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Phylogenetic analysis and systematics of the *Acrapex unicolora* Hampson species complex (Lepidoptera, Noctuidae, Noctuinae, Apameini), with the description of five new species from the Afrotropics

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Abstract. Ten morphologically similar species of *Acrapex* Hampson, 1891 (Lepidoptera, Noctuidae, Noctuinae, Apameini) from Central and Eastern Africa are reviewed, including five new species: *Acrapex kafula* le Ru sp. nov., *A. kavumba* le Ru sp. nov., *A. kiakouama* le Ru sp. nov., *A. miscantha* le Ru sp. nov. and *A. simillima* le Ru sp. nov. Evidence is provided to transfer the monotypic genus *Poecopa* Bowden, 1956 to the genus *Acrapex*. Host plants of five species are recorded, some of them for the first time. *Acrapex kavumba* sp. nov., *A. miscantha* sp. nov. and *A. simillima* sp. nov. were found on one host plant each. *Acrapex mediopuncta*, previously reported in West Africa from *Pennisetum purpureum* Schumach., *Rottboellia compressa* L., *Setaria megaphylla* (Steud) Dur. & Schinz. and *Sorghum arundinaceum* (Desv.) Stapf, was only found from *S. megaphylla* in Central Africa. Larvae of *Acrapex unicolora* were collected on *Andropogon gayanus* Kunth, *Chrysopogon zizanoides* (L.) Roberty, *Cymbopogon schoenanthus* subsp. *proximus* (Hochst. ex A.Rich.) Maire & Weller, *Cymbopogon pospischiilii* (K.Schum.) C.E.Hubb., *Hyparrhenia diplandra* (Hack.) Stapf and *Setaria sphacelata* (Schumach.) Moss. We also conducted molecular phylogenetic analyses (using maximum likelihood) and molecular species delimitation analyses on a comprehensive sample of 61 specimens belonging to eight of the studied species. Molecular phylogenetic analyses provided additional evidence of the synonymy of *Acrapex* and *Poecopa*, whereas molecular species delimitation analyses support the validity of the five newly described species and unravel another potential new species, only collected in the larval stage.

Keywords. *Acrapex*, Afrotropical Region, Apameini, Noctuidae, Sesamiina.

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Introduction

Among the African noctuid stem borers of the subtribe Sesamiina (Lepidoptera, Noctuidae, Noctuinae, Apameini) the genus *Acrapex* Hampson, 1891 consists of about 90 species that are mostly distributed in the Afrotropical region (Le Ru *et al.* 2014). Until recently, very little was known about *Acrapex* host preferences as specimens had been obtained mainly from light trap collections. Extensive surveys conducted since 2004 (Le Ru *et al.* 2006 a, 2006b; Ong'amo *et al.* 2006, 2013, 2014; Ndemah *et al.* 2007; Matama-Kauma *et al.* 2008; Moolman *et al.* 2014) in several sub-Saharan countries, targeting wild habitats rich in Poaceae and combining infested host plant collections and light traps, allowed us to obtain several hundred specimens of *Acrapex*. A recent study by Le Ru *et al.* (2014) focused on a small group of morphologically related species belonging to subsets of two (groups B and C) of the four morphological groups that have been defined by Berio (1973) based on male genitalia. The latter study unravelled no less than six new species, thus suggesting that the species diversity of *Acrapex* in Sub-Saharan Africa is greatly underestimated (Le Ru *et al*. 2014).

In the present study, we focus on a species complex that consists of *A. unicolora* Hampson, 1910 and nine morphologically related species (five of which are new to science). These species constitute another subset of group B as defined by Berio (1973); the other subset corresponds to the *A. stygiata* (Hampson, 1910) group (Le Ru *et al.* 2014). Our subset of interest (hereafter referred to as the *A. unicolora* group) consists of *A. cuprescens* (Hampson, 1910), *A. malagasy* Viette, 1967, *A. parvaclara* Berio, 1973, *A. unicolora*, *A. mediopuncta* (Bowden, 1956) comb. nov., *A. kafula* le Ru sp. nov., *A. kavumba* le Ru sp. nov., *A. kiakouama* le Ru sp. nov., *A. miscantha* le Ru sp. nov. and *A. simillima* le Ru sp. nov. It is characterised by the following combination of characters: (i) valve short and broad at basal half, cucullus rounded and tufted, with medium size hairs; (ii) coastal margin slightly broadened on the inner side and produced into a tooth-shaped spine, pointed and slightly curved inwardly; (iii) juxta large, plate-like, widening to the top without sclerotisation; (iv) aedeagus short, stout, slightly curved, with two lateral areas adorned with short setae; (v) vesica hand-shaped, with a tuft of cornutus, needle-shaped.

For this study we include the description of the five new species which have been cross-checked against all *Acrapex* types preserved in museums to avoid the coinage of synonymies. We also provide a supplemental description for five species of the *A. unicolora* group, with female genitalia presented for the first time for *A. cuprescens*, *A. parvaclara* and *A. unicolora*. Finally, we conduct phylogenetic analyses on a multi-marker molecular dataset (four mitochondrial gene fragments and two nuclear gene fragments) to explore species boundaries and investigate the phylogenetic placement of several species.

Material and methods

Sampling

Sampling of visually damaged grasses (Poales) in Eastern and Southeastern Africa was conducted over ten years (2004–2014) to collect the larval stages of noctuid stem borers within their wild host plants (Le Ru *et al*. 2006a, 2006b). Larvae were reared on an artificial diet (Onyango & Ochieng'Odero 1994) until pupation and the emergence of adults (Le Ru *et al.* 2006a, 2006b). A total of 271 larvae belonging to the group of interest were sampled in the localities listed in Table 1. In addition, 185 adults from this species group were collected in light traps set up in Cameroon, Kenya, the Republic of the Congo, Tanzania, Uganda and Zambia. The morphological study is based on 72 adult specimens belonging to 10 *Acrapex* species collected in 46 localities in seven countries: Cameroon, the Democratic Republic of the Congo, Kenya, the Republic of the Congo, Tanzania, Uganda and Zambia (see also Le Ru *et al.* 2014). Plant specimens were identified by Simon Mathenge (Botany Department, University of Nairobi, Kenya).

Morphological study

Genitalia were dissected after immersion of the end of the abdomen in a boiling 10% potash bath for a few minutes, then cleaned, immersed in absolute alcohol for a few minutes and mounted on slides in Euparal (after separating the aedeagus from the rest of the genitalia in the male).

Collected insects were identified by comparison with types and specimens housed in the following institutions:

BMNH = Natural History Museum, London, UK
MCSN = Museo Civico di Storia Naturale di Milano, Milan, Italy

Table 1. Localities at which specimens of the *Acrapex unicolora* group were collected. [continued on next page]

Country	Locality	Latitude	Longitude	Altitude (m.a.s.l.)	*Acrapex species*
Angola	Ndalatando	09°18'14" S	14°55'03" E	827	*A. unicolora*
Cameroon	Babessi	06°01'56" N	10°33'07" E	1203	*A. parvaclara*
	Ndop	05°58'40" N	10°24'25" E	1182	*A. parvaclara*
	Sanaga River	04°22'23" N	11°15'10" E	388	*A. kafula* sp. nov.
	Tapare	06°02'16" N	14°23'59" E	870	*A. mediopuncta*
	Wete-Wete	04°04'25" N	09°01'15" E	30	*A. mediopuncta*
Democratic Republic of the Congo	Yayoli	00°49'34" N	24°18'45" E	374	*A. mediopuncta*
Kenya	Kakamega Forest	00°22'32" N	34°53'40" E	1430	*A. simillima* sp. nov.
	Ruiru-Aukland	01°05'04" S	36°55'37" E	1595	*A. kafula* sp. nov.
	Ruma Main Gate	00°38'17" S	34°20'13" E	1254	*A. kafula* sp. nov.
	Ruma Sindo	00°36'18" S	34°16'03" E	1221	*A. kafula* sp. nov.
Malawi	Mlanje Plateau	15°58'47" S	35°35'50" E	1850	*A. unicolora*
Republic of the Congo	Bidoua	03°28'26" S	13°24'48" E	484	*Acrapex* sp.
	Forêt de Loudima	04°04'38" S	12°57'59" E	142	*A. unicolora*
	Kalakundu	04°22'09" S	13°40'31" E	325	*A. unicolora*
	Lac Loubi	04°53'40" S	11°55'32" E	4	*A. kiakouama* sp. nov.
	Lac Nanga	04°53'48" S	11°56'37" E	2	*A. kiakouama* sp. nov., *A. unicolora*
	Maloukou Trechot	03°59'58" S	15°35'15" E	585	*A. unicolora*
	Rivière de la Léfini	02°54'30" S	15°37'47" E	320	*A. kafula* sp. nov.
Tanzania	Akafilo	09°23'53" S	34°49'17" E	1922	*A. unicolora*
	Iboya	09°25'32" S	35°03'41" E	1664	*A. unicolora*
	Igima	09°13'14" S	34°46'29" E	1888	*A. unicolora*
	Igominyi	09°27'14" S	34°57'42" E	1668	*A. unicolora*
	Itambo	09°12'51" S	34°46'38" E	1888	*A. unicolora*
	Kifanya	09°33'27" S	35°06'15" E	1675	*A. unicolora*
	Kifanya 3	09°30'55" S	35°04'59" E	1685	*A. unicolora*
	Lilomwi	09°36'12" S	35°10'53" E	1555	*A. unicolora*
	Lukumburu	09°40'03" S	35°16'54" E	1299	*A. kafula* sp. nov., *A. unicolora*
	Masumbo-Ifunda	08°02'04" S	35°28'45" E	1752	*A. unicolora*
	Mbizi Forest	07°54'33" S	31°40'29" E	2147	*A. unicolora*
	Ngongwa	09°29'40" S	35°03'08" E	1662	*A. unicolora*
	Sao Hill 2	08°27'25" S	35°10'02" E	1845	*A. kavumba* sp. nov., *A. unicolora*
	Tulia	09°16'11" S	35°03'41" E	1734	*A. unicolora*
	Wino	09°44'30" S	35°18'20" E	1444	*A. unicolora*
	Yakobi	09°24'41" S	34°56'22" E	1693	*A. unicolora*
Uganda	Bwindi Forest	01°01'05" S	29°45'32" E	2203	*A. simillima* sp. nov.
	Itojo	00°50'33" N	30°13'08" E	1070	*A. kafula* sp. nov., *A. parvaclara*
	Kanga-Bukama	00°12'54" S	30°05'37" E	1277	*A. parvaclara*
	Katonga	00°01'35" S	32°00'57" E	1151	*A. parvaclara*
	Kayanga- Kalinzu Forest	00°22'02" S	30°06'43" E	1447	*A. simillima* sp. nov., *A. parvaclara*
	Kazizi	00°33'52" N	30°49'07" E	1251	*A. miscantha* sp. nov.
	Kibale E Forest	00°38'45" N	30°24'16" E	1565	*A. simillima* sp. nov.
	Mihunga	00°21'20" N	30°01'32" E	1756	*A. simillima* sp. nov.

Country	Locality	Latitude	Longitude	Altitude (m.a.s.l.)	*Acrapex* species
Zambia	Kafulo	14°08'44" S	23°27'38" E	1056	*A. kafula* sp. nov.
	Kalale	14°47'56" S	25°19'16" E	1154	*A. unicolora*
	Kantongo	09°29'02" S	32°37'54" E	1378	*A. unicolora*
	Kavumba	11°29'04" S	29°25'45" E	1193	*A. kavumba* sp. nov., *A. parvaclara*
	Keundwe	13°06'36" S	25°21'25" E	1225	*A. kavumba* sp. nov., *A. unicolora*
	Khaembe Farm	14°33'06" S	28°19'18" E	1191	*A. unicolora*
	Ngwenya	12°58'32" S	28°27'19" E	1243	*A. unicolora*
	Rwanko Azhi	12°13'13" S	25°39'04" E	1413	*A. kafula* sp. nov., *A. kavumba* sp. nov.
Zimbabwe	Bulawayo	20°10'12" S	28°34'48" E	1076	*A. unicolora*

MNHN = Muséum national d'Histoire naturelle, Paris, France
MRAC = Royal Museum for Central Africa, Tervuren, Belgium
NMKE = National Museum of Kenya, Nairobi, Kenya
PM = Pretoria Museum, Pretoria, South Africa
TMSA = Ditsong National Museum of Natural History, Pretoria, South Africa

The holotypes of the new species were deposited in MNHN and paratypes were deposited in MNHN and NMKE.

DNA Extraction and Sequencing

For this study, 67 specimens of *Acrapex* were selected for the molecular analyses, including 60 individuals from the *A. unicolora* group. We also included one representative of the *A. stygiata* species group (*A. stygiata*) and five representatives of the *A. albivena* species group (*A. albivena* Hampson, 1910, *A. salmona* Le Ru, 2014, *A. sporobola* Le Ru, 2014, *A. syscia* Fletcher, 1961 and *A. yakoba* Le Ru, 2014). As outgroups, we included representatives of four other genera in the subtribe Sesamiina based on the results of several molecular studies (Toussaint *et al.* 2012; Le Ru *et al*. 2014). DNA was extracted from hind legs using Qiagen DNAeasy tissue kits (Qiagen, Hilden, Germany). Polymerase chain reaction (PCR) amplifications were conducted for four mitochondrial gene fragments: a 681 bp region of the cytochrome *c* oxidase subunit I (COI), 1038 bp of cytochrome *b* (Cyt*b*), 389 bp of the ribosomal 12S RNA (12S) and 539 bp of the ribosomal 16S RNA (16S). Two nuclear gene regions were also sequenced: 835 bp of the 28S ribosomal DNA (28S) and 1230 bp of the elongation factor-1α (EF1α). For both genes we used the primers and settings detailed in Kergoat *et al.* (2012). Resulting PCR products were processed by the French sequencing center Genoscope using a BigDye v. 3.1 sequencing kit and Applied 3730xl sequencers. Both strands were sequenced for all specimens to minimize PCR artefacts and ambiguities. Sequences of complementary strands were automatically edited and reconciled using Geneious v. 5.1 software (available from www.geneious.com/). All the sequences generated in this study were deposited in GenBank (see Appendix for the accession numbers). Unlike the sequences of coding genes (COI, Cyt*b* and EF1α), the sequences of ribosomal genes (12S, 16S and 28S) were variable in length. Their alignment was accomplished using MAFFT v. 7 (Katoh & Standley 2013) with default option settings. For all protein-coding genes, we used Mesquite v. 3.04 (available from www.mesquiteproject.org) to check the coding frame for possible errors or stop codons. The combination of the six gene fragments resulted in a combined dataset of 71 specimens and 4712 aligned characters.

