

A revision of the African species of *Achaemenes* STÅL, 1866 (Homoptera, Cixiidae)

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Summary

A taxonomic study is presented treating the species of *Achaemenes* occurring on the African continent. The genus and all species are redescribed, a key is given, and for each species the male genitalia are illustrated. The following new synonyms are established: *Achaemenes eshowei* SYNAVE, 1952 equals *A. costalis* STÅL, 1866; *Achaemenes seydeli* SYNAVE, 1959 equals *A. malaisei* SYNAVE, 1953; *Achaemenes marleyi* SYNAVE, 1959 equals *A. notatinervis* STÅL, 1866; *Achaemenes kilimanus longispinus* SYNAVE, 1960 equals *Achaemenes longipennis* (WALKER, 1851); *Achaemenes kilimanus* JACOBI, 1910 and *Achaemenes kilimanus minutus* SYNAVE, 1953 are new junior synonyms of *Achaemenes australis*; *Achaemenes ornatipennis* STÅL, 1866 is confirmed as a synonym of *A. resurgens* (WALKER, 1858), and *Cixius obscurus* WALKER, 1851 is confirmed as a junior synonym of *Achaemenes australis* (WALKER, 1851); *Achaemenes obscurus* SYNAVE is proposed as a new status for *Achaemenes kilimanus* var. *obscurus* SYNAVE. A lectotype is selected for *A. notatinervis* and *A. resurgens*. The following new species are described: *Achaemenes kampalensis*, *A. furciferens*, *A. pseudocostalis*, *A. lobatus*, *A. pingatus*, *A. vehemens*, and *A. brixioides*.

Key-words: taxonomy, *Achaemenes*, Cixiidae, Africa.

Résumé

Ce travail présente une étude taxonomique des espèces afrotropicales du genre *Achaemenes*. Le genre ainsi que les espèces sont redécrites, une clé est présentée, et les genitalia mâles sont illustrés. Les noms suivants sont mis en synonymie: *Achaemenes eshowei* SYNAVE, 1952 égale *A. costalis* STÅL, 1866; *Achaemenes seydeli* SYNAVE, 1959 égale *A. malaisei* SYNAVE, 1953; *Achaemenes marleyi* SYNAVE, 1959 égale *A. notatinervis* STÅL, 1866; *Achaemenes kilimanus longispinus* SYNAVE, 1960 égale *Achaemenes longipennis* (WALKER, 1851); *Achaemenes kilimanus* JACOBI, 1910 et *Achaemenes kilimanus minutus* SYNAVE, 1953 sont mis en synonymie avec *Achaemenes australis*; *Achaemenes ornatipennis* STÅL, 1866 est confirmé comme synonyme de *A. resurgens* (WALKER, 1858), et *Cixius obscurus* WALKER, 1851 est confirmé comme synonyme de *Achaemenes australis* (WALKER, 1851); *Achaemenes obscurus* SYNAVE est proposé comme un nouveau statut pour *Achaemenes kilimanus* var. *obscurus* SYNAVE. Un lectotype est sélectionné pour *A. notatinervis* et *A. resurgens*. Les espèces suivantes sont décrites comme nouvelles pour la science: *Achaemenes kampalensis*, *A. furciferens*, *A. pseudocostalis*, *A. lobatus*, *A. pingatus*, *A. vehemens*, et *A. brixioides*.

Mots-clés: Taxinomie, Cixiidae, *Achaemenes*, Afrique.

Introduction

The genus *Achaemenes* was erected by STÅL, 1866 to accommodate four southern African species: *Achaemenes*

notatinervis STÅL, *A. costalis* STÅL, and *A. ornatipennis* STÅL. Between 1905 and 1920 six more species were added to this genus by MELICHAR (1905), JACOBI (1910 and 1917), all described from East and Southern Africa, and from Madagascar. SYNAVE (1953b) added *Cixius resurgens* WALKER (= *Achaemenes ornatipennis*), and *Cixius longipennis* (WALKER) and described during his further scientific career 17 new continental species and subspecies. Finally LINNAVUORI (1973) described one species from the Sudan. About 15 species are known from Madagascar.

Previously 26 nominal species were known from the African continent. As a result of the present study 21 of these are considered as valid species and six more are described as new to science. The major part has been recorded from the eastern part of Africa, extending from Uganda to the northern part of South Africa. Relatively few species and records are available from Southwest, Central and West Africa: within these *A. monticola* from southwest Cameroon and *A. machadoi* from Angola are clearly related to the East African species in general habitus and male genitalia; however, *A. musakensis*, described from Mt Cameroon, and *A. brixioides*, from South Africa, each represent a separate evolutionary line; *A. brixioides* in particular is of interest: the colour pattern on the tegmina as well as their dimensions recall those of *Brixia speciosa* MUIR, a species with the same remarkable black dots on the apex of the wings, although the genus *Brixia* probably evolved along another evolutionary line within cixiids. The function of these black spots is unknown.

Nothing is known about their life history; as in many cixiids the larvae might live subterranean in association with roots. One adult female specimen, identified here as *Achaemenes australis*, has been found in association with *Phiedole* ants.

Material and methods

The material studied below is deposited in the collections of the following museums and institutions:

KBIN	Koninklijk Belgisch Instituut voor Natuurwetenschappen, Belgium
KMMA	Koninklijk Museum voor Midden-Afrika, Belgium
BMNH	British Museum (Natural History), U.K.
PPRI	Plant Protection Research Institute, Pretoria, South Africa
MNHN	Museum National d'Histoire Naturelle, Paris, France
NR	Naturhistoriska Riksmuseet, Stockholm, Sweden
NMB	National Museum, Bulawayo, Zimbabwe
TM	Transvaal Museum, Pretoria, South Africa
SAM	South African Museum, Cape Town, South Africa
CL	Private collection of Dr. R. LINNAVORI (Raiseo, Finland), deposited in the American Museum of Natural History, New York, U.S.A.

The proportions of the vertex are measured as follows: the length is taken on the median line between the apex and the tip of the basal emargination. Its width is taken at the level of the tip of the basal emargination between both lateral margins. For the proportions of the tegmina the length is measured between base and apex, and the width is taken at the tip of the clavus, perpendicular to the ax of the length. In some cases where the apex is reduced this might however give a wrong idea.

In some cases certain morphological differences could not be interpreted with certainty as being of specific value. In this case we have chosen not to name the "form" (or population) until further material becomes available. For instance, for the species complex of *A. longipennis*, *A. hyleorias*, *A. obscurus* and *A. furciferens*, certain differences in the structure of the aedeagus could not be interpreted, especially by the lack of sufficient samples from different populations. In two other cases the aedeagus forms a mirror image of a known species; also here we have adopted this method.

Genus *Achaemenes* STÅL, 1866

Type species: *Achaemenes notatinervis* STÅL, 1866; designated by MUIR, 1925

Moderately large cixiids (5-11 mm), usually ochreous to brown with hyaline tegmina, in habitus resembling the species of the genus *Cixius* but more laterally compressed, with steeply tectiform tegmina. Head in dorsal view narrower than pronotum. Face flat and broad, median keel and median ocellus present. Vertex separated from frons by a very sharp and distinct keel, roundly excavated at base, its width equally or twice as long than its length taken from apex to tip of basal emargination, subapical transverse keel sharp, situated in the apical half, slightly arcuate, angulate, or straight; median longitudinal keel absent or present in the basal half, usually obsolete. Pronotum shortest in middle, with a median longitudinal keel

and two lateral keels running parallel to curvature of eye. Mesonotum tricarinate. Tegmina about three times as long as broad, in some species apex slightly reduced and having some additional transverse veins, always surpassing tip of abdomen. Sc+R leaving from basal cell separate from CM, usually forked basad or at same level as Cu; transverse veinlet between inner claval vein and clavocorial suture only faintly developed or absent; usually 13 apical veins between stigma and tip of clavocorial suture, sometimes 12; veins covered with concolorous granules bearing setae, costal margin in most species granulate at regular intervals. No granules in cells, stigma small. Abdomen laterally compressed, ochreous to brown. Legs relatively short, hind tibiae without lateral spines; hind tarsi with a single row of seven to eight black teeth on first tarsite, a double row of seven to eight membranous and small black teeth in most species, but sometimes more (12 to 15 in *flavescens* and *machadoi*).

Male genitalia: pygofer and genital styles symmetrical. Anal segment with apical lobe sometimes excavated, symmetrical or slightly asymmetrical. Pygofer with lateral margins gently rounded in profile, sometimes with a small lobe on laterodorsal angle. Apex of genital styles simple, rectangular, sometimes triangular. Aedeagus simple, consisting of a basal part with a chitinized periandrium and a distal membranous and articulating "flagellum". Usually one to three spines inserted apically near the base of the flagellum (exceptionally more), and a short membranous lobe on the flagellum.

Diagnosis: *Achaemenes* can be distinguished from other African genera by the combination of the following characters: body laterally compressed, tegmina steeply tectiform; vertex and face flat, lateral borders broadly separate; on tegmina Sc+R and Cu leaving separately from the basal cell; hind tibiae devoid of lateral spines; hind tarsi always with a single row of seven to eight black teeth on the first tarsite, and a double row of teeth on the second tarsite.

The genus is most closely related to *Flachaemus* VAN STALLE, *Cixius* LATREILLE and *Eucarpia* WALKER. From *Flachaemus* and *Cixius* *Achaemenes* can be distinguished by the total absence of lateral spines on the hind tibiae. It can be distinguished from *Eucarpia* by the presence of a transverse keel on the vertex and by the presence of a distinct median ocellus on the face.

Species not congeneric with *Achaemenes*

Achaemenes terminalis JACOBI was placed in *Cixius* by myself in 1984 (see also VAN STALLE, 1988). *Achaemenes coriaceus* FENNAH, 1957 is not congeneric with the species group revised here. We retain the species in *Achaemenes* until a more convenient genus has been erected to house this species. The same situation is applicable to *Achaemenes niger* MELICHAR, 1905 (see VAN STALLE, J. & P. LAUTERER, 1985), which is related to *Achaemenes coriaceus*. Finally, *Achaemenes dilutus* STÅL, *Achaemenes umkomaasi* SYNAVE, and *Achaemenes punctatus* SYNAVE have recently been

transferred to *Flachaemus* by myself (VAN STALLE, 1989). All the types of these species have been examined.

Key to species

Not included: *Achaemenes australis* (only known from females).

1. — Tegmina (fig. 117) with four black spots, each with a small white spot in middle (a South African species) . brixioides (p. 21)
 - Tegmina not coloured as described above.... 2
2. — largest known species; size 10-11 mm; aedeagus as illustrated in fig. 104
 - vehemens sp. n. (p. 20)
 - smaller than 10 mm 3
3. — Vertex (fig. 68) with subapical keel and longitudinal keel forming a cross; colour brown with a pale streak in middle covering vertex, middle of pronotum, mesonotum, and commisural margin of tegmina 4
 - Vertex and colour not as described above.... 5
4. — Aedeagus as illustrated in fig. 71, largest spine curved over less than 90°
 - costalis (p. 16)
 - Aedeagus as illustrated in fig. 73, largest spine hook-shaped
 - pseudocostalis sp. n. (p. 16)
5. — Second segment of hind tarsi with more than 9 teeth 6
 - Second segment of hind tarsi with 9 teeth or less 7
6. — Aedeagus with a large, straight spine on left side (fig. 64)flavescens (p. 16)
 - Aedeagus not with such a spine on left side (fig. 51) machadoi (p. 14)
7. — Aedeagus as illustrated in fig. 109
 - musakensis (p. 20)
 - Aedeagus with one spine on apex (figs. 11, 23) 8
 - Aedeagus with two spines on apex (fig. 3) 12
 - Aedeagus with three spines on apex (figs. 37, 42) 18
8. — Aedeagus with a plate-shaped process on ventral margin of apex (figs. 29, 33) 9
 - Aedeagus with apex "normal" (fig. 11) 10
9. — Aedeagus with unique spine recurved (fig. 29) kampalensis (p. 10)
 - Aedeagus with unique spine not recurved as above, and a second spine on flagellum (fig. 33) malaisei (p. 11)
10. — Spine straight, directed cephalad (fig. 11)
 - basilewskyi (p. 8)
 - Spine strongly curved or recurved caudad along flagellum 11
11. — Spine strongly curved (fig. 82)
 - tristis (p. 19)
 - Spine recurved caudad along flagellum (fig. 23) kalongensis (p. 9)
12. — Pygofer with a short but distinct process on laterodorsal margin (fig. 89)
 - lobatus (p. 19)
 - Pygofer not as described above 13
13. — Aedeagus with a spine which is implanted on the right side and curved to the left side (figs. 3, 56) 14
 - Aedeagus without such a spine 16
14. — Flagellum with a spine (fig. 3)
 - notatinervis (p. 7)
 - Flagellum without a spine 15
15. — Aedeagus as illustrated in fig. 53
 - monticola (p. 14)
 - Aedeagus as illustrated in fig. 56
 - wittei (p. 14)
16. — Aedeagus with a large spine directed to base (fig. 22) entabeniensis (p. 9)
 - Aedeagus otherwise shaped 17
17. — Aedeagus as illustrated in fig. 74
 - marginatus (p. 17)
 - Aedeagus as illustrated in fig. 78
 - apicemaculatus (p. 18)
 - Aedeagus as illustrated in fig. 96
 - resurgens (p. 19)
 - Aedeagus as illustrated in fig. 99
 - pingatus (p. 19)
 - 18. — Aedeagus with three spines visible in right lateral view 19
 - Aedeagus with one semicircular spine curved to left side, and, on apex, a small hook-shaped spine on right side and a small, straight spine on left side (fig. 47)
 - obscurus (p. 12)
 - 19. — Aedeagus with a semicircular spine curved to left side, a long, straight spine and a short spine 20
 - Aedeagus with one long and two short spines, the latter connected with each other at their base (fig. 44)
 - furciferens (p. 12)
 - 20. — Size 6-7.5 mm, spines on aedeagus shaped as illustrated in fig. 37
 - longipennis (p. 11)
 - Size 7.5-9 mm, spines on aedeagus as illustrated in fig. 42 hyleorias (p. 12)

Systematic account

Achaemenes notatinervis STÅL, 1866

(Figs. 1-7)

Achaemenes notatinervis STÅL, 1866: 171

Achaemenes marleyi SYNAVE, 1959: 3, figs. 5-7, syn. n.

