

A revision of the genus *Usambilla* Sjöstedt (Orthoptera: Acridoidea) and its allies

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Contents

Synopsis	1
Introduction	1
Material	2
Key to genera in the Lentulidae	3
<i>Chromousambilla</i> gen. n.	5
Key to species	6
Males	6
Females	6
<i>Microusam-billa</i> gen. n.	10
<i>Altiusambilla</i> gen. n.	12
<i>Rhainopomma</i> gen. n.	13
Key to species	14
Males	14
Females	15
<i>Usambilla</i> Sjöstedt	20
Key to species and subspecies	22
Males	22
Females	24
References	37
Index	38

Synopsis

The genus *Usambilla* Sjöstedt is redefined and fully revised with keys to the species and subspecies. Four new genera, ten new species and three new subspecies are described. *Altiusambilla modicicrus* (Karsch) is implicated in the defoliation of exotic *Pinus* plantations in northern Tanzania.

Introduction

The genus *Usambilla* has been assumed to consist of a homogeneous group of small lentulid grasshoppers. The male genitalia of the group reveal, however, that five genera are involved within the old definition of *Usambilla*. *Chromousambilla* has male penis valves of great length (Fig. 12) which enable the diminutive male to remain firmly attached to the female during copulation without standing upon her in the usual acridid manner. The penis valves are curved and fit into the female spermathecal duct, which is of similar shape and length (Fig. 23). *Usambilla* sensu stricto has tapered valvulae (Fig. 150) with barbs on each side short of the apex, while *Rhainopomma* (Fig. 72) has these barbs situated apically. *Microusam-billa* clearly has affinity with *Usambilla*, while *Altiusambilla* has affinity with *Rhainopomma* and *Mecostibus*.

Reports have recently been published (Whellan, 1975; 1976) of eumasticids and lentulids causing defoliation of exotic *Pinus*, particularly *P. patula*. In Malawi defoliation has been caused by *Plagiotriptus* Karsch (Eumastacidae) and members of the lentulid genera *Mecostibus*, *Nyass-acris* and *Malawia*. In Tanzania attacks so far reported are from W. Kilimanjaro in December, 1975 at Msituni, the species involved being members of the genus *Chromothericles* Descamps (Eumastacidae) and the lentulid *Altiusambilla modicicrus*. This last is morphologically much

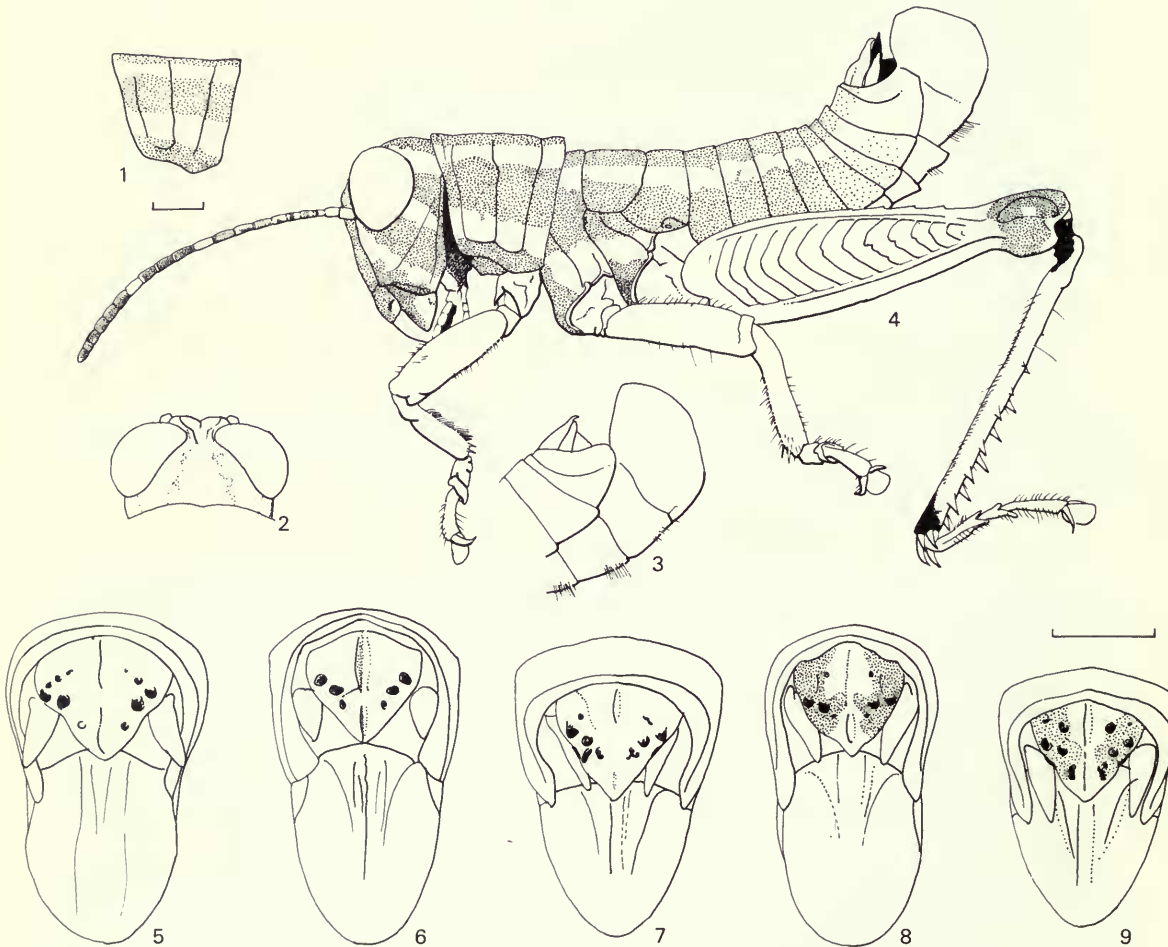
closer to *Mecostibus* than to the rest of *Usambilla* sensu stricto. Indeed the close similarity between the genera described in this paper may be due to convergent evolution. The external similarity between *Altiusambilla modicicrus* and *Rhainopomma montanum* is particularly striking.

Material

Most of the material used for this study is in the collections of the first two institutions listed below. Museums loaning specimens have their abbreviations listed in the text as follows.

BMNH	British Museum (Natural History), London
COPR, London	Centre for Overseas Pest Research, London
NR, Stockholm	Naturhistoriska Riksmuseet, Stockholm
MNHU, Berlin	Museum für Naturkunde der Humboldt-Universität, Berlin
MRAC, Tervuren	Musée Royal de l'Afrique Centrale, Tervuren

Kenya series were immensely improved by the addition of COPR material collected recently by Dr I. A. D. Robertson and Mrs A. Robertson.

