

African Crickets (Gryllidae). 6. The Genus *Gryllus* and Some Related Genera (Gryllinae, Gryllini)

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ABSTRACT.—This paper treats four genera of Gryllinae (Gryllini). Under the genus *Gryllus* we synonymize *Lenigryllus* Chopard and *Homaloblemmus* Saussure and include fifteen African species (four new species, and ten species transferred from other genera). A new monotypic genus *Sigagryllus* is described. *Acanthogryllus* remains monotypic. Under *Scapsipedus* we describe one new species and add one species through transfer; we also transfer fifteen nominal species to *Velarifictorus*, *Gryllus*, *Platygryllus*, and to a new undescribed genus. A species list summarizes these changes. [Africa, crickets, Gryllidae, Gryllini, morphology, new taxa, Orthoptera, songs, systematics]

This paper treats twenty-two species in four African cricket genera: *Gryllus* Linné, *Sigagryllus* n. gen., *Scapsipedus* Saussure, and *Acanthogryllus* Saussure. *Lenigryllus* and *Homaloblemmus* are synonymized under *Gryllus*.

GRYLLUS. This genus is one of the most widespread genera of crickets. It ranges throughout the Americas, Europe, Africa, and extends eastwards into tropical Asia. Probably it extends into temperate Asia as well. Prior to the present series of papers (Otte and Cade 1983a,b,c; Otte 1983; Otte and Cade 1984a,b) two species were listed from the Afrotropics: *bimaculatus* and *subpubescens*. In 1961 Chopard very briefly described the genus *Lenigryllus* into which he placed four species—three African and one Indian. For lack of diagnostic characters we have here synonymized *Lenigryllus* (see further discussion under genus *Gryllus*).

In Africa *Gryllus* now includes fifteen species, although several are only tentatively included here. Three species are moved from *Lenigryllus*, five from *Scapsipedus*, one from *Platygryllus*, and one from *Homaloblemmus*. Four new species are described.

SIGAGRYLLUS. This new genus is monotypic and is based upon a wingless species (*camerunensis*) previously placed in *Cophogryllus*. The latter genus now includes a wide variety of both related and unrelated species which were placed together because they are apterous. Examination of the male genitalia reveals their true affinities. Obviously the wings have been lost independently in a number of Grylline genera.

SCAPSIPEDUS. The genus *Scapsipedus* has heretofore included a number of species which do not belong in the genus. We have not yet had an opportunity to examine all African species which Chopard placed in the genus. The basic changes we have made in this genus are as follows: (a) *meridianus* is a new species described from South Africa; (b) *fuliginatus* Chopard is moved from *Modicogryllus*, and *Modicogryllus nigrodorsatus* Chopard becomes a junior synonym of it; (c) fifteen nominal species are moved to other genera—seven to *Velarifictorus*, five to *Gryllus*, two to *Platygryllus*, and one to a new undescribed genus. See Species List below for summary.

ACANTHOGRYLLUS. This genus remains monotypic. It may be best characterized as a *Gryllus*

which has become a deep burrowing species. We believe it may be closely related to *Platygyryllus primiformis*. *Scapsipedus parallelus* Walker is a synonym of *Acanthogryllus fortipes*, not of *Scapsipedus marginatus*, as indicated by Chopard 1967.

LIST OF SPECIES

Gryllus Linne 1758

(*Lenigryllus* Chopard 1961) n. syn.

(*Homaloblemmus* Saussure 1877) n. syn.

1. **bimaculatus** DeGeer 1773
2. **argenteus** Chopard 1954 (moved from *Lenigryllus*)
3. **rixator** n. sp.
4. **bellicosus** n. sp.
5. **meruensis** Sjöstedt 1909 (moved from *Lenigryllus*)
6. **nyasa** n. sp.
7. **luctuosus** Bolívar 1910 (moved from *Scapsipedus*)
8. **jallae** Giglio-Tos 1907 (moved from *Lenigryllus*)
9. **zambesi** Saussure 1877 (moved from *Homaloblemmus*)
10. **braueri** Karny 1910 (moved from *Platygyryllus*)
11. **namibius** n. sp.
12. **chappuisi** Chopard 1938b (moved from *Scapsipedus*)
13. **carvalhoi** Chopard 1961 (moved from *Scapsipedus*)
14. **conradti** Bolívar 1910 (moved from *Scapsipedus*)

Scapsipedus Saussure 1877

15. **marginatus** Afzelius and Brennius 1804
16. **meridianus** n. sp.
17. **niger** Chopard 1954 (moved from *Scapsipedus*)
18. **flavomarginatus** Chopard 1934
19. **obscuripennis** Chopard 1938
20. **fuliginatus** Chopard 1961a (moved from *Modicogryllus*)
(*nigrodorsatus* Chopard 1961b) new synonym

Sigagryllus n. gen.

21. **camerunensis** Chopard 1945 (moved from *Cophogryllus*)

Acanthogryllus Saussure 1877

22. **fortipes** Walker 1869
parallelus Walker 1869 (not synonym of *Scapsipedus marginatus*)

SCAPSIPEDUS SPECIES LISTED FROM AFRICA (CHOPARD 1967)
BUT NOT YET STUDIED

nigriceps Chopard 1954
obscuripes Chopard 1961a

SCAPSIPEDUS SPECIES BELONGING IN OTHER GENERA

katangensis Sjöstedt 1917 (synonym of *Velarifictorus vittifrons* (Sjöstedt))
lucens Chopard 1934 (member of new genus, Otte ms)
lesnei Chopard 1936 (moved to *Velarifictorus*, Otte and Cade 1983b)
vittifrons Sjöstedt 1917 (moved to *Velarifictorus*, Otte ms)
neavei Sjöstedt 1917 (moved to *Velarifictorus*, Otte ms)
chappuisi Chopard 1938 (moved to *Gryllus*, present paper)
carvalhoi Chopard 1961a (moved to *Gryllus*, present paper)
nigrithorax Chopard 1961a (moved to *Velarifictorus*, Otte and Cade 1983b)
convexifrons Chopard 1961a (synonym of *Platygyryllus cockbilli*, Otte and Cade 1984a)
mosambicus Chopard 1961a (moved to *Velarifictorus*, Otte and Cade 1983b)
whellani Chopard 1954 (moved to *Velarifictorus*, Otte and Cade 1983b)
cockbilli Chopard 1954 (moved to *Platygyryllus*, Otte and Cade 1984a)

METHODS

All tape recordings were made with a Nagra SN tape recorder (8.9 cm/s) and a Sony ECM-50PS electret condenser microphone attached to a parabolic reflector. Tapes were copied onto 5 inch reels by a Uher 4000 Report L tape recorder. Sonographs of all songs were made with a Kay Elemetrics 7029A Sonograph.

Temperatures were determined whenever recordings were made. The thermometer was placed as close as possible to the place where the cricket was singing, especially when crickets were singing in leaf litter, in burrows, or on the ground.

Body parts of crickets are named according to the terminology of Otte and Alexander 1983.

Specimens examined are deposited at the following institutions: BERLIN, Zoologisches Museum, Humboldt Universität; HONOLULU, Bernice Bishop Museum; LONDON, British Museum (Natural History); PARIS, Muséum National d'Histoire Naturelle; PHILADELPHIA (ANSP), Academy of Natural Sciences; TERVUREN, Musée Royal de l'Afrique Centrale; TORINO, Museo ed Istituto di Zoologia Sistemica della Università di Torino; STOCKHOLM, Naturhistoriska Riksmuseet; VIENNA, Naturhistorisches Museum; MADRID, Instituto Español de Entomología.

TAPE RECORDING AND COLLECTING LOCALITIES

5. Tanzania, Serengeti Park, Seronera, 14 x 1980
6. Tanzania, Serengeti National Park, Kirawira area, 20 x 1980
- 6A. Tanzania, Serengeti Park, Mbalageti R, nr. Kirawira, 20 x 1980
11. South Africa, Natal, Eshowe, 30 x 1980
12. South Africa, Natal, Mtunzini, 7 ix 1980
13. South Africa, KwaZulu, Hlabisa, 9 ix 1980
14. South Africa, Natal, St. Lucia, 10 ix 1980
15. South Africa, Natal (KwaZulu) Hluhluwe Game Reserve, 10 xi 1980
16. South Africa, Eshowe, Dindza Forest, 12 xi 1980
17. South Africa, Natal (KwaZulu), Tugela River (Middle Drift area), 15 xi 1980
18. South Africa, Natal, Howick, 16 xi 1980
19. South Africa, Natal, Karkloff area, near Howick, 17 xi 1980
20. South Africa, Natal (KwaZulu), Mkuze Game Reserve, 19 xi 1980
21. South Africa, Mkuze Game Reserve, Nsumu Pan, 19 xi 1980
22. South Africa, Transvaal, Rust-de-Winter, 20 ix 1980
30. South Africa, northern Cape Province, 41 km W of Vanzylsrus, on route R31, 4 iii 1982
31. Namibia (South West Africa), 3–20 km S of Aroab, 6 iii 1982
32. Namibia, 39 km S of Aroab, on sand dunes, 6 iii 1982
39. South Africa, Cape province near Bitterfontein, N of Vanrhynsdorp, on route N7, 8 iii 1982
42. South Africa, Cape Province, Stellenbosch, Jonkershoek Valley, 8 iii 1982
50. South Africa, Natal, Eshowe, 13–30 iii 1982
55. South Africa, Natal (KwaZulu) ca. 18 km W of Empangeni, 17 iii 1982
57. South Africa, Natal (KwaZulu) ca. 30 km NE of Eshowe, old Empangeni road, 18 iii 1982
58. South Africa, Natal, 18 km W of Empangeni, 18 iii 1982
63. South Africa, Natal (KwaZulu), Hluhluwe Game Reserve, 23 iii 1982
67. South Africa, Natal (KwaZulu), Mkuze Game Reserve, 28 iii 1982
68. South Africa, Transvaal, Budplass, 30 iii 1982
74. South Africa, Kruger National Park, Skukusa–Tshokwane road, 2 iv 1982
75. South Africa, Transvaal, Kruger Nat. Park, nr. Pretoriuskop, 2 iv 1982
- 76A. Kenya, Nairobi, 11 ix 1982
- 77A. Kenya, near Nairobi, Karen, 13 ix 1982
78. Kenya, Hunter's Lodge, Nairobi–Mombasa Road, 14 ix 1982
82. Kenya, plain and Valley S of Sagala Hills, nr. Voi, 17 ix 1982
85. Kenya, nr. Mombasa, Matuga, Agricultural Expt. Sta. 18 ix 1982
86. Kenya, Shimba hills, W slope, 19 ix 1982
87. Kenya, Waa, 17 km S of Mombasa, 18 ix 1982
96. Tanzania, Mombo, 27 ix 1982
97. Tanzania, Mombo, W side, 27 ix 1982
99. Tanzania, Dar-es-Salaam, 28 ix 1982
104. Tanzania, 20 km W of Kirogwe on road to Handeni, grassland, 2 x 1982
106. Tanzania, 40 km W of Handeni, 3 x 1982
108. Tanzania, 15 km S of Babati, nr. Bonga, 6 x 1982
154. Tanzania, Tarangire National Park, 6 x 1982

Genus *Gryllus* Linné

Gryllus Linné 1758: 428. Type species: *Gryllus campestris* Linné, by subsequent designation, Latreille 1810: 433.
Homaloblemmus Saussure 1877: 247. Type species: *Homaloblemmus zambesi* Saussure, by monotypy. NEW SYNONYM.
Lenigryllus Chopard 1961b: 270. Type species: *Gryllus meruensis* Sjöstedt, by original designation. NEW SYNONYM.