Table 2. Results of PartitionFinder analyses, based on the AICc.

Partitions	Models
#1: 12S, 16S, COI_pos3, Cyt*b*_pos1	GTR + G + I
#2: 28S, COI_pos1, Cyt*b*_pos2, EF1α_pos2, EF1α_pos3	GTR + G + I
#3: COI_pos2, Cyt*b*_pos3	GTR + G
#4: EF1α_pos1	GTR + G

Phylogenetic and molecular species delimitation analyses

Maximum likelihood (ML) was used to infer phylogenetic relationships on the combined dataset. To improve phylogenetic accuracy we carried out partitioned analyses (Nylander *et al.* 2004). Partitions and substitution models were determined using PartitionFinder v. 1.1.1 (Lanfear *et al.* 2012), based on the corrected Akaike information criterion (AICc). Maximum Likelihood analyses were carried out with the recently developed IQ-TREE (Nguyen *et al.* 2015), using the web server at http://iqtree.cibiv.univie.ac.at/. IQ-TREE optimises the ML search by focusing on local optima and comparing them to find the best ML tree, and it has been shown to potentially outperform other ML programs (Nguyen *et al.* 2015). Based on the AICc results we used four partitions (Table 2), with the corresponding models of substitutions being determined using the *Auto* function on the IQ-TREE web server, following the authors' recommendations. Clade support was then assessed under IQ-TREE using ultrafast bootstrap replicates (Minh *et al*. 2013) (1000 replicates were used); nodes supported by bootstrap values (BV) ≥ 70% were considered strongly supported following Hillis & Bull (1993).

For molecular species delimitation procedures, we relied on Poisson-tree-processes (PTP) analyses (Zhang *et al.* 2013). With the PTP model, speciation or branching events are modelled in terms of number of substitutions (represented by branch lengths). This approach has the advantage of not requiring the inference of an ultrametric tree, which is usually a time-consuming and potentially error-prone process (Astrin *et al.* 2012; Tang *et al.* 2014); it has also recently been used in several noctuid groups, providing relevant results from a morphological and ecological point of view (Le Ru *et al.* 2014, 2015; Dumas *et al*. 2015). Corresponding analyses were conducted on the web server of the Exelixis Lab (http://species.h-its.org/ptp/), with default settings and using the best ML tree from the IQ-TREE analysis.

Results

Morphological study

After having cross-checked against museum types to avoid coincidence of synonymies, we provide morphological evidence that *Acrapex* Hampson, 1894 and the monotypic *Poecopa* Bowden, 1956 are synonyms, with *Acrapex* being the senior synonym. We also establish that *Acrapex cuprescens* (Hampson, 1910) and *Acrapex rufidorsata* (Hampson, 1910) comb. nov. are synonyms and that *Acrapex unicolora* (Hampson, 1910), *Acrapex brunneosa* Bethune-Baker, 1911, *Busseola fuscantis* Hampson, 1918, *Acrapex simplex* Janse, 1939, *Acrapex hemiphlebia* (Hampson, 1914) and *Acrapex quadrata* Berio, 1973 are synonyms as well. We present descriptions of five new species: *A. kafula* sp. nov. and *A. kavumba* sp. nov. from Zambia; *A. kiakouama* sp. nov. from the Republic of the Congo; *A. miscantha* sp. nov. from Uganda; *A. simillima* sp. nov. from Kenya and Uganda. We also provide a supplemental description of the previously described species, with male and female genitalia presented for the first time for *A. parvaclara* and *A. unicolora*.

Taxonomy

Order Lepidoptera Linnaeus, 1758
Family Noctuidae Latreille, 1809
Subfamily Noctuinae Latreille, 1809
Tribe Apameini Boisduval, 1828
Subtribe Sesamiina Fibiger & Goldstein, 2005

Genus ***Acrapex*** Hampson, 1891

Acrapex cuprescens (Hampson, 1910)
Figs 1A–F, 2A–I, 3A

Busseola cuprescens Hampson, 1910: 162.
Busseola rufidorsata Hampson, 1910: 163.

Acrapex cuprescens – Poole 1989: 19 (recombination, catalogue).
Busseola rufidorsata – Poole 1989: 181 (catalogue).

Diagnosis

Male easily separated from males of other species of the group by the short and stout, slightly curved aedeagus and the vesica with a tuft of needle-shaped, horizontally oriented cornutus (Fig. 2I); female easily separated from females of other species of the group by the small sclerotized area of the ductus bursae on ostial side, half the length of the ductus bursae, and with the ventral plate of the ostium bursae sclerotized, slightly bilobate and invaginated on the back side (Fig. 3A).

Material examined

Holotype

NIGERIA: ♂, Niger Province, Minna, 9 Oct. 1910, coll. Scott Macfie, 1911-269 (BMNH, Agrotidae genitalia slide 2276).

Other material

NIGERIA: 1 ♂, same locality as holotype; ♀, holotype of *Busseola rufidorsata*, Niger Province, Minna, 30 Sep. 1910, coll. Scott Macfie, 1911-269 (BMHN, Agrotidae genitalia slide 2273).

Description

The descriptions of the external features of the male holotype and of the female holotype of *B. rufidorsata*, by Hampson (1910) were accurate. The male looks very similar to the female; however, the general shape of the female's fore wing is more elongated at the apex (Figs 1A–B, E–F). Descriptions of the genitalia of both sexes were not provided by Hampson (1910).

Wingspan. 20 mm (2 ♂♂); 30 mm (1 ♀).

Male genitalia (Fig. 2A, I). Uncus long, widening in distal third, truncated at apex, tufted with long hairs on upper side. Tegumen with medium-sized rounded penniculi, vinculum pointed, with medium-sized triangular saccus, valves short and broad, cucullus rounded and tufted, with medium-sized hairs, coastal margin slightly broadened on inner side and produced into a strong, tooth-shaped spine, roundly pointed and slightly curved inwardly; juxta large, plate-like, widening to the top without sclerotisation. Aedeagus short, stout, slightly curved, with two lateral areas adorned with short setae; hand-shaped vesica with a tuft of needle-shaped, horizontally oriented cornutus.

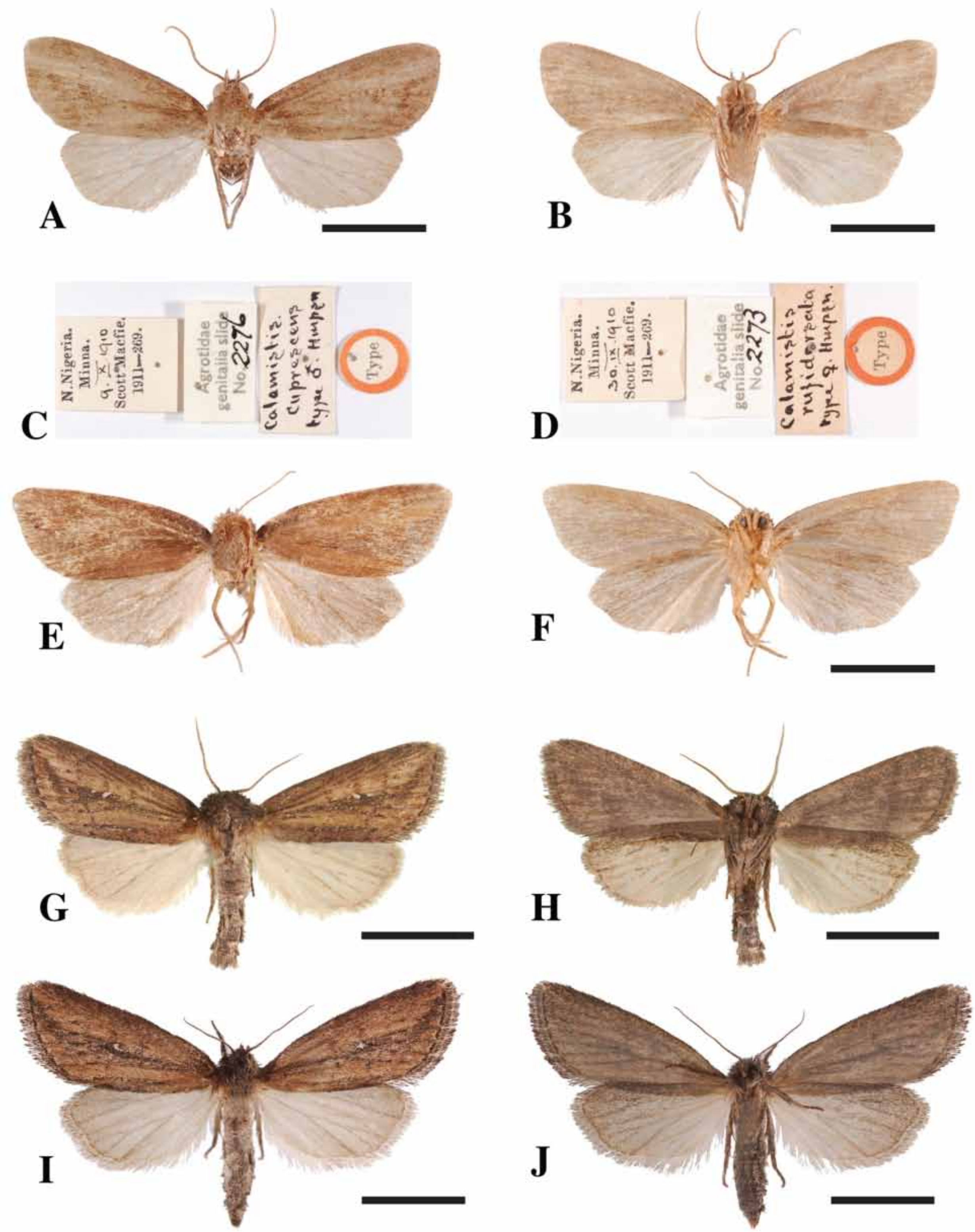

Fig. 1. Adults of species of *Acrapex*. – **A–F**. *A. cuprescens* (Hampson, 1910). **A**. ♂, upper side. **B**. ♂, under side. **C**. ♂, original labels from BMNH. **D**. ♀, original labels from BMNH. **E**. Upper side. **F**. Under side. – **G–J**. *A. kafula* le Ru sp. nov. **G**. ♂, upper side. **H**. ♂, under side. **I**. ♀, upper side. **J**. ♀, under side. Scale bars = 3 mm.

Female genitalia (Fig. 3A). Corpus bursae short and globular, without signum; ductus bursae short, one third as long as corpus bursae, with a small sclerotized area on ostial side, half length of ductus bursae; ductus seminalis from basal part of bursa; ventral plate of ostial bursae sclerotized, slightly bilobate and

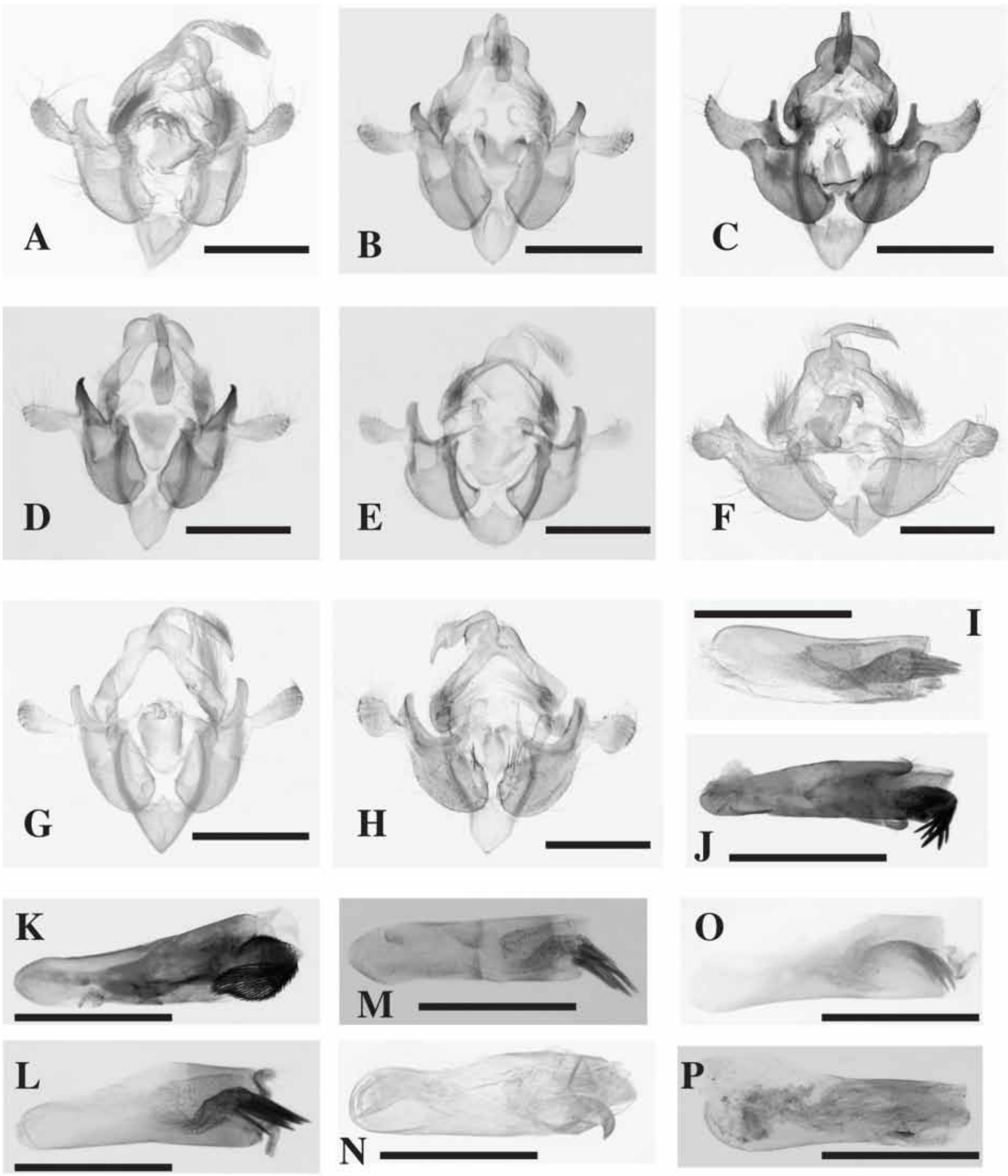

Fig. 2. Male genitalia of species of *Acrapex*. – **A**, **I**. *A. cuprescens* (Hampson, 1910). – **B**, **J**. *A. kafula* le Ru sp. nov. – **C**, **K**. *A. kavumba* le Ru sp. nov. – **D**, **L**. *A. kiakouama* le Ru sp. nov. – **E**, **M**. *A. malagasy* Viette, 1967. – **F**, **N**. *A. mediopuncta* (Bowden, 1956). – **G**, **O**. *A. parvaclara* Berio, 1973. – **H**, **P**. *A. unicolora* (Hampson, 1910). Scale bars = 0.5 mm.

invaginated on back side, dorsal plate large, broad and weakly sclerotized. Ovipositor lobes relatively short and wide (twice as long as wide), with bluntly pointed apex, dorsal surface bearing numerous short and stout setae.