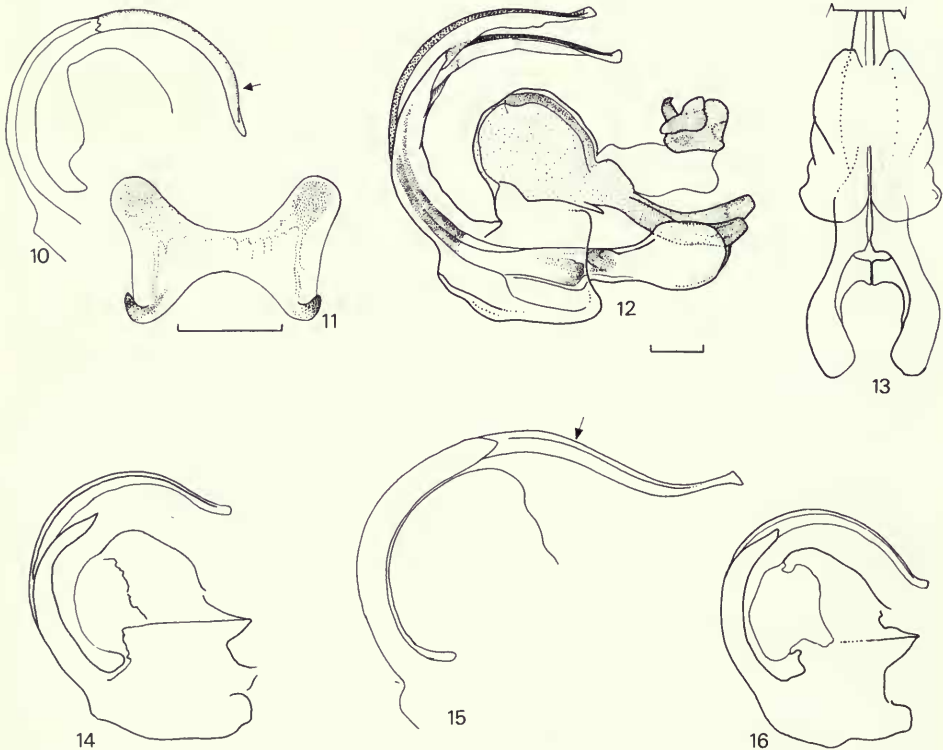


Figs 1-9 *Chromousambilla* species. 1, lateral aspect of pronotum of male *C. veseyi*. 2, dorsal aspect of head of male *C. latestriata*. 3, apex of male abdomen of *C. burtti*, lateral aspect. 4, entire male of *C. latestriata*. 5-9, dorsal aspect of male abdominal tip in (5) *C. burtti*; (6) *C. mweruensis*; (7) *C. robertsoni*; (8) *C. latestriata*; (9) *C. veseyi*. Scale lines represent 1 mm, that below Fig. 1 applies to Figs 1-4, that above Fig. 9 applies to Figs 5-9.

Key to genera in the *Lentulidae* (modified after Dirsh, 1965)

- 1 External apical spines of hind tibia absent. Head prognathous, or face vertical, or moderately sloping backwards 2
 – External apical spine of hind tibia present. Head conical or acutely conical, with face strongly sloping backwards or vertical 16
- 2 Coxa of middle leg with large conical process, sometimes with a small tubercle *MECOSTIBUS* Karsch
 – Coxa of middle leg without process, sometimes with a small tubercle 3
- 3 Ninth abdominal tergite of male with a median dorsal bifurcate appendage 4
 – Bifurcate appendage on mid-dorsal margin on ninth abdominal tergite absent 5
- 4 Frons vertical or sloping forwards, slightly excurved or straight; fastigium of vertex not protruding. Body small but comparatively robust *SHELFORDITES* Karny
 – Frons sloping backwards, slightly incurved, fastigium of vertex and upper part of frons strongly protruding forwards. Body elongate, slender *KALAHARICUS* Brown
- 5 Dorsum of pronotum crossed by four deep transverse sulci *MECOSTIBOIDES* Dirsh
 – Dorsum of pronotum crossed by three or fewer transverse sulci, or sulci not crossing disc at all 6
- 6 Frontal ridge deeply sulcate below level of antennal sockets 7
 – Frontal ridge weakly sulcate to flat below level of antennal sockets 8
- 7 Fastigium of vertex horizontal, triangular, seen from above, strongly projecting in front of eyes *SYGRUS* I. Bolivar
 – Fastigium of vertex sloping obliquely forwards; as seen from above (Fig. 27) weakly projecting in front of eyes *MICROUSAMBILLA* gen. n. (p. 10)
- 8 Fastigium of vertex moderately or slightly projecting in front of compound eyes, as seen from above 9
 – Fastigium of vertex not projecting in front of eyes *NYASSACRIS* Ramme
- 9 Hind femur not inflated bilaterally but strongly bilaterally compressed 10
 – Hind femur often stocky and inflated, not bilaterally compressed 11
- 10 Interocular distance in males about as wide, in females twice as wide, as antennal scape. Fastigium of vertex in males, from above, seen to be excised at apex *PARALENTULA* Rehn
 – Interocular distance in males about twice, in females about four times, as wide as antennal scape. Fastigium of vertex, as seen from above, widely rounded or truncate *LENTULA* Stål
- 11 Body moderately to very smooth. Frontal ridge moderately widened in upper part with weak carinulae and shallow depression. Male supra-anal plate with black tubercles (Figs 35, 50–54, 94–100) 13
 – Body strongly rugose. Frontal ridge strongly widened in upper half, strongly carinate. Supra-anal plate lacking tubercles on disc. 12
- 12 Hind femora stocky, length to depth ratio R about 3.2. Compound eyes strongly inflated, width across eyes to pronotal width ratio 3 : 2. Length of pronotum at dorsal midline shorter than its width. Supra-anal plate and ninth abdominal tergite of male lacking any callosities *KARRUACRIS* Dirsh
 – Hind femur slender, ratio R about 4.0. Compound eyes only moderately inflated, width across eyes rather less than maximum pronotal width as seen from above. Pronotal length at midline equal to its greatest width. Supra-anal plate and ninth abdominal tergite with small marginal callosities. *MALAWIA* Dirsh
- 13 Hind femora of males yellow or greenish yellow with genicular part black. Eyes protruding, red in males. Penis valves elongate, flagelliform (Fig. 15). Female ventral ovipositor valves shovel-shaped (Fig. 24) *CHROMOUSAMBILLA* gen. n. (p. 5)
 – Hind femora green, brown or yellowish brown with genicular part dark brown, light brown, blue or some other colour other than black. Eyes in males never red. Penis valves barbed (Figs 38, 72, 133). Female ventral ovipositor valves pointed, tapered (Figs 147, 148) 14
- 14 Margin of abdominal tergite 9 in males bearing one or two pairs of black tubercles (Fig. 35). Penis valves apically attenuate with barbs apical. Anterior penis valves short, auricular (Fig. 37). Posterior part of median pronotal carina raised into a large tubercle (Fig. 36) in females. *ALTIUSAMBILLA* gen. n. (p. 12)
 – Rear margin of tergite 9 of abdomen without conical black tubercles. Penis valves tapering, conical in dorso-posterior view (Figs 72, 133). Anterior penis valves flat, vertically orientated and racket-shaped (as in Fig. 12) 15

