

Revision of the African genus *Acroprivesa* Schmidt, 1912 (Hemiptera, Fulgoromorpha, Ricaniidae)

Adam Stroiński*

Museum and Institute of Zoology PAS, Wilcza 64, 00–679 Warszawa, Poland

Abstract

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Key Words

Africa

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The African genus *Acroprivesa* Schmidt, 1912 (type-species *Acroprivesa suturalis* Schmidt, 1912) is reviewed and re-interpreted based on two recent and one fossil species. Lectotype and paralectotypes are designated for *A. suturalis* Schmidt, 1912. *A. bifurcata* sp. n. is described. The distribution of the genus suggests an East Africa origin and the present distribution as the result of post-glacial expansion and evolution. Environmental data for extinct and recent species suggest also a probable connection with trees and bushes of family Fabaceae (subfamily Caesalpinioideae).

Introduction

Planthoppers family Ricaniidae, to which belongs more than 400 “named” species placed in 51 genera, surprisingly never has been subdivided into suprageneric grouping (subfamilies or tribes). A recent study of Ricaniidae (Stroiński, unpublished) based on new morphological characters and reinterpretation of some of the already used ones shown that conception of the genera should be revised. Moreover based on the examined specimens of Ricaniidae from several collections and institutions the much more reliable number of species belonging to this family should be estimated 1,000 rather than 400 (Stroiński, unpublished).

In order to prepare a new proposal of the higher classification of the family revisions of the all genera appear therefore necessary and the present paper is the first of a series of them about Afrotropical Ricaniidae.

Except few genera and particularly the three huge and widely distributed genera *Ricania*, *Pochazia* and *Tarundia* that need critical revisions, most of them are recorded only from Afrotropical region. Indeed, almost half of all described genera (26) and about 1/3 of all named “species” are recorded from the Afrotropical Region (including Mascarene Islands and Southern Arabia).

The monotypic genus *Acroprivesa* was erected by Schmidt (1912) for his new species *A. suturalis* from Tanzania (Deutsch Ost Africa), mainly based on shape

of claval angle in tegmina. During the study of Fulgoromorpha and Cicadomorpha fauna from East African copal (Pleistocene–Holocene) Stroiński & Szwedo (2002) described the second species – *A. msandarusi* and a third species, *A. bifurcata* sp. n. is described here.

Material and methods

Preparations and illustration

The abdomen of the specimens examined was cut and boiled in 10% KOH with a few drops of black chlorazol for dyeing the ectodermic genital ducts based on the method introduced by Carayon (1969) and Bourgoin (1993). Dissections and cleaning of genital structures were done in distilled water. Final observations and drawings were done in glycerin using a camera lucida attached to Olympus microscopes (SZH10 and BX50). The photos were made using digital camera Minolta 7D and microscope Leica MZ 16, with camera IC 3D; images are produced using the software Synoptics Automontage[®]. The SEM photograph were made using the microscope HITACHI S-3400N.

The nomenclature of the male genitalia follows Bourgoin (1998), Bourgoin & Huang (1990) and for the female genitalia Bourgoin (1993).

Measurements and abbreviations

The following measurements and abbreviations were made and used in this study:

Total length	measured (in dorsal view) from anterior margin of vertex to apex of tegmina
A/B	width of vertex measured at the anterior margin/length of vertex measured in mid line
C/E	width of frons at upper margin/length of frons in mid line
D/E	maximum width of frons/length of frons in mid line

* E-mail: adam@miiz.waw.pl

F/B	length of pronotum in mid line/length of vertex in mid line
G/B + F	length of mesonotum/cumulative length of vertex and pronotum in mid line
G/H	length of mesonotum in mid line/width of mesonotum between lateral angles
I/J	length of tegmen measured from the base to the apical margin in median portion/width of tegmen measured from apex of clavus to the anterior margin

Material

The material studied comes from the institutions listed below (names of the curators of the collection in parentheses):

BMNH	The Natural History Museum, London (A. Ross, M. Webb)
BPBM	Bernice P. Bishop Museum, Honolulu, Hawaii, USA (D.J. Preston)
IRSNB	Royal Belgian Institute of Natural Sciences, Brussels, Belgium (R. Detry)
MIZ	Museum and Institute of Zoology PAS, Warsaw
ZMB	Museum für Naturkunde Humbolt-Universität zu Berlin, (J. Deckert)

Results

Acroprivesa Schmidt, 1912

Figures 1–25

Acroprivesa Schmidt, 1912: 77.

Acroprivesa: Melichar 1923; Metcalf 1955; Stroiński & Szwedo 2002; Szwedo, Bourgoin & Lefebvre 2004.

Type species. *Acroprivesa suturalis* Schmidt, 1912: 78; type species by original designation.

Diagnosis. *Acroprivesa* is similar to genus *Pocharista* Melichar, 1923 (type-species *Scolypopa conradti*

Schmidt, 1906) by the following characters: frons (lateral carinae separated at base, frontal fields present), clypeus (without median carina), tegmina (elongated with almost straight longitudinal veins, costal area about as wide as costal cell, costal cell without transverse veinlets), male genitalia (periandrium with lateral split which surpasses the half of his length, lateral lobe of dorsal part of periandrium well developed, lateral processes of aedeagus present) and female genitalia (posterior margin of gonoplac with a row well developed teeth, bursa copulatrix with 2 widely connected pouches). *Acroprivesa* differs from *Pocharista* by the form of margin in claval angle – triangular/re-entrant (almost straight in *Pocharista*), presence of small fold on lateral lobe of upper periandrium (lateral lobe smooth/plain in *Pocharista*) and single posterior lateral fold of aedeagus (double in *Pocharista*).

Description

Head (Figs 1–2, 13–14). Head with compound eyes (in dorsal view) about as wide as thorax.

Vertex transverse, distinctly wider than long in mid line; all margins well carinate; median carina observed in recent species (in some specimens extremely weakly visible), in fossil species absent.