Material: lectotype ♂, here designated, "Caffraria", J. WAHLBERG, NR (examined).

Paralectotypes: 1 ♂, 1 ♀, same data, NR.

Additional: holotype ♂ *Achaemenes marleyi*, South Africa, N. Kloof, 15.V.1937, Marley, SAM; 1 paratype

(damaged) *A. marleyi*, KBIN; 10 ♂, 12 ♀, Zululand, Eshowe, IV-V.1926, R.E. TURNER, BMNH, KBIN; 1 ♂ 2 ♀, Natal: Kloof 1500 ft, VIII.1926, R.E. TURNER, BMNH; 1 ♂, South Africa, Karkloof, near Howick, 12.XII.1978, J.G. THERON, PPRI.

Description: general colour pale ochreous. Vertex 1.2 times as long as broad, apex in lateral view forming a sharp angle with face; median longitudinal keel faintly developed. Tegmina hyaline, three times as long as broad, costal margin covered with concolorous granules; apex slightly reduced; apical and transverse veins fumated with brown. Chaetotaxy of hind tarsi 7-8/(7-8).

Length: 6-6.5 mm.

Male genitalia: anal segment, pygofer and genital styles symmetrical. Apical margin of anal segment not excavated. Aedeagus on right side with two spines inserted on apex, the shortest one bent to left side, and one spine on flagellum.

Diagnosis: easily distinguished from other species by the profile of the face and by the shape of the male genitalia.

***Achaemenes basilewskyi* SYNAVE, 1960**
(Figs. 8-13)

Achaemenes Basilewskyi (sic) SYNAVE, 1960: 377, figs. 1-5.

Material: holotype ♂, Kenya, Molo, Mau Escarpment, 2150-2200 m, 11-12.IV.1957, KMMA.

Additional: 1 ♂, Marakwet, Elgeyo escarpment, 2500 m, MNHN; 4 ♂, "Kenya", no date, BMNH; 1 ♂, 1 ♀, Limuru kc, IV.1955, BMNH; Kenya, Aberdare range, Mt. Kinangop., 13,000 ft, J. FORD, "*Senecio brassicaeformis* or *Senecio aberdarica*, BMNH; 1 ♂, 1 ♀, W. Aberdares, 10-11,000 ft, XI.1934, A.J.F. GEDYE, BMNH.

Description: colour brown, head and legs paler than mesonotum and abdomen. Head pale ochreous, vertex 1.5 to 1.7 times as broad as long. Tegmina three times as long as broad, stigma, apical margin, commisural margin, and often a lunular spot beginning on apex and running along tip of clavus to anterior margin of stigma, brown; costal margin densely covered with small granules. Legs pale ochreous, femora somewhat darker, chaetotaxy of hind tarsi 8/(8).

Length: 5.5-7 mm.

Male genitalia: anal segment, pygofer and genital styles as illustrated in figs. 8, 9 and 10. Apical lobe of anal segment slightly asymmetrical in caudal view. Pygofer with a small triangular lobe at the dorsolateral angles. Aedeagus (Fig. 11) with one long spine at right side.

Diagnosis: this species can be distinguished from all other *Achaemenes* species by the process on the lateral margins of the pygofer and by the presence of only one long spine on the aedeagus.

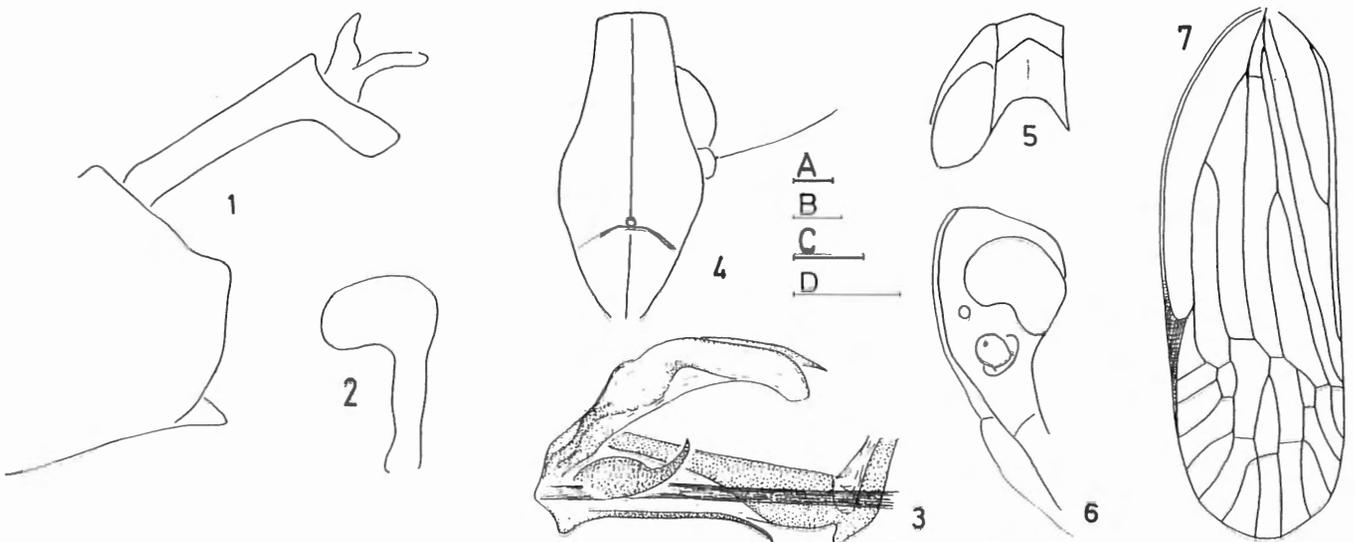
***Achaemenes* sp. apud basilewskyi**
(Figs. 14-16)

Material: 1 ♂, 3 ♀, Kenya, Aberdare Range, Mt. Kinangop., 9,000 ft, J. FORD, bamboo forest, BMNH.

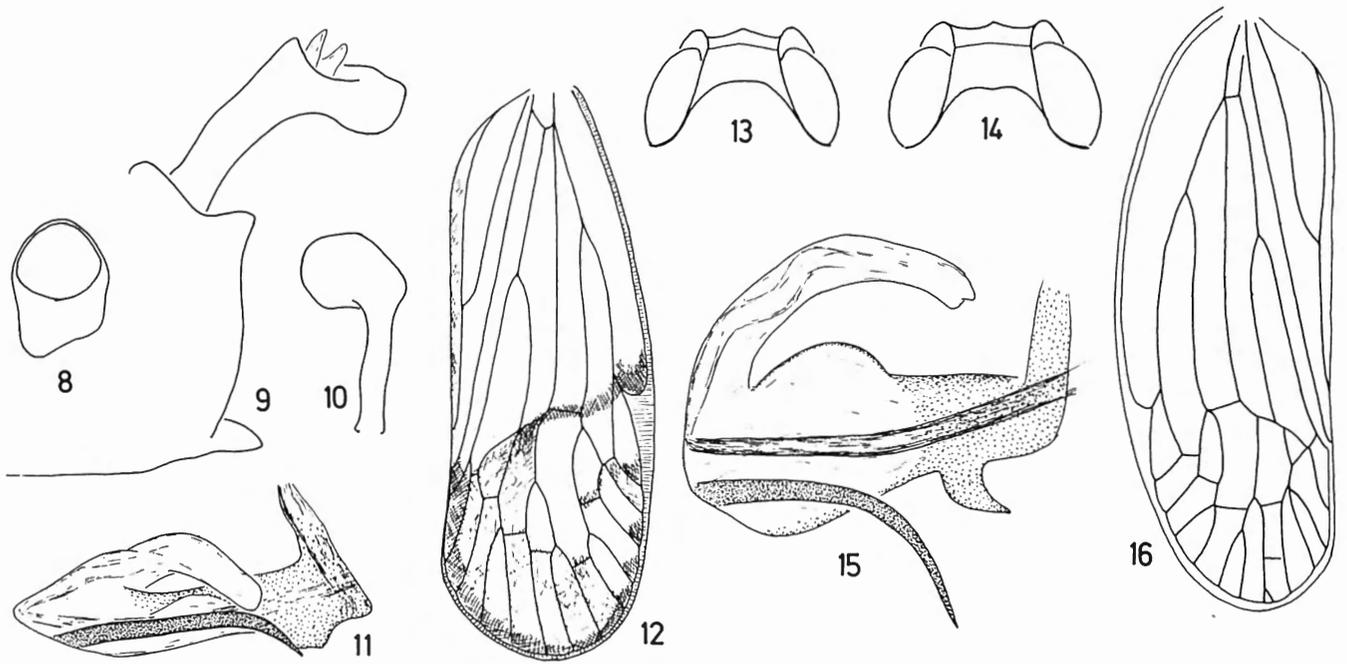
Description: resembling *A. basilewskyi* but vertex less broad, 1.3 times as broad as long, tegmina with a reduced apex, therefor narrowing distally, and without a moon-shaped colour mark, and hind tarsi with more teeth: 9-10/(13).

Length: 6-6.5 mm.

Male genitalia: as those of *A. basilewskyi*, but aedeagus in lateral view broader and with a distinct basal process on ventral margin; lateral spine more curved than the same spine in *A. basilewskyi*.



Figs. 1-7. *Achaemenes notatinervis* STÅL, lectotype ♂ — 1: pygofer and anal segment, left lateral view; 2: left genital style; 3: aedeagus, right lateral view; 4: head, frons and clypeus; 5: vertex; 6 head, lateral view; 7: left tegmen. Scale A (0.2 mm): 4, 5, 6; B (0.5 mm): 7; C (0.2 mm): 1, 2; D (0.2 mm): 3.



Figs. 8-13. *Achaemenes basilewskyi* SYNAVE — 8: anal segment, caudal view; 9: pygofer and anal segment, left lateral view; 10: left genital style; 11: aedeagus, right lateral view, holotype; 12: right tegmen; 13: vertex.

Figs. 14-16. *Achaemenes* sp. apud *basilewskyi* — 14: vertex; 15: aedeagus, right lateral view; 16: left tegmen. Scale (see figs. 1-7): A: 13, 14; B: 12, 16; C: 8, 9, 10; D: 11, 15.

Remark: this is probably a new species but we would like to await more material before naming it.

***Achaemenes entabeniensis* SYNAVE, 1959**
(Figs. 17-22)

Achaemenes entabeniensis SYNAVE, 1959: 1, figs. 1-4.

Material: holotype ♂, South Africa, Entabeni, Zpbg, XI.1931, G. van Son, TM.

Paratype: 1 ♂, Tshakoma, Zpbg, XI.1931, G. van Son, KBIN.

Additional material: 1 ♂, South Africa, Groot River, C.P., 16.X.1964, H.K. MUNRO, PPRI; 1 ♂, South Africa, Natal, VAN REENEN, Drakensberg, 1-22.I.1927, BMNH; 8 ♂♂, 3 ♀♀, South Africa, E. Cape Prov., Katberg, 4000 ft, X-XI.1932, I.1933, BMNH, KBIN.