- 15 Male supra-anal plate with eight to twelve strong black tubercles on the disc (Figs 50, 54). Male penis valves with apical barbs (Figs 64, 67, 68, 72) **RHAINOPOMMA** gen. n. (p. 13)
- Male supra-anal plate with eight to ten strong black tubercles on its disc (rarely as in Figs 97, 99, with pair of weak ones making 12 in all). Male penis valves with pre-apical lateral barbs (Figs 133, 135, 138, 141, 142, 145, 150) **USAMBILLA** Sjöstedt (p. 20)
- 16 Fastigium of vertex not projecting in front of eyes, sloping strongly forwards and forming part of face **EREMIDIUM** Karsch
- Fastigium of vertex projecting or strongly projecting in front of eyes, horizontal 17
- 17 Basal angles of fastigium of vertex detached from eyes and projecting laterally; body strongly rugose **SWAZIACRIS** Dirsh
- Basal angles of fastigium of vertex of normal shape, touching eyes. Body smooth or only moderately rugose 18
- 18 Frontal ridge, in profile, more or less strongly projecting in upper half or upper third 19
- Frontal ridge, in profile, straight, not projecting in upper part 22
- 19 Fastigium of vertex elongate. Antennae ensiform, serrated **DEVYLDERIA** Sjöstedt
- Fastigium of vertex shorter. Antennae phylliform or filiform 20
- 20 Frontal ridge in upper projecting part lamelliformly compressed, below shallowly sulcate 21
- Frontal ridge sulcate along whole length **BASUTACRIS** Dirsh
- 21 Antennae very short, phylliform, compressed and strongly widened, about four times longer than wide. Fastigium of vertex with lateral carinulae. Pronotum shorter than its width. Body rugose **KARRUIA** Rehn
- Antennae narrow, almost filiform. Fastigium of vertex without carinulae. Pronotum longer than its width. Body smooth **GYMNIIDIUM** Karsch



Figs 10–16 *Chromousambilla* species, male phallic complex. 10, 14–16, lateral aspect of aedeagal valves of (10) *C. robertsoni*; (14) *C. mweruensis*; (15) *C. burtti*; (16) *C. veseyi*. 11, epiphallus of *C. robertsoni*. 12, lateral aspect of right side of entire complex in *C. latestriata*. 13, ventral aspect of cingular rami and anterior valves of penis of *C. latestriata*. Scale-lines represent 0.5 mm—that below Fig. 12 applies to 10 and 12–16; that below 11 to that figure. Small arrows on Figs 10 and 15 show equivalent position on each set of valvulae.

- 22 Fastigium of vertex comparatively short, angular. Body slender, moderately elongate 23
 – Fastigium of vertex elongate, angular or narrow parabolic, with obtusely angular apex. Body slender and very elongate 24
- 23 Fastigium of vertex broadly angular, wider than longest diameter of eye. Frontal ridge sulcate along whole length. *QACHASIA* Dirsh
 – Fastigium of vertex narrowly angular, much narrower than longest diameter of eye. Frontal ridge in upper fourth compressed, without sulcus, sulcate below *HELWIGACRIS* Rehn
- 24 Fastigium of vertex angular. Frontal ridge above base of antennae low, compressed. Antennae thick, strongly and regularly narrowing towards apex, weakly compressed in basal half. Body smooth *BETISCOIDES* Sjöstedt
 – Fastigium of vertex narrow parabolic. Frontal ridge above base of antennae produced, strongly lamelliformly compressed. Antennae very wide, strongly compressed laterally, only slightly narrowed at apex. Body rugose *BACTERACRIS* Dirsh

CHROMOUSAMBILLA gen. n.

Type-species: *Adolfia latestriata* Ramme.

DIFFERENTIAL DIAGNOSIS. *Male.* Separable from closely related genus *Usambilla* by great length of aedeagal valves, which lack barbs (Figs 10, 14, 15, 16). (Proximal section of female spermathecal duct (Fig. 23) correspondingly stiffened and elastically thickened for a distance corresponding to length of aedeagal valves distal to their basal attachment below greatly inflated cingular arch.) In life aedeagal valves curled over greatly inflated membranous arch of cingulum (Fig. 12), their tips touching ectophallic membrane posterior to epiphallus. Cingular rami also very unusual, small and parallel, being approximated on mid-line so that they lie between flattened anterior (internal) valvulae of penis (Figs 12, 13). Epiphallus very small and simple, lacking ancorae, function of which taken over by hook-like development of ventro-lateral corners of epiphallus (Fig. 11). Whole apparatus housed within enlarged pod-like subgenital plate (Figs 4, 8).

Fastigial depression gently concave, its mid-frontal edge being notched as viewed from above (Fig. 2). Inter-ocular groove well developed, short and wider capitad than caudad. Differs from that of *Usambilla sensu stricto*, which is in form of an elongated slot (Fig. 92) or a slightly wider parallel-sided groove. Body shape like that of *Usambilla* (Fig. 4).

Supra-anal plate bears callosities of type found in *Usambilla*, but proportions of supra-anal plate to sub-genital plate clearly differ (Figs 8, 94–101).

Female. Ventral valves of ovipositor (Fig. 24) straight-edged; median process of subgenital plate almost level with their tips.

Coloration. General colouring very uniform in genus. Male eyes vermilion, frons blackish; three lateral light yellow or whitish stripes on side of head (Fig. 4). Upper pair of light stripes continued along thorax and abdomen. Subgenital plate yellow. Posterior femora yellow to yellow-green, knees black; posterior tibiae yellow-green, sooty at extreme tip and near knee. Dark body stripes blue to blue-black or brown. Female more variable, but in general (Figs 17, 20, 21, 26) lighter brown to olivaceous dorsally, with light banding like that of male, but with uppermost of light (dorso-lateral) bands weak and lower one on pronotum strong. Broad dark lateral band variable in intensity. Light bands yellow or creamy colour. Posterior leg colour as for male but less intense. Body colour of female *C. veseyi* exceptional in that body and head olive green dorsally and uppermost dorso-lateral light bands bright yellow. Lateral dark bands very black so that female of this species resembles male more closely than do those of rest of genus.

There is great instability in the callosities of the male supra-anal plate and too much variation for this feature to be reliable diagnostically.

DISCUSSION. The genus is known only from NW. Zambia and Tanzania. *C. mweruensis* in the Mweru Wa Ntipa and Malagarasi R. drainages, which were once part of the Congo R. drainage basin before the formation of Lake Tanganyika by rifting, may be indicative of the great antiquity of the genus. Each species seems confined to the wettest eco-zones of a separate drainage basin. Some of these, as in the Dodoma area or Mpwapwa basin, are closed internal drainages. Others like the Ruaha R. valley are open systems, but have no ecological bridges suitable for the genus by which they can enter other drainages.

Key to species

Males

- 1 Antennae fully twice length of head and pronotum. Large species with blue/black dark longitudinal stripes on body. Light longitudinal stripes white to cream.
Subgenital plate larger in profile (Fig. 3) than other species in genus (Fig. 4) and narrowed at level of cercus apices as seen from above (Fig. 5) *C. burtti* sp. n. (p. 9)
- Antennae clearly less than twice length of head and pronotum. Dark body stripes grey, blue or Prussian blue to blue-green. Light longitudinal stripes yellow 2
- 2 Supra-anal plate laterad, at level of cercus apices (Figs 8, 9), black in addition to black callosities 3
- Supra-anal plate without black areas in addition to black callosities (Figs 6, 7) *C. mweruensis* sp. n. (p. 9)
- 3 Pronotum and more particularly subgenital plate clothed with sparse hairs (Fig. 8). Black area of supra-anal plate broadly pigmented to base 4
- Pronotum and subgenital plate almost without hairs (Fig. 9). Black areas of supra-anal plate not reaching base of plate *C. robertsoni* sp. n. (p. 10)
- 4 Lower light yellow band on pronotum laterad, roughly equal in depth to dark band immediately above it (Fig. 1) *C. veseyi* sp. n. (p. 8)
- Lower light yellow band on pronotum laterad, half depth of dark band immediately above it (Fig. 3) *C. latestriata* (Ramme) (p. 6)