Bionomics

Biology unknown.

Distribution

Nigeria. Only known from the type locality. The record is from lowland rain forest and secondary grassland (Mosaic #11) (White 1983) (Fig. 4), belonging to the Sudanian bioregion (Linder *et al*. 2012) (Fig. 5).

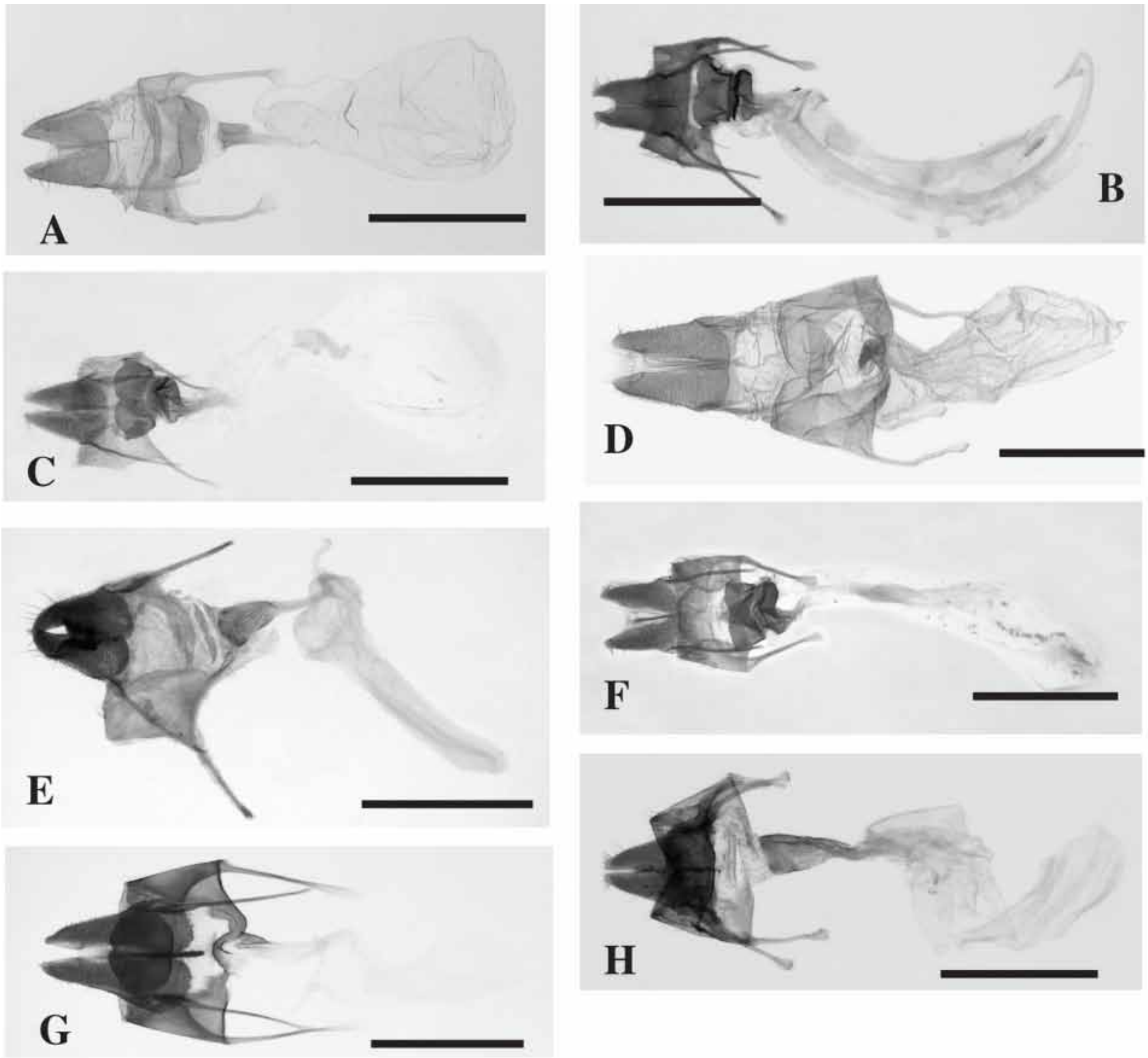

Fig. 3. Female genitalia of species of *Acrapex*. **A**. *A. cuprescens* (Hampson, 1910). **B**. *A. kafula* le Ru sp. nov. **C**. *A. kiakouama* le Ru sp. nov. **D**. *A. mediopuncta* (Bowden, 1956). **E**. *A. miscantha* le Ru sp. nov. **F**. *A. parvaclara* Berio, 1973. **G**. *A. simillima* le Ru sp. nov. **H**. *A. unicolora* (Hampson, 1910). Scale bars = 1 mm.

Acrapex kafula Le Ru sp. nov.
urn:lsid:zoobank.org:act:B727D00A-7E31-4B44-9B33-E6DC82D548B2
Figs 1G–J, 2B, J, 3B

Diagnosis

Male easily separated from males of other species of the group by the shovel-shaped uncus (at the apex) and the distal part of the aedeagus (grooved-shaped), with the vesica having a basal tuft of needle-shaped cornutus, pointed downward (Fig. 2B, J). Female easily separated from females of other species of the group by the very short ductus bursae, with a strongly sclerotised funnel-shaped connection with the ostium; antrum sclerotized, with a large, broad ventral plate, slightly bilobate, widening to the front, the anterior part shaped like a thin lip and more sclerotized than the posterior part, slightly concave (Fig. 3B).

Etymology

Named after the village of Kafulo in Zambia.

Type material

Holotype

ZAMBIA: ♂, Western Province, Kafulo, 14°08.726' S, 23°27.638' E, 1056 m a.s.l., 20 Mar. 2012, ex light trap, B. Le Ru leg. (MNHN, gen. prep. LERU Bruno/G595).

Paratypes

CAMEROON: 1 ♀, Central Region, Sanaga River, 04°22.387' N, 11°15.162' E, 388 m a.s.l., Dec. 2013, ex light trap (MNHN, gen. prep. LERU Bruno/G603).

KENYA: 2 ♂♂, 2 ♀♀, Nyanza Province, edge of Ruma Park, 00°36.293' S, 34°16.046' E, 1221 m a.s.l., 14 Nov. 2012, ex light trap, B. Le Ru leg. (MNHN, gen. prep. LERU Bruno/G511-G513-G529); 1 ♂, Central Province, Ruiru Aukland, 01°05.063' S, 36°55.621' E, 1595 m a.s.l., Jun. 2011 (MNHN).

REPUBLIC OF THE CONGO: 1 ♂, Plateau Region, Lefini River, 02°54.501' S, 15°37.776' E, 320 m a.s.l., 13 Apr. 2013, ex light trap (MNHN, gen. prep. LERU Bruno/G584).

TANZANIA: 1 ♂, Iringa Region, Lukumburu, 09°40.048' S, 35°16.892' E, 1299 m a.s.l., 17 Apr. 2015, ex light trap, B. Le Ru leg. (MNHN, gen. prep. LERU Bruno/G799).

UGANDA: 2 ♂♂, Western Region, Itojo, 00°50.546' N, 30°13.131' E, 1070 m a.s.l., 22 May 2014, ex light trap (MNHN, gen. prep. LERU Bruno/G714).

ZAMBIA: 1 ♂, same date and locality as holotype, ex. light trap, B. Le Ru leg. (MNHN, gen. prep. LERU Bruno/G178); 1 ♀, same date and locality as holotype, ex light trap (MNHN, gen. prep. LERU Bruno/G165).

Description

Both sexes look similar; however, general shape of female fore wing more elongated at apex than in male and fore wings paler in females (Fig. 1G–J); antennae bright fuscous dorsally and ochreous ventrally, filiform in female and slightly ciliate in male; flagellum adorned dorsally with black scales, palpus cupreous brown, eyes fuscous. Head and base of thorax brown, thorax becoming gradually fuscous; legs brown-ringed with buff, buff on inner surface; abdomen fuscous, irrorated with buff scales.

Fore wing. Ground colour ochreous in both sexes, suffused with fuscous scales, more heavily along veins and costal area, particularly in males; reniform indicated by a few white scales, preceded by some brown scales; longitudinal brown median fascia along lower external margin of cell, ending obliquely at apex; veins below cell adorned with white, fuscous and brown scales; postmedial row of white spots on veins; row of black elongated spots between veins on margin; fringe whitish externally, fuscous suffused with brown internally. Underside of fore wing with ground colour fuscous, densely suffused with brown scales.

Hind wing. Ground colour white, veins slightly irrorated, with fuscous scales, costa and apex more heavily suffused with fuscous scales; hind wing of males much more suffused with fuscous scales than in females; fringe white, suffused with fuscous and adorned with narrow fuscous line. Underside of hind wing white, suffused with fuscous scales but much more heavily on costa and apex; veins slightly irrorated, with fuscous scales.

Wingspan. 18–22 mm (6 ♂♂); 21–25 mm (5 ♀♀).

Male genitalia (Fig. 2B, J). Uncus long, widening in distal third, shovel-shaped at apex, tufted with long hairs on upper side. Tegumen with medium-sized rounded penniculi, vinculum pointed, with medium-sized triangular saccus, valves short and broad, cucullus rounded and tufted with medium-sized hairs,

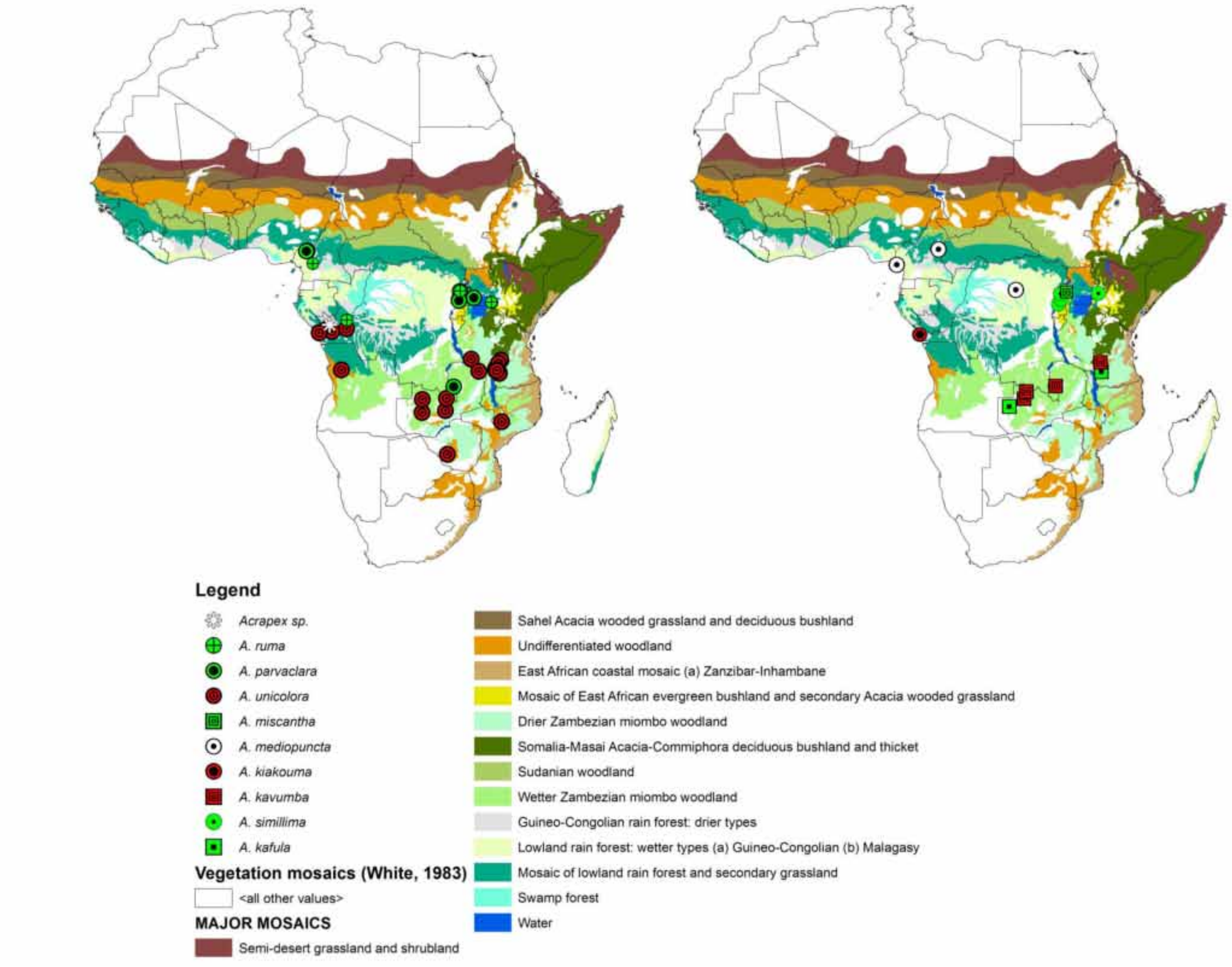

Fig. 4. Distribution map of sampled specimens of *Acrapex* Hampson, 1891.

coastal margin slightly broadened on inner side and produced into strong, tooth-shaped spine, strongly sclerotized at apex, pointed and slightly curved inwardly; juxta large, plate-like, without sclerotisation. Aedeagus short, slightly curved, with two lateral areas adorned with short setae; hand-shaped vesica with basal tuft of needle-shaped cornutus, pointed downward.

Female genitalia (Fig. 3B). Corpus bursae elongated ovoid and globular without signa; ductus bursae very short, with strongly sclerotised, funnel-shaped connection with ostium; antrum sclerotized, with large, broad ventral plate, slightly bilobate, widening to the front, anterior part shaped like a thin lip, more sclerotized than posterior part, slightly concave; dorsal plate small, weakly sclerotized. Ovipositor lobes relatively short (2.2 times as long as wide), with pointed apex, dorsal surface bearing numerous short and stout setae.