Description: general colour ochreous. Vertex 1,5 times as broad as long. Tegmina three times as long as broad, hyaline with three brown streaks in the costal cell; Sc+R forked slightly anterior of Cu, tips of apical cells bordered with brown. Veins yellowish, mottled with brown; costal margin granulate. Females more brown, with on the tegmina an inconspicuous moon-shaped band in the apical part, beginning at stigma and continuing along transverse veins to apical border. Legs with chaetotaxy hind tarsi 7-8/(8).

Length: ♂: 7.5 mm; ♀: 8 mm.

Male genitalia: pygofer and genital styles symmetrical, anal segment with an asymmetrical apical process.

Aedeagus with two spines: one thin spine running parallel to flagellum and one large, round and hollow spine inserted on apex and running along ventral margin of aedeagus.

Remarks: the large spine on the aedeagus was not figured by SYNAVE; as it is present in the holotype, it was probably overlooked as it fits close to the aedeagus in resting position; moreover, the processes at the tip of the flagellum were equally not observed upon examination of the holotype.

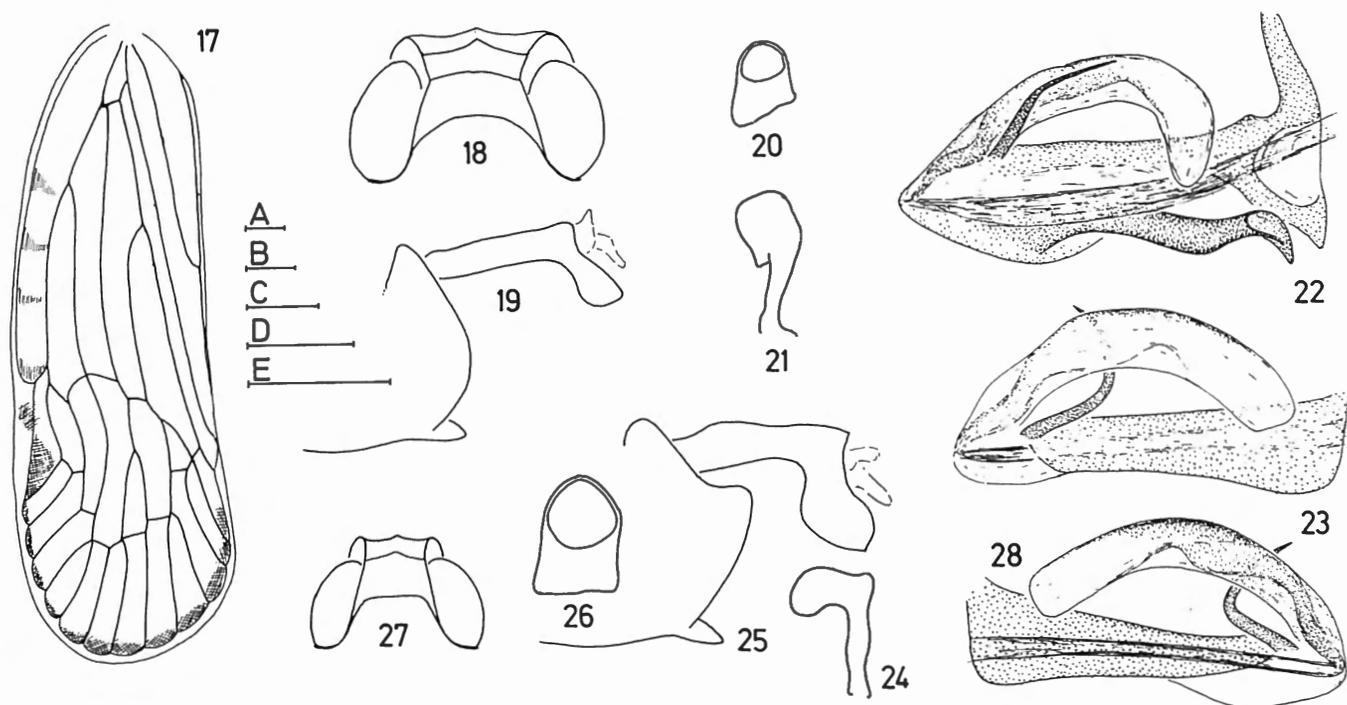
Diagnosis: *A. entabeniensis* resembles *A. flavescens* in the general shape of the aedeagus, namely the presence of a large ventral spine in combination with a thin spine near the apex of the right side. *A. entabeniensis* can be recognised by the more narrow shape of the vertex, the different, more uniform colour of the body, and the detailed structure of the spines on the aedeagus.

***Achaemenes kalongensis* SYNAVE, 1963**
(Figs. 23-27)

Achaemenes kalongensis SYNAVE, 1963: 12, figs. 22-24, 26-32.

Material examined: holotype ♂, Zaïre, P.N.A., Massif Ruwenzori, Kalonge, 2010 m, Riv. Nuamwamba, affl. Butahu, KMMA.

Paratypes: 34 ♂♂ and ♀♀, "forme A", Zaïre, Parc National Albert, I-II.1953, P. VANSCHUYTBROECK & J.



Figs. 17-22. *Achaemenes entabeniensis* SYNAVE — 17: left tegmen; 18: vertex; 19: pygofer and anal segment, left lateral view; 20: anal segment, caudal view; 21: left genital style; 22: aedeagus, right lateral view, specimen "Groot River".

Figs. 23-27. *Achaemenes kalongensis* SYNAVE — 23: aedeagus, right lateral view; 24: left genital style; 25: pygofer and anal segment, left lateral view; 26: anal segment, caudal view; 27: vertex.

Fig. 28. *Achaemenes* sp. apud *kalongensis* — 28: aedeagus left lateral view.
Scale A (0.2 mm): 18, 19, 20, 21, 27; B (0.5 mm): 17; C (0.2 mm): 24-26; D (0.2 mm): 22; E (0.2 mm): 23, 28.

KEKENBOSCH, KBIN; 32 ♀♀, "forme B", same loc., KBIN; 5 ♀♀, "forme C", same loc., 1 ♀, "forme D", same loc., KBIN; 1 ♂, "forme E", same loc., KBIN, 1 ♀, "forme F", same loc., KBIN.

Additional: 1 ♂, Uganda, Ruwenzori Range, Misigo, 8550 ft, 2-3.VIII.1952, D.S. FLETCHER, BMNH; 1 ♂, 1 ♀, Ruwenzori Range, Lake Mahoma, 9600 ft, 12.VII.1952, D.S. FLETCHER, BMNH.

Description: colour ochreous; vertex 0.8 times as long as broad. Tegmina 3.2 times as long as broad, hyaline, apex slightly reduced; SYNAVE distinguishes seven colour varieties, all based on females which are more intensively coloured than the males. The specimens of Uganda have hyaline tegmina with the tips of the apical veins embrowned. Legs ochreous, chaetotaxy of hind tarsi 7-8/(8). Length: 4.5-6 mm.

Male genitalia: anal segment with a large apical lobe; pygofer with angulately bent lateral margins, this angle less conspicuous in the males from Uganda. Genital styles as illustrated in fig. 24. Aedeagus with one semicircular process inserted apically on right side and bent to left side.

Diagnosis: closely related to *A. kampalensis* and *A. malaisei*. It differs in the absence of the large ventral lobe apically on the aedeagus.

Achaemenes sp. apud *kalongensis* (Fig. 28)

A male specimen from "Uganda, Ruwenzori Range, Misigo, 8550 ft, 2-3.VIII.1952, D.S. FLETCHER, BMNH" closely resembles *A. kalongensis*, but differs from it in the other orientation of the curved spine on the aedeagus; in *A. kalongensis* it is curved from right to left, in this specimen it is curved from left to right. We prefer to await more material to name it in case it appears to be a good species.

Achaemenes kampalensis n. sp. (Figs. 29-32)

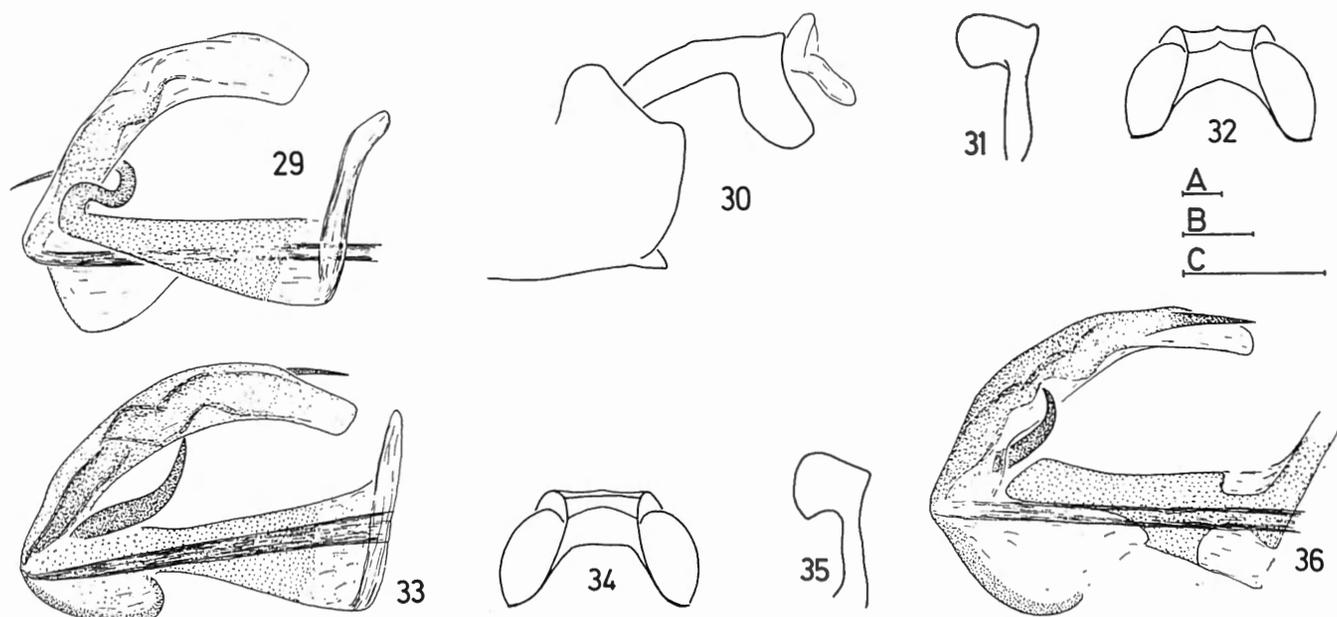
Material: holotype ♂, Uganda, Kampala, Kawanda, II.1958, at light, BMNH.

Paratypes: 79 ♂♂ and ♀♀, same loc., BMNH, KBIN; 1 ♂, S. Rhodesia, Mtshabezi Valley, Matopos, 19.II.1972, E. PINHEY, NMB.

Description: colour brown, mesonotum paler between keels. Vertex as long as broad. Tegmina hyaline, veins ochreous with brown spots, and brown spots in the apical cells; costal margin with granules. Chaetotaxy of hind tarsi 8/(9).

Length: 6 mm.

Male genitalia: anal segment, pygofer and genital styles



Figs. 29-32. *Achaemenes kampalensis* sp. n., holotype — 29: aedeagus, right lateral view; 30: pygofer and anal segment, left lateral view; 31: left genital style; 32: vertex.

Figs. 33-35. *Achaemenes malaisei* SYNAVE (holotype *A. seydeli*) — 33: aedeagus, right lateral view; 34: vertex; 35: left genital style.

Fig. 36. *Achaemenes malaisei*, specimen from "Elisabethville".
Scale A (0.2 mm): 32, 34, B (0.2 mm): 30, 31, 35, C (0.2 mm): 9, 33, 36.

as illustrated in fig. 30 and 31. Aedeagus with one circularly curved spine, inserted on right side and directed to left side, and one membraneous, lamelliform process on apex with sclerified apical margin. The spine is slightly different in the specimen from Zimbabwe.

Diagnosis: *A. kampalensis* resembles *A. kalongensis* and *A. malaisei* in the shape of the male genitalia; it differs from *A. kalongensis* in the presence of the large apical process on ventral margin; it differs from *A. malaisei* in the absence of a second spine on the flagellum.

***Achaemenes malaisei* SYNAVE, 1953**
(Figs. 33-36)

Achaemenes malaisei SYNAVE, 1953: 11, figs. 17, 18.
Achaemenes Seydeli (sic) SYNAVE, 1959: 8, figs. 21-23
syn. n.
Achaemenes seydeli SYNAVE, 1969: 183.