Females

- 1 Median dorsal carinula of pronotum elevated and clear to weak but entire 2
- Median dorsal carinula of pronotum weak, flattened (Fig. 22).
Colouring akin to that of males with median dorsal part of body olive brown and dorso-lateral yellow band visible and entire as far back as 8th abdominal tergite (Fig. 19) *C. veseyi* sp. n. (p. 8)
- 2 Large species (Fig. 21). Pronotal side stripe white, bordered above and below by black. Antennae 1.50 times longer than head and pronotum together *C. burtti* sp. n. (p. 9)
- Smaller species. Pronotal side stripe less heavily delineated or even absent. Antennae less than 1.45 times longer than head and pronotum together 3
- 3 Lower outer lobe of knee of hind femur uniformly creamy or light brown in colour. Ratio of length of antennae to that of head and pronotum (R) about 1.0 or 1.4. Dorso-lateral yellow pronotal line very weak or absent (Figs. 20 and 26) 4
- Lower outer lobe of knees of hind femur with additional black markings. Ratio (R) about 1.2. Dorso-lateral yellow pronotal line narrow but usually clear (Fig. 17) *C. latestriata* (Ramme) (p. 6)
- 4 Brownish insects (Fig. 26); body length less than 18 mm. Ratio of antennal length to length of head and pronotum (R) about 1.0 *C. robertsoni* sp. n. (p. 10)
- Olivaceous or brownish insects (Fig. 20); body length more than 18 mm. Ratio (R) 1.4 *C. mweruensis* sp. n. (p. 9)

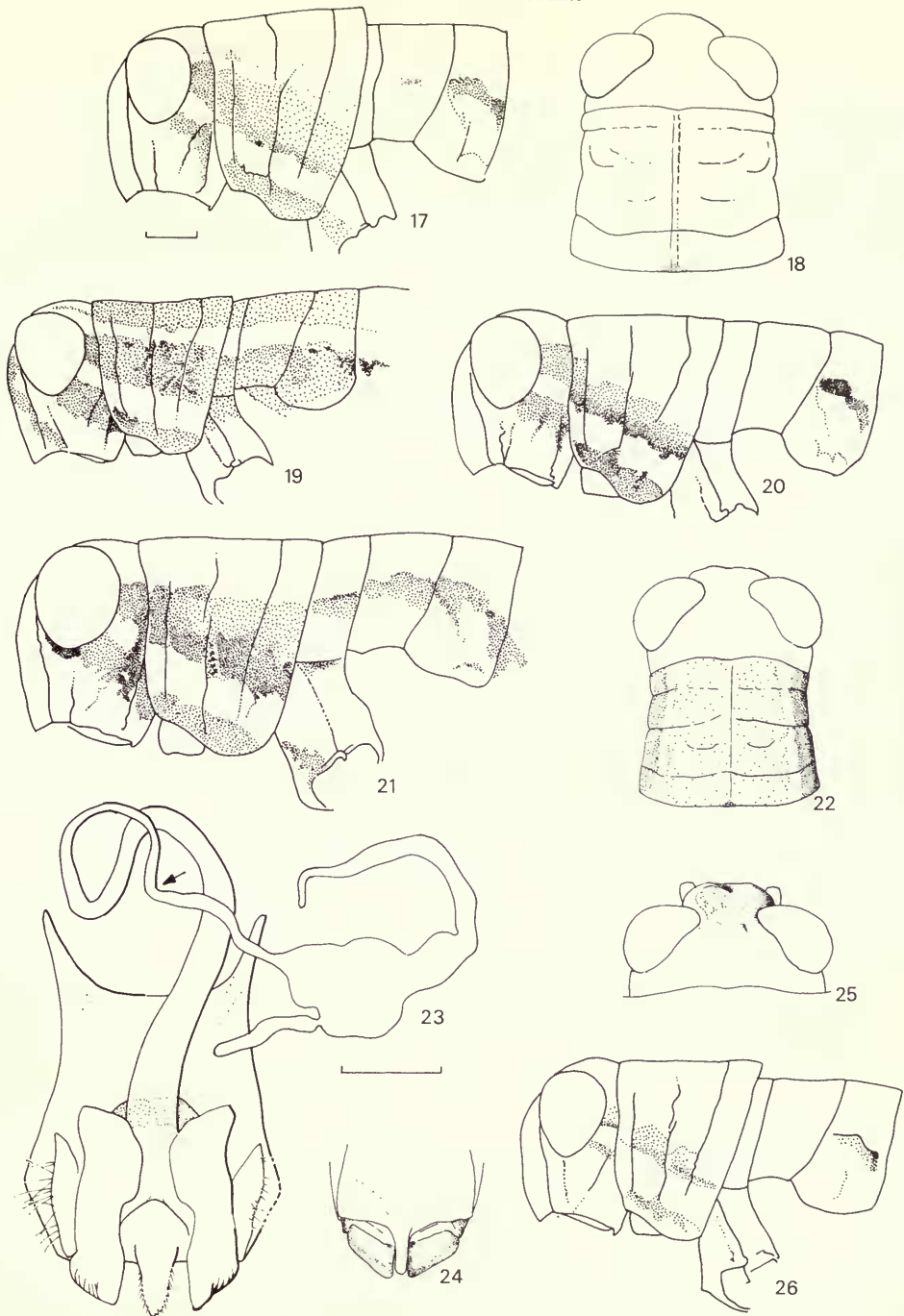
Chromousambilla latestriata (Ramme) comb. n.

(Figs 2, 4, 8, 12, 13, 17, 18, 24, 25)

Adolfia latestriata Ramme, 1929: 307, fig. 29c. Holotype ♂, TANZANIA: Ukimbu, Nkila, 20–21.viii.1899 (Glauning) (MNHU, Berlin) [examined].

DIFFERENTIAL DIAGNOSIS. Male with supra-anal plate blackened laterally (Fig. 8), thus differing from *C. burtti* and *C. mweruensis*. Aedeagal valves longer than those of *C. robertsoni* or *C. veseyi* (see Figs 10, 12, 16); in former, pronotum and subgenital plate almost lack hairs, and black areas on supra-anal plate do not extend to its base. In contrast, *C. latestriata* and *C. veseyi* are sparsely but clearly hirsute on pronotum and subgenital plate, and black areas of supra-anal plate are as in Figs 8, 9. *C. latestriata* differs from *C. veseyi* in proportions of lateral pronotal bands (Figs 1, 3).

Female differs markedly in colouring from *C. veseyi* (see key) and lacks well-developed median pronotal carina of *C. burtti*. Lower outer lobe of knee of posterior femora with dark spots, thus differing from uniformly light brownish lobe of *C. robertsoni* and *C. mweruensis*.