Gryllus species are distinguishable from similar appearing species in other genera only by the male genitalia. Typically in Europe and the Americas the male epiphallus consists of three lobes, including a longer, slender median lobe (similar to *bimaculatus*, Fig. 6A). In Africa a greater range of conditions exist which suggests that the genus has diversified more here than elsewhere, and it seems to grade into other closely related genera making the clustering of species into genera more difficult and arbitrary. Below we discuss the status of several species which appear to be especially divergent from typical *Gryllus*.

LENIGRYLLUS. Chopard's (1961b) complete description of *Lenigryllus* is as follows: "Pseudépiphalle présentant des formes très analogues à celle des *Gryllus*. Corps plus épais, couvert d'une pubescence abondante." The African species he placed in the genus do not appear to us to be particularly stocky, but they are very pubescent especially when compared to the exceptionally glabrous *G. bimaculatus*. But a number of American *Gryllus* are equally

pubescent. There does appear to have been a separate radiation of *Gryllus* in Africa (not including *G. bimaculatus*) but there are as yet no sure ways to define the African species as a separate group.

HOMALOBLEMMUS. The only character which sets this monotypic genus apart from other African *Gryllus* is the peculiarly widened, backward slanting forehead. This is reminiscent of heads in genera of the "blemmus" group of



FIG. 1. *Gryllus bimaculatus*, male.

Modicogryllini and led Saussure to place *zambesi* in a distinct genus. Aside from this feature, however, *zambesi* is very similar to *argenteus*, *rixator*, and *bellicosus*. By placing it into a separate genus one loses sight of the presumed close relationship among these species.

DIAGNOSTIC CHARACTERS. *Male genitalia:* This genus can best be distinguished from closely related genera by the male epiphallus, which is distinctly tri-lobed. In one case (*jallae*) the median lobe has become flattened. The most divergent genitalia are those of *jallae*, *carvalhoi*, and *nyasa*. In the latter species they are more similar to *Acanthogryllus* but in other morphological characters these two species are not closely similar.

Auditory tympana: Foretibiae with a small inner and large outer tympanum. Very occasionally (e.g., some *bellicosus*) the inner tympanum is obsolete.

Body color: In Africa most species are deep reddish brown to black, but *bimaculatus* males and females may occasionally be brownish or pale brown on the forewings.

Surface texture: Most African species are covered with fine dense pubescence on the back of the head, pronotum, abdomen, and legs. In some species (*argenteus*, *jallae*, *bellicosus*, *rixator*, *nyasa*) silvery pubescence is present on the pronotum, abdomen, and legs. In this same group the vertex of the head has several longitudinal depressions in which the pubescence is more dense.

Head shape: Most African species have elongate faces due to possession of elongate jaws. In this respect they resemble some *Velarifictorius* species. The most divergent heads are seen in male *zambesi* where the forehead is peculiarly widened and in male *carvalhoi* in which it is especially broad and dome-shaped.

Wings: All species have well developed forewings and, except for *bimaculatus*, very small hindwings. Apparently all African endemic *Gryllus* are micropterous. In females the forewings are usually not much longer than the pronotum, have broadly rounded posterior margins and are largely non-overlapping medially.

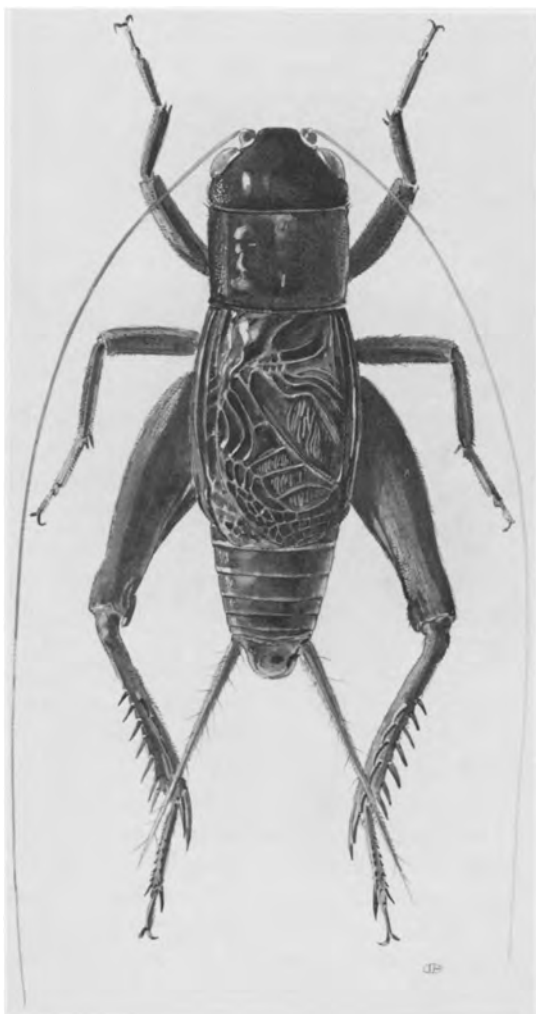


FIG. 2. *Gryllus bellicosus*, Tanzania, loc.106 (*G. rixator* and *G. argenteus* very similar).

In male forewings the mirror is well-developed and has a single dividing vein; the harp has 3–6 (usually 3 or 4) veins.

Legs: Legs in African species usually black, but hind femora often reddish. Hind tibiae with 5 or 6 inner and 5–7 (usually 6) outer subapical spurs.

Ovipositor: In species we have examined the ovipositor is 1.0 to 1.45 times as long as the hind femur.

BIOLOGY. Little is known about the biology of African crickets other than *bimaculatus* which has been extensively studied (see Chopard

1967: 49–51 for a long list of references). The three species which we collected in the Argenteus Group (*rixator*, *bellicosus*, and *braueri*) were all associated with dead wood. The former two species were found as nymphs inside cavities of rotting logs. *G. rixator* was also heard singing up in bark crevices of an acacia tree in Tarangire National Park, Tanzania; some males were also heard in detritus under the tree. The long legs in all of the species (aside from *bimaculatus*) suggests that they do not make their own burrows. *G. braueri* was found near the base of desert shrubs, among the numerous tightly packed stems emerging from the sand. The soil around the base of the shrubs was riddled with holes, but apparently not made by the crickets. One of the males we captured was singing on a stem about 18 inches above the ground.

1. *Gryllus bimaculatus* DeGeer

Gryllus bimaculatus DeGeer 1773: 521

RECOGNITION. Figs. 1, 4, 5A, 6A. Tables 1, 2. **Males:** Easily distinguished from other African species by following characters: Large, black, glabrous; with two pale markings on dorsal surface of forewings next to pronotal margin. Forewings with well developed apical area. Occasional specimens have pale brown legs and forewings. Forehead rather strongly angulate in profile. Forewings nearly or entirely covering abdomen; more than 3.5 times as long as pronotum. Hind femora relatively small; ca. 0.7 times as long as forewings and 1.18 times as long as hind tibiae. Hindwings usually extending well beyond abdomen.

Females: Similar to males in size and color. Forewings nearly covering abdomen. Hindwings usually extending well beyond abdomen. Ovipositor slightly longer than hind femora. Cerci shorter than hind femora.

DISTRIBUTION. This is the most widespread of all *Gryllus* species. It ranges from the tip of Africa into Europe and then eastwards through southern Asia to at least Thailand.

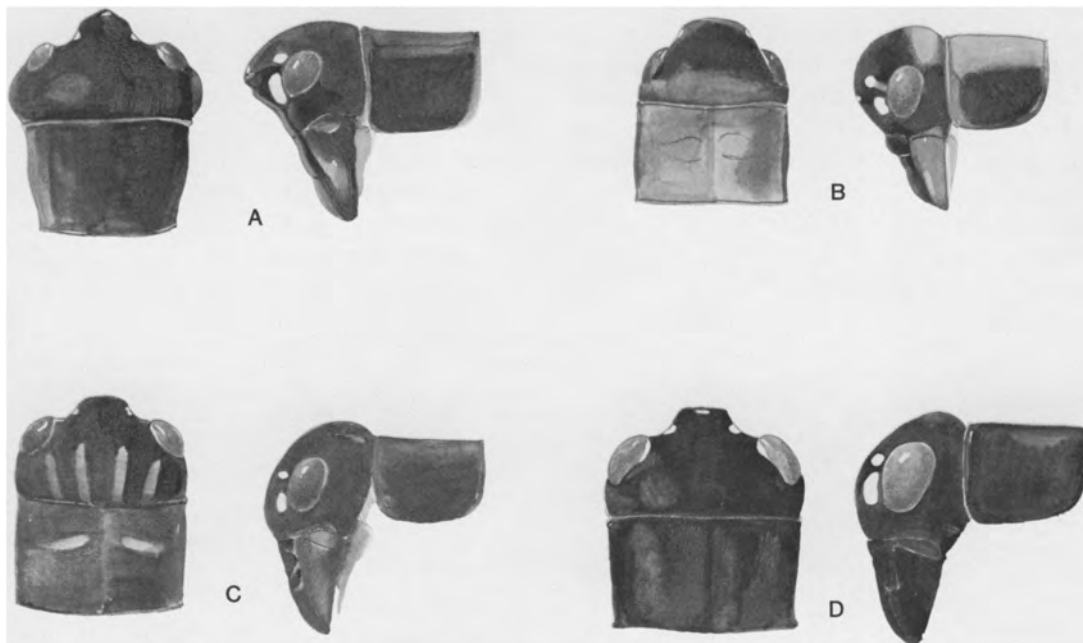


FIG. 3. Heads and pronota of *Gryllus* species. A, *zambezi*, Vila Pery, Mozambique; B, *carvalhoi* holotype; *chappuisi* holotype; D, *niger* holotype.

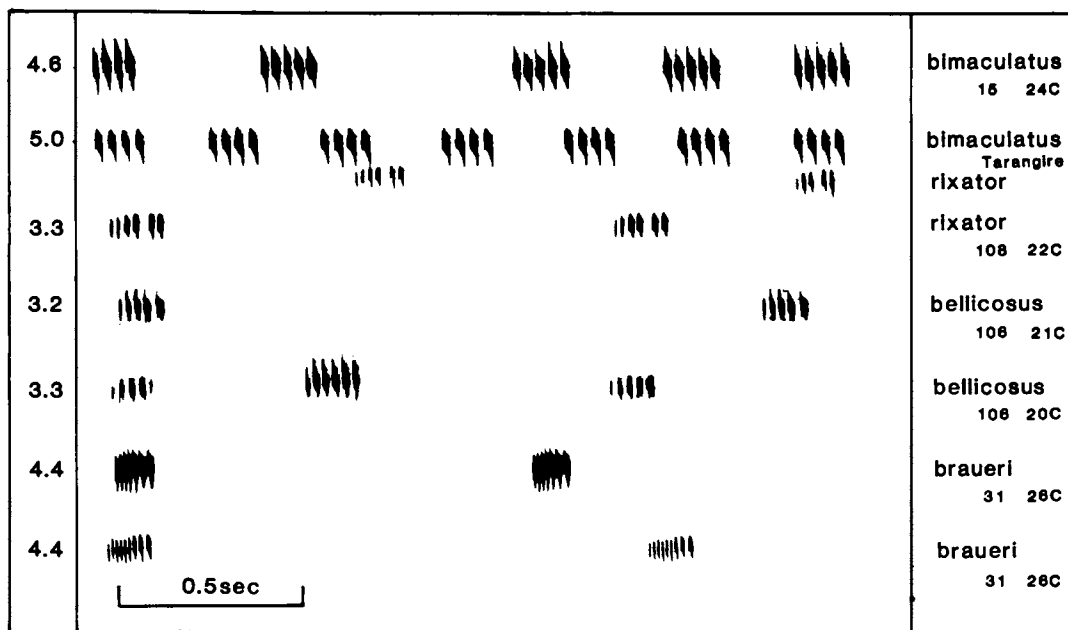


FIG. 4. Songs of four *Gryllus* species. Numbers at left indicate frequency in kiloHertz. Numbers beneath names indicate taping locality and temperature in °C.

