Diversity of Leaf Katydids (Orthoptera: Tettigoniidae: Phaneropterinae) of Dzanga-Ndoki National Park, Central African Republic, With Selected Records from Other African Countries

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Diversity of leaf katydids (Orthoptera: Tettigoniidae: Phaneropterinae) of Dzanga-Ndoki National Park, Central African Republic, with selected records from other African countries

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Abstract

Forty-four species of Phaneropterinae are recorded from Dzanga-Ndoki National Park in the Central African Republic. Eight species collected within the park are described as new to science: *Phlaurocentrum morettoi* n. sp., *P. paratuberosum* n. sp., *P. elegans* n. sp., *Myllocentrum raggei* n. sp., *Poreuomena sanghensis* n. sp., *Cestromoecha longicerca* n. sp., *C. magnicerca* n. sp., and *Goetia purpurea* n. sp. An additional new species from Guinea is described from specimens preserved in the Museo Nacional de Ciencias Naturales of Madrid, *Poreuomena huxleyi* n. sp. *Eurycorypha stylata* Stål, 1873 is recorded for the first time from Burkina Faso and *Brycoptera lobata* Ragge, 1981 from Ivory Coast. The following synonyms are established: *Enochletica affinis* Bolívar, 1906 is synonymized with *Enochletica ostentatrix* Karsch, 1896, *Poreuomena gladiator* Bolívar, 1906 is synonymized with *Poreuomena forcipata* Sjöstedt, 1902, and *Azamia doriae* (Griffini, 1906) is synonymized with *Azamia biplagiata* Bolívar, 1906. In addition, morphological characters of previously unknown females of *Phaneroptera maculosa* Ragge, 1956 and *Eurycorypha canaliculata* Karsch, 1890, and males of *Myllocentrum stigmosum* (Karsch, 1896) and *Cestromoecha crassipes* (Karsch, 1890) are described. The presence of titillators in four African genera (*Gelotopoia*, *Brycoptera*, *Phlaurocentrum* and *Azamia*) is recorded for the first time. In the genus *Zeuneria*, a sub-equally bilobed, dorsally curved, dorso-lateral abdominal appendage is described for the first time. This new structure apparently delimits an abdominal gland of unknown function on the second tergite.

Key words

new species, new records, synonymies, taxonomy, distribution

Introduction

Dzanga-Ndoki National Park is located in the extreme south-west of the Central African Republic, in a triangular-shaped part of the country (Fig. 1a,b). Established in 1990, it is divided into two non-continuous sectors: the northern Dzanga Park (49,500 ha) and the southern Ndoki Park (72,500 ha). The two are joined by the Dzanga-Sangha Rainforest Reserve (335,900 ha), where controlled hunting and other exploitation is allowed. Dzanga-Ndoki National Park is part of the Sangha Trinational, a UNESCO World Heritage Site which covers an area of 4,520,000 ha and includes three national parks: Loboké (Cameroon), Nouabalé-Ndoki (Congo) and Dzanga-Ndoki. Dzanga-Ndoki National Park is located in the Congo River basin, within an extensive tropical forest, approximately six days walk from the nearest inhabited village, and constitutes a very rich sanctuary of biodiversity which is still poorly known. The park is bordered to the West by the Sangha River, also the border with Cameroon, and contains more than ten natural lakes of different size (from *ca* 1 km by 400 m to 100 by 150 m). The whole park is on alluvial sands; along streams, forest clearings can be found with marshy depressions. The Dzanga Bai (= the village of elephants) is a sandy salt lick that measures 250 m by 500 m. It is traversed through the middle by the Dzanga stream. There are three types of forest within Dzanga-Ndoki National Park: mainly dryland, a semi-evergreen forest that contains swamp-forest areas along the rivers, and a closed-canopy, monodominant *Gilbertiodendron dewevrei* forest. The dryland forest is an open, mixed canopy that is dominated by Sterculiaceae and Ulmaceae; often associated with it is a dense understorey of Marantaceae and Zingiberaceae (Fig. 1d-g).

From 24th January to 4th March 2012, the French entomologist, Philippe Moretto, participated in the Sangha 2012 entomological expedition to the Dzanga-Ndoki National Park. During the long survey, P. Moretto was able to collect more than two thousand specimens of Orthoptera that he kindly sent to the author's laboratory at the Department of Agricultural and Forest Sciences, University of Palermo, Italy.

Here, I report on the diversity of the Phaneropterinae (Tettigoniidae, Orthoptera) found within Dzanga-Ndoki National Park. As the Phaneropterinae are one of the most commonly encountered groups of katydids in Africa, I utilize this opportunity to review a number of interesting taxa collected in other African countries.

Material and methods

Most Orthoptera were collected by P. Moretto at night with the aid of UV lamps, one installed above ground, the other placed in the canopy. Specimens were dried by smoke and preserved individually in paper bags each day. These bags were later sent to Department of Agricultural and Forest Sciences, Palermo University, Italy, together with additional specimens collected by P. Moretto on previous trips to Ivory Coast, Senegal and Burkina Faso. All specimens were mounted in the laboratory of the Department of Agricultural and Forest Sciences, Palermo University.

Some specimens were photographed with a Nikon Coolpix 4500 digital camera, mounted on a Wild M5 Stereomicroscope, and photos were integrated using the freeware CombineZP (Hadley 2008). Mounted specimens were measured with a digital calliper (precision 0.01 mm); the following measures were taken (all measurements in mm): **body length** - Dorsal length from the frons to the apex of the abdomen, ovipositor excluded in females; **pronotum length** - Length of the pronotum along dorsal median line; **pronotum height** - Maximum height of the pronotum; **femur** - Length of hind femur; **tegmen** - Length of tegmen; **ovipositor** - Length of ovipositor (females only).

Collecting localities.—Collecting localities, dates, GPS coordinates (Fig. 1c) from Dzanga-Ndoki National Park, Central African Republic, and capture sessions as recorded by Philippe Moretto:

1. Ndoki, Lake 1, 02°28′51.0N 016°13′04.5E, 26.I.2012;
2. Ndoki, Lake 1, UV trap 1, 02°28′40.5N 016°13′02.6E,
   2a. 31.I.-2.II.2012,
   2b. 2-4.II.2012,
   2c. 4-5.II.2012,
   2d. 6-8.II.2012,
   2e. 8-10.II.2012,
   2f. 10-11.II.2012,
   2g. 11-12.II.2012,
   2h. 20-23.II.2012,
   2i. 24-25.II.2012,
   2j. 28-29.II.2012,
   2k. 29.II-1.III.2012,
   2l. 1-2.III.2012;
3. Ndoki, border of Lake 1, UV trap 02°28′51.0N 016°13′04.5E, 13-14.II.2012;
4. Ndoki, Lake 1, camp 1, 02°28′51.0N 016°13′04.5E,
   4a. 14-15.II.2012,
   4b. 15-16.II.2012;
5. Ndoki, Lake 1, UV trap 2, 02°28′40.5 016°13′02.6E,
   5a. 10-12.II.2012,
   5b. 15-16.II.2012;
6. Ndoki, Lake 3, UV trap 02°29′18.2N 016°13′56.5E,
   6a. 18-19.II.2012,
   6b. 24-26.II.2012;
7. Ndoki, Lake 1, platform on the canopy, 35m, UV trap 02°28′51.0N 016°13′04.5E,
   7a. 4-5.II.2012,
   7b. 10-11.II.2012;
8. Ndoki, Lake 1, platform on the canopy, 45m, UV trap 02°28′40.5N 016°13′02.6E,
   8a. 28-29.II.2012;
   8b. 3-4.III.2012.

Abbreviations used for collecting localities.—

CAR	Central African Republic
DRC	Democratic Republic of Congo

Specimens from the following six museums were included in this study where applicable:

MNCN	Museo Nacional de Ciencias Naturales, Madrid
NMW	Naturhistorisches Museum, Vienna
MSNT	Museo Regionale di Scienze Naturali, Turin
MSNG	Museo Civico di Storia Naturale 'G.Doria', Genoa
ZMHB	Museum für Naturkunde, Berlin
MRT	Museo Regionale di Storia Naturale, Terrasini (Palermo).

Unless stated otherwise, specimens collected in the Dzanga-Ndoki National Park, Central African Republic, are preserved in the following collection:

BMCP Bruno Massa Collection, Palermo.

Unless otherwise stated, all descriptions refer to males.

Results and discussion

Phaneroptera maculosa Ragge, 1956
(Fig. 2)

Ragge, 1956. Proc. zool. Soc. London 127 (2): 243.
Type locality: Lolodorf (Cameroon).

Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, UV trap 31.I.-2.II.2012 (2♂); 20-23.II.2012 (2♂, 1♀); 24-25.II.2012 (♂); 28-29.II.2012 (1♂, 1♀); 1-2.III.2012 (♂); Ndoki, border of Lake 1, UV trap 13-14.II.2012 (2♂, 1♀); Ndoki, Lake 1, platform on the canopy, 45m, UV trap 28-29.II.2012 (2♀) (Collector P. Moretto) (BMCP).

Description.— **Female.** The female of *P. maculosa*, which is described here for the first time, is characterized by a smooth and gently upcurved ovipositor, basally black spotted, finely toothed apically, and by slender and pointed black and yellow cerci (Fig. 2.). The sub-genital plate is triangular and pointed.

Remarks.— *P. maculosa* are conspicuously mottled but most of them lack the ventral spinules on the hind femora that are present in the holotype. Within the series of 9 males and 5 females listed above, only one male does not show ventral spinules on the hind femora.

Distribution.— Ragge (1956) described *P. maculosa* on a single male from Lolodorf (Cameroon), but later he (Ragge 1980) obtained five further males from Efulen (Cameroon) and Irumu (DRC).

Genus *Catoptropteryx* Karsch, 1890
(Fig. 3)

Karsch, 1890. Entom. Nachricht. 16 (23): 361.

When this genus was erected only one species was known, but just six years later, Karsch (1896) described six further species. Upon revision by Huxley (1970), the number of species rose to 15. *Catoptropteryx* is one of the most common representatives of forest Phaneropterinae in Central Africa. Females of this genus are characterized by a reduced ovipositor.

Catoptropteryx nanus Huxley, 1970

Huxley, 1970. Bull. Br. Mus. (Nat. Hist.) Ent. 24 (5): 147.
Type locality: Efulen (Cameroon).

Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, platform on the canopy, 35m, UV trap 4-5.II.2012, P. Moretto (♂) (BMCP).

Distribution.—Previously known only from Cameroon (Huxley 1970).

Catoptropteryx capreola Karsch, 1896

Karsch, 1896. Stett. Entomol. Z. 57: 332, 335.
Type locality: Lolodorf (Cameroon).

Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, 26.I.2012 (2♀); Ndoki, Lake 1, UV trap 1 31.I.-2.II.2012 (11♂, 4♀); 2-4.II.2012 (♂); 6-8.II.2012 (♂); 8-10.II.2012 (17♂, 7♀);

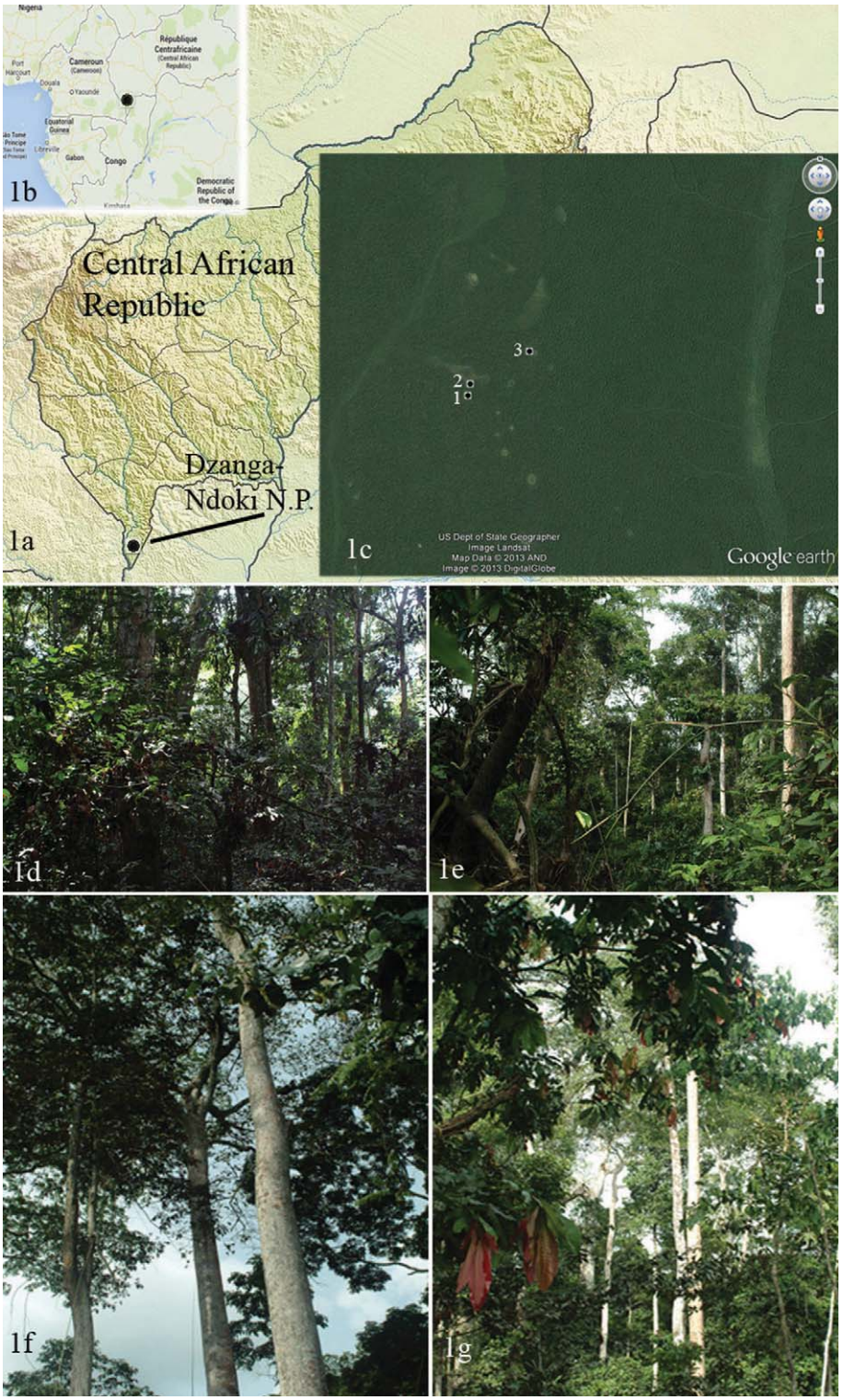


Fig. 1. Study area in the CAR (the black dot indicates the Dzanga-Ndoki National Park) (1a); Central African Republic (the black dot indicates the N.P.) and the other countries bordering it (1b); Area of the Dzanga-Ndoki N.P. where UV traps were placed to collect insects (from Google Earth); GPS coordinates: 1: 02°28′51.0N 016°13′04.5E; 2: 02°28′40.5N 016°13′02.6E; 3: 02°29′18.2N 016°13′56.5E (1c). Primary forest types of the study area (Photos by Philippe Moretto) (1d-g). For color version, see Plate II.

10-11.II.2012 (10♂, 9♀); 11-12.II.2012 (20♂, 15♀); 20-23.II.2012 (28♂, 9♀); 24-25.II.2012 (♂); 28-29.II.2012 (♂, ♀); 29.II-1.III.2012 (2♂); Ndoki, Lake 3, UV trap 18-19.II.2012 (18♂, 10♀); Ndoki, Lake 1, camp 1, 14-15.II.2012 (3♂, 3♀); 15-16.II.2012 (3♀); Ndoki, Lake 1, UV trap 2, 15-16.II.2012 (12♂, 9♀); Ndoki, Lake 3, UV trap 18-19.II.2012 (♂); Ndoki, Lake 1, platform on the canopy, 35m, UV trap 4-5.II.2012 (5♂, 3♀); 10-11.II.2012 (5♂, 3♀); Ndoki, Lake 1, platform on the canopy, 45m, UV trap 28-29.II.2012 (7♂, 3♀); Mboki 24.I.2012 (4♂, 6♀) (Collector P. Moretto) (BMCP).

Distribution.—Described from Cameroon, recorded from Guinea, Liberia, Ghana, CAR, and DRC (Griffini 1906; Huxley 1970; Naskrecki 2009), *C. capreola* is probably the most widespread species of the genus in Central Africa.

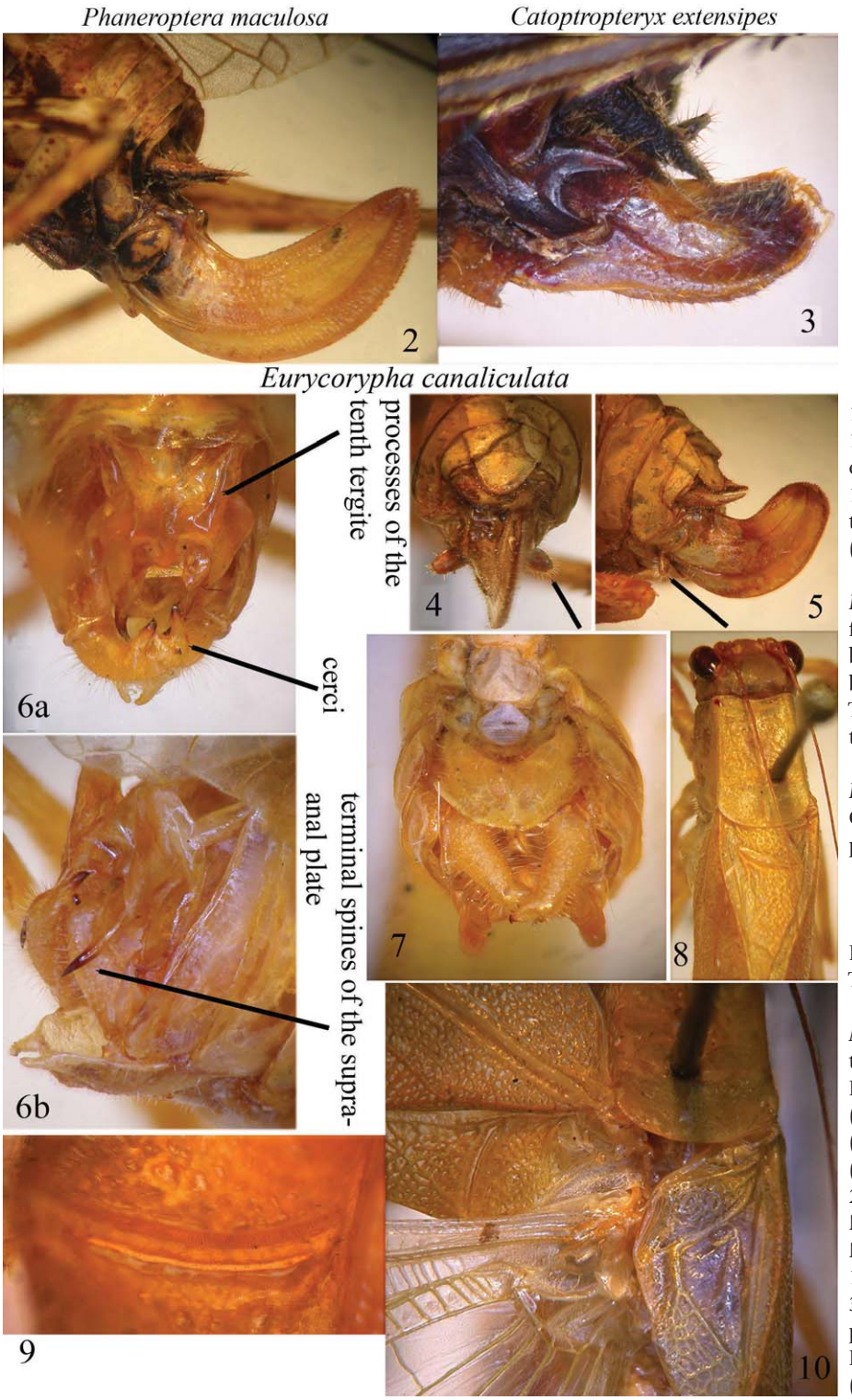
Catoptropteryx apicalis Bolívar, 1893

Bolívar I., 1893. Ann. Soc. ent. Fr. 62: 177. Type locality: Assinie (Ivory Coast).

Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, UV trap 1, 31.I.-2.II.2012 (2♂, 1♀); 11-12.II.2012 (2♂, 1♀); 20-23.II.2012 (5♂); Ndoki, border of Lake 1, UV trap 13-14.II.2012 (2♂); Ndoki, Lake 1, camp 1, 14-15.II.2012 (♂); 15-16.II.2012 (3♂); Ndoki, Lake 1, platform on the canopy, 35m, UV trap 4-5.II.2012 (1♂, 1♀); Ndoki, Lake 1, platform on the canopy, 45m, UV trap 28-29.II.2012 (♂) (Collector P. Moretto) (BMCP).

Diagnosis.— Males of *C. apicalis* are easily distinguished by the peculiar shape of the cerci (with the apex inflated behind large terminal spinule, cf. Huxley 1970), while females are very difficult to separate from *C. neutralipennis* when they are not associated with males. In addition, according to Huxley (1970), the females of *C. neutralipennis* and *C. afra* are also not separable. It is possible that *C. neutralipennis* and *C. afra* are synonymous, although this could not be established here since no males of *C. afra* are known and neither *C. neutralipennis* nor *C. afra* were examined in the present study.