Figs 17–26 *Chromosambilla* species, females. 17, lateral aspect of head and thorax of *C. latestriata*. 18, dorsal aspect of head and pronotum of *C. latestriata*. 19–21, lateral aspect of head and thorax of (19) *C. veseyi*; (20) *C. mweruensis*; (21) *C. burtti*. 22, dorsal aspect of head and pronotum of *C. veseyi*. 23, dissected display of ventral ovipositor valves (*vv*) and spermatheca showing point distal to which duct is non-sclerotised (arrow) and apical sac plus preapical diverticulum. 24, ventral valves of ovipositor, from below, of *C. latestriata*. 25, dorsal aspect of head and pronotum of *C. latestriata*. 26, lateral aspect head and thorax *C. robertsoni*. Scale line under Fig. 17 represents 1 mm and applies to all except Figs 23 and 24, to which 1 mm scale line under Fig. 23 applies.

MEASUREMENTS

	Males		Females	
Head width	(11)	3.4-3.7, 3.52	(8)	4.1-4.4, 4.26
Antenna length	(9)	5.6-6.4, 6.72	(7)	6.0-7.2, 6.71
Posterior femur length	(11)	7.1-8.3, 7.88	(7)	9.2-10.2, 9.73
Posterior femur depth	(11)	2.0-2.3, 2.11	(7)	2.5-2.9, 2.68
Body length	(11)	12.0-14.1, 13.09	(8)	16.8-18.8, 17.81

MATERIAL EXAMINED

Tanzania: 4 ♂, 8 ♀, Rukwa, Kapombo Hill, 25.iv.1958 (*Vesey-FitzGerald*) (BMNH); 1 ♂, 1 ♀, Ufipa, Ilemba gap, 12.iii.1959 (*Vesey-FitzGerald*) (BMNH); 11 ♂, 10 ♀, Ufipa plateau, Mkundi, 26 km NNW. of Sumbawanga, 16-27.v.1966 (*Jago*) (5 ♂, 2 ♀; rest COPR, London); 1 ♂, 2 ♀, Rukwa valley, Red Locust Camp, Musa, 26-27.ix.1964 (*Jago*) (BMNH).

DISCUSSION. This species was originally described from 'Ukimbu (S.O.-Tanganyika)'. At that time 'Tanganyika' was applied to a region embracing parts of what are now Katanga, northern Zambia and SW. Tanzania, and 'Ukimbu' was an area to the east of L. Rukwa. The COPR collections include material from the Rukwa valley and Ufipa plateau west of L. Rukwa. The females from the valley floor have dark colouring with two light yellowish body stripes laterad, the rest of the insect being dark greenish. Females from the plateau lack the upper pair of lighter bands laterad but are lighter insects overall.

A collection was made of the plant association characterising the herb cover of the habitat. This insect occurred together with *Usambilla haematogramma* and was particularly abundant at the base of old termite hills at the edge of a forestry plantation. The plants were kindly identified in 1967 at the East African Herbarium by S. P. Kibuwa; the species were *Bidens steppia* (Steetz) Scherff, *Erlangea* sp. near *E. laxa* S. Moore (Compositae); *Hypoestes verticillaris* R. Brown (Acanthaceae); *Pycnostachys* (?) *stuhlmanni* Guerke (Labiateae); *Pseudarthria hookeri* Wight & Arnott (Papilionaceae); *Achyranthes aspera* L. (Amaranthaceae); *Physalis peruviana* L. (Solanaceae).

Like *U. haematogramma*, *C. latestriata* seems to occur in a plant community which is structurally part of a woodland subclimax. It does not live in the forest or grassland and would therefore seem to be an insect adapted to a transient ecosystem. The Ufipa forests seem to be at a curious senescent stage in which many of the broad-leaved trees are dying, leaving many areas with tree euphorbias as dominants. Local ecologists implicate climatic change and the effects of man in accelerating the decline in this unique forest mosaic.

Chromousambilla veseyi sp. n.

(Figs 1, 9, 16, 19, 22)

Holotype ♂, **Tanzania:** Ruaha. Nat. Park, riverine, 15.iii.1966 (*Vesey-FitzGerald*) (BMNH).

DIFFERENTIAL DIAGNOSIS. Male with supra-anal plate (Fig. 9) blackened laterally, thus differing from *C. burtti* and *C. mweruensis*. Like latter, however, in having short aedeagal valvulae (Figs 14, 16). Unlike *C. robertsoni* in having moderately hirsute pronotum and subgenital plate. Dark body stripes definitely bluish black, not black or dark brown. Light body stripes golden yellow, differing in proportions from *C. latestriata* (see Figs 1, 3; also key, p. 6).

Female differs from all other species (Fig. 19): generally darker dorsally and olive green with clear dorso-lateral yellow side stripes. Dark lateral stripes black.

MEASUREMENTS

	Males		Females	
	Holotype			
Head width	3.5	3.6	4.1	4.4
Antenna length	6.9	7.6	7.6	7.9
Posterior femur length	7.8	8.1	9.7	10.3
Posterior femur depth	2.1	2.2	2.6	2.8
Body length	14.1	13.2	16.2	15.9

MATERIAL EXAMINED

Paratypes. **Tanzania**: 1 ♂, 2 ♀, same data as holotype (1 ♂, 1 ♀ in COPR, London; 1 ♀ in BMNH).

DISCUSSION. This new species is named after the late L. D. E. F. Vesey-FitzGerald, a close friend and colleague. The species is unique in having the male and female with similar bright colour patterns.

Chromousambilla burtti sp. n.

(Figs 3, 5, 15, 21)

Holotype ♂, **Tanzania**: Kikombo, Mpwapwa, 17.iv.1947 (*E. Burtt*) (BMNH).

DIFFERENTIAL DIAGNOSIS. Both sexes distinguished at once by larger size. Antennae in both sexes longer proportionately than other species, twice length head and pronotum in male, 1.5 times in female. Supra-anal plate of male lacking areas of black pigmentation (Fig. 5), thus differing from *C. latestriata*, *C. veseyi* and *C. robertsoni*. Dark body stripes of male dark brown; light body stripes dull cream. Female (Fig. 21) with dark brown side stripes with other darker regions black. Dark side stripe on metathorax and first abdominal tergite strongly arched. Back of female pronotum often green. Male and female with pronounced though slender median dorsal carinula.

Male genitalia (Fig. 15) very long and aedeagus narrowed pre-apically with an oblique tip. Whole complex enclosed in large pod-shaped sub-genital plate (Fig. 3).

MEASUREMENTS

	Male holotype	Female allotype
Head width	3.9	5.0
Antenna length	10.5	10.3
Posterior femur length	9.6	11.9
Posterior femur depth	2.6	3.3
Body length	15.7	21.2

MATERIAL EXAMINED

Paratypes. **Tanzania**: 2 ♂, 1 ♀ allotype and 2 ♀, same data as holotype (1 ♂, 1 ♀ (allotype), 1 ♀ BMNH; 1 ♂, 1 ♀ COPR, London); 1 ♂, 1 ♀, Kikombo, Mpwapwa, 20.iv.1947 (*E. Burtt*) (♀, BMNH; ♂ COPR, London); 1 ♂, 2 ♀, Kikombo, Mpwapwa, 18.iv.1947 (*E. Burtt*) (BMNH).

DISCUSSION. The species is named after the late Eric Burtt who did so much to improve our knowledge of the acridid fauna of central and eastern Africa.

Chromousambilla mweruensis sp. n.

(Figs 6, 14, 20)

Holotype ♂, **Zambia**: Mporokosa distr., Mweru wa Ntipa, [8-13.]vii.1952 (*Uvarov*) (BMNH).