Frons at upper margin about as wide as high in mid line, widest at median portion about level of ocelli; lateral margins arcuate, not incised near the ocelli, in lower part slightly curved to frontoclypeal suture; frontal disc delicately rugose vertically; lateral carinae separated at base; transverse carina absent; frontal fields (more or less visible) present near the connection of lateral carinae

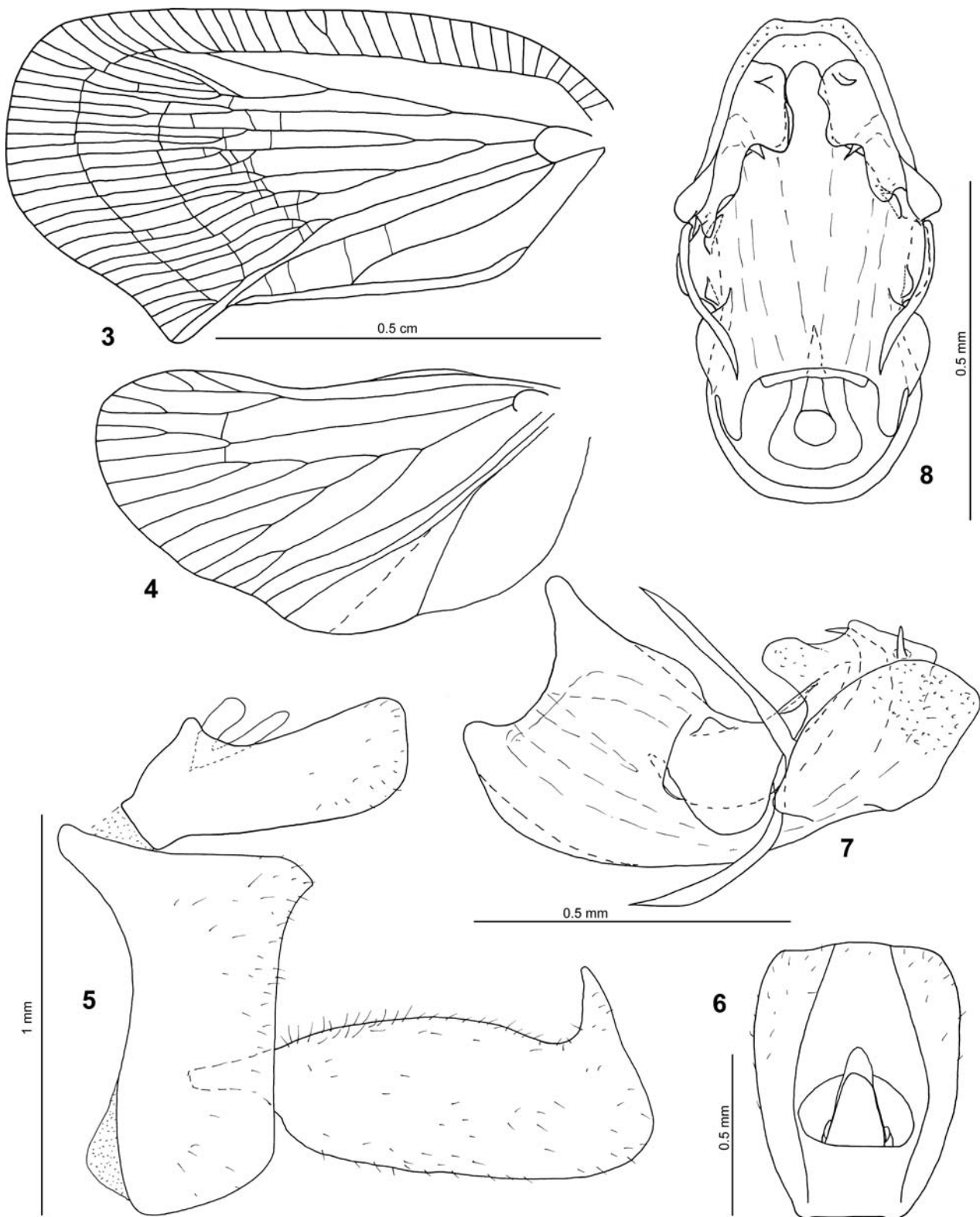


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Figures 1–2. *Acroprivesa suturalis* Schmidt, 1912, female, type. 1. Frons, anterior view; 2. Habitus, dorsal view.



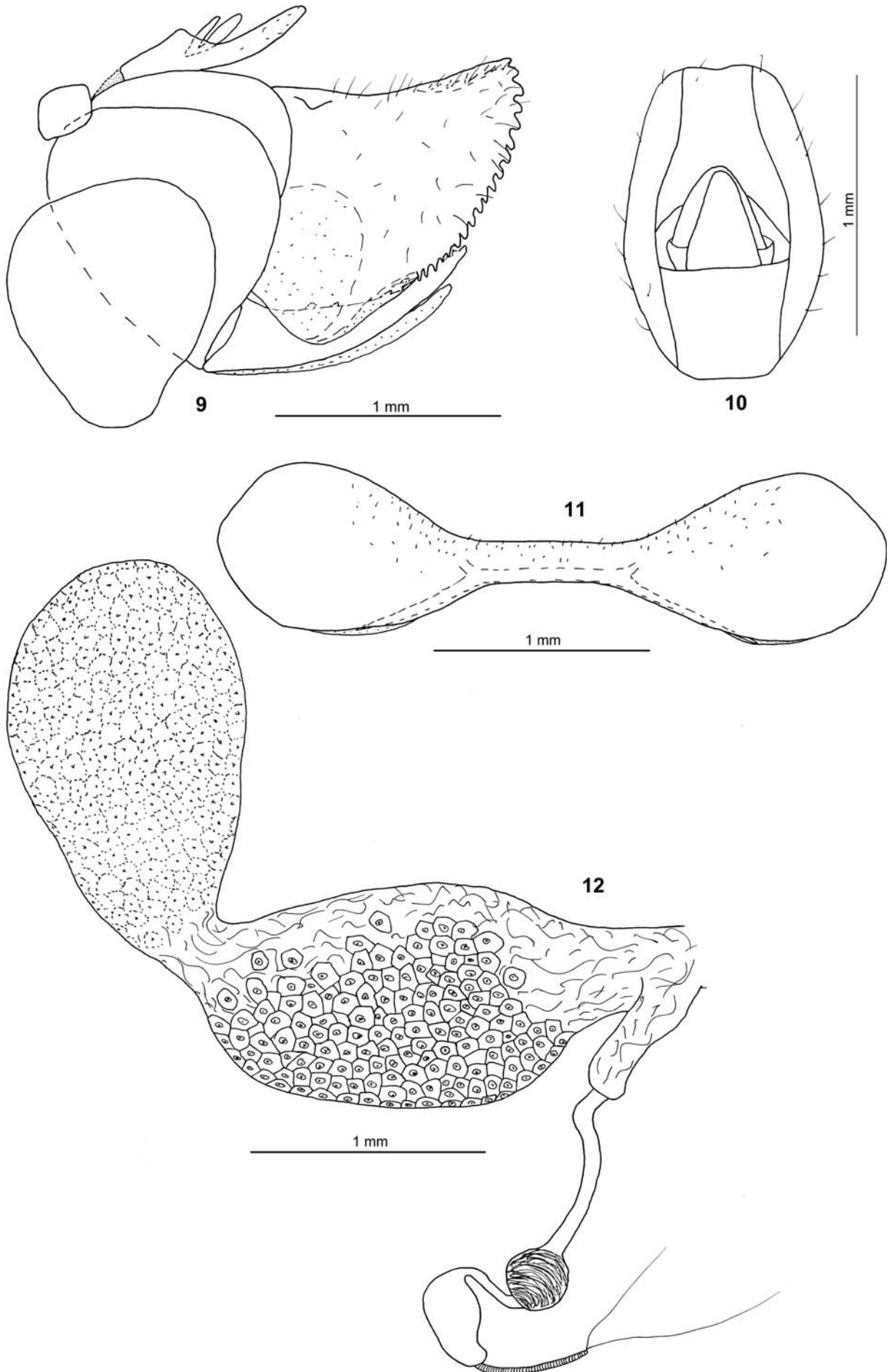
Figures 3–7. *Acroprivesa suturalis* Schmidt, 1912, male. **3.** Left tegmina, dorsal view; **4.** Left wing, dorsal view; **5.** Genital capsule, lateral view; **6.** Anal tube, dorsal view; **7.** Phallic complex, lateral view; **8.** Phallic complex, dorsal view.