Distribution.— *C. apicalis* was previously known only from Ivory Coast and Ghana (Naskrecki, 2009) *C. afra* is known only from Uganda, whereas *C. neutralipennis* is known to occur from Sierra Leone to Cameroon.



Figs 2-10. Lateral view of the ovipositors of *Phaneroptera maculosa* (2) and *Catoptropteryx extensipes* (3). *Eurycorypha canaliculata*: Posterior (4) and lateral views of the ovipositor (5); Posterior (6a), lateral (6b) and ventral (7) views of last abdominal segments of male; Dorsal view of head and pronotum (8); Dorsal view of the stridulatory file (9); Stridulatory areas of left and right tegmina (10). For color version, see Plate II.

***Catoptropteryx ambigua* Huxley, 1970**

Huxley, 1970. Bull. Br. Mus. (Nat. Hist.) Ent. 24 (5):159.
Type locality: Ntandi, Bwamba (Uganda).

Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, UV trap 1, 31.I.-2.II.2012 (9♂, 1♀); 8-10.II.2012 (4♂, 1♀); 11-12.II.2012 (8♂, 2♀); 20-23.II.2012 (11♂, 1♀); 29.II-1.III.2012 (2♀); Ndoki, border of Lake 1, UV trap 13-14.II.2012 (3♂); Ndoki, Lake 1, camp 1, 14-15.II.2012 (♂); Ndoki, Lake 1, UV trap 2, 15-16.II.2012 (4♂, 1♀); Ndoki, Lake 3, UV trap 18-19.II.2012 (♀); Ndoki, Lake 1, platform on the canopy, 35m, UV trap 4-5.II.2012 (♀); 10-11.II.2012 (2♂); Ndoki, Lake 1, platform on the canopy, 45m, UV trap 28-29.II.2012 (♂) (Collector P. Moretto) (BMCP).

Diagnosis.— *C. ambigua* is easily distinguishable from other species of the same genus simply by coloration. The hind tibiae are wholly dark brown to black and sometimes lighter ventrally. The cerci are red-brown ventrally and consistently black dorsally (Huxley 1970).

Distribution.—*C. ambigua* is recorded from Cameroon, DRC and Uganda, and thus its presence in the CAR was expected.

***Catoptropteryx punctulata* (Karsch, 1890)**

Karsch, 1890. Entom. Nachricht. 16: 260.
Type locality: Kribi (Cameroon).

Material examined.— CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, UV trap 1, 31.I.-2.II.2012 (4♂, 1♀); 6-8.II.2012 (♀); 8-10.II.2012 (2♂, 1♀); 10-11.II.2012 (3♂, 1♀); 11-12.II.2012 (3♂, 1♀); 20-23.II.2012 (5♂); 29.II-1.III.2012 (♂); Ndoki, Lake 3, UV trap 18-19.II.2012 (4♂, 2♀); Ndoki, Lake 1, camp 1, 15-16.II.2012 (♂); Ndoki, Lake 1, UV trap 2, 15-16.II.2012 (5♂); Ndoki, Lake 3, UV trap, 24-26.II.2012 (2♂, 1♀); Ndoki, Lake 1, platform on the canopy, 35m, UV trap, 4-5.II.2012 (2♂); Ndoki, Lake 1, platform on the canopy, 45m, UV trap 28-29.II.2012 (2♂, 1♀); Mboki 24.I.2012 (1♂, 2♀) (Collector P. Moretto) (BMCP).

Diagnosis.—*C. punctulata* is certainly the most easily recognizable species of the genus, both for its coloration of tegmina (with purple-brown appearance and black spots), male cerci (short, arcuate, depressed in apical half, strongly sinuose when viewed from posterior side, with apex bearing a terminal spine) and female ovipositor (first gonocoxa large, very slightly concave).

Distribution.—*C. punctulata* is widespread from Sierra Leone to Uganda (Huxley 1970).

***Catoptropteryx guttatipes* Karsch, 1890**

Karsch, 1890. Entom. Nachricht. 16 (23): 362.
Type locality: Barombi Station (Cameroon).

Material examined.—CAR, Dzanga-Ndoki National Park, 31.I.-2.II.2012 (2♂, 9♀); 8-10.II.2012 (4♂, 3♀); 11-12.II.2012 (4♀); 20-23.II.2012 (4♂, 2♀); 24-25.II.2012 (2♀); Ndoki, border of Lake 1, UV trap 13-14.II.2012 (2♂, 6♀); Ndoki, Lake 1, camp 1, 14-15.II.2012 (♀); 15-16.II.2012 (♂); Ndoki, Lake 1, UV trap 2, 15-16.II.2012 (3♂, 1♀); Ndoki, Lake 3, UV trap 18-19.II.2012 (♂); Ndoki, Lake 1, platform on the canopy, 35m, UV trap 4-5.II.2012 (♀); 10-11.II.2012 (♂); Ndoki, Lake 1, platform on the canopy, 45m, UV trap 28-29.II.2012 (2♀); Mboki 24.I.2012 (♂, ♀) (Collector P. Moretto) (BMCP).

Distribution.—*C. guttatipes* was previously recorded from Nigeria to Uganda and from Guinea (Huxley 1970).

***Catoptropteryx occidentalis* Huxley 1970**

Huxley, 1970. Bull. Br. Mus. (Nat. Hist.) Ent. 24 (5): 164.
Type locality: Forest Reserve Rest House (Liberia).

Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, UV trap 1, 10-11.II.2012 (2♂); 11-12.II.2012 (2♂); 20-23.II.2012 (♂); Ndoki, Lake 1, camp 1, 15-16.II.2012 (♂, ♀) (Collector P. Moretto) (BMCP).

Diagnosis.—*C. occidentalis* is morphologically similar to *C. guttatipes*, but the male cerci are much longer and less sinuose than in *C. guttatipes*. The ovipositor is peculiar, the first gonocoxa is very large, with the ventro-posterior angle about 90°, containing a small, deep depression; the second gonocoxa is particularly prominent (Huxley 1970).

Distribution.—*C. occidentalis* was previously known to occur in Liberia and Ivory Coast.

***Catoptropteryx extensipes* Karsch, 1896**
(Fig. 3)

Karsch, 1896. Stett. Entomol. Z. 57: 334-335.
Type locality: Lolodorf (Cameroon).

Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, UV trap 1, 20-23.II.2012, P. Moretto (♂, ♀) (BMCP).

Diagnosis.—*C. extensipes* is easily recognizable by the shape of the eyes (large, elliptical and prominent), the male cerci (strongly arcuate, near apex abruptly narrowed and bent downward slightly, with apex acute) and the color of the hind tibiae (deep brown, paler or more reddish dorsally, with two broad, well defined, very pale yellow or green bands in proximal third). Only males were available to Karsch (1896) and Huxley (1970). Huxley (1970) suspected that when the female was found, probably a new genus would need to be erected for this species. However, Huxley (1972) described the female whose ovipositor morphology is not unique. Using the terminology of Huxley (1970) the ovipositor of the females is characterized by the large and slightly concave first gonocoxa while the second gonocoxa is narrow and the supragonangulum (antero-dorsal division of the gonangulum) is rounded, posterior angle of infragonangulum (postero-ventral division of the gonangulum) is semilunar and apical margin of dorsal valve is smooth (Fig. 3).

Distribution.—*C. extensipes* is known from Cameroon, Sierra Leone, Liberia, Guinea (Fernando Poo), Ivory Coast and Ghana.

Genus *Eurycorypha* Stål, 1873
(Figs 4-15)

Stål, 1873. Ofv. K. Vetensk. Akad. Forh. 30 (4): 40.

The genus *Eurycorypha* includes at least 37 species of varying sizes and morphological characters; only the female is known for some of the species. A revision of species is needed (Ragge 1980; Hemp *et al*. 2013), and the description of species based only on examination of female specimens with no regard for associated males, must be avoided.

***Eurycorypha canaliculata* Karsch, 1890**
(Figs 4-10, 14, 15)

Karsch, 1890. Entom. Nachricht. 16: 261.
Type locality: Kribi (Cameroon).

Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, platform on the canopy, 45m, UV trap 28-29.II.2012, P. Moretto (3♂, 1♀) (BMCP).

Redescription.—In *E. canaliculata*, the head has small frontogenal carinae, the fastigium of vertex slopes clearly to the frons, is slightly broader than the first antennal segment and the eyes are oval, elongate and prominent (Fig. 14, male, and Fig. 15, female). The pronotum has lateral carinae and the surface is smooth and shiny. The 10th abdominal tergite of the male is modified; laterally it has two raised processes (Figs 6, 7) that delimit the supra-anal plate with long, apical, black-tipped spines (Fig. 6a,b); the cerci are basally broad and end in three apices, similar to fingers, which are also black-tipped (Figs 6a,b; 7); the sub-genital plate is wide and its apex is narrow and concave with two small projections similar to styli (Figs 6a,b; 7).
Female. The ovipositor is short with fine teeth and one lateral bulge on each side (Figs 4, 5), absent in other species of *Eurycorypha*.

Remarks.—*E. canaliculata* was described on a single male from Cameroon. Since additional material has now become available, the male can be characterized in more detail and the female is redescribed (Figs 4-10, 14-15). *E. canaliculata* resembles *Plangiodes* Chopard, 1954 more than other species of *Eurycorypha*. According to Ragge (1980), *Eurycorypha* may be recognized easily from the head alone, with its combination of frontogenal carinae, elongate eyes and very broad fastigium of the vertex and frons (usually at least twice as broad as the first antennal segment). *Plangiodes* also has frontogenal carinae and is very similar to *Eurycorypha* in most other characters but has a narrower fastigium; only one male of one species of this genus is known (*P. carinatus* Chopard, 1954). Although *E. canaliculata* resembles *Plangiodes*, in the absence of further material of *Plangiodes*, it seems better to leave *E. canaliculata* in its original genus.

***Eurycorypha stylata* Stål, 1873**
(Figs 11-13)

Stål, 1873. Ofv. K. Vetensk. Akad. Forh. 30 (4): 43.
Type locality: Sierra Leone.

Material examined.—Ivory Coast, Bondoukou Zamou VII.2004, P. Moretto (♂, ♀); Burkina Faso, Pama VIII.2005, P. Moretto (4♂, 1♀); Burkina Faso, Touife VIII.2005, P. Moretto (♂) (BMCP); Guinea, Principe Is. (1♂, 2♀) (MSNG).

Diagnosis.—Described on a single male from Sierra Leone, *E. stylata* is characterized by a long raised sulcate process above and below the 10th tergite, forked apically. The cerci are stout, in-curved and pointed (Figs 11, 12). The female sub-genital plate is fairly triangular and medially sulcate, divided into a pair of concavities by a distinct fissure medially (Fig. 13).

Distribution.— *E. stylata* has previously been recorded from Gabon, Cameroon, Somalia, Guinea, Uganda and Ivory Coast (Brunner von Wattenwyl 1878; Karsch 1889, 1892; Schultess-Schindler 1898; Griffini 1906; Ragge 1968; Sjöstedt 1933).

***Monteiroa nigricauda* Ragge, 1980**

Ragge. 1980. Bull. Br. Mus. (Nat. Hist.) Ent. 40(2):178.
Type locality: Lamto (Ivory Coast).

Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, camp 1, 15-16.II.2012 (♀); Ndoki, Lake 1, platform on the canopy, 35m, UV trap 10-11.II.2012 (♀); Mboki, 24.I.2012 (♀) (Collector P. Moretto) (BMCP).

Distribution.—*M. nigricauda* was previously recorded from Ivory Coast, Guinea, Liberia, Ghana, Nigeria, and DRC (Ragge 1980).

***Poecilogramma cloetensi* (Griffini, 1908)**

Griffini, 1908. Mem. Soc. entom. Belgique, Bruxelles 15: 77.
Type locality: Beni Bendi, Sankuru (DRC).

Material examined.—Gabon, Sette Cama, VII.1976, P. Moretto (♀) (BMCP); DRC, Hombo 31.XII.1960, T. De Stefani (♀) (MRT).

Distribution.—According to Ragge (1980), this very colorful species occurs in central Africa from Cameroon to DRC.

***Corycomima camerata* (Karsch, 1889)**

Karsch, 1889. Berlin Ent. Z. 32: 457.
Type locality: Barombi Station (Cameroon).

Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, UV trap 1, 1-2.III.2012, P. Moretto (♀) (BMCP); Cameroon (♀) (MNCN).

Distribution.—*C. camerata* is a rare species, previously known only from a few specimens, mainly females, from Cameroon, DRC and Uganda (Ragge 1980).

***Gelotopoia bicolor* Brunner von Wattenwyl, 1891**
(Fig. 17)

Brunner von Wattenwyl, 1891. Verh. der Zoologisch-Botanischen Gesellsch. Wien 41: 11.
Type locality: Sierra Leone.

Material examined.—Ivory Coast, VII.2004, P. Moretto (♂); CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, UV trap 1, 10-11.II.2012 (♂); 20-23.II.2012 (♀); 24-25.II.2012 (♀); Ndoki, border of Lake 1, UV trap 13-14.II.2012 (♂) (Collector P. Moretto) (BMCP).

Remarks.—This interesting and uncommon species has titillators (Fig. 17), as do few other Phaneropterinae species reported here (*Phlaurocentrum* spp., *Brycoptera lobata* and *Azamia biplagiata*).

Distribution.—*G. bicolor* was originally described from Sierra Leone (Brunner von Wattenwyl 1891), but has since been recorded from Cameroon (Lolodorf) by Bruner (1920), Ivory Coast by Chopard (1954) and Ragge (1968), and CAR by Leroy (1985).

***Brycoptera lobata* Ragge, 1981**
(Fig. 16)

Ragge, 1981. J. Nat. Hist. 15 (6): 328.
Type locality: Dala Tando (Angola).

Material examined.—Ivory Coast, Mt. Tonkoui VIII.2008, P. Moretto (♂) (BMCP).

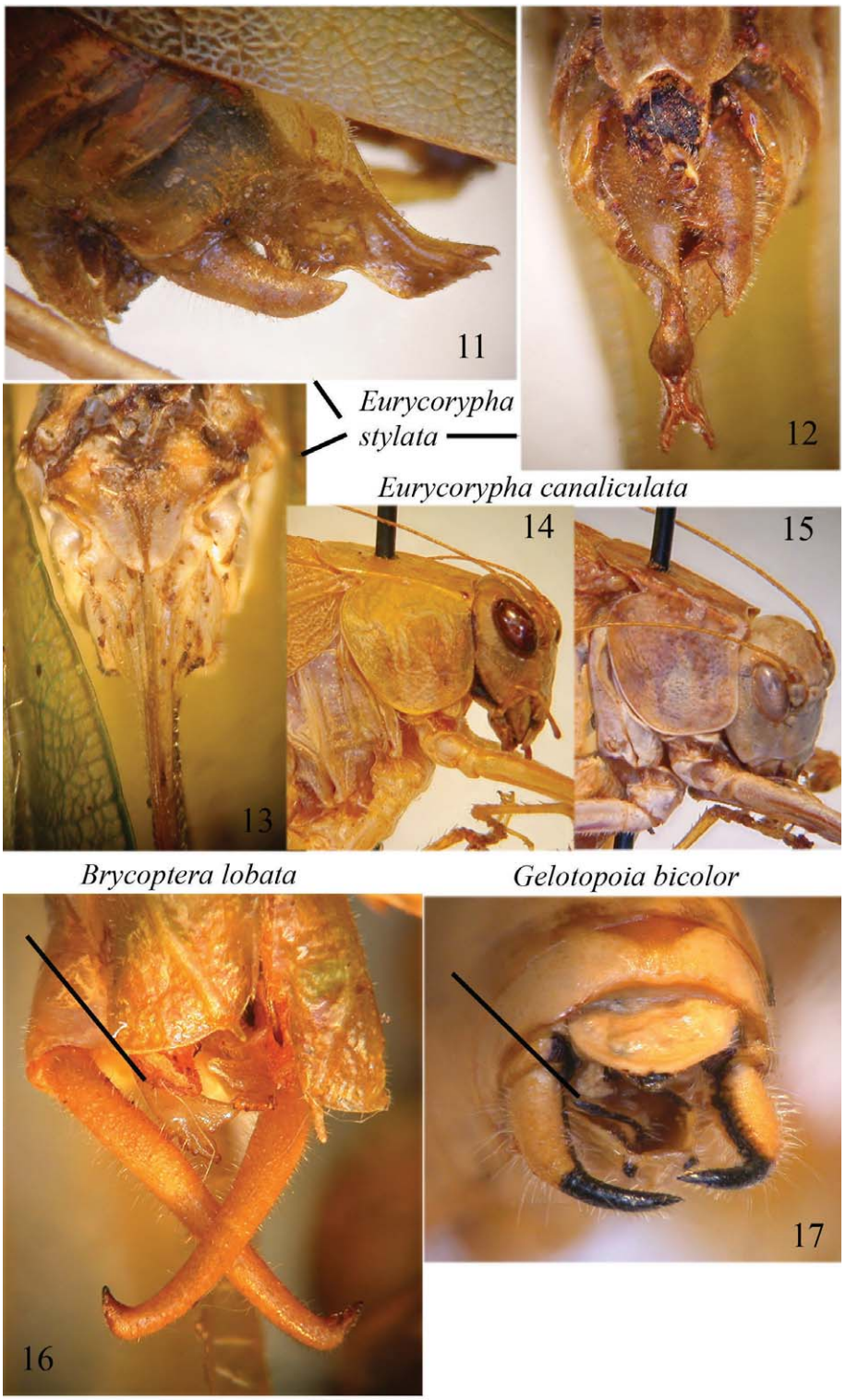
Remarks.—Ragge (1981) and Leroy (1985) highlighted the mimicry of wings and lobate legs of this very unique species. The tegmina of *B. lobata* are shaped as though they contain bite marks of a caterpillar. *B. lobata* also has titillators which have not previously been reported (Fig. 16).

Distribution.—The type locality of *B. lobata* is in Angola (Dala Tando) (holotype), but the series of paratypes comes from Guinea, Uganda, CAR and Cameroon (Ragge 1981; Holstein & Ingrisch 2004). It is newly recorded from Ivory Coast.

Genus *Phlaurocentrum* Karsch, 1889
(Figs 18-61)

Karsch, 1889. Berlin Ent. Z. 32: 445.

The genus *Phlaurocentrum* contains six species: *P. turbatum* (Walker, 1869), *P. latevittatum* Karsch, 1889, *P. mecopodoides* Karsch, 1891, *P. lobatum* Ragge, 1962, *P. tuberosum* Ragge, 1962 and *P. maculatum* Ragge, 1962. Although photos exist of type specimens of *Phlaurocentrum fulvipenne* Bruner, 1920 (Naskrecki & Otte 1999; Eades *et al.* 2013), the name must be considered a *nomen nudum*. The specimen from the photographs was recorded from ZMB Berlin but is now missing. Furthermore, despite the citation on the photographs, no description of this species exists in Bruner (1920). The erroneously labeled photographs match descriptions of morphological characters of *P. latevittatum* (Karsch 1889; Fig. 26).



Figs 11-17. *Eurycorypha stylata*: Lateral (11) and posterior (12) views of last tergites of male; ventral view of the ovipositor and sub-genital plate of female (13). *E. canaliculata*: Lateral views of the head and pronotum of male (14) and female (15). *Brycoptera lobata*: Last abdominal tergite, cerci and titillators (shown by the arrow) (16). *Gelotopoia bicolor*: Last abdominal tergite, cerci and titillators (shown by the arrow) (17). For color version, see Plate III.

Diagnosis.— (From Karsch 1889; Ragge 1962a; pers. obs.) Fastigium of vertex narrow, compressed, furrowed, eyes oval, head small, pronotum centrally narrowed, flat above, lateral lobes with hind angle, longer than high, inferiorly and posteriorly rounded, elytra narrow, obliquely truncate apically. Fore coxae armed, inner tympanum of fore tibiae closed, outer open. Femora ventrally armed with spines, apex of genicular lobes toothed, fore tibiae dorsally furrowed, exterior margin with spines. Meso- and metasternum posteriorly sub-truncate. Genital characters are very unusual. The male has a modified 10th tergite and long cerci that are bent in species-specific opposing directions. In addition, two well sclerotized titillators are present; these originate from the 10th tergite and possess a dentate apex; the titillators are moderately long and extend beyond the cerci. The cerci are different in each species and may be easily used as specific diagnostic character. The presence of titillators was overlooked by previous authors working on African species, but has been reported for other Phaneropterinae species outside of Africa (*e.g.*, Grant 1964, who named them "*tergal lobes*"; Liu & Kang 2009; Buzzetti *et al.* 2010; Liu & Liu 2011; Ingrisch 2011).

Female. The ovipositor is very short, with more or less straight valves and an obtuse apex. The sub-genital plate is moderately wide, with a concave apex. The last tergite is wide and convex, with posterior margin rounded; spines or swellings may be present laterally on the lower valves.

Eggs.—The species belonging to this canopy-dwelling genus lay unusual eggs for the subfamily of Phaneropterinae; differently from the majority of species, their eggs are not flat, but, even if oval, they are fairly round and thick (Fig. 25a, b). The morphology of the egg suggests a high resistance to desiccation (very thick chorionic layers that reduce the rate of water loss). Additionally, the valvules of the ovipositor are not flattened laterally, which indicates that the eggs are not inserted between the layers of the leaf epidermis. This is possibly due to the fact that they lay their eggs in clusters between cracks of tree bark.

In the following paragraphs all known species of *Phlaurocentrum* are listed, highlighting their diagnostic characters, and three new species are described.

Phlaurocentrum latevittatum Karsch, 1889
(Figs 18, 29-31, 40, 48, 49)

Karsch, 1889. Berlin Ent. Z. 32: 446.
Type locality: Kuako to Kimpoki (DRC).

Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, 26.I.2012 (♀); Ndoki, Lake 1, UV trap 1, 10-11.II.2012 (♀); 20-23.II.2012 (3♀); 24-25.II.2012 (♂);1-2.III.2012 (♂); Ndoki, border of Lake 1, UV trap 13-14.II.2012 (3♂, 1♀); Ndoki, Lake 1, camp 1, 14-15.II.2012 (♂) (Collector P. Moretto) (BMCP); Guinea, Makota (♂, ♀) (MNCN).

Measurements.—Males. Body length: 19.2±0.6; pronotum length: 4.3±0.1; pronotum height: 4.1±0.1; femur: 22.6±1.3; tegmen: 32.5±2.4. Females. Body length: 20.8±1.4; pronotum length: 4.4±0.1; pronotum height: 4.2±0.1; femur: 22.7±0.7; tegmen: 31.4±0.9; ovipositor: 1.4±0.1.

Diagnosis.— The 10th tergite of the male of *P. latevittatum* has a dark sclerotized plate with raised margins; the hind margin is concave with two pointed apices (Figs 29-31). The cerci are abruptly bent at an angle of about 90° at midlength with an acute apex (Figs 29-31). The titillators are short with an inflated apex possessing several small teeth (Figs 30-31). Karsch (1891) confused the titillators with cerci. The stridulatory area of the left tegmen of the male is long and brown (Fig. 18). The sub-genital plate of the female is gently v-shaped (Fig. 40). The costal area of the tegmen is moderately wide (Figs 48-49).

Distribution.—Karsch (1889, 1890) first described the female and male of the species, respectively. *P. latevittatum* has been reported from Kuako-Kimpoko (DRC) and Barombi (Cameroon) (Karsch 1889, 1890), then reported from Lolodorf (Cameroon) (Bruner 1920), Guinea (Chopard 1954), Mundame (Cameroon), Eala and Lusambe (DRC) (Ragge 1962a, 1967).

Phlaurocentrum mecopodoides Karsch, 1891
(Figs 20, 25a,b, 27, 28, 43, 56, 57)

Karsch, 1891. Berlin Ent. Z. 36 (2): 321-322.
Type locality: Barombi Station (Cameroon).

Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, 31.I.-2.II.2012 (♀); 10-11.II.2012 (♂); 11-12.II.2012 (♂, ♀); 20-23.II.2012 (♀); 28-29.II.2012 (♂); Ndoki, Lake 1, platform on the canopy, 45m, UV trap 28-29.II.2012 (♂) (Collector P. Moretto) (BMCP); Cameroon (♂) (MNCN).

Measurements.—Males. Body length: 21.1±2.4; pronotum length: 4.8±0.1; pronotum height: 4.3±0.1; femur: 21.8±0.4; tegmen: 29.6±1.1. Females. Body length: 23.2±3.6; pronotum length: 4.8±0.1; pronotum height: 4.3±0.1; femur: 23.7±2.2; tegmen: 34.8±2.5; ovipositor: 1.7±0.2.

Diagnosis.—The last abdominal tergite of the male of *P. mecopodoides* has two laterally protruding dark tubercles. The cerci are differentiated into a stout basal part with an inner slender branch apically. A bulge is present at the point where the cercus produces the inner branch (Figs 27-28). The titillators are short and have numerous apical teeth (Figs 27-28). The hind margin of the female sub-genital plate is almost straight and thickened (Fig. 43). The upper part of the lateral lobes of the pronotum are black, contrasting with the pale pronotal disc. The stridulatory area of the left tegmen of the male is comparatively short, brown-yellow and has a more oblique shape than in other species of the genus (Fig. 20). The costal area of the tegmen is moderately wide (Figs 56-57).

Distribution.—*P. mecopodoides* was described on a male from Barombi (Cameroon) (Karsch 1891); later Griffini (1908) described the female from Mukonje farm (Cameroon). Sjöstedt (1912) recorded it from Buea (Cameroon) and Ragge (1962a) from Mundame (Cameroon) and Eala (DRC).

Phlaurocentrum turbatum (Walker, 1869)
(Fig. 24)

Walker, 1869. Catalogue of the Specimens of Dermaptera Saltatoria in the Collection of the British Museum 2: 340.
Type locality: Congo.

Material examined.—DRC (holotype ♂) (photographs in Eades *et al*. 2013).

Remarks.—Walker (1869) described *P. turbatum* as *Phaneroptera turbata*; the description is very short and it is impossible to distinguish *P. turbatum* from the other species. The holotype is very badly preserved. For this reason Ragge (1964) proposed to consider it as a *nomen dubium*, suspecting that some species subsequently described could be its synonym. However, the tegmina are narrow and the stridulatory area of the left tegmen of the holotype is long and greyish, appearing different from other known species (Fig. 24). The costal area of the tegmen is moderately wide.

Phlaurocentrum lobatum Ragge, 1962

Ragge, 1962. Bull. Br. Mus. (Nat. Hist.) Ent. 13: 9.
Type locality: Eala (DRC).

Diagnosis.—The male of *P. lobatum* is characterized by the shape of the 10th tergite which is differentiated into two lobes which are very close to each other (Fig. 16 of Ragge 1962a) and cerci with a slight indentation at the apex. According to Ragge (1962a) the tegmina are rather wide at their apical ends and the costal area is moderately wide.

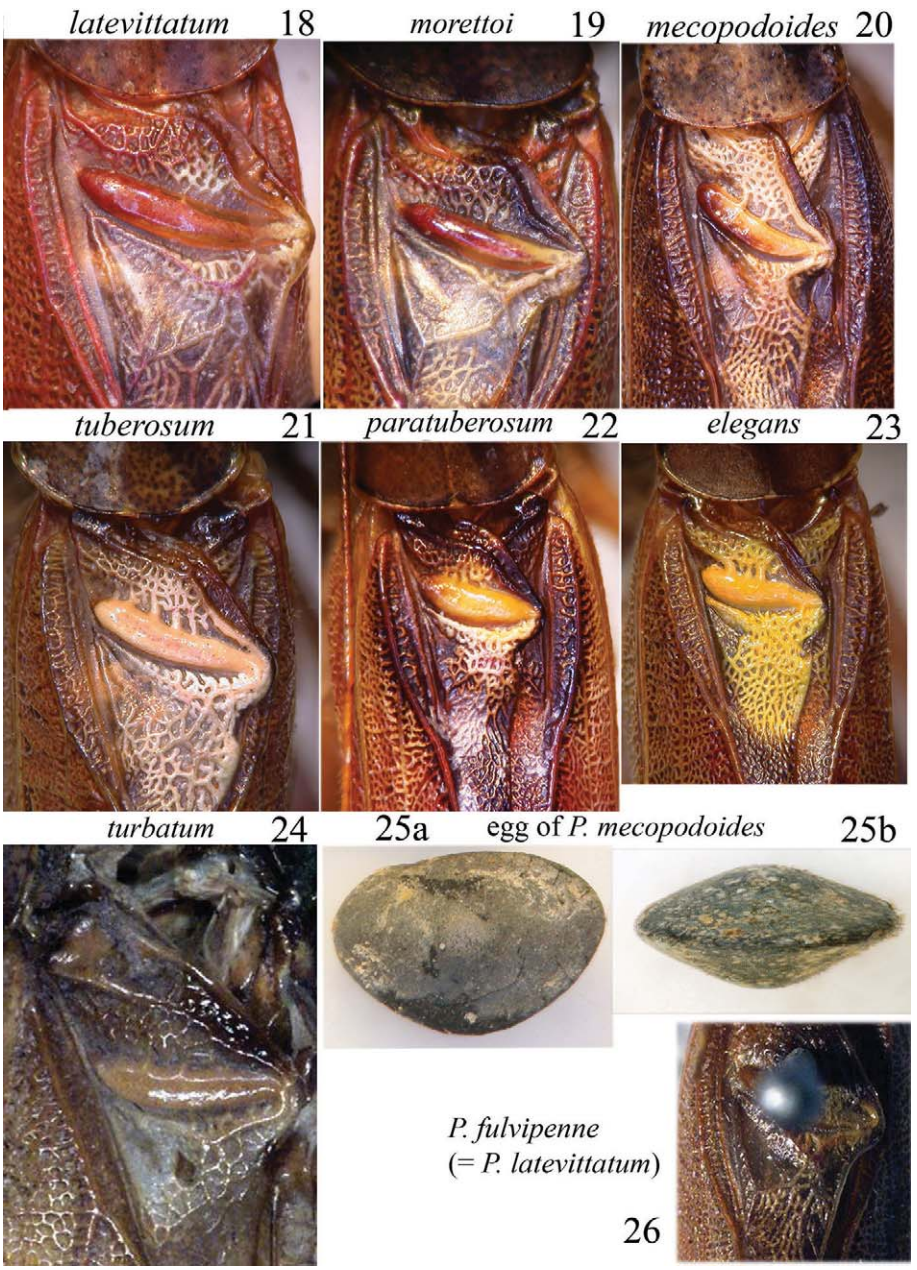
Distribution.—Only the male was described from the DRC (Congo Basin); the female is unknown.

Phlaurocentrum maculatum Ragge, 1962
(Figs 42, 60)

Ragge, 1962. Bull. Br. Mus. (Nat. Hist.) Ent. 13: 10.
Type locality: Mawambi Irumu (DRC).

Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, UV trap 1, 11-12.II.2012 (2♀); 20-23.II.2012 (♀); Ndoki, Lake 1, camp 1, 15-16.II.2012 (2♀) (Collector P. Moretto) (BMCP).

Measurements.— Female. Body length: 26.0±2.4; pronotum length: 4.9±0.2; pronotum height: 4.5±0.1; femur: 25.2±0.9; tegmen: 34.6±1.4; ovipositor: 1.9±0.1.



Figs 18-26. *Phlaurocentrum*: Dorsal view of the stridulatory area of the left tegmen of *latevittatum* (18), *morettoi* n. sp. (19), *mecopodoides* (20), *tuberosum* (21), *paratuberosum* n. sp. (22), *elegans* n. sp. (23), and *turbatum* (24). Frontal and lateral views of the egg of *mecopodoides* (25a,b). Stridulatory area of *P. fulvipenne nomen nudum* (=*P. latevittatum*) (26). For color version, see Plate III.

Diagnosis.—The male of *P. maculatum* is characterized by a 10th tergite with the posterior margin evenly incurved, with laterally pointed apices. The cerci are long and bent at 90°. The female sub-genital plate is poorly sclerotized and has a v-shaped emargination; at the base of the ovipositor, two small pointed processes are present (Fig. 42). *P. maculatum* is conspicuously mottled in color. According to Ragge (1962a) the apical margin of the male tegmen is rather wide and the costal area is moderately wide (Fig. 60); the costal area of the female tegmen is wider than that of the male.

Distribution.—*P. maculatum* was previously known only from the mountainous parts of Ituri and Kive (DRC).

***Phlaurocentrum tuberosum* Ragge, 1962**
(Figs 21, 34-35, 45, 54-55)

Ragge, 1962. Bull. Br. Mus. (Nat. Hist.) Ent. 13: 8.
Type locality: Mabira Forest (Uganda).

Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, UV trap 1, 11-12.II.2012 (♂, ♀); 20-23.II.2012 (3♂, 6♀); Ndoki, border of Lake 1, UV trap 13-14.II.2012 (♀); Ndoki, Lake 1, camp 1, 14-15.II.2012 (♂); Ndoki, Lake 3, UV trap 24-26.II.2012 (♀) (Collector P. Moretto) (BMCP); Cameroon (♂) (MNCN).

Measurements.—Males. Body length: 24.0±2.0; pronotum length: 5.2±0.1; pronotum height: 4.4±0.1; femur: 24.7±0.4; tegmen: 35.7±1.0. Females. Body length: 25.8±2.8; pronotum length: 5.6±0.1; pronotum height: 4.3±0.1; femur: 26.3±0.6; tegmen: 37.0±1.0; ovipositor: 1.2±0.1.

Diagnosis.—The 10th abdominal tergite of male *P. tuberosum* has well-developed lateral tubercles and cerci are upwardly bent with a clubbed apex (Figs 34, 35). Titillators are dorso-ventrally flattened, long, apically bent, with many small teeth (Figs 34, 35). The sub-genital plate of the female has a wide v-shaped emargination at its posterior margin and a spine is present on the sides of lower valves of the ovipositor (Fig. 42). The stridulatory area of the left tegmen of the male is long and ivory-colored; the area bordering it is also ivory-colored (Fig. 21). A slender yellowish longitudinal stripe delimits the darker area of the pronotum. The costal area of the tegmen is moderately wide and the apical margin is rather wide (Figs 54, 55).

Distribution.—*P. tuberosum* was previously known from Uganda, DRC and Cameroon (Ragge 1962a).

***Phlaurocentrum morettoi* n. sp.**
(Figs 19, 32, 33, 41, 52, 53)

Type locality: Dzanga-Ndoki National Park (CAR).

Material examined and depository.—Holotype, ♂: CAR, Dzanga-Ndoki National Park, Lake 1, UV trap 1, 31.I.-2.II.2012 (MSNG); allotype, ♀: same data 20-23.II.2012; paratype, ♂: same data 6-8.II.2012; paratype, ♀: same data 11-12.II.2012; 5 paratypes, ♂: same data 20-23.II.2012; paratype, ♂: same data 1-2.III.2012; paratype, ♂: CAR, Dzanga-Ndoki National Park, Lake 1, UV trap 2, 15-16.II.2012; 2 paratypes, ♀: CAR, Dzanga-Ndoki National Park, Lake 1, camp 1, 10-12.II.2012 (Collector P. Moretto) (BMCP).

Description.—**Male.** General characters are those of the genus. *P. morettoi* is identifiable at once by its very narrow tegmina, with the costal area narrower than in other species of the genus *Phlaurocentrum* (only in *P. paratuberosum* n. sp. it is as narrow as in *P. morettoi*) (Figs 52, 53). Fastigium of vertex is compressed, sulcate above, eyes oval. The stridulatory area of the left tegmen is long (Fig. 19). Legs are long, fore coxae armed, fore femora with 6-8 spines on the inner ventral margin, fore tibiae with 3-4 spines on inner and 6-7 on outer ventral margins, mid femora with 4-5 spines on inner ventral margin, mid tibiae with 7-8 spines on inner and 10-12 on outer ventral margin, hind femora with 5-7 spines on ventral margins, hind tibiae with 10-12 spines on outer and 5-7 on inner ventral margin. The 10th tergite is clearly bilobate, with rounded apices delimiting a narrow concavity (Figs 32, 33). Cerci are bent upwards at a right angle, their apices are pointed and in-curved (Figs 32, 33). The sub-genital plate is straight, the styli are slender. Titillators are very small, not chitinous, with two pointed short apices (Fig. 33).
Female. Same morphological characters, but larger than the male (see measurements). The ovipositor is very short. The sub-genital plate is straight with raised lateral margins (Fig. 41); sides of the ovipositor are inflated at basal part.

Color.— Brown with some black spots on tegmina. Antennal segments with some basal yellow rings; upper part of the head and pronotum and posterior margin of tegmina darker than the rest of the body. Stridulatory area of the male is yellow-brown colored. Legs have some small dark spots.

Measurements.—Males. Body length: 17.9±0.2; pronotum length: 4.3±0.1; pronotum height: 3.9±0.1; femur: 21.3±0.8; tegmen: 28.4±1.1. Females. Body length: 21.0±2.7; pronotum length: 4.3±0.1; pronotum height: 4.0±0.1; femur: 22.4±1.0; tegmen: 30.7±1.1; ovipositor: 1.5±0.1.

Diagnosis.—*P. morettoi* is characterized by very narrow wings, with the costal area narrow. The male 10th tergite is wide, clearly bilobate, with rounded apices. The cerci are bent upwards at a right angle, their apices are pointed and in-curved, and titillators are very small. The female sub-genital plate is straight with raised lateral margins; sides of the ovipositor are inflated at basal part.

Etymology.—This species is gratefully named after the French colleague Philippe Moretto, who collected the specimens of *P. morettoi* n. sp. and other interesting species in the CAR.

Phlaurocentrum paratuberosum n. sp.
(Figs 22, 36, 37, 46, 58, 59)

Type locality: Dzanga-Ndoki National Park (CAR).

Material examined and depository.—Holotype, ♂ and allotype, ♀: CAR, Dzanga-Ndoki National Park, Lake 1, UV trap 1, 24-25.II.2012; paratype, ♀: same data, 31.I-2.II.2012; paratype, ♀: same data 20-23.II.2012; paratype, ♀: same data 28.29.II.2012; paratype, ♂: CAR, Dzanga-Ndoki National Park, Lake 1, platform on the canopy, 45m, 28-29.II.2012 (BMCP); paratype, ♂: CAR, Dzanga-Ndoki National Park, Lake 1, UV trap 1, 10-11.II.2012 (Collector P. Moretto) (MSNG).

Description.—**Male.** General characters are those of the genus. *P. paratuberosum* is characterized by its narrow tegmina, with the costal area narrower than in other species of the genus *Phlaurocentrum*, with the only exception of *P. morettoi* (Figs 58, 59). Fastigum of vertex compressed, furrowed above. The stridulatory area of the left tegmen is short (Fig. 22). Legs are long, fore coxae are armed, fore femora with 6-8 spines on the inner ventral margin, fore tibiae with 4-5 spines on inner and on outer ventral margins, mid femora with 4-5 spines on inner ventral margin, mid tibiae with 6-8 spines on inner ventral and 9-10 on outer ventral margin, hind femora with 7-8 spines on ventral margins, hind tibiae with 12-13 spines on outer and 5-7 on inner ventral margin. The 10th tergite ends with two squared apices, toothed on inner side, separated by a wide emargination (Figs 36, 37). Cerci are long and bent at an obtuse angle, with clubbed apex (Figs 36, 37). The sub-genital plate is wide with a posterior concavity, styli are short. Titillators are long and apically bent; their basal arms are toothed, while apical ones are narrow, smooth and in-curved (Figs 36, 37).
Female. Morphological characters are the same of the male, the size is larger. The sub-genital plate has a posterior emargination (Fig. 46); at the basal sides of the ovipositor there is a spine coupled with a swelling (Fig. 46). The ovipositor is slightly longer than in other species of the genus (Fig. 46).

Color.—Brown; upper part of the head and pronotum and posterior margin of tegmina darker than the rest of the body. Tegmina are laterally brown or greenish (only in the males). Antennae brown. Stridulatory area of the male is yellow-ivory-colored. Legs are yellowish, tympanum of fore tibiae and apex of fore femora are blackish.

Measurements.—Males. Body length: 19.9±2.1; pronotum length: 5.0±0.1; pronotum height: 4.0±0.1; femur: 24.3±0.2; tegmen: 32.9±1.0. Females. Body length: 20.0±1.7; pronotum length: 5.2±0.1; pronotum height: 4.2±0.1; femur: 25.1±1.1; tegmen: 32.6±0.8; ovipositor: 1.8±0.1.

Diagnosis.— Wings of *P. paratuberosum* are narrow and the costal area of the tegmen is narrower than in other species (only in *P. morettoi* n. sp. it is as narrow as in *P. paratuberosum*). The male 10th tergite ends with two squared apices, toothed on inner side, separated by a wide emargination. Cerci are long and bent at an obtuse angle, with clubbed apex. Titillators are long and apically bent; their basal arms are toothed, while apical ones are narrow, smooth and in-curved. The stridulatory area of the left tegmen of the male is short and yellow. The female sub-genital plate has a posterior emargination; sides of the ovipositor have a spine and a swelling. The ovipositor is slightly longer than in other species of the genus.

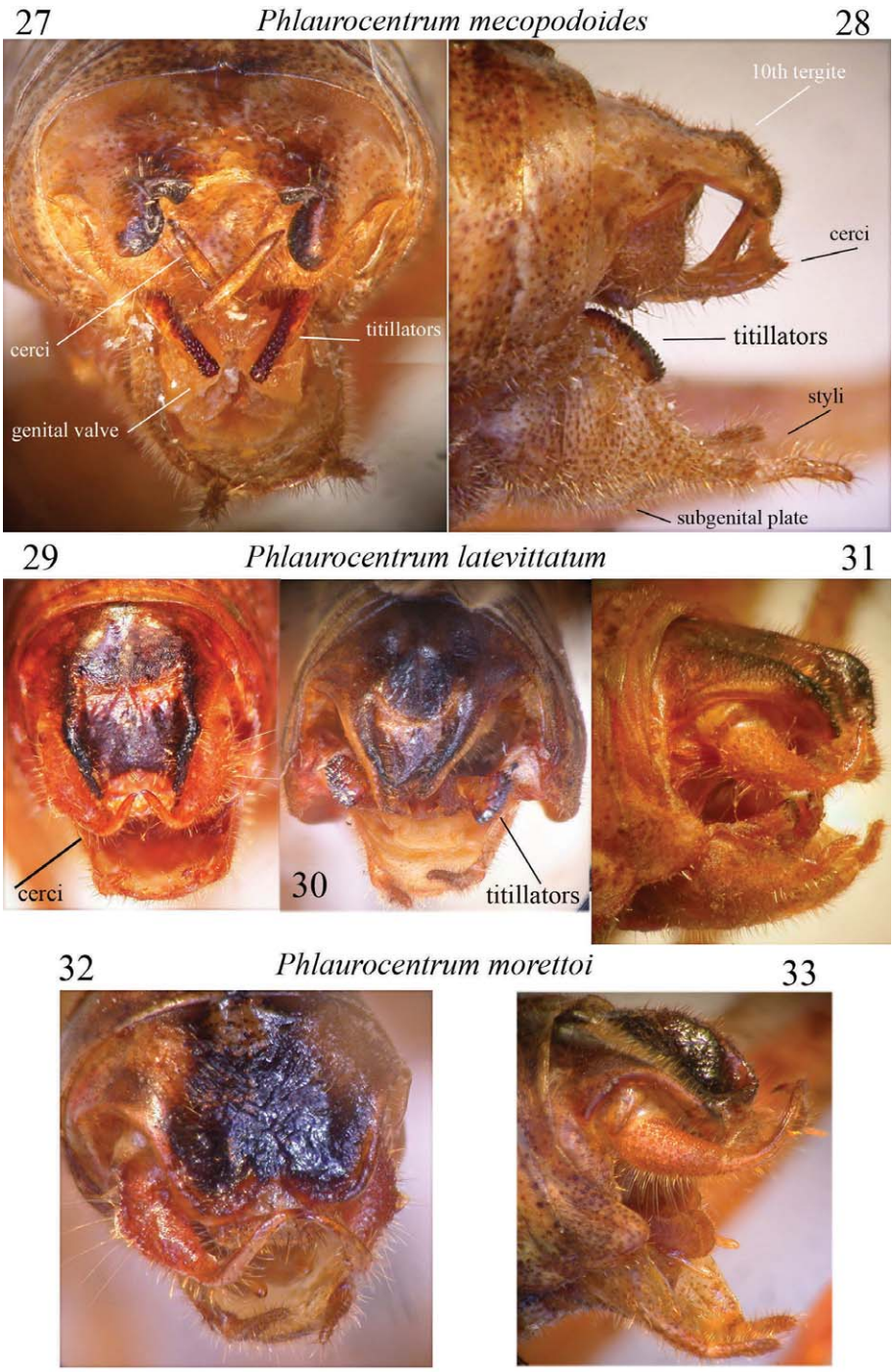
Etymology.—Named for the similarity of the 10th tergite of males with that of *P. tuberosum*.

