891); SAUSSURE et PICTET, Biol. Cent.-Amer., I, pp. 351 (1897).

The present genus is typically tropical American. The three dozen or more species, which have been referred to it, vary greatly in size and general appearance, as may be gathered from a reference to Brunner's *Monograph of the Phaneropteridæ* and his *Addimenta* thereto. Undoubtedly many more forms exist, which remain to be made known. In fact the present collection contains a number, which do not appear to fit in Brunner's last synoptical key for the separation of the forms; but, until all of the other species described since—a dozen or more of them—are synoptically treated, it is difficult to place new forms definitely. Specimens of two species are at hand, however, which on account of their marked characteristics have been determined as probably new and deserving of description.

#### 56. *Phylloptera quinque-maculata* sp. nov.

Related to *maculosa* of Burmeister, from which it differs in its considerably smaller size as well as in other characters here noted. Body, and especially the head, pleura, and legs, hirsute. Anterior tibiae plainly sulcate above, armed on this side only with the external apical spine, the intermediate pair likewise armed; anterior and middle femora both spined below on their anterior margin, the hind pair armed as in *maculosa*. Pronotum with the posterior third of the disc cinereous, margined with dark purple merging into black. Elytra broadly rounded behind, the apex roundly acuminate, the disc provided with five whitish twin maculations surrounded by purple, three

of these maculations following the ulnar vein and the other two located on the forks of the branch of the posterior radial. The branch of the radial is given off at about its middle and forks on its basal third.

General color pale green, the legs, and especially the tibiae, closely flecked with ferruginous and fuscous dots about the roots of the pale hairs mentioned above. Under side testaceous. Ovipositor short and very robust, strongly bent upward, the apex acuminate.

Length of body, ♂, 19 mm., ♀, 20 mm.; of pronotum, ♂, 5 mm., ♀, 5.5 mm.; of tegmina, ♂, 31 mm., ♀, 35 mm.; width of tegmina, ♂, 10 mm., ♀, 12 mm.; length of hind femora, ♂, 16 mm., ♀, 17 mm.; of ovipositor, 5 mm.

*Habitat.*—The male and female types, as well as quite a series of other specimens were taken at Chapada, near Cuyabá, Matto Grosso, Brazil, during the months of June to August. (H. H. Smith collector.) The types are in the Carnegie Museum.

#### 57. *Phylloptera ovalifolia* Burmeister.

*Phylloptera ovalifolia* BURMEISTER, Handb. Ent., II, p. 693 (1838); BRUNNER, Monog. Phaneropt., pp. 309, 311, pl. 6, fig. 89, a-c (1878); BOLIVAR, Viaje al Pacif., Ins., p. 56 (1884); SAUSSURE et PICTET, Biol. Cent.-Amer., I, p. 352 (1897).  
*Phylloptera punctum-album* SERVILLE, Ins. Orth., p. 407, no. 5 (1839).  
*Phylloptera viridicata* SERVILLE, l. c. no. 6 (1839).

*Habitat.*—A number of this rather generally distributed and somewhat variable species are at hand. They come from Rio de Janeiro (H. H. Smith).

#### 58. *Phylloptera roseo-inflata* Brunner?

*Phylloptera roseo-inflata* BRUNNER, Addit. Monog. Phaneropt., pp. 157, 16 (1891).

*Habitat.*—Several specimens of what I doubtfully refer to Brunner's *P. roseo-inflata* are found among the material collected by H. H. Smith at Chapada, near Cuyabá, Matto Grosso, Brazil. Both sexes are represented.

#### 59. *Phylloptera famula* Brunner.

*Phylloptera famula* BRUNNER, Monog. Phaneropt., pp. 309, 313 (1878); *Ib.*, Addit. Monog. Phaneropt., p. 158 (1891).

*Habitat.*—Several specimens of both sexes of a small species of the genus coming from Corumbá, Brazil, are referred here with doubt. They were collected by H. H. Smith. Other specimens are also at hand coming from Bolivian localities. These latter were taken by J. Steinbach.

60. *Phylloptera linea-purpurea* sp. nov.

Related to *P. picta* Brunner, but much smaller and of different color. Rather below the medium in size, somewhat robust, and with sub-corneous shining tegmina.

Front smooth and rounded, nearly perpendicular, the sides a little compressed, roughened; vertex acuminate, sulcate. Pronotum with the disc flat, roundly emarginate in front, rounded behind, in the middle provided with a depressed longitudinal line; lateral carinae flavous, blunt, but continuous to the front border; lateral lobes perpendicular, higher than long. Elytra sub-corneous, rather closely punctulate, shining, the veins of the costal area very obscure, widest before the middle. Anterior femora below two-spined in front, intermediate three-spined and the posterior many-spined externally and three-spined internally. Mesosternal lobes acuminate, the metasternal lobes rounded behind.

General color of pronotum, tegmina, and body above greenish testaceous. Lateral carinae of pronotum flavous in continuation of the humeral angle and dorsal margin of the tegmina, on the disc of pronotum bordered internally with a vinaceous line, which continues anteriorly along the sides of the occiput to the hind margin of the eyes. Tegmina punctulate, marmorate and maculate with ferruginous, purple, and brown. Of the larger maculations there are six, three located along the ulnar vein, one on the upper fork of the radial branch, and two on the lower fork.

Length of body, ♂, 21 mm., of pronotum, 4.75 mm., of tegmina, 28 mm., width of tegmina, 8.5 mm., length of hind femora, 15 mm.

*Habitat*.—The single specimen now before me comes from the "Province del Sara, Bolivia," where it was taken at an elevation of 450 meters above sea-level. (J. Steinbach, collector.) The type belongs to the insect collections of the Carnegie Museum.

61. *Phylloptera spinulosa* Brunner?

*Phylloptera spinulosa* BRUNNER, Monog. Phaneropt., pp. 309, 314 (1878); *Ib.* Addit. Monog. Phaneropt., p. 159 (1891).

*Habitat*.—There are specimens at hand from both Chapada and Corumbá, Brazil, which appear in some regards to be this species according to the synoptical table given in Brunner's Additamenta. They were taken by H. H. Smith, but the reference is only made by me provisionally.

## Genus HYPERPHRONA Brunner.

*Hyperphrona* BRUNNER, Monog. Phaneropt., p. 315 (1878); *Ib.*, Addit. Monog. Phaneropt., p. 165 (1891).

This is one of the commoner genera of American katydids, but its representatives seem to be confined to the tropical portions of South America. A dozen or more species are already known. Another is now added. The various representatives can be separated by the table of Brunner's as printed in the later of the two publications referred to above.

62. *Hyperphrona abdominalis* sp. nov.

A rather large insect related to Brunner's *striolata*, from which it differs very notably in having the abdomen of both the male and female very strongly tinted with bright carmine above, and along the hind margins of all the segments, even well down their sides, in the longer hind femora and tegmina of the male; and in having the antennæ ferruginous and annulated with fuscous throughout, instead of being entirely fuscous. The terminal segments of the abdomen of the male, together with the cerci are similar to those described for this sex of *striolata*. General color yellowish green, the head, pronotum, legs, and under side paler, almost dull white; antennæ with the two basal joints whitish and twice longitudinally streaked, and the apex half-way margined with deep black; several of the following joints, all of which are ferruginous, also longitudinally streaked with black below. Eyes pale castaneous. Anterior and median tibiæ more or less tinged with ferruginous, the hind pair also to a limited degree likewise tinted apically. Tegmina with three dark blotches along the ulnar vein where its principal branches are given off, the dorsal margin and also the cells along some of the veins more or less infuscated. Abdomen as described above, the last segment of the male dorsally having the lateral acuminate lobes colored to their tips. Ovipositor with the apex and corrugations or tooth-like roughenings piceous.

Length of body, ♂, 27 mm., ♀, 29 mm.; of pronotum, ♂ and ♀, 6 mm.; of tegmina ♂, 42 mm., ♀, 45 mm.; greatest width of same ♂ and ♀, 18 mm.; length of hind femora, ♂, 24 mm., ♀, 25 mm.; of ovipositor, 10 mm.

*Habitat*.—The female type comes from Las Juntas, Department of Santa Cruz, Bolivia, at an elevation of 250 meters above sea-level.

Another pair are labeled "Province del Sara, Bolivia," from an elevation of 350 meters. The former were collected in December, while the latter were taken in November. All of these specimens were collected by J. Steinbach. The types, ♂ and ♀, are among the collections of the Carnegie Museum.

The female specimen taken in the Province del Sara has the tegmina 2 mm. narrower and 4 mm. shorter than those of the type.

### 63. *Hyperphrona cærulescens* Brunner?

*Hyperphrona cærulescens* BRUNNER, Addit. Monog. Phaneropt., p. 166 (1891).

*Habitat.*—A single female specimen belonging to the genus *Hyperphrona*, bearing the locality label "Corumbá, Brazil (high land)," is referred with doubt to *H. cærulescens* Brunner. It was taken during April by H. H. Smith.

### Genus TOPANA Walker.

*Topana* WALKER, Cat. Derm. Salt. B. M., II, p. 364 (1869); KIRBY, Syn. Cat. Orth., II, p. 478 (1906).

*Plagioptera* STÅL, Öfv. Vet.-Akad. Förh. XXX (4), p. 41 (1873); *Ib.*, Recens. Orth., II, p. 16 (1874); BRUNNER, Mon. Phaneropt., pp. 29, 321 (1878); *Ib.*, Addit. Mon. Phaneropt., p. 22 (1891).

The present genus contains small, slender-limbed insects, which undoubtedly live somewhat obscure lives, either upon the ground among scattered small vegetation, or upon the trunks of trees among vines and other entangling plants. All of the species are more or less vari-colored, marked by blotches or splashes of ferruginous, giving to them the appearance of dead or dying leaves. The genus is based on the species placed by Brunner in his section I.1. of the table for separating them (see Mon. Phaneropt. p. 322). All of these insects seem to be confined to South America. Five species have been described, three of them by Walker, and one each by Stål and Brunner. A sixth appears to be represented in the material at hand.

### 64. *Topana media* Walker?

*Topana media* WALKER, Cat. Derm. Salt. B. M., II, p. 365 (1869); KIRBY, Syn. Cat. Orth., II, p. 478 (1906).

*Habitat.*—A male specimen of *Topana* has been referred with some doubt to Walker's *T. media*. It comes from the "Province del Sara, Bolivia," where it was taken during February at an elevation of 350 meters above the sea-level (J. Steinbach).

65. *Topana postica* Walker.

*Topana postica* WALKER, Cat. Derm. Salt. B. M., II, p. 365 (1869); KIRBY, Syn. Cat. Orth., II, p. 478 (1906).

*Habitat.*—A single female, bearing the locality label "Puerto Suarez, Bolivia," is at hand.

66. *Topana rubiginosa* sp. nov.

About the size of *cincticornis* Stål, but somewhat more robust. Hind margin of elytra for about two-thirds of their length straight. Fastigium of the vertex open behind, but scarcely tuberculate. Pronotum with the disc flat and entirely margined with a raised carina, which on the sides is bisinuate, so as to leave a rather prominent outwardly directed tooth. Legs much as in *cincticornis*, but with only two large compressed spines, instead of four to five smaller slender ones on the front and intermediate femora.

Head rust-red, the fastigium of front and of vertex ivory-white, basal antennal joints testaceous, beyond at rather distant intervals widely banded with fuscous, as in *cincticornis*. Pronotum on the lateral lobes, pleura, and abdomen ferruginous; the disc dirty yellow, very narrowly bordered in front and at sides with purple, becoming black on hind margin inside of the bounding carina, the latter old-ivory-white. Tegmina yellowish green, with the stridulating field and dorsal margin, the base of costal field, and a large patch on middle of hind border, solid ferruginous; the remainder of costal and ulnar borders irregularly blotched with patches of the same color. Basal third of hind femora and apex of all the femora and bases of the tibiæ dark ferruginous.

Length of body, ♂, 11 mm., of pronotum, 3 mm., of tegmina, 21 mm., width of tegmina, 7.15 mm., length of hind femora, 12.25 mm.

*Habitat.*—Chapada, Brazil, in April (H. H. Smith). The insect is accompanied by a red label bearing the number 2157. The type is unique. It is deposited in the Carnegie Museum.

67. *Topana cincticornis* Stål.

*Plagioptera cincticornis* STÅL, Öfv. Vet.-Akad. Förh. XXX (4), p. 43 (1873); BRUNNER, Mon. Phaneropt., 322, 323 (1878).

*Topana cincticornis* KIRBY, Syn. Cat. Orth., II, p. 478 (1906).

*Habitat.*—There are a number of specimens of both sexes of this insect at hand, which also come from Chapada, Brazil (H. H. Smith).

Some of these vary considerably, both in color and size, from the typical form as described by Stål. At present, however, they are left without further study.

Genus PYCNOPALPA Serville.

*Pycnopalpa* SERVILLE, Ins. Orth., p. 408 (1839).

*Soria* WALKER, Cat. Derm. Salt. B. M., II, p. 363 (1869).

This is a closely related tropical American genus represented by two species.

68. *Pycnopalpa bicordata* Serville.

For synonymy see KIRBY, Syn. Cat. Orth., II, p. 477 (1906).

*Habitat*.—There are specimens of both sexes of this insect at hand. They come from Rio de Janeiro, where they were taken by H. H. Smith.

Genus DIPLOPHYLLUS Saussure.

*Diplophyllus* SAUSSURE, Rev. et Mag. Zoöl. (2), p. 202 (1859).

*Turpilia* STÅL, Recens. Orth., II, p. 16 (1874); BRUNNER, Monog. Phaneropt., pp. 29, 324 (1878); *Ib.*, Addit. Monog. Phaneropt., pp. 22, 176 (1891); SAUSSURE et PICTET, Biol. Cent.-Amer., Orthop., I, p. 353 (1898); KIRBY, Syn. Cat. Orthopt., II, p. 478 (1906).

The representatives of the present genus are for the most part found in the tropical portions of the Americas. Already at least fifteen species have been recognized. What appears to be an additional species is now at hand.

69. *Diplophyllus insularis* sp. nov.

Related to *opacus* Brunner and *punctatus* Stål, from both of which it differs in several respects.

Eyes globose, quite prominent; fastigium of the vertex subacuminate, profoundly sulcate. Pronotum subopaque, rather closely and coarsely punctulate, the disc flat, gently narrowed anteriorly, the sides distinctly carinated, but the carinae becoming less marked from behind forward, the front margin straight, behind subangulately rounded; lateral lobes much higher than long, the anterior margin roundly emarginate. Tegmina subopaque, the hind margin nearly straight, moderately broad. Anterior and middle femora spined beneath on the front margin, the hind pair spined on both margins. Metasternal lobes rather lengthily produced behind, their outer margin straight, the inner margin rounded; mesosternal lobes triangular, acuminate. Hind femora rather short. Ovipositor short, strongly bent upwards, the apex subacuminate, the apical half crenulate on both margins.



General color grass-green, eyes castaneous; face testaceous; apex of ovipositor more or less piceous.

Length of body, ♀, 23.5 mm., of pronotum, 5.65 mm., of tegmina, 35 mm., width of tegmina, 10 mm., length of hind femora, 18 mm., of ovipositor, 5.5 mm.

*Habitat.*—The type and only specimen examined is contained in a collection made at Nueva Gerona, Isle of Pines, West Indies. It was taken during the month of June, and is in the Carnegie Museum, belonging to Acc. No. 4656.

#### Genus OROPHUS Saussure.

*Orophus* SAUSSURE, Rev. et Mag. Zool. (2), XI, p. 204 (1859); WALKER, Cat. Derm. Salt. Brit. Mus., II, p. 381 (1869); KIRBY, Syn. Cat. Orth., II, p. 480 (1906).

*Microcentrum* SCUDDER (in part), Boston Journ. Nat. Hist., VII, p. 446 (1862); STÅL, Recens. Orth., II, p. 18 (1874); BRUNNER, Monog. Phaneropt., pp. 29, 333 (1878); *Ib.*, Addit. Monog. Phaneropt., pp. 22, 179 (1891).

The genus *Orophus* contains more than two dozen recognized species, all of which belong to the tropical regions of America. At least two or three of the species, however, also occur in the temperate regions of North America nearly or quite to the northern border of the United States.

#### 70. *Orophus angustatus* (Brunner).

*Microcentrum angustatum* BRUNNER, Mon. Phaneropt., pp. 334, 335 (1878); *Ib.* Addit. Mon. Phaneropt., p. 179 (1891); SAUSSURE & PICTET, Biol. Cent.-Amer., Orth., I, pp. 357, 358 (1898).

*Orophus angustatus* KIRBY, Syn. Cat. Orth., II, p. 480 (1906).

*Habitat.*—There are specimens of this species at hand, which were taken at Bogotá, Colombia, and Bahia, Brazil (H. H. Smith), and others coming from the Province del Sara, Bolivia (J. Steinbach). The latter were collected during the months of February, November, and December at a locality with an elevation of 350 meters above sea-level.

#### 71. *Orophus lanceolatus* (Burmeister).

*Phylloptera lanceolata* BURMEISTER, Handb. Ent. II, p. 692 (1838).

*Microcentrum lanceolatum* BRUNNER, Mon. Phaneropt., pp. 334, 335, Pl. 7, fig. 97, a, b (1878); *Ib.*, Addit. Mon. Phaneropt., p. 179 (1891).

*Orophus lanceolatus* KIRBY, Syn. Cat. Orth., II, p. 480 (1906).

For further synonymy see KIRBY, *l. c.*

*Habitat.*—Rio dos Velhos, Minas Geraes, Brazil, and Rio de Janeiro, Brazil. A pair, ♂ and ♀, were taken at the last named locality by Dr. W. J. Holland.

72. *Orophus marginatus* (Brunner).

*Microcentrum marginatum* BRUNNER, Mon. Phaneropt., pp. 334, 336 (1878); *Ib.*, Addit. Mon. Phaneropt., p. 179 (1891); SAUSSURE & PICTET, Biol. Cent.-Amer. Orth., I, pp. 357, 358 (1898).

*Orophus marginatus* KIRBY, Syn. Cat. Orth., II, p. 481 (1906).

*Habitat.*—A single male specimen is at hand bearing simply the label "June." Possibly it comes from some Brazilian locality and may have been taken by either H. H. Smith or J. D. Haseman.

73. *Orophus colosseus* (Brunner)?

*Microcentrum colosseum* BRUNNER, Mon. Phaneropt., pp. 335, 341 (1878); *Ib.*, Addit. Mon. Phaneropt., p. 180 (1891); SAUSSURE & PICTET, Biol. Cent.-Amer., Orth. I, pp. 358, 361, Pl. 17, figs. 9, 10 (1898).

*Orophus colosseus* KIRBY, Syn. Cat. Orth., II, p. 481 (1906).

*Habitat.*—A male specimen coming from Rio de Janeiro has been temporarily placed here. It was possibly taken by H. H. Smith.

74. *Orophus erosus* (Brunner).

*Microcentrum erosum* BRUNNER, Addit. Mon. Phaneropt., pp. 180, 181 (1891); SAUSSURE & PICTET, Biol. Cent.-Amer., I, p. 358 (1898).

*Orophus erosus* KIRBY, Syn. Cat. Orth., II, p. 481 (1906).

*Habitat.*—A single female specimen of this species is at hand. It comes from "Province del Sara," Bolivia, and was taken by J. Steinbach during November, or December.

75. *Orophus nigrolineatus* sp. nov.

Size rather small. Related to *securiferus* and *pallidus* Brunner, but quite distinct from both of these. Characterized by a conspicuous narrow black line following along the anterior radial vein of the tegmina and a longitudinal row of six or seven small smooth yellow papillæ along the middle of the costal area.

General form of insect robust, the head as broad as the anterior margin of the pronotum, its sides parallel, front smooth. Fastigium roundly depressed, about twice as wide as the first antennal joint, a very little sulcate. Pronotum short, rather closely punctulate above, less closely so on the deflexed lobes, with the sides almost parallel; the disc flat, rounded behind, sinuate in front; lateral lobes perpendicular, higher than long, obtusely joined to the disc. Tegmina of moderate width, both forks of the branch of the posterior radial reaching the posterior border in advance of the apex, the anterior fork

distantly united with the ulnar by a cross-vein. Ulnar and discal areas also provided with a few scattered, raised, smooth, pale papillæ, as described in connection with the costal area. Anterior and middle femora spineless below, hind femora spined on both margins. Cerci of male bowed, the apex not clavate but provided with a blunt hook; subgenital plate tricarinate, the apex truncate, stylets of moderate length and a little bent downwards.

General color grass-green, a little paler on the head, sides of body, and below. Lateral margins of pronotum and stridulating area, together with the middle portion of the posterior radial vein of tegmina, testaceous.

Length of body, ♂, 22 mm., of pronotum, 5 mm., of tegmina, 36 mm., width of tegmina, 10.5 mm., length of hind femora, 19 mm.

*Habitat.*—Province del Sara, Bolivia, at an elevation of 350 meters. Collected by J. Steinbach during December 1912. The type, a male, is the only specimen at hand. It is in the Carnegie Museum.

#### Genus LOBOPHYLLUS Saussure.

*Lobophyllus* SAUSSURE, Rev. et Mag. Zoöl. (2) XI, p. 205 (1859); BRUNNER, Mon. Phaneropt., pp. 30, 343 (1878); *Ib.*, Addit. Mon. Phaneropt., p. 22 (1891).

This monotypic genus of katydids is confined to Brazil. It is represented in the present collection.

#### 76. *Lobophyllus legumen* (Saussure).

*Phylloptera legumen* SAUSSURE, Rev. et Mag. Zoöl. (2) XI, p. 205 (1859).

*Lobophyllum legumen* BRUNNER, Mon. Phaneropt., p. 343, pl. 7, fig. 98 *a, b* (1878); SAUSSURE & PICTET, Biol. Cent.-Amer., Orth., I, p. 364, Pl. 18, figs. 12-15 (1898).

*Habitat.*—A single female specimen taken by H. H. Smith at Chapada, Brazil, is referred here.

#### Genus SYNTTECHNA Brunner.

*Synttechna* BRUNNER, Mon. Phaneropt., pp. 30, 347 (1878); *Ib.*, Addit. Mon. Phaneropt., p. 23 (1891); SAUSSURE & PICTET, Biol. Cent.-Amer., Orth., I, p. 366 (1898).

#### 77. *Synttechna divisa* (Walker).

*Microcentrum divisum* WALKER, Cat. Derm. Salt. B. M., II, p. 373 (1869).

*Synttechna divisa* KIRBY, Syn. Cat. Orth., II, p. 485 (1906).

*Habitat.*—There are two female specimens of this insect at hand from the island of Jamaica, West Indies. They form a part of the Holland collection, Accession No. 2306, in the Carnegie Museum.

## Genus PHILOPHYLLIA Stål.

*Philophyllia* STÅL, Recens. Orth., 2, p. 18 (1874); BRUNNER, Monog. Phaneropt., p. 349 (1878).

The representatives of this small genus are confined, so far as known, to southern Mexico and Central and South America. Three species have been described. Only one of these is at hand.

78. *Philophyllia venosa* Brunner.