Material: ♂ holotype, "Congo belge", Lusinga (1700 m), 18.VII.1947, Miss. G.F. DE WITTE, KMMA.
Paratypes: 4 ♀ ♀, same loc., KMMA, KBIN; 1 ♂, Kaziba (1140 m), 16.II.1948, KMMA.
Additional: holotype ♂ *A. seydeli*, "Elisabethville" (à la lumière), X.1954, Ch. SEYDEL, KMMA.

Description: colour brown, keels and legs paler. Vertex 0.6 times as long as broad; subapical keel slightly convex. Tegmina 3.2 times as long as broad, hyaline, veins ochreous. Sc+R forked at same level as Cu; costal margin

granulated. Chaetotaxy of hind tarsi 7/(7).
Length: 6-7 mm.

Male genitalia: anal segment with a large apical lobe. Pygofer with lateral margins angulately bent. Genital styles as illustrated. Aedeagus with a curved spine inserted on right side and directed to left side, and a second spine on left side near apex of flagellum; a further lamelliform process on apex, sclerified on its border.

Remark: the synonymy was probably caused by two elements; first of all the aedeagus was wrongly illustrated in SYNAVE's figure: the apical processes and the spine on the flagellum are not illustrated, although present in the holotype; secondly, the lamelliform process is damaged (partly detached) and might have been overlooked by this fact.

In one specimen from "Elisabethville", 16.XII.1950, KMMA, the aedeagus is exactly the mirror image of that shown for *A. malaisei*, as illustrated in fig. 36.

***Achaemenes longipennis* (WALKER)**
(Figs. 37-41)

Cixius longipennis WALKER, 1851: 347.
Achaemenes longipennis WALKER; SYNAVE, 1953b: 33;
Fennah, 1957: 15.
Achaemenes kilimanus longispinus SYNAVE, 1960: 21,
fig. 41, syn. n.

Material: holotype ♀ "type", BMNH.
Additional: 2 ♂, 6 ♀, paratypes of *A. kilimanus longispinus* SYNAVE, Zaïre, Parc Nat. Garamba, Miss. H.

DE SAEGER, 22.III-16.VIII.1952, KBIN; 19 ♂♂, 31 ♀♀, South Africa, Zululand, Natal, St. Lucia Park, 12-19.I.1968, E. BRINKMAN, PPRI, KBIN; 3 ♂, Mocambique, Dondo Forest, 3.IX.1967, NMB.

Description: general colour ochreous. Vertex 1.7 times as broad as long. Tegmina relatively long, 3.7 times as long as broad; costal margin granulate; veins pale yellowish, mottled with brown spots. Legs pale ochreous, chaetotaxy of hind tarsi 8/(7).

Length: ♂: 6-6.5; ♀: 7-7.5 mm.

Male genitalia: anal segment, pygofer and genital styles as illustrated in fig. 38 to 40. Aedeagus (fig. 37) with three spines, all visible from right side: a small spine on apex, a long, straight spine on right margin and a circularly curved spine implanted on right side and going to left side along inner side of flagellum.

Diagnosis: this species can be recognised by the length of the tegmina in comparison to other species: 3.7 times as long as broad instead of three times or less. The most distinctive character is the shape of the aedeagus which is characterized by the form of the three spines. It closely resembles *A. hyleorias* from which it differs in the smaller size and in small details of the structure of the spines on the aedeagus.

Remark: the type of *A. longipennis* has been compared to the type of *A. kilimanus longispinus* and to the other specimens listed above. They agree in all characters.

***Achaemenes hyleorias* LINNAVUORI, 1973**
(Figs. 42-43)

Achaemenes hyleorias LINNAVUORI, 1973: 90, fig. 29 a, b.

Material examined: holotype ♂, Sudan, Equatoria, Aloma Plateau, Yei-Iwatoka road, 12-13.IV.1963, CL. Paratype: 1 ♀, same loc., CL.

Description: colour ochreous to brown. Vertex 1.3 times as long as broad. Tegmina hyaline, 3.1 times as long as broad, with brown spots in the apical cells and a few subapical spots; Cu forking at same level as Sc+R; costal margin with small concolorous granules. Stigma dark, veins mainly brown.

Length: ♂: 7.5 mm; ♀: 9 mm.

Male genitalia: anal segment, pygofer and genital styles as in the preceding species. Aedeagus with three spinose processes, all visible in right lateral view: one long spine directed cephalically, one short spine at apex, and one circularly curved spine inserted on right side and directed to left side along inner side of flagellum.

Diagnosis: this species is closely related to *A. longipennis* from which it can be distinguished by its larger size, and by the somewhat broader proportions of the tegmina and vertex; on the aedeagus, the longest spine is more curved in lateral aspect.

Remark: *A. hyleorias* might be a junior synonym of *A. longipennis*, but, as there are small but distinct differences such as its length, I would like to examine more material. LINNAVUORI (1973) figures and describes only two processes on the aedeagus. In fact, there are three spines on the right side.

***Achaemenes furciferens* n. sp.**
(Figs. 44-45)

Achaemenes kilimanus JACOBI; SYNAVE, 1953a: 20, figs. 3 A-C; SYNAVE, 1961: 92; SYNAVE, 1963: 11; SYNAVE, 1969: 83.

Material: holotype ♂, Kivu, Nyongera (près Rutshuru), Butumba 1218 m, 17.VII.1935, KBIN.

Paratypes: 2 ♂, Uganda, Kampala, Kawanda, at light, II.1958, BMNH, KBIN; 7 ♂♂, 5 ♀♀, P.N. Albert, 7-15.VII.1955, Mont Hoyo, 1280 m, "sur plantes basses", KBIN, KMMA; 2 ♂♂, 2 ♀♀, Kivu, Nyongera (près Rutshuru), Butumba 1218 m, 17.VII.1935, KBIN; 1 ♂, Kivu, Rutshuru, 1285 m, 2.VII.1935, KBIN; 1 ♂, S. Malawi, Zomba Mt., 15.V.1966, NMB; 1 ♂, Malawi, Nkata Bay, Mkuwabzi Forest, 11.V.1966, NMB; 2 ♂♂, Angola, Duque de Braganca Falls, 11-12.III.1972, BMNH; 1 ♀, Angola, Tundavala, 8-10 mls NW, Sa da Banderia, 27-29.III.1972, BMNH.

Description: colour ochreous. Vertex 1.8 times as broad as long. Tegmina 3.2 times as long as broad, hyaline with some brown spots in the apical cells, costal margin granulate. Chaetotaxy hind tarsi 8/(8).

Length: 7-7.5 mm.

Male genitalia: anal segment with apical lobe not excavated. Pygofer with lateral margins gently rounded in profile. Genital styles as those of the preceding species. Aedeagus with three spines: one inserted on right side and curved to left side, and two small hook-shaped spines at apex.

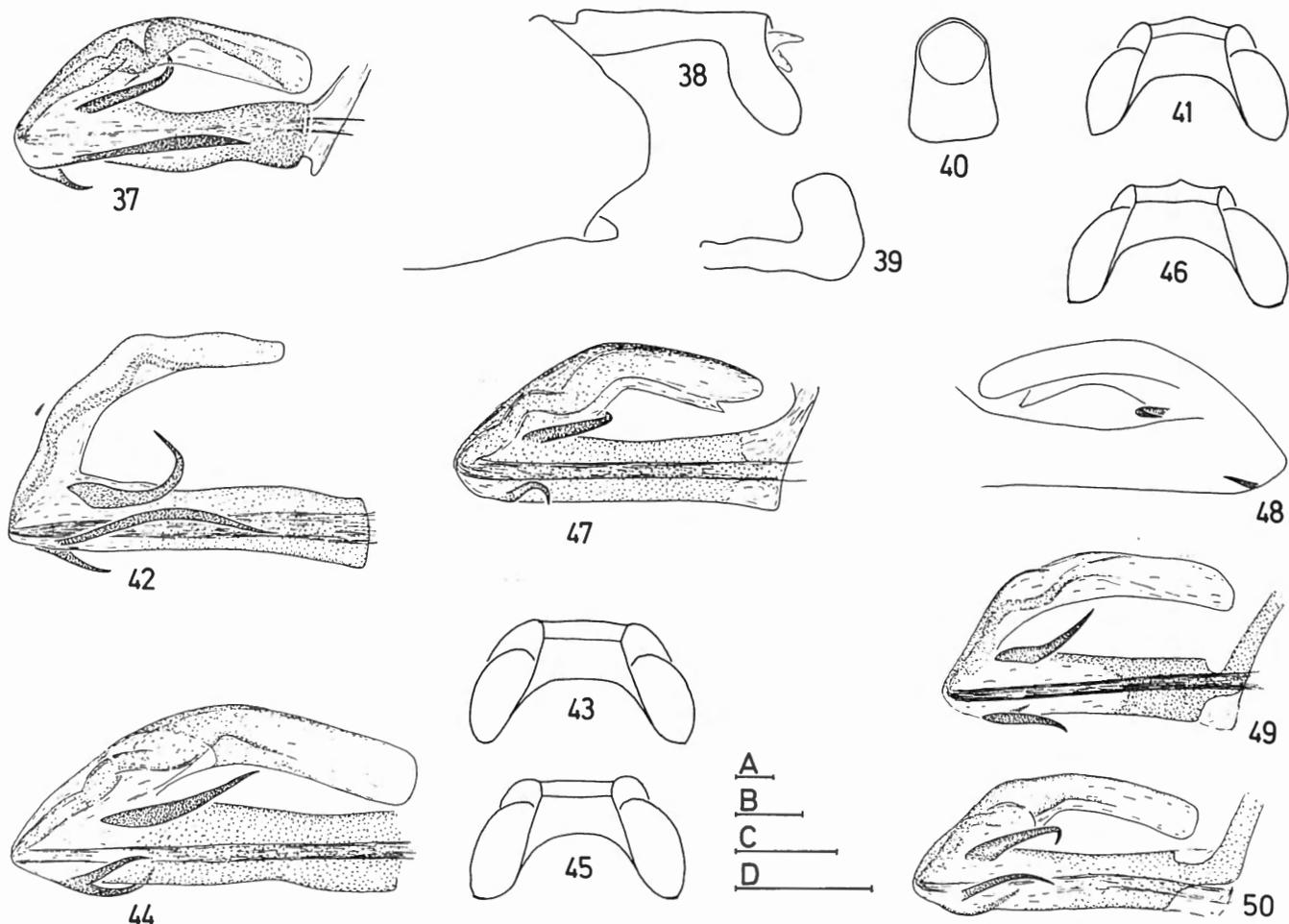
Diagnosis: this species closely resembles *A. longipennis* and *A. hyleorias* in the structure of the aedeagus; it is distinguished from these species by the presence of two short hook-shaped spines instead of a long and a short spine as is the case in the two species mentioned above.

***Achaemenes obscurus* SYNAVE, 1953 stat. n.**
(Figs. 46-48)

Achaemenes kilimanus var. *obscurus* SYNAVE 1953a: 22.

Material: holotype ♂, P.N. Albert, Kalondo (Kivu), alt. 1750 m, 6-9.VIII.1935, KMMA.

Paratypes: 1 ♂, same data as holotype, KBIN; 1 ♂, P.N. Albert, lac Mokoto: Lukulu, 15.VIII.1935, KBIN. Additional material: 4 ♂♂, Uganda, Kampala, Kawanda, at light, II-III.1958, P.E.S. WHALLEY, BMNH; 1 ♂, Uganda, Bugisu Buluchoke, X.1956, BMNH.



Figs. 37-41. *Achaemenes longipennis* (WALKER), ♂ St. Lucia park, Natal — 37: aedeagus, right lateral view; 38: pygofer and anal segment, left lateral view; 39: left genital style; 40: anal segment, caudal view; 41: head.

Figs. 42-43. *Achaemenes hyleorias* LINNAVUORI, holotype — 42: aedeagus, right lateral view; 43: head.

Figs. 44-45. *Achaemenes furciferens* sp. n., ♂ from Uganda — 44: head; 45: aedeagus, right lateral view.

Figs. 46-48. *Achaemenes obscurus* SYNAVE — 46: head; 47: aedeagus, right lateral view; 48: aedeagus, left lateral view.

Fig. 49. *Achaemenes* close to *longipennis* - *obscurus*: aedeagus, right lateral view, specimen from "Elisabethville" (Lubumbashi, Zaïre).

Fig. 50. *Achaemenes* close to *longipennis* - *obscurus*: aedeagus, right lateral view, specimen from Mt Tonkoui, Ivory Coast. Scale A (0.2 mm): 41, 43, 45, 46; B (0.2 mm): 38, 39, 40; C (0.2 mm): 37, 42, 47-50; D (0.2 mm): 44.

Description: general colour brown, tibiae and tarsi paler. Vertex twice as broad as long. Tegmina hyaline, veins yellowish with plenty of brown spots, costal margin without granules. Chaetotaxy of hind tarsi 8/(8). Length: 6.5-7 mm.