HABITAT. Grassy areas but also found in railroad gravel, soil cracks, gardens, and old fields. Usually found where man has influenced the habitat in some way as in agricultural lands, and around cities and villages; occasionally collected far from human influence. We have usually collected *bimaculatus* on the surface of the ground or in soil cracks, but never in self made burrows.

SONG. A succession of 3 to 5 pulse chirps delivered at roughly 3 chirps per second.

Locality	p/s	ch/s	p/ch	KHz	°C air
6 (n = 2)	28.3,29.3	3.3,3.5	4,4	4.5,4.8	19
14	31.2	2.4	4	2.4	23
15 (n = 2)	29.7,30.5	3.5,2.6	4,5	4.6,4.6	24
11	26.4	3.2	4	4.5	20
19	22.5	2.4	5	4.8	15
22	27.3	3.7	3-4	4.8	21
30	25.6	2.9	4	4.6	20
39	28.3	3.5	3-4	4.7	25-28
42	22.0	2.8	3	4.8	21
68	28.3	3.4	4	4.7	25
Tarangire Nat. Park	26.4	3.2	4	5.0	25
77A	28.3	2.5	4	4.5	21
76A	26.4	3.2	4	4.8	21

In addition to the above localities we have heard this species along the entire railroad line between Johannesburg and Durban.

2. *Gryllus argenteus* (Chopard)

Acheta argentea Chopard 1954: 914. Holotype ♂, southern Rhodesia [Zimbabwe]. Salisbury District, 21 x 1952 (M.C. Mossop) LONDON. *Lenigryllus*, Chopard 1961: 270. Type examined. NEW COMBINATION.

NOTES ON HOLOTYPE. Figs. 5B, 6B. Tables 1, 2. Large, entirely black, long jawed cricket with two silvery-white pubescent bands on dorsum running posteriorly from margin of eye and along lateral ridges of pronotum. Hind femora with ring of similar silvery pubescence at two thirds point, especially pronounced on dorsal

and inner faces. Similar in size and head size to *rixator* and *bellicosus*.

Females: Two females from Salisbury and Fort Victoria probably belong to this species. These are similar in color, but the largely exposed abdomen has 6 or 7 longitudinal rows of silvery pubescent spots running the length of the abdomen.

HABITAT. Not reported.

SONG. Not known.

SPECIMENS. Holotype ♂ LONDON. ZIMBABWE: Salisbury to Enkeldoorn, 23 xii 1970 (Sedlacek) 1 ♀ HONOLULU. Fort Victoria, 26 xii 1970 (Sedlacek) 1 ♀ HONOLULU.

3. *Gryllus rixator* n. sp.

HOLOTYPE. ♂, Tanzania, 15 km S of Babati, near Bonga, Arusha-Dodoma road, wooded hillside, 6 x 1982 (Otte) ANSP.

RECOGNITION. Figs. 4, 5E, 6C. Table 1. **Males:** Largely indistinguishable from *bellicosus*; differs in song, in slightly different wing shape, in having pale veins on lateral field of forewings, and in having pale marking on upper face of hind femora just anterior to knee.

Females: not known.

DISTRIBUTION. Known from the type locality and Tarangire National Park.

HABITAT. At the type locality nymphs were found in rotting logs in a hillside woods. These were reared and tape recorded in the lab. At Tarangire, specimens were heard in a trash heap and up in the deep crevices of a tree about 10 feet above the ground.

SONG. Short chirps delivered from once every second to once every two seconds. Each chirp consists of six pulses, a first group of four pulses followed by a pair of pulses.

Locality	p/s mean*	ch/s	p/ch	KHz	°C
108	39.8	0.73-1.20	6	3.25	22
Tarangire	48.0	0.45	6	3.8	25-30
Tarangire	47.3	0.22-0.40	6	3.7	25-30

*Gap before last pulse pair not included.

SPECIMENS. Holotype ♂ ANSP.

TABLE 1. Comparison of species. Males. HT, holotype; PT, paratype; BL, body length; F3L, hind femur length; FWL, forewing length; PL, pronotal length measured along midline; TL, hind tibia length; i/O, small inner and large outer tympana; OL, ovipositor length.

	BL		Approx no. file teeth	FWL PL	TL F3L	Number subapical spurs		No. harp of veins	Condition of tympana
	approx (mm)	F3L				inner	outer		
<i>Gryllus</i>									
<i>bimaculatus</i>	25-34	11-13	145-160	3.5+	0.85	4,5	5,6	4,5	i/O
<i>argenteus</i> (HT)	29	17	120	2.2	0.89	5	6	4	i/O
<i>rixator</i> (HT)	28.5	16	110	2.32	0.80	5,6	6,7	4	i/O
<i>bellicosus</i> (HT)	28	17	122	2.23	0.83	5	6,7	5	i/O
<i>bellicosus</i> (PT)	24.5	14.2		2.43	0.78	5	6,7	5	-/O
<i>meruensis</i> (HT)	16	10.5	102	2.55	0.78	6	7	3	i/O
<i>nyasa</i> (HT)	20	12.0	150	2.65	0.70	6	6	4	i/O
<i>nyasa</i> (2PT)	18,21	11.8,12.0	146,149	—	—	6,—	6,—	5½,5	i/O
<i>jallae</i>	23	16.0	100	2.3	0.83	5	6	3	i/O
<i>luctuosus</i> (HT)	21	13.7	118	2.7	0.82	5	6	4	i/O
<i>zambezi</i>	25	15.3	105	1.79	0.72	6	6	3½	i/O
<i>conradti</i> (HT)	20	14.7	140	2.23	0.77	5	5	3	-/O
<i>braueri</i> (n = 3)	19-22	11-15	103,107HT	2.6-2.7	0.7-0.8	6	6,7	3-5	i/O
<i>namibius</i> (HT)	24	15	93	3.1	0.75	6	6	4	i/O
<i>chappuisi</i> (HT)	27	16	126	2.1	0.82	6	6,7	4½	i/O
<i>carvalhoi</i> (HT)	22	lost	121	2.2	—	—	—	5	i/O
<i>Scapsipedus</i>									
<i>meridianus</i>	20-25	11-13	250-260	2.5-3.0	0.75-0.80	6	6	4,5	i/O
<i>marginatus</i>	19-23	11-13.5	239	2.4-2.9	0.75-0.80	6	6	4,6	i/O
<i>niger</i> (HT)	15.5	9.5	178	2.7	0.79	5	6	4	i/O
<i>obscuripennis</i> (HT)	15	8	174	2.9	0.67	5	6	4	i/O
<i>fuliginatus</i> (HT)	14	8	165	3.1	—	6	6	4	i/O
<i>Acanthogryllus</i>									
<i>fortipes</i> (n = 7)	23-34 30.1	12-14	108-120 114.3	3.4	0.63	7,8	7,8	3,4	i/O

4. *Gryllus bellicosus* n. sp.

HOLOTYPE. ♂, Tanzania, ca. 40 km W of Handeni, on road to Kondoa, 3 x 1982 (Otte) ANSP.

RECOGNITION. Figs. 2, 4, 6D. Tables 1, 2. *Males*: Almost indistinguishable from *rixator*, but with different songs and slightly different wings. Veins on lateral field black (pale in *rixator*). Hind femora largely black (dark reddish brown and with pale dorsal mark in *rixator*). Large black crickets with relatively long faces and body covered with very fine short pubescence. Upper half of eye gray, lower half blackish. Holotype with 122 teeth. Holotype foretibia with large oval outer tympanum and

very tiny inner one, but three paratypes (one male, two females) lack inner tympanum; in one female a small depression remains. Hindwings shorter than pronotum.

Females: Similar to males but forewings much shorter. Hindwings, if present, hidden beneath forewings.

DISTRIBUTION. Known only from the type locality.

HABITAT. Specimens (all late instar nymphs) were found by ripping off the bark on a dead tree. The interior of the tree was moist and contained numerous insect species. The surrounding countryside was exceedingly dry and we speculate that this species passes the dry

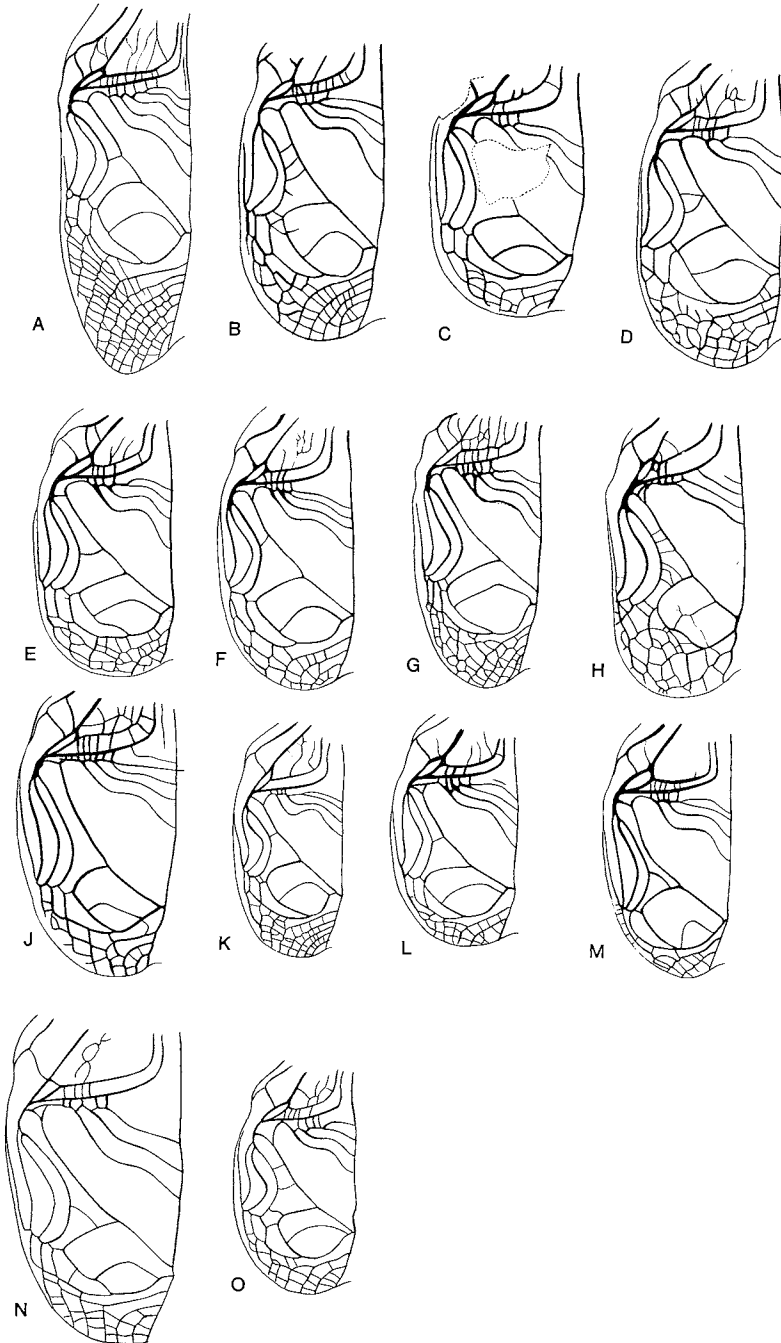


FIG. 5. Forewings (dorsal field) of *Gryllus* species (not all same scale). **A**, *bimaculatus*; **B**, *argenteus* holotype; **C**, *meruensis* lectotype; **D**, *jallae*, Vila Pery, Mozambique; **E**, *rixator*, loc. 108; **F**, *braueri*, loc. 31; **G**, *nyasa* holotype; **H**, *zambezi*, Vila Pery, Mozambique; **J**, *carvalhoi* holotype; **K**, *namibius* holotype; **L**, *chappuisi* holotype; **M**, *niger* holotype; **N**, *conradti* holotype; **O**, *luctuosus* holotype.