Phlaurocentrum elegans n. sp.
(Figs 23, 38, 39, 47, 50, 51)

Type locality: Dzanga-Ndoki National Park (CAR).

Material examined and depository.—Holotype, ♂, allotype, ♀: CAR, Dzanga-Ndoki National Park, Lake 1, UV trap 1, 20-23.II.2012 (MSNG); 4 paratypes, 3♂, 1♀: same data 23.II.2012; 2 paratypes, 1♂, 1♀: same data 29.II-1.III.2012 (Collector P. Moretto) (BMCP).

Description.—**Male.** General characters are those of the genus. Fastigium of vertex is compressed, sulcate above, eyes oval. The stridulatory area of the left tegmen is short (Fig. 23). Legs are long, fore coxae are armed, fore femora with 4-5 spines on the inner ventral margin, fore tibiae with 5-6 spines on inner and 4-5 on



Figs 27-33. *Phlaurocentrum* males: Posterior and lateral views of last abdominal segments of *mecopodoides* (27-28), *latevittatum* (29-31), and *morettoi* n. sp. (32-33). For color version, see Plate IV.

outer ventral margins, mid femora with 4-5 spines on inner ventral margin, mid tibiae with 5-7 spines on inner ventral and 8-10 on outer ventral margin, hind femora with 4-5 spines on ventral margins, hind tibiae with 10-12 spines on outer and 8-10 on inner ventral margin. The 10th tergite has a median keel and two square-shaped apices, toothed on the inner side (Figs 38, 39). Cerci are slender and bent at a right angle (Figs 38, 39). The sub-genital plate has a small posterior concavity, styli are laterally flattened. The titillators are long, ivory-colored, with stout basal arms and slender and down-curved apical arms, with several spines at their clubbed apices (Figs 38, 39).

Female. Same as morphological characters of the male. The sub-genital plate is very peculiar, with an almost straight emargination on the hind margin (Fig. 47). The costal area of the tegmen is moderately larger than in the male, wings are shorter than in the male (Figs 50, 51).

Color.—Brown; upper part of the head and pronotum darker than the rest of the body; a slender yellowish longitudinal stripe delimits the darker area of the pronotum. The stridulatory area of the left tegmen of the male is bright yellow, as well as the area bordering it.

Measurements.—Males. Body length: 25.1±1.3; pronotum length: 5.4±0.2; pronotum height: 4.2±0.1; femur: 25.4±0.9; tegmen: 38.2±0.8. Females. Body length: 23.4±1.6; pronotum length: 5.6±0.5; pronotum height: 4.2±0.2; femur: 24.7±2.0; tegmen: 34.8±2.8; ovipositor: 1.4±0.1.

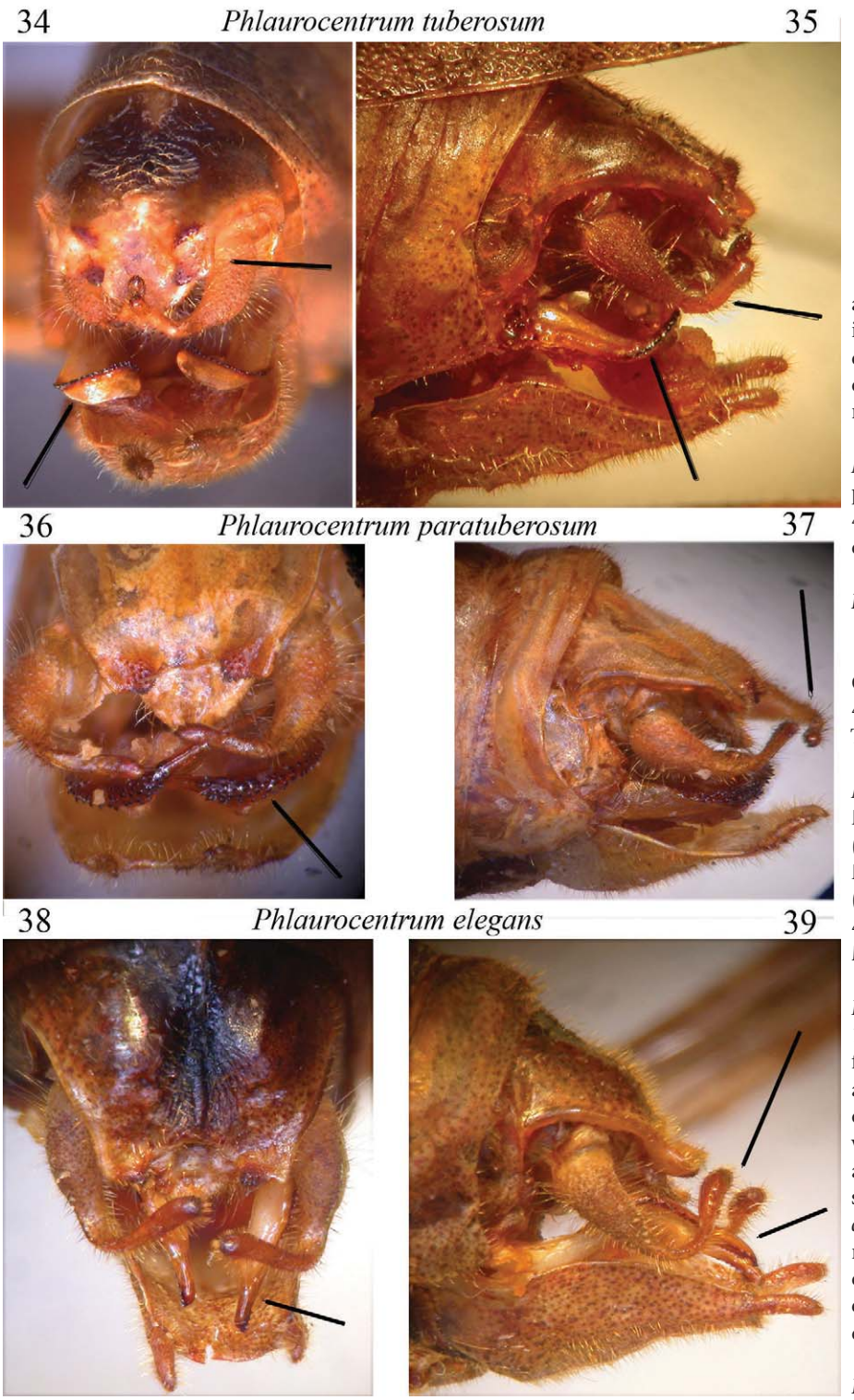
Diagnosis.—*P. elegans* is characterized by the male 10th tergite with a median keel and two square shaped apices, toothed on the inner side. Cerci are slender and bent at right angle. Titillators are long, ivory-colored, with a stout basal arm, apically down-curved, with some spines on the apices. The stridulatory area of the left tegmen of the male is short and bright yellow, as well as the area bordering it. The hind margin of the female sub-genital plate has an almost straight emargination. The costal area of tegmina is moderately wide in the male and wider in the female which has shorter wings than the male. The tegmina of *P. elegans* are longer than those of *P. morettoi* n. sp., *P. paratuberosum* n. sp. and *P. latevittatum*, similar to those of *P. mecopodoides*, with the costal area moderately wide (Fig. 50).

Etymology.—Named for its elegant appearance.

***Phlaurocentrum* sp.**
(Figs 44, 61)

Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, 31.I.-2.II.2012 (♀);11-12.II.2012 (♀) (Collector P. Moretto) (BMCP).

Remarks.—Among the series of specimens of this genus coming from the Dzanga-Ndoki National Park there are two females that do not match with any described species. They could belong to *P. lobatum* or an undescribed taxon, but males are needed to establish this. Morphological characters of these specimens are the following: the sub-genital plate is very narrowed on the apical part, that ends with



Figs 34-39. *Phlaurocentrum* males: Posterior and lateral views of last abdominal segments of *tuberosum* (34, 35), *paratuberosum* n. sp. (36, 37), and *elegans* n. sp. (38, 39). For color version, see Plate IV.

a v-shaped posterior margin (Fig. 44). A spine is present on the sides of the lower valve of the ovipositor, that is longer than in other species of the genus. The costal area of the tegmen is moderately wide (Fig. 61).

Measurements.— Females. Body length: 26-26.8; pronotum length: 5.3-5.4; pronotum height: 4.5-4.6; femur: 26-26.6; tegmen: 34.3-34.5; ovipositor: 2-2.5.

***Leiodontocercus angustipennis* Chopard, 1954**
(Figs 62, 63)

Chopard, 1954. Mem. Inst. franc. Afr. Noire 40 (2): 84.
Type locality: Mt. Nimba (Guinea).

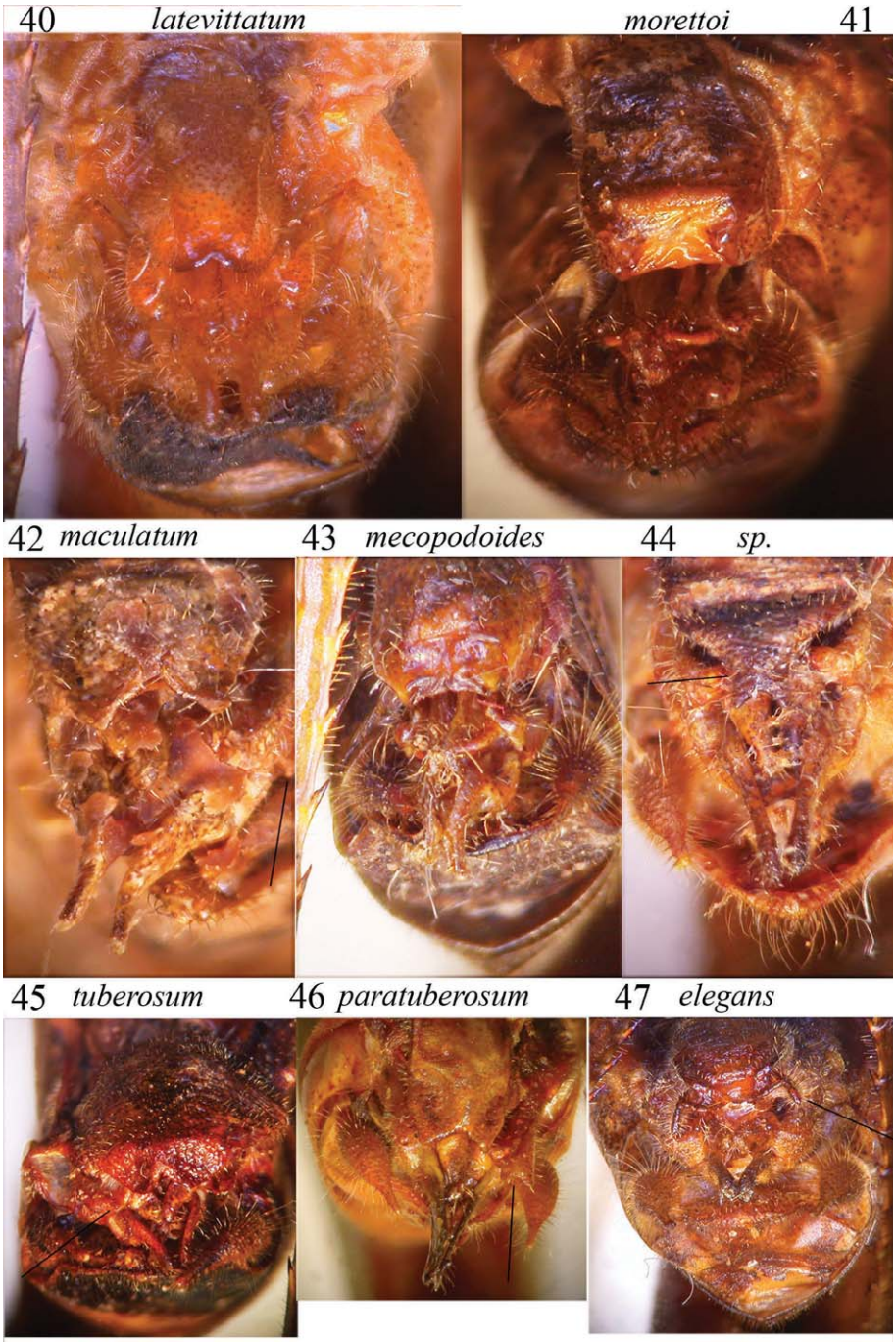
Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, 31.I.-2.II.2012 (♀); 8-10.II.2012 (♂); 20-23.II.2012 (♂, ♀); Ndoki, border of Lake 1, UV trap 13-14.II.2012 (2♂); Ndoki, Lake 1, platform on the canopy, 45m, UV trap 28-29.II.2012 (♂) (Collector P. Moretto) (BMCP).

Remarks.—The genus *Leiodontocercus* Chopard, 1954 is characterized by a strongly compressed fastigium of vertex which slopes to the frons and is sulcate above, tegmina are very narrow, obliquely truncate apically, male last sternite without styli, and cerci stout and enlarged apically. Ragge (1962a) described two further species within this genus (*L. malleus* Ragge and *L. condylus* Ragge), based on the different shape of male cerci. The ovipositor is very similar to that of the species of the genus *Phlaurocentrum*; differently from *Phlaurocentrum*, the sub-genital plate of *Leiodontocercus* lacks diagnostic characters.

Distribution.—*L. angustipennis* (Figs 62, 63) was previously known from Guinea and Sierra Leone (Ragge 1962a).

***Enochletica ostentatrix* Karsch, 1896**
(Figs 64-67)

Karsch, 1896. Stett. Entomol. Z. 57: 337.
Type locality: Lolodorf (Cameroon).



Figs 40-47. *Phlaurocentrum* females: Subgenital plate and ovipositor of *latevittatum* (40), *morettoi* n. sp. (41), *maculatum* (42), *mecopodoides* (43), *Phlaurocentrum* sp. (44), *tuberosum* (45), *paratuberosum* n. sp. (46), and *elegans* n. sp. (47). For color version, see Plate V.

***Enochletica affinis* Bolívar, 1906 n. syn.**

Bolívar, 1906. Mem. Soc. espan. Hist. nat. 1: 333.
Type locality: Cameroon.

Material examined.—Cameroon, Lolodorf, L. Conradt (syntypes of *E. ostentatrix*) (ZMHB); Cameroon, L. Conradt 1898-1899 (holotype of *E. affinis*) (MNCN); CAR, Dzanga-Ndoki National Park, Ndoki, border of Lake 1, UV trap 13-14.II.2012 (10♂); Ndoki, Lake 1, UV trap 1, 20-23.II.2012 (11♂); 24-25.II.2012 (6♂); 28-29.II.2012 (♂); 29.II-1.III.2012 (♂); 1-2.III.2012 (2♂); Ndoki, Lake 1, camp 1, 15-16.II.2012 (3♂); Ndoki, Lake 1, UV trap 2, 10-12.II.2012 (2♂) (Collector P. Moretto); CAR, 10 km E of Bambio (490 m) 10.XII.2008, J. Halada (♂) (BMCP).

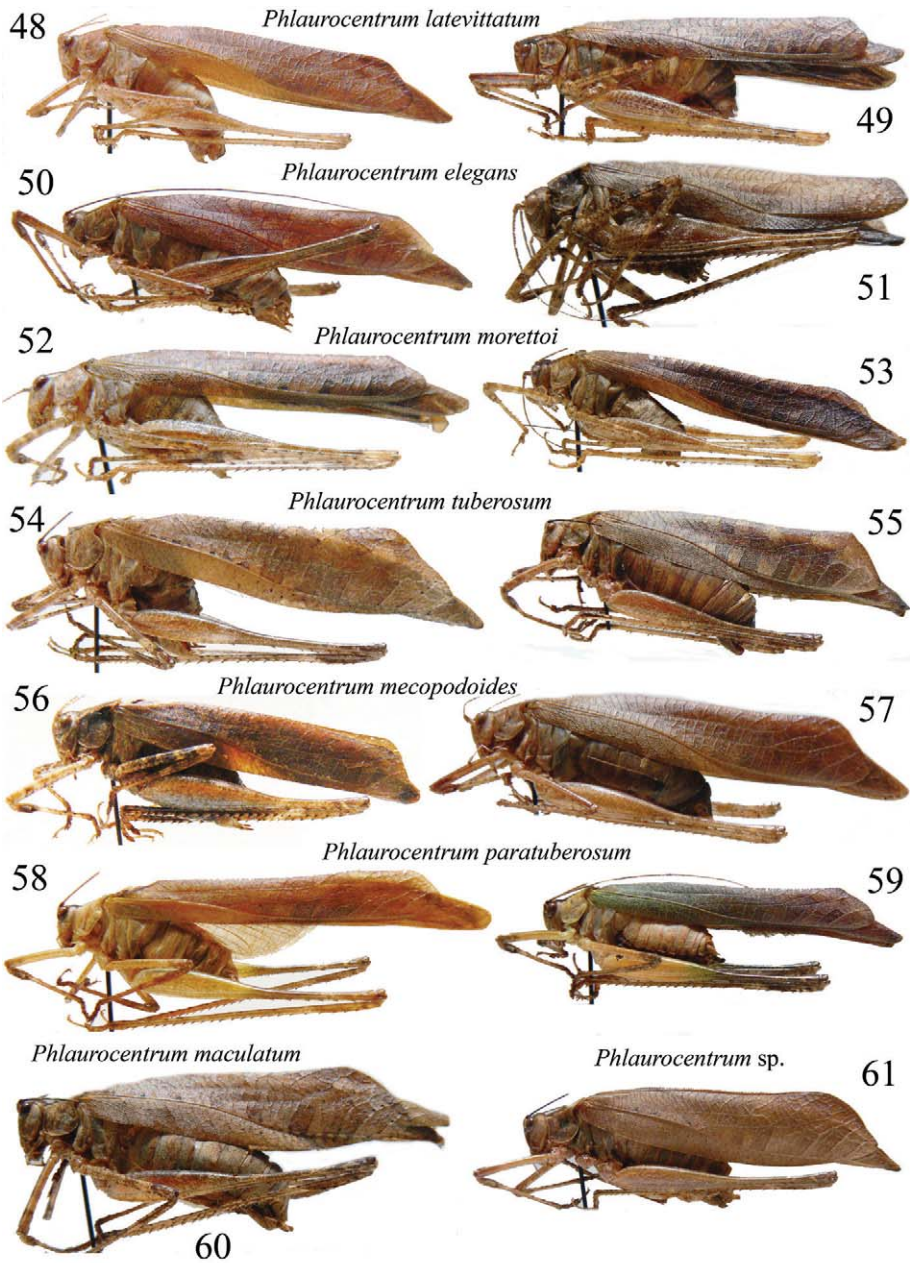
Diagnosis.—The genus *Enochletica* Karsch, 1896 is very characteristic: its build is stout, the body color and hing wings are dark-colored, and hind legs are short. Leroy (1985) pointed out the mimicry of *Enochletica* with dead leaves.

Remarks.— *E. ostentatrix* was described from Lolodorf (Cameroon) (Karsch 1896), later recorded in the DRC (Giglio Tos 1907; Sjöstedt 1929), Ivory Coast and CAR (Chopard 1954; Ragge 1968; Leroy 1985). *E. affinis* was also described from Cameroon (Bolívar 1906); it was collected by the same person (L. Conradt) who some years earlier collected the specimens studied by Karsch (1896). The female of *E. affinis* was described from Lukungu (DRC) by Griffini (1908), who wrote that he decided to assign his specimen to *E. affinis* because it had a shorter ovipositor (3.2 *vs* 6.5 mm) and a larger size (Body length 27 *vs* 24 mm, but tegmina 39 *vs* 40 mm). Karsch (1896) described *E. ostentatrix* on both sexes, the male being smaller than the female and characterized by stout cerci, in-curved and pointed, and very long styli (Figs 64, 66). Bolívar (1906) described *E. affinis* on a male that differed from *E. ostentatrix* by larger size, more sulcate fastigium and lighter color (Figs 65, 67). The comparison of types of the two species did not elucidate any difference in male sexual characters (Figs 64-67). The shorter length of the ovipositor cited by Griffini (1908) in *E. affinis* seems like a polymorphism or mutation. The sole evident difference between the two species seems to be the color. For these reasons, *E. affinis* is now considered a junior synonym of *E. ostentatrix*.