Male genitalia: anal segment, pygofer and genital styles as illustrated. Aedeagus with three spines: one circularly curved, inserted on right side and bent to left side, a second curved spine near apex on right side and a third spine on apex on left side.

Diagnosis: *A. obscurus* can be distinguished from other species by the shape and number of spines on the aedeagus; the structure of the aedeagus somewhat recalls that of *A. wittei*, from which it can be distinguished by the presence of a third spine on the left side in *A. obscurus*.

Remark: in accordance with article 45 (g) of the International Code of Zoological Nomenclature the name *Achaemenes kilimanus* var. *obscurus* is an available name

of subspecific rank. As we consider it as a good species the name *obscurus* is raised to specific rank. However, the name *Cixius obscurus* WALKER might enter into homonymy with *Achaemenes obscurus* SYNAVE as they might be secondary homonyms. *Cixius obscurus* is considered as a junior synonym of *Achaemenes australis* WALKER and accordingly the name *obscurus* WALKER has never been used in combination with the name *Achaemenes*; the name *obscurus* SYNAVE is therefore considered here as an available name in the genus *Achaemenes*.

Populations related to *longipennis-obscurus*

At least two different populations can be distinguished from which the identity is regarded here as uncertain, due to the lack of adequate information of species variability in this group:

1. 9 ♂♂, 11 ♀♀, "Elisabethville", XII.1938, KBIN; 1 ♂, 8 ♀♀, Tanzania, Musosa, IX-XI.1939, KBIN; Also related to this form: 1 ♂, Kamogobe (Sud Masisi), 4.III.1936, KMMA, identified by Fennah, 1957: 15 as *A. longipennis*.

Aedeagus as illustrated as in fig. 49; the dorsal spine is not semicircular, but straight, but the ventral spine is longer than the same spine in *A. furciferens*.

2. (= *Achaemenes kilimanus* JACOBI; SYNAVE, 1971: 6) 1 ♂, 1 ♀, Rep. centrafr., La Maboque, "piège lumineux", 7.XI.1972, MNHN; 1 ♂, Ivory Coast, Mt Tonkoui, 15-22.X.1973, KBIN.

Aedeagus as illustrated in fig. 50; the large spine is semicircular and recurved to the left side. The small apical spine inserted near the ventral margin on the right side is relatively long. By the presence of a semicircular spine it somewhat resembles the aedeagus of *A. obscurus*, from which it can be distinguished by the different proportions of the spines.

Achaemenes machadoi SYNAVE (Figs. 51-52)

Achaemenes machadoi SYNAVE, 1961: 92, figs. 8 & 9.

Material: holotype ♂, Angola, rive du lac Calundo, 27.XII.1954, A. DE BARROS MACHADO, Mus. Dundo (not examined).

Paratypes: 13 ♂♂ and ♀♀, 6 ♀♀ in KBIN.

Description: a slender species with brown to black body contrasting with the yellowish tegmina. Frons dark brown. Vertex twice as broad as long, with a straight subapical keel, brown near frons, more ochreous to base. Pronotum ochreous. Mesonotum dark brown with concolorous lateral keels, median keel tinged with yellow. Tegmina 3.4 times as long as broad, costal margin covered with con-

colorous granules; colour yellowish, sometimes embrowned in clavus and on stigma. Legs yellowish, chaetotaxy of hind tarsi 7-8/(15-16).

Length: 7 mm.

Male genitalia: according to fig. 9 in SYNAVE (1961) the pygofer, anal segment and genital styles are symmetrical. The aedeagus bears two spines on apex, inserted on right side, and according to the figure one spine is recurved to the left side. The flagellum bears a subapical spine.

Diagnosis: *A. machadoi* externally resembles *A. flavescens* in the contrasting colour of body and wings, general habitus and chaetotaxy of the hind tarsi; it can be distinguished from this species by the shape of the male genitalia.

Remark: although I asked the type on loan several times, I did not get any answer of the Museo do Dundo (Angola), where the type is deposited.

Achaemenes monticola VAN STALLE, 1987 (Figs. 53-55)

Achaemenes monticola VAN STALLE, 1987: 32, figs. 30-32.

Material: holotype ♂, southwest Cameroon, Mt Oku, 2500 m, 8.III.1983, KBIN.

Paratypes: 1 ♂, 4 ♀♀, Bambouto Mts, 16.I.1983, swept in gallery forest, KBIN.

Description: colour ochreous, mesonotum somewhat darker. Vertex as long as broad, no median longitudinal keel. Tegmina hyaline, three times as long as broad, Sc+R forking slightly basad of Cu; costal margin granulate. Legs with chaetotaxy hind tarsi 7-8/(8).

Male genitalia: anal segment not excavated at apex. Pygofer with lateral margins slightly angulate. Aedeagus with two spines, one running straight cephalad, the other inserted on right side and recurved to left margin.

Diagnosis: this species resembles *A. wittei* in the shape of the aedeagus; the ventral spine is longer than the same spine in *A. wittei*, and the vertex is narrower.

Achaemenes wittei SYNAVE, 1953 (Figs. 56-62)

Achaemenes wittei SYNAVE, 1953a: 22, figs. 3 D-F.

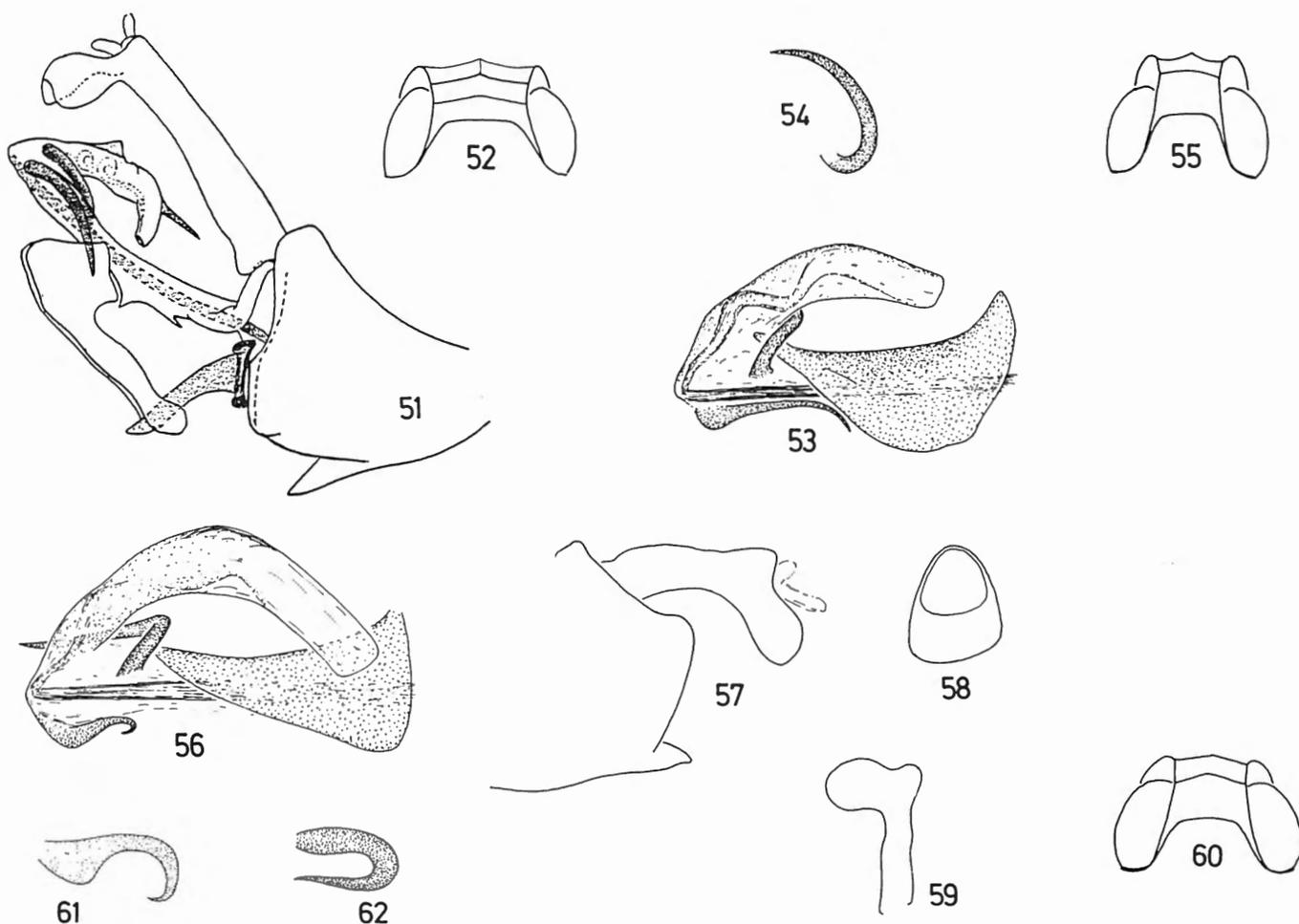
Achaemenes wittei SYNAVE; SYNAVE, 1963: 17.

Achaemenes wittei SYNAVE; VAN STALLE, 1984: 127 [error].

Material: holotype ♂, Kashwa (entre Ngesho-Bishakishaki), 2000 m, 7-23.I.1935, KMMA.

Paratypes: 70 specimens, KMMA, KBIN.

Additional: 2 ♂♂, P.N.A., 1.III.1954, secteur Tshiaberimu, Kirungu, 2720 m; 1 ♂, P.N.A., 20.IV.1955, secteur Tshiaberimu, riv. Kisesa, affl. Talya Nord, 2580 m, KBIN.



Figs. 51-52. *Achaemenes machadoi* SYNAVE — 51: anal segment, pygofer, genital style, and aedeagus, right lateral view (after Synave, 1961); 52: head (with, anteriorly, upper part of frons).

Figs. 53-55. *Achaemenes monticola* VAN STALLE, holotype — 53: aedeagus, right lateral view; 54: semicircular spine, dorsal view; 55: head.

Figs. 56-62. *Achaemenes wittei* SYNAVE, paratype — 56: aedeagus, right lateral view; 57: pygofer and anal segment, left lateral view; 58: anal segment, caudal view; 59: left genital style; 60: head; 61: ventral spine of aedeagus, specimen P.N. Albert, secteur Tshiaberimu, riv. Kisesa; 62: ventral spine of aedeagus, specimen P.N. Albert, secteur Tshiaberimu, Kirungu.

Scale (see figs. 37-50) A (0.2 mm): 52, 55, 60; B (0.2 mm): 57-59; C (0.2 mm): 53, 54; D (0.2 mm): 56, 61, 62.

Description: colour pale ochreous to yellowish. Vertex 1.3 as broad as long. Tegmina 3.1 times as long as broad, with yellowish veins; costal margin covered with concolorous granules. Chaetotaxy of hind tarsi 7-8(8). Length: 5.5-6 mm.

Male genitalia: anal segment, pygofer and genital styles as illustrated in figs. 57-59. Aedeagus with two spines, both near apex, one on dorsal margin and circularly curved to left side, and a second spine on ventral margin, hook-shaped or totally recurved as illustrated in fig. 62. As far as can be judged from the material available, the ventral spine is variable in shape, but at least always hook-shaped.

Diagnosis: a relatively small and pale species which can be recognised by the shape of the spines on the aedeagus: one of these is circularly curved, the second one hook-shaped. No other closely related species have been observed so far. The structure of the aedeagus somewhat recalls that of *A. obscurus*, from which it can be distinguished by the lack of a third spine on left side, and by the pale yellowish colour instead of brown as is the case in *A. obscurus*.

Remark: the specimens recorded by myself in 1984 as *A. wittei* belong to another species which we will not name here due to the lack of material.

***Achaemenes flavescens* SYNAVE, 1953**
(Figs. 63-67)

Achaemenes flavescens SYNAVE, 1953: 11.
Achaemenes flavescens SYNAVE; SYNAVE, 1969: 183.

Material: holotype ♀, Zaire, Kankunda, 22-24.XI.1947, KMMA.

Additional: 12 ♂♂, 20 ♀♀, Zaire, "Elisabethville", C. SEYDEL, 1951, 1959, KBIN; 1 ♂, N.E. Rhodesia, Serenje Distr., 4500 ft, BMNH.

Description: head and mesonotum dark brown, pronotum, legs, and keels of head ochreous. Vertex 2.4 times as broad as long, mesonotum with concolorous keels. Tegmina yellowish to pale ochreous, contrasting in colour with head and thorax, border from stigma along apex to tip of clavus and inner border of inner claval vein fumated with brown; costal margin with a few concolorous granules between base and stigma; Sc+R forking slightly before Cu. Legs yellowish, chaetotaxy of hind tarsi 8-9/(12-15).