Bionomics

Biology unknown. The moths were caught in a light trap in grasslands near marshes.

Distribution

Cameroon, Kenya, the Republic of the Congo, Tanzania, Uganda and Zambia. Moths were found in a mosaic of lowland rainforest and secondary grassland (Mosaic #11), in a mosaic of Zambezian dry evergreen forest and wetter miombo woodland (Mosaic #21), in a mosaic of East African evergreen bushland and secondary Acacia wooded grassland (Mosaic #45) and in undiffentiated montane vegetation (Mosaic #19) (White 1983) (Fig. 4), belonging to the Congolian and Zambezian bioregions (Linder *et al*. 2012) (Fig. 5).

Acrapex kavumba Le Ru sp. nov.
urn:lsid:zoobank.org:act:17B55911-C7C0-4733-B131-D9C0C59FE72A
Figs 2C, K, 6A–B

Diagnosis

Males easily separated from males of other species of the group by the spoon-shaped cucullus and the turn of the hand-shaped vesica being adorned with a large tuft of needle-shaped cornutus (Fig. 2C, K).

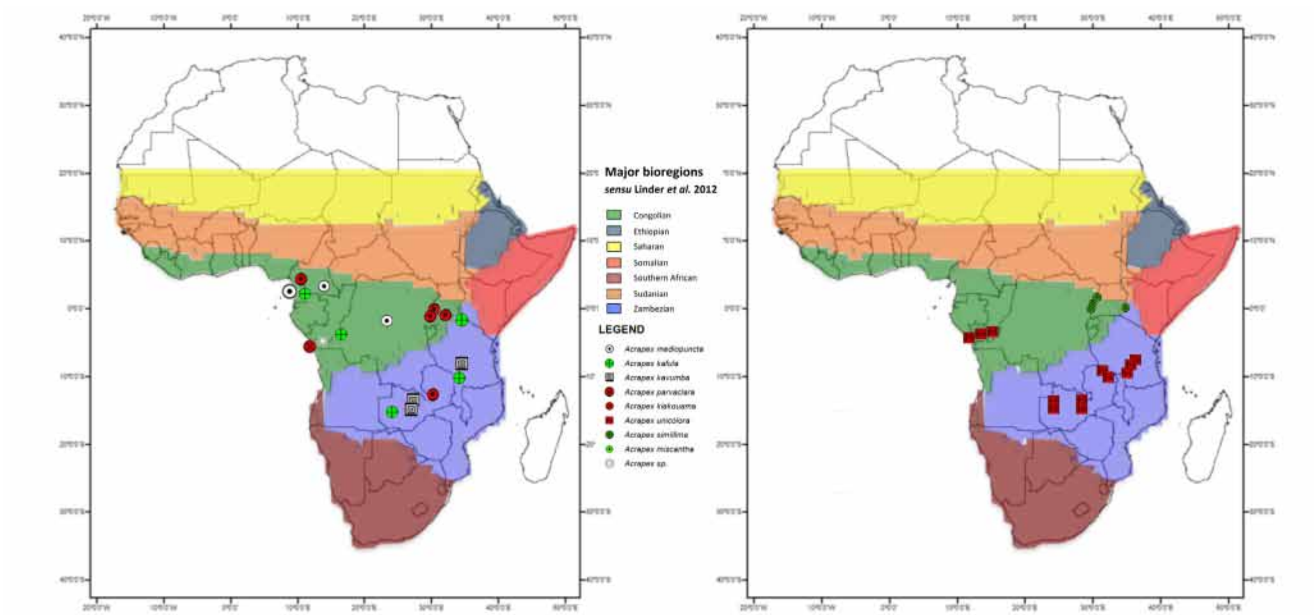

Fig. 5. Major bioregions, modified after Linder *et al.* (2012).

Etymology

Named after the village of Kavumba in Zambia.

Type material

Holotype

ZAMBIA: ♂, Luapula Province, Kavumba, 11°29.074' S, 29°25.757' E, 1193 m a.s.l., 22 Mar. 2012, ex light trap, B. Le Ru leg. (MNHN, gen. prep. LERU Bruno/G161).

Paratypes

ZAMBIA: 2 ♂♂, North-Western Province, Rwanko Azi, 12°13.212' S, 25°39.064' E, 1413 m a.s.l., 20 Mar. 2012, ex light trap (MNHN, gen. prep. LERU Bruno/G169-G377).

TANZANIA: 1 ♂, Iringa region, Sao Hill, 08°27.421' S, 35°10.036' E, 1845 m a.s.l., 22 Jan. 2012, ex larva (in stem of *Hyparrhenia* sp.), B. Le Ru leg. (MNHN); 3 ♂♂, same locality, Nov. 2015, ex light trap, B. Le Ru leg. (MNHN, gen. prep. LERU Bruno/G937).

Description

Only the male is known (Fig. 6A–B); antennae cupreous brown dorsally and ochreous ventrally, slightly ciliate; flagellum adorned dorsally with white scales, palpus cupreous brown, adorned with white scales, eyes fuscous. Head and base of thorax brown, thorax becoming gradually ochreous; legs brown-ringed with white; abdomen brown irrorated with fuscous scales, extremity of abdomen densely suffused with buff scales.

Fore wing. Ground colour dark ochreous, suffused with fuscous and brown scales, more heavily along veins and in costal area; reniform indicated by few white scales, preceded by some brown scales; longitudinal brown median fascia along lower external margin of cell, ending obliquely at apex; veins below cell adorned with white, fuscous and brown scales; postmedial row of white spots on veins; row of black elongated spots between veins on margin; fringe whitish externally, ochreous suffused with brown internally. Underside of fore wing with ground colour brown, suffused with fuscous scales on costa.

Hind wing. Uniformly brown; fringe white suffused with fuscous and adorned with narrow fuscous line. Underside of hind wing brown, suffused with fuscous scales.

Wingspan. 21–23 mm (4 ♂♂).

Male genitalia (Fig. 2C, K). Uncus long, widening in distal third, truncated at apex, tufted with long hairs on upper side. Tegumen with medium-sized rounded penniculi, vinculum pointed, with medium-sized triangular saccus, valves short and broad, cucullus spoon-shaped and tufted with medium size hairs, coastal margin slightly broadened on inner side and produced into narrow, straight, long lobe, roundly pointed; juxta oblong, pear-shaped, with long and wide neck, elongate bifid. Aedeagus short, slightly curved, with two lateral areas adorned with short setae; turn of hand-shaped vesica with large tuft of needle-shaped cornutus.

Bionomics

One larva was collected at the bottom of a stem of a *Hyparrhenia* sp. growing in grasslands near marshes (Table 3); like many species of *Acrapex*, *A. kavumba* sp. nov. is a markedly hygrophilous species. Unfortunately, no pictures were taken before pupation. All the moths were caught in a light trap in grasslands near marshes.

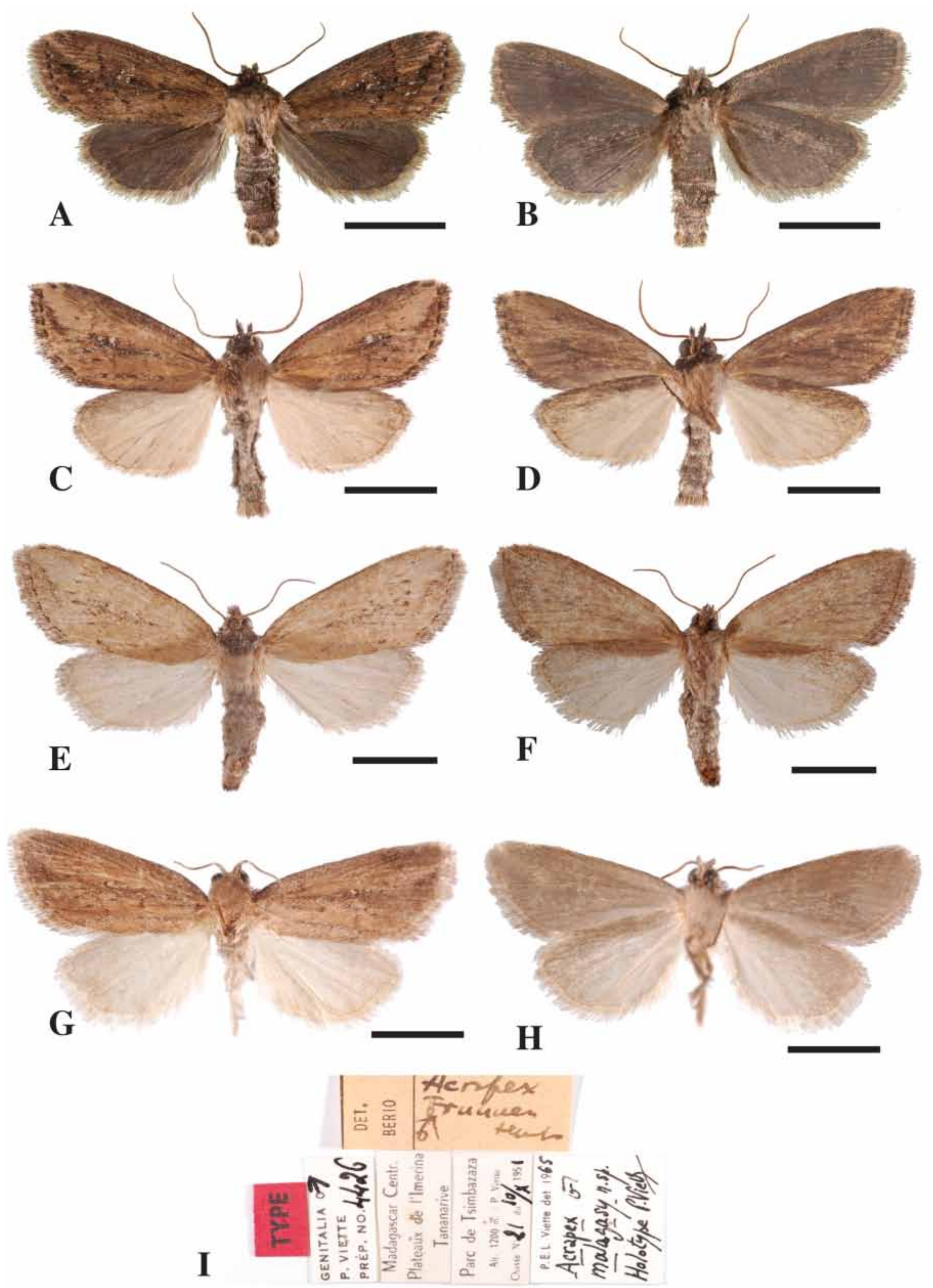

Fig. 6. Adults of species of *Acrapex*. – **A–B**. *A. kavumba* le Ru sp. nov. **A**. ♂, upper side. **B**. ♂, under side. – **C–F**. *A. kiakouama* le Ru sp. nov. **C**. ♂, upper side. **D**. ♂, under side. **E**. ♀, upper side. **F**. ♀, under side. – **G–I**. *A. malagasy* Viette, 1967. **G**. ♂, upper side. **H**. ♂, under side. **I**. ♂, original labels from MNHH. Scale bars = 10 mm.

Table 3. Host plants on which larvae of the *Acrapex unicolora* group were collected.

Acrapex species	Host plant species
A. kavumba sp. nov.	*Hyparrhenia* sp.
A. mediopuncta	*Pennisetum purpureum* Schumach.
	Rottboellia compressa L.
	Setaria megaphylla (Steud) Dur. & Schinz.
	Sorghum arundinaceum (Desv.) Stapf
A. miscantha sp. nov.	*Miscanthus violaceus* (K. Schum.) Pilg.
A. simillima sp. nov.	*Setaria megaphylla* (Steud) Dur. & Schinz.
A. unicolora	*Andropogon gayanus* Kunth
	Chrysopogon zizanoides (L.) Roberty
	Cymbopogon giganteus Chiov.
	Cymbopogon nardus (L.) Rendle
	Hyparrhenia diplandra (Hack.) Stapf
	Setaria sphacelata (Schumach.) Moss

Distribution

Tanzania and Zambia. The records are from a mosaic of Zambezian dry evergreen forest and wetter miombo woodland (Mosaic #21) (White 1983) (Fig. 4), belonging to the Zambezian bioregion (Linder *et al*. 2012) (Fig. 5).

Acrapex kiakouama Le Ru sp. nov.

urn:lsid:zoobank.org:act:5FD4E344-68BA-423B-AF86-347CAD502914

Figs 2D, L, 3C, 6C–F

Diagnosis

Male easily separated from males of other species of the group by the uncus being shovel-shaped at the apex and by the large, plate-like juxta, with a narrow pyriform base and a long and widening, slightly sclerotised neck (Fig. 2D); female easily separated from females of other species of the group by having the antrum strongly sclerotized, with a large, broad ventral plate, bilobate, widening to the front, anterior part shaped like a fleshy lip, the posterior part concave (Fig 3C).

Etymology

Named after Kiakouama, the technician who collected this species in the Republic of the Congo.

Type material

Holotype

REPUBLIC OF THE CONGO: ♂, Kouilou Department, Lac Nanga, 04°56.090' S, 11°56.713' E, 2 m a.s.l., 17 Apr. 2013, ex light trap, B. Le Ru leg. (MNHN, gen. prep. LERU Bruno/G843).

Paratypes

REPUBLIC OF THE CONGO: 4 ♂♂, same date and locality as holotype, ex light trap, B. Le Ru leg. (MNHN, gen. prep. LERU Bruno/G533-G537-G781); 4 ♀♀, same date and locality as holotype, ex light trap, B. Le Ru leg. (MNHN, gen. prep. LERU Bruno/G536); 1 ♂, Kouilou Province, Lac Loubi, 04°53.573' S, 11°55.535' E, 4 m a.s.l., 16 Apr. 2013, ex light trap, B. Le Ru leg. (MNHN).

Description

Both sexes look similar; however, the general shape of the female fore wing is more elongated at the apex than in the male and is paler (Fig. 6C–F); antennae bright ochreous dorsally and ochreous ventrally, filiform in female and slightly ciliate in male; flagellum adorned dorsally with grey scales, palpus ochreous grey, eyes fuscous brown. Head and base of thorax bright brown, thorax ochreous; legs ochreous, ringed with grey white; abdomen grey.