Genus *Myllocentrum* Ragge, 1962
(Figs 68-79)

Ragge, 1962. Bull. Br. Mus. (Nat. Hist.) Ent. 13: 15.

Ragge (1962a) erected this genus to include *Phlaurocentrum stigmosum* Karsch, 1896, described only on the female. Characters of this genus are the fastigium of vertex moderately compressed, sloping steeply to frons, sulcate above, anterior margin of pronotum slightly concave, posterior margin rounded, tegmina of moderate breadth, ovipositor much reduced. In addition, hind femora are rather short and slender, and the pronotum is flat, nearly depressed. Ragge (1962a) pointed out that the genus *Myllocentrum* is not a



Figs 48-61. *Phlaurocentrum*: Lateral habitus of males (48, 50, 52, 54, 56, 58) and females (49, 51, 53, 55, 57, 59-61) of *latevittatum* (48, 49), *elegans* n. sp. (50, 51), *morettoi* n. sp. (52, 53), *tuberosum* (54, 55), *mecopodoides* (56, 57), *paratuberosum* n. sp. (58, 59), *maculatum* (60), and *Phlaurocentrum* sp. (61). For color version, see Plate VI.

close relative to *Phlaurocentrum* and related genera, but instead to *Enochletica*. However, the reduced length of the hind legs is the only shared character between *Myllocentrum* and *Enochletica*, and this may be caused by convergence.

Myllocentrum stigmosum (Karsch, 1896)
(Figs 68, 70, 72, 74, 76, 78)

Karsch, 1896. Stett. Entomol. Z. 57: 336.
Type locality: Lolodorf (Cameroon).

Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, UV trap 1, 31.I.-2.II.2012 (♂, ♀); 2-4.II.2012 (♂); 11-12.II.2012, (2♂, 3♀); 20-23.II.2012 (2♂, 1♀); 24-25.II.2012 (3♂); Ndoki, border of Lake 1, UV trap 16.II.2012 (4♂); Ndoki, Lake 1, UV trap 2, 15-16.II.2012 (2♂, 2♀); Ndoki, Lake 1, platform on the canopy, 45m, UV trap 28-29.II.2012 (4♂, 3♀) (Collector P. Moretto) (BMCP).

Diagnosis.—*M. stigmosum* is characterized by its short and slender hind legs that are *ca* 0.40-0.45× the length of the tegmina. The species has black spots on the tegmina and black markings on the vertex, the sides of the pronotal disc, and a double dark stripe along the dorsal surface of hind tibiae. Ragge (1962a) also highlighted the presence of conspicuous and prominent small teeth on certain veinlets in the anal area on the right female tegmen. The ovipositor of this species is very short (Fig. 72).

Male. Coloration is the same as that of the female (Fig. 68), 10th tergite is slightly concave; cerci are long, in-curved, sinuous and covered by thick yellow pilosity (Fig. 70). The subgenital plate is long, tricarinate and slightly concave, styli are very small (Fig. 70). Left tegmen has a well-developed stridulatory area (Fig. 74), right tegmen has a small speculum (Fig. 76), and stridulatory file (Fig. 78) is rather straight and composed of 35-40 files.

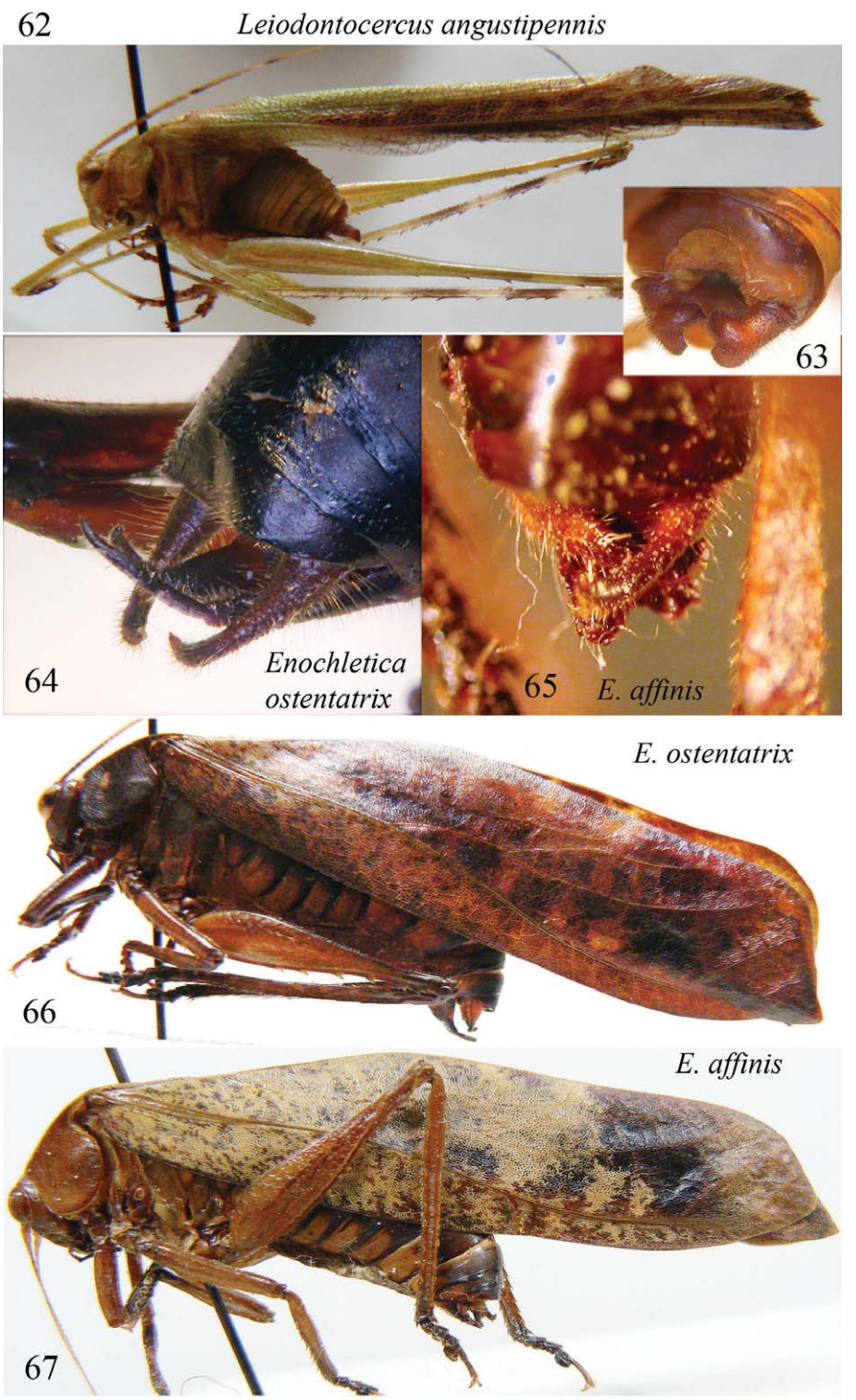
Measurements.—Males. Body length: 28.5±2.5; pronotum length: 5.6±0.3; pronotum height: 5.2±0.3; femur: 17.5±1.2; tegmen: 40.1±1.2. Females. Body length: 30.4±2.8; pronotum length: 5.3±0.2; pronotum height: 5.0±0.05; femur: 17.7±0.9; tegmen: 43.2±0.8; ovipositor: 4.8±0.1.

Distribution.—*M. stigmosum* has been previously recorded from Lolodorf (Cameroon) and Oban district (Nigeria) (Ragge 1962a).

Myllocentrum raggei n. sp.
(Figs 69, 71, 73, 75, 77, 79)

Type locality: Dzanga-Ndoki National Park (CAR).

Material examined and depository.—Holotype, ♂, allotype, ♀: CAR, Dzanga-Ndoki National Park, Lake 1, UV trap, 20-23.II.2012 (MSNG); 6 paratypes, 3♂, 3♀: same data; 3 paratypes, 1♂, 2♀: same data 31.I-2.II.2012; paratype, ♀: same data 2-4.II.2012; 2 paratypes, ♂, ♀: same data 10-11.II.2012; paratype, ♀: same data 11-12.II.2012; 3 paratypes, 2♂, 1♀: same data 15-16.II.2012; paratype, ♂: same data 24-25.II.2012; 3 paratypes, 2♂, 1♀: CAR, Dzanga-Ndoki National Park, Lake 1, UV trap 2, 15-16.II.2012; 5 paratypes, ♂: CAR, Dzanga-Ndoki National Park, Lake 1, border of Lake 1, 13-14.II.2012; 2 paratypes, ♂: CAR, Dzanga-Ndoki National Park, Lake 1, Lake 3, 18-19.II.2012; 4 paratypes, 2♂, 2♀: CAR, Dzanga-Ndoki National



Figs 62-67. *Leiodontocercus angustipennis*: Lateral habitus (62) and posterior view of cerci (63). *Enochletica ostentatrix* male: Last abdominal segments of *Enochletica ostentatrix* (64) and of *E. affinis* syntype (65); Lateral habitus of *E. ostentatrix* (66) and of *E. affinis* (67). For color version, see Plate VII.

Park, Lake 1, platform on the canopy, 45m, 28-29.II.2012 (Collector P. Moretto) (BMCP).

Description.—**Male.** General characters are those of the genus, hind legs are short (*ca* 0.40× length of the tegmen) (Fig. 69). The fastigium of the vertex is sulcate above, anterior margin of pronotum is slightly concave, posterior margin rounded. Pronotum is abundantly punctate, punctures are deep and well-defined (Figs 75, 77). Lateral keels of pronotum are barely visible. Tegmina are well-developed, *ca* 1.7 × longer than the body length. Hind wings are longer than tegmina. The 10th tergite is slightly concave, cerci are in-curved, long and slender; their apex is covered by thick and short yellow hairs (Fig. 71). The sub-genital plate is long, quite straight, styli are small (Fig. 71). The stridulatory area on the left tegmen is short (Fig. 75), the right tegmen has a small speculum (Fig. 77), and the stridulatory file is nearly straight and composed of 32-38 teeth (Fig. 79). **Female.** Same morphological characters as the male, but larger body size. Tegmina are *ca* 1.5× longer than the body length. The ovipositor is short and up-curved, cerci are slender and in-curved (Fig. 73). The sub-genital plate is triangular and pointed.

Color.—*M. raggei* is green or brown colored with some small black spots on the tegmina (Figs 69, 75, 77), in some specimens the head is whitish. The stridulatory area on the left tegmen has black markings on the left or central-left side (Fig. 75).

Measurements.—Males. Body length: 20.9±0.6; pronotum length: 4.4±0.1; pronotum height: 4.1±0.1; femur: 13.6±0.5; tegmen: 33.9±1.0. Females. Body length: 23.2±1.0; pronotum length: 4.4±0.2; pronotum height: 4.0±0.1; femur: 14.1±1.1; tegmen: 35.2±1.7; ovipositor: 4.7±0.2.

Diagnosis.—*M. raggei* is a small *Myllocentrum* without the characteristic black markings on the pronotum and tegmina, and deeper punctures on the pronotum than in *M. stigmosum*. Apart from the differences in the black markings, general characters are similar to those of *M. stigmosum*, but the size is smaller (see measurements); pronotum punctures are deep and well-defined, differently from *M. stigmosum*, where pronotum is rather smooth with some small punctures (Figs 75-77). The 10th tergite of the male is also similar to that of *M. stigmosum*, but cerci are more slender. The ovipositor is proportionally longer and less up-curved, cerci are more slender than in *M. stigmosum* (Fig. 73). Ragge (1968) recorded a female of a *Myllocentrum* sp. from Ivory Coast (Divo) that could belong to this species.

Etymology.—This species is named after the English orthopterist David Ragge, who contributed very much to the knowledge of African Tettigoniidae.

Genus *Poreuomena* Brunner von Wattenwyl, 1878
(Figs 80-85, 89-94)

Brunner von Wattenwyl, 1878. Monographie der Phaneropteriden 187.

This African genus is characterized by small and slender size, inner tympanum of fore tibiae closed, outer tympanum open, fore coxae armed, narrow tegmina, lower margin of fore and mid femora unarmed, male 10th tergite ending with two lobes, and styli absent. Six species are known, namely: *P. africana* Brunner von Wattenwyl, 1878 (Figs 82, 83), *P. forcipata* Sjöstedt, 1902, *P. gladiator* Bolívar, 1906 (Fig. 84), *P. duponti* Griffini, 1908 (Fig. 81), *P. wilverthi* Griffini, 1908, and *P. lamottei* Chopard, 1954. They are mainly distinguished by characters of male 10th tergite and cerci; here two further species are described.

***Poreuomena huxleyi* n. sp.**
(Figs 80, 89)

Type locality: S.ta Isabel, Fernando Poo (Guinea).

Material examined and depository.—Holotype, ♂: Guinea, Fernando Poo, Sta. Isabel IX.1928, T. Vives[1] (MNCN) (a second label on the specimens reports: «*Poreuomena* nov. sp. det. John Huxley 1963»).

Description.—**Male.** Eyes round, tegmina narrow, stridulatory area of the left tegmen short. Legs are long, lower margin of fore and mid femora are unarmed, two spines are present on lower margin of hind femora. The apical lobes of the 10th tergite are short and square, separated by a wide concavity; the cerci are in- and down-curved, dorso-ventrally flattened in the apical portion, where a lateral spine is present (Figs 80, 89). Styli are absent.
Female. Unknown.

Color.—*P. huxleyi* n. sp. is brownish colored, with green tegmina and hind tibiae, a black marking at the base of the tegmina with some small black spots on the posterior margin of tegmina.

Diagnosis.—*P. huxleyi* is easily recognizable by short apical lobes on the male 10th tergite, and cerci clearly up-curved and with a lateral spine. Styli are absent. The most related species is *P. africana* Brunner von Wattenwyl, 1878 (type species of the genus) (Figs 82, 83), which has much longer lobes and more robust cerci.

Etymology.— *P. huxleyi* is named after the English entomologist John Huxley, who identified the specimen preserved at the Museo Nacional de Ciencias Naturales of Madrid as a new taxon.

***Poreuomena sanghensis* n. sp.**
(Fig. 85, 90-94)

Type locality: Dzanga-Ndoki National Park (CAR).

Material examined and depository.— Holotype, ♂: CAR, Dzanga-Ndoki National Park, Lake 1, UV trap, 10-12.II.2012 (MSNG); allotype, ♀: same data 20-23.II.2012; paratype, ♂: same data 8-10.II.2012; 5 paratypes, ♂: same data 20-23.II.2012; paratype, ♂: same data 31.I-2.II.2012; 2 paratypes, ♂: CAR, Dzanga-Ndoki National Park, border of Lake 1, 13-14.II.2012; paratype, ♂: CAR, Dzanga-Ndoki National Park, Lake 1, camp 1, 14-15.II.2012 (Collector P. Moretto) (BMCP).

Description.—**Male.** Eyes round, fastigium of vertex narrow, sulcate above. Tegmina narrow, stridulatory area of the left tegmen short and straight. Inner tympanum of fore tibiae closed, outer open. Fore coxae armed. Legs are long, lower margin of fore and mid femora are unarmed, while the lower margins of hind femora have 2 spines. The 10th tergite ends with two short reddish rounded flat lobes with an inner spine (Figs 90, 91); the cerci have a wide round base, with an inner spine, then they become narrow, up-curved and pointed apically (Figs 90, 92). The male sub-genital plate is small, triangular, with a small concavity and without styli (Fig. 92).
Female. Same morphological characters as the male. The last tergite ends with a concave reddish plate with flat and rounded margins and a small apical concavity (Fig. 94). The cerci are pointed and up-curved. The ovipositor is short, sharply tapering and bent upwards near the base, the upper margin is finely toothed (Fig. 94).

Color.—Green or brown colored, with brown-reddish upper area of abdominal tergites. A black marking is present at the base of the tegmina of the male, absent in the female.

Measurements.—Males. Body length: 16.0±0.7; pronotum length: 3.1±0.1; pronotum height: 2.6±0.1; femur: 17.4±0.8; tegmen: 24.3±0.7. Female. Body length: 19.4; pronotum length: 3.3; pronotum height: 2.8; femur: 19.2; tegmen: 30.0; ovipositor: 3.9.

Diagnosis.—Small and slight species, green or brown colored, with brown-reddish upper area of abdominal tergites. A black marking is present at the base of tegmina of the male. Peculiar male 10th tergite and cerci allow easy distinction of this species from others of the same genus.

Etymology.—After the Sangha river, bordering the CAR.

***Poreuomena forcipata* Sjöstedt, 1902**
(Fig. 84)

Sjöstedt, 1902. Bihang Kungl. Svenska Vet. Akad. Handl. 27 (3): 12
Type locality: Cameroon.

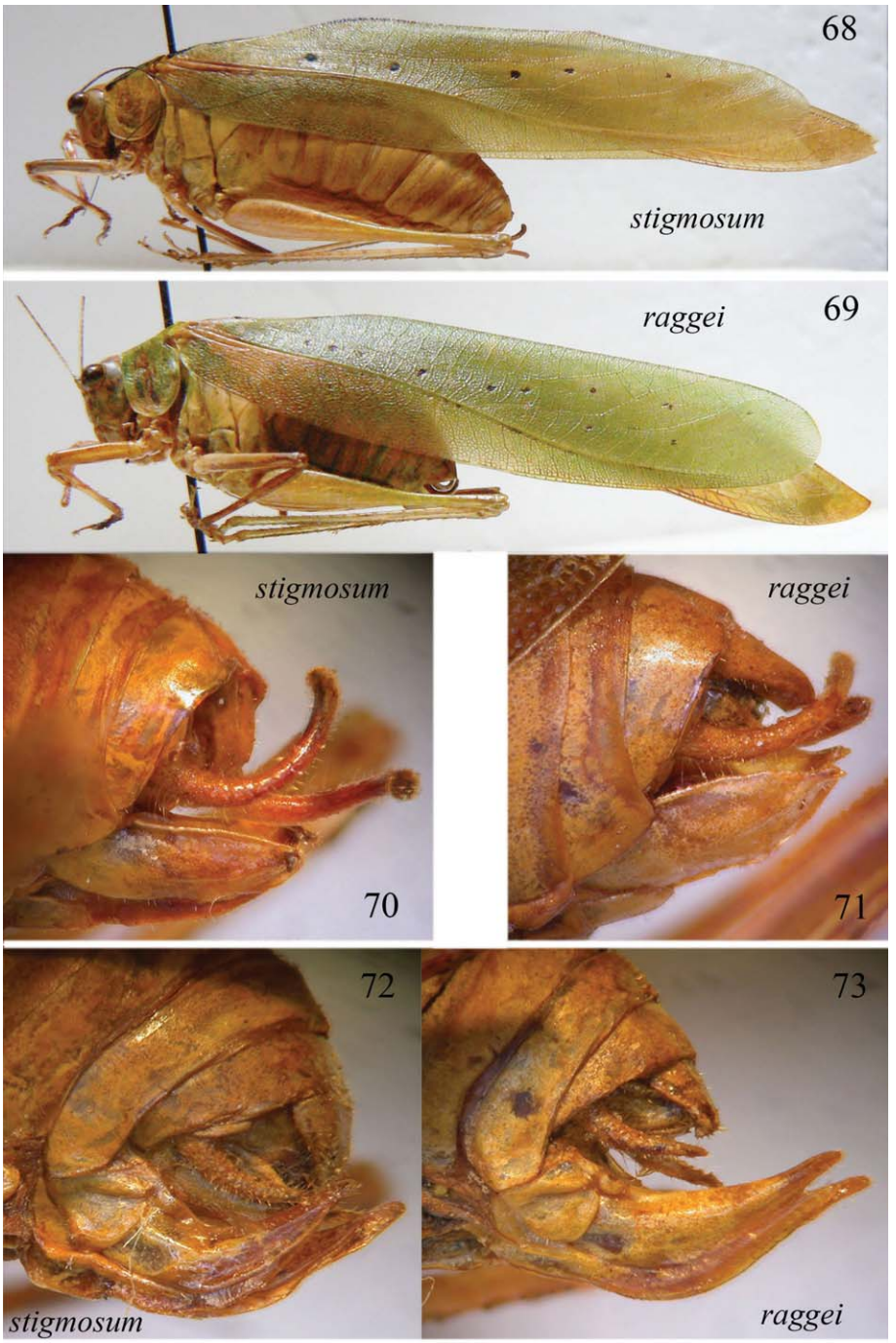
***Poreuomena gladiator* Bolívar, 1906 n. syn.**

Bolívar, 1906. Mem. Soc. espan. Hist. nat. 1: 337.
Type locality: Cameroon.

Material examined.—Cameroon, holotype of *P. gladiator* (MNCN); photographs of the holotype of *P. forcipata* from Cameroon in Eades *et al.* (2013).

Remarks.—Griffini (1908) supposed that, because Bolívar (1906) overlooked the paper of Sjöstedt (1902), *P. gladiator* Bolívar, 1906 from Cameroon could be synonymous with *P. forcipata* Sjöstedt, 1902, also from Cameroon. Although *P. gladiator* has a slightly longer stridulatory area than *P. forcipata*, male cerci of the two taxa are identical. Both species lack the black marking in the stridulatory area of the male left tegmen. Thus, *P. gladiator* is a junior synonym of *P. forcipata*.