Length: 6.5-7.5 mm.

Male genitalia: anal segment, pygofer and genital styles symmetrical, as illustrated in fig. 65 and 66. Aedeagus with a membraneous process on flagellum and two spines inserted near apex: a short one on right margin and a very long and straight spine on left side.

Diagnosis: *A. flavescens* closely resembles *A. machadoi* in general colouration, habitus, and chaetotaxy of the hind tarsi; it can be distinguished from this species in the shape of the male genitalia. *A. flavescens* also somewhat resembles *A. costalis* and *A. apicemaculatus* in the colouration of the tegmina; it can easily be distinguished from these and other species by the contrasting colour of head and thorax (brown) and tegmina (yellowish), the chaetotaxy of the hind tarsi, as well as by the proportions of the spines on the aedeagus. It also resembles *A. entabeniensis* in the general structure of the aedeagus. From this species *A. flavescens* can be distinguished in the contrasting colouration of the body, the more narrow shape of the vertex and in the different structure of the spines on the aedeagus.

***Achaemenes costalis* STÅL, 1866**
(Figs. 68-72)

Achaemenes costalis STÅL, 1866: 170.
nec *Achaemenes costalis* STÅL; Fennah, 1955: 431 [error].
Achaemenes eshowei SYNAVE, 1952: 6, fig. 1, F, syn. n.

Material: ♀ holotype, "Caffraria", NR.
Additional: ♀ holotype *A. eshowei*, Zululand, Eshowe, 1-7.X.1949, A.L. CAPENER, KBIN; 2 ♀, paratypes *A. eshowei*, Umgababa (Natal), 8.III.1951, KBIN, KMMA; 1 ♂, 3 ♀♀, South Africa, Natal, Umkomaas, 6.IX.1968, A.L. CAPENER, PPRI; 1 ♂, Natal, Umtentweni, VII.1952, A.L. CAPENER, KMMA; 5 ♂♂, 12 ♀♀, Cape

Province, Somerset East, XI.1930, 10-22.XII.1930, BMNH; 4 ♂♂, 4 ♀♀, Zululand, Eshowe, 1-22.IV.1926, BMNH, KBIN; 3 ♂♂, N. Tvl., Wylie's Poort, II.1941, A.L. CAPENER, KBIN, KMMA; 1 ♂, Mtunzini, Zululand, VI.1940, A.L. CAPENER, KBIN; 1 ♂, Durban, Bell Marley, BMNH.

Description: face, pronotum, abdomen and legs ochreous; lateral parts of mesonotum brown. A pale streak visible in dorsal view, composed by the pale colour of the vertex, dorsal part of pronotum, mesonotum between keels, and clavus between commisural suture and inner branch of claval veins. Vertex as long as broad, subapical keel situated at halfway its length, and a median keel over about its total length. Tegmina three times as long as broad, pale ochreous to dark brown, costal margin and apical margin somewhat darker; commisural margin whitish (see above); granules present in costal cell; Sc+R forking appreciably before Cu. Chaetotaxy of hind tarsi 8/(8-9).

Length: ♂: 6.5-7 mm; ♀: 7.5-8 mm.

Male genitalia: anal segment, pygofer and genital styles as illustrated in fig. 69; genital styles slightly excavated on apex in the specimen illustrated, not excavated, or apex more triangular in other specimens. Aedeagus with two spines on right side, the largest variable in shape, the small spine broken off in some specimens; flagellum with two lamelliform processes on left side, one on halfway its length and one near apex.

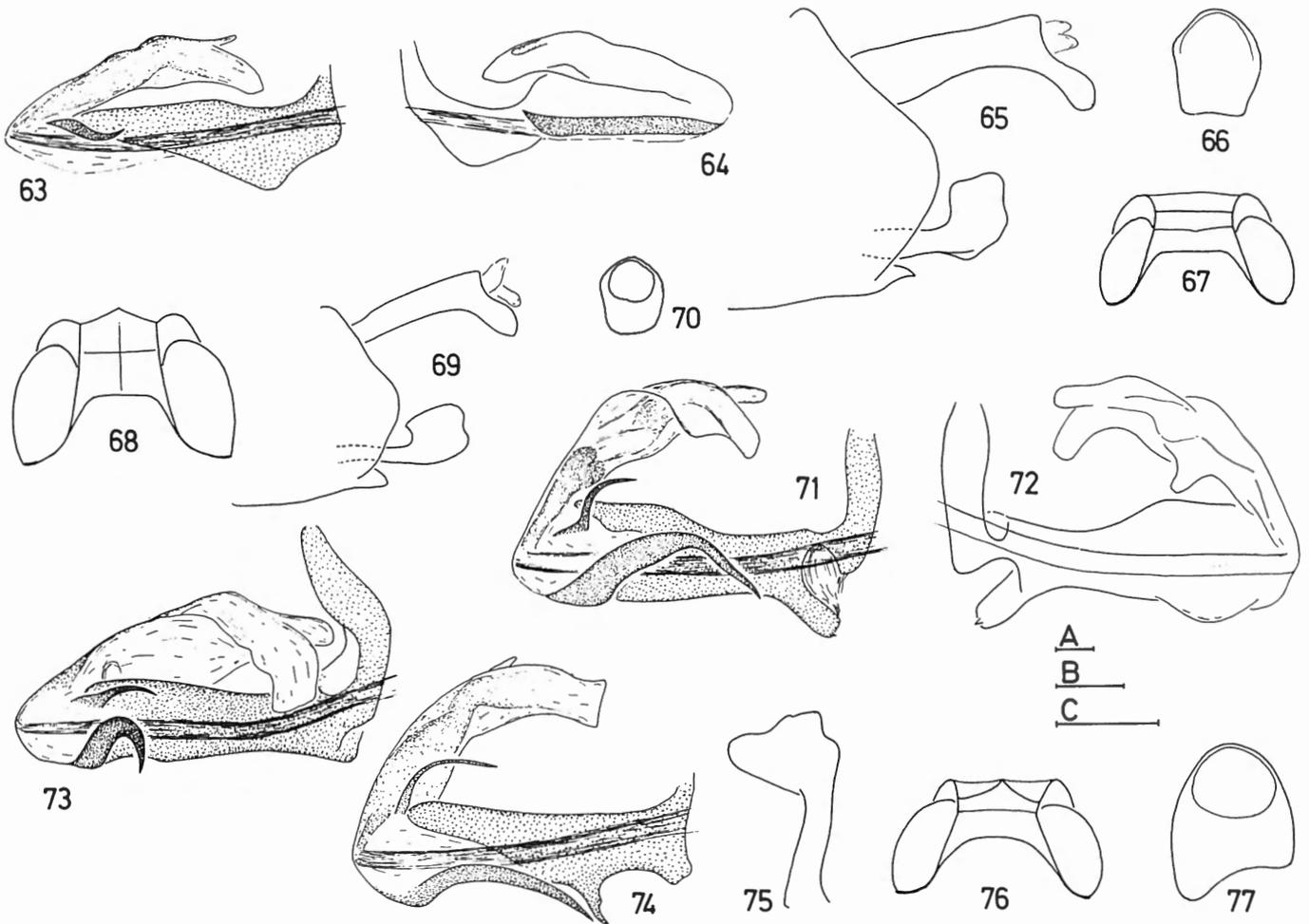
Remark: although the nominal species *A. costalis* and *A. eshowei* were described on female material only, they undoubtedly refer to the same species; the species can be easily recognized from other *Achaemenes* by the brown colour of the tegmina and the whitish streak formed by the vertex, pronotum, mesonotum and tegmina, characters only shared with *A. pseudocostalis*; together with the examination of other characters such as size and the chaetotaxy of the hind tarsi, it can be concluded that *A. eshowei* SYNAVE, 1952 is a junior synonym of *A. costalis* STÅL, 1866; no other species have been observed with this combination of characters.

One of the paratypes in the Tervuren museum is wrongly labelled; in fact, it concerns a *Noriaesus* species. The specimens recorded by FENNAH (1955) belong to another species.

***Achaemenes pseudocostalis* sp. n.**
(Fig. 73)

Material: holotype ♂, South Africa, Natal: VAN REENEN, Drakensberg, XXI.1926, BMNH.
Paratypes: 4 ♂♂, 3 ♀♀, same data as holotype, BMNH, KBIN; 1 ♂, R. Natal Park, 19.I.1981, J.G. THERON, PPRI.

Description: externally as the preceding species. *A. pseudocostalis* differs from *A. costalis* in the shape of the aedeagus: the largest spine is short and U-shaped.



Figs. 63-67. *Achaemenes flavescens* SYNAVE, ♂ from "Elisabethville" — 63: aedeagus, right lateral view; 64: aedeagus, left lateral view; 65: pygofer anal segment and genital style, left lateral view; 66: anal segment, caudal view; 67: head.

Figs. 68-72. *Achaemenes costalis* STÅL, ♂ from Natal, Umkomaas — 68: head; 69: pygofer, anal segment and genital style, left lateral view; 70: anal segment, caudal view; 71: aedeagus, right lateral view; 72: aedeagus, left lateral view.

Fig. 73. *Achaemenes pseudocostalis* sp. n., holotype, aedeagus, right lateral view.

Figs. 74-77. *Achaemenes marginatus* SYNAVE, holotype — 74: aedeagus, right lateral view; 75: left genital style; 76: head; 77: anal segment, caudal view.

Scale A (0.2 mm): 67, 68, 76; B (0.2 mm): 65, 66, 69, 70, 75, 77; C (0.2 mm): 63, 64, 71-74.

***Achaemenes marginatus* SYNAVE**
(Figs. 74-77)

Achaemenes marginatus SYNAVE, 1963: 11, figs. 18-21.

Material: holotype ♂, Tshiaberimu: Kalindera, 2720 m, 26.IV.1955, KMMA.

Description: head, pronotum and mesonotum brown, middle of pronotum and ventral surface of body and legs pale ochreous. Vertex 1.7 times as broad as long, without a median longitudinal keel, subapical transverse keel straight. Tegmina hyaline, veins ochreous, darker apically, apical margin bordered with a dark brown band between stigma and apex of clavus. Costal margin granulated.

Legs with chaetotaxy of hind tarsi 7/(8).

Length: 7.5 mm.

Male genitalia: anal segment slightly asymmetrical, apical lobe on left side slightly longer in caudal view. Pygofer with lateral margins gently rounded in profile, symmetrical. Genital styles with a triangular apex. Aedeagus with two spines on right side and a spinose process on ventral margin of periandrium; flagellum with a lamelliform process on left side.

Diagnosis: closely related to *Achaemenes costalis*, *A. pseudocostalis* and *A. apicemaculatus* in the colour pattern of the tegmina and the structure of the male genitalia. It differs from *A. costalis* and *A. pseudocostalis* in the proportions of the vertex which is broader in *A.*

marginatus and in details of the shape of the spines on the aedeagus, namely the more tapering form of the ventral process on the perianthrium. It differs from *A. apicemaculatus* in the shape of the apex of the anal segment, of the spines on the aedeagus and in the absence in *A. apicemaculatus* of a ventral process on the perianthrium.

***Achaemenes apicemaculatus* SYNAVE, 1953**
(Figs. 78-81)

Achaemenes apicemaculatus SYNAVE, 1953: 12, figs. 15-16.