Fore wing. Ground colour bright ochreous in both sexes, suffused with fuscous and brown scales, more heavily along veins and costal area, particularly in male; reniform indicated by few white scales, surrounded by some brown scales; longitudinal brown median fascia along lower external margin of cell, ending obliquely at apex; veins below cell adorned with white and fuscous scales; row of black elongated spots between veins on margin; fringe grey externally, ochreous suffused with fuscous internally. Underside of fore wing with ground colour ochreous, densely suffused with brown scales.

Hind wing. Ground colour pale ochreous in male, more whitish in female; veins slightly irrorated, with fuscous scales, costa and apex more heavily suffused with fuscous scales; hind wing of male much more suffused with fuscous scales than that of female; fringe pale ochreous, suffused with fuscous and adorned with narrow fuscous line. Underside of hind wing pale ochreous in male, more whitish in female, suffused with brown scales but much more heavily on costa and apex; veins slightly irrorated with pale fuscous scales.

Wingspan. 16–18 mm (4 ♂♂); 20–23 mm (7 ♀♀).

Male genitalia (Fig. 2D, K). Uncus long, widening in distal third, shovel-shaped at apex, tufted with long hairs on upper side. Tegumen with medium-sized rounded penniculi, vinculum pointed, with medium-sized triangular saccus, valves short and broad, cucullus rounded and tufted, with medium-sized hairs, coastal margin slightly broadened on the inner side and produced into strong tooth-shaped spine, strongly sclerotized at apex, pointed and curved inwardly; juxta large, plate-like, base pyriform, without sclerotization, with long and widening, slightly sclerotized neck. Aedeagus short, slightly curved, with two lateral areas adorned with short setae; hand-shaped vesica with basal tuft of needle-shaped cornutus, pointed obliquely downward.

Female genitalia (Fig. 3C). Corpus bursae long and globular, without signa; ductus bursae very short, with strongly sclerotized funnel-shaped connection with ostium; antrum strongly sclerotized, with large, broad ventral plate, bilobate, widening to the front, anterior part shaped like a fleshy lip, posterior part concave; dorsal plate small, weakly sclerotized. Ovipositor lobes relatively short (2 times as long as wide), with pointed apex, dorsal surface bearing numerous short and stout setae.

Bionomics

Biology unknown. The moths were caught in a light trap in grasslands near marshes.

Distribution

Republic of the Congo. Known from two close localities only in the Kouilou region, south coast of Pointe Noire. Moths were found in a mosaic of lowland rain forest and secondary grassland (Mosaic #11A) (White 1983) (Fig. 4), belonging to the Congolian bioregion (Linder *et al*. 2012) (Fig. 5).

Acrapex malagasy Viette, 1967
Figs 2E, M, 6G–I

Acrapex malagasy Viette, 1967: 712–714, figs 552a–b, 553.

Acrapex malagasy – Poole 1989: 20 (catalogue).

Diagnosis

Easily separated from other species of the group by the large, plate-like juxta, with the base slightly flattened, without sclerotization, with a long and widening neck, ending on each side in a rounded apex, on both sides tufted with small-sized hairs (Fig. 2E).

Material examined

Holotype

MADAGASCAR: ♂, Plateau de l'Imerina, Tananarive, Parc de Tsimbazaza, 1200 m a.s.l., 10 Oct. 1951 (MNHN, gen. prep. 4426). Several specimens are recorded by Viette (1967).

Paratype

MADAGASCAR: 2 ♂♂, same locality and date as holotype (MNHN); 3 ♂♂, same locality as holotype, 8 Nov. 1954, P. Viette leg. (MNHN, gen. prep. 4438).

Description

The description of the external features of the holotype by Viette (1967) was accurate (Fig. 6G–H).

WINGSPAN. 17–20 mm (♂♂) according to Viette (1967); however, only one specimen is preserved in MNHN.

MALE GENITALIA (Fig. 2E, M). (After Viette 1967) Additional description: juxta large, plate-like, base slightly flattened, without sclerotization, with long and widening neck, ending on each side in rounded apex, on both sides tufted with small-sized hairs; aedeagus short, stout, not curved, with two lateral areas adorned with short setae; hand-shaped vesica with tuft of needle-shaped cornutus, pointed obliquely downward.

Bionomics

Biology unknown.

Distribution

Madagascar. Only known from the type locality. The record is from secondary grassland replacing upland and montane forest (Mosaic #18) (White 1983) (Fig. 4), belonging to the Sudanian bioregion (Linder *et al*. 2012) (Fig. 5).

Acrapex mediopuncta (Bowden, 1956) comb. nov.
Figs 2F, N, 3D, 7A–E

Poecopa mediopuncta Bowden, 1956: 418–420, figs 6–9.

Poecopa mediopuncta – Poole 1989: 818 (catalogue).

Diagnosis

Male easily separated from males of other species of the group by the broadly based, stout, strongly curved cornutus, pointed downward at a right angle (Fig. 2N); female easily separated from females of other species of the group by the small sclerotized area at the base of the ductus bursae and the weakly sclerotized antrum (Fig. 3D).

Material examined

Holotype

GHANA: ♂, Gold Coast, Kwadaso, near Kumasi, 25 Jun. 1952, ex larva (in stems of *Rottboellia compressa* L.), J. Bowden leg. (BMNH 1953/9, Agrotidae genitalia slide 1338).

Allotype

GHANA: ♀, Gold Coast, mile 19–20 on Kumasi-Mampong Road, 31 Aug. 1951, ex larva (in stems of *Setaria megaphylla* (Steud) Dur. & Schinz.), J. Bowden leg. (BMNH 1953/11, Agrotidae genitalia slide 1337).

Paratype

GHANA: 1 ♂, same locality and date as allotype; 12 paratypes of both sexes were recorded in the original description; only one was found in BMNH.

Other material

CAMEROON: 1 ♂, Southwest Region, Limbe, Wete Wete, 04°04.417' N, 09°01.250' E, 30 m a.s.l., 2 Feb. 2007, ex larva (in stem of *Setaria megaphylla* (Steud) Dur. & Schinz.), B. Le Ru leg. (MNHN, gen. prep. LERU Bruno/G284).

Description

The descriptions of the external features of the male holotype and female allotype by Bowden (1956) were accurate. The male looks very similar to the female; however, the general colour of the fore wing is a little bit darker in the male than in the female (Fig. 7A–D).

WINGSPAN. 20–32 mm (3 ♂♂); 33 mm (1 ♀).

MALE AND FEMALE GENITALIA (Figs 2F, N, 3D). The genitalia of both sexes were described by Bowden (1956) with sufficient detail; however, it should be added that the vesica of the aedeagus is hand-shaped with a stout, broadly based, strongly curved cornutus, pointed downward at a right angle.

Bionomics

Acrapex mediopuncta is a markedly forest species inhabiting open patches of grasses along forest roads. Larvae collected in Ghana were reported from *P. purpureum*, *R. compressa*, *S. arundinaceum* and *S. megaphylla* (Bowden 1956) (Table 3). The few larvae collected in Cameroon, the Democratic Republic of the Congo and the Republic of the Congo by our group were all from *S. megaphylla;* unfortunately, no pictures were taken before pupation. Larvae were collected at the bottom of young stems and were always solitary. Typically, plants exhibiting signs of infestation by *A. mediopuncta* larvae have a curled, brown, central leaf. No pupae were found in the stems, and therefore the borers probably pupate in the soil near exit holes.

Distribution

Cameroon, the Democratic Republic of the Congo, Ghana and the Republic of the Congo. The records are from Guineo-Congolian rain forests, lowland rain forests and secondary grassland vegetation mosaics (Mosaics #1–3) (White 1983) (Fig. 4), belonging to the Congolian bioregion (Linder *et al.* 2012) (Fig. 5).

Acrapex miscantha Le Ru sp. nov.

urn:lsid:zoobank.org:act:A4657886-D162-4D14-BCD4-46C7A02CC426

Figs 3E, 7F–G

Diagnosis

Female easily separated from females of other species of the group by the strongly curved and tooth-shaped ovipositor lobes (Fig. 3E).

Etymology

Named after the host-plant *Miscanthus violaceus* (K.Schum.) Pilg. in Uganda.

Material examined

Holotype

UGANDA: ♀, Occidental Province, Kyenjojo, Kazizi, 00°33.865' N, 30°49.117' E, 1251 m a.s.l., 24 May 2014, ex larva (in stems of *Miscanthus violaceus*), B. Le Ru leg. (MNHN, gen. prep. LERU Bruno/G734).

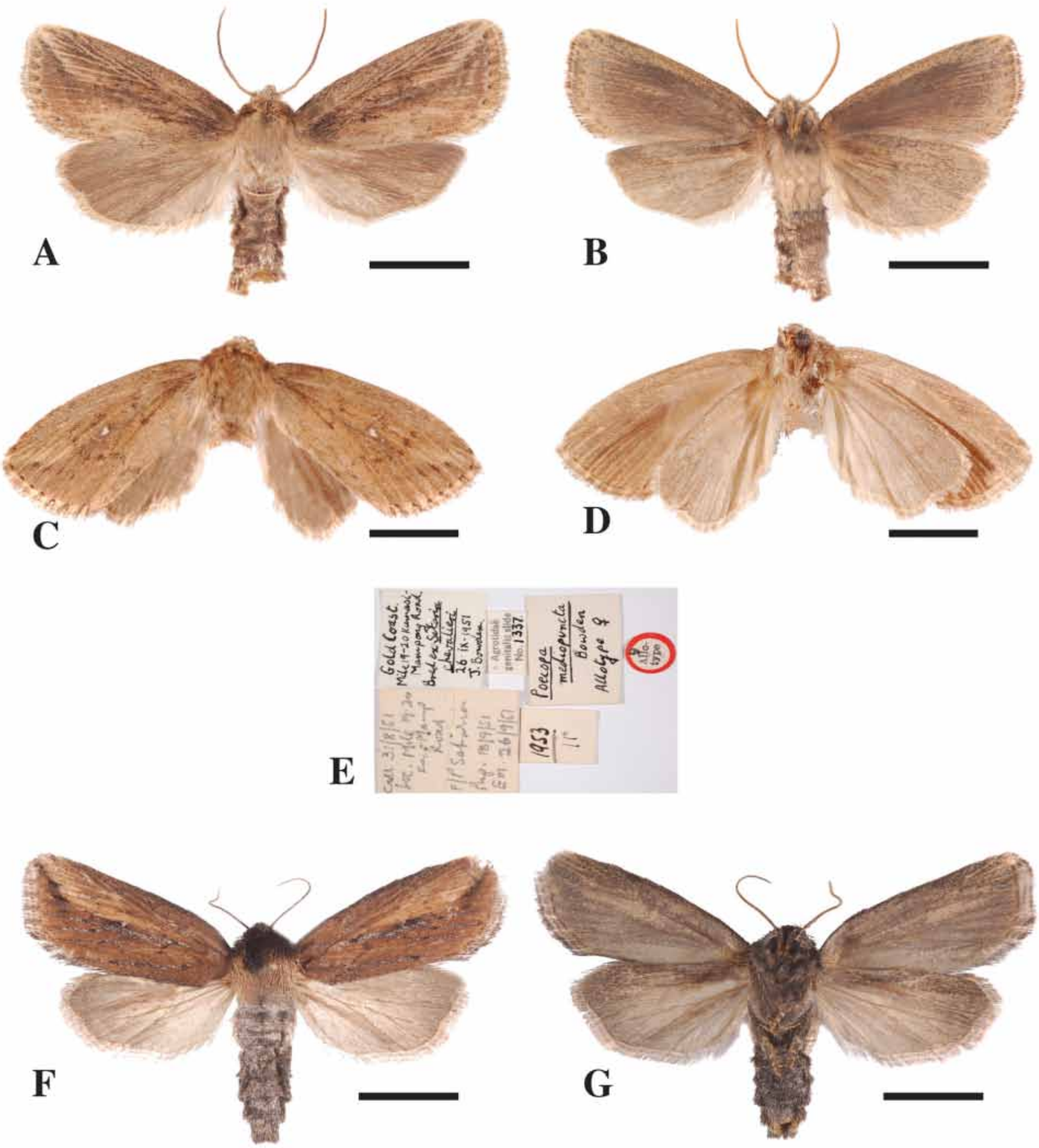

Fig. 7. Adults of species of *Acrapex*. – **A–E**. *A. mediopuncta* (Bowden, 1956). **A**. ♂, upper side. **B**. ♂, under side. **C**. ♀, upper side. **D**. ♀, under side. **E**. ♀, original labels from BMNH. – **F–G**. *A. miscantha* le Ru sp. nov. **F**. ♀, upper side. **G**. ♀, under side. Scale bars = 10 mm.

Description (Fig. 7F–G)

Antennae fuscous dorsally and ochreous ventrally, filiform; flagellum adorned dorsally with black scales, palpus fuscous, eyes black. Head and base of thorax black, thorax ochreous; legs fuscous suffused with white scales, ringed with white; abdomen fuscous, dorsally suffused with grey scales, black ventrally, suffused with grey scales.

Fore wing. Ground colour dark ochreous, suffused with fuscous, black and white scales, more heavily along veins and costal area; reniform indicated by few white scales, surrounded by some black scales; irrorated ochreous median area extended on distal side to termen; longitudinal grey median fascia along lower external margin of cell, ending obliquely at apex, adorned with two black elongated spots between veins; veins below cell adorned with grey, white and black scales; fringe grey white, slightly suffused with fuscous. Underside of fore wing with ground colour grey white, suffused with fuscous and some brown scales, more heavily on costa and close to termen.

Hind wing. Ground colour white, strongly suffused with fuscous scales; veins slightly irrorated with fuscous scales, costa and apex more heavily suffused with fuscous scales; fringe grey white, suffused with fuscous. Underside of hind wing grey-white, suffused with fuscous scales, but much more heavily on costa and apex; veins slightly irrorated with fuscous scales.

Wingspan. 22 mm (1 ♀).

Female genitalia (Fig. 3E). Corpus bursae elongated ovoid and globular, without signa; ductus seminalis from base of bursae; ductus bursae about one third length of corpus bursae, not sclerotised on bursa side, widening and sclerotised on ostial side; antrum narrow, band-like, slightly sclerotised, leaning on back and adorned with very narrow and strongly sclerotised plate divided in two in the middle. Ovipositor lobes relatively short (2 times as long as wide), with dorsal surface bearing numerous short and stout setae, apex of each lobe strongly curved and tooth-shaped.

Bionomics

Larvae were collected at the bottom of stems of *M. violaceus* growing in grasslands near marshes (Table 3); as many *Acrapex* species, *A. miscantha* sp. nov. is a markedly hygrophilous species. Unfortunately, no pictures were taken before pupation.