*Philophyllia venosa* BRUNNER, Monog. Phaneropt., p. 351 (1878).

The material collected by H. H. Smith at Rio de Janeiro contains a pair of this species. The male agrees with Brunner's description in every respect so far as given. The hind femora are 22 mm. in length. The female has the following dimensions: Length of body, 23 mm., of pronotum, 5.15 mm., of tegmina, 38 mm., width, 10 mm., length of hind femora, 24 mm., of ovipositor 5 mm. At first I was inclined to place the female in the genus *Orophus* on account of the structure of the ovipositor, which does not agree with the description of that organ for the genus (see generic synopsis section *dd* under \*\*). Instead of being acuminate, the lower valve is rounded and crenulate at the apex as in *Orophus*. The prominent veins, pointed tegmina, and the row of raised tubercles on their costal margin, however, are identical with those of the male. The female specimen is not in color and probably has faded from immersion in spirits.

## Family MECOPODIDÆ.

Only three genera of the present family of the Tettigonoidea have been recorded from South American territory. None appear to be among the material now being reported upon. Their representatives are all entirely apterous, and can be separated as follows:

## SYNOPSIS OF S. A. GENERA OF MECOPODIDÆ.

- A. Legs very long and slender, the hind femora more than twice the length of the body, at base but little enlarged. . . . . *Rhammatopoda* Redtenbacher.
- AA. Legs less elongate, the hind femora less than twice the length of the body, at the base rather robust.
- b. Meso- and metasternum two-spined on each side of middle. *Tabaria* Walker.
- bb. Meso- and metasternum one-spined on each side of middle. *Encentra* Redtenbacher.

## Family PSEUDOPHYLLIDÆ.

This family is very extensive, if we consider it as represented in both the Orient and Occident, together with the various islands of the seas. Naturally the group is tropical, although quite a number of the species of certain genera are found also in the warmer parts of the temperate regions. Most of the species are inconspicuously colored, *i. e.*, they are generally various shades of browns and grays, mottled and marbled with black, in such a manner as to be protected. They generally live among dead and fallen leaves lying on the floor of the forest, or among thorny herbs, shrubs, bushes, and on tree-trunks in the crevices of and under loose bark, where they lurk during the day-time and move about after nightfall. The representatives of a few of the genera, however, are green and entirely arboreal, and live among the foliage, which they imitate in general appearance. Our true "katy-dids" are examples of these green forms.

The various genera are separated by such characters as form of pronotum, of meso- and metasternum, spine characters, form of ovipositor, antennal structure and length, on the presence or absence of tegmina and wings, etc. The species, on the other hand, are recognized more by color and comparative size of the various parts of the body and attachments instead of the characters employed for generic separation. Unless these insects are especially searched for, they are liable to be overlooked. Hence the comparatively small series of the different species, which generally are found in collections. The various genera of the Pseudophyllidæ belonging to tropical America, North and South, may be differentiated as follows:

## SYNOPSIS OF THE TROPICAL AMERICAN GENERA OF PSEUDOPHYLLIDÆ.

- A. Foveola of the metasternum distant or joined by a transverse sulcus.
  - b. Metasternum widely transverse, the foveolæ farther apart than from the lateral border, always joined by a straight sulcus.
    - c. All the femora unarmed below. Anterior tibiæ provided with wide open foramina. (Legs slender. Tegmina strongly abbreviated, or, when they are perfectly developed, acuminate. Wings missing.)
      - d. Pronotum flat. Femora smooth. Intermediate tibiæ unarmed above.....*Aphractus* Redtenbacher.
      - dd. Pronotum saddle-shaped. All the femora below ciliate. Intermediate tibiæ spined above.....*Polycleptis* Karsch.
    - cc. All the femora spined below. Anterior tibiæ with the foramina shell-like.
      - d. Anterior femora above acute-angled or rounded, never compressed. Intermediate tibiæ somewhat compressed, often spined above on both margins.

- e. Anterior tibiae flattened above, acute-angled.
- f. Pronotum with the posterior margin elevated into callosities, obtusely triangulately emarginate.
- g. Disc of the pronotum unequal, but not tuberculate, Tegmina broader, the median vein crooked, elongate, the left speculum of the male obscure. Ovipositor straight. . . . . *Xerophyllopteryx* Rehn.
- gg. Disc of the pronotum tuberculate or spinose on the sides.
- h. Pronotum provided on each side of disc with a long spine; the hind margin tuberculated at middle and with the front margin dentate.  
*Championica* Sauss. & Pict.
- hh. Disc of the pronotum provided on each side with an acuminate tubercle; the hind margin not tuberculated at middle, nor with the front margin dentate.  
*Tetragonomera* Stål.
- ff. Pronotum with the posterior margin rounded, narrowly bordered. (Disc unequal, not tuberculate, the deflexed lobes perpendicular. Median vein straight. Ovipositor curved) . . . . . *Schochia* Brunner.
- ee. Anterior tibiae rounded above, very rarely flattened, in which case both margins are spined. (Anterior margin of the pronotum sometimes furnished with a small tubercle or spine).
- f. Pronotum with its anterior margin in the middle provided with a more or less obvious obtuse tubercle; the metazona not dilated, the hind margin not spinose. Anterior femora one-half longer than the pronotum.
- g. Anterior femora below spined at least on the front margin. Anterior tibiae unarmed above. Tegmina and wings fully developed. Size larger. . *Tetanopus* Redtenbacher.
- gg. Anterior femora below spined on both margins. The anterior tibiae armed above on both margins with strong spines. Tegmina very much abbreviated, not passing the first abdominal segment. . *Sagephorus* Redtenbacher.
- ff. Pronotum armed in front with a median spine, the metazona often dilated (except in the genus *Adeclus* and in *Dicanthodis granosa*). Anterior femora not one-half longer than the pronotum.
- g. Femora unarmed above with spines.
- h. Genicular lobes of the femora spined.
- i. Metazona of the pronotum greatly dilated, produced into spines on both sides, posterior margin many-spined. Ovipositor robust, straight.  
*Orpacophora* Kirby.
- ii. Metazona of the pronotum narrower, behind trun-

- cate, the hind border smooth. Ovipositor narrow, curved. . . . . *Adeclus*<sup>2</sup> Brunner.
- hh. Genicular lobes of the femora obtuse.
- Hæmodiasma* Brunner.
- gg. Femora spined above. (Pronotum saddle-shaped, the metazona on both sides furnished with a spine. Ovipositor narrow, a little curved. . . . *Dicanthodis* Walker.
- dd. Anterior femora more or less compressed. Middle tibiæ compressed, sometimes spined on the posterior margin or entirely unarmed.
- e. Middle tibiæ above one- to three-spined basally, very rarely without spines. (In *Dasyscelus*).
- f. Tegmina much abbreviated. . . . . *Dasyscelus* Redtenbacher.
- ff. Tegmina fully developed.
- g. Upper carina of the anterior and posterior femora terminating at the apex in an acute apical lobe. Middle tibiæ above armed with three flattened spines. (Front femora a little longer than the pronotum. Posterior tibiæ armed above on the inner margin with heavier spines) . . . . . *Anonistus* Walker.
- gg. Upper carina of the anterior and posterior femora apically running out or missing. Middle tibiæ armed above with two acute spines or with one spine.
- h. Wings with the transverse veins narrowly pale-bordered. Posterior tibiæ hardly compressed from the sides, armed above on the inner margin with nine large dilated teeth. . . . . *Pleminia* Stål.
- hh. Wings unicolorous smoky or tessellate. Posterior tibiæ somewhat compressed, armed above with ten to twelve spines not much larger nor dilated.
- i. Disc of the pronotum not provided with large tubercles, or sometimes with two obtuse ones on each side.
- j. Anterior femora below three- to four-spined. Middle tibiæ above two- to four-spined. Wings not tessellate (except in *Lichenochrus tessellatus* and *muticus*). Metazona of the pronotum neither angulated nor tuberculated at its sides. . . . . *Lichenochrus* Karsch.
- jj. Anterior femora below smooth or nearly smooth. Middle tibiæ above typically sometimes armed basally with one spine. Wings always tessellate. Metazona of the pronotum laterally subangulate and on both sides provided with large obtuse tubercles. (Genicular lobes of the hind femora spined). . . *Acanthodis* Serville.

<sup>2</sup> According to Kirby (Syn. Cat. Orth., II, p. 314) the genus *Apereisis* Walker should be placed between *Adeclus* and *Hæmodiasma*.

- ii. Disc of the pronotum provided with acuminate tubercles, which are arranged in two longitudinal series.....*Pristes* Redtenbacher.
- ee. Middle tibiae above unarmed or through variation one-spined (in some species of the genus *Platyphyllum* two-spined). Anterior femora somewhat compressed and a very little curved at their base. (Pronotum on the hind margin not, or but weakly, bordered. Some species provided with green tegmina).
- f. Pronotum closely granoso-rugulose, very flat, the transverse sulci inconspicuous, the deflexed lobes low or narrow, the anterior angle obtuse, strongly rounded. Legs greatly depressed, long and densely pilose. Anterior femora curved at their base; above laminate...*Stenoschema* Redtenbacher.
- ff. Pronotum smooth or obtusely granulose, the sulci distinct, the deflexed lobes with the anterior angle right, acute. Legs less compressed. Anterior femora compressed and gently curved, above acutely carinated or somewhat compressed, above rounded.
- g. Wings smoky or tessellate. Tegmina fuscous.  
*Leurophyllum* Kirby.
- gg. Wings hyaline. Tegmina often bright green or flavous.
- h. Tegmina more than quadruple the length of the pronotum. Posterior tibiae above on both margins many-spined.....*Platyphyllum* Serville.
- hh. Tegmina not more than three times the length of the pronotum. Posterior tibiae above on the outer margin smooth or few-spined. Species confined to Jamaica.....*Jamaicana* Brunner.
- bb. Metasternum narrowed posteriorly, the foveolæ between themselves less distant than from the lateral margin, joined together by an arcuate sulcus. Anterior femora frequently armed with small inwardly curved genicular spines, or with none. (Wings smoky, never with the transverse veins margined with paler color.)
- c. Genicular lobes of the hind femora armed on both sides with a spine, or at least the lobes triangulately produced. (In *Brachyauchenus atrosignatus* the external lobe is rounded.)
- d. Pronotum smooth, or obtusely rugose, or granulose. Metasternal foveolæ less remote one from the other than from the lateral margin. Metazona of the pronotum a little shorter than the pro- and mesozona united.
- e. Anterior femora below four-spined, the spines concolorous. (Antennæ unicolorous fuscous, or pale annulate. Genicular lobes, except the external one on the intermediate femora, armed with an incurved spine.....*Meronicidius* Serville.
- ee. Anterior femora below three-spined, all of the spines black. (Genicular lobes of the anterior femora obtuse, sometimes the inner lobes are provided with a very small spine).  
*Tricentrus* Brunner.



- dd. Pronotum acutely granulose or spinose.
- e. Femora above not spinose. Middle tibiæ smooth above. Tegmina equaling or passing the abdomen. Pronotum equally densely granose. (Posterior femora heavier, the base strongly dilated).....*Brachyauchenus* Brunner.
- ee. Femora above lengthily spinose. Middle tibiæ above spined. Tegmina not attaining the apex of the abdomen. Pronotum furnished with dense acuminate granules.  
*Chæroparnops* Dohrn.
- cc. Genicular lobes of the posterior femora obtuse, or sometimes the internal lobes spined.
- d. Anterior femora below armed with three to four spines.
- e. Tegmina and wings fully developed.
- f. Posterior tibiæ spined above on both margins.
- g. Middle tibiæ sulcate above.
- h. Intermediate tibiæ above two-spined on the posterior margin.
- i. Anterior tibiæ below the auditory grooves, chiefly in the male, more or less incrassate. Posterior femora on both sides provided with obtuse genicular lobes.....*Gongrocnemis* Redtenbacher.
- ii. Anterior tibiæ not incrassate. Posterior femora on the inner side provided with spined genicular lobes.....*Anchiptolis* Brunner.
- hh. Intermediate tibiæ above three- or four-spined on the posterior margin. (Coxæ marked with black. Spines of the femora entirely, or with the apex black. Anal segment of male produced on both sides into a tooth. Supra-anal lamina of male rounded or quadrate, or callosed and involuted. Ovipositor slender, straight)...*Idiarthron* Brunner.
- gg. Middle tibiæ above rounded, smooth. (Pronotum wide, densely granulose).....*Drepanoxiphus* Brunner.
- ff. Posterior tibiæ above entirely spineless on the outer margin.  
*Enthacanthodes* Redtenbacher.
- ee. Tegmina lobiform. Wings wanting.
- f. Posterior tibiæ unarmed above on the outer margin. Ovipositor short, straight, beyond the middle obliquely truncate. [Colombia and Mexico].....*Liparoscelis* Stål.
- ff. Posterior tibiæ provided above with several spines on the outer margin. Ovipositor more or less arcuate, evenly tapering. [Galapagos Islands].....*Nesæcia* Scudder.
- dd. Anterior femora below without spines. (Pronotum somewhat granoso-rugulose, the transverse sulci distinct. Tegmina not reaching the middle of the abdomen, provided with fuscous areoles).....*Trichotettix* Stål.
- AA. Foveolæ of the metasternum joined in a single orbicular furrow or in a longitudinal sulcus.

- b. Pectus or sternum moderately compressed, meso- and metasternum not lobate, except in the genus *Polyancistrus*. Antennæ slender, their bases not contiguous. Tegmina narrow, lying flat when at rest.
- c. Body and tegmina testaceous or olivaceo-testaceous; the latter often long and narrow with their margins parallel, their texture leathery, the veins prominent, the anterior ulnar vein running out near the apex of the elytra. Middle coxæ not tuberculate at the base.
- d. Pronotum not produced posteriorly, without lateral carinæ. Basal antennal joints obtuse at the apex, except in some species of the genus *Bliastes*. (Anterior femora with their external genicular lobes rounded.)
- e. Anterior tibiæ not one-half longer than the pronotum (except in the species *Nannolettix longipes*), above rounded or flattened, not sulcate, the conchs or auditory apparatus closed.
- f. Mandibles abnormal, very large, at the base provided with a long tooth. Fastigium of the vertex compressed, sulcate, at the base not tuberculate.
- g. Mandibles very large, not toothed.  
*Gnathocleta* Hagenbach.
- gg. Mandibles provided at the base with a long tooth. (Fastigium of the front produced into an acute process.)  
*Dicranostomus* Dohrn.
- ff. Mandibles normal. Fastigium of the vertex tuberculate on the sides.
- g. Pronotum granulose.
- h. Anterior femora with their genicular lobes spined internally.
- i. Tegmina and wings perfectly formed, sometimes shorter than the abdomen.
- j. Middle tibiæ smooth above, without spines.  
Hind tibiæ above short-spined.
- k. Anterior tibiæ normal. . . . . *Bliastes* Stål.
- kk. Anterior tibiæ with the conchs widely open and below the conchs lobate on the outer margin. . . . . *Parabliastes* Brunner.<sup>3</sup>
- jj. Middle tibiæ above two-spined. Posterior tibiæ armed above with strong erect spines.  
*Æmasia* Brunner.
- ii. Tegmina and wings greatly abbreviated.
- j. Tegmina in the female fenestrate. All of the femora spined above. . . *Panoploscelis* Scudder.
- jj. Tegmina of the females normal. Femora above spineless. . . . . *Stenolettix* Stål.

<sup>3</sup> The genera *Nastonotus* Bolivar (Ann. Soc. Ent. France (6) x, p. 143 (1890)) and *Clisis* Walker (Cat. Derm. Salt. B. M., V, Suppl., p. 47 (1871)) belong in this vicinity.

- hh. Anterior femora with their internal genicular lobes obtuse.
- i. Tegmina and wings completely developed.
- j. Anterior tibiæ four-angled.
- k. Auditory opening of anterior tibiæ narrow.
- l. Intermediate and hind femora with the genicular lobes spined. . . . . *Cocconotus* Stål.
- ll. Genicular lobes of all the femora produced into a spine . . . . . *Cratonotus* Bolívar.
- kk. Auditory opening of tibiæ rather wide.  
*Thamnobates* Sauss. & Pict.
- jj. Anterior tibiæ tumescent below the foramina, rounded . . . . . *Condylonemis* Redtenbacher.
- ii. Tegmina and wings abbreviated.
- j. Clypeus smooth. Posterior tibiæ spined above on both margins. . . . . *Nannotellix* Redtenbacher.
- jj. Clypeus bituberculate or bispined. Posterior tibiæ above smooth on the outer margin, or one-spined . . . . . *Disceratus* Scudder.
- gg. Pronotum smooth, shining. (All the femora with the genicular lobes spined) . . . . . *Homalaspis* Brunner.
- ee. Anterior tibiæ more than one-half longer than the pronotum, compressed, above sulcate, the auditory foramina widely opened. (Legs long, slender.)
- f. Middle tibiæ rounded below, neither sulcate, nor spined. Anterior tibiæ above provided with an apical spine on both sides. (Posterior tibiæ armed above with an apical spine on both sides) . . . . . *Ischomela* Stål.
- ff. Middle tibiæ sulcate below, often spined. Anterior tibiæ without apical spines above.
- g. Pronotum smooth, neither granulose, nor rugose.
- h. Middle tibiæ above sometimes armed on the hind margin of the base with some spinules. Pronotum elongate, the transverse sulci equally and profoundly impressed. Color greenish testaceous.  
*Jimenezia* Bolívar.
- hh. Middle tibiæ above spined on both sides. Pronotum short, the hind-most sulcus deeply impressed. Color fusco-testaceous . . . . . *Macrochiton* Redt.
- gg. Pronotum granulose or rugose.
- h. Anterior margin of the pronotum tuberculate. Metazona armed on each side with a spine. (*Habitus* of the genus *Brisilis*) . . . . . *Acanthodiphrus* Walker.
- hh. Anterior margin of the pronotum not tuberculate, semicylindrical, or with the sides of the metazona angulate, not spined.
- i. Metazona of the pronotum not angulated at the sides. Wings unicolorous, lightly smoked.

- j.* Genuiclar lobes all, or only the external lobes rounded. (Preradial field of the elytra with the transverse veins regularly arranged.)  
*Leptotettix* Stål.
- jj.* Genuiclar lobes all spined  
*Semileptotettix* Brunner.
- ii.* Metazona of the pronotum at the sides angulated or marked with a shining paler line.
- j.* Wings with the transverse venules broadly margined with fuscous. Genital armature of the male abdomen normal. . . . . *Teleutias* Stål.
- jj.* Wings colored, the disc infuscated and varied with irregular pale maculations. Genital armature of the male abdomen abnormal, complicated. . . . . *Diyllus* Stål.
- dd.* Pronotum posteriorly produced into an acuminate process or a long spine, the lateral carinae denticulate or smooth.
- e.* Pronotum flattened above. Lateral carinae present, prominent, crenulate or dentate.
- f.* Tegmina lobate, wings missing. Hind margin of the pronotum somewhat elevated and in the middle strongly spined. [Cuba.]  
*Polyancistroides* Rehn.
- ff.* Tegmina and wings fully developed. Hind margin of the pronotum not elevated, produced, acute-angled. [Hayti.]  
*Polyancistrus* Serville.
- ee.* Pronotum saddle-shaped. Lateral carinae wanting; the hind lobe flattened and provided on each side with three oblique spines and a single upright one on the middle of the hind border. [Ecuador]. . . . . *Pemba* Walker.
- cc.* Body and tegmina green. These coriaceous, the veins poorly expressed, wider and with the margins rounded, the anterior ulnar vein running out long before reaching the apex of the elytra. Middle coxae more or less distinctly tuberculated on the lower margin.
- d.* Posterior femora somewhat incrassate, armed below on the apical half with some spinules. Fastigium of the vertex reaching in front of the margins of the antennal scrobes.
- e.* Anteradial field of the elytra irregularly veined, or the veins few and regularly placed, the mediastin vein somewhat distinct, produced obliquely from the base. Anterior femora compressed, curved at the base.
- f.* Meso- and metasternal lobes more or less acutely produced.  
*Scopiorus* Stål.
- ff.* Meso- and metasternal lobes not produced, at most minutely dentate. . . . . *Caloxiphus* Sauss. & Pict.
- ee.* Anteradial field of the elytra closely and regularly reticulate, with oblique transverse veins, the median vein at its base closely approaching the radial vein, on its basal third suddenly deflexed. Anterior femora rounded or compressed, straight.

- f. Hind lobe of the pronotum not carinated at the sides. The genicular lobes obtuse. Male cerci forked.
- g. Tegmina of male irregularly veined in the postradial field. Anterior and middle femora four-spined.  
*Pterophylla* Kirby.
- gg. Tegmina of male regularly veined in the postradial field. Anterior and middle femora eight-spined.  
*Chlorocœlus* Kirby.
- ff. Hind lobe of the pronotum carinated at sides. Genicular lobes acuminate; male cerci simple. . . . . *Thliboscelus* Serville.
- dd. Posterior femora greatly incrassate, below entirely, or nearly, armed with heavier spines. Fastigium of the vertex not produced beyond the anterior margin of the antennal scrobes.
- e. Pronotum destitute of a longitudinal median carina.
- f. Middle tibiæ above spined on their posterior margin. Tegmina opaque, the posterior margin straight. . *Diophanes* Stål.
- ff. Middle tibiæ above smooth or very minutely spinulose. Tegmina corneous, shining, the posterior margin rounded.  
*Xestoptera* Redtenbacher.
- ee. Pronotum provided with a median longitudinal carina.  
*Lophaspis* Redtenbacher.
- bb. Pectus or sternum greatly compressed. Meso- and metasternum produced into acuminate lobes. Antennæ heavier, their bases touching. Tegmina when at rest directed upwards.
- c. Posterior radial vein straight or (in the genus *Chlorophyllia*) somewhat decurved, running out before the apex of the tegmina. Genicular lobes obtuse or acuminate, not spined. Posterior femora below with few spines. Middle tibiæ greatly compressed. Labial palpi amplified at the apex, obliquely truncate.
- d. Wings colored.
- e. Wings ocellate at their apex.
- f. Tegmina with their front margin nearly straight, the apical third rounded and somewhat sinuate. (Anterior border of the wings straight, not produced into an apical lobe.)  
*Pterochroza* Serville.
- ff. Tegmina with their anterior margin sinuate behind the middle.
- g. Elytra acuminate. Wings a little shorter than the tegmina, their anterior margin broadly sinuate, and at the apex produced into a lobe. . . . . *Tanusia* Stål.
- gg. Elytra obliquely truncate at their apex. Wings much shorter than the tegmina, their anterior margin straight, the apex rounded. . . . . *Porphyromma* Redtenbacher.
- ee. Wings variegately colored, but the apex not ornamented with eye-spots. . . . . *Rhodopteryx* Saussure & Pictet.
- dd. Wings unicolored, white, or hyaline, not ocellate. (Pronotum above flat or concave, the deflexed lobes attached with an acute angle.