DIFFERENTIAL DIAGNOSIS. Male differs from all other species, except *C. burtti*, in having supra-anal plate free of black shading laterally (see Figs 6, 7). Aedeagal valves resemble *C. veseyi* (see Figs 14, 16), but this differs on supra-anal plate facies. Male dark body stripes blue-black, those of *C. burtti* being black. Latter also bigger species with longer antennae (ratio of antennal length to length of head plus pronotum 2.0 in males, 1.5 in females); antenna in *C. mweruensis* having equivalent ratios for male 1.8 and female 1.0.

MEASUREMENTS

	Males		Females	
	Holotype			
Head width	3.5	3.8	4.5	4.3
Antenna length	6.9	7.7	8.1	9.4
Posterior femur length	8.6	8.2	10.2	9.4
Posterior femur depth	2.3	2.2	2.8	3.0
Body length	16.1	14.5	19.5	21.1

MATERIAL EXAMINED

Paratypes. **Zambia**: 1 ♀, same data as holotype (BMNH). **Tanzania**: 6 ♂, 2 ♀, 35.4 km W. of Kahama, Mkwemi, [14–29.iii.1947 (*E. Burt*) (1 ♂, 1 ♀ COPR, London; rest BMNH); 4 ♂, 35.4 km W. of Kahama, Mkwemi, [xii.1946–ii.1947] (*E. Burt*) (BMNH); 2 ♂, Old Shinyanga, 1.ii.1947 (*E. Burt*) (BMNH); 2 ♀, 16.1 km N. of Ussure, on Msigiri rd, 12.iv.1936 (*E. Burt*) (BMNH).

DISCUSSION. The species name originates from the Mweru wa Ntipa area of Zambia.

Chromousambilla robertsoni sp. n.

(Figs 7, 10, 11, 26)

Holotype ♂, **Tanzania**: 70.8 km N. of Dodoma, nr Meia Meia, [16–18.]vi.1967 (*Jago*) (BMNH).

DIFFERENTIAL DIAGNOSIS. Aedeagal valvulae (Fig. 10) of intermediate length, pointed apically like *C. latestriata* and *C. veseyi*, with black patches laterad on supra-anal plate, but these areas not reaching broadly to base of plate. Male colour and body markings like those of *C. latestriata*, but lower outer lobe of hind knee mostly white with limited dark spots (unlike *C. latestriata* in which this lobe extensively mottled with black). Pronotum and subgenital plate almost without hairs. Female almost uniform dull brown (Fig. 26) with weakly differentiated creamy diagonal side stripe. Hind femora dull olive to yellow with lower outer knee lobe pale brown, immaculate (unlike *C. latestriata* which has dark spots on this area). Ratio of antenna length to length of pronotum plus head about 1.8 in males and 1.4 in females; antennae being shorter in proportion than any other species.

MEASUREMENTS

	Males		Females	
Head width	(12)	3.2–3.5, 3.41	(2)	4.1 4.1
Antenna length	(11)	6.2–7.7, 6.78	(2)	6.6 6.3
Posterior femur length	(12)	7.4–9.1, 8.03	(2)	9.8 9.4
Posterior femur depth	(12)	1.9–2.4, 2.16	(2)	2.9 2.7
Body length	(12)	11.0–13.0, 12.20	(2)	13.1 17.4

MATERIAL EXAMINED

Paratypes. **Tanzania**: 10 ♂, 2 ♀, same data as holotype (9 ♂, 1 ♀, BMNH; 1 ♂, 1 ♀, COPR, London).

DISCUSSION. The species is named for Dr I. A. D. Robertson and his wife Ann who are formidable collectors of acridids. The species occurred in rather dry *Acacia* woodland in the same biotope as *Physocrobylus burtti* Dirsh (described in Jago, 1978).

MICROUSAMBILLA gen. n.

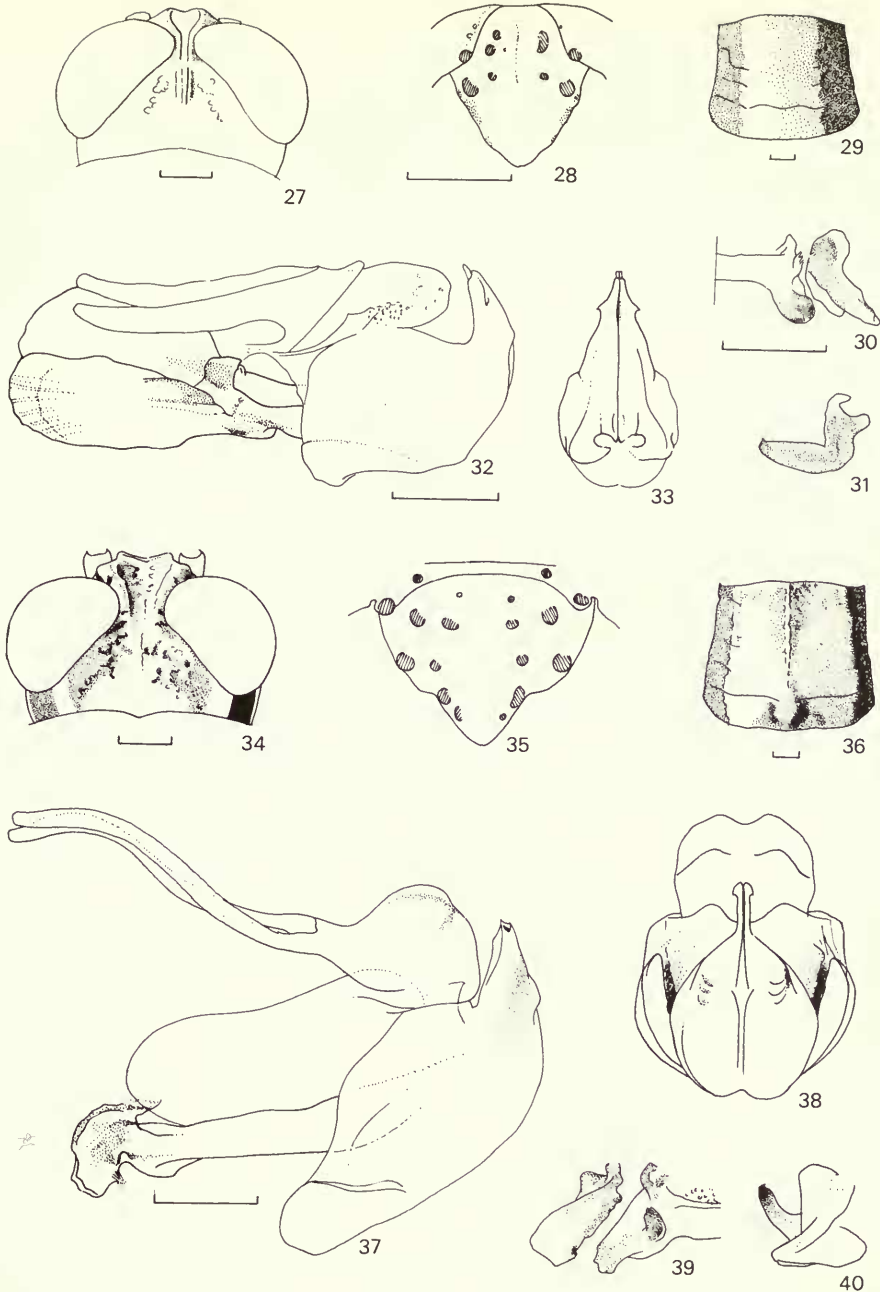
(Figs 27–33)

Type-species: *Usambilla cylindricollis* Ramme.