Distribution

Uganda. Only known from the holotype locality in Occidental Province close to Kyenjojo. This species was found in a mosaic of East African evergreen bushland and secondary *Acacia* wooded grassland (Mosaic #45) (White 1983) (Fig. 4), belonging to the Congolian bioregion (Linder *et al*. 2012) (Fig. 5).

Acrapex parvaclara Berio, 1973
Figs 2G, O, 3F, 8A–D

Acrapex parvaclara Berio, 1973: 150–152, fig. 33.

Acrapex parvaclara – Poole 1989: 20 (catalogue).

Diagnosis

Male easily separated from males of other species of the group by the small rounded protuberance on each side of the apex of the juxta and by the small curved, hand-shaped vesica (Fig. 2G, O); female easily separated from females of other species of the group by the strongly sclerotized antrum, with a large, broad ventral plate, slightly bilobate, widening to the front, the anterior part shaped like a thin lip, the posterior part concave (Fig. 3F).

Material examined

Holotype

DEMOCRATIC REPUBLIC OF THE CONGO: ♂, North Kivu, Ngesho, Sep. 1937, J. Ghesquière leg. (MRAC, gen. prep. Berio N 3755).

Paratypes

DEMOCRATIC REPUBLIC OF THE CONGO: 2 ♂♂, Sankuru, Dimbelenge, Apr. 1951, Dr Fontaine leg. (MNHN); 1 ♂, Sankuru, Lac Hukauda, Nov. 1951, Dr Fontaine leg. (MNHN); 1 ♂, Kindu, Dr Russo leg. (MNHN); 1 ♂, Katanga, Kimbai, Dec. 1925, Ch. Seydel leg. (MCSN).

Other material

CAMEROON: 1 ♀, Northwest Region, Babessi, 06°01.926' N, 10°33.112' E, 1203 m a.s.l., Dec. 2013, ex light trap (MNHN, gen. prep. LERU Bruno/G636); 1 ♂, Northwest Region, Ndop, 05°58.670' N, 10°24.410' E, 1182 m a.s.l., 4 Dec. 2013, ex light trap (MNHN, gen. prep. LERU Bruno/G605).

UGANDA: 1 ♂, Kalinzu Forest, T.H.E. Jackson leg., B.M.E Afr. Exp. B.M. 1985-203 (BMNH, Noctuidae genitalia slide 2466); 1 ♀, South Buganda Region, Katonga, 00°01.577' S, 32°00.958' E, 1151 m a.s.l., 28 May 2014, ex light trap (MNHN, gen. prep. LERU Bruno/G715); 3 ♀♀, Western Region, Itojo, 00°50.546' N, 30°13.131' E, 1070 m a.s.l., 22 May 2014, ex light trap (MNHN, gen. prep. LERU Bruno/G713); 1 ♀, Western Region, Kanga-Bukama, 00°12.898' S, 30°05.624' E, 1277 m a.s.l., 21 May 2014, ex light trap (MNHN, gen. prep. LERU Bruno/G712).

ZAMBIA: 2 ♂♂, Luapula Province, Kavumba, 11°29.074' S, 29°25.757' E, 1193 m a.s.l., 22 Mar. 2012, ex light trap (MNHN, gen. prep. LERU Bruno/G157).

Redescription (Fig. 8A–D)

Both sexes look similar; however, the general shape of the female fore wing is more elongated at the apex than in the male and fore wings are also paler in females; antennae ochreous, filiform in female, slightly ciliate in male; flagellum fuscous, adorned dorsally with black scales, palpus fuscous, eyes brown. Head and base of thorax fuscous, thorax ochreous; legs ochreous, ringed with white; abdomen fuscous, suffused with grey scales.

Fore wing. Ground colour ochreous, suffused with fuscous, black and white scales, more heavily along veins and costal area; reniform indicated by few white scales, surrounded by some black scales; row of black elongated spots on veins in front of reniform; longitudinal fuscous median fascia along lower external margin of cell, ending obliquely at apex; veins below cell adorned with fuscous scales; row of black elongated spots between veins on margin; fringe white, slightly suffused with fuscous. Underside of fore wing with ground colour ochreous, strongly suffused with fuscous and some brown scales, more heavily on costa and close to termen.

Hind wing. Ground colour white in female, white ochreous in male, suffused with fuscous scales; veins slightly irrorated with fuscous scales, costa and apex more heavily suffused with fuscous scales; fringe white, suffused with fuscous. Underside of hind wing white, suffused with fuscous scales, but much more heavily on costa and apex; veins slightly irrorated, with fuscous scales.

Wingspan. 18–22 mm (5 ♂♂); 23–25 mm (5 ♀♀).

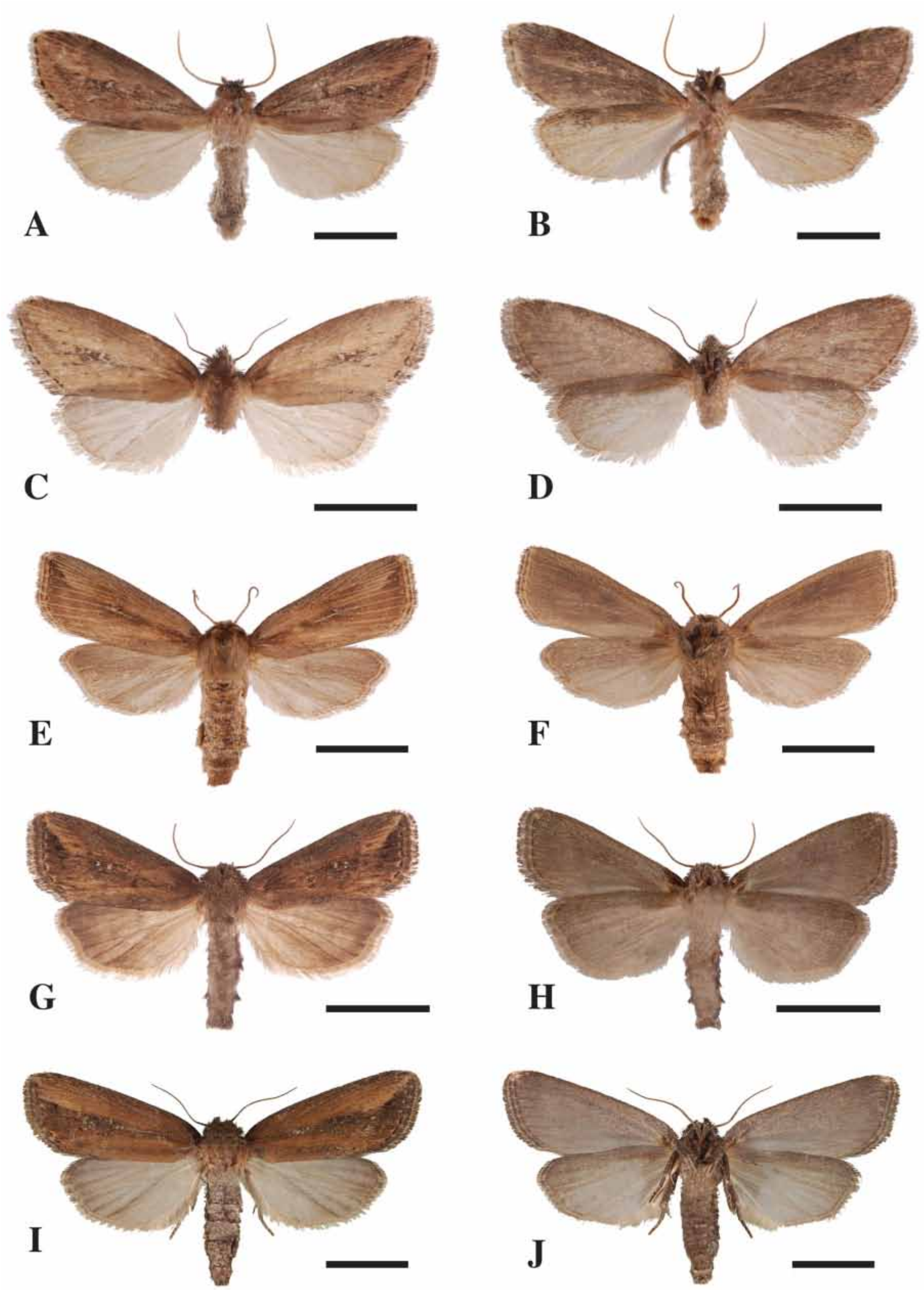

Fig. 8. Adults of species of *Acrapex*. – **A–D**. *A. parvaclara* Berio, 1973. **A**. ♂, upper side. **B**. ♂, under side. **C**. ♀, upper side. **D**. ♀, under side. – **E–F**. *A. simillima* le Ru sp. nov. **E**. ♀, upper side. **F**. ♀, under side. – **G–J**. *A. unicolora* (Hampson, 1910). **G**. ♂, upper side. **H**. ♂, under side. **I**. ♀, upper side. **J**. ♀, under side. Scale bars = 10 mm.

Male genitalia (Fig. 2G, O). Uncus long, widening in distal third, tapering in truncate apex, tufted with long hairs on upper side. Tegumen with medium-sized rounded penniculi, vinculum pointed, with medium-sized triangular saccus, valves short and broad, cucullus rounded and tufted with medium-sized hairs, coastal margin slightly broadened on inner side and produced into strong, tooth-shaped spine, sclerotized at apex, pointed and slightly curved inwardly; juxta large, plate-like, base slightly flattened, without sclerotization, with long and widening bilobate neck, ending on each side with small, rounded protuberance. Aedeagus short, slightly curved, with two lateral areas adorned with short setae; curved, hand-shaped vesica with basal tuft of needle-shaped cornutus, pointed obliquely downward.

Female genitalia (Fig. 3F). Corpus bursae long and globular, without signum; ductus bursae very short, with strongly sclerotised funnel-shaped connection with ostium; antrum strongly sclerotized, with large, broad ventral plate, slightly bilobate, widening to the front, anterior part shaped like thin lip, posterior part concave; dorsal plate small, weakly sclerotized. Ovipositor lobes relatively short (2 times as long as wide), with bluntly pointed apex, dorsal surface bearing numerous short and stout setae.

Bionomics

Biology unknown. The moths were caught in a light trap in grasslands near woodlands.

Distribution

Cameroon, the Democratic Republic of the Congo, Uganda and Zambia. Known from several localities at medium altitude between 1000 and 1200 m a.s.l. Moths were found in a mosaic of lowland rainforest and secondary grassland (Mosaic #11) and from a mosaic of Zambezian dry evergreen forest and wetter miombo woodland (Mosaic #21) (White 1983) (Fig. 4), belonging to the Congolian and to the Zambezian bioregion respectively (Linder *et al*. 2012) (Fig. 5).

Acrapex simillima Le Ru sp. nov.
urn:lsid:zoobank.org:act:336CE140-8928-451F-A33F-CC74CBBEF930
Figs 3G, 8E–F, 9A

Diagnosis

Female easily separated from females of other species of the group by the sclerotized, band-like ventral plate, strongly concave on the front (Fig. 3G).

Etymology

The species epithet refers to the close similarity of the wing pattern with that of *A. mediopuncta* (Bowden, 1956).

Material examined

Holotype

UGANDA: ♀, Southern Region, Kayanga Forest, 00°22.027' S, 30°06.722' E, 1447 m a.s.l., 6 Apr. 2006, ex larva (in stem of *Setaria megaphylla* (Steud) Dur. & Schinz.), B. Le Ru leg. (MNHN, gen. prep. LERU Bruno/G69).

Paratypes

KENYA: 2 ♀♀, Western Province, Kakamega Forest, 00°22.530' N, 34°53.660' E, 1430 m a.s.l., May 2007, ex larva (in stem of *Setaria megaphylla*), B. Le Ru leg. (MNHN, gen. prep. LERU Bruno/G31).

UGANDA: 3 ♀♀, same date and locality as holotype, ex light trap, B. Le Ru leg. (MNHN, gen. prep. LERU Bruno/G32, G770).

Description (Fig. 8E–F)

Antennae ochreous, filiform; flagellum ochreous, palpus ochreous, eyes black. Head and base of thorax brown, thorax ochreous; legs brown, suffused with ochreous scales, ringed with ochreous; abdomen ochreous, suffused with fuscous scales.

Fore wing. Ground colour bright ochreous, suffused with dark ochreous and fuscous scales, more heavily between veins and on costal area; reniform indicated by few white scales, surrounded by some black scales; longitudinal brown median fascia along lower external margin of cell, ending obliquely at apex, adorned with two black elongated spots between veins; row of black elongated spots between veins on margin; fringe ochreous, suffused with brown. Underside of fore wing with ground colour ochreous, heavily suffused with fuscous and brown scales.

Hind wing. Ground colour grey white, strongly suffused with fuscous scales, more heavily on costa and apex; veins slightly irrorated, with fuscous scales; fringe grey white, suffused with fuscous. Underside of hind wing grey white, suffused with fuscous scales, but much more heavily on costa and apex; veins slightly irrorated, with fuscous scales.

Wingspan. 26–32 mm (7 ♀♀).

Larval L5 instar (Fig. 9A). Length 20–25mm, width 2.5 mm; head smooth, black, prothoracic shield brown; body with ground colour dark pink, pinacula and caudal plate black. Young larvae very similar to mature ones.

Female genitalia (Fig. 3G). Corpus bursae elongated, ovoid and globular, without signa; ductus seminalis from base of bursae; ductus bursae about less than half length of corpus bursae, not sclerotised on bursa side, widening and slightly sclerotised on ostial side; antrum ovoid, with sclerotized, band-like ventral plate, strongly concave on front; ovipositor lobes relatively short (2 times as long as wide), with bluntly pointed apex, dorsal surface bearing numerous short and stout setae.

Bionomics

Acrapex simillima sp. nov. is a markedly forest species, inhabiting open patches of grasses along forest roads. Larvae were all collected at the bottom of young stems of *S. megaphylla* (Table 3) and were always solitary. Typically, plants exhibiting signs of infestation by *A. simillima* sp. nov. larvae have a curled, brown central leaf. One pupa was found in a stem; however, as in most species of *Acrapex*, most larvae probably pupate in the soil near exit holes.

Distribution

Kenya and Uganda. The records are from Guineo-Congolian rain forests (Mosaic #1) (White 1983) (Fig. 4), belonging to the Congolian bioregion (Linder *et al*. 2012) (Fig. 5).