- e.* Anterior femora armed entirely, or in part, with flattened teeth. Posterior tibiae more or less lobate.
- f.* Anterior tibiae not flattened above, strongly compressed; the auditory openings linear. Spines of the anterior femora only in part foliaceous. Tegmina with the anterior field narrower than the posterior field. . . . *Calidophylla* Sauss. & Pict.
- ff.* Anterior tibiae flattened above, not compressed.
- g.* Inner opening of the auditory foramina of anterior tibiae very prominent or produced. Pronotum lengthily produced behind, emarginate. Spines of anterior femora all foliaceous. Tegmina with the anterior margin rounded or sinuate. . . . . *Mimetica* Pictet.
- gg.* Inner operculum of the foramina of the anterior tibiae not produced. Pronotum truncate behind.
- h.* Wings with their apex rounded. Anterior femora compressed, toothed, the apex very rarely lobate.
- i.* Posterior margin of the pronotum not one-half wider than the anterior margin. Elytra widest in their apical third. Mediastin vein running out in the basal third of the tegmina, two or three branched. . . . . *Tyrophyllum* Serville.
- ii.* Posterior margin of the pronotum almost twice as wide as the front margin. Tegmina widest in the middle. Mediastin vein running out towards the middle of the elytra, seven- or eight-branched.  
*Roxelana* Kirby.
- hh.* Wings with their apex produced into a lobe. Anterior femora lobate at the apex. . . . *Catasparata* Brunner.
- ee.* Anterior femora round, armed with very minute spinules or unarmed. Posterior tibiae entirely unarmed, or armed with very small spines. . . . . *Chlorophylla* Pictet.
- cc.* Posterior radial vein curved downwards at the apex, running out before the apex of the elytra. Genicular lobes spined. Posterior femora closely armed with large spines. Middle tibiae but little compressed. Elytra green, acuminate, the anterior margin rounded. Wings entirely hyaline. . . . . *Cycloptera* Serville.

## Genus ANONISTUS Walker.

*Anonistus* WALKER, Cat. Derm. Salt. B. M., V, Suppl., p. 46 (1871); KIRBY, Syn. Cat. Orth., II, p. 315 (1906).

*Phyllostachys* STÅL, Recens. Orth., 2, p. 61 (1874); BRUNNER, Monog. Pseudophyll., pp. 15, 120 (1895).

There is a single male before me which is referable to this genus according to the synoptical key, but does not fit the descriptions of either of the described species. It is therefore here described as new.

79. *Anonistus elongata* sp. nov.

In color and other general characters most closely related to *A. scops* of Burmeister, but larger, and belonging in the section of the genus in which the genicular lobes of the hind femora are obtuse, instead of acuminate.

Pronotum verrucose, in front above provided with a rather prominent compressed blunt spine. Tegmina with the ground-color pale greenish gray, rather narrow, tapering, the principal longitudinal veins green, the transverse and some of the longitudinal veins narrowly black-margined. All the legs closely fringed below with pale, long hairs, above less closely with shorter hairs, gray, marmorate with fuscous. Front cinereous; eyes shiny, ferruginous, mottled with fuscous. Antennæ annulated with fuscous. Anterior femora internally on apical half transversely dimly and closely fasciate with fuscous; the intermediate pair along with their tibiæ largely irregularly black marmorate.

Length of body, ♂, 28 mm., of pronotum, 8 mm., of tegmina 33 mm., of hind femora, 18 mm.

*Habitat.*—Rio de Janeiro, Brazil (H. H. Smith). The type belongs to the Carnegie Museum.

The three species of this genus may be separated as follows:

## SYNOPSIS OF THE SOUTH AMERICAN SPECIES OF ANONISTUS.

- A. Superior carina of the hind femora terminating in an acute-angled lobe. Genicular lobes rounded at apex.
  - b. General color testaceous. The front bluish black. Pronotum granulose. *scariosa* Burmeister.
  - bb. General color pale greenish-gray. Front cinereous. Pronotum verrucose or strongly rugulose. . . . . *elongata* sp. nov.
- AA. Superior carina of the hind femora not lobate; genicular lobes acuminate. Color pale greenish gray, marmorate with fuscous. . . . . *scops* Burmeister.

## Genus LICHENOCHRUS Karsch.

*Lichenochrus* KARSCH, Ent. Nachr., XVI, pp. 268, 275 (1890); BRUNNER, Mon. Pseudophyll., pp. 16, 125 (1895); SAUSS. & PICT., Biol. Cent.-Amer., Orth., I, p. 409 (1898).

This is a rather extensive genus of the Pseudophyllidæ. Most of the species are at home in tropical American countries.

80. *Lichenochrus vulturinus* (De Geer)?

*Locusta vulturinus* DE GEER, Mem. Ins., III, p. 451, Pl. 39, fig. 2 (1773).

*Brisilis vulturina* STÅL, Recens. Orth., II, p. 80 (1874).

*Lichenochrus vulturinus* BRUNNER, Mon. Pseudophyll., 125, 127 (1895).  
*Conocephalus trifidus* THUNBERG, Mem. Acad. Petersb., V, p. 277 (1815).

*Habitat.*—A single female specimen, which according to the synoptic table is referable to the genus *Lichenochrus*, is classified as *vulturinus* with some doubt. It bears the label, "Presented as from S. America."

#### Genus ACANTHODIS Serville.

*Acanthodis* SERVILLE, Ann. Sci. Nat., XXII, p. 150 (1831); *Ib.* Ins. Orth., p. 450 (1839); BURMEISTER, Handb. Ent., II, p. 699 (1838); BLANCHARD, Hist. Nat. Ins., III, p. 21 (1840) *nec* Stål.  
*Brisilis* Stål, Cefv. Vet.-Akad. Förh., XXX, (4) p. 46 (1873); *Ib.*, Recens. Orth., II, pp. 62, 78 (1874); BRUNNER, Mon. Pseudophyll., pp. 16, 132 (1895).

This is also a strictly South American genus of the Pseudophyllidæ. All of the described species of the genus are large protectively colored insects, which live about the trunks of trees, to the bark of which they show a remarkable similarity in appearance. There are two species among the material now in hand. One of these seems to be new. The following table will assist in recognizing the species including the new one:

#### SYNOPSIS OF THE SPECIES OF ACANTHODIS.

- A. Metazona of pronotum bituberculate on both sides. Wings tessellate, without transverse veins in the pallid maculations. Hind femora ornamented on the inner face with a black vitta.
- b. Ovipositor not longer than the hind femora.
- c. Pronotum with the hind margin subangulated, lateral tubercles of the metazona very distinct. . . . . *aquilina* Linnæus.
- cc. Pronotum with the posterior margin rounded, lateral tubercles of the metazona somewhat obsolete. . . . . *curvidens* Stål.
- bb. Ovipositor much longer than the hind femora.
- c. Smaller. (Tegmina of female 70 mm.) . . . . . *longicauda* Stål.
- cc. Larger. (Tegmina of female 82 mm.) . . . . . *gigantea* sp. nov.
- AA. Metazona of pronotum unituberculate. Wings unicolorous, infuscated, the transverse veins equally arranged. Posterior femora unicolorous on the inner face, pale.
- b. Front together with the sternum black. Mesosternum with its anterior angles obtuse. . . . . *tenebrosa* Brunner.
- bb. Front and sternum pallid. Mesosternum with its anterior angles produced into a spine. . . . . *unicolor* Brunner.

#### 81. *Acanthodis gigantea* sp. nov.

Size maximum. General structure and color as described for *longicauda*.

Length of body, ♀, 57 mm., of pronotum, 13 mm., of tegmina, 82



mm., width of tegmina, 16 mm., length of hind femora, 40 mm., of ovipositor 52 mm., width of ovipositor, 6 mm.

*Habitat.*—The type, a beautiful female specimen, was taken at Quatro Ojos, in the Department of Santa Cruz, Bolivia, during the month of November at an elevation of 300 meters above sea-level. (J. Steinbach.) It is the property of the Carnegie Museum.

### 82. *Acanthodis tenebrosa* (Brunner).

*Brisilis tenebrosa* BRUNNER, Mon. Pseudophyll., pp. 132, 134 (1895).

*Acanthodis tenebrosa* Kirby Syn. Cat. Orth., II, p. 319 (1906).

A single female of this species is contained in the collection made at Puerto Suarez, Bolivia. It was also taken by J. Steinbach during the period November to January inclusive. It is quite typical.

### Genus PRISTES Brunner.

*Pristes* BRUNNER, Mon. Pseudophyll., pp. 16, 135 (1895); SAUSSURE & PICTET, Biol. Cent.-Amer., Orth., I, p. 411 (1898).

This small genus of the Pseudophyllidæ seems to be confined to northern South America and Central America. It is represented by two female specimens which appear to belong to a new species intermediate between the two described forms. The species of *Pristes*, including the present, may be recognized as follows:

#### SYNOPSIS OF THE SPECIES OF PRISTES.

- A. Pronotum between the tubercles granular.
  - b. Sternum black. Size larger.....*tuberosus* Stål.
  - bb. Sternum brown. Size smaller.....*colombiæ* sp. nov.
- AA. Pronotum between the tubercles almost smooth. Sternum concolorous.
  - minor* Brunner.

### 83. *Pristes colombiæ* sp. nov.

As indicated by the above table, this insect is intermediate between *tuberosus* Stål and *minor* Brunner. It is rather dark fusco-testaceous, varied with green on the tegmina along the costal field near the base and the median veins, and marked with dark fusco-cinereous on the legs. On the tegmina near the base of the disc is located a patch of ochraceous blotches, while the outer side of the hind femora are also rather largely testaceous on their middle one-third. Front, including the clypeus, brunneo-piceous, bordered with testaceous; cheeks and occiput longitudinally alternately pale and dark banded.

Length of body, ♀, 49 mm., of pronotum, 11 mm., of tegmina, 56 mm., width of tegmina about 13 mm.; length of hind femora, 33 mm., of ovipositor, 30 mm.

*Habitat*.—Bonda and Don Diego, Department of Magdalena, Colombia, in May and June, at an elevation of 100 feet to 250 meters above sea-level. (H. H. Smith.) The type is in the Carnegie Museum.

## Genus LEUROPHYLLUM Kirby.

*Platyphyllum* SERVILLE, Ins. Orth., p. 443 (1839)—in part.

*Leurophyllum* KIRBY, Syn. Cat. Orth., II, p. 320 (1906).

For other synonymy see KIRBY, *l. c.*

While the representatives of the present genus are rather numerous and widely distributed over the neotropical regions, there are but fourteen forms recognized so far. Twelve of these are described in Brunner's Monograph of the family Pseudophyllidæ. There are before me specimens of two species, neither of which seem to agree with any of those treated by Brunner. His key for the disposal of the species recognized by himself is given herewith with such modifications as are necessary to include the two apparently new forms. I do not happen to have the description of *regimbarti* Griffini at hand, while Walker's species is recognizable only by examination of the type.

## SYNOPSIS OF THE SPECIES OF LEUROPHYLLUM.

- A. Anterior femora compressed at their base, a little curved, above acutely carinated or sulcate. Wings of one color.
- b. Femora all lengthily pilose beneath. Ovipositor narrow. (Front black).
- c. Wings smoky, unicolored.
- d. Pronotum unequal, but not granulose. Cerci of the male simply spined.
- e. Anterior femora below with the anterior margin smooth or two-spined, the posterior margin subundulate.
- transiens* Brunner.
- ee. Anterior femora below three-spined, the posterior margin straight. . . . . *unicolor* Brunner.
- dd. Pronotum granulose (closely verrucose). Cerci of male bidentate at the apex. . . . . *granulosum* Brunner.
- cc. Wings infumed, the transverse veins pale bordered.
- d. Tegmina with their veins and veinlets fuscous. Posterior femora below almost spineless (at the apex two-spined).
- pleminioides* Brunner.
- dd. Tegmina with their veins and veinlets concolorous, provided with castaneous areoles. Posterior femora below six-spined.
- guttatum* Brunner.
- bb. Femora all remotely pilose or smooth below. Ovipositor heavy.
- c. Front black or gray. Anterior femora two-spined below.
- d. Ovipositor at middle one-fifth as wide as long. Subgenital plate of female profoundly incised. [Amazonical].
- brevixiphum* Brunner.

- dd. Ovipositor at middle not over one-sixth as wide as long. Subgenital plate of female very little emarginate. [Bolivia].  
*angustixiphum* Brunner.
- cc. Front concolorous or pale bluish-gray. Anterior femora below three- to four-spined.
- d. Anterior femora three-spined below.
- e. Color greenish testaceous. Clypeus more than twice as wide as long, largely black.
- f. Posterior femora black on their inner side or face.  
*consanguineum* Serville.
- ff. Posterior femora with little black on the inner face.  
*bolivianum* sp. nov.
- ee. Color pale yellow. Clypeus equally as long as wide.  
*luridum* Brunner.
- dd. Anterior femora four-spined below. Intermediate tibiæ two-spined above. Last segment of abdomen black in both sexes.  
*nigricaudum* sp. nov.
- AA. Anterior femora not compressed, above almost rounded. Wings smoky, and variegated with paler.
- b. Tegmina testaceous.
- c. Wings fuscous, the transverse veins bordered with white. Anterior femora below three-spined. [Mexico].....*toltecum* Saussure.
- cc. Wings somewhat smoked, the transverse veins broadly margined with fuscous. Anterior femora one-spined below.  
*unispinulosum* Brunner.
- bb. Tegmina greenish. (Wings tessellate with fuscous and pallid). [Brazil, Peru, etc.].....*maculipenne* Serville.

#### 84. *Leurophyllum bolivianum* sp. nov.

About the size of *luridum* Brunner, but differing from that insect, as indicated in the synoptical key of species. General color greenish testaceous, quite profusely and rather prominently variegated with paler and fuscous maculations. The pronotum rugulose, the transverse sulci deeply impressed, the disc on the hind lobe flattened, longitudinally streaked with fuscous. Front lurid (♀) or bluish gray (♂), the clypeus formed much as described for the much larger *consanguineum*. Anterior femora three-spined below, the intermediate four-spined, posterior seven- to eight-spined; all the legs rather prominently variegated with black or fuscous. Dorsal margin of closed tegmina prominently marked alternately with pallid and fuscous maculations. Ovipositor moderately robust, the base at sides and above and all of the apical half black. Cerci of male with the apex terminating with a single prominent inwardly directed tooth.

Length of body, ♂, 32 mm., ♀, 37 mm.; of pronotum, ♂, 7.25 mm., ♀, 8 mm.; of tegmina, ♂, 33 mm., ♀, 41 mm.; width of tegmina, ♂, 7.5 mm., ♀, 8 mm.; length of hind femora, ♂, 19.5 mm., ♀, 23 mm.; of ovipositor, 17 mm.

*Habitat.*—Santa Cruz de la Sierra, Bolivia, at an elevation of 450 meters above sea-level. (J. Steinbach collector.) The types, ♂ and ♀, are the only specimens examined. They belong to the Carnegie Museum.

85. *Leurophyllum maculipes* sp. nov.

There are four other specimens at hand which rather strongly resemble this species both in color and size, but differ in spine-characters. The anterior femora are four-spined below, as are also the intermediate pair. The middle tibiae above are one- to two-spined. The color variations from those of *bolivianum* are the lacking of most of the greenish tint in the general color and the addition to the number and regularity of the fuscous maculations, there being considerable regularity in the transverse fuscous markings of the tegmina. The ovipositor is somewhat slenderer and a little more arcuate, while it is not black on the sides and above at the base. I suggest the name, *Leurophyllum maculipes* for this second insect. Its measurements are practically those of the preceding form. In the table of species *maculipes* would fall in the section with *nigricaudum*.

*Habitat.*—Four specimens, 1♂, 3♀, are at hand. They come from the Province del Sara, Bolivia, where they were collected during November at 350 meters above sea-level (J. Steinbach). The typical specimens are also in the insect collection of the Carnegie Museum.

86. *Leurophyllum nigricaudum* sp. nov.

Of about the same stature as the two preceding but lacking much of the maculations exhibited in them. The chief distinguishing color characteristic of *nigricaudum* is the uniform black anal segment of both sexes. General color of tegmina and body a dark cinereotestaceous. Front gray. Dorsal margins of the tegmina more or less clearly alternately brown and pale maculate. Pronotum and legs fusco-varied, the flecks on the latter chiefly external and more or less gathered into patches; internally the hind femora are pallid. Ovipositor heavy, nearly straight above, the apical half deep piceous.

Length of body, ♂, 37 mm., ♀, 38 mm.; of pronotum, ♂, 8.15 mm., ♀, 8.7 mm.; of tegmina, ♂, 37 mm., ♀, 40 mm.; width of tegmina,

♂, 8.5 mm., ♀, 9 mm.; length of hind femora, ♂ and ♀, 21-22 mm.; of ovipositor, 19.5 mm.

*Habitat.*—These insects come from Puerto Suarez, Bolivia, at an elevation of 150 meters above sea-level. They were collected by J. Steinbach during the months of November to January inclusive. The types are deposited in the Carnegie Museum.

Genus PLATYPHYLLUM Serville.

*Platyphyllum* SERVILLE, Ann. Sci. Nat., XXII, p. 145 (1831); *Ib.*, Ins. Orth., p. 443 (1839); STÅL, Recens. Orth., II, p. 62 (1874).

? *Platyphyllus* BURMEISTER, Handb. Ent., II, p. 699 (1838).

*Lissophyllum* BRUNNER, Mon. Pseudophyll., pp. 16, 143 (1895).

If I have rightly determined it, only a single representative of this genus is before me and it seems to be new.

87. *Platyphyllum nigriventris* sp. nov.

Nearly maximum in size, the pronotum obtusely rugulose; the transverse sulci moderately deep, the lower margin of the sides of pronotum rather heavily bordered and somewhat rugulose. Body strongly depressed.

General color brunneo-cinereous with a more or less distinct greenish tinge on the pronotum, tegmina, pleura, and apex of femora, most apparent in the male; this color rather relieved by numerous irregular markings of fuscous on the cheeks, occiput, pronotum, legs, and tegmina. Front glossy black bordered widely with white, the fastigium of the front white; antennæ pale, streaked and annulated with fuscous. Sternum and underside of abdomen rather broadly black. Tegmina lanceolate, the apex subacuminate. Wings infumate, not tessellated. Anterior femora below minutely two-spined on anterior edge; middle pair with four large spines externally, the hind pair eight-spined. All the legs lengthily hirsute. Genicular lobes of anterior and posterior femora spined on both sides, inner lobes of middle femora spined, outer lobes broadly rounded. Middle coxæ quite prominently tubercled below at the apex. Last ventral segment of abdomen of male or subgenital plate narrowed, deeply emarginate, and armed with long and heavy styles. Subgenital plate of female, rather small, tapering, the apex roundly emarginate. Ovipositor rather robust, almost straight above and with the upper margin crenulate.

Length of body, ♂, 33 mm., ♀, 31 mm.; of pronotum, ♂ and ♀, 8.25 mm.; of tegmina, ♂, 37 mm., ♀, 41 mm.; width of tegmina, ♂, about 7.5 mm., ♀, about 10 mm.; length of hind femora, ♂, 22 mm., ♀, 25.5 mm.; of ovipositor, 19.5 mm.

*Habitat.*—1♂, 1♀. Province del Sara, Bolivia, at an elevation of 350 meters above sea-level. The female was collected during October and the male in either April or May (J. Steinbach). The types are in the Carnegie Museum.

Genus JAMAICANA Brunner.

*Jamaicana* BRUNNER, Mon. Pseudophyll., pp. 16, 146 (1895).

The present genus is characteristic of the Island of Jamaica, West Indies, where it is represented by at least three species. Two of these have been described heretofore, while the third is now characterized.

SYNOPSIS OF THE SPECIES OF JAMAICANA.<sup>4</sup>

- A. Pronotum unicolored. Wings unicolored. Wings yellowish, the veins ferruginous, with the transverse veins narrowly black-bordered. Posterior tibiae spined on the external border.....*unicolor* Brunner.
- AA. Pronotum vittate with fuscous. Posterior tibiae not spined on the outer margin.
- b. Smaller (♀, 40 mm.); the pronotum rugulose, provided with a black vitta along each of the lateral carinae. Wings strongly infumate, almost fuscous.....*subguttata* Walker.
- bb. Larger (♀, 46 mm.); the pronotum subglabrous, not only provided with lateral vittae along the carinae but also with the disc largely piceous. Wings flavous, narrowly infuscated along the transverse veins.  
*superba* sp. nov.

88. *Jamaicana unicolor* Brunner.

*Jamaicana unicolor* BRUNNER, Mon. Pseudophyll., p. 147 (1895); KIRBY, Syn. Cat. Orth., II, p. 322 (1906).

There are several specimens, male and female, of this species at hand. They come from the Island of Jamaica, and form part of the Carnegie Museum, Accession No. 2306.

89. *Jamaicana subguttata* Walker.

*Merocidius subguttatus* WALKER, Cat. Dermap. Salt. B. M., III, p. 445 (1870).  
*Jamaicana vittata* BRUNNER, Mon. Pseudophyll., p. 147 (1895); KIRBY, Syn. Cat. Orth., II, p. 322 (1906).

The Jamaica material at hand also contains several specimens which belong to *subguttata* of Walker. The females average much darker

<sup>4</sup> An additional species is included in the genus by Kirby (Syn. Cat. Orth., II, p. 322), but I have not included it here since it is not native to Jamaica.

than the males in their coloration. They are also much larger as seems to be the rule in the various representatives of the genus. These latter specimens also belong to Accession No. 2306.

90. *Jamaicana superba* sp. nov.

Size large, form robust. Spine characters as given in synoptic table. Head and pronotum sub-glabrous, the rugæ of the pronotum, although fairly numerous, small and inconspicuous, the transverse sulci inconspicuous, not deeply impressed. General color including the tegmina flavo-testaceous. Occiput and disc of pronotum largely brunneo-piceous. There are four rather large spots or patches on the pleura and the sides of the basal abdominal segment are also black. Apical half of the ovipositor more or less piceous.

Length of body, ♀, 46 mm., of pronotum, 11.5 mm., of tegmina, 46 mm., width of tegmina, 11 mm., length of hind femora, 30 mm., of ovipositor, 20 mm.

*Habitat.*—The type and only specimen examined comes from the Island of Jamaica, West Indies, where it was collected by F. Klages. It is deposited in the Carnegie Museum of Pittsburgh and forms part of the collection of Dr. W. J. Holland, Accession L. No. 131.

Genus *MERONCIDIUS* Serville.

*Meroncidius* SERVILLE, Rev. Meth., Ann. Sci. Nat., XXII, p. 53 (1831); *Ib.*, Hist. Orth., 448 (1839); BRUNNER, Mon. Pseudophyll., pp. 17, 148 (1895); KIRBY, Syn. Cat. Orth., II, p. 322 (1906).  
*Meroncidium* STÅL, Cefv. Vet.-Akad. Förh., XXX, (4), p. 46 (1873).

All the representatives (eleven) of the genus *Meroncidius* excepting *M. fuscus* recorded in Kirby's Synonymic Catalogue of the Orthoptera are credited to strictly South American territory. In the material now being studied I find several specimens of a species which apparently should be located in this genus. It seems to be distinct from the described forms.