1 Teodoro Vives Camino (1897-1946) was an aviator of Aviacion Militar Española, and an entomologist, who was involved in the collection of specimens in Guinea, in collaboration with the Museo Nacional de Ciencias Naturales of Madrid. He died in an air crash between Barcelona and Zaragoza.



Figs 68-73. *Myllocentrum*: Male lateral habitus of *stigmosum* (68) and *raggei* n. sp. (69); Male lateral view of last abdominal segments of *stigmosum* (70) and *raggei* n. sp. (71); Female lateral view of last abdominal segments, cerci and ovipositor of *stigmosum* (72) and *raggei* n. sp. (73). For color version, see Plate VII.

Genus *Cestromoecha* Karsch, 1893
(Figs 86-88, 95-108)

Karsch, 1893. Berlin Ent. Z. 38: 128.

The genus *Cestromoecha*, related to *Poreuomena*, which also lives in central Africa, was erected by Karsch (1893). *Cestromoecha* differs from *Poreuomena* chiefly in the shape of the male 10th tergite, which is slightly bilobate or rounded, in the male sub-genital plate, which is deeply bilobate, and in the shape of the cerci. Styli are absent in the species of this genus. *Cestromoecha* species are of larger size than *Poreuomena*. Only three species are known, *C. crassipes* (Karsch, 1890), *C. tenuipes* (Karsch, 1890) and *C. mundamensis* Karsch, 1896. Here, two new species are described.

***Cestromoecha crassipes* (Karsch, 1890)**
(Figs 88, 102-106)

Karsch, 1890. Entom. Nachricht. 16: 364.
Type locality: Cameroon.

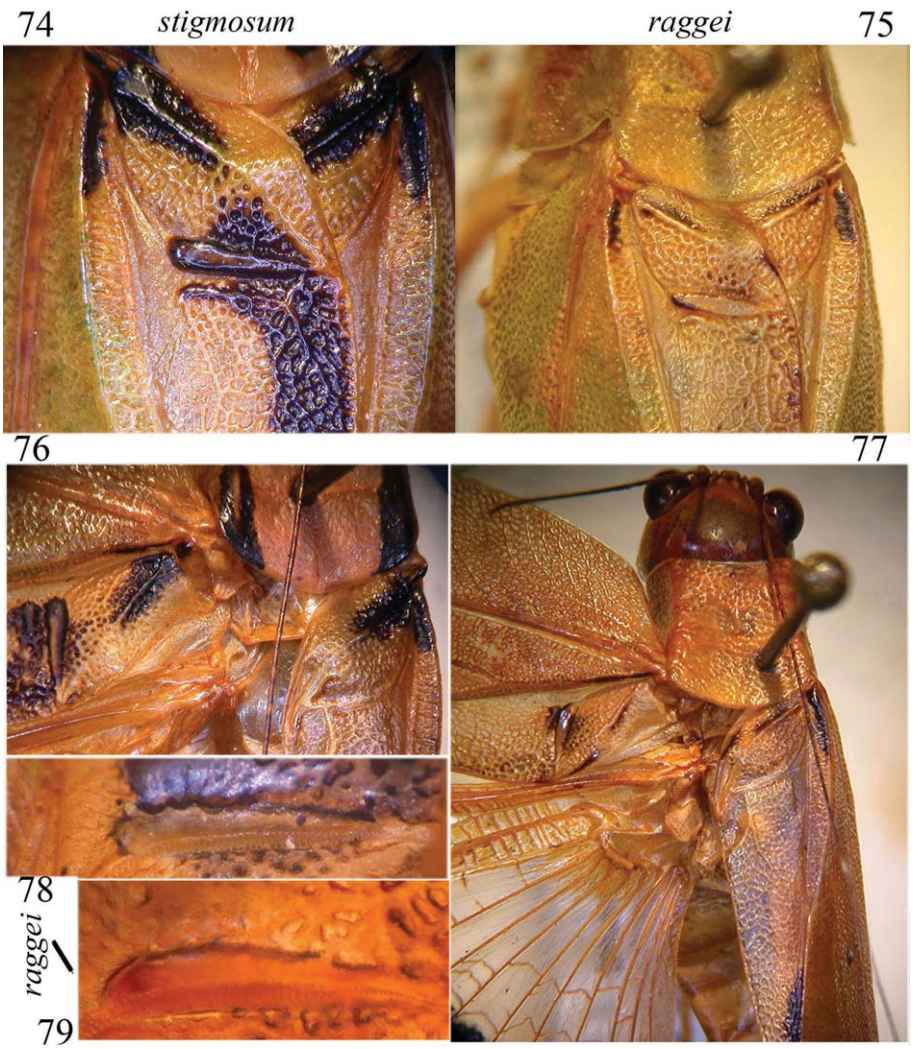
Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, UV trap 1, 31.I.-2.II.2012 (♂);11-12.II.2012 (♂); 20-23. II.2012 (♂); Ndoki, Lake 1, camp 1, 15-16. II.2012 (♂); Ndoki, Lake 1, UV trap 2, 15-16. II.2012 (♂) (Collector P. Moretto) (BMCP).

Description.— **Male.** Diagnostic characters of the 10th tergite are that it is apically rounded with a clear bilobate incision (Figs 102, 103); cerci are robust, up-curved and in-curved, their apex is sharply narrowed and pointed (Figs 102, 103). The sub-genital plate is not long, but clearly bilobate (Figs 102, 103). The stridulatory area of left tegmen is black, short and straight, the right tegmen has a small speculum (Figs 104, 105), and the stridulatory file has *ca* 40 teeth, apically up-curved (Fig. 106).

Measurements.—Males. Body length: 18.3±0.8; pronotum length: 3.9±0.1; pronotum height: 3.4±0.1; femur: 19.8±0.4; tegmen: 28.8±1.6.

Diagnosis.—*C. crassipes* is most similar to *C. tenuipes* Karsch (1890, 1893) but does not possess the following characters of *C. tenuipes*: in-curved and stout cerci at the base, sharply becoming slender and pointed, and a long and deeply bilobate sub-genital plate.

Distribution.—Karsch (1890, p. 364, note 1) described very briefly only the female of *C. crassipes* from Cameroon. *C. crassipes* is known also from the DRC and Ivory Coast (Ragge 1967, 1968). It may be assumed that specimens from Dzanga-Ndoki, CAR, could belong to this species, whose male was hitherto unknown.



Figs 74-79. *Myllocentrum* males: Stridulatory area of left tegmen of *stigmosum* (74) and *raggei* n. sp. (75); Stridulatory area of left and right tegmina of *stigmosum* (76) and *raggei* n. sp. (77); Stridulatory file of *stigmosum* (78) and *raggei* n. sp. (79). For color version, see Plate VIII.

***Cestromoecha longicerca* n. sp.**
(Figs 86, 107, 108)

Type locality: Dzanga-Ndoki National Park (CAR).

Material examined and depository.—Holotype, ♂: CAR, Dzanga-Ndoki National Park, Lake 1, UV trap, 11-12.II.2012, P. Moretto; paratype, ♂: same data 20-23.II.2012, P. Moretto (BMCP). Material examined of *Cestromoecha mundamensis*. Fernando Poo (Guinea) I.1902 (1♂, 2♀) (MSNG).

Description.—**Male.** Diagnostic characters as of the genus. Eyes round, fastigium of vertex moderately sulcate. Fore coxae armed, fore and mid femora ventrally unarmed, hind femora with 2-3 spines on the ventral margin. Tegmina are narrow. The stridulatory area of the left tegmen is short. Cerci have a very stout downward base, with inner part concave, which sharply bends upwards and narrows; the apex is very pointed. Length of the cerci exceeds the height of the 10th tergite (Figs 107, 108). The sub-genital plate is concave but fairly short (Figs 107, 108).
Female. Unknown.

Color.— Green-brownish, tegmina green with a black marking on the stridulatory area, black spots on the posterior margin of tegmina, 3-4 small yellow spots on the center of tegmina. Some small reddish spots are present on the pronotum.

Measurements.—Males. Body length: 15.7-16.0; pronotum length: 4.0-4.2; pronotum height: 3.5-3.7; femur: 17.4-17.5; tegmen: 25.8-28.2.

Diagnosis.—Cerci of the male have a very stout base, with inner part concave, that bends sharply upwards and becomes very narrow; cerci length clearly exceeds the height of the 10th tergite and the apex is very pointed. Karsch (1896) described *C. mundamensis* from Mundame (Cameroon), which is quite related to *C. longicerca*. Cerci of *C. mundamensis* are also up-curved and long, but their stout base is horizontal, and they are longitudinally keeled; additionally the male sub-genital plate is long and deeply concave (Fig. 101) and the male stridulatory area of the left tegmen is more brightly-colored than in *C. longicerca*.

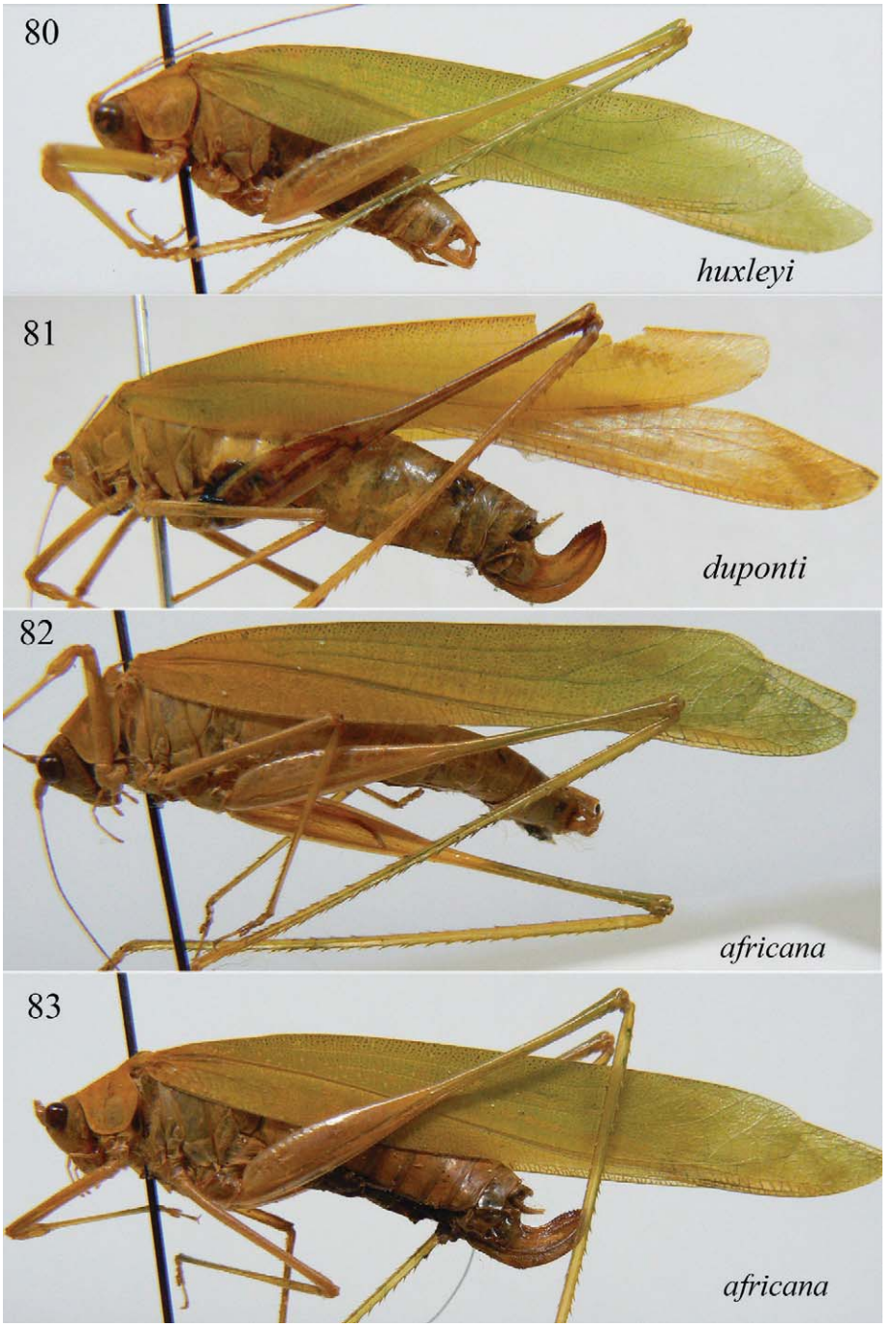
Etymology.—Named for its very peculiar and long cerci.

***Cestromoecha magnicerca* n. sp.**
(Figs 87, 95-100)

Type locality: Dzanga-Ndoki National Park (CAR)

Material examined and depository.—Holotype, ♂: CAR, Dzanga-Ndoki National Park, Lake 1, UV trap, 6-8.II.2012 (MSNG); paratype, ♂: same data; paratype, ♂: same data 11-12.II.2012; paratype, ♂: same data 20-23.II.2012; 2 paratypes, ♂: CAR, Dzanga-Ndoki National Park, Mboki 24.I.2012; 2 paratypes, ♂: CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, camp 1, 15-16.II.2012 (Collector P. Moretto) (BMCP).

Description.—**Male.** Diagnostic characters as of the genus. Eyes round, fastigium of vertex triangular, sulcate. Fore coxae armed, fore and mid femora unarmed. Ventral margins of hind femora have 3-4 spines. Tegmina are narrow, stridulatory area of the left tegmen is black, long and straight, the speculum of the left tegmen is small (Figs 99, 100), stridulatory file has *ca* 50 teeth (Fig. 98) and is clearly longer and with smaller teeth than in *C. longicerca*. Cerci are stout, long and in-curved, with the basal part rounded and the apical part pointed; they appear as trifid because before their apex they have a well-developed upper laterally flattened bulge and an inner long spine (Figs 95-97); the sub-genital plate is concave, triangular and long, with a deep concavity, whose processes are very close to each other (Fig. 97).



Figs 80-83. *Poreuomena*: Lateral habitus of *huxleyi* n. sp. male (80), *duponti* syntype female (81) and *africana* male (82) and female (83). For color version, see Plate VIII.

Female. Unknown.

Color.—Brown or green, stridulatory area of left tegmen and the area below it black. Small black spots are present on posterior margins of tegmina.

Measurements.—Males. Body length: 20.6±0.5; pronotum length: 3.9±0.1; pronotum height: 3.5±0.1; femur: 20.9±0.8; tegmen: 31.3±0.8.

Diagnosis.—*C. magnicerca* is larger in size than *C. longicerca* n. sp. and *C. crassipes*. Cerci of the male are stout, long and in-curved, with the basal part rounded and the apical part laterally compressed; in the first quarter of the length from the basal attachment, the cerci have a well-developed upper flat bulge and an inner long spine; the sub-genital plate is concave, but not long, with its processes very close to each other.

Etymology.— Named for its very peculiar cerci.

***Vossia obesa* Brunner von Wattenwyl, 1891**

Brunner von Wattenwyl, 1891. Verh. der Zoologisch-Botanischen Gesellsch. Wien 41: 140
Type locality: Cameroon.

Material examined.—CAR, Dzanga-Ndoki National Park, Lake 1, UV trap, 10-11.II.2012 (♂); 11-12.II.2012 (♂); 20-23.II.2012 (2♀); Ndoki, Lake 1, UV trap 2, 15-16.II.2012 (2♂); Ndoki, Lake 3, UV trap 18-19.II.2012 (3♂); Ndoki, Lake 1, platform on the canopy, 35m, UV trap 4-5.II.2012 (♂); Mboki 24.I.2012, P. Moretto (♂); Togo, Fazao 3-4.VIII.2013, UV, P. Moretto (♂) (BMCP); Cameroon (♂, ♀) (MNCN).

Distribution.—Brunner von Wattenwyl (1891) described the female of *Vossia obesa* from Cameroon, later Bolívar (1906) described the male, also from Cameroon, and recorded a female from Rio Aye (Guinea). Griffini (1906, 1908) recorded this species from Guinea and the DRC, Bruner (1920) from Lolodorf (Cameroon), Ragge (1968) from Ivory Coast and Naskrecki (2009) from Ghana. Few specimens have been reported; it seems to be an uncommon species distributed widely throughout central Africa.

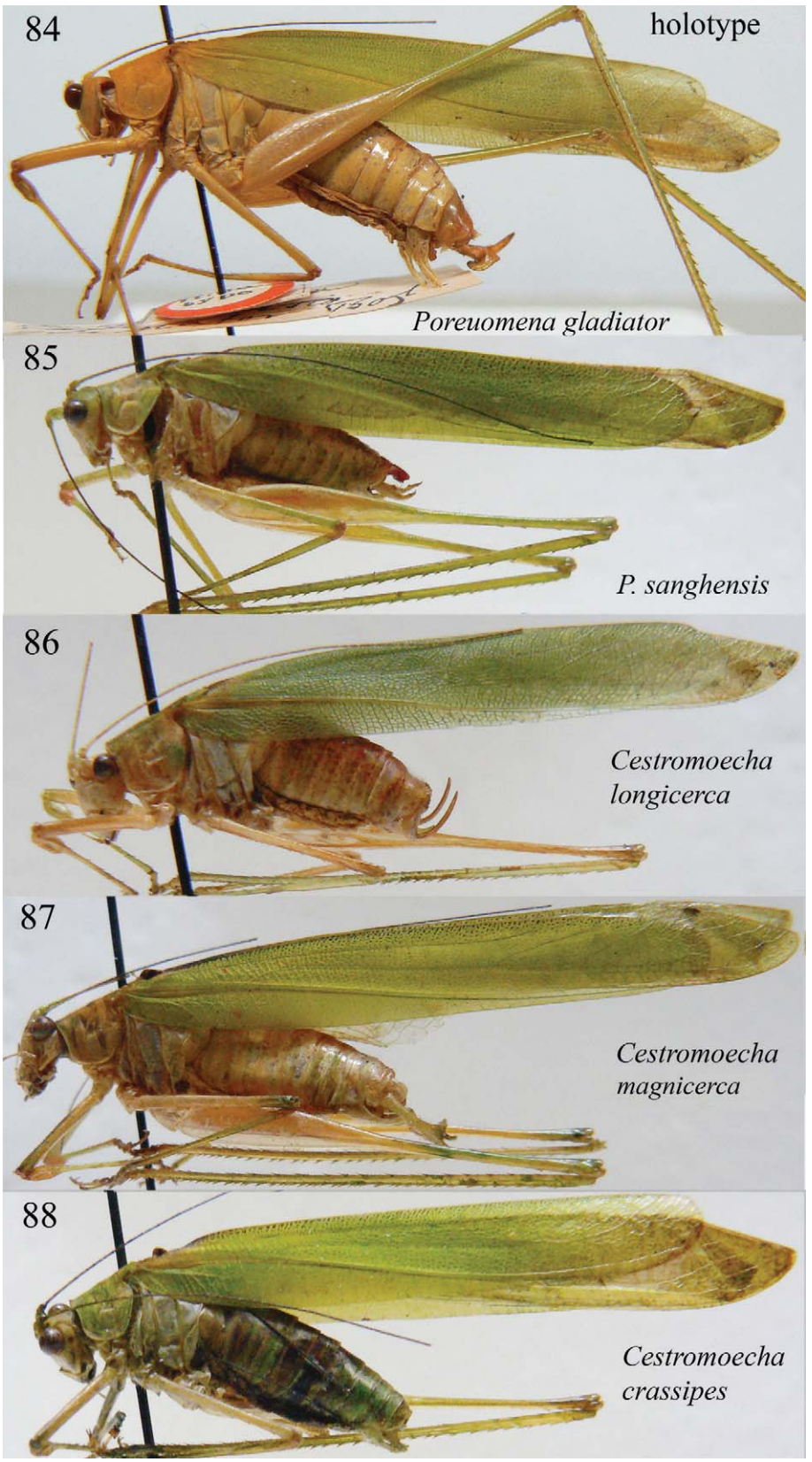
***Azamia biplagiata* Bolívar, 1906**
(Figs 109-113)

Bolívar, 1906. Mem. Soc. espan. Hist. nat. 1: 341.
Type locality: Cameroon.

***Azamia doriae* (Griffini, 1906) n. syn.**

Vossia doriae Griffini, 1906.
Griffini, 1906. Ann. Mus. Civ. Stor. Nat. Genova 3 (2): 395.
Type locality: Musola, Fernando Poo (Guinea).

Material examined.—Cameroon, L. Conradt (♂ holotype of *A. biplagiata*) (MNCN); Fernando Poo, Musola (Guinea) III.1902



Figs 84-88. Male lateral habitus of *Poreuomena gladiator* (holotype) (84), and *P. sanghensis* n. sp. (85); *Cestromoecha longicerca* n. sp. (86), *C. magnicerca* n. sp. (87), and *C. crassipes* (88). For color version, see Plate IX.

(♂ holotype of *Vossia doriae*) (MSNG); CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, UV trap, 31.I.-2.II.2012 (♂);11-12.II.2012 (♂); 24-25.II.2012 (♂); Ndoki, border of Lake 1, UV trap 13-14.II.2012 (2♂); Ndoki, Lake 1, UV trap 2, 15-16.II.2012 (♂) (Collector P. Moretto); Ivory Coast IV.1999, P. Moretto (♂) (BMCP).