and upper margin of frons; frontal disc near the clypeal suture (in lateral view) weakly concave.

Antennal segment II (pedicel) shallowly elongate barrel-shape, with microsetae and a few plate organs present only on the top of pedicel.

Compound eyes with small callus at lower margin. Ocelli present.

Clypeal suture almost straight. Clypeus without median carina; median portion partly flattened.



Rostrum with apical segment shorter than subapical one, its apex reaching to hind coxae.

Thorax (Figs 1–4, 15–16, 23–24). Pronotum distinctly longer in mid line than vertex; disc of pronotum with median carina and two lateral impressions.

Mesonotum diamond-shape, distinctly longer than cumulative length of vertex and pronotum in mid line; median carina distinctly visible; lateral carinae connected at base and reaching to posterior margins (in some specimens near the posterior margin partly melted); anterolateral carinae not surpassing the lateral angles of mesonotum and connected with lateral carinae (in most of specimens connection point weakly visible).

Tegmina membranous, flattened and elongate; anterior margin straight and almost parallel to posterior one; apical angle broadly rounded, placed distad relatively to claval angle claval angle triangular (re-entrant); posterior margin arcuate; costal area with dense and numerous transverse veinlets, about as wide as costal cell; costal cell without transverse veinlets; longitudinal veins almost straight; subcosta forming common stem with radial, median leaving basal cell as single stem (in recent species) or separately (in fossil species); nodal line (transverse veinlets more or less regularly arranged but not drawing a distinct line) present, posterior part of tegmina with distinctly visible apical and subapical transverse line of transverse veinlets, apical and subapical cells long and narrow, about this same size; clavus with scarce and weakly visible, single veinlets between CuP – Pcu and Pcu + A1 – CuP.

Wings with well visible, narrow and elongate precostal cell; longitudinal veins almost straight; 2 transverse veinlets: r-m, m-cu present.

Hind tibia elongate and slender, not widened at apical part, with 2 lateral spines and 6 apical teeth of similar size, arranged in distinctly arcuate line; basitarsomere with 6 apical teeth of similar size, arranged in line.

Male (Figs 5–8, 18–21). Anal tube (in lateral view) elongate, distinctly surpassing pygofer; base of anal tube slightly narrower than posterior part; lower margin almost straight, posterior margin almost straight, postero-anal upper margin almost parallel to lower one. Anal tube (in dorsal view) widest at posterior part, with anal aperture placed before half of length (at about 1/3); lateral margin slightly arcuate.

Pygofer (in lateral view) higher than wide; dorsal posterior angle without process, sharp.

Genital styles (in lateral view), distinctly longer than wide and bearing distinct spine-like process at the end of dorsal margin; lower margin almost straight, in median portion with extremely weakly visible incises; hind

margin in caudo-dorsal angle widely rounded and a little surpassing the posterior margin of process; upper margin arcuate.

Phallic complex. Perianthrium with long lateral split surpassing the half of his length (to about 2/3); dorsal perianthrium not elevated basally and without extra structures; upper margin smooth or with folds, apex slightly oriented dorsally, lateral fold distinctly developed, wide and bearing small fold; lateral basal part smooth; apex of ventral perianthrium not extending apex of dorsal one; lower margin with narrow and elongate fold; posterior margin not cut and without additional structures; apical and lateral parts of lower part of perianthrium with small spineferous microsculpture.

Aedeagus s.l. with a pair of long, narrow, sclerotized and smooth lateral spinose processes, both single arms almost straight or weakly curved; one oriented dorsally and basally with single apex; second oriented ventrally (directed ventrad and curving mesad) and basally with single or bifurcated apex; base of both process placed after the lateral lobe dorsal perianthrium; posterior lateral fold single and membranous with smooth margins; surface with small process and spineferous microsculpture; posterior process oriented dorsally with sharp and sclerotized apex.

Female (Figs 9–12, 17). Pregenital sternite with well developed lateral lobes; anterior and posterior margin in median portion almost straight.

Anal tube (in lateral view) elongated, not surpassing the half of upper margin of gonoplac; posterior part of anal tube partly dorsoventrally flattened.

Gonoplac unilobate, laterally flattened, posterior margin with row of well development teeth (in upper part partly double), placed about 45° in respect to longitudinal axis of the body, posterior ventral part partly membranous.

Gonophysis VIII partly laterally flattened at dorsal shallowly concave with sharp apex and well visible teeth placed at the posterior-dorsal margin.

Bursa copulatrix with widely connected two pouches; wall of first pouch with well visible cells and sclerotized ornamentation, cells most placed at lower part of pouch, second pouch membranous with very weakly visible cells and very small central sclerotized ornamentation.

Spermatheca well developed; *ductus receptaculi* with long and smooth basal ductus and wrinkled membranous bulba at apex; *diverticulum ductus* distinctly shorter than *ductus receptaculi* with short basal ductus and with membranous and elongated bulba at apex, ductus about same length as bulba.

Distribution. Africa (Fig. 25): Malawi, Namibia, Tanzania, Zambia.