91. *Meroncidius insularis* sp. nov.

Related to *M. ochraceus* Burmeister, but differing from it in several respects, as noted in the following brief description.

Size large, the antennæ excessively long, in the male fully three times, in the female more than twice, the length of the body including the ovipositor. Pronotum somewhat rugulose, but nowise tuberculate, the hind transverse sulcus profound, the disc back of this sulcus

somewhat flattened, anterior margin broadly rounded, the middle provided with a minute tubercle in the male, but smooth in the female. Tegmina moderately broad and rather long, testaceo-cinereous, feebly marmorate with fuscous, the speculum of the male margined with castaneous. Legs moderately robust; the anterior femora flattened below, the front margin three-spined, intermediate pair four-spined externally, hind pair seven-spined; intermediate tibiae two-spined above near the base. Ovipositor heavy, straight, about one-seventh as broad as long, only gently obliquely truncate, the disc smooth.

General color ochraceo-cinereous, irregularly variegated with fuscous. Front gray or greenish-gray. Pronotum with the disc bordered laterally with piceous vittæ, which extend from the front to hind margins. Anterior femora beneath varying from testaceous through oil-green to dull gray. Ovipositor strongly infuscated beyond the middle. Wings pallid, the transverse veins a little embrowned. Antennæ pale at base, becoming dusky beyond, not annulate.

Length of body, ♂ and ♀, 46 mm.; of pronotum, ♂, 9.5 mm., ♀, 10 mm.; of tegmina, ♂, 45 mm., ♀, 50 mm.; width of tegmina, ♂, 10 mm., ♀, 11 mm.; length of hind femora, ♂, 30 mm., ♀, 31 mm.; of ovipositor, 28 mm.

*Habitat*.—Jamaica, West Indies. Several specimens from the collection of Dr. W. J. Holland, (coll. F. Klages) Acc. L. No. 131; and others labeled "Jamaica W. I., Accession No. 2306." The types, ♂ and ♀, are in the Carnegie Museum.

#### Genus ANCHIPTOLIS Brunner.

*Anchiptolis* BRUNNER, Monog. Pseudophyll., pp. 18, 170 (1895); SAUSSURE & PICTET, Biol. Cent.-Amer., Orth., I, p. 421 (1898).

This is another of the tropical American genera of the Pseudophyllidæ which seems to be represented in the present collection. According to Kirby's Synonymic Catalogue there have been nine species described. Our specimen does not appear to fit any of these descriptions, and accordingly is presented herewith as new.

#### 92. *Anchiptolis chapadensis* sp. nov.

Approaching *A. pleminioides* Brunner, but differing from it in size and color. General color cinereo-testaceous, variegated with brown and fuscous. Front pale gray, margined at sides by a pale testaceous



line reaching from the lower inner margin of eyes to the outer base of the clypeus. Antennæ unicolorous, ferruginous. Pronotum bluntly rugulose, marmorate with grayish fuscous. Tegmina with the veins and cross-veins narrowly bordered with fuscous, giving to these wings a netted appearance; posterior margin rather widely alternately pale and brown maculate. Wings uniformly pale fuscous, or strongly enfumed. Ninth and tenth abdominal segments above glossy black. Legs all profusely variegated with fuscous bands and lines. Anterior and middle femora below four-spined, posterior pair six- or seven-spined. Front tibiæ flattened above, a little swollen below the foramina and without apical spines; intermediate tibiæ a little compressed and dilated basally, two-spined above.

Length of body, ♀, 35 mm., of pronotum, 8 mm., of tegmina, 38 mm., width of tegmina, 9 mm., length of hind femora, 23 mm., of ovipositor, 19 mm.

*Habitat.*—The only specimen at hand, a female and the type, comes from Chapada, Brazil, where it was taken during the month of August by H. H. Smith. It is to be found in the insect collections of the Carnegie Museum.

#### Genus LIPAROSCELIS Stål.

*Liparoscelis* STÅL, Obs. Orth. Æfv. Vet.-Akad. Förh., XXX, (4) p. 47 (1873); BRUNNER, Mon. Pseudophyll., pp. 18, 174 (1895).

A female specimen coming from Bom Fim, Bahia, Brazil, has been determined as belonging to this genus. It does not, however, agree with the described species.

#### 93. *Liparoscelis brasiliensis* sp. nov.

Moderately robust, general color fusco-olivaceous, profusely variegated with black on the head, pronotum, tegmina, and legs. Falling in the same section with *nigrispinis* Stål, but differing from it in a number of respects.

Front somewhat depressed, but convex, comparatively smooth, with few punctures and transverse aciculations. Pronotum somewhat flattened above, rather densely and coarsely granulose. Tegmina abbreviated, the ulnar margins overlapping, the apex rounded, reaching the hind border of the second abdominal segment. Anterior and median femora moderately robust, the former below on the anterior border three- to four-spined, the latter three-spined; hind femora

four- to five-spined; the anterior tibiae smooth above, six-spined on both margins below; the intermediate seven-spined on both margins; hind tibiae above on the external margin three- to four-spined. Subgenital plate of female short, broadly rounded at the center, narrowly, but roundly, emarginate. Ovipositor nearly straight, the base heavy, the apex lengthily acuminate.

Front with two oblong depressed black spots; occiput between two narrow testaceous lines solidly black, the sides of the face back of the eyes also provided with an oblique black dash. Pronotum with several depressed glabrous areas which are likewise black. Tegmina with the costal and oblique transverse veins piceous, the disk above more or less infuscated. Femora, especially the anterior and median, profusely transversely maculate with black; the front tibiae internally, the median externally longitudinally streaked with the same color. Apical half and lateral carinae basally piceous. Spines of legs pale, black-tipped.

Length of body, ♀, 40 mm., of pronotum, 9.25 mm., of tegmina, 12 mm., of hind femora, 19.5 mm., of ovipositor, 18 mm., width of latter near the base 3.75 mm.

*Habitat.*—The only specimen at hand, the type, bears the following label: "Bom Fim, Bahia (at Facenda Amaratii), Oct. 20, 1908. J. D. Haseman collector." The type is deposited in the Carnegie Museum.

#### Genus COCCONOTUS Stål.

*Cocconotus* STÅL, Öfv. Vet.-Akad. Förh., XXX, (4), p. 46 (1873); *Ib.*, Recens. Orth., II, pp. 65, 89 (1874); BOLIVAR, Viaje al Pacif., Ins., p. 70 (1884); BRUNER, Mon. Pseudophyll., pp. 19, 198 (1895); GIGLIO-TOS, Boll. Mus. Torino, XIII, no. 311, p. 95 (1898); SAUSSURE & PICTET, Biol. Cent.-Amer. Orth., I, p. 425 (1898).

Representatives of this genus are abundantly distributed in tropical American countries from southern Mexico to Peru. Being arboreal and to a certain extent also diurnal, most of the species are rather pale or light-colored, many of them being more or less green-tinted. According to Kirby's Synonymic Catalogue of the Orthoptera there had been thirty-three separate species recognized up to the beginning of 1906. The material now at hand contains a specimen of what seems to be an additional species. There are also two others represented.

94. *Cocconotus reliarius* Stål?

*Cocconotus reliarius* STÅL, Recens. Orth., II, p. 90 (1874); BRUNNER, Monog. Pseudophyll., pp. 199, 202 (1895).

A female specimen coming from Bogota, Colombia, is doubtfully referred here. It was taken by H. H. Smith.

95. *Cocconotus vittagenæ* sp. nov.

Related to *C. degeeri* Stål and *aratifrons* Brunner, but distinct from both of these in color. Antennæ excessively long, ferruginous. Front similar to that of the species to which compared, *i. e.* glossy black, partially separated into three broad vittæ on upper two-thirds by two narrow wedge-like pale streaks coincident with the inner margins of the antennal scrobes, the median dark vitta continuing mesially nearly half way across the clypeus; the two lateral of the five black vittæ are located on the cheeks and separated from the black front by a prominent band of testaceous; outer portion of lip and mandibles also black. Pronotum at sides testaceous, above brunneo-ferruginous, fore and hind margins, except of the disc behind, narrowly black-bordered. Elytra testaceo-ferruginous, except on the costal field, where the veinlets are largely green. Legs pale ferruginous, the spines entirely black. Ovipositor rather robust, on the outer or apical half together with the upper and lower margins broadly castaneous.

Length of body, ♀, 30 mm., of pronotum, 8 mm., of tegmina, 42 mm., width of tegmina, about 7.5 mm., length of hind femora, 23 mm., of ovipositor, 17 mm.

*Habitat.*—Don Diego, Department of Magdalena, Colombia, at an elevation of 100 feet above sea-level, in May (H. H. Smith.) Type in the Carnegie Museum.

96. *Cocconotus angustatus* Brunner?

*Cocconotus angustatus* BRUNNER, Mon. Pseudophyll., pp. 201, 210 (1895).

A single female taken by J. Steinbach in the "Province del Sara," Bolivia, is referred here with some doubt. It was taken at a point 450 meters above sea-level.

## GENUS NANNOTETTIX.

*Nannotettix* BRUNNER, Mon. Pseudophyll., pp. 19, 212 (1895).

Only a single specimen of the genus *Nannotettix* is at hand and it seems to be new.

97. *Nannotettix steinbachi* sp. nov.

Most closely related to *guentheri* Brunner, but differing from it in the somewhat larger size, the absence of the black lines from the sides of the pronotum, etc.

General color brunneo-testaceous, with darker markings on the sides of the abdomen, and a pale yellowish line on the sides of the occiput and along the pronotal carinæ. Antennæ unicolorous, ferruginous. Face of female dirty greenish gray, of male grayish brown, sides of front yellow-bordered in female, orange-bordered in male. Pronotum rugulose both above and at the sides, the transverse sulci deeply impressed. Tegmina brown with testaceous nervures, reaching the hind border of the first abdominal segment in both sexes, their apex broadly rounded. Abdomen at sides and dorsally wood-brown varied with piceous, most strongly so in the male, where the sides are almost entirely of this color, while in the female the posterior margins of the segments alone are thus marked. Immediately above this dusky maculation there is a well-marked longitudinal testaceous line giving to the insect a vittate appearance. Beneath testaceous, the femora ferruginous, a little paler at their base, darker apically. Anterior and middle femora below three- to four-spined, hind femora about seven-spined. Last ventral segment of the abdomen of the male somewhat attenuated, the apex roundly emarginate, the styles large, about five times as long as broad, the apex blunt. Cerci pallid in both sexes, in the male very robust, bullate, with the apex greatly constricted, bent inwardly, and provided with an anteriorly directed spine. Ovipositor normal, the apical half rubro-piceous. Subgenital plate of female triangular, the apex triangulately emarginate.

Length of body, ♂, 24 mm., ♀, 34 mm.; of pronotum, ♂, 5 mm., ♀, 6.35 mm.; of tegmina, ♂ and ♀, 5 mm.; of hind femora, ♂, 16.5 mm., ♀, 20 mm.; of ovipositor, 14 mm.

*Habitat*.—Santa Cruz de la Sierra, Bolivia, 450 meters above sea-level, J. Steinbach, collector. The types, male and female, are in the Carnegie Museum.

## Genus DIOPHANES Stål.

*Diophanes* STÅL, Bihang Svensk. Akad., III, (14), p. 38 (1874); BRUNNER, Monog. Pseudophyll., pp. 21, 241 (1895); SAUSSURE & PICTET, Biol. Cent.-Amer., I, p. 446 (1898).  
*Platyphyllum* BRULLÉ, (*partim*), Hist. Nat. Ins. IX, p. 138 (1835).

The species of this genus, all of which are green, are tropical American in their distribution. Six have been recognized according to Kirby's Synonymic Catalogue. Another is now added. They may be separated by the accompanying synoptic table.

SYNOPSIS OF THE SPECIES OF DIOPHANES.<sup>5</sup>

- A. Genicular lobes of the anterior femora obtuse; those on the middle femora internally armed with a spine. Middle tibiæ spined above.
- b. Humeral vein on the distal half diverging from the discoidal vein; branch of hind radial arising before the middle. Wings roseate; styles of the subgenital plate of the abdomen of male long.
- c. Wings beautiful rose-colored. Ovipositor slender. [Mexico, Central, and South America].....*perspicillatus* Fabricius.
- cc. Wings hyaline roseate. Ovipositor very broad. [Panama.]  
*rosescens* Saussure & Pictet.
- bb. Humeral vein contiguous with the discoidal vein for a long distance, at the apex suddenly deflexed.
- c. Spines of the hind femora pale, their apex fuscous.
- d. Somewhat large. Metazona of the pronotum of male flattened. Tegmina with the branch of the median starting beyond the middle; tympanal field black-bordered. Wings whitish. [Bolivia].....*atrosignatus* Brunner.
- dd. Smaller. Metazona of pronotum of male ascending. Tegmina with the branch of the median arising before the middle; tympanal field pale-bordered. Styles very short [Mexico].  
*abbreviatus* Brunner.
- cc. Spines of the hind femora black at their base and paler towards the apex, or wholly black.
- d. Hind femora with the spines pale towards the apex. Wings smoky. [Peru, Upper Amazons].....*nigro-spinosus* Brunner.
- dd. Hind femora with the spines entirely black. Wings pale yellowish white. [Bolivia].....*atrospinosus* sp. nov.
- AA. Genicular lobes of all the femora each minutely spined, or those of the front pair sometimes triangular. Intermediate tibiæ unarmed above. Wings infuscated. [Martinique, West Indies].....*scabricolle* Serville.

98. *Diophanes atrosignatus* Brunner.

*Diophanes atrosignatus* BRUNNER, Monog. Pseudophyll., p. 242 (1895); SAUSSURE & PICTET, Biol. Cent.-Amer. Orth., I, p. 446 (1898).

There are two specimens, male and female, of *Diophanes* before me, which I am inclined to refer to Brunner's *atrosignatus*, although they do not agree with the description in every respect.

<sup>5</sup> Modified from Saussure & Pictet (Biologia Centrali-Americana, Orth. I, p. 446 (1898)).

*Habitat.*—The male bears the label "Rio Japacani, Department of Santa Cruz, Bolivia," while the female was taken at Las Juntas, in the same department. (J. Steinbach.)

99. *Diophanes atrospinosus* sp. nov.

As indicated by the synoptic key, as well as by the specific name, the present species is at once characterized by its black femoral spines. Size medium, color above bright green. Head, legs, and underside flavo-testaceous. Antennæ long, ferruginous. Tarsi infuscated. Pronotum rather closely and sharply granulose, wider than long, somewhat saddle-shaped, the metanotum a little produced and elevated, flattened, and with the hind margin roundly truncated. Tegmina considerably longer than the abdomen, the margins nearly parallel, the extreme posterior margin infuscated. Branch of the posterior radial arising near the middle, somewhat mixed with cross-veins, so as to render its recognition more or less difficult, the posterior radial terminating near the beginning of the apical third of the elytra. Femoral genicular spines rather prominent. Anterior femora three-spined, intermediate five-spined and posterior eight- to nine-spined below; those on the anterior and middle pairs black-tipped, on hind straight, slender, and rather long, entirely black. Middle tibiae two-spined above. Male cerci long and somewhat sinuose, gently tapering, provided with an inwardly directed spine at tip; the subgenital plate narrow, elongate, deeply and roundly fissured.

Length of body, ♂, 35 mm., of pronotum, 7.25 mm., of tegmina, 46 mm., width of tegmina about 11 mm., length of hind femora, 20.5 mm.

*Habitat.*—Santa Cruz de la Sierra, Bolivia, at an altitude of 450 meters above sea-level. J. Steinbach, collector. The type alone is at hand. It belongs to the Carnegie Museum.

Genus *TYPOPHYLLUM* Serville.

*Typophyllum* SERVILLE, Ins. Orth., p. 439 (1839); PICTET, Mem. Soc. Genève, XXX, (6), p. 24 (1888); BRUNER, Mon. Pseudophyll., pp. 22, 257 (1895).  
*Tovaria* BOLIVAR, Ann. Soc. Ent. Fr. (6), X, p. 141 (1890).

The representatives of the present genus are all South American and occur only in the tropical forests. More than a dozen species have been recognized and described. They are remarkably leaf-like in appearance.

100. *Typophyllum helleri* Brunner.

*Typophyllum helleri* BRUNNER, Mon. Pseudophyll., pp. 258, 259 (1895).

A single partially mutilated female specimen of this species is at hand. It comes from Pará, Brazil, where it was probably taken by H. H. Smith. It was collected in the month of April.

## Genus CHLOROPHYLLA Pictet.

*Chlorophylla* PICTET, Mem. Soc. Genève, XXX, (6), p. 42 (1888); BRUNNER, Mon. Pseudophyll., pp. 22, 265 (1895); SAUSSURE & PICTET, Biol. Cent.-Amer. Orth., I, p. 455 (1898).

101. *Chlorophylla falcifolia* Walker.

*Cycloptera falcifolia* WALKER, Cat. Derm. Salt. B. M., III, p. 463 (1870).

*Cycloptera arcuata* SAUSSURE & PICTET, Biol. Cent.-Amer. Orth., I, pp. 455, 456, pl. 22, fig. 19 (1898).

The male of this species is represented by a single specimen taken at Quatro Ojos, Department of Santa Cruz, Bolivia (J. Steinbach).

102. *Chlorophylla latifolia* Pictet.

*Chlorophylla latifolia* PICTET, Mem. Soc. Genève, XXX, (6), p. 43, pl. I, figs. 14, 14a (1888).

Three females of this genus coming from Puerto Suarez, Bolivia, are referred here. They were taken by J. D. Haseman.

## Family LISTROSCELIDÆ.

Like the Agræciidæ the representatives of the present family are also tropical in their distribution. The American genera number only seven with twenty-six recognized species. The life-history of these insects is almost unknown, but it is surmised that they are chiefly insectivorous. The genera may readily be separated by the following synoptical key which is a modification of that of Karny as published in *Genera Insectorum*, Fascicle No. 131.

## SYNOPSIS OF TROPICAL AMERICAN GENERA OF LISTROSCELIDÆ.

- A. Auditory foramina of anterior tibiæ on both sides, or at least on the outer, with margin wide open.
  - b. Tegmina fully developed, but shorter than the wings. . . . . *Phlugis* Stål.
  - bb. Tegmina greatly abbreviated. . . . . *Phlugiola* Karny.
- AA. Auditory foramina of anterior tibiæ on both sides shell-like or linear.
  - b. Face with the front rugulose, wrinkled. . . . . *Cerberodon* Perty.
  - bb. Face more or less smooth, not wrinkled.
    - c. Tegmina and wings fully formed.

- d. Large, tegmina basally without a spot. . . *Monocerophora* Walker.  
 dd. Not so large. Tegmina basally in front provided with a pale spot. . . . . *Listrocelis* Serville.  
 cc. Tegmina and wings abbreviated, lobate, or scale-like.  
 d. Legs robust. General color, including the femora, brunneo-ferruginous.  
 e. Left mandible of the male greatly lengthened, angulately bent at middle [Cuyabá, Matto-Grosso, Brazil]. *Carliella* Karny.  
 ee. Left mandible of the male normal, not unusually lengthened [Chapada, Brazil]. . . . . *Macromelopon* gen. nov.  
 dd. Legs very long and slender. General color variable, the femora green or greenish [Colombia]. . . . . *Arachnoscelis* Karny.

Genus *PHLUGIS* Stål.

*Phlugis* STÅL, Eug. Resa, Orth., p. 324 (1860).

*Pilugis* WALKER, Cat. Dermapt, Salt. B. M., V, Suppl., p. 15 (1871).

*Thysdrus* STÅL, Recens. Orth., II, p. 102 (1874), and most authors since.

The insects which comprise the genus *Phlugis* with a single exception are found in tropical America. They are small and inconspicuous, being pale testaceous, or greenish, and usually their tegmina are more or less hyaline. Judging from the spined anterior tibiae and femora they may be predaceous in their food habit, using this pair of legs for seizing and holding their prey while devouring it. The diagnostic characters are such as size, venation, comparative length of tegmina and wings, the spines on the anterior and middle femora and tibiae, and the form and arrangement of the various terminal appendages of the male abdomen. Of all of these characters possibly size, spine structure, and the abdominal appendages are most to be relied upon for separating the species. Undoubtedly close and careful collecting over all of tropical South and Central America will bring to light several additional forms. The accompanying synoptic key shows all of the previously described forms together with others now characterized as new.

SYNOPSIS OF THE SPECIES OF *PHLUGIS*.

- A. Tegmina passing beyond the apex of the abdomen.  
 b. Ovipositor shorter than the female cerci; male not known [Guatemala, French Guiana]. . . . . *infirmus* Saussure & Pictet.  
 bb. Ovipositor longer than the female cerci.  
 c. Costal area of the tegmina regularly reticulate, the transverse veins parallel.  
 d. Anterior area of tegmina provided with seven to fifteen transverse veins.



- e. Costal area with seven to nine transverse veins.  
 f. Cerci of male curved, shorter than the subgenital plate.  
*tener* Stål.
- ff. Cerci of male straight, longer than the subgenital plate.  
*proxima* sp. nov.
- ee. Costal area with twelve to fifteen transverse veins.  
 f. Costal area with about twelve transverse veins [Mexico, Central America].....*mexicanus* Saussure & Pictet.  
 ff. Costal area with about fifteen transverse veins.  
 g. Posterior margin of the elytra infuscated. Anterior tibiae five-spined on both of their margins [upper Amazon].  
*marginata* Redtenbacher.  
 gg. Posterior margin of the elytra concolorous.  
 h. Pronotum behind roundly produced.  
 i. Cerci of male much shorter than the subgenital plate, not cruciate nor forficata.  
 j. Valves of the subgenital plate of the male with their superior margin provided with a distinct angle.  
 k. Size smaller (male tegmina 11 mm.), superior angle of valves of subgenital plate obtuse.  
*virnes* Thunberg.  
 kk. Size larger (male tegmina 13.5 mm.). Superior angle distinct.  
*abnormis* Redtenbacher.  
 jj. Valves of the subgenital plate above destitute of an angle (male tegmina 9.5 mm.).  
*similis* sp. nov.  
 ii. Cerci of male very long, recurved, forficata, or cruciate.....*caudata* Redtenbacher.  
 hh. Pronotum truncate behind. The tegmina short.  
*macilenta* Redtenbacher.
- dd. Anterior area of tegmina with about twenty-five cross-veins.  
 e. Anterior tibiae five-spined.  
 f. Front tibiae unusually elongate and curved...*nemoptera* Bolivar.  
 ff. Front tibiae less elongate and less curved.....*teres* DeGeer.  
 ee. Anterior tibiae four-spined.....*mantispa* Bolivar.
- cc. Costal field of the tegmina irregularly veined, the cross-veins more or less tortuous.  
 d. Size smaller (tegmina of female 15 mm.).....*irregularis* sp. nov.  
 dd. Size larger (tegmina of female 18 mm.).....*coriacea* Redtenbacher.
- AA. Tegmina not reaching the apex of the abdomen.  
 b. Middle tibiae three-spined below [Brazil].....*cephalotes* Bolivar.  
 bb. Middle tibiae unarmed below [Borneo].....*dubia* Karny.