Bolívar (1906) and Griffini (1906), respectively, described *Azamia biplagiata* from Cameroon and *Vossia doriae* from Fernando Poo (Guinea). Later, Griffini (1908) studied another specimen from Bussanga (Cameroon) and transferred *Vossia doriae* to the genus *Azamia*. By comparison of the holotypes, it is now possible to establish that the two species are synonyms. *A. biplagiata* was published on 1st August 1906, while *Azamia doriae* on 5th August 1906 (Poggi 2010). Thus, *Azamia doriae* (Griffini, 1906) is a junior synonym of *Azamia biplagiata* Bolívar, 1906.

Diagnosis.—Male cerci stout, with a first pointed apex, below which a second apex branches off, consisting of stout appendices with two inner wide apices and a third pointed apex (Figs 110-112). In ventral view, the last inner spine is evident (Fig. 112). Stridulatory file has an obtuse angle that divides it into two parts, the first shorter than the second one; it consists of 85-95 teeth (Fig. 113). *A. biplagiata* has chitinous, wide and laterally toothed titillators, with a serrated pointed apex (Fig. 112).

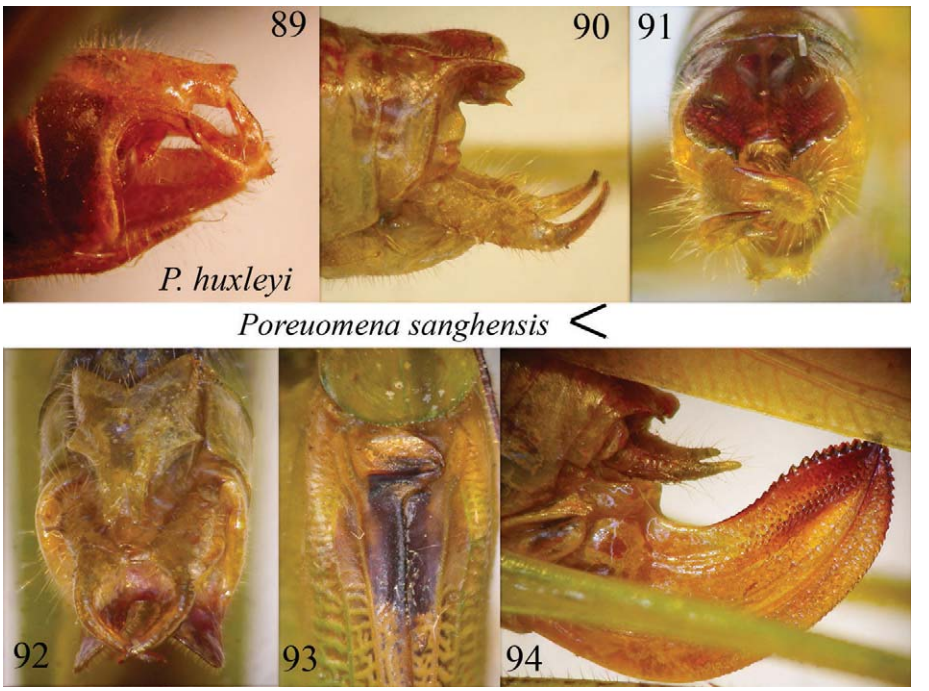
Ecology.—*A. biplagiata* has predaceous habits: between the mandibles of one of the specimens listed above, the hind leg of a *Catoptropteryx* sp. was found.

Distribution.—*A. biplagiata* was recorded from Guinea, Ivory Coast, Cameroon, Ghana and the DRC (Ragge 1967, 1968).

Genus *Morgenia* Karsch, 1890
(Figs 115-120)

Karsch, 1890. Entom. Nachricht. 16: 261.

Species belonging to this genus are characterized by their stout cerci, more or less club-like and armed at the apex, and the male sub-genital plate which is concave without styli. Five species are known, *M. hamuligera* Karsch, 1890, *M. melica* Karsch, 1893, *M. modulata* Karsch, 1896, *M. rubricornis* Sjöstedt, 1913 and *M. spathulifera* Griffini, 1908. When Karsch (1896) briefly described *M. modulata* from Cameroon, he highlighted the similarity of this



Figs 89-94. *Poreuomena*: Male last tergites and cerci of *huxleyi* n. sp. (89); *sanghensis* n. sp.: Lateral (90), posterior (91), and ventral (92) view of male last abdominal segments, stridulatory area (93), and ovipositor (94). For color version, see Plate IX.

species with *M. melica*, also described from Cameroon; additionally, *M. rubricornis* from the DRC seems morphologically similar to *M. hamuligera* from Cameroon, and *M. spathulifera* from Cameroon is considered by Griffini (1908) morphologically similar to *M. modulata*. It is very likely that some of them are synonymously described.

***Morgenia hamuligera* Karsch, 1890**
(Figs 115, 117, 119)

Karsch, 1890. Entom. Nachricht. 16: 263.
Type locality: Kribi (Cameroon).

Material examined.— CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, UV trap 1, 31.I.-2.II.2012 (♂); 8-10.II.2012 (♂); 10-11.II.2012 (7♂); 11-12.II.2012 (5♂); 20-23.II.2012 (6♂); Ndoki, border of Lake 1, UV trap 13-14.II.2012 (9♂); Ndoki, Lake 1, camp 1, 14-15.II.2012 (4♂); 15-16.II.2012 (♂); Ndoki, Lake 3, UV trap 18-19.II.2012 (♂); Ndoki, Lake 1, platform on the canopy, 35m, UV trap 4-5.II.2012 (♂); 10-11.II.2012 (6♂); Ndoki, Lake 1, platform on the canopy, 45m, UV trap 28-29.II.2012 (♂); Mboki, 24.I.2012 (♂); between Ndoki and Mboki, 24.I.2012 (2♂) (Collector P. Moretto); 35 km S Bangui, env. Salanga, 28-31.XII.2008, J. Halada (♂) (BMCP).

Diagnosis.—Only males were captured by UV light in CAR. This species clearly differs from *M. melica* both by the shape of cerci (Fig. 117), the stridulatory area and stridulatory file (Figs 115, 119). The male has a black marking of variable extent on the left tegmen; the stridulatory file is angular with longer teeth than in *M. melica* (Fig. 119). Cerci are long and stout, with a bulb-like apex and a small inner spine.

Distribution.—*M. hamuligera* is widespread in western Africa.

***Morgenia melica* Karsch, 1893**
(Figs 116, 118, 120)

Karsch, 1893. Entom. Nachricht. 19 (13): 196.
Type locality: Victoria (Cameroon).

Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, UV trap 1, 31.I.-2.II.2012 (3♂); 10-11.II.2012 (2♂); 11-12.II.2012 (6♂); 20-23.II.2012 (8♂); Ndoki, border of Lake 1, UV trap 13-14.II.2012 (7♂); Ndoki, Lake 1, camp 1, 14-15.II.2012 (2♂); 15-16.II.2012 (3♂); Ndoki, Lake 1, UV trap 2, 15-16.II.2012 (2♂); Ndoki, Lake 3, UV trap 18-19.II.2012 (7♂); Ndoki, Lake 1, platform on the canopy, 35m, UV trap 4-5.II.2012 (4♂); 10-11.II.2012 (2♂); Ndoki, Lake 1, platform on the canopy, 45m, UV trap 28-29.II.2012 (2♂); Mboki, 24.I.2012 (6♂); Ndoki, 26.I.2012 (♂) (Collector P. Moretto) (BMCP); DRC, Hombo 22.XII.1970, T. De Stefani (♂) (MRT).

Diagnosis.—Only males were captured by UV light in CAR. *M. melica* has a narrower black marking on the left tegmen, more regularly curved stridulatory file and shorter teeth than in *M. hamuligera* (Figs 116, 120). Cerci are slender, apically flattened and end with a small inner spine (Fig. 118).

Distribution.— *M. melica* is widespread in central and western Africa.

***Dapanera genuteres* Karsch, 1889**

Karsch, 1889. Berlin Ent. Z. 32: 441.
Type locality: Accra (Ghana).

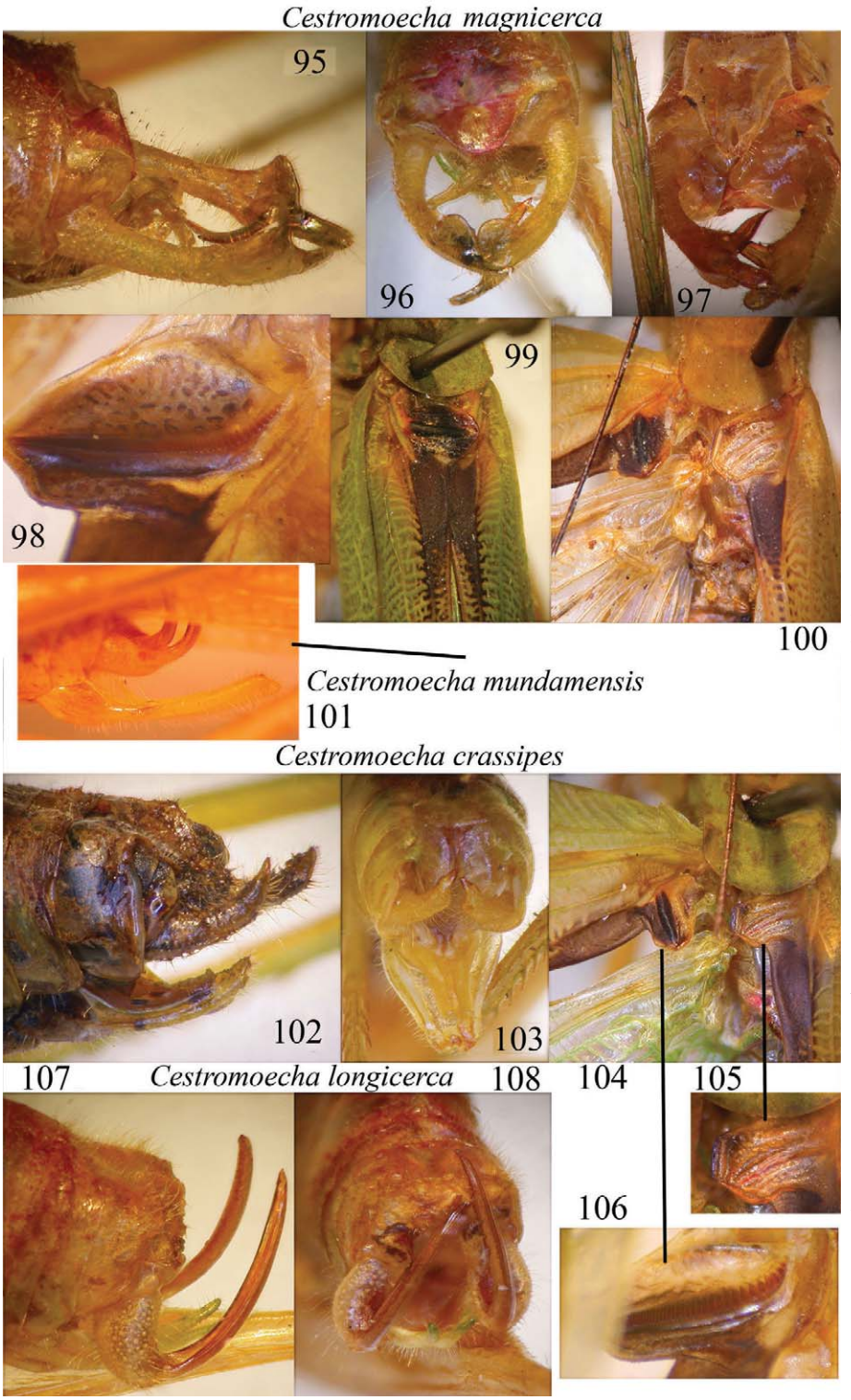
Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, UV trap 1, 31.I.-2.II.2012 (2♂); 8-10.II.2012 (♀); 10-11.II.2012 (♂); 11-12.II.2012 (1♂, 2♀); 20-23.II.2012 (3♂, 2♀); 24-25.II.2012 (♀); 29.II-1.III.2012 (♂); 1-2.III.2012 (2♀); Ndoki, border of Lake 1, UV trap 13-14.II.2012 (5♂, 2♀); Ndoki, Lake 1, camp 1, 14-15.II.2012 (2♂, 2♀); 15-16.II.2012 (♂); Ndoki, Lake 3, UV trap 18-19.II.2012 (2♀); Ndoki, Lake 1, platform on the canopy, 35m, UV trap 4-5.II.2012 (1♂, 3♀); 10-11.II.2012 (♀); Ndoki, Lake 1, platform on the canopy, 45m, UV trap 28-29.II.2012 (2♀); Ndoki, 26.I.2012 (♂) (Collector P. Moretto) (BMCP).

Remarks.—The ratio of males and females captured by UV light trap was 18 to 20.

Specimens of *D. genuteres* and *D. irregularis* were measured to compare them (see *D. irregularis*).

Measurements.—Males. Body length: 25.3±0.9; pronotum length: 6.4±0.3; pronotum height: 5.3±0.2; femur: 19.5±1.2; tegmen: 40.4±2.3. Females. Body length: 27.0±2.2; pronotum length: 6.3±0.4; pronotum height: 5.4±0.2; femur: 19.8±1.3; tegmen: 38.7±2.6; ovipositor: 7.6±0.3; femur/ovipositor: 2.6±0.2.

Distribution.—Described from Accra (Ghana) (Karsch 1889), later recorded from the DRC (Sjöstedt 1902; Ragge 1967), Cameroon (Griffini 1908; Sjöstedt 1912) and Ivory Coast (Ragge 1968).



Figs 95-108. *Cestromoecha magnicerca* n. sp. male: lateral (95), posterior (96), and ventral (97) views of last abdominal segments, stridulatory file (98), stridulatory area of left (99) and right (100) tegmina; last abdominal segments of *mundamensis* male (101); *crassipes* male: lateral (102) and posterior (103) views of last abdominal segments; stridulatory area (104-105) and stridulatory file (106). Lateral (107) and posterior (108) views of last abdominal segments of *longicerca* n. sp. male. For color version, see Plate IX.

***Dapanera irregularis* Karsch, 1890**

Karsch, 1890. Entom. Nachricht. 16: 258-259.
Type locality: Kribi (Cameroon).

Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, UV trap 1, 31.I.-2.II.2012 (8♂); 8-10.II.2012 (3♂); 2-4.II.2012 (5♂, 1♀); 6-8.II.2012 (3♂, 1♀); 10-11.II.2012 (♂); 11-12.II.2012 (3♂); 20-23.II.2012 (14♂, 1♀); Ndoki, border of Lake 1, UV trap 13-14.II.2012 (13♂, 1♀); Ndoki, Lake 1, camp 1, 14-15.II.2012 (2♂); 15-16.II.2012 (3♂); Ndoki, Lake 1, UV trap 2, 15-16.II.2012 (2♂); Ndoki, Lake 3, UV trap 18-19.II.2012 (4♂); Ndoki, Lake 1, platform on the canopy, 35m, UV trap 10-11.II.2012 (♂); Ndoki, Lake 1, platform on the canopy, 45m, UV trap 3-4.III.2012 (2♂) (Collector P. Moretto) (BMCP).

Diagnosis.—*D. irregularis* is smaller in size than *D. genuteres*, with very similar morphological characters; the color of fore tibiae spines which Griffini (1908) recorded to be surrounded by a black spot, are not present in all specimens; the ovipositor is proportionally shorter than in *D. genuteres* and the difference between the ratio femur/ovipositor of the two species is significantly different (Student's t = 10.116, 22 df, P<0.001). The ratio of males to females captured by UV light trap was higher for *D. irregularis* than for *D. genuteres*: 63 males to 4 females.

Measurements.—Males. Body length: 19.3±1.5; pronotum length: 5.4±0.3; pronotum height: 4.3±0.1; femur: 18.9±0.3; tegmen: 30.8±1.9. Females. Body length: 21.7±0.9; pronotum length: 5.6±0.2; pronotum height: 4.4±0.1; femur: 19.0±1.4; tegmen: 32.9±1.9; ovipositor: 4.0±0.2; femur/ovipositor: 4.7±0.4.

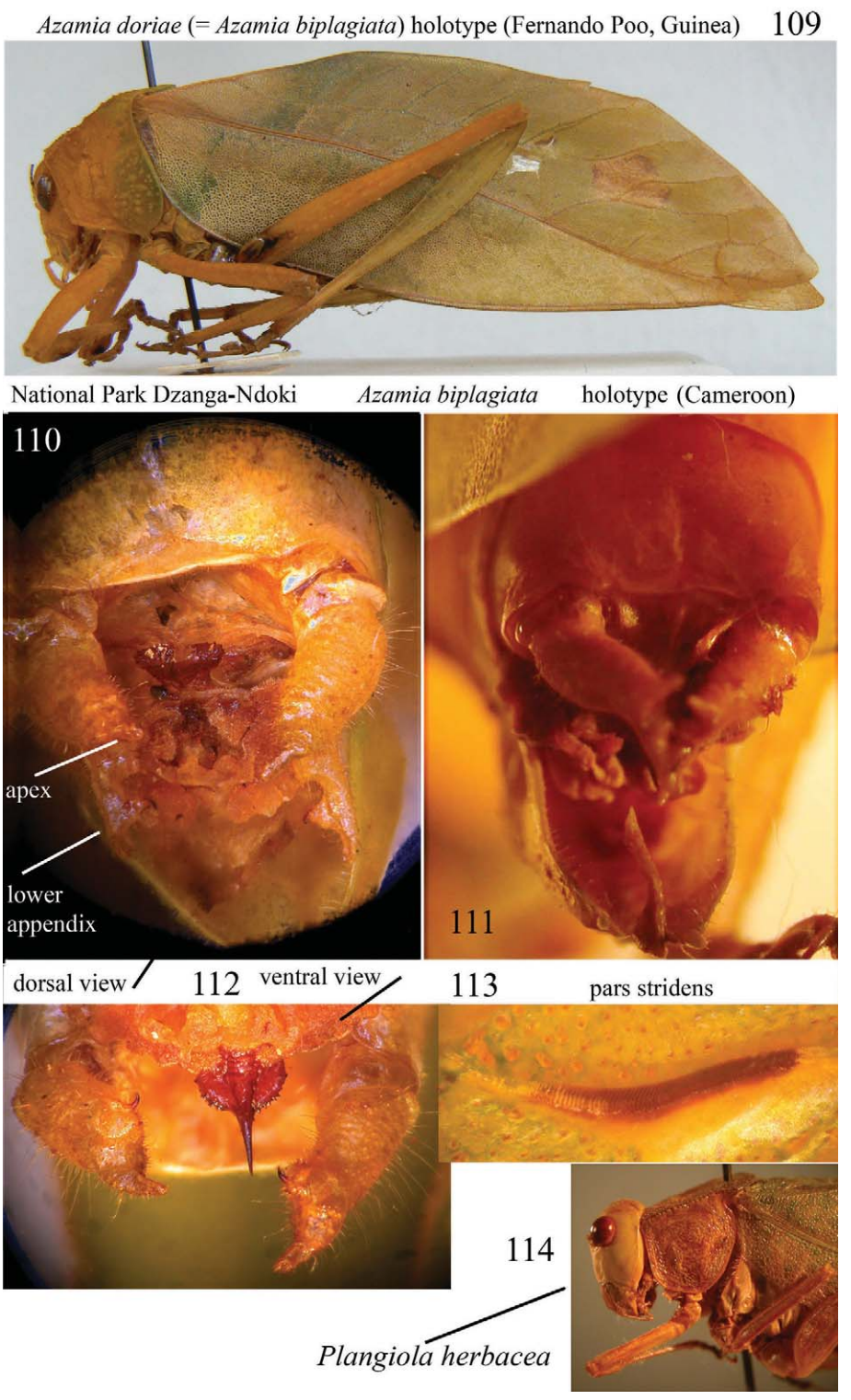
Distribution.—Described from Kribi (Cameroon) (Karsch 1890), later recorded from Mukonje Farm (Cameroon) by Griffini (1908) and from Buea (Cameroon) by Sjöstedt (1912).

***Plangiola herbacea* Bolívar, 1906**
(Fig. 114)

Bolívar, 1906. Mem. Soc. espan. Hist. nat. 1: 336.
Type locality: Cameroon.

Material examined.—Cameroon, L. Conradt (♂ holotype) (MNCN); CAR, Dzanga-Ndoki National Park, Lake 1, UV trap, 20-23.II.2012 (♂); Mboki, 24.I.2012, P. Moretto (♂) (BMCP).

Diagnosis.—*P. herbacea* is very characteristic for its pronotum equipped with very punctuated margins (Fig. 114).



Figs 109-114. *Azamia biplagiata*: Lateral habitus of holotype of *Vossia doriae* (=*Azamia biplagiata*) (109), last abdominal segments from Central African Republic (110), last abdominal segments of *A. biplagiata* holotype (111), ventral view of last abdominal segments and titillators (112), stridulatory file (113). Lateral view of head and pronotum of *Plangiola herbacea* (114). For color version, see Plate X.

Remarks.—Although Bolívar (1906) described the genus and the species on a single male, Ragge (1968) pointed out that at MNCN there are two additional syntypes, one male and one female, not mentioned by Bolívar.

Distribution.—*P. herbacea* has not been previously recorded outside Cameroon.

***Drepanophyllum marmoratum* Karsch, 1890**

Karsch, 1890. Entom. Nachricht. 16 (23): 360.
Type locality: Barombi Station (Cameroon).

Material examined.—CAR, Dzanga-Ndoki National Park, Ndoki 25.I.2012, P. Moretto (♂); Ndoki, Lake 1, UV trap 1, 24-25.II.2012, P. Moretto (♀); Ndoki, Lake 1, camp 1, 14-15. II.2012, P. Moretto (♀) (BMCP); Gabon (♂) (MNCN).