DIFFERENTIAL DIAGNOSIS. *Male*. Vertex with narrow selliform groove opening forward into disc-shaped fastigium (Fig. 27). Pronotum rounded above, lacking median carina (Fig. 29). Antennae slightly flattened, not widened and about 1.25 times length of head and pronotum. Ninth abdominal tergite deeply excavate (Fig. 28), bearing black tubercles on either side of median emargination. Supra-anal plate simple, triangular, bearing two large submarginal tubercles laterally and up to three pairs of small tubercles on disc. Penis complex like that in *Usambilla*, with large racket-shaped anterior valves and aedeagus bearing a single pair of pre-apical lateral teeth (Figs 32, 33). Epiphallus simple, ancorae (Fig. 31) weak and forwardly directed, ventro-lateral lophus (Figs 30, 31) at right angles to disc and with single apical hook. Hind femur 3.8 times longer than deep, rather slender.

Female. Head as seen from above very similar to that of male. Pronotum with traces of median dorsal carina. Antenna about 1.25 times length of head and pronotum. Ventral ovipositor valves slender, pointed. Hind femora slender, like those of male.

Coloration. General colour pattern of both sexes similar (Fig. 29). Light brown above, dark brown laterally. Dorso-laterally, pair of faint whitish stripes, side lobe of pronotum with another arcuate band of same colour but twice as deep. Hind femora olive, brown above. Hind tibiae brown, sooty below.



Figs 27–33 *Microusambilla cylindricollis*. 27, dorsal aspect of male head. 28, dorsal aspect of male supra-anal plate. 29, dorsal aspect of female pronotum. 30, right side, epiphallus and lateral plate, male. 31, epiphallus of male, right side. 32, entire male phallic complex (epiphallus removed), lateral oblique view, left side. 33, cingular rami and apical valvulae, rear aspect. All scale lines represent 0.5 mm.

Figs 34–40 *Altiusambilla modicicrus*. 34, dorsal aspect of male head. 35, dorsal aspect of male supra-anal plate. 36, dorsal aspect of female pronotum. 37, entire male phallic complex, apical valvulae, rear aspect. 39, left side of epiphallus and lateral plate, male. 40, right side of epiphallus. Scale line under Fig. 37 represents 0.5 mm and applies to Figs 35, 37–40. Other scale lines represent 0.5 mm.

DISCUSSION. The genus is monotypic. It is morphologically close to *Sygrus* from which it differs in having a flattened sloping fastigium of the vertex and a weaker system of black nodules on the male ninth tergite. *Sygrus* also has a more definite dorsal pronotal carinula (see key, p. 3). In future, when further material is available, it may be best to unite *Sygrus* and *Microusbilla* under one genus.

Microusbilla cylindricollis (Ramme) **comb. n.**

Usambilla cylindricollis Ramme, 1929: 302, fig. 27a. Holotype ♂, ZIMBABWE: Mashonaland, Chirinda forest, 1150 m, 22.ii.1907 (C. F. M. Swynnerton) (BMNH) [examined].

MEASUREMENTS

	Male	Female
Head width	3.0	4.9
Posterior femur length	7.7	9.0
Posterior femur depth	2.0	2.0
Body length	12.1	14.2

MATERIAL EXAMINED

Zimbabwe: 2 ♂, 3 ♀, Monarch Mine, Umtali, 1213 m, 6.iv.1945 (N. C. E. Miller) (BMNH); 6 ♀, same data but 7.iv.1945 (BMNH).

ALTIUSAMBILLA gen. n.

(Figs 34–40)

Type-species: *Lentula modicicrus* Karsch.

DIFFERENTIAL DIAGNOSIS. *Male*. Head and fastigium rugulose (Fig. 34) with transverse carinulae in depressed anterior part of fastigium. Upper part of frons, between antennal bases concave and widened. Groove of vertex ending just behind narrowest approximation of compound eyes dorsally, two oblique ridgelets separating it from the highly pitted occiput. Pronotum smoothly rounded above, median carinula being weak but present along whole length of disc. Dorso-lateral light pronotal stripe very narrow while ventral band on pronotal side lobe very deep, extending from pronotal margin one-third of way up side lobe. Posterior margin of ninth abdominal tergite gently concave, bearing one and sometimes two black tubercles on each side (Fig. 35). Supra-anal plate without marginal callosities of the *Rhainopomma* type (Figs 50–54) but with at least six pairs of tubercles on the disc and base of distal appendage (Fig. 35). Phallic complex like that in *Lentula*, with small auricular anterior penis valves (Fig. 37). Penis valves styliform with apical barbs (Fig. 38). Epiphallus with no ancorae and with lophal lobes slender, turned upwards at 45° to epiphallic disc (Fig. 40) and ruggedly hooked at tip (Fig. 39). Length to depth ratio of hind femur 4.

Female. Angular differentiation of frontal groove and fastigium more pronounced than in male, latter being pitted and sloping forward at 45° to horizontal body axis. Lateral body stripes relatively undifferentiated. Dorsal median pronotal carina forming a large hump in the metazona (Fig. 36). Tergites of abdomen sharply carinulate. Tips of ventral ovipositor valves quadrilateral with acutangulapices.

Coloration. Fore and midlegs yellow green. Hind femur yellow green; knee lenules blackish, rest brown. Hind tibiae pale bluish yellow-green, sooty apically. Generally olivaceous brown or greenish with creamy pronotal stripes in males. Dark brown to blackish side stripe in males and females from behind eye to side of first abdominal segment. On latter segment often black, continuing as broken black zig-zag on each side to abdominal segment 6.

Altiusambilla modicicrus (Karsch) **comb. n.**

Lentula modicicrus Karsch, 1896: 280. Holotype ♂,

TANZANIA: Madjame, Mt Kilimanjaro (MNHU, Berlin) [examined].

MEASUREMENTS

	Males	Females
Head width	(64) 2.5–3.0, 2.69	(42) 3.0–3.5, 3.24
Posterior femur length	(60) 6.0–7.0, 6.55	(39) 7.8–9.3, 8.67
Posterior femur depth	(62) 1.5–1.8, 1.68	(39) 2.0–2.4, 2.20
Body length	(59) 10.9–13.4, 12.11	(39) 13.1–17.1, 15.98

MATERIAL EXAMINED

Tanzania: 1 ♂, Moshi, 18.xi.1943 (*E. Burt*) (BMNH); 3 ♀, Kirua Vunja, 28.ix.1952 (*Guichard*) (BMNH); 2 ♀, W. Kilimanjaro, Msituni, defoliating *Pinus patula*, 10.xii.1975 (BMNH); 1 ♀, W. Kilimanjaro, Moshi, on *Pinus patula* (BMNH); 23 ♂, 5 ♀, nymphs, Kilimanjaro, S. side nr Manderu hut, 2370–2730 m, 15.xi.1964 (*Jago*) (BMNH); 30 ♂, 29 ♀, E. of Mt Meru, Ngurdota-Meru N.P., crater lake rim, forest glades, 22.xi.1964 (BMNH); 5 ♂, 1 ♀, Ngurdota-Meru N.P., Kisari L., 22.xi.1964 (*Jago*) (BMNH); 3 ♂, 3 ♀, Mt Meru, 1426 m, 25.ii.1967 (*E. S. Brown*) (COPR, London); 5 ♂, 7 ♀, Jekukumia R., 3°14'S, 36°47'E, 2.vi.1972 (*Robertson & Robertson*) (COPR, London).