103. *Phlugis tener* (Stål).

*Thysdrus tener* STÅL, Recens. Orth., II, p. 117 (1874); REDTENBACHER, Monog. d. Conocephalid., p. 225 (1891).

*Phlugis tenera* KARNY, Revis. Conoceph., p. 101 (1907).

? *Locusta spinipes* FABRICIUS, Ent. Syst. II, p. 37 (1794).

There are several specimens at hand which I am inclined to place here. They come from Villeta, Paraguay, and Chapada, Brazil. They were taken during the months of April, May, July, and November (H. H. Smith).

104. *Phlugis proxima* sp. nov.

A small inconspicuous insect, which closely resembles *P. tener* of Stål, but which differs from it in several respects, as indicated by the synoptical key printed herewith.

Size small, greenish to pale testaceous, tegmina and wings translucent or pellucid. Antennæ without fuscous annulations. Pronotum elongated and rounded behind. Tegmina not quite reaching the tips of the hind femora, their costal field provided with few transverse veins, about seven to nine. Anterior femora below three-spined in front, four-spined behind; anterior tibiæ five-spined on both margins, the spines slender and acuminate; middle tibiæ two-spined below. Male cerci straight, a trifle longer than the subgenital plate. Latter short, its sides vertical, heavy, contracted at middle, the apical portion viewed laterally spatulate and with the apex obliquely truncated from above, deeply and narrowly fissured at middle.

Length of body, ♂, 12 mm., of pronotum, 3 mm., of tegmina 10 mm., of wings, 16 mm., of hind femora, 9 mm.

*Habitat*.—A single male, the type, comes from Chapada, Brazil, where it was taken by H. H. Smith during the month of May. It is in the Carnegie Museum.

105. *Phlugis virens* (Thunberg).

*Conocephalus virens* THUNBERG, Mem. Acad. Petersb., V, p. 274 (1815).

*Thysdrus virens* STÅL, Recens. Orth., II, p. 117 (1874); REDTENBACHER, Mon. Conocephal., p. 224 (1891).

*Phlugis virens* KIRBY, Syn. Cat. Orth. Brit. Mus., II, p. 285 (1906); KARNY, Revis. Conocephal., p. 101 (1907).

*Phlugis chrysope* BOLIVAR, Orth. Cuba, p. 37 (1888).

There are specimens of this species before me from Rio de Janeiro, Pará, and Chapada, Brazil, and Puerto Suarez and the Province del Sara, Bolivia. They were taken from September to January by H. H. Smith and J. Steinbach.

106. *Phlugis similis* sp. nov.

Green. Related to *virens* Thunberg, from which it differs in its somewhat smaller size and the very different subgenital plate of the abdomen of the male. Anterior tibiae four-spined as in *P. mantispa* Bolivar.

Pale green, the tegmina somewhat pellucid. Pronotum unicolorous, the hind margin produced, rounded. Tegmina narrow, their tips about reaching the apex of the subgenital plate of the abdomen in the male, the costal area provided with about fifteen cross-veins. Anterior tibiae four-spined on both margins, those in front rather blunt; the front femora three-spined in front and four-spined behind; middle tibiae two-spined below. Male cerci moderately robust at their base, gently curved, not quite one-half the length of the subgenital plate. The latter large, broad, with the lateral margins nearly parallel on their basal three-fifths, roundly narrowing beyond, the apex deeply cleft and the two branches twisted, so that their upper surface is apposing somewhat after the fashion of the insect determined by me as *P. mantispa* Bolivar, their upper margin nowise angulate as stated in the descriptions of *virens* Thunberg and *abnormis* Redtenbacher.

Length of body, ♂, 9.5 mm., including subgenital plate 12.5 mm., of pronotum, 2.65 mm., of tegmina, 10 mm., of hind femora, 9 mm.

*Habitat.*—Bahia, Brazil, October 24, 1907. Collected "by sweeping grass in a garden in edge of the City, J. D. Haseman." The type is the only specimen at hand. It is in the Carnegie Museum, Pittsburgh, Pa.

107. *Phlugis caudata* (Redtenbacher)?

*Thysdrus caudatus* REDTENBACHER, Mon. Conocephal., p. 223 (1891).

*Phlugis caudatus* KIRBY, Syn. Cat. Orth. B. M., II, p. 285 (1906); KARNY, Revis. Conocephal., p. 102 (1907).

A single male specimen coming from Quatro Ojos, Department of Santa Cruz, Bolivia, where it was taken by J. Steinbach during November, 1913, is referred to this species with considerable doubt. The very abnormal form of the cerci and subgenital plate do not quite agree with the original description. Especially does this remark hold true regarding the sub-genital plates, which are more like long, somewhat flattened, and gently upwardly curved styles, which are widely separated from their base. The costal area of the tegmina is likewise abnormal, being much narrower than usual and with the median vein running lengthwise through its middle parallel to the costa.

108. *Phlugis nemoptera* Bolivar?

*Phlugis nemoptera* BOLIVAR, Mem. Soc. Zool. France, I, p. 153 (1888); KIRBY, Syn. Cat. Orth. B. M., II, p. 284 (1906); KARNY, Revis. Conocephal., p. 102 (1907).  
*Thysdrus nemoptera* REDTENBACHER, Mon. Conocephal., p. 221 (1891).

Three specimens coming from the "Province de la Sierra," Bolivia, are referred to this species with some doubt. While agreeing with the description of *P. nemoptera* in most respects, they have a rather prominent orange-colored line running length-wise of the disc of the pronotum, instead of the emerald-green line attributed to that species. They were collected during December by J. Steinbach.

109. *Phlugis teres* (de Geer).

*Locusta teres* DE GEER, Mem. Ins., III, p. 458, Pl. 40, fig. 5 (1778).  
*Phlugis teres* STÅL, K. S. Freg. Eugen. Resa., Ins. Orth., p. 324 (1860); KIRBY, Syn. Cat. Orth. B. M., II, p. 285 (1906).  
*Thysdrus teres* STÅL, Recens. Orth., II, p. 116 (1874); REDTENBACHER, Mon. Conocephal., p. 222 (1891).

Three specimens, 1♂ and 2♀, from Chapada, Brazil, are referred to de Geer's species. They were taken by H. H. Smith in April and May. There is also a pair taken by J. Steinbach at "Sta. Cruz de la Sierra," Bolivia, at an elevation of 450 meters above sea-level.

110. *Phlugis mantispa* Bolivar.

*Phlugis mantispa* BOLIVAR; Orthopt. Cuba, p. 30 (1888); KIRBY, Syn. Cat. Orth. B. M., II, p. 285 (1906).  
*Thysdrus mantispa* REDTENBACHER, Mon. Conocephal., p. 222 (1891).

A number of specimens of both sexes, coming from Bolivia, Brazil, and Paraguay have been referred to Bolivar's species *P. mantispa* originally described from Cuban material. These insects were collected by H. H. Smith and J. Steinbach, the latter having taken a specimen at Puerto Suarez, Bolivia.

111. *Phlugis irregularis* sp. nov.

Size medium, green, or greenish testaceous, the antennæ more or less fasciate with fuscous. Tegmina and exposed apical portion of wings somewhat coriaceous. Most closely related to *P. coriacea* Redtenbacher, but decidedly smaller, as will be seen by a reference to the foregoing table of species.

Pronotum somewhat produced behind, the posterior border evenly rounded. Tegmina of medium width, tapering but little apically,

the tips extending beyond the apex of the hind femora, obliquely rounded from below. Costal area with the transverse veins somewhat irregular, the median vein reaching the costal margin at about the middle of the tegmen. Anterior femora below three-spined in front and four-spined behind; anterior tibiæ four-spined on both margins, the spines robust and blunt at tips, decreasing in length from base to apex; middle tibiæ two-spined externally and provided internally with two to three minute spines. Ovipositor normal, the cerci curved, evenly tapering, reaching a trifle beyond the middle of the slender portion of the ovipositor.

Length of body, ♀, 14 mm., of pronotum, 3 mm., of tegmina, 14.5–15 mm., of hind femora, 10.5 mm., of ovipositor, 3.5 mm.

*Habitat*.—Puerto Suarez, Bolivia, at 150 meters elevation above sea-level, November to January, 2 ♀ ♀, collected by J. Steinbach. Two others, also females, come from the "Province del Sara," at an altitude of 350 meters, where they were taken in December. Still a fifth example is at hand. This latter bears the label "São Luiz de Caceres, Rio Paraguay, Matto Grosso, Brazil, May 17, 1909." It was taken by J. D. Haseman. The type is in the Carnegie Museum.

#### Genus MACROMETOPON gen. nov.

The insect which is the type of the present genus is a representative of the family *Listroscolidae*. It is related to *Carliella* Karney, and might be placed in that genus, were it not for the differences in the development of the mandibles.

The present genus may be characterized as follows: Head very large, considerably wider than the anterior portion of the pronotum, the occiput rounded, without a longitudinal median carina; fastigium of the vertex greatly compressed, much narrower than the diameter of the first antennal joint, its apex somewhat advanced and widely separated from the fastigium of the front; lower part of the face and especially the mandibles and labrum considerably elongated as in *Anostostoma* and one or two other genera of the family *Stenopelmatidae*. Maxillary palpi elongate, slender. Eyes prominent, slightly elongate; ocelli small, the median situated just within a line drawn from the lower margin of the eyes. Pronotum broadest above the insertion of anterior legs with the anterior edge wider than the posterior, the latter elevated and almost straight behind, the front also nearly straight, principal sulcus very profound; lower edge of the lateral

lobes nearly straight. Tegmina present but abbreviated, the stridulating veins well developed. Legs long, the anterior femora robust, fully twice the length of the pronotum, broadly sulcate beneath and spined as well as finely serrated on both margins; anterior tibia slenderer, and more elongate, somewhat bowed (the auditory openings on both sides linear), both edges provided with six long, strong, articulated spines, the apical pair much the shortest. Intermediate femora shorter and less robust, the under side also sulcate and both serrate and spined, the spines, however, being smaller. Hind femora long, robust on basal half, slender beyond, the genicular lobes minutely and bluntly spined, lower margins both spined with two series as are the anterior and middle pairs; hind tibiae numerous spined both above and below, the spines of ordinary size, the apex above with a robust spine on each side, below with two on each side. Anterior coxae above lengthily spined, intermediate and hind pairs below bluntly spined. Pro-, meso- and meta-sternum provided with two erect, rather long spines. Cerci robust, the apical half bent abruptly inwards and tapering to an acute point; subgenital plate provided with rather long finger-like styles.

112. *Macrometopon rantale* sp. nov.

For the size of this insect giving the general impression of being moderately graceful. General color brunneo-testaceous, the front transversely finely aciculate, and more nearly castaneous in color; mandibles black on apical half. Lower side of the anterior femora jet-black, the surface also finely transversely aciculate. Anterior and middle tibiae castaneous at base of spines. Tegmina infuscated, the veins and veinlets brunneo-testaceous.

Length of body, ♂, 38 mm., of pronotum, 10 mm., greatest width, 9 mm., length of tegmina, 10 mm., length of anterior femora, 20 mm., of anterior tibiae, 24 mm., of middle femora, 16 mm., of middle tibiae, 17 mm., of hind femora, 29 mm.; of hind tibiae, 31 mm.

*Habitat*.—The type, a male and only specimen examined, comes from Chapada, Brazil, where it was taken presumably by H. H. Smith in September. It is in the Carnegie Museum.

There is a female specimen at hand from the same general locality, but it seems to be somewhat immature. The ovipositor is rather long and slender as in the *Gryllacridae*. The anterior legs are less robust and comparatively shorter than in the opposite sex described above somewhat in detail. This female specimen was taken in May.

## Family CONOCEPHALIDÆ (Xiphidiidæ).

The representatives of this family are rather small, compared with the COPIPHORIDÆ, in which they have usually been included. It is unfortunate that so much confusion has arisen and still exists in connection with the nomenclature of these two families of the *Tetti-gonoidea*. In fact there is much confusion in the nomenclature throughout the entire order *Orthoptera*, as one soon learns when taking up the study of the insects of the group.

These insects live among grass and low herbage, where they may be found in rather large numbers throughout the summer and early fall. Representatives occur in all temperate and tropical countries. They are the chief "grass-hoppers" of all such regions. While the group is widely distributed there are comparatively few genera. Not more than four are found in South America. They may be separated as follows:

## SYNOPSIS OF SOUTH AMERICAN GENERA OF CONOCEPHALIDÆ.

- A. Pronotum strongly saddle-shaped [Peru]. . . . . *Paraxiphidium* Redtenbacher.
- AA. Pronotum more or less even, not saddle-shaped.
  - b. Tegmina not as in the alternative category.
    - c. Ovipositor very robust, somewhat falcate or sickle-shaped, the apex very acuminate. Tegmina lobate in both sexes; cerci of male abdomen without an internal tooth or spine. . . . . *Euxiphidion* gen. nov.
    - cc. Ovipositor less robust, straight, or a little curved, the apex not finely acuminate. Tegmina variable, but never lobate in the male; cerci of male abdomen provided with one or two inwardly-directed teeth. *Conocephalus* Thunberg.
  - bb. Tegmina very broad, hiding the abdomen; costal field provided throughout with prominent parallel veins [Paraguay]. . . . . *Xiphelium* Caudell.

## Genus EUXIPHIDION gen. nov.

Related to the genera *Odontoxiphidion* Morse and *Conocephalus* Thunberg (*Xiphidion* of various authors), but readily separated from them by the characters given in the generic synopsis above.

113. *Euxiphidion subapterus* sp. nov.

Body moderately robust, minutely, but thickly, hirsute. Head large, a little wider than the anterior edge of the pronotum; fastigium as in representatives of both the genera *Orchelimum* and *Conocephalus*, touching the fastigium of the front; eyes subglobular, rather large and prominent; first antennal joint abruptly one-half wider on its apical third. Pronotum short, wide, the disc convex, with scarcely a trace

of transverse sulci, truncate in the male, or sub-truncate in the female, both in front and behind; lateral lobes similar to those in *Conocephalus nemoralis* Scudder and *C. propinquus* Redtenbacher. Tegmina broadly lobate in both sexes, scarcely reaching the hind margin of the pronotum in the female, or the hind margin of the first abdominal segment in the male. Abdomen above glabrous, without a median carina. Cerci of male straight, a little tapering and rather short, the inner side without a tooth, but with the apex two-toothed, the inner one of these a trifle the shorter, blunt, the outer one acuminate. Subgenital plate rather broad, its apex bisinuate, the styles short and blunt. Ovipositor very robust, broadly sickle-shaped, the apex finely acuminate. Prosternum two-spined, mesosternum acutely lobate, the metasternum triangulately lobate. Legs normal, the anterior and middle tibiae armed below with six pairs of spines, all the femora below spineless, the genicular lobes of the hind pair provided with a single blunt spine. Auditory openings of front tibiae linear.

General color fusco-brunneous, paler beneath (obscure testaceous); front, cheeks, sides of pronotum and legs, profusely flecked with round ferruginous to piceous dots from the centers of which usually arise short pallid hairs. Fastigium of the vertex above, occiput and disc of the pronotum, together with a wide dorsal stripe on the abdomen, piceous in the male, much paler in the female, bordered on each side by a prominent testaceous line, the sides of pronotum above and sides of abdominal segments on the basal two-thirds piceous. Basal half of hind femora externally prominently fasciate longitudinally with fuscous.

Length of abdomen, ♂, 9.2 mm., ♀, 13 mm.; of pronotum, ♂, 2.55 mm., ♀, 3.1 mm.; of tegmina, ♂, 1.25 mm., ♀, 1 mm.; of hind femora, ♂, 8.75 mm., ♀, 12 mm.; of ovipositor, 8 mm.

*Habitat*.—The male specimen bears the label "Chapada, Campo, Oct.," the female "Corumbá, March (H. H. Smith)." The type specimens are the only representatives examined. They belong to the Carnegie Museum. Both specimens are somewhat broken.

#### Genus CONOCEPHALUS Thunberg.

*Conocephalus* THUNBERG, Mém. Acad. Petersb., V, p. 214 (1815).

*Xiphidion* SERVILLE, Ann. Sci. Nat., XXII, p. 156 (1831); Ins. Orthopt., p. 505 (1839).

*Xiphidium* Burmeister, Handb. Ent., II, p. 707 (1838).



The insects, which comprise the present genus, are among the long-horned grass-hoppers what the various species of the genera *Orphulella* and *Oxya* are among the short-horned grasshoppers, or locusts, the "common grasshoppers" of the grassy hillsides and meadows. They occur in nearly all quarters of the globe, and are fairly numerous in both species and individuals. Heretofore seventeen species have been credited to South American regions, and now two others are added. Very likely still others will be met with from time to time as different sections of the country are visited and worked over by collectors. These South American species may be separated as follows:

SYNOPSIS OF THE SOUTH AMERICAN SPECIES OF CONOCEPHALUS.

- A. Anterior tibiæ armed below with five to seven spines.
  - b. Ovipositor rarely longer than the posterior femora, but, if longer, then the elytra are perfectly developed.
  - c. Cerci of the male heavy, the apex depressed, obtuse.
  - d. Posterior femora below armed with a single spine or without any.
    - e. Fastigium of the vertex narrow; viewed from the front, the lateral margins are subparallel. Tegmina in both sexes longer than the pronotum. . . . . *truncatus* Redtenbacher.
    - ee. Fastigium of the vertex wider; viewed from the front with the lateral margins divergent.
    - f. Lateral lobes of the pronotum with their hind margin sinuate [Chili]. . . . . *vitticollis* Blanchard.
    - ff. Lateral lobes of the pronotum with their hind margin nearly straight.
      - g. Tegmina abbreviated, in the male a little longer than the pronotum in the female. Ovipositor nearly straight [Galapagos Islands]. . . . . *exitiosus* McNeill.<sup>6</sup>
      - gg. Tegmina perfectly developed or the ovipositor not straight.
        - h. Tegmina abbreviated, not entirely covering the abdomen. Ovipositor sickle-shaped.
          - i. Anterior margin of the elytra infuscated.
            - nemoralis* Scudder.
          - ii. Anterior margin of the elytra not infuscated.
            - propinquus* Redtenbacher.
        - hh. Tegmina longer, entirely covering the abdomen. Genuiclar lobes of the posterior femora bidentate.
          - fasciatus* de Geer.

<sup>6</sup> The species *strictoides* Caudell, described from Paraguay, is also brachypterous and related to both *strictus* Scudder and *exitiosus* McNeill. [See Proc. U. S. Nat. Mus., XXX, p. 242 (1906)]. It should be added to the list of South American species of *Conocephalus*.

- dd. Posterior femora spined below.
- e. Tegmina with their apex surpassing the abdomen.
- f. Lateral lobes of the pronotum with their posterior margin rounded.
- g. Styles of subanal plate of male spiniform, above each of which the plate is also produced into a very acute spine. Pronotum with a discal ferruginous band.  
*longipes* Redtenbacher.
- gg. Styles of subanal plate of male filiform, the subgenital plate of male not produced into spines. Disc of the pronotum concolorous, not provided with a ferruginous median longitudinal band. . . . . *unicolor* sp. nov.
- ff. Lateral lobes of the pronotum with their posterior margin straight or nearly so.
- g. Abdomen concolorous.
- h. Fastigium of the vertex, viewed from in front with the lateral margins distinctly divergent [Panama].  
*saltator* Saussure.
- hh. Fastigium of the vertex, viewed from in front with the lateral margins nearly parallel [Ecuador].  
*equatorialis* Giglio-Tos.
- gg. Abdomen variegated with black [Ecuador].  
*versicolor* Redtenbacher.
- ee. Tegmina with their tips not attaining the apex of the abdomen.
- f. Fastigium of the vertex broad, viewed from in front with the lateral margins distinctly divergent.
- g. Elytra in the male double, in the female less than double, the length of the pronotum. Ovipositor equal to, or shorter than, the hind femora.
- h. Tegmina in the female longer than the pronotum. Ovipositor nearly straight.
- i. Tegmina of the female a trifle longer than the pronotum. Ovipositor distinctly shorter than the posterior femora [South America].  
*brachypterus* Redtenbacher.
- ii. Tegmina of the female distinctly longer than the pronotum. Ovipositor of equal length with the hind femora [Brazil] . . . . . *meridionalis* Scudder.
- hh. Tegmina in the female shorter than the pronotum. Ovipositor sickle-shaped [Bolivia].  
*borellii* Giglio-Tos.
- gg. Elytra in both male and female more than twice the length of the pronotum. Ovipositor usually longer than the hind femora . . . . . *recticaudus* sp. nov.
- ff. Fastigium of the vertex narrow, viewed from in front with the lateral margins nearly parallel.
- g. Green. Abdomen concolorous [Colombia].  
*angustifrons* Redtenbacher.

gg. Ferruginous-yellow. Abdomen black, interrupted before the apex on the dorsum by a yellowish band.

*festæ* Giglio-Tos.

cc. Cerci of male slender, sensibly acuminate, the apex not, or but little, depressed. . . . . *caizanus* Giglio-Tos.

bb. Ovipositor very long. Tegmina abbreviated (Uruguay).

*doryphorus* Karny.

AA. Anterior tibiæ armed below with nine to ten spines. . . *aberrans* Redtenbacher.<sup>7</sup>

#### 114. *Conocephalus unicolor* sp. nov.

A large, pallid, robust insect, with fully developed tegmina and wings, in which there are no variations of coloration, as is the case in most of the species of the genus. Most nearly related to *longipes* of Redtenbacher, as may be ascertained by referring to the preceding synopsis of the species found in South America.

Fastigium moderately robust, viewed from in front with its lateral margins divergent. Antennæ robust and very long. Pronotum much as in *C. recticaudus* described hereafter. Tegmina fully developed and reaching the apex of the hind femora, in the male heavy and broad on the basal two-fifths, much narrowed beyond, in the female tapering evenly from the base, the apex rounded. Hind femora below provided externally with four to six rather prominent spines. Male cerci robust, tapering, the extreme apex depressed inwardly, toothed near the base. Subanal plate of male not, or very faintly, carinated at middle; the styles small, filiform; the apex of the plate subangulate. Ovipositor large, straight.

General color pale greenish, the wings faintly rose-tinted. Antennæ with the apex of joints narrowly fuscous. Apex of the hind femora briefly infuscated. Spines of hind femora and tibiæ dusky.

Length of body, ♂, 16 mm., ♀, 21 mm.; of pronotum, ♂, 3.1 mm., ♀, 3.6 mm.; of tegmina, ♂, 16 mm., ♀, 20 mm.; of hind femora, ♂, 13 mm., ♀, 16 mm.

*Habitat*.—The types come from Corumbá, Brazil, where they were taken in March. Additional specimens were collected during April (H. H. Smith). The female type bears the additional label "2166" on red. They are the property of the Carnegie Museum.

#### 115. *Conocephalus recticaudus* sp. nov.

A moderately large and robust species with somewhat abbreviated tegmina and wings in both sexes. As indicated by the accompanying

<sup>7</sup> The *X. cinereum* Thunberg from Jamaica has not been placed.

synoptical key it is related to *brachypterus* Redtenbacher, *meridionalis* Scudder, and *borellii* Giglio-Tos.