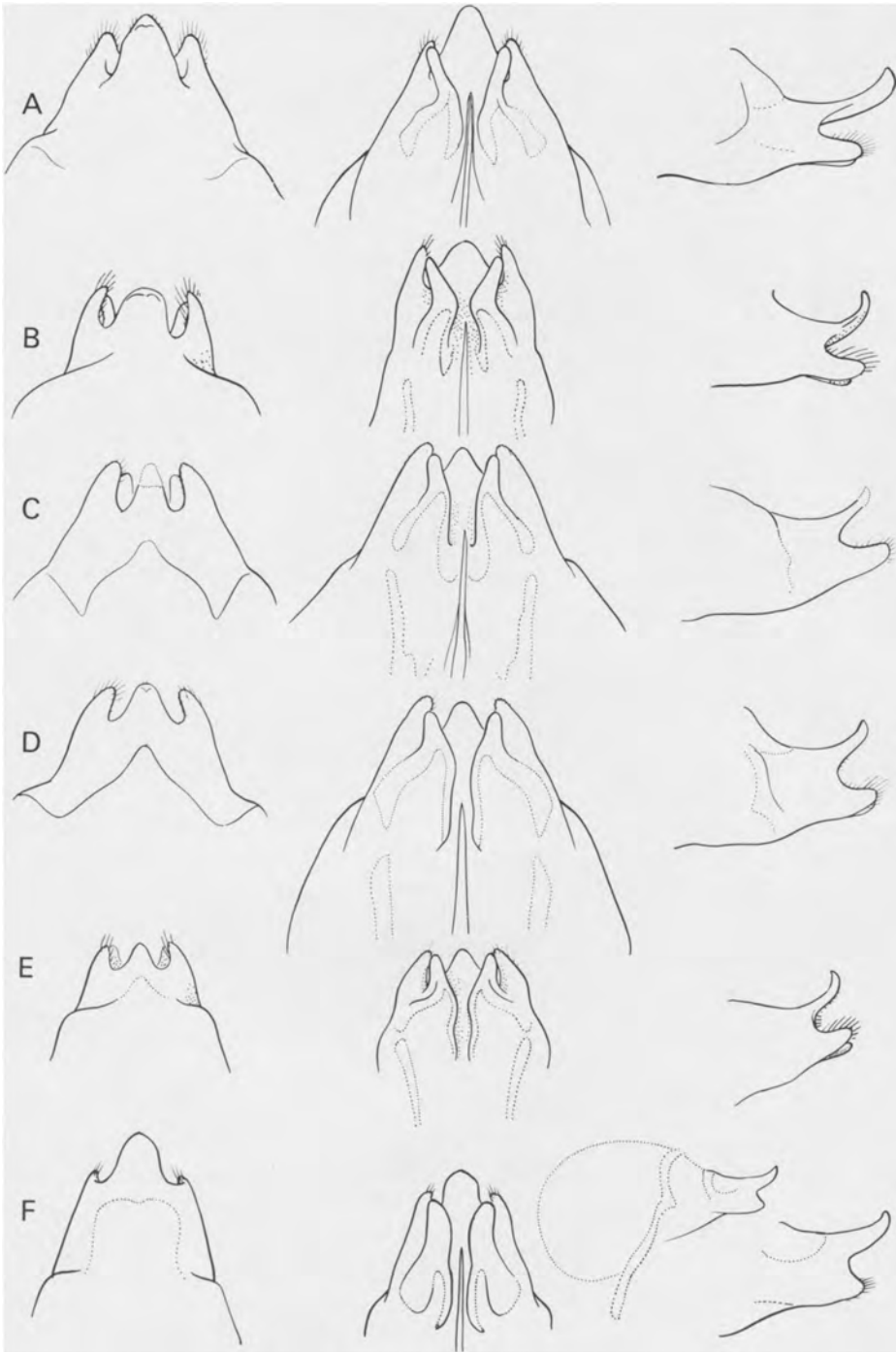


FIG. 6. Male genitalia of *Gryllus* species showing dorsal, ventral and lateral aspects. A, *bimaculatus*, loc. 14; B, *argenteus* holotype; C, *rixator* holotype; D, *bellicosus* holotype; E, *meruensis* lectotype; F, *nyasa* holotype.

TABLE 2. Comparison of species. Females. AT, allotype. See Table 1 for other abbreviations. Numbers in italics are means.

	BL approx (mm)	F3L	FWL PL	TL F3L	Number subapical spurs		OL F3L	Condition tympana
					inner	outer		
<i>Gryllus</i>								
<i>bimaculatus</i>	25–35	11–13	3.5+	ca. 0.85	5	6	1.0–1.1	i/O
<i>argenteus</i> (n = 2)	29,27	18.5,17	1.3,1.4	0.80,0.80	5	6	1.2,1.2	i/O
<i>bellicosus</i> (n = 2)	28,29	17.5,—	1.1–1.5	0.80	5	6	1.35,1.35	-/O
<i>jallae</i> (HT)	26	19.5	1.0	0.80	5	6	1.00	i/O
<i>jallae</i>	26	18.0	1.0	0.80	5	6	1.10	-/O
<i>zambezi</i>	22	14.5	0.6	0.78	6	6	1.25	i/O
<i>braueri</i>	21	13	1.3	0.78	6	7	1.16	—
<i>chappuisi</i>	25	15	1.3	0.83	5	6	1.43	i/O
<i>Scapsipedus</i>								
<i>meridianus</i> (n = 6)	22–25	13–15	2.4–3.0	0.75–0.80	6	6	ca. 1.4	i/O
<i>marginatus</i> (n = 6)	20–24	12.5–14	2.3–3.0	0.75–0.80	6	6,7	1.4–1.9	i/O
<i>flavomarginatus</i> (HT)	17	9.5	2.3	0.73	6	6	0.66	i/O
<i>obscuripennis</i> (AT)	13	8	2.9	0.70	5	6	1.00	i/O
<i>Acanthogryllus</i>								
<i>fortipes</i> (n = 6)	23–30 26.1	10–13	3.0	0.59	7	7	0.82	i/O

period as late nymphs and matures with the first rains. We reared and recorded specimens in the laboratory in Philadelphia.

SONG. Widely spaced short chirps (usually one chirp every 1.5 to 2 seconds). Pulse rate during each chirp decreases slightly. Pulse rate figures given below are means for the entire chirps.

Locality	p/s mean	ch/s	p/ch	KHz	°C
106	36.0	0.5–0.67	4–5	3.2	21
106	37.7	0.5	6	3.3	20
106	39.6	0.73	5	3.1	20

SPECIMENS. Holotype ♂ ANSP. Paratypes: same date as holotype, 1♂ 2♀ ANSP.

5. *Gryllus meruensis* Sjöstedt

Gryllus meruensis Sjöstedt 1909. Lectotype ♂, here designated, [Tanzania] Meru, Neider, 22 ix 1905 (Sjöstedt) LONDON. *Acheta*, Chopard 1954: 915. *Lenigryllus*, Chopard 1961: 270.

NOTES ON TYPE. Figs. 5C, 6E. Table 1. Body color entirely dark brown. Head with fine pubescence on occiput. Pronotum and abdomen entirely dark brown. Forewings dark brown. Hindwings shorter than pronotum. Legs unicolorous dark brown.

HABITAT. Not reported.

SONG. Not known.

SPECIMENS. Lectotype ♂ LONDON. Paralectotype ♂ STOCKHOLM.

6. *Gryllus nyasa* n. sp.

HOLOTYPE. ♂, Nyasaland [Malawi], Limba, 4500 ft, 28 xi 1950 (Virginia Orr) ANSP.

RECOGNITION. Figs. 5G, 6F. Table 1. Entirely black cricket with very fine silvery pubescence. Head: fine pubescence on occiput; glabrous on vertex and forehead. Face black becoming reddish brown on mouth parts. Forewings black but more pale at shoulders and along forewing ridge. Abdomen black. Legs all black. Hind-

wings hidden, a little more than half the length of the forewings.

DISTRIBUTION. Known from the type locality, and from near Songea, Tanzania.

HABITAT. Not known.

SONG. Not known.

SPECIMENS. Holotype ♂ ANSP. Paratypes: TANZANIA: Matengo highlands, WSW of Songea, 1–10 xii 1935 (Zerby) VIENNA.

7. *Gryllus luctuosus* (Bolívar)

Scapsipedus luctuosus Bolívar 1910. Holotype ♂, Tanzania, Tabora, Ounyanyembe, 1^{er} Trim 1885 (R. P. Haute-coeur) MADRID. Type examined. NEW COMBINATION.

RECOGNITION. Figs. 5O, 7A. Table 1. *Male*: Body color black. Very similar to *bellicosus*, *rixator*, and *nyasa* but differing in the male genitalia. Dorsum of head with faint stripes 1, 2, and 3. Hindwings less than $\frac{1}{3}$ pronotal length.

Females: Not known.

DISTRIBUTION. Known only from type locality.

HABITAT. Not known. Probably savanna woodland.

SONG. Not known.

SPECIMENS. Holotype ♂ MADRID.

8. *Gryllus jallae* Giglio-Tos

Gryllus jallae Giglio-Tos 1907. Holotype ♀, Kazungula, TORINO. *Acheta*, Chopard 1954. *Lenigryllus*, Chopard 1961: 270. Type examined.

RECOGNITION. Figs. 5D, 7C. Tables 1, 2. *Males*: Large, black, with two rows of silvery or white pubescence, each running from upper posterior margin of eye to posterior margin of pronotum. Very similar to *argenteus* but epiphallus quite different. Dorsal surface of hind femora with band of silvery pubescence just proximal to knees.

Females: (including holotype): Similar to male. Dorsum of abdomen with longitudinal rows of silvery pubescence—median row and five rows on either side; lateral rows wider.

Forewings black, oval, about as long as pronotum, meeting at midline.

9. *Gryllus zambesi* (Saussure)

Homaloblemmus zambesi Saussure 1877: 247. Holotype ♀, “L’interieur de l’Afrique; les rives du fleuve Zambese.” Collection of M. Brunner de Wattenwyl, No. 5537, VIENNA. Type not examined. NEW COMBINATION.

NOTE. We did not examine the type, but compared a female determined by Chopard to the description and the figures given by Saussure. Until males from the type locality and their songs are known the identity of the male mentioned below will remain doubtful.

RECOGNITION. Figs. 5H, 7D. Tables 1, 2. *Males*: Large, entirely black crickets with strongly flattened, hypognathous faces. Body covered with fine pubescence. Without hindwings.

Females: Face not so flattened, but front of face slightly concave in lateral profile. Forewings very short—about half as long as pronotum and not overlapping at midline.