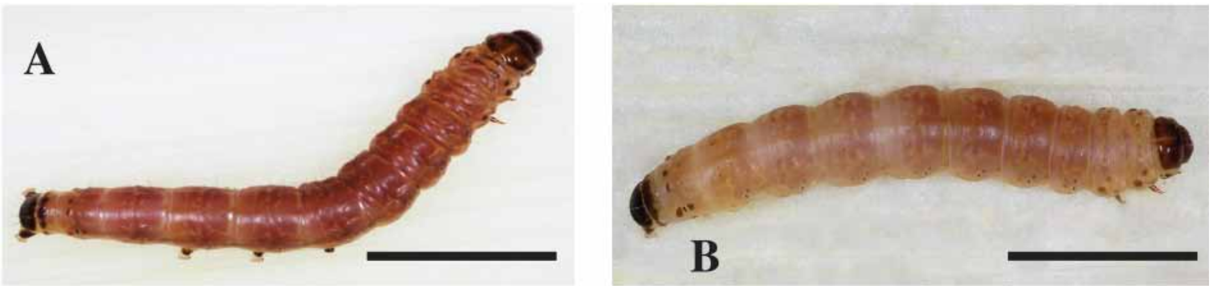

Fig. 9. Last instar larva. **A**. *Acrapex simillima* le Ru sp. nov. **B**. *A. unicolora* (Hampson, 1910). Scale bar = 10 mm.

***Acrapex unicolora* (**Hampson, 1910)
Figs 2H, P, 3H, 8G–J, 9B

Calamistis unicolora Hampson, 1910: 279, pl. 143, fig. 12.
Acrapex brunneosa Bethune-Baker, 1911: 517.
Busseola hemiphlebia Hampson, 1914: 161.
Busseola fuscantis Hampson, 1918: 153.
Acrapex simplex Janse, 1939: 359.
Acrapex quadrata Berio, 1973: 150, fig. 35.

Acrapex brunneosa – Poole 1989: 19 (catalogue).
Busseola fuscantis – Poole 1989: 181 (catalogue).
Acrapex hemiphlebia – Poole 1989: 20 (recombination, catalogue).
Acrapex quadrata – Poole 1989: 20 (catalogue).
Acrapex simplex – Poole 1989: 21 (catalogue).
Acrapex unicolora – Poole 1989: 21 (recombination, catalogue).

Diagnosis

Male easily separated from males of other species of the group by the pointed apex of the uncus, the ridge-like, roundly pointed expansion of the coastal margin and by the aedeagus having no vesica (Fig. 2H, P); female easily separated from females of other species of the group by the ductus bursae, which are widening and sclerotised on the ostial side, and by the narrow, band-like, slightly sclerotised antrum (Fig. 3H).

Material examined

Holotype

DEMOCRATIC REPUBLIC OF THE CONGO: ♂, Upper Congo, 1907, A.F.R. Wollaston leg. (BMNH 1907-269, Agrotidae genitalia slide 1458).

Other material

ANGOLA: 2 ♂♂, N'Dalla Tando, N Angola, 2700 ft, 26 Nov. 1908, Dr W.J. Ansorge leg. (BMNH, Noctuidae genitalia slide 2480).

DEMOCRATIC REPUBLIC OF THE CONGO: ♂, holotype of *A. quadrata*, Sankuru, Dimbelenge, 25 Nov. 1950, Dr M. Fontaine leg. (MRAC, adult; MCSN, genitalia, Berio, E prep N.3753).

MALAWI: 1 ♀, Mt Mlanje, Nyasaland, 30 Jun. 1913, S.A. Neave leg. (BMNH 1914-171, Agrotidae genitalia slide No 1345); 5 ♂♂, Mt Mlanje, Nyasaland, 26 Mar. 1913, S.A. Neave leg. (BMNH 1914-171); 1 ♂, Luchenya River, Mlanje, Nyasaland, 26 Mar. 1913, S.A. Neave leg. (BMNH 1914-171).

NIGERIA: ♂, holotype of *A. hemiphlebia*, Kateregi, 12 Sep. 1910, Scott Macfie leg. (BMNH, 1911-269, Agrotidae genitalia slide No 1460).

TANZANIA: 2 ♀♀, Iringa Region, Kifanya, 09°33.443' S, 35°06.246' E, 1675 m a.s.l., 22 Mar. 2007, ex larva (in stem of *Andropogon gayanus* Kunth), B. Le Ru leg. (MNHN, gen. prep. LERU Bruno/G365-G366); 2 ♂♂, Iringa Region, Ngongwa, 09°29.665' S, 35°03.137' E, 1662 m a.s.l., 3 Mar. 2008, ex larva (in stem of *Andropogon gayanus* Kunth), B. Le Ru leg. (MNHN, gen. prep. LERU Bruno/G364-G474).

REPUBLIC OF THE CONGO: 1 ♂, Kouilou Department, Lac Nanga, 04°31.005' S, 12°04.172' E, 35 m a.s.l., 17 Apr. 2013, ex light trap, B. Le Ru leg. (MNHN, gen. prep. LERU Bruno/G538); 2 ♂♂, 2 ♀♀, Bouenza Department, Kalakundu, 04°22.145' S, 13°40.516' E, 325 m a.s.l., 7 Apr. 2013, ex light trap, B. Le Ru leg. (MNHN, male gen. prep. LERU Bruno/G577, female gen. prep. LERU Bruno/G576).

ZAMBIA: 2 ♂♂, 2 ♀♀, Luapula Province, Ngwenya, 12°58.538' S, 28°27.319' E, 1243 m a.s.l., 21 Mar. 2012, ex light trap, B. Le Ru leg. (MNHN, male gen. prep. LERU Bruno/G174, female gen. prep. LERU Bruno/G150); 1 ♀, North-Western Province, Keundwe, 13°06.596' S, 25°21.421' E, 1225 m a.s.l., 19 Mar. 2012, ex light trap, B. Le Ru leg. (MNHN, gen. prep. LERU Bruno/G158); 1 ♂, 1 ♀, Central Province, Khaembe, 14°33.107' S, 28°19.301' E, 1191 m a.s.l., 15 Mar. 2012, ex light trap, B. Le Ru leg. (MNHN, male gen. prep. LERU Bruno/G170, female gen. prep. LERU Bruno/G171).

ZIMBABWE : 1 ♂, Bulawayo Dist., 16 Jan. 1918, ex light trap, A.J.T. Janse leg. (PM, gen. prep. 3370).

Redescription (Fig. 8G–J)

The sexes look similar; however, the general shape of the female fore wing is more elongated at the apex than in the male; antennae fuscous, filiform in female and slightly ciliate in male; flagellum fuscous, adorned with grey scales, palpus fuscous, suffused with grey scales, eyes fuscous brown. Head and base of thorax brown, thorax dark ochreous; legs brown, suffused with grey scales, ringed with grey; abdomen fuscous, suffused with grey scales.

Fore wing. Ground colour dark ochreous, suffused with fuscous and black scales, more heavily along veins, termen and costal area; reniform indicated by few white scales, surrounded by some brown scales; row of black elongated spots on veins in front of reniform; longitudinal brown median fascia along lower external margin of cell, ending obliquely at apex; veins below cell adorned with fuscous brown and white scales; row of black elongated spots between veins on margin; fringe fuscous, slightly suffused with brown. Underside of fore wing with ground colour grey, suffused with fuscous scales, more heavily on costa and close to termen.

Hind wing. Ground colour white in female, white ochreous in male, heavily suffused with fuscous scales in male; veins heavily irrorated, with fuscous scales, costa and apex more heavily suffused with fuscous scales; fringe grey, suffused with fuscous. Underside of hind wing grey, suffused with fuscous scales, but much more heavily on costa and apex; veins slightly irrorated, with fuscous scales.

Wingspan. 20–23 mm (8 ♂♂); 22–28 mm (7 ♀♀).

Larval L5 instar (Fig. 9B). Length 20–25 mm, width 2.5 mm; head smooth, dark brown, prothoracic shield brown; body with ground colour pink, pinacula and caudal plate dark brown. Young larvae very similar to mature ones.

Male genitalia (Fig. 2H, P). Uncus long, widening in distal third, tapering in pointed apex, tufted with long hairs on upper side. Tegumen with medium-sized rounded penniculi, vinculum pointed, with medium-sized triangular saccus, valves short and broad, cucullus rounded and tufted, with medium-sized hairs, coastal margin slightly broadened on inner side and produced into ridge-like expansion, roundly pointed and slightly curved inwardly; large juxta, plate-like, base slightly flattened, without sclerotization, with long and widening neck, slightly bilobate at apex, ending on each side with rounded expansion; aedeagus short, slightly curved.

Female genitalia (Fig. 3H). Corpus bursae elongated, ovoid, without signa; ductus bursae about one-third length of corpus bursae, not sclerotised on bursa side, widening and sclerotised on ostial side. Antrum narrow, band-like, slightly sclerotised. Ovipositor lobes short (2 times as long as wide), with bluntly pointed apex, dorsal surface bearing numerous short and stout setae.

Bionomics

Acrapex unicolora is a markedly hygrophilous species of banks of streams, rivers and marshes. Larvae were collected in Tanzania from *A. gayanus*, *Chrysopogon zizanoides* (L.) Roberty, *Cymbopogon schoenanthus* subsp. *proximus* (Hochst. ex A.Rich.) Maire & Weller, *Cymbopogon pospischilii* (K. Schum.) C.E.Hubb., *Hyparrhenia diplandra* (Hack.) Stapf and *S. sphacelata* (Schumach.) Moss (Table 3). Larvae were collected at the bottom of young stems and were always solitary. Typically, plants exhibiting signs of infestation by *A. unicolora* larvae have a curled, brown central leaf. No pupae were found in stems and therefore borers probably pupate in the soil near exit holes.

Distribution

Angola, the Democratic Republic of the Congo, Malawi, Nigeria, the Republic of the Congo, Tanzania, Zambia and Zimbabwe. Known from many localities from sea level to 2147 m a.s.l. Moths were found in a mosaic of lowland rain forest and secondary grassland (Mosaic #11A), a mosaic of Zambezian dry evergreen forest and wetter miombo woodland (Mosaic #21), wetter Zambezian miombo woodland (Mosaic no 25) and undifferentiated montane vegetation (Mosaic #19) (White 1983) (Fig. 4), belonging to the Congolian and to the Zambezian bioregion, respectively (Linder *et al*. 2012) (Fig. 5).

Remarks

It is worth highlighting that the records of *Acrapex hemiphlebia* by Janse (1939) correspond to specimens from a different species that is not yet described and related to *Acrapex albivena* Hampson, 1910.

Phylogenetic and molecular species delimitation analyses

Maximum likelihood analyses performed with IQ-TREE yielded a well-supported topology (49 of the 70 nodes supported by BV ≥ 70%; see Fig. 10), especially when considering interspecific relationships (17 of the corresponding 18 nodes supported by BV ≥ 70%). The only representative of *A. mediopuncta* (formerly *P. mediopuncta*) is recovered in a derived position among other members of the genus *Acrapex*. Members of the *A. albivena* species group are recovered as sister to the *unicolora* group (*A. albivena*, *A. salmona*, *A. sporobola*, *A. syscia* and *A. yakoba*), with a high support (BV of 96%), while the only representative of the *stygiata* species group (*A. stygiata*) is found as sister to both the *albivena* and *unicolora* group (BV of 100%).

Results of the PTP molecular species delimitation are congruent with the results of the morphological study. Interestingly, PTP analyses highlight the existence of a potential new species refered to as *Acrapex* sp. SECOG7537 (Fig. 10). This specimen corresponds to a unique larva collected in the Republic of the Congo on *Pennisetum unisetum* (Nees) Benth.

Discussion

The ten species treated here make up a morphologically homogeneous group; this contradicts the statement made by Tams & Bowden (1953) about the isolation of the genus *Poecopa*. Indeed, the male genitalia of *A. mediopuncta* show the typical male characteristics of the *A. unicolora* group, namely the short and broad valves, the coastal margin slightly broadened on the inner side and produced into a spine and the short and stout aedeagus with a hand-shaped vesica with needle-shaped cornutus. The synonymy of *Poecopa* with *Acrapex* at the generic level is also entirely supported by the results of the phylogenetic analyses, which recover *A. mediopuncta* in a derived position within the clade encompassing all *A. unicolora* representatives. Although the ten species revised and described here present a very similar wing pattern and colour, they are easily separated with both male and female genitalia; the vesica is the most useful character to identify the males and the ventral plate of the antrum allows a clear identification of the different females. However the group is composed of two ecological sub-groups, with

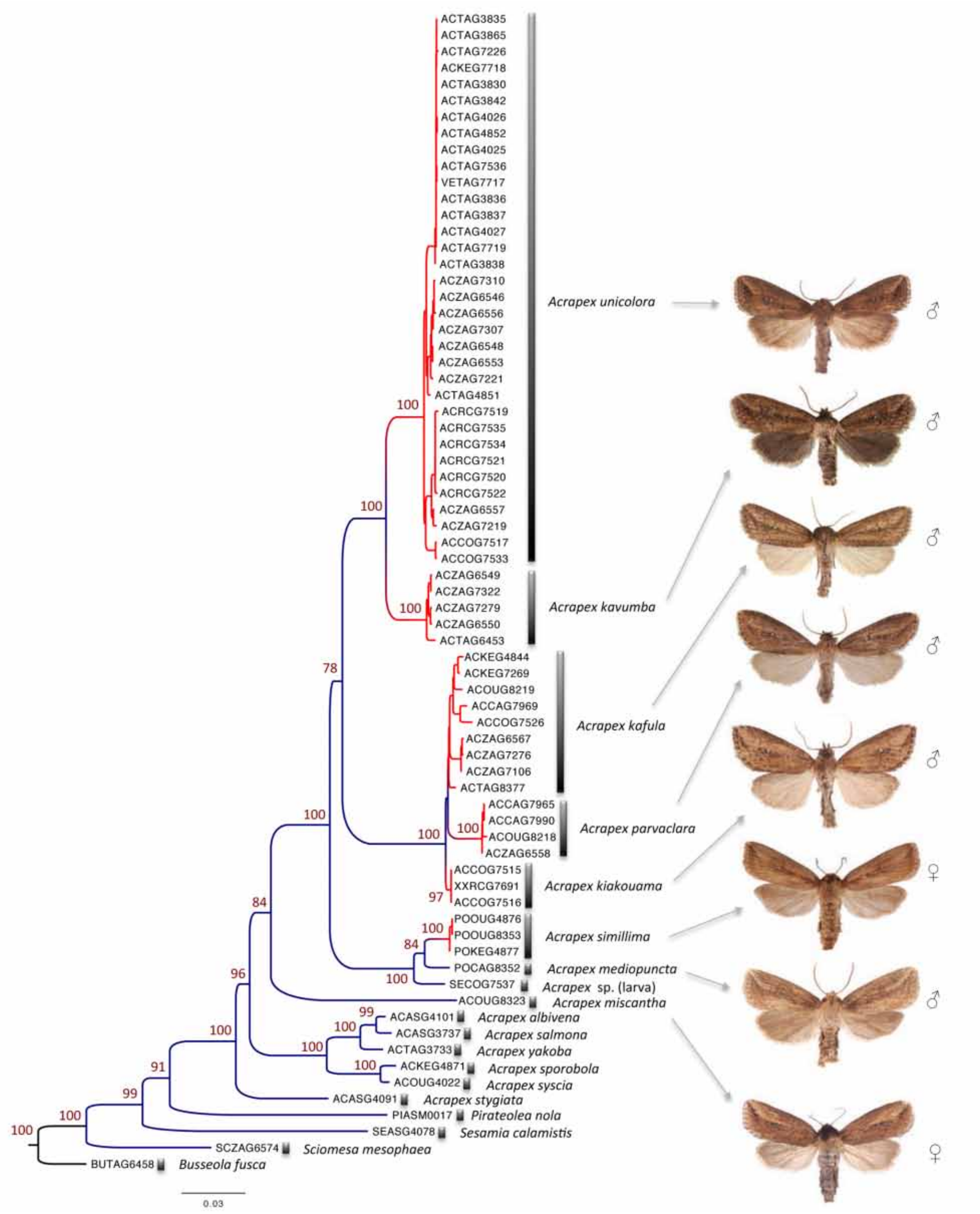

Fig. 10. Maximum likelihood tree resulting from the analysis of the combined dataset carried out with IQ-TREE. Support of major nodes is displayed as BV (only BV > 50% are shown). On the right, corresponding adult habitus (for species belonging to the *A. unicolora species* group) are also included for illustrative purposes. Results of PTP analyses are figured using coloured branches and vertical side bars. Putative molecular species clusters are indicated using transitions between blue-coloured branches to red-coloured branches (vertical bars are also informative).