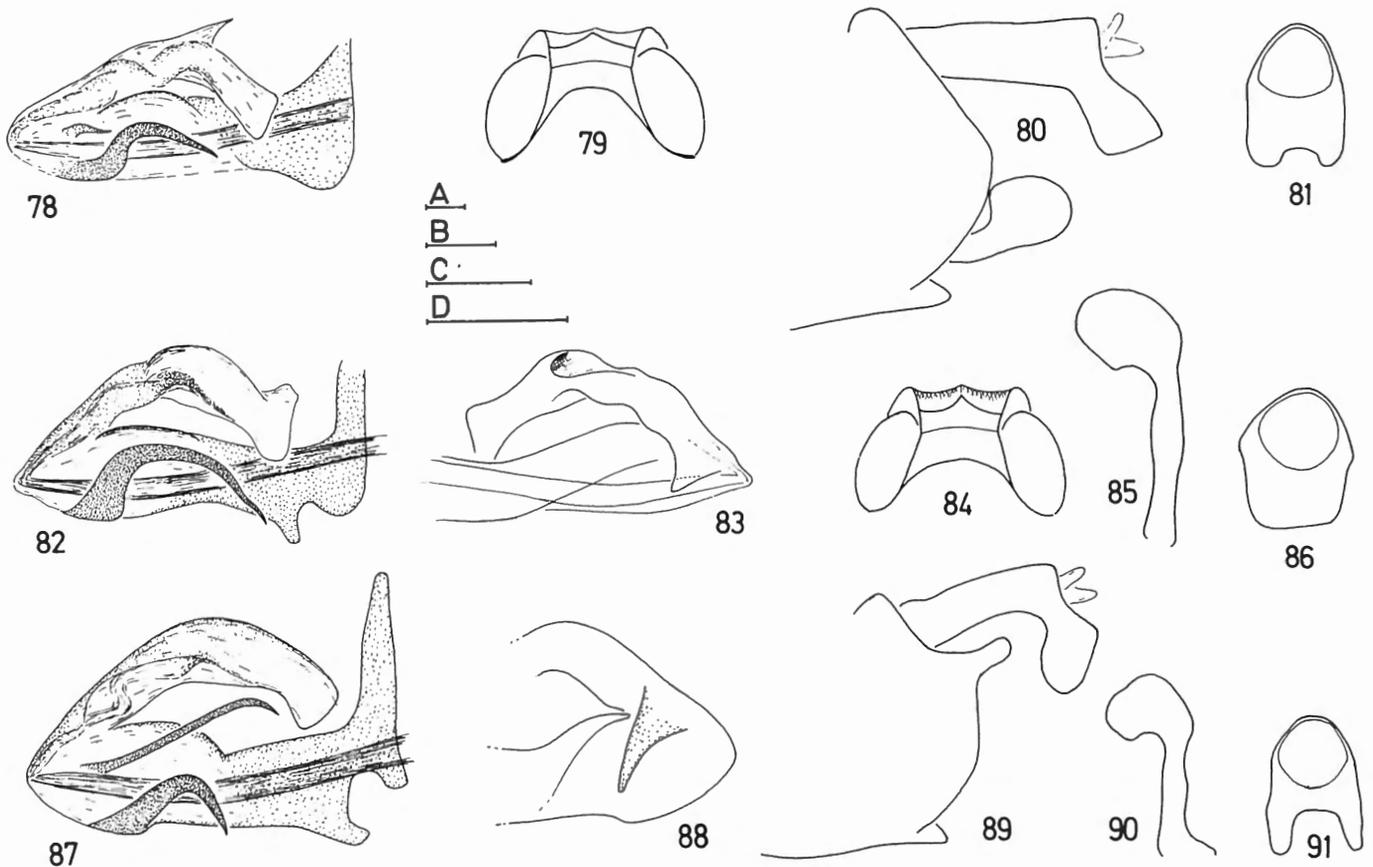
Material: holotype ♂, Zaïre, P.N.U., Kaswabilenga (700 m), 16.X.1947, KMMA.

Paratypes: 1 ♂, same loc., KMMA; 9 ♂♂, 5 ♀♀, Zaïre, Parc National Upemba, Lusinga (1760 m), 12-17.XII.1947, KMMA, KBIN.

Description: colour of head, pronotum, mesonotum and legs ochreous. Vertex 1.3 times as broad as long. Mesonotum with concolourous keels. Tegmina three times as long as broad, yellowish, bordered with brown on apex and on inner claval vein. Chaetotaxy of hind tarsi 8/(7-8). Length: 7-8 mm.

Male genitalia: anal segment incised apically. Pygofer with lateral margins in profile. Apex of right genital style more rounded than apex of left style. Aedeagus with two spines on right side; flagellum with a membranous spinose process.

Diagnosis: *A. apicemaculatus* somewhat resembles *A. costalis*, *A. pseudocostalis*, *A. marginatus* and *A. flavescens* in the colouration of the tegmina. It differs from these species in the proportions of the vertex, the presence of an incision apically on the anal segment, the shape and proportions of the spines on the aedeagus, and the absence of a ventral spinose process on the perianthrium.

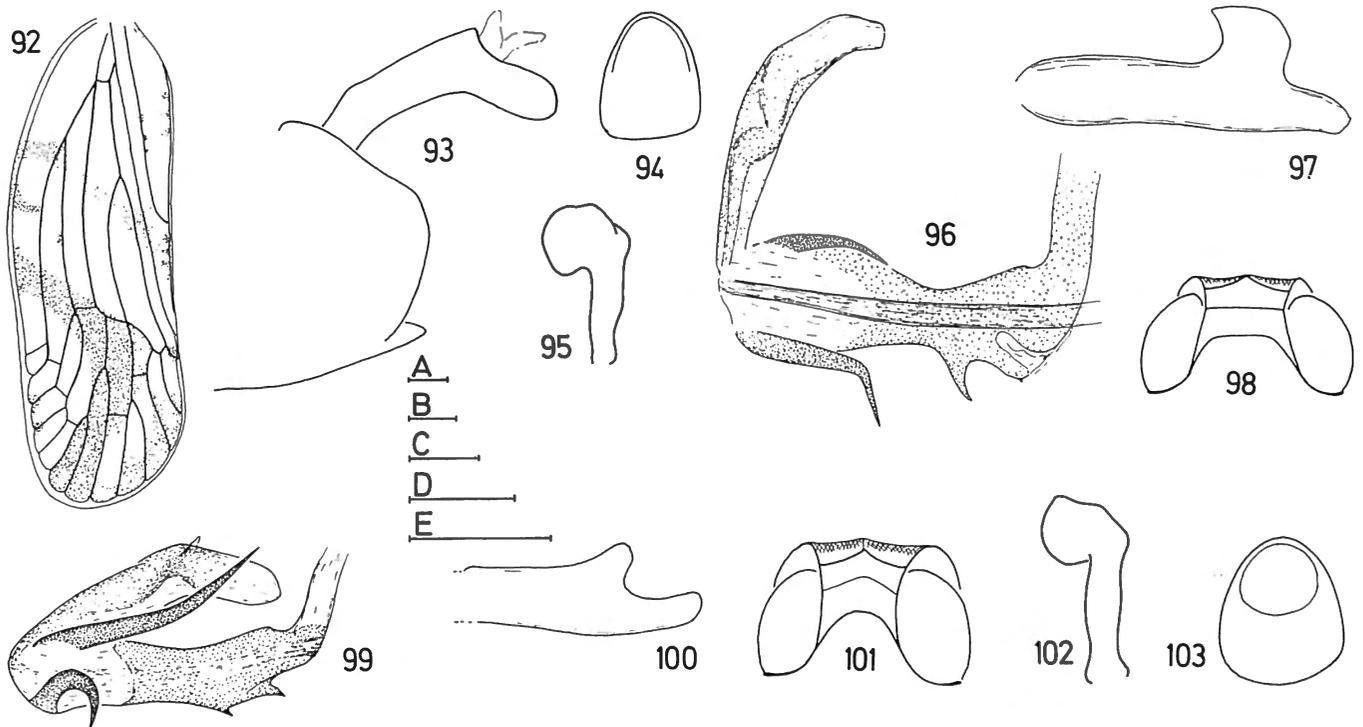


Figs. 78-81. *Achaemenes apicemaculatus* SYNAVE, paratype — 78: aedeagus, right lateral view; 79: head (with upper part of frons); 80: pygofer, anal segment and genital style, left lateral view; 81: anal segment, caudal view.

Figs. 82-86. *Achaemenes tristis* FENNAH, holotype — 82: aedeagus, right lateral view; 83: aedeagus, left lateral view; 84: head (with upper part of frons); 85: left genital style; 86: anal segment, caudal view.

Figs. 87-91. *Achaemenes lobatus* sp. n., holotype — 87: aedeagus, right lateral view; 88: aedeagus, left lateral view; 89: pygofer and anal segment, left lateral view; 90: left genital style; 91: anal segment, caudal view.

Scale A (0.2 mm): 79, 84; B (0.2 mm): 80, 81, 85, 86, 89-91; C (0.2 mm): 78, 82, 83; D (0.2 mm): 87, 88.



Figs. 92-98. *Achaemenes resurgens* (WALKER), ♂ Pietermaritzburg — 92: left tegmen; 93: pygofer and anal segment, left lateral view; 94: anal segment, caudal view; 95: left genital style; 96: aedeagus, right lateral view; 97: dorsal view of flagellum; 98: head (with upper part of frons).

Figs. 99-103. *Achaemenes pingatus* sp. n., holotype — 99: aedeagus, right lateral view; 100: dorsal view of flagellum; 101: head (with upper part of frons); 102: left genital style; 103: anal segment, caudal view.
Scale A (0.2 mm): 98, 101; B (0.5 mm): 92; C (0.2 mm): 93, 94, 95, 102, 103; D (0.2 mm): 99, 100; E (0.2 mm): 96, 97.

like those of *Achaemenes resurgens*; aedeagus with two spines on right side as illustrated in fig. 99, a membranous process on left side of flagellum, and three small teeth ventrally near base of periandrium, two of which next to each other on middle line.

Diagnosis: closely related to *A. resurgens* from which it can be distinguished in the more narrow vertex and in the shape of the spines on the aedeagus.

***Achaemenes vehemens* sp. n.**
(Figs. 104-108)

Material: holotype ♂, South Africa, Pondoland, Port St. John, IX.1923, BMNH.
Paratypes: 3 ♀ ♀, same data as holotype, BMNH, KBIN.

Description: colour ochreous to brown, vertex yellowish, 1.2 times as broad as long. Tegmina hyaline with brown veins and a few inconspicuous brown spots on apex; Sc+R forked before Cu, costal margin granulate. Chaetotaxy of hind tarsi 8/(8).
Length: 10.5-11 mm.

Male genitalia: apex of anal segment not incised; pygofer with rounded lateral margins; genital styles with a triangular apex. Aedeagus with two spines on right side and a plate-shaped lobe on left side of flagellum.

Diagnosis: *A. vehemens* is the largest known *Achaemenes* on the continent. Apart from its large size it can also be distinguished from other species by the characteristic shape of the spines on the aedeagus.

***Achaemenes musakensis* sp. n.**
(Figs. 109-111)

Material: holotype ♂, Mt Cameroon, Musaka 6350 ft, 9.I.1932, M. STEELE, at light, BMNH.
Paratypes: 3 ♂ ♂, 5 ♀ ♀, Onyanga, 8100 ft, 24.I.1932, M. STEELE, "by sweeping", BMNH, KBIN; 2 ♂ ♂, 1 ♀, Jonga, 500 ft, 7.II.1932, M. STEELE, "among scrub", BMNH.

Description: colour pale brown; vertex 0.6 times as long as broad. Mesonotum somewhat darker laterally of keels. Tegmina 3.1 times as long as broad, hyaline, veins ochreous with brown spots, and four transverse bands in subcostal cell; costal margin densely granulate; Sc+R forking slightly before Cu. Chaetotaxy of hind tarsi 8/(8).
Length: 7-8 mm.

Male genitalia: anal segment slightly asymmetrical in caudal view. Pygofer with lateral margins circularly curved. Genital styles as illustrated in fig. 110. Aedeagus with five spinose processes, all visible from right lateral view; apical spine implanted on left side and surpassing apex of aedeagus.