DISTRIBUTION. Known only from the type locality and from Vila Pery, Mozambique.

HABITAT. Not known.

SONG. Not known.

SPECIMENS. Holotype ♀ VIENNA. MOZAMBIQUE: Vila Pery 1928 (P. Lesne) 1♂ 1♀ PARIS.

10. *Gryllus braueri* (Karny)

Acheta braueri Karny 1910: 43. Lectotype ♂, here designated, Namibia, Windhoek (Techow S.) BERLIN. *Platygryllus*, Chopard 1961b.

RECOGNITION. Figs. 4, 5F, 7E. Tables 1, 2. *Males*: Very similar to *namibius*, differing mainly in male genitalia (median lobe of epiphallus not as long). Medium sized, dark reddish brown to blackish cricket. Body covered with fine silvery pubescence. Epistomal suture strongly bowed upwards. Hind femora orange-brown to deep purple-black. Forewings ivory at shoulder and along wing angle. Lateral field of forewings black, but with pale gray lower margin. Foretibiae with a small inner and a large outer tympanum.

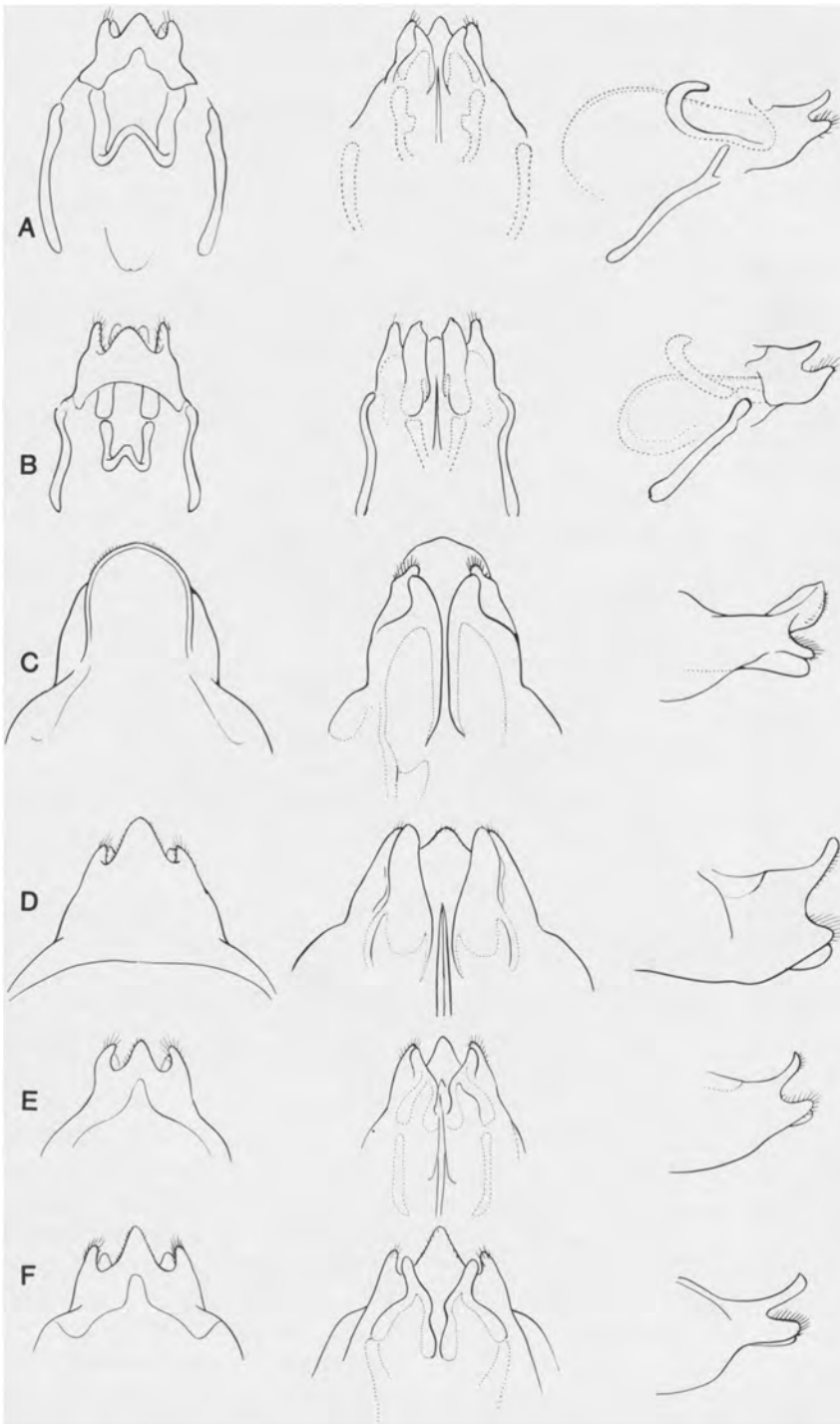


FIG. 7. Male genitalia of *Gryllus* species. A, *luctuosus* holotype; B, *conradti* holotype; C, *jallae*, Vila Pery, Mozambique; D, *zambezi*, Vila Pery, Mozambique; E, *braueri*, loc. 31; F, *namibius* holotype; G, *chappuisi* holotype.

Female (Paralectotype): Dark reddish brown. Forewings with narrow ivory streak along forewing angle; lateral field black, with pale gray lower margin; slightly longer than pronotum, overlapping medially. Abdomen uniform dark reddish brown. Ovipositor and cerci broken near base.

DISTRIBUTION. Known from central and southern Namibia.

HABITAT. Found in debris and holes under large shrubs in sandy areas and dunes. The male we captured was singing from a perch about 18 inches above the ground.

SONG. Short, variably spaced chirps; pulse rate decreases during each chirp beginning with 4 to 6 rapidly delivered pulses, followed by 3 slower pulses.

Locality	p/s			ch/s	p/ch	KHz	°C
	slowest	mean	fastest				
31	46.8		89.8	0.88	7	4.4	26
		68.3					
31	48.0		88.0	0.69	9	4.4	26
		68.0					
32	52.5		88.0	0.78	8	4.3	26
		70.3					

SPECIMENS. Holotype ♂ BERLIN. Paralectotypes: NAMI-BIA: Farm Lichtenstein, near Windhoek (F. Kunze) 1♂ BERLIN. Kung-Bushmanland (Lubbert S.V.) 1♀ BERLIN 3–20 km S of Aroab, among shrubs on dunes, 6 iii 1982 (Otte and Cade) 1♂ ANSP.

11. *Gryllus namibius* n. sp.

HOLOTYPE. ♂, Karibib, S.W.A. (Namibia) PARIS.

RECOGNITION. Figs. 5K, 7F. Table 1. *Male:* Very similar to *braueri*, but differing in male genitalia. Medium-large. Very dark reddish brown species with head almost black. Hindwings present, about as long as pronotum. Foretibiae with small inner and large outer tympanum. Seems to be most closely related to *braueri*, but larger, median lobe of genitalia more pronounced, apical area of forewings longer.

Females: Not known.

DISTRIBUTION. Known only from the type locality.

HABITAT. Not known. Taken from desert scrub region.

SONG. Not known.

SPECIMENS. Holotype ♂ PARIS.

12. *Gryllus chappuisi* (Chopard)

Scapsipedus chappuisi Chopard 1938b: 129. Holotype ♂, Kenya, Escarpment, Kikuyu Escarpment, 2,300 m, 1932–1933 (Mission de l'Omo, C. Arambourg, PA. Chappuis, B. Jeannel) PARIS. Type examined. NEW COMBINATION.

RECOGNITION. Figs. 5L, 8A. Tables 1, 2. *Males:* Large dark reddish brown with orange-brown hind femora. Vertex and occiput of head with faint bands 1 and 2 and grooved along these bands. Face dark brown to blackish. Mandibles reddish. Body finely pubescent. Pronotum with parallel sides. Pronotum dark brown, darker on lateral lobes. Forewings dark brown; lateral field blackish but with pale veins. Abdomen blackish.

Females: Similar to male in color.

DISTRIBUTION. Known only from the type locality.

HABITAT. Not known.

SONG. Not known.

SPECIMENS. Holotype ♂ PARIS. Paratype: same data as holotype, ♀ PARIS.

13. *Gryllus carvalhoi* (Chopard)

Scapsipedus carvalhoi Chopard 1961a: 32. Holotype ♂, Angola, Lac Calundo, PARIS. Type examined. NEW COMBINATION.

RECOGNITION. Figs. 5J, 8B. Table 1. *Males:* Large, gray-brown, blackish on sides of body and with forehead especially broad and shiny black. Median lobe of epiphallus longer than lateral lobes. Frons and clypeus shiny black. Upper lobe of clypeus bulging (side view). Cheeks black. Mandibles rusty red. Pronotum pubescent; disk grayish, lateral lobes blackish. Forewings dark brown on dorsal field, black on lateral field. Front and middle legs dark brown.

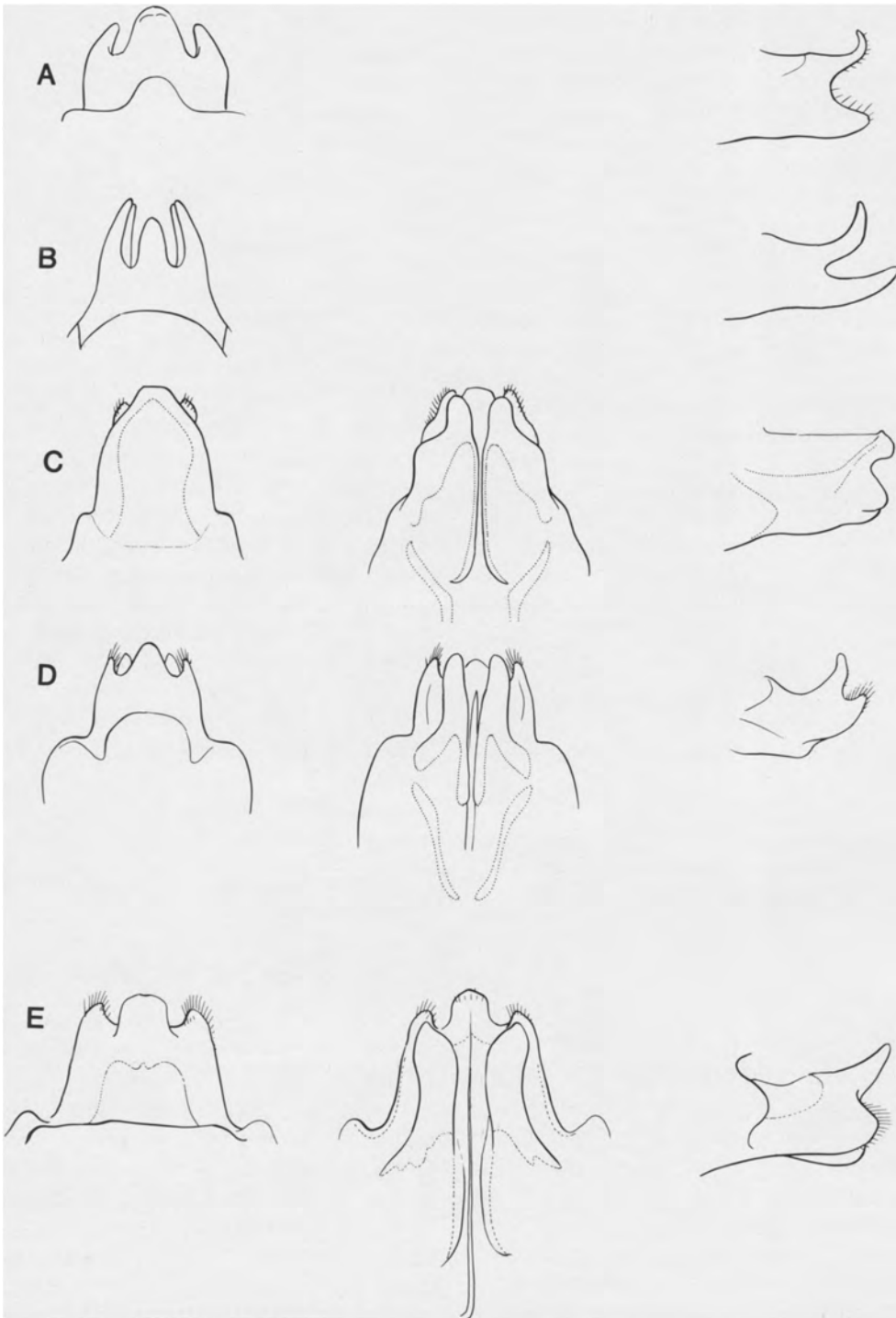


FIG. 8. Male genitalia of *Gryllus*, *Sigagrillus*, and *Acanthogryllus*. A, *Gryllus chappuisi* holotype; B, *Gryllus carvalhoi* holotype; C, *Gryllus niger* holotype; D, *Sigagrillus camerunensis* holotype; E, *Acanthogryllus fortipes*, loc. 11.