Figures 9–12. *Acroprivesa suturalis* Schmidt, 1912, female. **9.** Genital capsule, lateral view; **10.** Anal tube, dorsal view; **11.** Pregenital sternite flattened, dorsal view; **12.** Ectodermal genital structures, lateral view.

Key to the species of the genus *Acroprivesa*

1. Veins M1 + M2 separating at the basal cell level (Fig. 23) – fossil species. *A. msandarusi* Str. & Szw.
- Veins M1 + M2 living basal cell after a common stem (Figs 2–3) – recent species 2
2. Apex of lower lateral process of aedeagus single (Fig. 7) *A. suturalis* Schmidt
- Apex of lower lateral process of aedeagus bifurcated (Fig. 20) *A. bifurcata* sp. n.

Acroprivesa suturalis Schmidt, 1912

Figures 1–12

Acroprivesa suturalis Schmidt, 1912: 78

Acroprivesa suturalis: Melichar 1923, Metcalf 1955; Stroiński 1999; Stroiński & Szewo 2002.

Locus typicus. Lindi, Tanzania.

Diagnosis. *Acroprivesa suturalis* is similar to *A. msandarusi*, but differs by the venation of tegmina in *A. suturalis* M veins leaving basal cell as single stem, in *A. msandarusi* M vein leaving basal cell separately.

Description

Total length 0.75–0.94 cm.

Head. Vertex (Fig. 2). Proportion A/B = 6.50–7.40; anterior margin arcuate; lateral margins almost straight or very weakly arcuate; posterior margin arcuate with major curvature than anterior one.

Frons (Fig. 1). Proportion C/E = 0.94–1.11; proportion D/E = 1.20–1.40; upper margin straight; median carina and lateral carinae well visible, reaching to 3/4 of frons high; lateral carinae distinctly arcuate and almost parallel to lateral margins, with breaking point about half of length.

Thorax (Fig. 2). Pronotum. Proportion F/B = 1.33–1.60; anterior margin broadly arcuate; posterior margin almost parallel.

Mesonotum. Proportion G/F + B = 4.50–6.00; proportion G/H = 1.04–1.08.

Tegmina (Figs 2–4). Proportion I/J = 2.03–2.31; M veins leaving basal cell as single stem. Sc + R forking slightly after M fork, Cu bifurcates distad to Sc + R and M fork.

Male (Figs 5–8). Anal tube (in lateral view) almost rectangular; posterior angles about 90°. Anal tube (in dorsal view) almost rectangular, basal margin almost straight; posterior margin in median portion shallowly convex.

Pygofer. Upper margin (in lateral view) almost straight and almost perpendicular to posterior one; posterior margin almost straight.

Phallic complex. Periandrium. Upper margin with 2 folds, basal fold biggest than posterior one; lateral lobe with fold placed at median portion; lower margin fold not extending the half periandrium.

Aedeagus s.l. second lateral process single.

Female (Figs 9–12). Anal tube (in lateral view) reaching to 1/5 of upper margin of gonoplac, lower margin of anal tube delicate arcuate.

Anal tube (in dorsal view) elongated, with similar wide of basal and posterior part; basal margin almost straight, lateral margins arcuate with breaking point about level of anus, before half of length; posterior margin in median portion weakly concave.

Coloration (Figs 1–2). Vertex brown with two yellow patches on lateral parts, median portion with yellow line. Frons yellowish with brown ornamentation placed between lateral carinae near the upper margin and narrow band near the clypeal suture, between lateral carinae and margins with small and brown spots; median portion with melted brown coloration, frontal fields yellowish. Clypeus ochraceous to brown with well visible dark brown musculature. Pronotum in median portion brown near posterior margin more darkness, lateral parts with small brown spots; median carina and lateral impressions yellow. Mesonotum brown with yellow patches especially in median portion; carinae yellow. Legs, abdomen and genital capsule yellowish to light brown. Tegmina brown, with much lighter median portion; costal area with 2 white patches: smaller in basal portion, not surpassing the costal area, second triangular, much biggest than first, lower margin reaching to costal cell; in 1/3 of length transverse brown band; apical cell with irregular white and brown spots. Wing hyaline, along posterior margin with more or less brown band; veins brown.

Type material. Lectotype, ♂: [D.-Ostafrika 1.VII.09 bis Mitte VIII.09 Tendaguru, Lindi Janensch S. G.], [Type], [*Acroprivesa suturalis* Schmidt ♂ Edm. Schmidt determ. 1912] – (ZMB).

Paralectotypes: [D.-Ostafrika 1.VII.09 bis Mitte VIII.09 Tendaguru, Lindi Janensch S. G.], [Type], [*Acroprivesa suturalis* Schmidt ♂ Edm. Schmidt determ. 1912], [Mus. Zool. Polonicum Warszawa 12/45], [SYNTYPE (No. 2523)] – (♂, MIIZ); [D.-Ostafrika 1.VII.09 bis Mitte VIII.09 Tendaguru, Lindi Janensch S. G.], [Type], [*Acroprivesa suturalis* Schmidt ♀ Edm. Schmidt determ. 1912], [Mus. Zool. Polonicum; Warszawa; 12/45], [SYNTYPE (No. 2524)] – (♀, MIIZ); [Tanga Hammerstein S.], [Type], [*Acroprivesa suturalis* Schmidt ♀ E. Schmidt determ. 1912], [Mus. Zool. Polonicum Warszawa 12/45], [SYNTYPE (No. 2525)] – (♀, MIIZ); [D.-Ostafrika 1.VII.09 bis Mitte VIII.09 Tendaguru, Lindi Janensch S. G.], [Type], [*Acroprivesa suturalis* Schmidt ♀ Edm. Schmidt determ. 1912] – (2♀, ZMB).

Remarks to type material. 2♀ from original series deposited in ZMB and labeled: [D.-Ostafrika 1.VII.09 bis Mitte VIII.09 Tendaguru, Lindi Janensch S. G.], [Type], [*Acroprivesa suturalis* Schmidt ♀ Edm. Schmidt determ. 1912] were found as completely destroyed. Two pins were also observed in the same box (near the types) labeled as part of original type specimens: [D.-Ostafrika 1.VII.09 bis Mitte VIII.09 Tendaguru, Lindi Janensch S. G.] but both were undeterminate and also

destroyed (one pin with only right tegmen and wing, the second without any parts of specimen). Based on labels, both “specimens” could belong to the original series however preparation of these “specimens” was different as the labelled types series were pinned on minutia pin mounted on the cardboard while these two were pinned on “normal” pins.

Based on article 74 International Code of Zoological Nomenclature I designated the lectotype and paralectotypes to fix the taxonomic status of this species.