A. mediopuncta and *A. simillima* sp. nov. as markedly forest species inhabiting open patches of grasses in Guineo-Congolian rain forests of the Congolian bioregion and all the other species markedly hygrophilous of banks of streams, rivers and marshes in Zambezian miombo woodland belonging to the Zambezian bioregion. While *A. unicolora*, *A. kafula* sp. nov. and *A. parvaclara* are recorded from East Africa to western areas of Central Africa, our results suggest restricted distributions for all six other species. Despite extensive surveys in more than 16 sub-Saharan countries, we did not collect any species of the *A. unicolora* group in the Southern or Somalian Bioregions (Linder *et al*. 2012).

We report here for the first time a host-plant association of *A. unicolora* to different species of Andropogonae and to one Panicae, *S. sphacelata*, and of *A. miscantha* sp. nov. to another Andropogonae, *M. violaceus*. The potential new species collected in the Republic of the Congo was also reared from another species of Andropogoneae, *Pennisetum unisetum*. Although we did not record any host plant association for other species of the group, considering that the grasses of the miombo woodland are normally members of the Andropogonae (McClanahan & Young 1996), we can hypothetize that most of the species should be associated to species of that tribe. This is also consistent with the pattern of host-plant associations that were demonstrated for other species of *Acrapex* (the *albivena* and *stygiata* species groups), which were exclusively reared from Andropogoneae (Le Ru *et al.* 2014).

As all recorded *Acrapex* larvae, the four *Acrapex* species of the *A. unicolora* group collected in the field as larvae came from host plants belonging to the *Sesamia*-like species as defined by Le Ru *et al.* (2006b). They are morphologically similar, with ground colour pinkish buff, without any markings. The feeding habits of the four species are similar, with the typical symptom of plant attack being death of the central tiller, often referred to as ‘dead heart’. In addition, as for *Acrapex* spp. (Le Ru *et al.* 2014), we always found the larvae solitary in the stems. We speculate that *Acrapex* larvae typically fed on more than one stem before completing their development. We suspect that the larvae disperse when they reach the fourth instar. No pupae were found in stems, and therefore borers probably pupate in the soil.

Acknowledgments

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Appendix

Accession numbers.

Species	Voucher	GenBank accession numbers					
		12S	**16S**	**Cytb**	**COI**	**28S**	**EF1-α**
Acrapex kafula Le Ru sp. nov.	ACCAG7969	KX423962	KX424028	KX424165	KX424233	KX424097	KX424302
Acrapex kafula Le Ru sp. nov.	ACCOG7526	–	KX424029	KX424166	KX424234	KX424098	KX424303
Acrapex kafula Le Ru sp. nov.	ACKEG4844	KX423963	KX424030	KX424167	KX424235	KX424099	KX424304
Acrapex kafula Le Ru sp. nov.	ACKEG7269	KX423964	KX424031	KX424168	KX424236	KX424100	KX424305
Acrapex kafula Le Ru sp. nov.	ACOUG8219	KX423965	KX424032	KX424169	KX424237	KX424101	KX424306
Acrapex kafula Le Ru sp. nov.	ACTAG8377	KX423966	KX424033	KX424170	KX424238	KX424102	KX424307
Acrapex kafula Le Ru sp. nov.	ACZAG6567	KX423967	KX424034	KX424171	KX424239	KX424103	KX424308
Acrapex kafula Le Ru sp. nov.	ACZAG7106	KX423968	KX424035	KX424172	KX424240	KX424104	KX424309
Acrapex kafula Le Ru sp. nov.	ACZAG7276	KX423969	KX424036	KX424173	KX424241	KX424105	KX424310
Acrapex kavumba Le Ru sp. nov.	ACTAG6453	–	KX424037	KX424174	KX424242	KX424106	KX424311
Acrapex kavumba Le Ru sp. nov.	ACZAG6549	KX423970	KX424038	KX424175	KX424243	KX424107	KX424312
Acrapex kavumba Le Ru sp. nov.	ACZAG6550	KX423971	KX424039	KX424176	KX424244	KX424108	KX424313
Acrapex kavumba Le Ru sp. nov.	ACZAG7279	–	KX424040	KX424177	KX424245	KX424109	KX424314
Acrapex kavumba Le Ru sp. nov.	ACZAG7322	KX423972	KX424041	KX424178	KX424246	KX424110	KX424315
Acrapex kiakouama Le Ru sp. nov.	ACCOG7515	KX423973	KX424042	KX424179	KX424247	KX424111	KX424316
Acrapex kiakouama Le Ru sp. nov.	ACCOG7516	KX423974	KX424043	KX424180	KX424248	KX424112	KX424317
Acrapex kiakouama Le Ru sp. nov.	ACRCG7691	KX423975	KX424044	KX424181	KX424249	KX424113	KX424318
Acrapex mediopuncta (Bowden, 1956)	ACCAG8352	KX423976	KX424045	KX424182	KX424250	KX424114	KX424319
Acrapex miscantha Le Ru sp. nov.	ACOUG8323	KX423977	KX424046	KX424183	KX424251	KX424115	KX424320
Acrapex parvaclara Berio, 1973	ACCAG7965	KX423978	KX424047	KX424184	KX424252	KX424116	KX424321
Acrapex parvaclara Berio, 1973	ACCAG7990	KX423979	KX424048	KX424185	KX424253	KX424117	KX424322
Acrapex parvaclara Berio, 1973	ACOUG8218	KX423980	KX424049	KX424186	KX424254	KX424118	KX424323
Acrapex parvaclara Berio, 1973	ACZAG6558	KX423981	KX424050	KX424187	KX424255	KX424119	KX424324

Appendix (cont.)

Accession numbers.

Species	Voucher	GenBank accession numbers					
		12S	**16S**	**Cytb**	**COI**	**28S**	**EF1-α**
Acrapex simillima Le Ru sp. nov.	ACKEG4877	KX423982	KX424051	KX424188	KX424256	KX424120	KX424325
Acrapex simillima Le Ru sp. nov.	ACOUG4876	KX423983	KX424052	KX424189	KX424257	KX424121	KX424326
Acrapex simillima Le Ru sp. nov.	ACOUG8353	KX423984	KX424053	KX424190	KX424258	KX424122	KX424327
Acrapex sp.	ACCOG7537	KX423985	KX424054	–	KX424259	KX424123	KX424328
Acrapex unicolora (Hampson, 1910)	ACCOG7517	KX423986	KX424055	KX424191	KX424260	–	KX424329
Acrapex unicolora (Hampson, 1910)	ACCOG7533	KX423987	KX424056	KX424192	KX424261	KX424124	KX424330
Acrapex unicolora (Hampson, 1910)	ACKEG7718	KX423988	KX424057	KX424193	KX424262	KX424125	KX424331
Acrapex unicolora (Hampson, 1910)	ACRCG7519	KX423989	KX424058	KX424194	KX424263	KX424126	KX424332
Acrapex unicolora (Hampson, 1910)	ACRCG7520	KX423990	KX424059	KX424195	KX424264	KX424127	KX424333
Acrapex unicolora (Hampson, 1910)	ACRCG7522	KX423991	KX424060	KX424196	KX424265	KX424128	KX424334
Acrapex unicolora (Hampson, 1910)	ACRCG7534	KX423992	KX424061	KX424197	KX424266	KX424129	KX424335
Acrapex unicolora (Hampson, 1910)	ACRCG7535	KX423993	KX424062	KX424198	KX424267	KX424130	KX424336
Acrapex unicolora (Hampson, 1910)	ACRCG7521	KX423994	KX424063	KX424199	KX424268	KX424131	KX424337
Acrapex unicolora (Hampson, 1910)	ACTAG3830	KX423995	KX424064	KX424200	KX424269	KX424132	KX424338
Acrapex unicolora (Hampson, 1910)	ACTAG3835	KX423996	KX424065	KX424201	KX424270	KX424133	KX424339
Acrapex unicolora (Hampson, 1910)	ACTAG3836	KX423997	KX424066	KX424202	KX424271	KX424134	KX424340
Acrapex unicolora (Hampson, 1910)	ACTAG3837	KX423998	KX424067	KX424203	KX424272	KX424135	KX424341
Acrapex unicolora (Hampson, 1910)	ACTAG3838	KX423999	KX424068	KX424204	KX424273	KX424136	KX424342
Acrapex unicolora (Hampson, 1910)	ACTAG3842	KX424000	KX424069	KX424205	KX424274	KX424137	KX424343
Acrapex unicolora (Hampson, 1910)	ACTAG3865	KX424001	KX424070	KX424206	KX424275	KX424138	KX424344
Acrapex unicolora (Hampson, 1910)	ACTAG4025	KX424002	KX424071	KX424207	KX424276	KX424139	KX424345
Acrapex unicolora (Hampson, 1910)	ACTAG4026	KX424003	KX424072	KX424208	KX424277	KX424140	KX424346
Acrapex unicolora (Hampson, 1910)	ACTAG4027	KP682532	–	KP682639	KP682610	KP682581	KP682668
Acrapex unicolora (Hampson, 1910)	ACTAG4851	KX424004	KX424073	KX424209	KX424278	KX424141	KX424347

Appendix (cont.)

Accession numbers.

Species	Voucher	GenBank accession numbers					
		12S	16S	Cytb	COI	28S	EF1-α
Acrapex unicolora (Hampson, 1910)	ACTAG4852	KX424005	KX424074	KX424210	KX424279	KX424142	KX424348
Acrapex unicolora (Hampson, 1910)	ACTAG7226	KX424006	KX424075	KX424211	KX424280	KX424143	KX424349
Acrapex unicolora (Hampson, 1910)	ACTAG7536	KX424007	KX424076	KX424212	KX424281	KX424144	KX424350
Acrapex unicolora (Hampson, 1910)	ACTAG7717	KX424008	KX424077	KX424213	KX424282	KX424145	KX424351
Acrapex unicolora (Hampson, 1910)	ACTAG7719	KX424009	KX424078	KX424214	KX424283	KX424146	KX424352
Acrapex unicolora (Hampson, 1910)	ACZAG6546	KX424010	KX424079	KX424215	KX424284	KX424147	KX424353
Acrapex unicolora (Hampson, 1910)	ACZAG6548	KX424011	KX424080	KX424216	KX424285	KX424148	KX424354
Acrapex unicolora (Hampson, 1910)	ACZAG6553	KX424012	KX424081	KX424217	KX424286	KX424149	KX424355
Acrapex unicolora (Hampson, 1910)	ACZAG6556	KX424013	KX424082	KX424218	KX424287	KX424150	KX424356
Acrapex unicolora (Hampson, 1910)	ACZAG6557	KX424014	KX424083	KX424219	KX424288	KX424151	KX424357
Acrapex unicolora (Hampson, 1910)	ACZAG7219	KX424015	KX424084	KX424220	KX424289	KX424152	KX424358
Acrapex unicolora (Hampson, 1910)	ACZAG7221	KX424016	KX424085	KX424221	KX424290	KX424153	KX424359
Acrapex unicolora (Hampson, 1910)	ACZAG7307	KX424017	KX424086	KX424222	KX424291	KX424154	KX424360
Acrapex unicolora (Hampson, 1910)	ACZAG7310	KX424018	KX424087	KX424223	KX424292	KX424155	KX424361
Acrapex albivena Hampson, 1910	ACASG4101	KX424019	KX424088	KX424224	KX424293	KX424156	KX424362
Acrapex salmona Le Ru, 2014	ACASG3737	KX424020	KX424089	KX424225	KX424294	KX424157	KX424363
Acrapex sporobola Le Ru, 2014	ACKEG4871	KX424021	KX424090	KX424226	KX424295	KX424158	KX424364
Acrapex stygiata (Hampson, 1910)	ACASG4091	KX424022	KX424091	KX424227	KX424296	KX424159	KX424365
Acrapex syscia Fletcher, 1961	ACOUG4022	KX424023	KX424092	KX424228	KX424297	KX424160	KX424366
Acrapex yakoba Le Ru, 2014	ACTAG3733	KX424024	KX424093	KX424229	KX424298	KX424161	KX424367
Busseola fusca (Fuller, 1901)	BUTAG6458	KX424025	KX424094	KX424230	KX424299	–	KX424368
Pirateolea nola Moyal *et al.*, 2010	PIASM0017	KX424026	KX424095	KX424231	KX424300	KX424162	KX424369
Sciomesa mesophaea (Aurivillius, 1910)	SCZAG6574	–	–	–	–	KX424163	–
Sesamia calamistis Hampson, 1910	SEASG4078	KX424027	KX424096	KX424232	KX424301	KX424164	KX424370