Hind legs lost, but remaining base of one hind femur gray brown and with dark oblique stripes on outer face. Median lobe of epiphallus longer than lateral lobes.

Females: Not known.

DISTRIBUTION. Known only from the type locality.

HABITAT. Not known.

SONG. Not known.

SPECIMENS. Holotype ♂ PARIS.

14. *Gryllus conradti* (Bolívar)

Scapsipedus conradti Bolívar 1910. Holotype ♂, Kame-run, 1898–1899 (L. Conradt) MADRID. Type examined. NEW COMBINATION.

RECOGNITION. Figs. 5N, 7B. Table 1. *Male:* Body color reddish but with pale gray forewings. Dorsum of head without stripes and scarcely pubescent. Ocelli large, yellowish. Jaws elongate. Disk of pronotum lighter than lateral lobes. Abdomen dark brown. Hindwings less than one half pronotal length. Legs uniform reddish brown. Cerci longer than hind femora.

Females: Not known.

DISTRIBUTION. Known only from type locality.

HABITAT. Not known.

SONG. Not known.

SPECIMENS. Holotype ♂ MADRID.

Genus *Scapsipedus* Saussure

Scapsipedus Saussure 1877: 23. Type species: *Acheta marginatus* Afzelius and Brennius, designated by Kirby 1906: 45.

Chopard includes 22 nominal species under this genus; all but one (from Madagascar) are African. Our studies reveal that most of the species in Chopard's (1967) list do not belong to *Scapsipedus*. The necessary changes are indicated in the species list at the beginning of this paper. Our conclusion is that the genus is much smaller than previously indicated and that some of the species listed under the genus, but

not yet studied, will also be found to belong to other genera.

DIAGNOSTIC CHARACTERS. The only character which we were able to use to distinguish this genus from *Gryllus*, *Platygryllus*, and *Teleogryllus* is the male genitalia. The epiphallus is tri-lobed and the median lobe is dorsoventrally flattened, triangular in shape and extends well beyond the lateral lobes. The ectoparameres are quite similar to *Gryllus*.

Foretibiae with small inner and large outer tympana. Mirror with a single dividing vein. Harp with 4–6 veins (usually 4). Hind tibiae with 5 or 6 inner and 6 outer subapical spurs.

The head is variable in this genus; in some species the forehead is broad, has a pale stripe between the lateral ocelli and the face declines posteriorly from the top to bottom. In other species the head is like that of *Gryllus* and *Modicogryllus*.

13. *Scapsipedus marginatus* (Afzelius and Brennius)

Acheta marginata Afzelius and Brennius 1804: 23. Location of types not known. Afzelius specimens went to Schönherr Collection (Horn 1926) at least part of which went to Stockholm. But Stockholm does not have the specimens.

RECOGNITION. Figs. 9, 10A, 11, 12A. Tables 1 and 2. Indistinguishable from *meridianus* except by song. *Males:* Medium to large cricket with broad, backward slanting forehead with broad ivory band between lateral ocelli; dorsum blackish, venter pale; legs pale to medium brown and with blackish spots on dorsum and in darker specimens with dark streaks on inner and outer faces. Foretibiae with small (but not minute) inner and a large oval outer tympanum. Forewings blackish, but pale along medial vein; always extending beyond middle of abdomen. Hindwings present, often hidden beneath forewings, sometimes extending well beyond end of abdomen. Abdomen: dorsum blackish, usually with two longitudinal rows of pale markings on either side of median line. Cerci pale brown, slightly longer than hind femora.

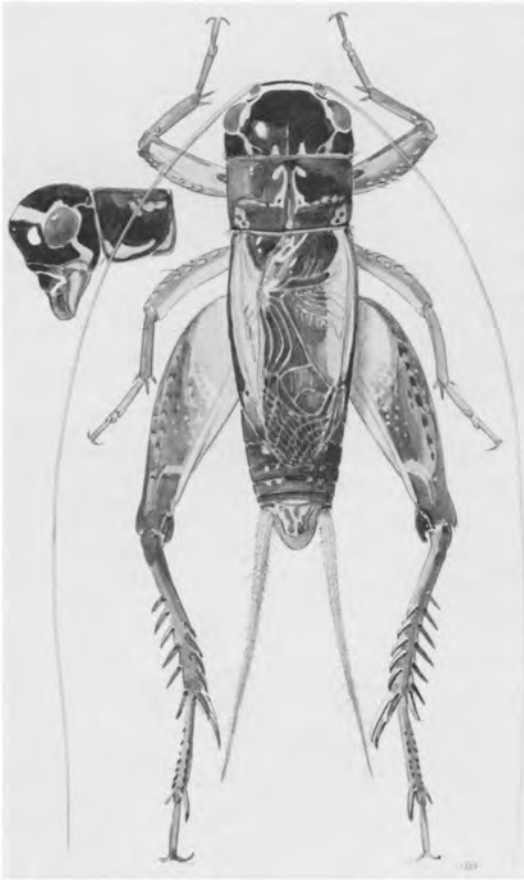


FIG. 9. *Scapsipedus marginatus*, Tanzania loc. 104.

Females (Table 2): Similar to males in color, size, and wing length. Ovipositor much longer than hind femora. Face not as oblique, and not as long as in male.

DISTRIBUTION. Widespread in East Africa, across to west Africa. Songs have not been recorded in West Africa, therefore what we presently perceive to be a single widespread species may eventually come to be broken into several species. The point of contact between *marginatus* and the southern species, *meridianus*, is not yet known.

HABITAT. Grasslands and open woodland. We have always found this species on the surface, either in leafy debris or in thick grass. At Hunter's Lodge it was in weeds and detritus

under some large acacia trees. Near Voi it was among twigs and leafy debris under a heavy canopy of acacia trees in a wash. At Matuga and in Shimba hills it was in thick grass. In the Serengeti Plains it was along small depressions in very closely cropped grasslands.

SONG. Groups of pulses (chirps) are variable in this species. Usually each group consists of 1–4 major pulses each of which may be preceded by one or two minor pulses. Sometimes only major pulses are delivered. In *meridianus* each chirp consists of pairs of pulses of equal intensity.

Local-ity	p/s (major pulses)	ch (sec) interval	p/ch major pulses	KHz	°C
5 (n = 1)	5.8–6.8	2–5.8	2–3	4.8	19
6 (n = 2)	6.6, 7.1	—, 4–8.5	1–2	5.0, 5.5	19
6A (n = 1)	6.3–7.8	3.5–5.0	1–3	5.1	25
78	5.7	3–5	3	5.5	22
82	6.3	0–3	1–2	5.7	25
85	5.7	widely spaced	3	5.5	26
86 (n = 2)	7.1, 7.3	—	2–4	5.7, 6.0	25–27
87 (n = 1)	6.3–6.7	widely spaced	2–4	5.7–6.0	26
96	6.14	2–3	2–4	5.2	23
97	6.3	3–2	3–4	5.3–5.5	23–25
99	7.3	—	4	5.8	23
104	11.3	0.4–0.6	3–4	6.2	29

SPECIMENS. All ANSP: TANZANIA: Loc. 6, 2♀. Loc. 99, 2♂ 2♀. Loc. 104, 3♂ 3♀. KENYA: Karen (Nairobi) 1♀. Loc. 78, 3♂ 2♀. Loc. 85, 3♂ 2♀. Loc. 87 3♂.

14. *Scapsipedus meridianus* n. sp.

HOLOTYPE. ♂, South Africa, Hluhluwe Game Reserve, 10 xi 1980 (D. Otte) ANSP.

RECOGNITION. Figs. 10A, 11, 12B. Tables 1, 2. Virtually identical to *marginatus*. These two species can presently be separated only by their songs.

DISTRIBUTION. Presently known from Natal and eastern Transvaal in South Africa, and southern Mozambique.

HABITAT. Lowlands, open woodlands, and grasslands; very common in the bushveld of Natal and Tansvaal. Always found on the surface. May hide under grass, in leaf litter, or in soil cracks. In Zululand we occasionally found large numbers of individuals walking about on sparsely vegetated ground in the thorn scrub.

SONG. Chirps consisting of 1–5 pairs of pulses; the first pulse often not paired. Unlike *S. marginatus* the first pulse of a pair is just as loud as the second.

Local-ity	p/s	pairs/s	ch interval (sec)	No.		
				pairs	KHz	°C
14	13.6	—	8.5	2	5.3	23
15	13.9	3.5–4.4	—	1–3	4.8	24
15	13.9–15.5	4.1	2–7.5	1–3	5.25	24
20	13.2	3.5	7	2	5.1	20
58	16.6	5.1	—	3	5.5	25
50	13.9	5.4	—	1–5 ¹	5.3	24
75	13.8	4.13	—	2	5.5	23

¹This male also courting.

SPECIMENS. All ANSP: SOUTH AFRICA: Loc. 15, 3♂ 2♀. Loc. 50, 1♂. Loc. 55, 3♂ 3♀. Loc. 57, 3♂ 5♀. Loc. 63, 3♂ 1♀. Loc. 67, 1♂ 1♀. Loc. 72, 1♀j. Loc. 74, 1♂ 1♀.

15. *Scapsipedus niger* Chopard

Scapsipedus niger Chopard 1954b: 69. Holotype ♂, Nimba, Guinee. ii–iv (Lamotte) PARIS. Type examined.

NOTES ON TYPE. Figs. 5M, 8B. Table 1. Small entirely black cricket with silvery pubescence on back of head and pronotum. Jaws lengthened as in *bellicosus*. Head: entirely black; dorsum pubescent on occiput, glabrous from vertex to face. Pronotum black with silvery pubescence. Hindwings hidden, about as long as pronotum.

16. *Scapsipedus flavomarginatus* (Chopard)

Liogryllus flavomarginatus Chopard 1934: 19. Holotype ♀, Congo [Zaire], Vele, Van Kerkhovenville (Degreef) TERVUREN. *Scapsipedus*, Chopard 1938, 1951.