Other examined materials. **Tanzania:** [TANZANIA: D.O. Afr. Mikesse Bezirk Morogoro W. Janensch S. G.] – (3♂♂, 2♀♀, ZMB).

Distribution. Africa (Fig. 25): Tanzania.

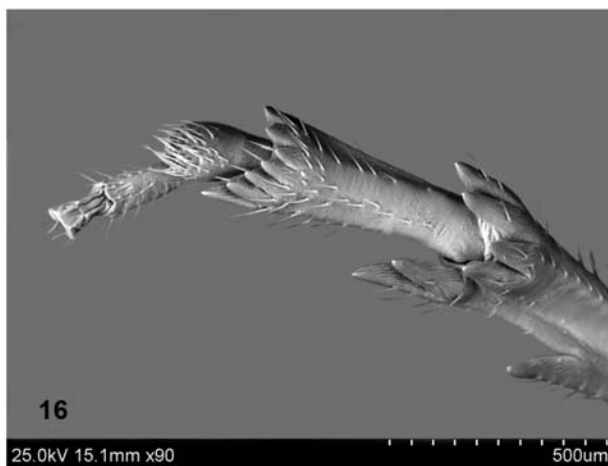
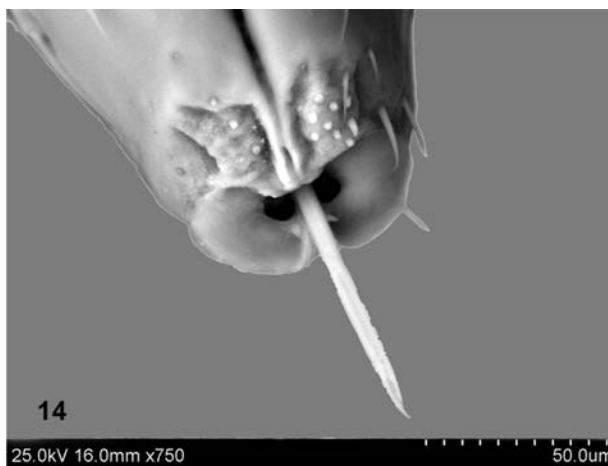
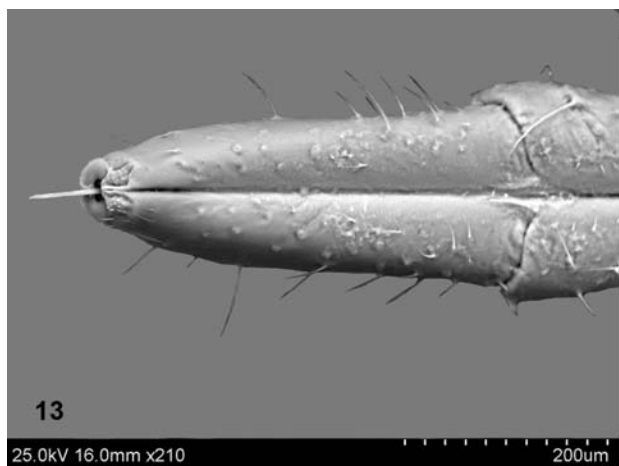
Remarks. The examined specimens were collected between July and September.

***Acroprivesa bifurcata* sp. n.**

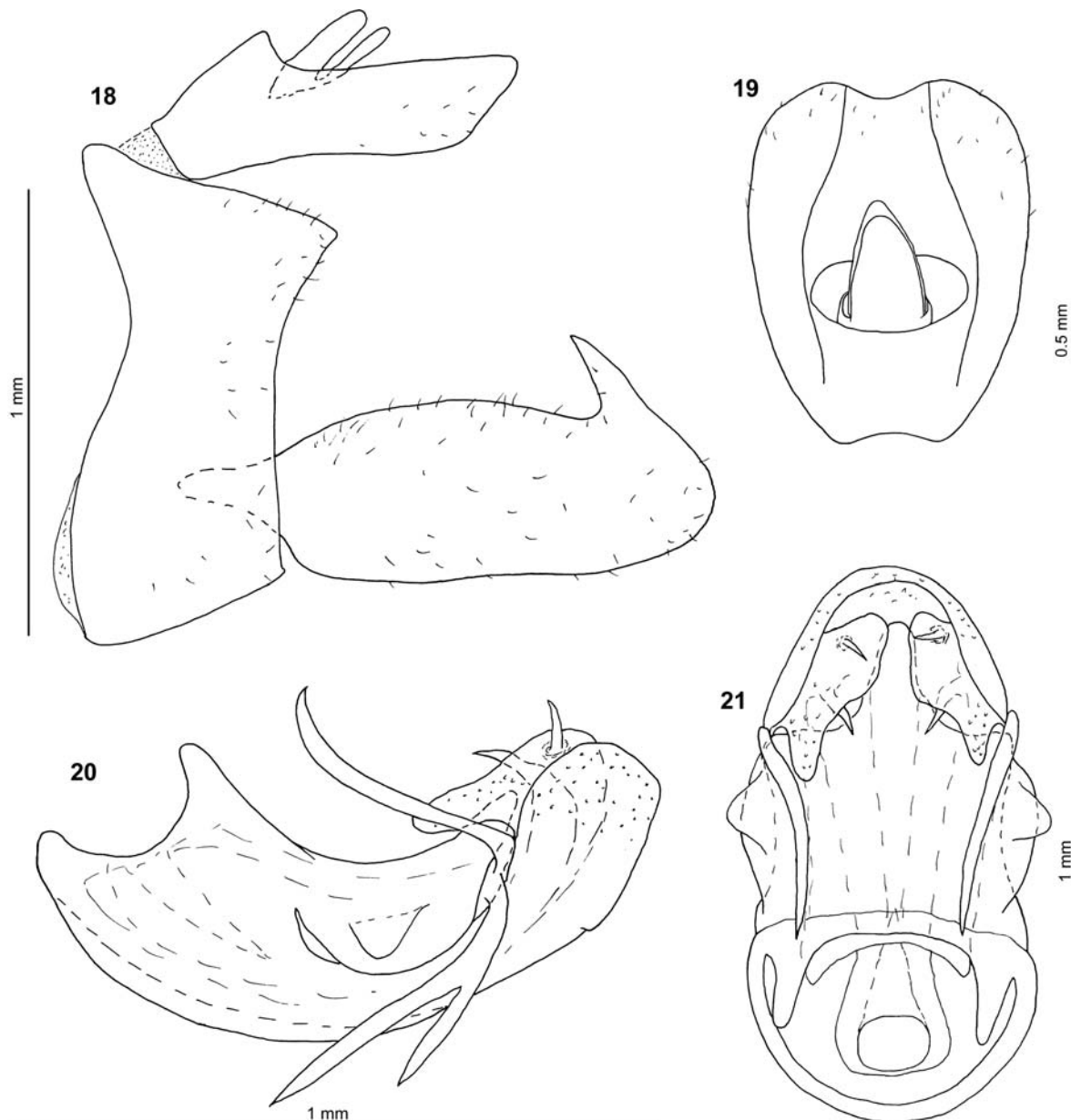
Figures 13–21

Etymology. The specific name refers to the bifurcate apex of lateral spine of aedeagus. Gender feminae.