Head large, the sides nearly parallel; front rounded, smooth, the fastigium of the vertex broad, viewed from in front with its sides strongly divergent; basal antennal joints large. Pronotum smooth, short, a little wider than long, its anterior and posterior margins above gently rounded, anterior margin of the lateral lobes rounded. Tegmina shorter than the abdomen, in female a little exceeding twice, in male fully thrice, the length of the pronotum. Ovipositor straight, nearly or quite as long as the hind femora. Cerci of male robust, the apex depressed, provided back of the middle with a large inwardly directed tooth; subanal plate rather large and carinated in the middle, its apex broadly angulated and its sides provided with fairly long and prominent filiform styles. Subanal plate of abdomen of female with its apex truncate, not emarginate. Hind femora three- to four-spined below on the outer margin.

General color pale testaceous; the fastigium, vertex, occiput, and disc of the pronotum provided with a dark ferruginous band, which broadens evenly to the rear. Tegmina unicolorous, without fuscous or ferruginous marking. Abdomen unicolorous. Apex of hind femora narrowly infuscated above. Spines of the femora and hind tibiae black. Antennae sub-fasciate, ferruginous basally, becoming infuscated beyond.

Length of body, ♂, 18 mm., ♀, 20 mm.; of pronotum, ♂, 3.5 mm., ♀, 4 mm.; of tegmina, ♂, 10.5 mm., ♀, 9 mm.; of hind femora, ♂, 14.5 mm., ♀, 16 mm.; of ovipositor, ♀, 15.5 mm.

*Habitat.*—The types, male and female, are from Corumbá, Brazil (H. H. Smith). They are in the Carnegie Museum.

#### 116. *Conocephalus truncatus* (Redtenbacher).

*Xiphidium truncatum* REDTENBACHER, Monog. Conocephalid., p. 208 (1891).

*Xiphidion truncatum* KARNY, Revis. Conocephalid., p. 86 (1907).

There is a female representative of the present species in the collection. It comes from Chapada, Brazil, where it was taken by H. H. Smith.

#### 117. *Conocephalus nemoralis* (Scudder).

*Xiphidium nemorale* SCUDDER, Proc. Bost. Soc. Nat. Hist., XVII, p. 65 (1875); Ent. Notes IV, p. 462 (1875) Ibid.

There is a specimen at hand of what seems to be the true *nemoralis*

of Scudder as found throughout the United States east of the Rocky mountains. It bears the locality label "Bogotá, Colombia," and forms part of the Carnegie Museum Accession No. 2306.

118. *Conocephalus fasciatus* (de Geer).

*Locusta fasciata* DE GEER, Mem. Ins., III, pl. 40, fig. 4 (1778).

*Xiphidium fasciatum* SERVILLE, Revue Method., p. 159 (1831).

For further synonymy see Redtenbacher's Monographie der Conocephaliden, p. 192 (1891).

This very widely distributed species is represented by specimens coming from a number of South American localities. They were taken by different collectors. As would naturally be supposed, the specimens vary somewhat in size, coloration, and length of wing. The synoptical table of species given on a previous page will aid materially in the identification.

119. *Conocephalus longipes* (Redtenbacher).

*Xiphidium longipes* REDTENBACHER, Monog. Conocephalid., p. 505 (1891).

*Xiphidion longipes* KARNY, Revis. Conocephalid., p. 88 (1907).

The collection contains specimens of this insect, which were taken at Puerto Suarez, Bolivia. They were collected by J. Steinbach at an elevation of 150 meters above sea-level. The species is also common further south in both Paraguay and Argentina.

120. *Conocephalus saltator* (Saussure).

*Xiphidium saltator* SAUSSURE, Orth. nova Amer., I, p. 12 (1859); REDTENBACHER, Monog. Conocephalid., p. 193 (1891).

*Xiphidium saltator* KARNY, Revis. Conocephalid., p. 88 (1907).

The present species is quite widely distributed, having been recorded from several of the West Indian islands and in South America from Panama to Uruguay. Specimens of both sexes are at hand from Chapada and Gloria, Minas Geraes, Brazil (H. H. Smith), and "Province del Sara" and "Las Juntas, Dept. Santa Cruz, Bolivia." (J. Steinbach.)

121. *Conocephalus æquatorialis* (Giglio-Tos).

*Xiphidium æquatoriale* GIGLIO-TOS, Boll. Mus. Anat. Comp. Torino, XIII, pp. 91, 92 (1898).

*Xiphidion æquatoriale* KARNY, Revis. Conocephalid., p. 88 (1907).

A female from Pará is referred here.

122. *Conocephalus versicolor* (Redtenbacher).

*Xiphidium versicolor* REDTENBACHER, Monog. Conocephalid., p. 193 (1891).  
*Xiphidium versicolor* KARNY, Revis. Conocephalid., p. 88 (1907).

A female of this insect is at hand. It was taken at Santa Cruz de la Sierra, Bolivia.

123. *Conocephalus brachypterus* (Redtenbacher).

*Xiphidium brachypterus* REDTENBACHER, Monog. Conocephalid., p. 209 (1891).  
*Xiphidium brachypterus* KARNY, Revis. Conocephalid., p. 88 (1907).

Specimens classed here come from Pará, Brazil, and "Province del Sara, Bolivia." They were collected respectively by H. H. Smith and J. Steinbach.

124. *Conocephalus meridionalis* (Scudder).

*Xiphidium meridionale* SCUDDER, Proc. Bost. Soc. Nat. Hist., XVII, p. 460 (1875);  
 REDTENBACHER, Monog. Conocephalid., p. 209 (1891).  
*Xiphidium meridionale* KARNY, Revis. Conocephalid., p. 88 (1907).

A female specimen, collected by H. H. Smith at Chapada, Brazil, is referred here.

## Family AGRÆCIIDÆ.

This family is small, when we consider the number of its representatives, as compared with such important groups as the Pseudophyllidæ, Copiphoridæ, and Phaneropteridæ. Nevertheless, as Dr. H. Karny remarks in his introduction to the paper dealing with the group in the "Genera Insectorum," it contains fifty-eight genera and two hundred and six recognized species. The family is almost entirely tropical. At least thirteen genera are known from the neotropical regions. These may be characterized as follows:

## SYNOPSIS OF THE NEOTROPICAL GENERA OF AGRÆCIIDÆ.

- A. Prosternum smooth, not armed with spines. Lobes of the mesosternum broad, either dull three-sided or rounded, not thorned or spined; the lobes of the metasternum rounded.
- b. Anterior tibiæ flattened above. . . . . *Hyperomerus* Redtenbacher.
- bb. Anterior tibiæ rounded or terete above.
- c. Tegmina well developed, or at least more than half as long as the abdomen.
- d. Fastigium of the vertex surpassing the first antennal joint, the apex bent downwards. . . . . *Erechthis* Bolivar.
- dd. Fastigium of the vertex not surpassing the first antennal joint, conical.
- e. Tegmina greatly surpassing the apex of the abdomen. . *Subria* Stål.

- ee. Tegmina but little, or not at all, passing beyond the apex of the abdomen. . . . . *Parasubria* Karny.
- cc. Tegmina greatly abbreviated, less than one-half as long as the abdomen. Middle tibiae spineless. Tegmina covered by the elytra. *Paranelytra* Karny.
- AA. Prosternum armed with two spines or teeth. Meso- and metasternum at most lobed, but without spines.
- b. Tegmina at the apex truncate-emarginate. . . . . *Eppia* Stål.
- bb. Tegmina rounded at the apex.
- d. First antennal joint provided internally with a sharp tooth-like projection. . . . . *Eschatoceras* Redtenbacher.
- dd. First antennal joint provided internally with a blunt tooth or entirely without any such attachment.
- e. Pronotum more or less truncate or roundedly truncate behind.
- f. Tegmina ordinarily constructed, without unnaturally enlarged nervures or deeply impressed points. Meso- and metasternal lobes triangular. . . . . *Agræcia* Serville.
- ff. Tegmina very rarely ordinarily constructed, either provided with extraordinarily thickened nervures or with deeply impressed pits between the anterior border and subcosta. . . *Loja* Giglio-Tos.
- ee. Pronotum roundly produced behind.
- f. Tegmina strongly abbreviated. Fastigium of the vertex broadly rounded at the apex, wider than the first antennal joint. *Uchuca* Giglio-Tos.
- ff. Tegmina fully developed, or at least almost the length of the abdomen.
- g. Fastigium of the vertex laminately compressed, above armed with a spine [Ecuador]. . . . . *Paralobaspis* Giglio-Tos.
- gg. Fastigium of the vertex above not armed with a spine.
- h. Ovipositor angulately bent. . . *Nannagræcia* Redtenbacher.
- hh. Ovipositor ordinarily curved [Paraguay]. *Bertoniella* Rehn.

#### Genus ESCHATOCERAS Redtenbacher.

*Eschatocerus* REDTENBACHER, Verh. Zool.-bot. Ges. Wien, XLI, pp. 331, 448 (1891); KARNY, Revis. Conocephal., pp. 52, 64 (1907).

This is a tropical South American genus of Agræciidæ and contains seven recognized species. Only one of these has been found in the present collection.

#### 125. *Eschatoceras nigrospinosus* Karny.

*Eschatoceras nigrospinosus* KARNY, Revis. Conocephal., p. 64 (1907).

*Habitat.*—There is a single female specimen of Karny's *E. nigrospinosus* among the material coming from the "Province del Sara, Bolivia." It was collected by J. Steinbach at an elevation of 350 meters above sea-level.

Genus *AGRÆCIA* Serville.

*Agræcia* SERVILLE, Rev. Method., p. 152 (1831).

While several species of the genus *Agræcia* occur in South America, only two of them are contained among the material now being reported upon. Judging from the few references to members of the genus in entomological writings, they are comparatively rare. They are the following:

126. *Agræcia vittipes* Redtenbacher?

*Agræcia vittipes* REDTENBACHER, Monog. Conocephalid., p. 140 (1891).

*Habitat.*—There is a single female among some material coming from Bogotá, Colombia, which is referred with some doubt to this species. It was among some other Orthoptera referred to me by the Carnegie Museum several years ago for study.

127. *Agræcia abbreviata* Redtenbacher.

*Agræcia abbreviata* REDTENBACHER, Monog. Conocephalid., p. 142 (1891).

A single male example of this species is at hand. It bears the label "Rio de Janeiro," and was probably taken by H. H. Smith.

128. *Agræcia* sp.?

*Habitat.*—Matanzas, Cuba. (J. A. Shafer.) 1♂ nymph.

Family COPIPHORIDÆ (*Conocephalinæ*).

The representatives of the present family are relegated to forty-four genera, of which nearly one-half are to be met with in tropical America. Aside from the families Phaneropteridæ and Pseudophyllidæ the representatives of this family are the most numerous of the Tettigonoidea. While these insects are mostly green, or greenish, and live among low vegetation, there are a few, which are brown or ferruginous, and live among fallen leaves and on the trunks of trees and stems of shrubbery. These insects, together with the representatives of the Conocephalidæ and Agræciidæ are the chief musicians among the Orthoptera. The twenty-nine genera known to inhabit the region now under consideration are separated herewith by the subjoined synoptical table.

## SYNOPSIS OF THE SOUTH AMERICAN GENERA OF COPIPHORIDÆ.

- A. Pronotum spined or ruguloso-spinose.  
 b. Size larger. Posterior femora above not lobate. Ovipositor narrow, long.  
 and nearly straight. . . . . *Panacanthus* Walker.



bb. Size smaller. Posterior femora furnished above with a tooth-like lobe.  
*Loboscelis* Redtenbacher.

AA. Pronotum smooth or granulate, never spinose.

b. Tegmina greatly abbreviated, not extending beyond the metanotum or failing altogether.

c. Fastigium of the vertex short and broad, not passing the first antennal joint.....*Dectinomima* Caudell.

cc. Fastigium of the vertex longer.

d. Fastigium long and curved. The ovipositor at base broad, strongly curved.....*Acanthacara* Scudder.

dd. Fastigium of the vertex globular, carinated below. Ovipositor narrow, acuminate, much longer than the abdomen, naturally straight, with parallel edges.....*Dædalus* Redtenbacher.

bb. Tegmina fully developed or somewhat shortened, but not rudimentary.

c. Prosternum smooth.

d. Cheeks ruguloso-granulose or provided with tubercles.

e. Fastigium of the vertex elongate, acuminate, or short and spined at middle.

f. Middle tibiæ furnished above with one to six spines.

*Copiphora* Serville.

ff. Middle tibiæ above spineless.

g. Ovipositor narrow, long, nearly straight, the apex obliquely truncate, acuminate.....*Acantheremus* Karny.

gg. Ovipositor shorter, broad, with the apex rounded.

*Lamniceps* Bolivar.

ee. Fastigium of the vertex short, broad, eared, or trituberculate.

f. Fastigium of the vertex trituberculate. *Lirometopum* Scudder.

ff. Fastigium of the vertex provided at sides with tubercles, eared.

*Monesta* Walker.

dd. Cheeks smooth.

e. Fastigium of the vertex slightly passing the first antennal joint.

f. Pronotum with very prominent and deep transverse sulci.

*Exocephala* Serville.

ff. Pronotum with the transverse sulci less prominent, not deep.

*Eriolus* Bolivar.

ee. Fastigium of the vertex greatly surpassing the first antennal joint.

*Gryporhynchus* Redtenbacher.

cc. Prosternum provided with two spines.

d. Tegmina abbreviated, about the length of the pronotum. Fastigium of the vertex below without a tooth or carina [Costa Rica].

*Sphyrometopa* Carl.

dd. Tegmina and wings fully developed.

e. Lobes of the meso- and metasternum produced into a spine.

f. Fastigium of the vertex broad, blunt.

g. Pronotum posteriorly strongly produced, rounded.

*Eurymetopa* Redtenbacher.

gg. Pronotum posteriorly little produced, truncate, or roundly truncate.

- h. Fastigium of the vertex bituberculate.  
*Liostethus* Redtenbacher.
- hh. Fastigium of the vertex trituberculate.  
*Basileus* Pictet & Saussure.
- ff. Fastigium of the vertex acuminate.
- g. Tegmina at the apex obliquely truncate. Ovipositor short, inferior margin somewhat curved, a little broadened.  
*Paroxyprora* Karny.
- gg. Tegmina at the apex rounded.
- h. Fastigium of the vertex distinctly separated from the fastigium of the front.....*Oxyprora* Stål.
- hh. Fastigium of the vertex joined to the fastigium of the front.
- i. Fastigium of the vertex below concolorous. Ovipositor at middle strongly dilated.  
*Phoxacris* Karny.
- ii. Fastigium of the vertex below black. Ovipositor straight, narrow, not dilated.  
*Melanophoxus* Karny.
- ee. Lobes of the meso- and metasternum not lengthened into a spine or entirely wanting.
- f. Fastigium of the vertex triangular, above plane.  
*Pyrgocorypha* Stål.
- ff. Fastigium of the vertex not triangular, or convex above.
- g. Tegmina at the apex acuminate.
- h. Fastigium of the vertex carinated on both sides.  
*Dorycoryphus* Redtenbacher.
- hh. Fastigium of the vertex rounded, not carinated. Fastigium of the vertex separated from the fastigium of the front.....*Coryphodes* Redtenbacher.
- gg. Tegmina at the apex rounded, or obliquely truncated.
- h. Metasternum compressed, the lobes obliterated. Stature very graceful.....*Caulopsis* Redtenbacher.
- hh. Metasternum not compressed, provided with distinct oval or triangular lobes.
- i. Posterior tibiae above with the lateral margins not amplified. Genuic lobes of the hind femora spined. Structure slender.
- j. Fastigium of the vertex distinctly divided from the fastigium of the front. Lateral lobes of the pronotum often broader, with the lower margin obtusangulate or rounded. Tegmina with the costal vein obliterated or indistinct, often strongly divergent from the radial vein.  
*Neoconocephalus* Karny.
- jj. Fastigium of the vertex contiguous with the fastigium of the front. The former globular or rounded in front....*Homorocoryphus* Karny.

- ii. Posterior tibiæ above with the lateral margins amplified. Structure robust.
- j. Ovipositor longer than the abdomen. *Bucrates* Burmeister.
- jj. Ovipositor short. . . . . *Parabucrates* Scudder.

## Genus COPIPHORA Serville.

*Copiphora* SERVILLE, Ann. Sci. Nat., XXII, p. 147 (1831).

*Copiphora* BURMEISTER, Handb. Ent., II, p. 702 (1838), and authors since.

*Copidophora* AGASSIZ, Zoöl. Nomencl., Ind. Univ., p. 98 (1846).

The present genus is characteristic of tropical America and occurs from southern Mexico to Paraguay and Bolivia. It has been monographed by Redtenbacher, Pictet and Saussure, and Karny. All of these authors have added new forms. In the present paper two additional species are likewise characterized for the first time. Undoubtedly further collecting in the tropical regions of South America will bring to light still other species.

The annexed synopsis of the species is modified from H. Karny's table published in his *Revisio Conocephalidarum*, pp. 6-7, and includes the two insects described beyond.

## SYNOPSIS OF THE SPECIES OF COPIPHORA.

- A. Middle tibiæ above armed with two to three spines on the inner margin, externally with one to two spines.
  - b. Fastigium of the vertex cochleate near its apex. . . . *cochleata* Redtenbacher.
  - bb. Fastigium of the vertex not cochleate. . . . . *monoceros* Pict. et Sauss.
- AA. Middle tibiæ above armed internally with one to six spines, externally without spines.
  - b. Fastigium of the vertex greatly surpassing the first antennal joint.
  - c. Intermediate tibiæ provided internally above with three spines.
    - d. Apex of the fastigium of the vertex rounded, not drawn out. *festæ* Giglio-Tos.
  - dd. Apex of the fastigium of the vertex acuminate.
  - e. Fastigium of the vertex below densely tuberculate or coarsely granulate.
    - f. Tegmina and wings fully developed, considerably surpassing the apex of the abdomen. [Northern South America and Central America]. . . . . *cornuta* de Geer.
  - ff. Tegmina and wings abbreviated, about as long as the abdomen. Ovipositor very long [Bolivia]. . . . . *brevipennis* sp. nov.
- ee. Fastigium of the vertex below smooth.
  - f. Apex of the fastigium compressed and carinated above. *cultricornis* Pictet.
  - ff. Apex of the fastigium plainly acuminate, not compressed, nor carinated above.

- g. Tegmina broader and shorter. The fastigium distinctly curved downwards.....*rhinoceros* Pictet.
- gg. Tegmina narrower and longer. The fastigium not distinctly bent downwards.
- h. Fastigium of the vertex elongate. Ovipositor very long, at least more than twice the length of the abdomen, greatly surpassing the tegmina.  
*longicauda* Serville.
- hh. Fastigium of the vertex shorter. Ovipositor less than one-half longer than the abdomen, scarcely surpassing the tegmina by one-half.....*brevicauda* Karny.
- cc. Intermediate tibiæ above armed internally with four to six spines.
- d. Middle tibiæ armed above with five or six spines.
- e. The middle tibiæ above furnished with six spines.
- f. Anterior femora below provided with spines on both margins.
- g. Anterior and intermediate femora five-spined on both margins; ovipositor distinctly shorter than the body.  
*cephalotes* Pictet et Saussure.
- gg. Anterior femora on the posterior margin two-spined; the intermediate femora without spines on the hind margin. Ovipositor equal to the body in length.  
*brachyptera* Karny.
- ff. Anterior femora below without spines on the hind margin.  
*capito* Stål.
- ee. The middle tibiæ above provided with five spines.  
*producta* Bolivar.
- dd. Middle tibiæ armed above with only four spines.
- e. Fastigium longer (Bolivia).....*steinbachi* sp. nov.
- ee. Fastigium shorter (Peru, St. Vincent, Lesser Antilles).  
*brevicornis* Redtenbacher.
- bb. Fastigium of the vertex only a trifle surpassing the apex of first antennal joint.
- c. Front castaneous.....*brevirostris* Stål.
- cc. Front pale.....*coronata* Redtenbacher.

129. *Copiphora steinbachi* sp. nov.

A medium-sized insect, with fully developed tegmina and wings, most closely related to *C. producta* Bolivar and *C. brevicornis* Redtenbacher, as shown by the synoptical table just given.

*Male*.—Form somewhat slender, general color pale, yellowish green. Front smooth, the cheeks provided with the usual rugosities below the eyes; fastigium of the vertex rather long, smooth, tapering, acuminate, the apex gently depressed, scarcely rugulose near the base above and without carinæ, the lateral sub-basal teeth prominent.

Pronotum glabrous, rather short, the hind margin sub-truncate. Tegmina sub-pellucid, the veins numerous, prominent, and quite regular. Stridulating area transparent, smooth. Anterior femora five-spined in front, smooth behind; middle femora six-spined externally, smooth internally; middle tibiæ four-spined internally. Cerci something like those described for *brevicornis* Redt., but with the teeth concolorous, instead of ferruginous. Clypeus and labrum ferruginous; mandibles internally and suture at base of clypeus black.

Length of body, ♂, 42 mm., of fastigium 6 mm., of pronotum 9 mm., of tegmina, 42 mm., of hind femora, 20 mm.

*Habitat.*—The type, a single male, comes from Quatro Ojos, Department of Santa Cruz, Bolivia, where it was taken in November, 1913, by J. Steinbach at an elevation of 300 meters above sea-level. It is the property of the Carnegie Museum.

130. *Copiphora brevipennis* sp. nov.

This new species as the name indicates is short-winged. It is most nearly related to *C. cornuta* de Geer, as indicated in the synoptic key. Both sexes are at hand, but since the female specimen is in the best condition it is selected as the chief basis of the description.

Robust; head large, a little wider than the anterior margin of the pronotum, rugose, especially in front and at the sides below the eyes. Fastigium of the vertex strongly tuberculate above, below, and at sides, the apical portion smoother, carinated below, the extreme tip deflexed, ferruginous. Pronotum rugoso-granulose, the hind margin evenly rounded. Tegmina abbreviated, tapering, the apex rounded, coriaceous, the secondary veining irregular. Anterior femora five-spined in front, smooth behind; middle femora six-spined externally, smooth internally; hind tibiæ externally three-spined, smooth internally. Ovipositor longer than the body. Subgenital plate of abdomen of female small and tapering, its apex rather deeply and roundly emarginate. Male cerci small, bowed, the apex two-toothed, the upper tooth much the larger, the lower one long and slender, not greatly divergent from the upper. Last ventral segment of moderate size, somewhat tapering, coarsely bicarinate and terminating in rather prominent style-like teeth, the emargination rounded, but less profound than in the female.

General color pale greenish testaceous, possibly altogether greenish in life. Front from the base of the clypeus to the transverse depressed

line between the eyes tinged with vinaceous, this patch decreasing in width upwards. Inner side of the mandibles, base of the clypeus and clypeal groove black, the clypeus and labrum dirty white. Ovipositor dark-tipped.