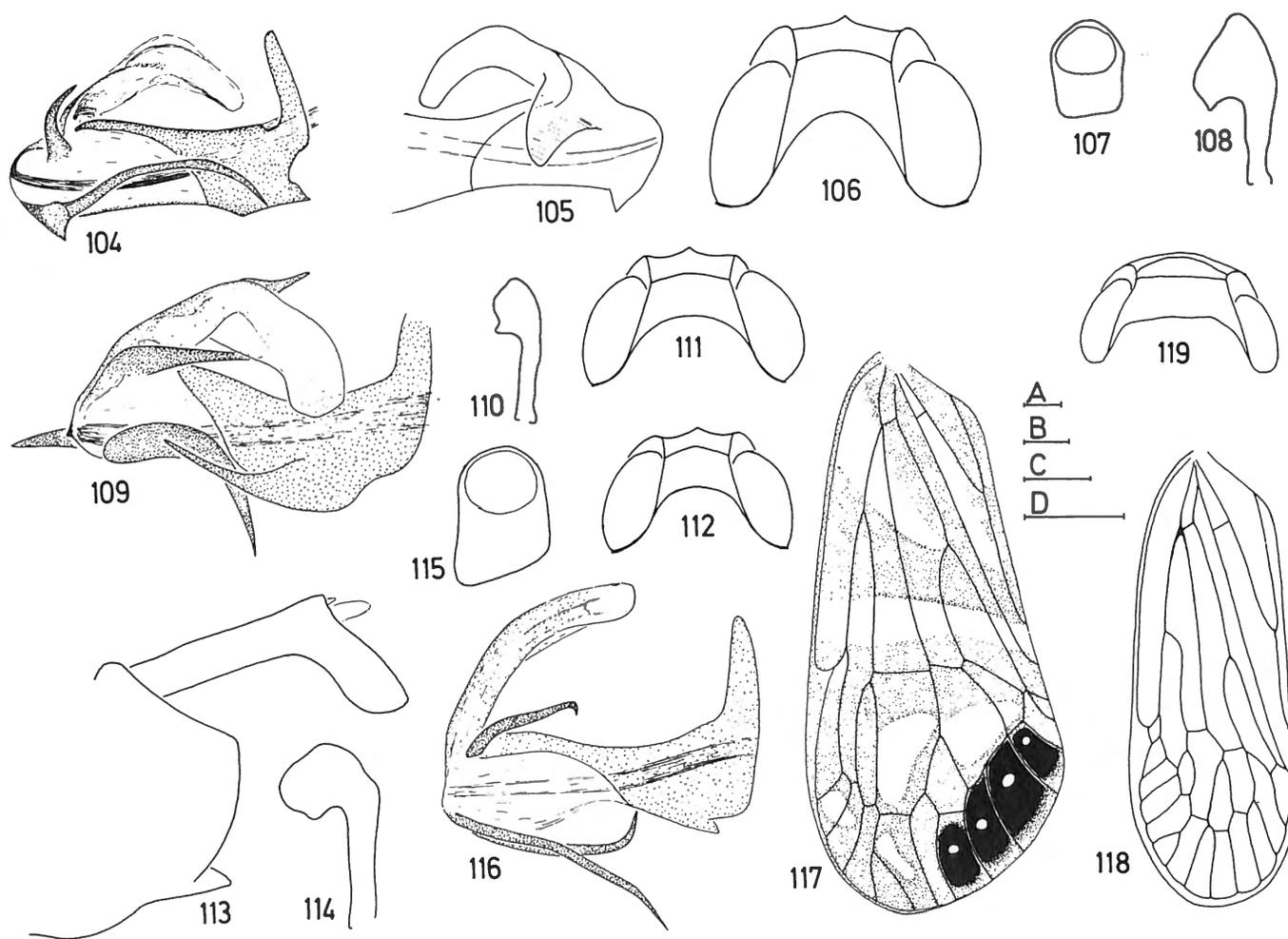
Achaemenes brixioides sp. n.
(Figs. 112-117)

Diagnosis: easily distinguished from other species by the number and place of implantation of the spinose processes on the aedeagus; no closely related species have been observed.

Remark: a male from Cameroon (Bafut Nguemba, X-XI.1975, MNHN) closely resembles this species but differs from it in the spines on the aedeagus: it bears two spines on the apex directed caudad, and no spines on the flagellum. It might represent a further new species closely related to *A. musakensis*.

Material: holotype ♂, South Africa, Cape Prov., Swellendam, 17.XII.1931-18.I.1932, BMNH.

Paratypes: 16 ♂♂, 12 ♀♀, same loc., BMNH, KBIN; 3 ♂♂, 5 ♀♀, S. Afr., Cape Prov., George, 15-17.XI.1921, BMNH; 1 (abdomen missing), Knysna, C.P., 18.X.1964, A.L. CAPENER, host plant: *Virgilia divaricata*; 1 ♂, South Africa, Tsitsikamma forest, 2.II.1977, J.G. THERON; 1 ♂, Bainskloof, 14.XII.1972, J.G. THERON; 1 ♀, Misgund, 3.II.1977, J.G. THERON; 1 ♀, Robinson Pass, 30.I.1980, J.G. THERON, PPRI.



Figs. 104-108. *Achaemenes vehemens* sp. n., holotype — 104: aedeagus, right lateral view; 105: aedeagus, left lateral view; 106: head; 107: anal segment, caudal view; 108: left genital style.

Figs. 109-111. *Achaemenes musakensis* sp. n., holotype — 109: aedeagus, right lateral view; 110: left genital style; 111: head.

Figs. 112-117. *Achaemenes brixioides* sp. n., holotype — 112: head; 113: pygofer and anal segment, left lateral view; 114: left genital style; 115: anal segment, caudal view; 116: aedeagus, right lateral view; 117: left tegmen.

Figs. 118-119. *Achaemenes australis* (WALKER), holotype — 118: left tegmen; 119: head.

Scale A (0.2 mm): 106-108, 110-112, 119; B (0.5 mm): 117, 118; C (0.2 mm): 104, 105, 107, 113-115; D (0.2 mm): 109, 116.

***Achaemenes tristis* FENNAH, 1957**
(Figs. 82-86)

Achaemenes tristis FENNAH, 1957: 15, fig. 4, A-D.

Material: ♂ holotype, Haut-Uele: Moto, XI.1922, L. BURGEON, KMMA.

Description: the holotype is severally damaged, and only the head, a part of the thorax with the second pair of wings and a part of the abdomen remains. Vertex 1.5 times as broad as long, without a median longitudinal keel. The chaetotaxy of the hind tarsi is 7/(7).

Length: 5.6 mm (from head to tip abdomen), tegmina 7.7 mm.

Male genitalia: anal segment and genital styles as illustrated in fig. 85 and 86. Aedeagus with one large spine on right side: flagellum with a lobe on left side, near apex, and one flat, inconspicuous spinose lobe just before its base.

Diagnosis: this species is related to *A. costalis* in the general form of the aedeagus; it differs from that species in the different structure of the head and in having only one large spine on the aedeagus and only one process on left side of flagellum.

***Achaemenes lobatus* sp. n.**
(Figs. 87-91)

Material: holotype ♂, Malawi, South reg., Mount Mulanje, Lichenya Plateau, 2000 m, 3/6.XI.1981, R. JOUQUÉ, KMMA.

Paratypes: 4 ♂♂, 7 ♀♀, same data as holotype, KMMA, KBIN.

Description: head, pronotum, tegulae, tegmina and legs pale ochreous, mesonotum dark brown, contrasting with the other parts of the body. Vertex 1.5 times as broad as long, subapical keel slightly convex, no median longitudinal keel. Tegmina about three times as long as broad, pale ochreous, costal and apical margin fumated with brown, females sometimes with a moon-shaped mark in apical part; costal margin densely

late; Sc+R forking slightly before Cu. Legs with chaetotaxy of hind tarsi 8/(8).

Length: ♂: 5.5 mm; ♀: 6-6.5 mm.

Male genitalia: anal segment with an excavated apical lobe; pygofer with a short, finger-shaped process on dorsolateral margin. Genital styles as illustrated in fig. 90. Aedeagus with two spines on right side and a third process on left side of flagellum.

Diagnosis: *A. lobatus* can be recognised from any other species by the excavated apical margin of the anal segment, the finger-shaped lobe on the pygofer and the structure of the spines on the aedeagus.

***Achaemenes resurgens* (WALKER, 1858)**
(Figs. 92-98)

Cixius resurgens WALKER, 1858: 42.

Achaemenes ornatipennis STÅL, 1866: 171, syn. n.

Material: lectotype ♀, here designated, BMNH (examined); 1 ♀ type *Achaemenes ornatipennis* STÅL, "STÅL", NR (examined).

Additional: 1 ♂, South Africa, Pietermaritzburg, 11.XII.1978, J.G. THERON; 1 ♂, SAZM Waterfall, Waterval Boven, E. Tvl, 20.XI.1967, E. BRINKMAN; 1 ♂, Durban, Bell Marley, KBIN; 1 ♀, Umtentweni, Natal, VII.1950, A.L. CAPENER, KMMA; 3 ♀♀, N. Tvl., Louis Trichardt, A.L. CAPENER, XII.1956, KMMA.

Description: general colour ochreous. Vertex 1.5 times as broad as long. Mesonotum somewhat darker on lateral parts outside of keels. Tegmina 3.1 times as long as broad, suffused with brown at base, a transverse brown band from costal margin to claval fork, and a moon-shaped band in apical part; costal margin strongly granulate, Sc+R forking before Cu. Legs yellowish, femora embrowned, two indistinct brown rings on fore and middle tibiae and base of hind tibiae, and base of hind tarsi fumated with brown; chaetotaxy of hind tarsi 8/(8).

Length: 5.5-6 mm.

Male genitalia: anal segment, pygofer and genital styles as illustrated in figs. 93-95. Aedeagus with two movable spines on apex, one spinose process ventrally near base, and two very minute teeth basad of these. Flagellum with a membraneous process on left side (fig. 97).

Diagnosis: closely resembling *A. pingatus* in general habitus and colouration. It can be distinguished from this species in the different proportions of the vertex and the different shape of the spines on the aedeagus.

Remark: the type of *Cixius resurgens* has been compared to specimens of Pietermaritzburg, which themselves were compared to the type of *Achaemenes ornatipennis* in the Stockholm Museum. In the type of *Cixius resurgens* the vertex is partly covered with dirt; since the type is old and fragile it was left intact, as other characters such as proportions, wing venation and colour pattern were identical with the other specimens from South Africa.

***Achaemenes pingatus* sp. n.**
(Figs. 99-103)

Material: holotype ♂, South Africa, Pondoland, Port St-John, 25-31.III.1923, BMNH.

Paratypes: 4 ♀♀, same locality, II-VI.1923, BMNH, KBIN.

Description: externally like the preceding species; vertex slightly more narrow, 1.3 times as broad as long.

Male genitalia: anal segment, pygofer and anal segment

Description: general colour pale ochreous; frons black between carinae, this black colour sometimes continuing on vertex as two separate lines. Vertex 0.7 times as long as broad. Outer carina on mesonotum bordered with black. Tegmina 2.4 times as long as broad, as illustrated in fig. 117, strongly widened distally, coloured with brown, and conspicuous black spots in apical cells, each containing a white spot. Legs pale ochreous with tips of tarsi embrowned, chaetotaxy of hind tarsi 8/(8).

Length: 7 mm.

Male genitalia: anal segment slightly asymmetrical in caudal view. Pygofer with angulate lateral margins. Genital styles as illustrated in fig. 114. Aedeagus with three long spines, all visible in right lateral view; these spines slightly different in the paratype from "George".

Diagnosis: the species is easily distinguished from all other *Achaemenes* species by the remarkable coloration of the tegmina; no closely related species have been observed.

Etymology: the name is an allusion to its resemblance with certain *Brixia* species, especially by the coloration of the tegmina.

***Achaemenes australis* (WALKER)**
(Figs. 118-119)

Cixius australis WALKER, 1851: 345.

Achaemenes australis (WALKER); SYNAVE, 1953b: 33.

Cixius obscurus WALKER, 1851: 347.

Achaemes [sic] kilimanus JACOBI, 1910: 107, pl. 1, figs. 9, 9a. syn. n.

A[chaemenes] kilimanus JACOBI; SYNAVE, 1952: 3.

Achaemenes kilimanus f. minutus SYNAVE, 1953b: 10. syn. n.

Material: holotype ♀, labelled "type", Port Natal, BMNH (examined).

Additional material: holotype ♀ *Cixius obscurus*, Port Natal, BMNH; holotype ♀ of *Achaemenes kilimanus* JACOBI, Kilimandjaro, Kibonoto, Niederung, NR; holotype ♀ *Achaemenes kilimanus f. minutus*, Kaziba,

1140 m, 10.II.1948; 2 ♀, Zululand, Mkuzi, XII.1945, light trap, BMNH; 1 ♀, Zaire, Kivu, Lwiro, X.1956; 1 ♀, Zaire, Katanga, Bianco, 8-11.VIII.1931, BMNH; 1 ♀, Natal: VAN REENEN, Drakensberg, XII.1926, BMNH; 1 ♀, Pelgrims Rest., 10 km N., 16.I.1963, P. Paliatseas, KBIN; 1 ♀, Borrowdate, 11.X.1976, "on roots of *Coxyza* sp. on association with *Phiedole* ants", R.J.S. Weaving, PPRI.

Description: general colour ochreous. Vertex twice as long as broad. Tegmina relatively short, 2.7 times as long as broad, with brown veins and indistinct brown spots on clavus and in each of the apical cells; costal margin not granulate. Legs ochreous, chaetotaxy of hind tarsi 8/(7), but difficult to see in the type.

Length: 5.5 mm.

Male genitalia: unknown.

Diagnosis: a small *Achaemenes* species with short tegmina, in which the apical cells each have a brown spot.

Remark: although listed as a male by WALKER, the type of *Cixius obscurus* is a female. The types of *Cixius obscurus*, *Achaemenes kilimanus*, and *Achaemenes kilimanus f. minutus* agree completely with that of *Achaemenes australis*. According art. 45 (g) of the International Code of Zoological Nomenclature *Achaemenes kilimanus f. minutus* SYNAVE is considered here as a name of subspecific rank and thus has to be regarded as a junior synonym of *australis*; in contrast to what is mentioned in SYNAVE (1953b), there are no significant differences between the type of "*f. minutus*" and the nominate form of *kilimanus*.

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