Locus typicus. Rimo-Marine Motel Kafue River (15°49' S/28°12' E), Zambia.



Figures 13–17. *Acroprivesa bifurcata* sp. n. **13–14.** Apical part of rostrum, dorsal view; **15.** Hind tibia, dorsal view; **16.** Hind tarsomere, dorsal view; **17.** Gonoplac (female), internal view.



Figures 18–21. *Acroprivesa bifurcata* sp. n. **18.** Genital capsule, lateral view; **19.** Anal tube, dorsal view; **20.** Phallic complex, lateral view; **21.** Phallic complex, dorsal view.

Diagnosis. *Acroprivesa bifurcata* is similar to *A. suturalis* but differs by male genitalia (*A. bifurcata* – upper margin of periandrium plain, apex of the lateral process of aedeagus bifurcate, in *A. suturalis* upper margin of periandrium is bearing 2 folds, apex of the lateral spine of aedeagus single).

Description

Total length 0.80–1.00 cm.

Head. Vertex. Proportion A/B = 7.50–9.25; anterior margin weakly arcuate, lateral margin straight and sub-

parallel, posterior margin concave more curving than anterior one.

Frons. Proportion C/E = 0.95–1.00; proportion D/E = 2.22–2.28; upper margin straight; median carina and lateral carinae distinctly visible, reaching almost to 3/4 of frons height; lateral carinae distinctly arcuate and almost parallel to lateral margin, apex of carinae weakly curved to clypeal suture.

Thorax. Pronotum. Proportion F/B = 1.50–2.00; anterior margin arcuate; posterior margin almost parallel to anterior one or with slightly minor curvature than anterior one.

Mesonotum. Proportion G/F + B = 5.42–5.80; proportion G/H = 1.01–1.04.

Tegmina. Proportion I/J = 1.85–2.12; M vein leaving basal cell as single stem.

Male (Figs 18–21). Anal tube (in lateral view); elongate, ventral posterior angle obtuse-angled; dorsal posterior angle acute. Anal tube (in dorsal view): basal margin concave; posterior margin, in median portion, concave.

Pygofer. Upper margin (in lateral view) straight and sloping/falling to posterior one; posterior margin arcuate.

Phallic complex. Periandrium. Upper margin smooth/plain; lateral lobe with fold placed at dorso-basally lower margin fold surpassing half periandrium.

Aedeagus s. l. Second lateral process distinctly bifurcated.

Female (Fig. 17). Anal tube (in lateral view) a little surpassing the posterior margin of IX tergite lower margin weakly arcuate, posterior part tapering apicad. Anal tube (in dorsal view) elongated, its basal and posterior part about this same as wide; basal margin straight; lateral margin arcuate; posterior margin in median portion almost straight or very weakly concave.

Coloration. As in *A. suturalis*.

Type material. Holotype, ♂: [Zambia: Rimo-Marine Motel Kafue River 15°49' S/28°12' E 16.–18.III.1993, lg.Göllner] – (ZMB).

Paratypes: **Malawi**: [Mpatamanga George Shire River S Malawi 1000FT R.J Murphy 24 Jan 2001], [Coll. I.R.Sc.N.B. Malawi] – (2 ♂♂, IRSNB); [On Mal. Minmale Est. 3–2-81 Thyolo Coll. L 222 Malawi Entomology] – (2 ♂♂, BMNH); [8/8/14 Ruo River E. Nyasaland 200 (RCW) in tent] – (♂, BPBM); **Namibia**: [Namibia –Exp. ZMB 1992 East Caprivi: Katima Mulilo, 17°29' S/24° 17' E, lux 3.–8.III.92, lg. J. Decker] – (♂, ZMB); **Zambia**: [Zambia: Kachalola 14°45' S/30°35' E, 820 m ü.n. 19.III.1993, leg. J. Deckert] – (♀, ZMB); [Zambia: South Luangwa N.P. Mfuwe, Crocodile Farm 13°06' S/31°47' E, 450 m ü.n. 21.–24.III.1993, lg Göllner] – (♂, ♀ ZMB).

Distribution. Africa (Fig. 25): Namibia, Malawi, Zambia.

Remarks. The specimens from Namibia and Zambia (ZMB) were collected along rivers valleys mostly in woodland with *Colophospermum mopane* (J. Kirk ex Benth.) J. Léonard (Fabaceae) and in gallery forest

(Koch et al. 1995). The examined specimens were collected between January and March.

Acroprivesa msandarusi Stroński & Szwedo, 2002

Figures 22–24

Acroprivesa msandarusi Stroński & Szwedo, 2002: 60.

Terra typica. East coast of Tanzania.

Diagnosis. *Acroprivesa msandarusi* is similar to *A. suturalis*, but differs by the venation of tegmina in *A. msandarusi* M vein leaving basal cell separately, in *A. suturalis* M veins leaving basal cell as single stem.

Description

Total length 0.97 cm.

Head. Vertex. Proportion A/B = 6.16; anterior and posterior margins arcuate and almost parallel; lateral margins straight and parallel; median carina absent.

Frons. Proportion C/E = 1.20; proportion D/E = 1.51; upper margin straight; median carina reaching almost to frontoclypeal suture; lateral carinae reaching to half of high; frontal disc (in lateral view) near the clypeal suture weakly concave.

Thorax. Pronotum. proportion F/B = 1.83; anterior margin widely arcuate, in median portion partly flattened; posterior margin arcuate, in median portion weakly concave.

Mesonotum. Proportion G/F + B = 3.94; proportion G/H = 1.06;

Tegmina (Figs 22–23). Proportion I/J = 1.90; M vein leaving basal cell with two separately stems. MA fork distad to MP fork and Sc + R fork, Sc + R bifurcates slightly before MP fork, Cu bifurcates distad to Sc + R, R, MA and MP fork.