Distribution.—According to Ragge (1962b), *D. marmoratum* occurs in forested parts of Nigeria, Cameroon and the DRC; its presence in CAR and Gabon was expected.

***Stenamblyphyllum dilutum* Karsch, 1896**

Karsch, 1896. Stett. Entomol. Z. 57: 327.
Type locality: Victoria (Cameroon).

Material examined.—CAR, Dzanga-Ndoki National Park, Lake 1, UV trap, 29.II-1.III.2012, P. Moretto (♂) (BMCP).

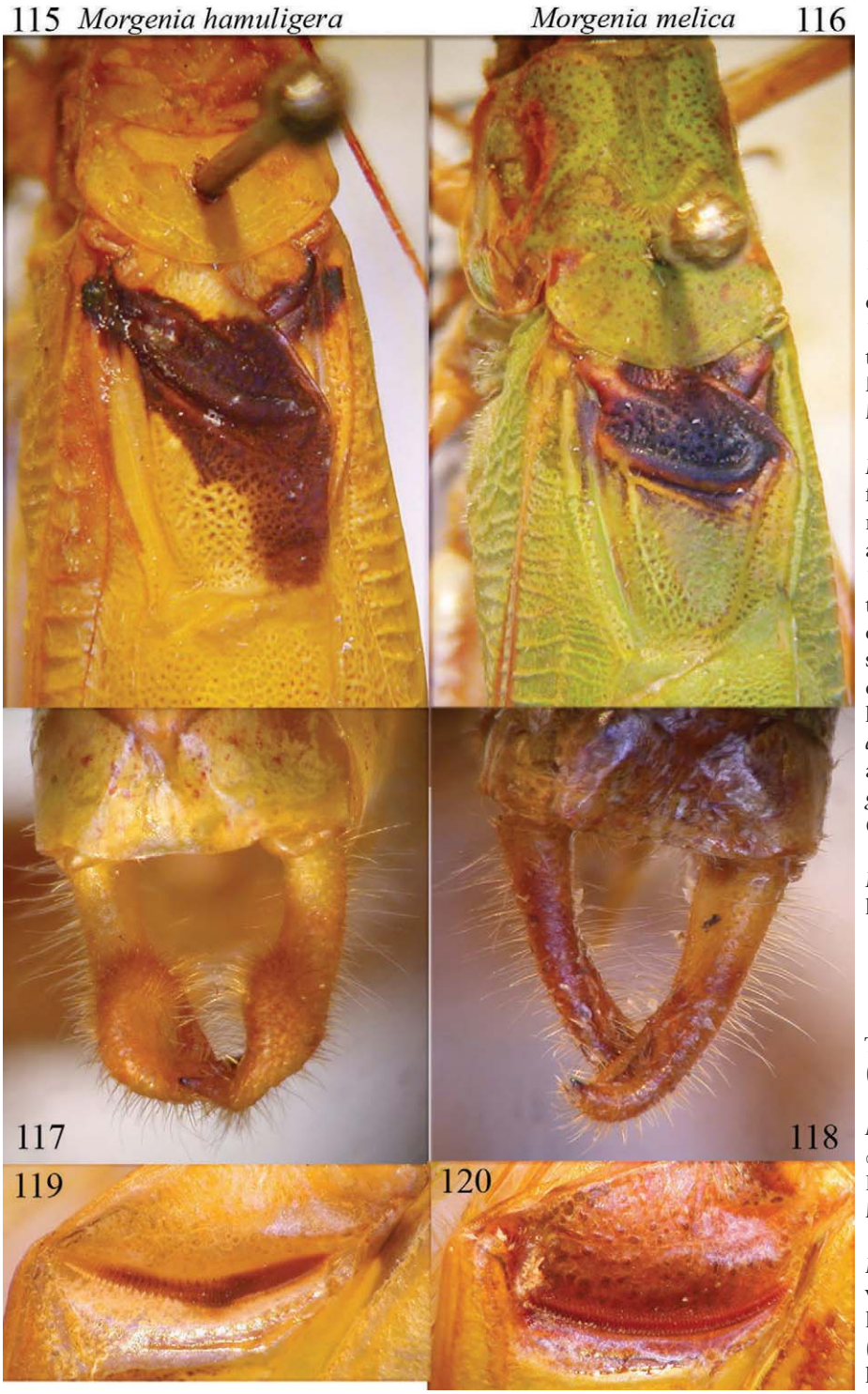
Distribution.—Previously known from Cameroon and the DRC (Ragge 1962b).

***Goetia galbana* Karsch, 1891**
(Figs 121-122)

Karsch, 1891. Berlin Ent. Z. 36 (1): 323.
Type locality: Barombi Station (Cameroon).

Material examined.—Guinea, Ebomeku VII.1948, Mateu (♂); Guinea, Fernando Poo (♀); Cameroon (♂) (MNCN); Guinea, Fernando Poo (♀) (MSNG).

Distribution.—*G. galbana* is widespread in central-western Africa. Karsch (1891) described the female from Barombi Station (Cameroon), Sjöstedt (1902) reported both sexes from Bonge (Cameroon), Griffini (1906, 1908) from Fernando Poo (Guinea) and Mukonje Farm (Cameroon), Chopard (1954) and Ragge (1968) from Ivory Coast, and Naskrecki (2009) from Ghana.



Figs 115-120. *Morgenia* male: Stridulatory area (115, 116), cerci (117, 118), and stridulatory file (119, 120) of *hamuligera* (115, 117, 119) and *melica* (116, 118, 120). For color version, see Plate X.

***Goetia dimidiata* Bolívar, 1906**
(Figs 123-127)

Bolívar, 1906. Mem. Soc. espan. Hist. nat. 1: 335.
Type locality: Fernando Poo (Guinea) and Cameroon.

Material examined.—Guinea, Fernando Poo, Escalera (♂, ♀ syntypes); Cameroon, L. Conradt (♀ syntype) (MNCN); CAR, Dzanga-Ndoki National Park, Lake 1, UV trap, 10-11.II.2012 (♂); 11-12.II.2012 (2♂); 20-23.II.2012 (3♂); 24-25.II.2012 (6♂); Ndoki, border of Lake 1, UV trap 13-14.II.2012 (6♂); Ndoki, Lake 1, UV trap 2, 15-16.II.2012 (4♂); Ndoki, Lake 3, UV trap 18-19.II.2012 (♂); Ndoki, Lake 1, platform on the canopy, 35m, UV trap 4-5.II.2012 (♂); 10-11.II.2012 (♂); Ndoki, Lake 1, platform on the canopy, 45m, UV trap 28-29.II.2012 (♂); Ndoki, saltpans 25.I.2012 (♂) (Collector P. Moretto) (BMCP).

Diagnosis.—*G. dimidiata* is easily distinguished from *G. galbana* by hexagonal areas in the tegmina and the absence of black spines which are present on the legs of *G. galbana* (Karsch 1891; Bolívar 1906) (Figs 121-124). In addition, cerci of *G. dimidiata* are long, in-curved, dorso-ventrally compressed and end with a small black spine (Figs 125-126) while those of *G. galbana* are sinuate and end with a round hairy bulge. Further, some specimens of *G. dimidiata* have dark fascia on the posterior area of the pronotum, which is absent in *G. galbana*. The stridulatory file consists of *ca* 55-60 teeth (Fig. 127).

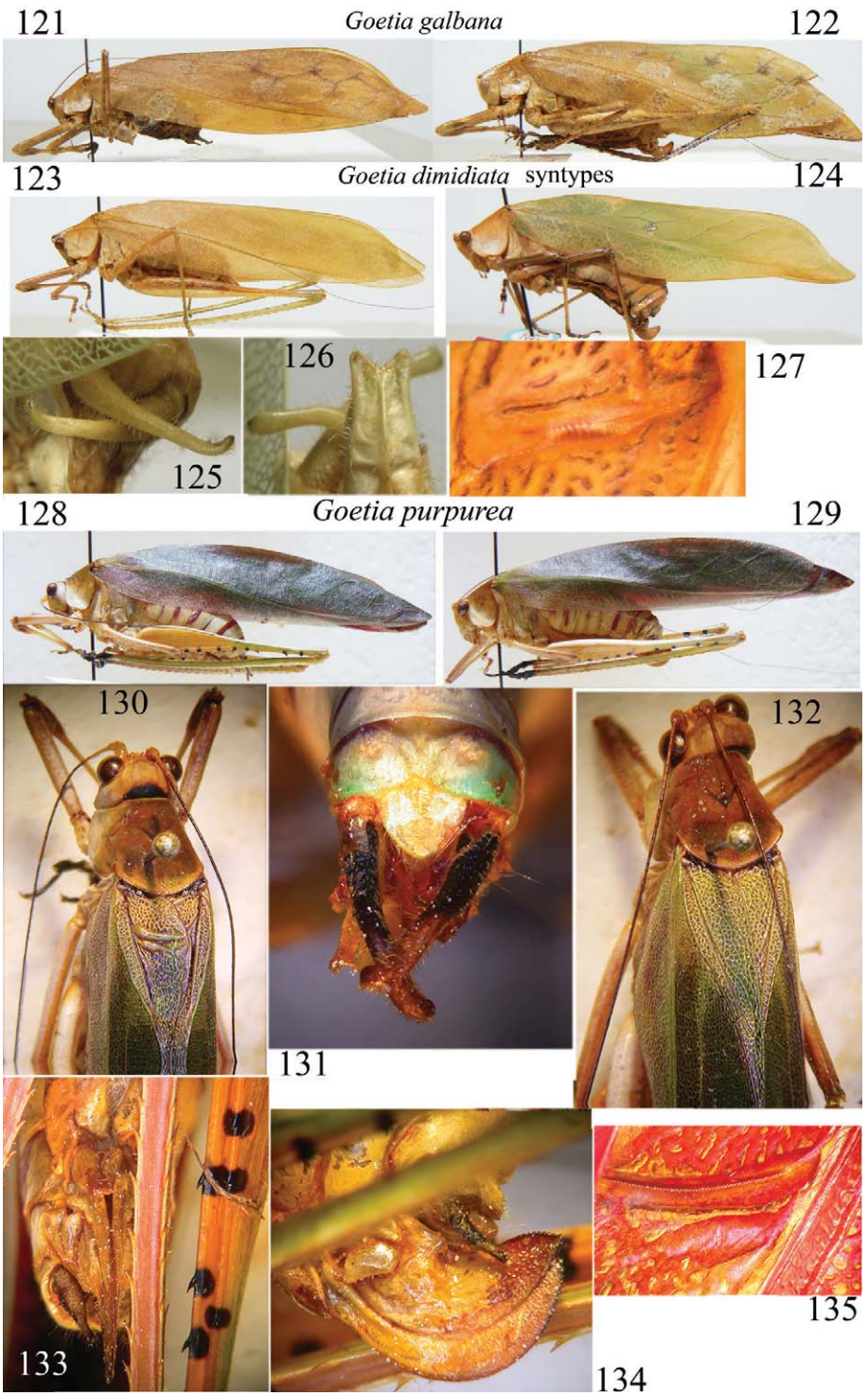
Distribution.—*G. dimidiata* was previously known only from Cameroon and Guinea.

***Goetia purpurea* n. sp.**
(Figs 128-135)

Type locality: Dzanga-Ndoki National Park (CAR).

Material examined and depository.—Holotype, ♂, allotype, ♀: CAR, Dzanga-Ndoki National Park, Ndoki, Lake 1, UV trap, 11-12.II.2012, P. Moretto (BMCP).

Description.—Male. Eyes oval, fastigium of vertex sulcate above. Lower margin of lateral lobes of the pronotum with a small concavity (Fig. 128), fore margin of pronotum straight, hind margin rounded (Fig. 130). Fore coxae armed, fore tibiae dorsally furrowed. Stridulatory area of left tegmen well-developed, with a swelling behind it (Fig. 130), corresponding with a bulge below the stridulatory file, that consists of 75 teeth (Fig. 135). The 10th tergite ends with a wide triangular projection (Fig. 131). Cerci are long, sinuous, down- and in-curved, covered by sparse hairs, basally black and apically brown and slightly flattened, with round apices (Fig. 131). Sub-genital plate has a straight concavity, delimited by two apical apices, without styli (Fig. 131). Inner tympanum of the fore tibiae is closed, outer tympanum is open. Fore femora have 4 inner ventral spines, fore tibiae 4 inner ventral spines; mid femora have 5 inner ventral spines, mid tibiae 9+1 inner and 11+1 outer ventral, and 2 inner



Figs 121-135. *Goetia galbana*: Lateral habitus of male (121) and female (122); *dimidiata* (syntypes): Lateral habitus of male (123) and female (124), dorsal (125) and ventral (126) views of cerci, and stridulatory file (127); *purpurea* n. sp.: Lateral habitus of male (128) and female (129), dorsal view of male head and pronotum (130), and cerci (131), dorsal view of female head and pronotum (132), dorsal (133) and lateral (134) view of ovipositor and sub-genital plate, and stridulatory file (135). For color version, see Plate XI.

dorsal spines. Hind femora have 9 outer and inner ventral spines, hind tibiae 20+1 inner, 20+2 outer ventral, 30+1 outer and 37+1 inner dorsal spines. Spines of femora are black and are surrounded by a wide black spot (Figs 128, 129, 133).

Female. Similar morphological characters as the male (Figs 129, 132). Hind femora with 11 outer and 9 inner ventral spines. Ovipositor short, gently curved and toothed at the apex of ventral and dorsal valves (Fig. 134). Sub-genital plate triangular with straight apex (Fig. 133).

Color.—Head whitish-ivory with a black marking on the back (Fig. 128). Pronotum brown with a black V on the disk, lateral lobes brown on the upper, ivory on the lower part. Base of tegmina with black spots, tegmina brown, stridulatory area of the male left tegmen yellowish-green. Right tegmen of male with a wide black speculum. Fore and hind wings purple colored, with red veinlets and apical brown archedictyon. Abdomen yellow, reddish above and between the segments. Female cerci are black on outer side, ivory on inner side.

Measurements.—Male. Body length: 30.5; pronotum length: 6.1; pronotum height: 7.0; femur: 28.0; tegmen: 49.6. Female. Body length: 33.5; pronotum length: 6.0; pronotum height: 6.9; femur: 29.0; tegmen: 50.1; ovipositor: 5.5.

Diagnosis.—*G. purpurea* is distinguished at once by its purple color and the presence of black spots on the lower margin of femora.

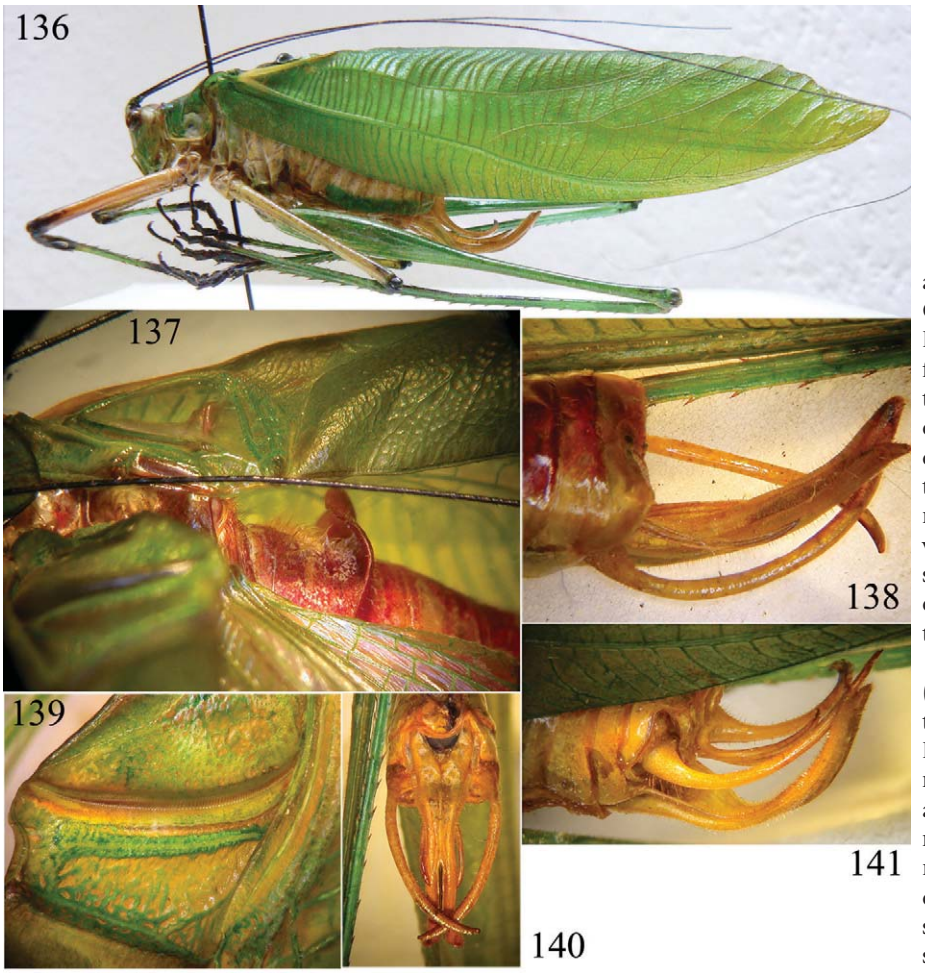
Etymology.—Named for the purple color of the wings.

Zeuneria longicercus Sjöstedt, 1929
(Figs 136-141)

Sjöstedt, 1929. Rev. Zool. Bot. Afr. 17: 39.
Type locality: Inkisi (DRC).

Material examined.—CAR, Dzanga-Ndoki National Park, Lake 1, UV trap, 31.I.-2.II.2012 (♂); 24-25.II.2012 (♂); 1-2.III.2012 (♂) (Collector P. Moretto) (BMCP). Material examined of *Zeuneria melanopeza* Karsch, 1889. Guinea, Fernando Poo, Basile VIII-IX.1901, L. Fea (7♂, 8♀); Cameroon, Mukonje Farm (♂, ♀); Nigeria, Oyakama, Port Harcourt I.1982, L. Santini (MSNG); Togo, Cascade of Womé 31.VII-1.VIII.2013, UV trap, P. Moretto (♂) (BMCP).

Diagnosis.—Males of *Z. longicercus* are characterized by very long in-curved cerci (as long as the sub-genital plate); from the base of cercus a long tooth branches off up to ca. two-thirds of the cercus length (Figs 136, 138, 140, 141). Stridulatory file is very long and consists of more than 150 teeth (Fig. 139). Males of species of the genus *Zeuneria* possess an abdominal gland, characterized by the



Figs 136-141. *Zeuneria longicercus*: male lateral habitus (136), lateral view of the structure on the abdominal tergites (137), lateral view of cerci and subgenital plate (138), stridulatory file (139), ventral view of last sternites (140), and fronto-lateral view of last abdominal tergites (141). For color version, see Plate XI.

presence of hairs, probably similar to that recorded by Ingrisch (2011) in some South-East Asian Phaneropterinae. Further, a previously unknown 2 mm dorso-lateral abdominal appendage delimits the hind area of the gland; it is sub-equally bilobed and curved dorsally and delimits the abdominal gland at the second tergite (Fig. 137); it might have the function of retaining gland exudates. This character is also present on *Zeuneria melanopeza* Karsch, 1889.

Distribution.—*Z. longicercus* is only known from DRC.

Genus *Arantia* Stål, 1874

Stål, 1874. Recencio Orthopterorum. Revue critique des Orthoptères décrits par Linné, De Geer et Thunberg. 2 Locustina: 10, 25.

This genus contains at least 29 species, some of which have been described only on females. Not less than eight species are included within material collected in the Dzanga-Ndoki National Park, some of which are undescribed; however, a revision of the genus is needed, and it is necessary to postpone the species analysis.

Concluding remarks

According to Colyn (1999), in Central-West Africa a certain amount of speciation and a great deal of subspeciation is said to have occurred during late Pleistocene climatic fluctuactions, especially since the last severe glaciation (*ca* 20,000 years BP). Due to a series of isolated forest fragments, the area of the Congo basin has played an important role as a refuge for biodiversity. One of these refuges lies in the Sangha-Likouala River system, which is characterized by different alluvial plains periodically flooded by the central Congo basin. During the periods of forest fragmentation, the E-W orientation of this river system probably acted as obstacle to the merging of Sudan and Zambia savannas. The area is very rich in endemic taxa of vertebrates; Colyn & Deleporte (2002) found several subunits in this area, apparently a result of fluctuating savanna and forest vegetation in the Quaternary.

The study of specimens of leaf katydids (Tettigoniidae: Phaneropterinae) collected in the tropical forests of Dzanga-Ndoki National Park (CAR) so far produced many interesting records. Forty-four species of Phaneropterinae are here recorded, but at least another 20 species remain unidentified at present. Probably the most unexpected finding was the high number of undescribed species, 8 of 44 (18.2%) of the species identified so far. The park is known as a sanctuary of biodiversity, particularly for high density populations of gorilla and bonobo. Dowsett (in Fishpool & Evans 2001) has included this wide area within the important bird areas of Africa, and now emerging entomological data also highlight the importance of this tropical forest as a hotspot of Orthoptera diversity.

Concerning the other African countries cited in this paper, many interesting and unpublished data emerged from the study of collections preserved in some European Museums of Natural History. These museums contain valuable collections of African Orthoptera diversity, including some previously undescribed taxa, and their collections are still a partially undiscovered treasure. Further, although historical explorations in central and western African countries were extensive, and Orthoptera have been investigated abundantly, chiefly between the late 1800s and mid 1900s (see bibliography), we may consider that their Orthoptero-fauna is still partially known and future research is likely to produce many interesting results.

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