Length of body, ♂, 38 mm., ♀, 48 mm.; of fastigium, ♂, 5.5 mm., ♀, 7.65 mm.; of pronotum, ♂, 9.5 mm., ♀, 10.75 mm.; of tegmina, ♂ and ♀, 30 mm.; of ovipositor, 54 mm.

*Habitat*.—Province del Sara, Bolivia, during February, March, and April, 1913. Collected by J. Steinbach. 1♂, 3♀. The types are in the Carnegie Museum.

### 131. *Copiphora cornuta* (De Geer).

*Locusta cornuta* DE GEER, Mem. Ins., III, p. 441, Pl. 37, fig. 7 (1773); BLANCH., Hist. Ins., III, p. 26 (1840).

*Copiphora cornuta* SERVILLE, Ins. Orth., p. 514, pl. 10, f. 7 (1839); KARNY, Revis. Conocephal., p. 6 (1907).

*Copiphora cornuta* BURMEISTER, Handb. Ent., II, p. 703 (1838); CHARPENTIER, Orth., pl. 43 (1843); STÅL, Recens. Orth., II, p. 104 (1874); REDTENBACHER, Mon. Conocephal., p. 26 (1891); SAUSSURE & PICTET, Biol. Cent.-Amer., Orth., I, pp. 376, 378 (1898).

*Habitat*.—The collection now being reported upon contains a specimen of this insect from Pará, Brazil. It was probably taken by H. H. Smith.

### 132. *Copiphora rhinoceros* (Pictet).

*Copiphora rhinoceros* PICTET, Mem. Soc. Genève, XXX (6), p. 44 (1888); REDTENBACHER, Mon. Conocephal., p. 342 (1891).

*Copiphora rhinoceros* KIRBY, Syn. Cat. Orth., II, p. 231 (1906); KARNY, Revis. Conocephal., p. 6 (1907).

*Habitat*.—There are two male specimens of the present species at hand. They come from Costa Rica, Central America.

### 133. *Copiphora producta* (Bolivar).

*Copiocera producta* BOLIVAR, Revist. Chileña, VII, p. 143 (1903).

*Copiphora producta* KIRBY, Syn. Cat. Orth., II, p. 231 (1906); KARNY, Revis. Conocephal., p. 7 (1907).

*Habitat*.—A male from Rio de Janeiro, Brazil (H. H. Smith), and a female from the "Province del Sara, Bolivia (J. Steinbach)" are referred to Bolivar's *C. producta*.

### Genus LAMNICEPS Bolivar.

*Lamniceps* BOLIVAR, Rev. Chileña, VII, p. 144 (1903); KIRBY, Syn. Cat. Orth., II, p. 232 (1906); KARNY, Revis. Conocephal., p. 2 (1907).

This monotypic genus occurs in Paraguay, southern Brazil, and southeastern Bolivia.

134. *Lamniceps giglio-tosi* Bolivar.

*Lamniceps giglio-tosi* BOLIVAR, Rev. Chileña, VII, p. 145 (1903).

Specimens of both sexes are before me. They come from Chapada, Brazil (H. H. Smith) and the Province del Sara, Bolivia (J. Steinbach).

Genus EXOCEPHALA Serville.

*Exocephala* SERVILLE, Ann. Sci. Nat., XXII, p. 160 (1831); *Ib.*, Ins. Orth., 507 (1839); BURMEISTER, Handb. Ent., II, p. 723 (1838); REDTENBACHER, Mon. Conocephal., pp. 14, 345 (1891); KARNY, Revis. Conocephal., pp. 2, 10, figs. 2, 3 (1907).

*Moncheca* WALKER, Cat. Derm. Salt., II, p. 289 (1869).

*Vestria* STÅL, Recens. Orth., II, pp. 97, 105 (1874).

This is another exclusively tropical American genus belonging to the family Copiphoridae. Seven species are known.

135. *Exocephala bisulca* (St. Farg. et Serville).

*Locusta* ST. FARG. et SERV., Encycl. Meth., Ins., X, p. 342 (1825).

*Exocephala bisulca* SERVILLE, Ann. Sci. Nat., XXII, p. 160 (1831); REDTENBACHER, Mon. Conocephal., p. 346, pl. 3, fig. 7 (1891); SAUSSURE & PICTET, Biol. Cent.-Amer., Orth., I, p. 381 (1898).

*Moncheca pretiosa* WALKER, Cat. Derm. Salt. B. M., II, p. 289 (1869).

*Habitat*.—A single female coming from Santa Cruz de la Sierra, Bolivia, belongs here. It was taken by J. Steinbach.

136. *Exocephala viridis* Redtenbacher.

*Exocephala viridis* REDTENBACHER, Mon. Conocephal., p. 347 (1891).

*Habitat*.—Four female specimens of this rather attractive insect are at hand. They were collected at Quatra Ojos, Department of Santa Cruz, Bolivia, by J. Steinbach. They belong to the Carnegie Museum Accession No. 5059.

Genus ERIOLUS Bolivar.

*Eriolus* BOLIVAR, Orth. de l'île Cuba, p. 35 (1888); REDTENBACHER, Monog. Conocephalid., p. 34 (1891); KARNY, Revis. Conocephalid., pp. 2, 11 (1907).

The representatives of the genus *Eriolus* somewhat resemble those of *Conocephalus*. They are confined to tropical America, where species are to be met with in the regions embraced between 24° north and south of the equator. There is quite a variation among

the species as regards the structure of the ovipositor as well as the fastigium of the vertex, as may be noticed in the synoptical key which is subjoined. About a dozen species have been recognized, one of them being here described as new.

## SYNOPSIS OF THE SPECIES OF ERIOLUS.

- A. Mesosternal lobes on both sides in front produced into an erect spine. Ovipositor with the apex obtuse.....*spiniger* Redtenbacher.
- AA. Mesosternal lobes smooth, not provided in front with erect spines. Ovipositor variable.
- b. Fastigium of the vertex plain, or flattened above, its apex rounded. Pronotum produced behind [Costa Rica].....*longipennis* Redtenbacher.
- bb. Fastigium of the vertex rounded above, the apex more or less acuminate. Pronotum not produced behind.
- c. Genicular lobes of the posterior femora acutely produced. The tegmina longer (23-37 mm.).
- d. Ovipositor with the apex not acute, the apex either rounded or obliquely truncated.
- e. Ovipositor with the apex of the upper valve rounded. Tegmina longer (34-37 mm.) [Island of Jamaica]...*jamaicensis* sp. nov.
- ee. Ovipositor with the apex of the upper valve obliquely truncated.
- f. Tegmina shorter (♀, 25 mm.) [S. America ?].  
*frater* Redtenbacher.
- ff. Tegmina longer (♀, 28-31 mm.) [Central America and Mexico].
- g. Fastigium of the vertex acute. Anterior femora in front four-spined [Mexico].....*mexicanus* Saussure.
- gg. Fastigium of the vertex blunt. Anterior femora six-spined. [Guatemala, Panama]....*consobrinus* Saussure & Pictet.
- dd. Ovipositor with its apex acute.
- e. Front unicolorous, pallid.
- f. Ovipositor longer (10.5 mm.), somewhat dilated back of its middle [Cuba].....*caraibeus* Bolivar.
- ff. Ovipositor shorter (5.5-6.5 mm.), not dilated back of its middle.
- g. Anterior femora below unarmed. Tegmina very slender, tapering to the apex [Panama].  
*acutipennis* Saussure & Pictet.
- gg. Anterior femora below four-spined. Tegmina graceful, but not remarkably slender [Guatemala].  
*falcatus* Saussure & Pictet.
- ee. Front with a large black maculation [Brazil]...*nigrifrons* Karny.
- cc. Genicular lobes of the posterior femora but little produced, not slenderly acute.
- b. Tegmina a little surpassing the tip of the abdomen, narrowed towards their apex [Guatemala].....*brevipennis* Redtenbacher.
- bb. Tegmina not surpassing the tip of the abdomen, the apex rounded. [Espirito Santo, Brazil].....*minus* Karny.



137. *Eriolus jamaicensis* sp. nov.

A moderately large insect related to *E. frater* Redtenbacher, *E. mexicanus* Saussure, and *E. consobrinus* Saussure & Pictet, from all three of which it differs in having in a representative of this genus a remarkably long fastigium of the vertex.

Moderately robust, unicolorous, grass-green. Fastigium of the vertex more than twice the length of the basal antennal joint, rounded above, carinated, and provided with a well-developed tooth below, its apex acuminate. Pronotum minutely granulose, the disc flattened and with its sides nearly parallel, the anterior margin very shallowly and roundly emarginate, the hind margin rotundo-truncate. Tegmina ample, coriaceous, closely and irregularly veined, gently tapering, the apex reaching far beyond the tip of the abdomen and even beyond the tip of the ovipositor, the extreme point subacuminate. Legs robust, short; anterior and middle femora six-spined; hind femora furnished below with seven to ten inconspicuous spines on the external and as many as two very small ones on the inner margin; anterior and middle tibiæ strongly spined below on both margins, the hind pair weakly spined. Meso-sternal lobes each provided in front with a minute blunt spine; metasternal lobes unarmed. Ovipositor moderately heavy, but gently arcuate, its upper margin bisinuate, widest a little before its middle, the valves provided with a roughened area caused by a series of obliquely directed closely arranged depressed lines; apex broadly rounded, the lower valves much shorter, narrower, and oblique at the apex. Subgenital plate of abdomen of female short, carinated at the middle, the sides terminating in prominent style-like teeth, the apex sinuate. Cerci of male moderately heavy, fully twice as long as broad, bowed inwards, and a little upwards, terminating in two teeth, the lower one much the larger and directed inwards; subgenital plate large, nearly twice as long as the basal width, strongly depressed and minutely carinated at middle, the lateral halves triangular in cross-section, broadly wedge-shaped, terminating in a small, rounded, tooth-like spine, middle deeply and angulately emarginate.

Length of body, ♂, 27-30 mm., ♀, 32 mm.; of fastigium, ♂, 2.75 mm., ♀, 3 mm.; of pronotum, ♂, 7 mm., ♀, 7.25 mm.; of tegmina, ♂, 33-34 mm., ♀, 37 mm.; of hind femora, ♂, 12 mm., ♀, 12.5 mm.; of ovipositor, 11 mm.

*Habitat.*—3♂♂ and 1♀, Jamaica, West Indies. They belong to

the collection of Dr. W. J. Holland, deposited in the Carnegie Museum, Acc. L. No. 131.

Genus *Gryporhynchus* Redtenbacher.

*Gryporhynchus* REDTENBACHER, Monog. Conocephal., p. 37 (1891); KARNY, Revis. Conocephal., p. 13 (1907).

138. *Gryporhynchus minor* sp. nov.

The present genus is a small one, and its representatives seem to be confined to Brazil, so far as known material would indicate. The type, a female, came from New Freiburg, Brazil. The specimen described as the male of the former is credited to Espirito Santo, which is in the interior; and now a second female is at hand with Rio de Janeiro as its habitat. Redtenbacher's female specimen was 25 mm. long, the fastigium 3.3 mm., the tegmina 30 mm. and the ovipositor 17 mm. Karny's male was 19.5 mm. long, the fastigium 2 mm. and it had tegmina only 17.5 mm. in length. The present female measures 22 mm. long, has the fastigium a trifle over 3 mm., the pronotum, 5.5 mm., the tegmina 19 mm., the hind femora 13.5 mm., and the ovipositor 14 mm. This last specimen being a female and varying so much from the measurements of typical *acutipennis* Redtenbacher, *l. c.*, p. 38, is considered distinct, and is given the name *Gryporhynchus minor*.

Karny's specimen may be the opposite sex of either of the females, but is most likely to go with the present. The short fastigium, however, seems to make this supposition somewhat doubtful. All three specimens are practically pale green, or faded testaceous. The type of *minor* is in the Carnegie Museum, Pittsburgh, Pa.

Genus *Oxyprora* Stål.

*Oxyprora* STÅL, Cefv. Vet.-Akad. Förh., XIII (4), p. 50 (1873); *Ib.*, Recens. Orth., II, p. 98, 106 (1874); REDTENBACHER, Verh. Zool.-bot. Ges. Wien, XLI, p. 358 (1891).

The species of the present genus have some of the characteristics of representatives of both *Copiphora* and *Neoconocephalus*. As is the case in the preceding genus and many of those which follow they are tropical American.

139. *Oxyprora flavicornis* Redtenbacher?

*Oxyprora flavicornis* REDTENBACHER, Mon. Conocephal., p. 46 (1891).

*Habitat.*—There are a number of specimens of *Oxyprora* contained in the present collection. They have been referred to *flavicornis*

Redt. with a little hesitation. They come from Chapada, Brazil (H. H. Smith), and the Province del Sara, Bolivia (J. Steinbach).

Genus CAULOPSIS Redtenbacher.

*Caulopsis* REDTENBACHER, Verh. Zool.-bot., Ges. Wien, XLI, p. 376 (1891); SAUSURE & PICTET, Biol. Cent.-Amer., Orth., I, p. 388 (1898).

This genus contains several species of rather small and comparatively slender insects, which resemble the much larger species of *Neoconocephalus*. At least five species are known from South American localities together with possibly two others. There are four supposedly distinct species at hand. They, with still another, may be separated as follows:

TABLE FOR SEPARATING THE SPECIES OF CAULOPSIS.

- A. Fastigium of the vertex with the apex acuminate, carinated below.  
 b. Size larger (♀, 37-44 mm.). Tegmina subacuminate.  
 c. Ovipositor fully one-half as long as the elytra (26 mm.).  
*gracilis* Redtenbacher.  
 cc. Ovipositor less than one-half as long as the elytra (13 mm.).  
*acuminata* sp. nov.  
 bb. Size smaller (♀, 28 mm.). Tegmina with the apex rounded.  
*oberthuri* Bolivar.  
 AA. Fastigium of the vertex with the apex obtuse, rounded below.  
 b. Smaller (♂, 24 mm.).....*cuspidata* Scudder.  
 bb. Larger (♂, 30 mm.).....*attenuata* sp. nov.

140. *Caulopsis acuminata* sp. nov.

Most nearly related to *C. gracilis* Redtenbacher, but considerably smaller. Antennæ, as in that species, unusually robust and strongly hirsute at the base and very long. The fastigium slender, acuminate. Eyes round, depressed. Pronotum cylindrical, broadly and roundly emarginate in front, truncate behind. Tegmina narrow, with few veinlets, the costal field subhyaline, the apex somewhat acuminate. Anterior and middle femora unarmed below, hind pair five- to six-spined on the outer margin apically.

Length of body, ♀, 36 mm., of pronotum, 5 mm., of tegmina, 36.5 mm., of hind femora, 15 mm., of ovipositor, 13 mm.

*Habitat.*—The type and only specimen at hand comes from Corumbá, Brazil, where it was collected by H. H. Smith. This type belongs to the Carnegie Museum.

141. *Caulopsis oberthuri* Bolivar.

*Caulopsis oberthuri* BOLIVAR, Revista Chilena, VII, p. 146 (1903); KIRBY, Syn. Cat. Orth., I, p. 240 (1906); KARNY, Revis. Conoceph., p. 21 (1907).

Specimens of an insect which have been determined as the *C. oberthuri* of Bolivar are at hand from Corumbá, Brazil, and Province del Sara (350 meters), Bolivia. They were taken by H. H. Smith and J. Steinbach respectively.

142. *Caulopsis cuspidata* (Scudder)?

*Conocephalus cuspidatus* SCUDDER, Proc. Bost. Soc. Nat. Hist., XX, p. 88 (1879).  
*Caulopsis cuspidata* REDTENBACHER, Verh. Zool.-bot. Ges. Wien, XLI, p. 377 (1891); KARNY, Revis. Conoceph., p. 21 (1907).

Several specimens are at hand of a species which seems to be the *cuspidata* of Scudder, although they come from a locality much farther south than has been recorded for it. From Corumbá, Brazil, March (H. H. Smith), and Quatro Ojos, Department Santa Cruz and Province del Sara, Bolivia, December (J. Steinbach).

143. *Caulopsis attenuata* sp. nov.

As shown by the table this species is related to the preceding, but is larger. The fastigium of the vertex is blunt at the apex and curved gently upwards. The eyes are round and prominent; antennæ slender and not hirsute basally. Stridulating field of tegmina tinged with ferruginous. Anterior and middle femora below on the anterior border one- to three-spined; hind femora below spined on both margins.

Length of body, ♂, 30 mm., of fastigium of vertex 4.75 mm., of pronotum, 5.2 mm., of tegmina, 40 mm., of hind femora, 17 mm.

*Habitat*.—Only the male is represented and that by but a single individual. It bears the label "Mogy das Cruzes, São Paulo, Brazil, July 21, 1908." It was collected by J. D. Hasegan. The type is the property of the Carnegie Museum.

## Genus NEOCONOCEPHALUS Karny.

*Neoconocephalus* KARNY, Revis. Conocephalid., pp. 4, 22 (1907).

The genus, or as H. Karny calls it, the subgenus *Neoconocephalus*, is practically confined to the New World. It is that portion of the old genus *Conocephalus* of Serville, *nec* Thunberg, in which the fastigium of the vertex and of the front are distinctly separated, and in which the costal vein of the elytra is obliterated or indistinct. The tegmina often lack the costal vein, or have it running obliquely towards:

the costa, instead of parallel to the radial vein. In his synopsis (*l. c.* pp. 22-29) he lists seventy-eight species. I am now adding three others. It is quite certain that a number of still undiscovered species will be found to inhabit the various parts of tropical America as they become better explored.

Many of these insects are quite similar in their general appearance and differ chiefly in the form and length of the fastigium as well as the color of the vertex, length of the wings, hind femora, in spine-characters and in the comparative smoothness or granulation of the pronotum, etc. The form and length of the ovipositor is also a diagnostic character. Most of the species live among grasses and other low herbage, but also frequently are to be met with among the foliage of trees. They are readily attracted to bright lights, and may be collected at night in cities and towns.

144. *Neoconocephalus crassus* (Bolivar).

*Conocephalus crassus* BOLIVAR, An. Soc. Españ., X, p. 499 (1881); *Ib.*, Viaje al Pacif., Ins., p. 102, Pl. 3, fig. 6 (1884); REDTENBACHER, Monog. Conocephalid., pp. 379, 390 (1891).

*Neoconocephalus crassus* KARNY, Revis. Conocephalid., p. 23 (1907).

There is an almost grown female nymph at hand which is referred here. It bears the label "Benivides, Brazil," and was probably collected by H. H. Smith.

145. *Neoconocephalus nigrosignatus* Karny?

*Neoconocephalus nigrosignatus* KARNY, Revis. Conocephalid., pp. 23, 31 (1907).

A single female insect bearing the locality label "Pará, Brazil," is referred doubtfully to Karny's *nigrosignatus*.

146. *Neoconocephalus nigropunctatus* (Redtenbacher).

*Conocephalus nigropunctatus* REDTENBACHER, Monog. Conocephalid., pp. 380, 391, Pl. 3, fig. 32 (1891).

*Neoconocephalus nigropunctatus* KARNY, Revis. Conocephalid., p. 24 (1907).

Male specimens of a *Neoconocephalus* taken at both Benevides and Pará are referred to Karny's *nigropunctatus*.

147. *Neoconocephalus elongatus* (Redtenbacher).

*Conocephalus elongatus* REDTENBACHER, Mon. Conocephalid., pp. 66, 79 (1891).

*Neoconocephalus elongatus* KARNY, Revis. Conocephalid., pp. 24 (1907).

A female coming from the "Province del Sara," Bolivia, 350 meters above sea-level and collected during the period of November and

December, 1912, has been determined as *elongatus* Redt. which was described from Peru. The specimen at hand was collected by J. Steinbach.

148. *Neoconocephalus muticus* (Redtenbacher).

*Conocephalus muticus* REDTENBACHER, Mon. Conocephalid., pp. 66, 79 (1891).  
*Neoconocephalus muticus* KARNY, Revis. Conocephalid., p. 24 (1907).

This insect was described from material collected in Cuba and St. Vincent, West Indies. The material now being reported was taken in the Island of Jamaica.

149. *Neoconocephalus irroratus* (Burmeister).

*Conocephalus irroratus* BURMEISTER, Handb. Ent., II, p. 705 (1838); REDTENBACHER, Mon. Conocephalid., pp. 66, 80 (1891).  
*Neoconocephalus irroratus* KARNY, Revis. Conocephalid., p. 24 (1907).

The specimens in the present collection, which agree with Burmeister's description of *irroratus*, bear the label "Rio de Janeiro." They were taken by H. H. Smith.

150. *Neoconocephalus redtenbacheri* Karny?

*Neoconocephalus redtenbacheri* KARNY, Revis. Conocephalid., pp. 24, 32 (1907).

Two male Neoconocephalids from "Province del Sara," Bolivia, taken at a point with an elevation of 350 meters above sea-level are referred here with some doubt. They were collected by J. Steinbach during the month of November, 1913.

151. *Neoconocephalus mexicanus* (Saussure).

*Conocephalus mexicanus* SAUSSURE, Orth. Nova Amer., I, p. 11 (1859); REDTENBACHER, Mon. Conocephalid., pp. 66, 81 (1891).  
*Neoconocephalus mexicanus* KARNY, Revis. Conocephalid., p. 24 (1907).

This widely distributed species is represented by a female specimen taken at Pará, Brazil.

152. *Neoconocephalus longicauda* Karny.

*Neoconocephalus longicauda* KARNY, Revis. Conocephalid., pp. 25, 33 (1907).

Specimens collected at Chapada, Brazil, are classified as this species. Karny's material came from Rio Grande do Sul.

153. *Neoconocephalus maxillosus* (Fabricius).

*Locusta maxillosa* FABRICIUS, Ent. Syst., II, p. 37 (1794).  
*Conocephalus maxillosus* SERVILLE, Hist. Nat. Ins. Orth., p. 520 (1839). For further synonymy see KIRBY, Syn. Cat. Orth. Brit. Mus., II, p. 243 (1906).

The present species, which is widely distributed over tropical America, is represented by specimens from Benevides, Chapada, and Rio de Janeiro, Brazil. They were taken by H. H. Smith.

154. *Neoconocephalus heteropus* (Bolivar).

*Conocephalus heteropus* BOLIVAR, Notas Entomol., V, p. 50 (1881); REDTENBACHER, Mon. Conocephalid., pp. 67, 86 (1891).

*Neoconocephalus heteropus* KARNY, Revis. Conocephalid., p. 26 (1907).

This is another of the rather widely distributed species of the genus found in tropical America. The determination is based on a female bearing the label "Lagoa Feia, Tocos, in Espirito Santo, Brazil."

155. *Neoconocephalus infuscatus* (Scudder).

*Conocephalus infuscatus* SCUDDER, Ent. Notes, IV, p. 19 (1875); REDTENBACHER, Mon. Conocephalid., pp. 66, 84 (1891).

*Neoconocephalus infuscatus* KARNY, Revis. Conocephalid., p. 26 (1907).

Several males are referred to this widely distributed tropical American species. They were taken by J. Steinbach during October and November in the Province del Sara, Bolivia.

156. *Neoconocephalus nietoi* (Saussure).