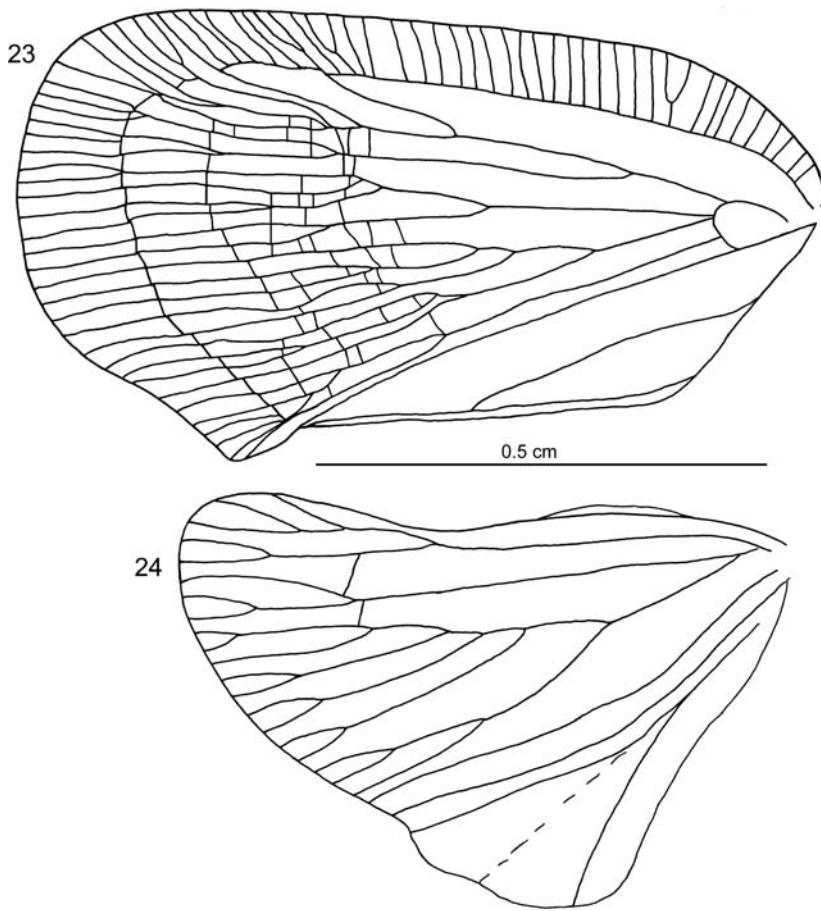
Wings. As in Figure 24.

Coloration. As in *A. suturalis*.

Type material. Holotype, ♂: [Gum Copal Inclusa Ricaniidae Homoptera E. Africa Brit. Mus. (N. H.) G.D.] – (BMNH). The piece of



Figure 22. *Acroprivesa msandarusi* Stroński & Szwedo, 2002, habitus, ventral view.



Figures 23–24. *Acroprivesa msandarusi* Stroński & Szwedo, 2002; **23.** Left tegmina, dorsal view; **24.** Left wing, dorsal view.

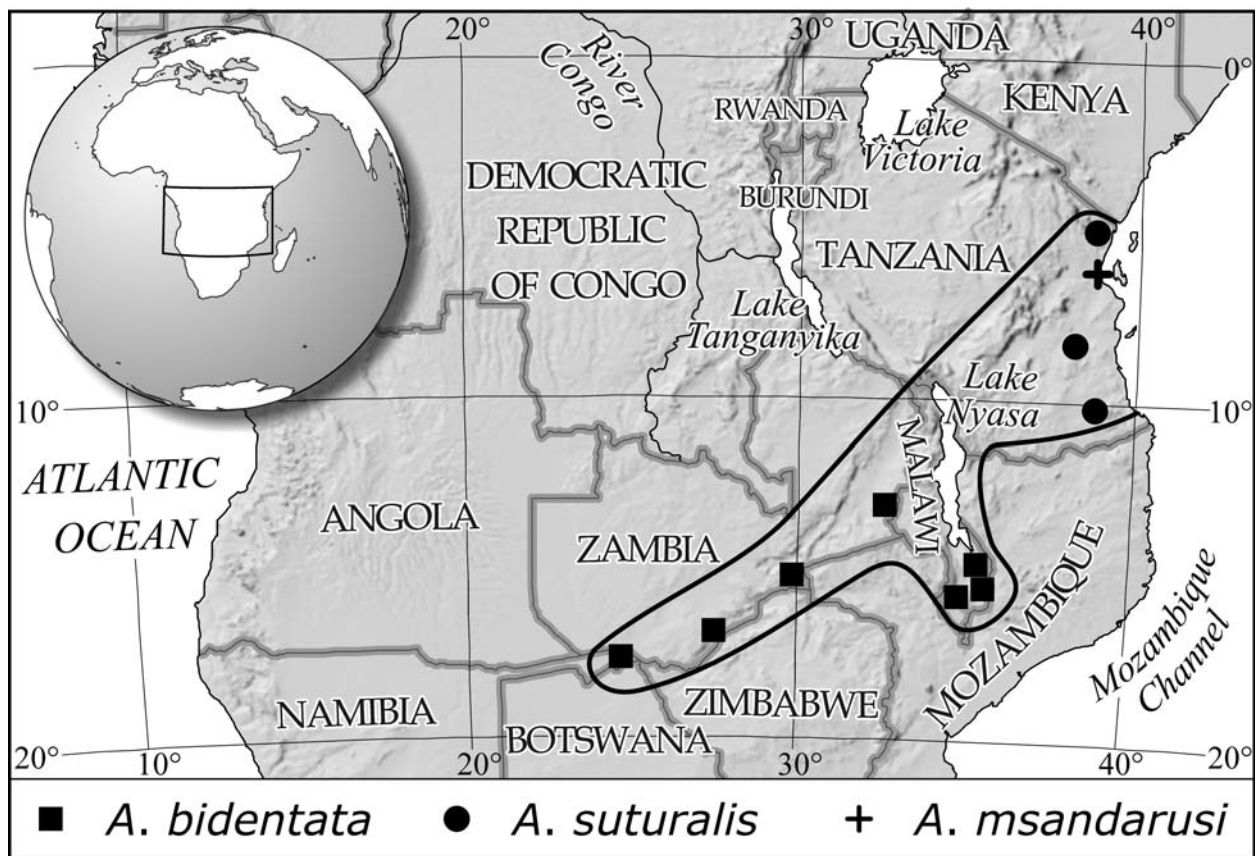


Figure 25. Distribution of the genus *Acroprivesa* Schmidt, 1912.

copal is sunk in Canada balsam, put into glass box and mounted on slide.