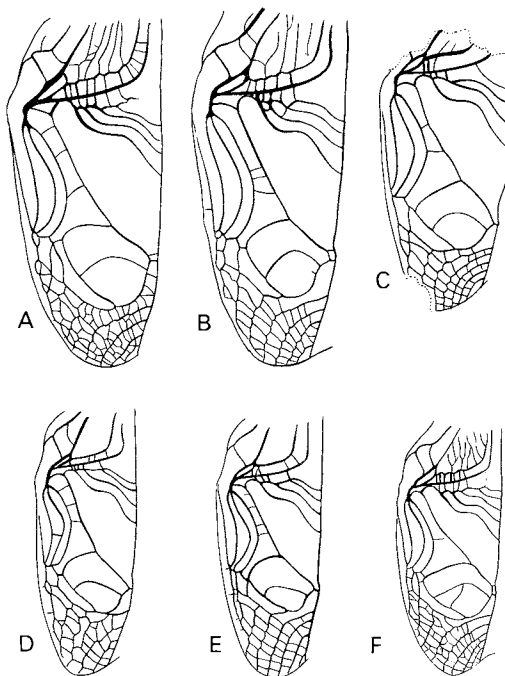


FIG. 10. A, *Scapsipedus marginatus*, loc. 6; B, *S. meridianus*, loc. 15; C, *S. fuliginatus* (holotype of *nigrodorsatus*). D, *S. fuliginatus* holotype; E, *S. obscuripennis* holotype; F, *Acanthogryllus fortipes*.

NOTES ON TYPE. Without males it is not possible to know if this species belongs to *Scapsipedus*. A medium sized, macropterous female. Body color black but with straw-colored streaks along the forewing ridges (R, M, and Cu veins). Head entirely black, ocelli small, pale. Eyes black. Pronotum entirely blackish, without pubescence or bristles. Forewings blackish except for straw colored streaks along ridge; 3.22 times as long as pronotum. Hindwings extend beyond end of ovipositor. Legs black. Foretibiae with small inner and large outer tympanum. Hind-femora blackish, becoming somewhat reddish in lower basal area. Hind tibiae 0.73 times as long as femora; with 6 inner and 6 outer subapical spurs. Ovipositor 0.66 times as long as hind femora. Body length ca. 17 mm; hind femur length 9.5 mm.

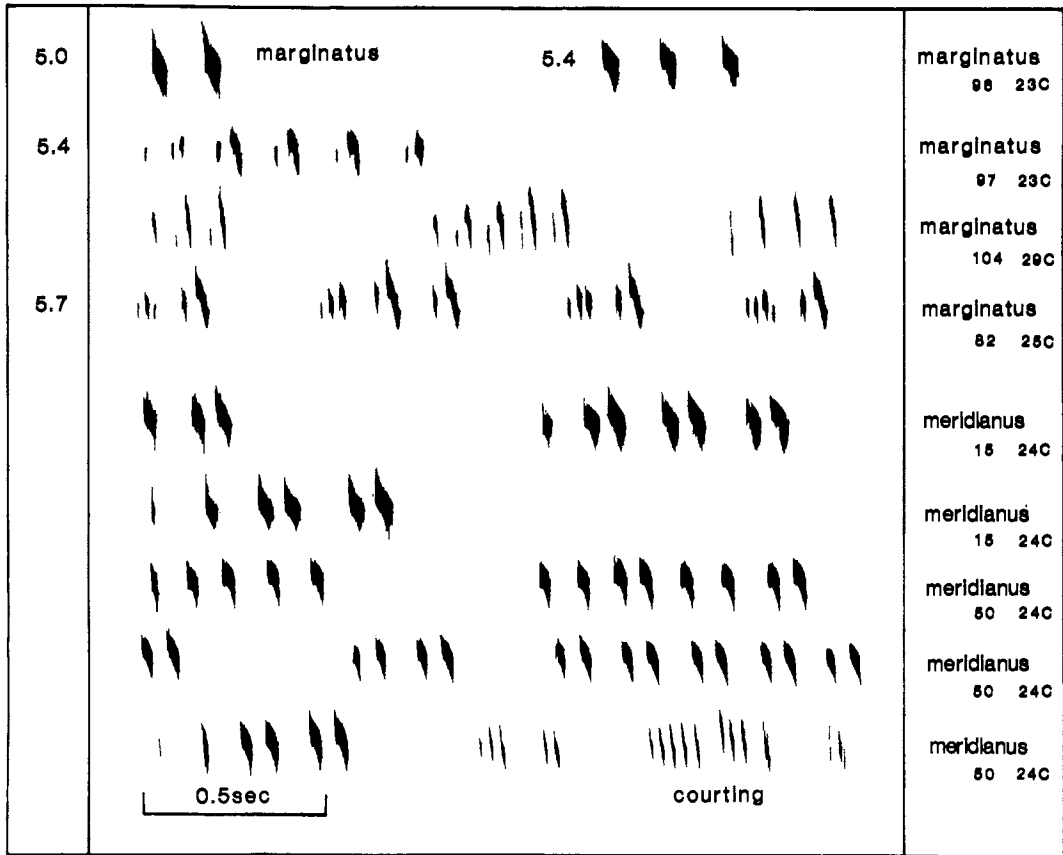


FIG. 11. *Scapsipedus* songs (see legend for Fig. 4).

17. *Scapsipedus obscuripennis* (Chopard)

Gryllulus obscuripennis Chopard 1938a: 51. Holotype ♂, Cote d'Ivoire, PARIS. *Modicogryllus*, Chopard 1961: 274. *Scapsipedus*, Chopard 1967b: 120. Type examined.

NOTES ON HOLOTYPE. Figs. 10E, 12C. Tables 1, 2. Small, dark brown, with blackish head and reddish brown legs; pronotum strongly pubescent. Head: dorsum black, occiput pubescent, vertex to forehead glabrous; no pale stripe between lateral ocelli; face dark brown, jaws small; cheeks black. Pronotum: dorsum dark brown to black; lateral lobes black. Abdomen blackish, pubescent. Forewings dark brown on dorsum but paler along M vein; lateral field black. Hindwing almost twice length of forewings. Foretibiae with small inner and large

outer tympana. Legs reddish brown. Cerci slightly shorter than hind femur.

Female: Similar in color to male. Ovipositor as long as hind femur.

18. *Scapsipedus fuliginatus* (Chopard)

Gryllus fuliginatus Chopard 1961a: 20. Holotype ♂, Angola, vicinity of Dundo Machado, PARIS. *Modicogryllus*. Chopard 1961b: 274. Type examined. NEW COMBINATION.

Modicogryllus nigrodorsatus Chopard 1961b: 281. Holotype ♂, Ivory Coast, Adiopodoume, PARIS. Type examined. NEW SYNONYM.

NOTES ON TYPE. Figs. 12D, 14D. Table 1. Dark brown to blackish, with dark rusty brown legs. Dorsum of head black, no occipital

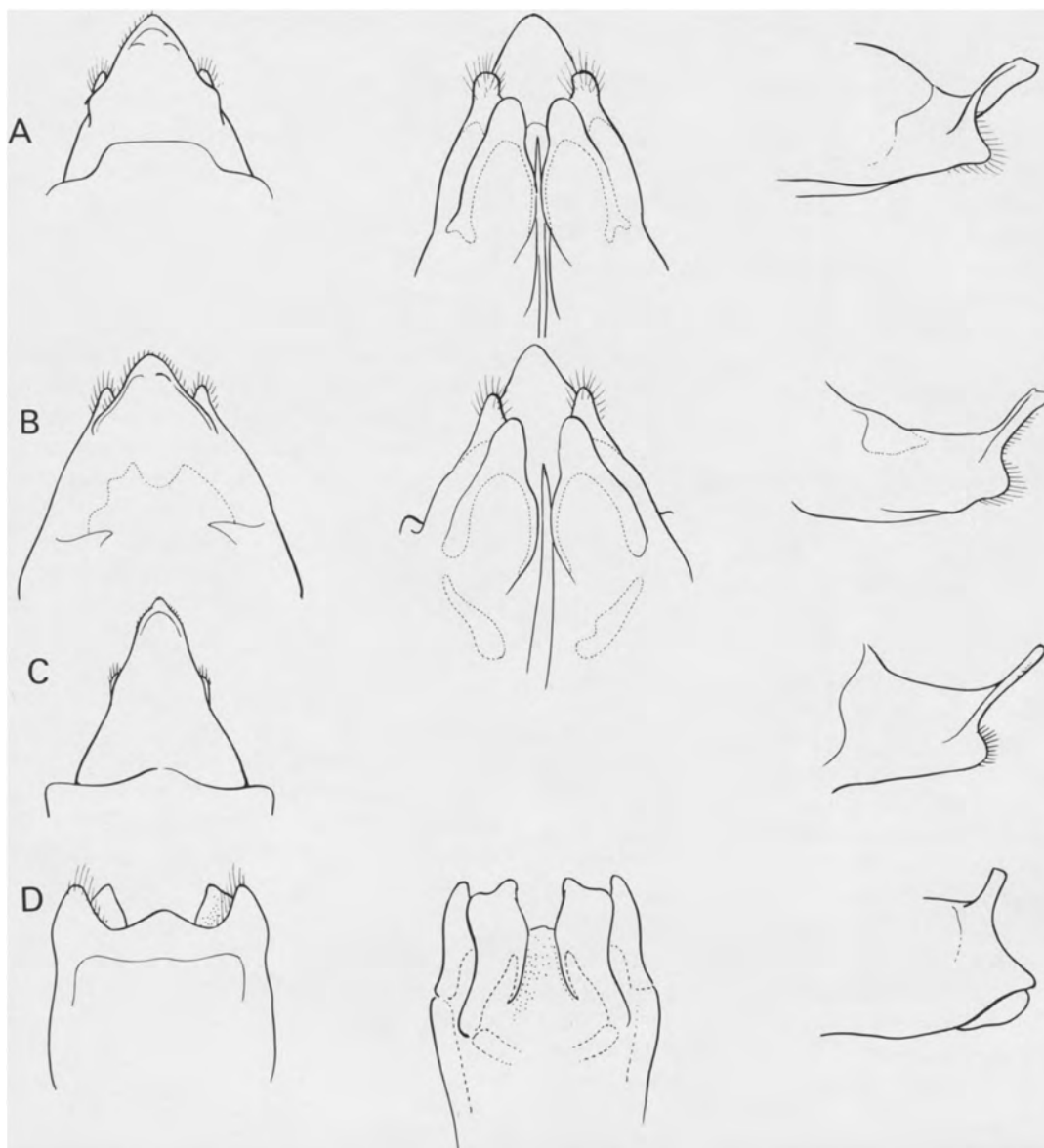


FIG. 12. Male genitalia of *Scapsipedus* species. **A**, *marginatus*, loc. 6; **B**, *meridianus*, loc. 15; **C**, *obscuripennis* holotype; **D**, *fuliginatus* (holotype of *nigrodorsatus*; the genitalia of the type of *fuliginatus* are identical to these).

stripes, no pale stripe between lateral ocelli. Cheeks dark brown. Pronotum entirely dark brown. Abdomen dark brown. Forewings blackish on lateral field. Hindwings present but

very small. Legs dark reddish brown without distinct spotting or striping. Hindwings hidden, about as long as pronotum. Foretibiae with a small inner and a large outer tympanum.

Genus **Sigagryllus** n. gen.

TYPE SPECIES. *Sigagryllus camerunensis* (Chopard)

DIAGNOSTIC CHARACTERS. *Males*: Without forewings or hindwings; without tympana. Genitalia very similar to *Gryllus*—epiphallus strongly trilobate, medium lobe longer than lateral lobes; parameres extending to near end of epiphallus.