*Conocephalus nietoi* SAUSSURE, Orth. Nov. Amer., I, p. 11 (1859); REDTENBACHER, Mon. Conocephalid., pp. 68, 91 (1891).

*Neoconocephalus nietoi* KARNY, Revis. Conocephalid., p. 28 (1907).

A female specimen of the genus coming from Jamaica, West Indies, has been referred to this species. It is quite typical. It also occurs in the southern part of the United States, Mexico, and Central America, and is common to all of the West Indian islands.

157. *Neoconocephalus gladiator* (Redtenbacher).

*Conocephalus gladiator* REDTENBACHER, Mon. Conocephalid., pp. 68, 92 (1891).

*Neoconocephalus gladiator* KARNY, Revis. Conocephalid., p. 29 (1907).

A female specimen of the genus coming from Chapada, Brazil, has been determined as this species.

158. *Neoconocephalus giganticus* sp. nov.

A very large, rather robust grass-green insect, with dusky feet and black spines on all the femora, in which the fastigium of the vertex is short and broadly rounded, and the ovipositor unusually long, broad, and gently decurved.

Head smooth, but little punctured or otherwise roughened, large

and robust, fully as broad as the anterior part of the pronotum, the fastigium gently ascending, sub-globose, nearly as wide as long, toothed below and rather widely separated from the fastigium of the front, its anterior margin evenly rounded. Pronotum a little longer than wide, its surface somewhat rugoso-punctate, most decidedly so on the disc, the lateral lobes furnished with a large depressed more or less transparent and sub-glabrous area, anterior margin above broadly emarginate, the hind margin subtruncate, the lateral lobes heavily margined. Elytra broad, fully twice as long as the abdomen and one-half again as long as the hind femora, their apex subacuminate, the costal vein not prominent, strongly divergent from the radial. Anterior femora provided with three spines, the intermediate with four spines and the hind pair with numerous black tipped spines arising in advance of rather large black blotches. Ovipositor broad, long, gently decurved, the apex obliquely acuminate from below. Subgenital plate carinated at middle, tapering, roundly emarginate at its apex.

General color bright grass-green, the basal half of the hind femora, ovipositor, and occiput, together with the upper part of the front, and cheeks and antennæ ferrugineo-testaceous. Mandibles bright saffron-yellow, the labrum, labium, and apical joints of the palpi purplish. Femora below prominently punctate or maculate with deep black, the tarsi, tips of the femora and tips as well as base of the tibiæ infuscate. Anterior margin of the fastigium of the vertex yellow-banded, scarcely fuscous-bordered beneath. Apex of the ovipositor somewhat infuscated. Eyes walnut-brown. Tegmina provided centrally on the apical two-fifths with fuscous maculations, the anterior margin pellucid.

Length of body 43 mm.; of fastigium 2.25 mm.; of pronotum 9.5 mm.; of tegmina 65 mm.; of hind femora, 38 mm.; of ovipositor, 42 mm.

*Habitat.*—The type and only specimen at hand was taken by J. Steinbach in the "Province del Sara," Bolivia, at an elevation of 350 meters above sea-level. It bears the Accession Number 5058.

In Karny's synoptic table of the genus<sup>8</sup> the present species would run to the vicinity of *N. macropterus* and *N. necessarius* of Redtenbacher.

159. *Neoconocephalus chapadensis* sp. nov.

General structure slender and elongate. Tegmina very long. Fastigium distinctly conical, fasciate beneath. Related to *N. elongatus*.

<sup>8</sup> Abhandl. K. K. Zool.-bot. Ges. Wien, IV, 3, p. 27 (1907).



*gatus* of Redtenbacher. General color testaceous with a greenish tinge upon the elytra.

Head small, smooth, tapering evenly from below to the apex of the fastigium. Latter slightly longer than one of the eyes, the sides obliquely truncate, its tip rounded, bluntly toothed at its base and separated from the fastigium of the front. Pronotum granulose throughout, most closely so on the disc, the latter flat and gently and evenly tapering anteriorly, the lateral lobes attached by a well-defined angle of equal prominence throughout; anterior margin above subtruncate, the hind margin subangulate. Tegmina very long and slender, their apex rounded, the anterior margin pellucid. Anterior and middle femora neither infuscated nor fusco-maculate, the hind pair dotted with fuscous at the base of the spines; anterior femora three-spined, intermediate pair one-spined, the hind femora with several spines on both margins. Ovipositor long and slender, at its base bent gently upwards, the apical portion slightly bowed downwards. Subgenital plate gently tapering and broadly and roundly emarginate at the apex.

General color testaceous with a greenish tinge upon the tegmina—possibly greenish in living specimens. Tarsi and tips of the tibiae somewhat infuscated. Fastigium of the vertex marked below with a narrow transverse apical band of fuscous. Antennae with a few fuscous annulations beyond their basal third.

Length of body, 29 mm., of pronotum 7.5 mm., of tegmina, 47.5 mm., of hind femora, 24 mm., of ovipositor, 29 mm.

*Habitat.*—The type, and only specimen at hand, comes from Chapada, where it was collected during August (H. H. Smith). It is the property of the Carnegie Museum. It also bears the number 2155 on a red label.

#### 160. *Neoconocephalus longifossor* sp. nov.

A rather small as well as moderately slender species with a very long ovipositor and short and rounded fastigium of the vertex, which is black below. Most nearly related to *N. redtenbacheri* Karny.

Vertex short and evenly rounded in front, plainly longer than broad, the entire under side black, or strongly infuscated, toothed, and separated from the fastigium of the front, its anterior margin flavofasciate. Pronotum quite evenly and closely granulose, its posterior margin rounded. Tegmina of medium width, about twice the length

of the abdomen and extending beyond the apex of the hind femora fully one-fourth of their length, the tips sub-acuminate. Anterior femora spineless, or at most with two spines, middle femora one- to two-spined beneath, hind femora with several spines on both margins. Ovipositor long and slender, a little bent upwards. Subgenital plate, or last ventral segment, roundly and shallowly emarginate.

General color yellowish green or pale ferruginous, in the latter case with the anterior margin of tegmina infuscated; antennæ, tibiæ, and ovipositor testaceo-ferruginous, the underside of fastigium entirely black or fuscous, all of the tarsi and to some extent also the tips of the tibiæ infuscated; underside of hind femora fusco-maculate at base of the spines. Anterior margin of the elytra hyaline.

Length of body, ♀, 30-32 mm., of fastigium, 1.35 mm., of pronotum 7-7.3 mm., of tegmina, 40-42 mm., of hind femora, 24-25 mm., of ovipositor, 33-36 mm.

*Habitat*.—Chapada, near Cuyabá, Matto Grosso, Brazil, during May and June (H. H. Smith). Several specimens. Type in Carnegie Museum.

Several other specimens in the collection remain to be studied. Possibly there may be new ones among them, as well as species already known.

#### Genus HOMOROCORYPHUS Karny.

*Homorocoryphus* KARNY, Revis. Conocephalid., pp. 4, 41 (1907).

*Conocephalus auct.* (in part).

*Conocephalus* REDTENBACHER, Mon. Conoceph. (Species 73-101), pp. 70-72, 103-115 (1891).

The species of the present genus have the same general appearance as those belonging to *Neoconocephalus*, but can at once be recognized by the contact of the fastigium of the front with the base of the fastigium of the vertex.

#### 161. *Homorocoryphus cocanus* (Bolivar)?

*Conocephalus cocanus* BOLIVAR, An. Soc. Españ. Hist. Nat., X, p. 497 (1881); *Ib.*, Viaje al Pacif., Ins., p. 97 (1884); REDTENBACHER, Mon. Conocephal., 70, 106 (1891).

*Conocephaloides cocanus* KIRBY, Syn. Cat. Orth., II, p. 248 (1906).

*Homorocoryphus cocanus* KARNY, Revis. Conocephal., p. 42 (1907).

*Habitat*.—A single female specimen of this genus now before me seems to belong to the *C. cocanus* of Bolivar. It was taken during the month of December, 1912. The locality label reads "Prov. del Sara, Bolivia, 350 meters" (J. Steinbach).

Genus *BUCRATES* Burmeister.

*Bucrates* BURMEISTER, Handb. Ent., II, p. 708 (1838); STÅL, Recens. Orth., II, p. 99 (1874); REDTENBACHER, Verh. Zool.-bot. Ges. Wien, XLI, pp. 330, 429 (1891); KARNY, Revis. Conocephal., p. 4 (1907).

The genus *Bucrates* is a small one, and contains insects which are confined to tropical America. Only two species are recognized so far.

162. *Bucrates capitatus* (De Geer).

*Locusta capitata* DE GEER, Mem. Ins., III, p. 455, Pl. 40, fig. 1 (1773).

*Bucrates capitatus* BURMEISTER, Handb. Ent., II, p. 709 (1838); REDTENBACHER, Mon. Conocephal., p. 115, pl. 3, fig. 48 a, b (1891); GRIFFINI, Boll. Mus. Zoöl. Anat. Comp. Torino, XI, no. 232, p. 26 (1896); KARNY, Revis. Conocephal., p. 115 (1907).

*Conocephalus* (?) *latifrons* WALKER, Cat. Derm. Salt. B. M., II, p. 310 (1869).

*Habitat.*—Specimens are at hand from Santarem, Pará, Munez Freire (Cachosiro) Espirito Santo, and Rio de Janeiro, Brazil.

## Family DECTICIDÆ.

Up to the time when Caudell issued his paper on the group in the *Genera Insectorum* no representatives of the family *Decticidæ* seemed to have been recorded from South American localities. It is almost incredible, however, that these insects should be entirely absent from the whole of that large and varied continent, since they are known to occur in all other portions of the Earth which are at all extensive and possess more or less arid and somewhat open tracts. Forms should be met with along the table-lands of Ecuador, Peru, Chili, and Argentina, where these conditions prevail to a large extent. The members of the family can be located by the synopsis of families printed on a preceding page of this present paper should any be found.

## Family GRYLLACRIDÆ.

The family known as Gryllacridæ is a rather extensive one if we include all the forms found in the Orient as well as the Occident. But when we limit ourselves to the Americas the genera are few. Of those which are known to contain South American species there are but five. These insects are also nocturnal in their movements and during the daytime usually conceal themselves in various nooks and crannies among rankly growing vegetation or among fallen leaves and other rubbish on the ground. The five genera referred to here may be separated as follows:

## SYNOPSIS OF THE SOUTH AMERICAN GENERA OF GRYLLACRIDÆ.

- A. Species winged.
- b. Subgenital plate of the male provided with articulated or movable styles.  
*Gryllacris* Serville.
- bb. Subgenital plate of the males not provided with jointed or movable styles.
- c. Posterior tibiæ provided above with two large spines internally and five spines externally. . . . . *Dibelona* Brunner.
- cc. Posterior tibiæ above provided on both margins with seven equal spines. . . . . *Hyperbænus* Brunner.
- AA. Species apterous or subapterous.
- b. Tegmina, when present, lobiform. . . . . *Neanias* Brunner.
- bb. Tegmina absent. Anterior and middle tibiæ below sometimes furnished with four spines on the apical third. . . . . *Neortus* Brunner.

## Genus GRYLLACRIS Serville.

*Gryllacris* SERVILLE, Ann. Sci. Nat., XXII, p. 138 (1831); *Ib.*, Hist. Nat. Ins. Orth., p. 392 (1839); BURMEISTER, Handb. Ent., II, p. 717 (1838); BRUNNER, Verh. Zool.-Bot. Ges. Wien, XXXVIII, pp. 316, 317 (1888); SAUSS. & PICT., Biol. Centr.-Amer., Orth., I, p. 285 (1897); and others.

*Larnaca* WALKER, Cat. Derm. Salt. B. M., I, p. 190 (1869).

The genus *Gryllacris* is distributed throughout the tropics. It is represented by over two hundred known species and others are being added at short intervals from time to time as collections from various new regions are studied. The representatives of the genus, as mentioned in the introductory remarks for the family, are all nocturnal in their movements. While some of the species have abbreviated tegmina and wings, I believe that none are entirely apterous, as is the case with some representatives of the other genera of the family.

The genus *Gryllacris* is without doubt one of the oldest of the Orthopteroid insects. This we assume from the fact of its wide distribution, continental, and insular. While the center of distribution seems to be Oceanica and the adjoining portions of Asia, there are many representatives also in both Africa and tropical America. Nine years ago there were at least a dozen species known from tropical American countries. Since then fully that many more have been added.

The material now being reported upon contains several specimens.

163. *Gryllacris lævigata* Brunner?

*Gryllacris lævigata* BRUNNER, Verh. Zool.-bot. Ges. Wien, XXXVIII, p. 344 (1888); KIRBY, Syn. Cat. Orth., II, p. 143 (1906).

*Habitat*.—A single female specimen of a *Gryllacris* coming from Rio de Janeiro, Brazil, is referred here with some doubt. It was taken by H. H. Smith during the month of November.

Other specimens of the genus are reserved for study, until I shall have had time to go over the extensive writings of Dr. Achille Griffini, who has been doing much original work on the family during the past six or eight years.

Genus *HYPERBÆNUS* Brunner.

*Hyperbænus* BRUNNER, Mon. der Stenopel. u. Gryllacr., p. 123 (1888); GRIFFINI, Spec. Gen. *Hyperbænus*, Redia, VII, pp. 187-203 (1911).

The present genus is confined to tropical America, where forms occur from Panama to Bolivia and Paraguay. According to Dr. Achille Griffini there were known at the time when he monographed the genus eight species and one variety. The present collection contains an additional form. All of the described forms are tabulated in Griffini's monograph on pages 190-192.

164. *Hyberbænus virgo* Brunner.

*Hyperbænus virgo* BRUNNER, Mon. Stenopel. u. Gryllacr., p. 194 (1888); GRIFFINI, Redia, VII, pp. 190, 192 (1911).

There are specimens of both sexes of this insect at hand. They come from Santa Cruz de la Sierra, Bolivia, where they were collected by J. Steinbach at an elevation of 450 meters above sea-level. There is also a nymph of what is considered to be the same species. It was taken by the same collector at Puerto Suarez, Bolivia, during the month of November.

165. *Hyperbænus minutipennis* sp. nov.

Characterized at once by the greatly abbreviated tegmina and wings, which reach only to the apex of the first abdominal segment, and the very slender, tapering, and nearly straight ovipositor.

Tegmina lobate, their apex rounded, their upper or inner margins not quite touching, scarcely one-third the length of the hind femora. The hind femora externally four-spined, internally five-spined, the three apical spines of the latter as large as those on the outer margin, the other two minute. Subgenital plate roundly triangular, the middle depressed from beneath, its apex not emarginate. General color flavo-testaceous with the abdomen above irregularly variegated with transverse fuscous streaks.

Length of body, ♀, 17 mm., of pronotum, 4 mm., of tegmina, 4 mm., of hind femora, 11 mm., of ovipositor, 16 mm.

*Habitat.*—A single female, the type, comes from the "Province del

Sara," Bolivia, where it was taken during the month of October, 1913, by J. Steinbach at an elevation of 350 meters. It is in the Carnegie Museum.

166. *Hyperbænus bohlsi* Giglio-Tos.

*Hyperbænus bohlsi* GIGLIO-TOS, Zoöl. Jahrb. Syst., VIII, p. 815 (1895); GRIFFINI, Redia, VII, pp. 191, 196 (1911).

Several specimens of the two sexes of this species are at hand. They were collected at Puerto Suarez, Bolivia, by J. Steinbach during the months of November, December, and January.

167. *Hyperbænus juvenis* Brunner?

*Hyperbænus juvenis* BRUNNER, Mon. Stenopel. u. Gryllacr., p. 124 (1888); GRIFFINI, Redia, VII, pp. 192, 201 (1911).

*Habitat.*—A male specimen coming from Corumbá, Brazil, is doubtfully referred to Brunner's *juvenis*. It was collected by H. H. Smith during the month of April.

Genus *NEANIAS* Brunner.

*Neanias* BRUNNER, Mon. Stenopel. u. Gryllacr., pp. 72, 129 (1888).

While the representatives of the genus *Neanias* have all been credited to the Orient, where the various forms are distributed over Africa, Asia, and Australasia, there seems to be one at hand bearing a South American locality label.

168. *Neanias* (?) *americanus* sp. nov.

General color (after long immersion in spirits) uniformly pale cinereo-testaceous, with the hind margins of the abdominal segments paler, or rather more nearly testaceous, the consistency of the chitin being denser and not permitting of the gray under color shining through. Genuicular lunules and base of hind tibiæ piceous. Head a little wider than the front margin of the pronotum, the vertex roundly depressed, the fastigium of the vertex linearly joined to the front, about twice as wide as the basal antennal joint. Pronotum short, broadest in front, the anterior margin of the disc a trifle roundly advanced upon the occiput at the middle, behind truncate. Tegmina present as very minute lateral scale-like lobes, which partly cover the suture between the dorsal and lateral portions of the mesothorax and extend only one-half the distance towards its hind margin. Anterior and middle tibiæ below five-spined in front, four-spined behind; hind tibiæ five-spined internally, six-spined externally.

Length of body, ♂, 12 mm., of pronotum, 3 mm., of hind femora 8 mm.

*Habitat.*—The type, a male, bears the label "Salto Grande de Paranapanema, São Paulo, Brazil, October, 12, 1908" (J. D. Haseman collector). This insect belongs to accession No. 3768 of the Carnegie Museum.

Family STENOPELMATIDÆ.

Although widely distributed over the surface of the earth, this family of the Tettigonoidea is represented in South America and nearby regions by only five genera, so far as at present known. Other representatives of the family are found in Mexico and the United States to the north. Not much is known concerning their food-habits, but some of them at least are supposed to be predaceous or carnivorous. The various species undoubtedly are largely nocturnal in their movements. Some burrow in the earth, while still others live under stones, tree-trunks, boards, and different kinds of encumbrances affording shelter, while some are dwellers in caves and underground passages.

The following synoptical key will aid in the recognition of the genera which are known to occur in South American territory:

SYNOPSIS OF THE SOUTH AMERICAN GENERA OF STENOPELMATIDÆ.

- A. Anterior tibiæ provided with an auditory opening on both sides.
  - b. Vertex viewed from above compressed. Fastigium of the vertex narrower than the first antennal joint, sulcate. Occiput provided with a longitudinal carina. . . . . *Schænobates* Saussure.
  - bb. Vertex viewed from above plane or rounded. Fastigium of the vertex as wide or wider than the first antennal joint, not sulcate.
    - c. Anterior tibiæ above on the inner margin two or three-spined.
      - d. Pronotum behind truncate, not covering the mesonotum. Front tibiæ above three-spined on the outer margin.
        - Pherterus* Brunner.
      - dd. Pronotum produced behind, entirely hiding the mesonotum. Front tibiæ above on the outer margin unarmed, with the exception of the apical spine. . . . . *Licodia* Walker.
    - cc. Anterior tibiæ above on both margins, with the exception of the apical spines, unarmed. . . . . *Glaphyrosoma* Brunner.
- AA. Anterior tibiæ without auditory openings. Fastigium of the vertex between the antennæ deflexed, compressed, sulcate. Posterior tibiæ robust, provided above with very strong spines. . . . . *Cratomelus* Blanchard

## Genus LICODIA Walker.

*Licodia* WALKER, Cat. Derm. Salt. B. M., I, p. 210 (1869); KIRBY, Syn. Cat. Orth., II, p. 119 (1906).

*Apotetamenus* BRUNNER, Mon. Stenopel. u. Gryllacr., p. 39, Pl. 6, fig. 16 (1888).

In general appearance the insects, which comprise the present genus, remind one somewhat of several North American representatives of the family Raphidophoridae, viz., the species of the genus *Udeopsylla* Scudder. The genus is strictly tropical American. Four species have been described, a possible fifth is represented in the present collection. These species may be separated as follows:

## SYNOPSIS OF THE SPECIES OF LICODIA.

- A. Anterior tibiae two-spined above on their anterior margin. Piceous, pale beneath [Hayti]..... *palipes* Walker.
- AA. Anterior tibiae one-spined above on the anterior margin.
- b. Sides of the pronotum marked with two oblique testaceous bands on each side..... *obliqua* Walker.
- bb. Sides of the pronotum with a single longitudinal pale patch on each side near the lower margin.
- c. Pronotum not longer than one-half the length of the hind femora. Fastigium of the vertex pale margined..... *amazona* Brunner.
- cc. Pronotum somewhat shorter than the hind femora. Fastigium of the vertex entirely piceous.
- d. Hind femora more robust, shorter, without a longitudinal piceous band along the lower outer face..... *clypeata* Brunner.
- dd. Hind femora less robust, longer; provided with a prominent longitudinal, piceous line on the lower edge of outer face.  
*polita* sp. nov.

169. *Licodia clypeata* (Brunner).

*Apotetamenus clypeatus* BRUNNER, Mon. Stenopel. u. Gryllacr., p. 39 (1888).  
*Licodia clypeata* KIRBY, Syn. Cat. Orth., II, p. 119 (1906).

A single female specimen from the "Province del Sara," Bolivia, is referred here. It was taken by J. Steinbach at an elevation of 350 meters above sea-level. This specimen has one of the anterior tibiae two-spined above on the anterior margin.

170. *Licodia polita* sp. nov.

Most nearly related to *clypeata*, from which it differs in the somewhat less robust and longer hind femora, and in having all of the legs rather strongly tinged with piceous near the apex of the femora and on the basal portion of the tibiae. Outer face of the hind femora prominently marked externally with a longitudinal piceous vitta.



Length of body, ♂, 18 mm., ♀, 19 mm.; of pronotum, ♂, 11.75 mm., ♀, 12 mm.; of hind femora, ♂, 17 mm., ♀, 18 mm.; of ovipositor, 10.5 mm.

*Habitat.*—The types, ♂ and ♀, come from Chapada, near Cuyabá, Matto Grosso, Brazil, where they were taken during November (H. H. Smith). Another specimen comes from "Province del Sara," Bolivia (J. Steinbach). The types are in the Carnegie Museum.

#### Family RHAPHIDOPHORIDÆ.

The family Rhaphidophoridae is composed of apterous rather active insects usually known as "cave crickets" and "camel crickets." Like the various species belonging to the preceding family most, if not all, of the representatives of the present family are nocturnal, or at least crepuscular in habit. The majority live in caverns, crevices, underground passages, beneath stones, logs, etc., while the remainder burrow in the ground. Only two genera of these insects appear to have been recorded as belonging to South America. They are the following:

##### SYNOPSIS OF SOUTH AMERICAN GENERA OF RHAPHIDOPHORIDÆ.

- A. Supra-anal plate of male abdomen transverse, very short, the apex on each side terminating with a straight, acuminate appendage. Cerci straight, pilose. The subgenital plate triangulately and lengthily produced, the styles very short. . . . . *Udenus* Brunner.
- AA. Supra-anal plate of male abdomen roundly produced. Cerci slender, not hirsute, the apex blunt. The subanal plate produced into a cylindrical tubercle, at the sides furnished with very small styles.

*Heteromallus* Brunner.

Representatives of neither of these genera are contained in the material, upon which report is now being made.<sup>16</sup>