Distribution. Africa (Fig. 25): Tanzania (east coast).

Remarks. The East African copal, also named Zanzibar copal, is a kind of fossil resin, which comes from a small area in East Africa coast. It was excavated from “Kopalgruben” (copal mines) since the beginning of the end 19th century. These localities are placed near the Dar es Salaam, in the coast of Tanzania (Schlüter & von Gnielinski 1987).

The age of this African fossil resins is still under debate. Geinaert (2002) suggest that then East African copal 100,000 years old, but Schlüter and von Gnielinski believe that this fossil resin is aged from Pleistocene and not older than Pliocene.

The East African copal is derived almost entirely from the trees of *Hymenaea verrucosa* Gaertn. (Fabaceae), recently this species is restricted to the East Africa and Zanzibar (Poinar 1992; Geinaert 2002).

Discussion

Acroprivesa belongs to the group of the African genera (work in progress) which could be separated by the following combination of the characters: frons with lateral carinae separated at base; clypeus without median carina; anterolateral carinae of mesonotum not surpassing the lateral angles of mesonotum and connected with lateral carinae; tegmina elongate with costal cell as wide as costal area and without transverse veinlets; longitudinal veins almost straight; nodal line (transverse veinlets more or less regularly arranged but not drawing a distinct line) present; perianthium with long lateral split surpassing the half of his length and with lateral lobes; posterior margin of gonoplac with row of well developed teeth, bursa copulatrix with 2 widely connected pouches.

Two characters are unique for the genus *Acroprivesa* and they represent probable autapomorphies for the genus: 1) the triangular/re-entrant claval angle of the tegmina and 2) the presence of an extra fold on the lateral lobe of the upper perianthium.

The genus *Acroprivesa* is the small genus with only 2 recent and one fossil species distributed through Africa, from Tanzania to Namibia. The extinct species *A. msandarusi* was described from East African copal (Pleistocene) collected in the east coast of Tanzania, and also from Tanzania *A. suturalis* is recorded. The “copal” tree is *Hymenaea verrucosa*, which recently is restricted to the East Africa and Zanzibar (Poinar 1992; Geinaert 2002). This area (southern Kenya and Tanzania) is recognized as one of the 7 sub-Saharan places of plant diversity and endemism and its probably the glacial refugium (Hamilton 1982; Linder 2001).

Most of the environments in which *A. bifurcata* specimens were collected are from the ecoregion of Zambezian and Mopane Woodlands, which are characterized

by the dominance of the tree *Colophospermum mopane*. Both trees – *H. verrucosa* and *C. mopane* belongs to family Fabaceae Lindl. (subfamily Caesalpinioideae DC.).

All this data suggest an East Africa origin area for the genus *Acroprivesa* and the present distribution as the result of post-glacial expansion and evolution. Environmental data for extinct and recent species of the genus *Acroprivesa* suggest that his is probably connected with trees and bushes of family Fabaceae.

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References

- Bourgoin, T. 1988. A new interpretation of the homologies of the Hemiptera male genitalia, illustrated by the Tettigometridae (Hemiptera, Fulgoromorpha). In Vidano, C. & Arzone, A. (eds). 6th Auchenorrhyncha Meeting, Turin, Italy, September 7–11, 1987. CNR-IPRA, Turin: pp. 113–120.
- Bourgoin T. 1993. Female genitalia in Hemiptera Fulgoromorpha, morphological and phylogenetic data. – Annales de la Société Entomologique de France (N.S.) 26: 555–564.
- Bourgoin, T. & Huang, J. 1990. Morphologie compare des genitalia males des Trypetimorphini et remarques phylogénétiques (Hemiptera: Fulgoromorpha: Tropiduchidae). – Annales de la Société entomologique de France (N.S.) 5: 179–193.
- Carayon, J. 1969. Emploi du noir chlorazol en anatomie microscopique des insectes. – Annales de la Société entomologique de France (N.S.) 5: 179–193.
- Schmidt, E. 1912. Diagnosen neuer Fulgoriden=Gattungen und Arten nebst einigen Bemerkungen. – Stettiner Entomologische Zeitung 73: 67–102.
- Geinaert, E. 1998. L'ambre. – Minéraux & Fossiles 266: 2–40.
- Hamilton, A. C. 1982. Environmental history of East Africa: a study of the Quaternary. Academic Press, London, New York: 328 pp.
- Koch, F., Deckert, J. & Uhlig, M. 1995. The Entomological Expeditions of the Museum of Natural History Berlin to Africa from 1992 to 1995 as a Basis for the Project “Biodiversity of Insects in the Afrotropical Region”. – Mitteilungen aus dem Zoologischen Museum in Berlin 71 (2): 189–211.
- Linder, H. P. 2001. Plant diversity and endemism in sub-Saharan tropical Africa. – Journal of Biogeography 28: 169–182.
- Melichar, L. 1898. Vorläufige Beschreibungen neuer Ricaniiden. – Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft in Wien 48: 384–400.
- Melichar, L. 1923. Homoptera Fam. Acanaloniidae, Flatidae et Ricaniidae. – Genera Insectorum 182: 1–185, 2 tabs.
- Metcalf, Z. P. 1955. Fascicle IV, Part 16, Ricaniidae. General Catalogue of the Homoptera: pp. 1–199.
- Poinar Jr., G. O. 1992. Life in amber. Stanford University Press, Palo Alto, California: 350 pp.
- Schlüter, T. & von Gnielinski, F. 1987. The East African copal its geologic, stratigraphic, paleontologic significance and comparison with fossil resins of of similar age. – National Museums of Tanzania Occasional Paper 8: 1–32.

-
- Stroiński, A. 1999. The type material of the families Lophopidae, Nogodinidae and Ricaniidae (Hemiptera-Auchenorrhyncha) in the Museum and Institute of Zoology PAS, Warsaw. – Bulletin of the Museum and Institute of Zoology PAS, supplement to Annales Zoologici 2: 63–68.
- Stroiński, A. & Szwedo, J. 2002. An overview of the Fulgoromorpha and Cicadomorpha in the East African copal (Hemiptera). – Denisia 04, Neue Folge 176: 57–66.
- Szwedo, J., Bourgoïn, T. & Lefebvre, F. 2004. Fossil Planthoppers (Hemiptera: Fulgoromorpha of the World. An Annotated catalogue with notes on Hemiptera classification. Studio 1, Warszawa: 199 pp.
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