Females: Not known.

OTHER FEATURES. See discussion of only known species *S. camerunensis* below.

19. Sigagryllus camerunensis (Chopard) n. comb.

Cophogryllus camerunensis Chopard 1945: 170. Holotype ♂, Cameroon, Bambouto Mountains, 2000 m, vii 1939 (P. Lapesme, B. Paulian, and A. Villiers) PARIS. Type examined. NEW COMBINATION.

RECOGNITION. Fig. 8C. Small, dark, wingless. Body color blackish, with much gray pubescence; legs black and brown. Tympana absent. Head: dorsum with 6 faint longitudinal stripes on vertex and occiput, these hidden under gray pubescence; forehead and face shiny black. Epistomal suture arching upwards medially. No pale lines connecting lateral ocelli. Cheeks black, becoming pubescent at back of head. Pronotum: with parallel sides, disk mottled brown and black, heavily pubescent; lateral lobes blackish, with a pale brown band along lower border. Abdomen black on tergum, gray to black on venter. Forewings and hindwings entirely absent. Front and middle legs: femora brown, with black marks in upper face, becoming entirely black in distal quarter; tibiae brown, becoming blackish at distal end. Hind femora: outer face with numerous strong black and brown oblique stripes; hind tibiae 74/90 times as long as hind femora; brownish on posterior face, black on anterior (lower face), with 5 inner and 5 outer subapical spurs. Cerci broken. Body length ca. 13 mm; hind femur length 8.2 mm.

DISTRIBUTION. Known only from type locality.

HABITAT. Not known.

SPECIMENS. Holotype ♂ PARIS.

Genus **Acanthogryllus** Saussure

Acanthogryllus Saussure 1877: 132. Type species: *Acanthogryllus fortipes* (Walker), by monotypy.

DIAGNOSTIC CHARACTERS. Male genitalia somewhat similar to *Gryllus*, i.e., epiphallus trilobed with median lobe extending beyond lateral lobes. Ectoparameres different, resembling those of *Platygryllus primiformis* but shorter. Foretibiae with very long apical spurs, almost as long as basal tarsomere. Hind tibiae with very pronounced, long spurs, including 7 or 8 inner and 7 or 8 outer subapical spurs. See Figs. 8D, 10F, 13, 14.

OTHER CHARACTERS. See *A. fortipes*.

RELATIONSHIPS. By the genitalia *A. fortipes* seems to be somewhat intermediate between *Gryllus* and *Platygryllus primiformis*. In colorations it appears to be more similar to *Platygryllus* than *Gryllus*. We surmise that it evolved from the same stock which gave rise to *Platygryllus* and *Teleogryllus*.

20. Acanthogryllus fortipes

Gryllus fortipes Walker 1869: 26. Holotype ♀, Port Natal, LONDON. Type examined. *Acanthogryllus*, Saussure 1877: 132.

Gryllus parallelus Walker 1869: 31. Natal (M. Gueinzus collection) LONDON. *Scapsipedus marginatus*, Chopard 1967: 119. NEW STATUS.

RECOGNITION. Figs. 8D, 10F, 13, 14. Tables 1, 2. Large dark brown cricket with pale orange-brown band across vertex of head. Foretibiae with one long apical spur (longer than basal tarsomere). Head: Blackish from vertex onto forehead; face blackish on forehead, orange brown on mouthparts; cheeks orange. Pronotum: dorsum patterned with pale orange brown and dark brown. Lateral lobes black in

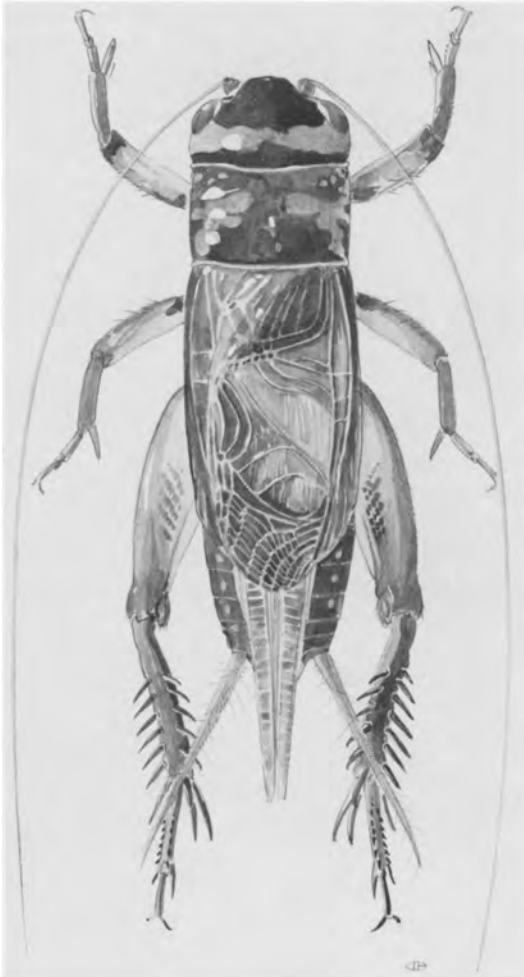


FIG. 13. *Acanthogryllus fortipes*, loc. 11.

upper half, pale in lower half. Forewings brown, dorsum pale along medial vein, never extending to end of abdomen. Hindwings usually extending slightly beyond forewings, sometimes hidden, rarely extending beyond end of abdomen. Legs pale brown to reddish brown, often spotted and streaked with darker brown. Foretibiae with large outer and much smaller inner tympanum. Basal tarsomere less than one third length of foretibia. Hind femur orange brown with dark brown oblique stripes on outer face. Hind tibiae dark brown with especially long and conspicuous subapical spurs.

Females: Forewings covering at least two thirds of abdomen. Ovipositor slightly shorter than hind femora: 7.5–12 mm.

DISTRIBUTION. Widespread in South Africa; north to Zimbabwe and Mozambique.

HABITAT. This species is especially abundant in mowed lawns in eastern South Africa where it is considered a pest—especially on cricket grounds where they damage the carefully manicured cricket pitches. Nymphs and adults dig deep burrows where they hide during the day. At night they emerge to feed on grasses and probably other organic matter. They damage lawns by cropping the grass around their burrows and piling the clipped grass blades over their burrow entrances. Under high densities the areas surrounding the burrows form almost a continuous area of dead lawn. Burrows often (if not usually) have two entrances which join

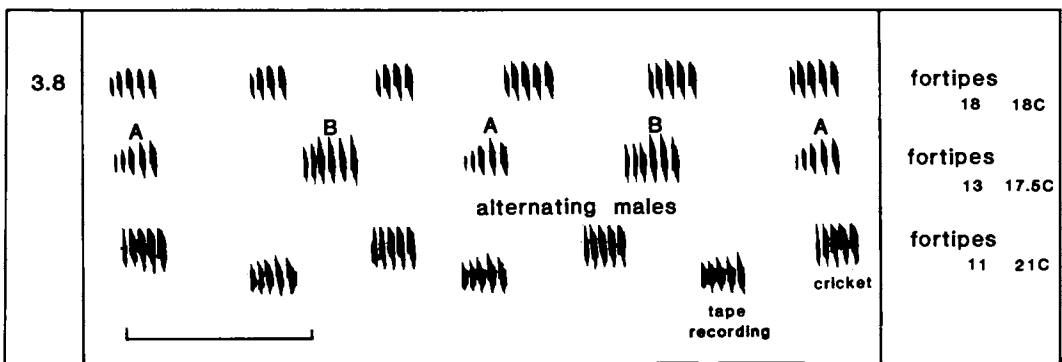


FIG. 14. Songs of *Acanthogryllus fortipes*. Top, a single male; middle, two males alternating; bottom, a male alternating with a tape recording of the same species taped at a lower temperature. Scale, 0.5 sec.

within a few centimeters from the surface. Evidently the dual entrance provides crickets with an extra avenue of escape. We watched a large sun spider hunting one day around noon. He would slow down and palpate the domes of grass covering the cricket burrows and enter some of them. Upon entering one burrow entrance a large cricket came hopping out of the other entrance.

We also observed two different kinds of pompilid wasp searching and entering cricket burrows. We dug up one of the burrows into which a large wasp had entered and found (about a foot down) a chamber with a number of dead or immobilized spiders. Perhaps both spiders and sunspiders prey on the crickets, and they in turn are hunted by wasps.

We also found this species on closely cropped grassy banks along river beds in game sanctuaries and speculate that these situations represent the original habitat of the species.

Alexander and Otte (1967) made the following laboratory observations on a male-female interaction in this species: “. . . we attempted to set up a mating interaction by introducing an adult male into the burrow of an adult female of unknown history. The female only reacted aggressively. Her burrow had been sealed off from the surface, but we opened the entrance and forced the male into the burrow. He managed to get past the female so that she was between him and the entrance. She patched the entrance and then encountered the male as she moved back into the recesses of her burrow. Instantly she attacked him, but the aggression was unlike that of the ordinary fight between two male crickets in that with each contact she attacked so fiercely that she either tore off an appendage or bit a hole in the side of his abdomen. To our surprise, the male did not at any time show the usual kinds of aggression toward the female, though he snapped his mandibles together audibly, and continued to do this in our hands when we removed him from the burrow. It seems possible that circumstances might arise in species of this sort when selection

would cause males that had copulated to re-enter the burrow, or remain in it, and, slowly or rapidly, be killed and consumed by the female.”

LIFE CYCLE. Adults of *A. fortipes* are especially common in the spring and early summer. By late summer in Zululand, numerous nymphs and very few adults could be found. We believe the dry period is passed either in the late nymphal or adult stage and mating and egg-laying takes place shortly after the rains have begun.

SONG. The song consists of a succession of four to seven pulse chirps (usually 4 and 5 pulses). Neighboring males chirp in alternation such that an individual calls during the silent period in a neighbour's song (Cade and Otte 1982). Alternating males sing at a 30 to 60% slower rate than isolated males. Nearest neighbor analysis demonstrates that male *A. fortipes* are usually aggregated.

Local-ity	p/s		ch/s	p/c	KHz	°C air temp. ¹
	slowest	fastest				
11 (n = 2)	33	49-66	0.7-0.8	4-5	3.4-3.6	18
11	38		2.0	4	3.7	23
11	38		1.8	5-6	4.3	21
12 (n = 2)	44		1.7-3.22	4	4.2	22
13 (n = 2)	34		1.1	5	3.6	18
14 (n = 2)	35,38	49,—	1.2,2.0	4-7	3.8	23
15 (n = 2)	38,39	—,66	2.2	5-6	3.8	24
17	38		1.2	4-5	4.3	17
18	34		2.6	4-5	3.8	18
20 (n = 2)	47,48		3.2,4.3	5,4	4.3,4.1	25
21	35	59	2.2	5-6	3.8	21
22	36		2.1	4-5	3.8	21

¹Because males often sing in burrows, which have stored up heat from the day, there is an unusual scatter of pulse rates when plotted against air temperature.

SPECIMENS. Holotype ♀ LONDON. SOUTH AFRICA (all ANSP): Loc. 11, 2♂ 3♀. Loc. 13, ♂. Loc. 14, 2♂ 1♀. Loc. 20 2♂. KwaZulu, Umfolozi Game Reserve 19 ii 1965

(Otte) 1♂ 1♀. Transkei, Port St. Johns (Toms) 1♂ 1♀. nr Orpen, Kruger National Park (Toms) 1♀. Natal, 75 km WSW of Escourt, Cathedral Peak Forest Station, 1400 m, 13 xii 1979 (S. and J. Peck) 1♀.

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