DISCUSSION. The genus is monotypic. The new generic name refers to the preference this species has for montane forest and lower heath zones on Kilimanjaro and Meru mountains.

The unusual pronotal morphology of this species is reflected in a less extreme manner in other female Lentulidae, e.g. *Usambilla emaliensis*, which also have an elevated crest in the pronotal metazona. Live material of *A. modicicrus* is interesting since its mating display shows a possible behavioural function for the dorsal humps. Males approach females, the female responding by jerking and opening the hind legs sideways, while pedalling the hind tibiae which are folded and unfolded alternately. The males often orientate incorrectly head to tail, the female responding by more violent jerking or kicking. If, however, the male approaches correctly from behind he climbs the female abdomen and nibbles at the female tergites after the fashion of some female cockroaches. In *A. modicicrus* the male climbs forward until he nibbles the pronotal bulge, whereupon the female presents her abdominal tip for copulation. A similar function may be involved in the strange bilateral pits on the metazona of many flightless Catantopinae, e.g. *Aresceutica* and *Serpusia* species.

Its attack on *Pinus patula* was preceded by years in which this grasshopper was very abundant in the indigenous natural vegetation. At the higher habitats *A. modicicrus* lives in a zone prone to unstable weather conditions with irregular rainfall. It is possible that drought conditions, forcing the insect to sample exotic *Pinus*, were responsible for the initial phase of the adaptation that insects have shown to a new food plant. Forestry involving *Pinus patula* should be free of attack by this species if trees are planted in areas other than Meru and Kilimanjaro. The very similar *Rhainopomma montanum* found in the West Usambara and Pare mountains is unlikely to adapt to *Pinus* species. Care should be taken not to introduce *A. modicicrus* to other highland areas of East Africa. This could be easily done if young trees were transferred with egg pods hidden in soil at their roots.

***RHAINOPOMMA* gen. n.**

(Figs 41–72)

Type-species: *Adolfia usambarica* Ramme.

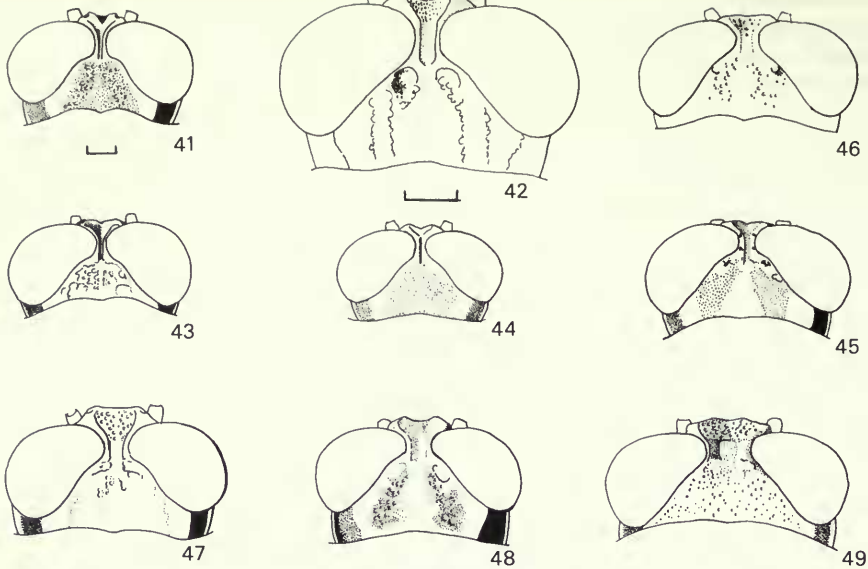
DIFFERENTIAL DIAGNOSIS. *Male.* Differing from all other Lentulidae and particularly the closely similar genus *Usambilla* in the extreme apical position of the aedeagal barbs (Figs 63, 64). Otherwise form of supra-anal plate (Figs 50–54) and epiphallus as in *Usambilla* (compare Figs 65, 144). Inter-ocular space very narrow, a feature correlated with great inflation of the compound eyes (Figs 41–45).

Female. Vertex narrower in proportion between compound eyes than in females of *Usambilla* (compare Figs 49, 83), but this apart identical with that genus.

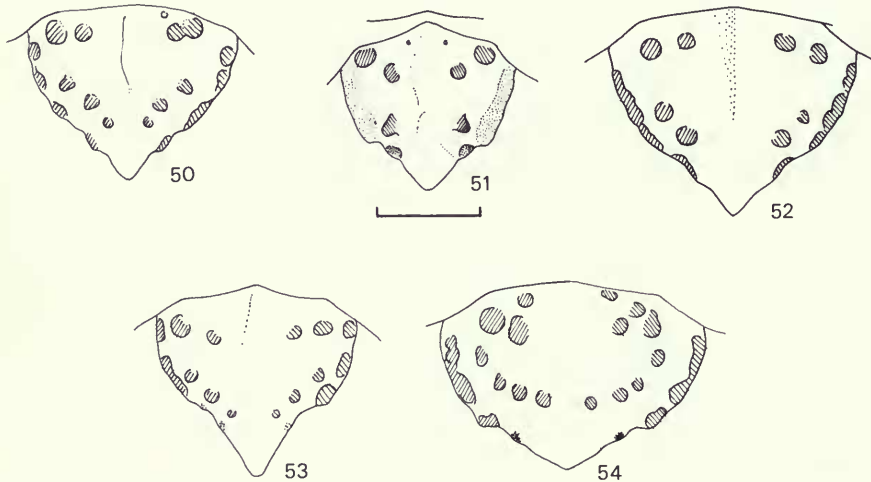
Coloration. Male more brightly coloured than the female. Hind tibiae blue in some species, a character so far known from only one *Usambilla* species.

DISCUSSION. Distribution of the genus suggests a long period of evolution in wet lowland to middle altitude montane forests in eastern Africa, east of the Rift Valley. Habitats generally in higher rainfall areas than those of *Usambilla*. Females only surely identified generically by association with the males.

The genus is distributed in SE. Kenya and the piedmont forest blocks of the Pare, Usambara, Nguru, Uluguru mountains and Pugu hills. It is thus indigenous to forests on ancient uplifted mountain blocks which have not experienced the volcanism characteristic of the central rift. Their speciation suggests isolation in forest islets as a major factor in speciation.



Figs 41–49 *Rhainopomma* species, dorsal aspect of head. 41, *R. usambaricum*, male. 42, *R. montanum*, male. 43, *R. nguruense*, male. 44, *R. wapugu*, male. 45, *R. magnificentum*, male. 46, *R. usambaricum*, female. 47, *R. nguruense*, female. 48, *R. wapugu*, female. 49, *R. magnificentum*, female. All scale lines represent 0.5 mm, that under Fig. 42 applies only to that figure.



Figs 50–54 *Rhainopomma* species, male supra-anal plate. 50, *R. usambaricum*. 51, *R. montanum*. 52, *R. nguruense*. 53, *R. wapugu*. 54, *R. magnificentum*. Scale line represents 0.5 mm.

Key to species

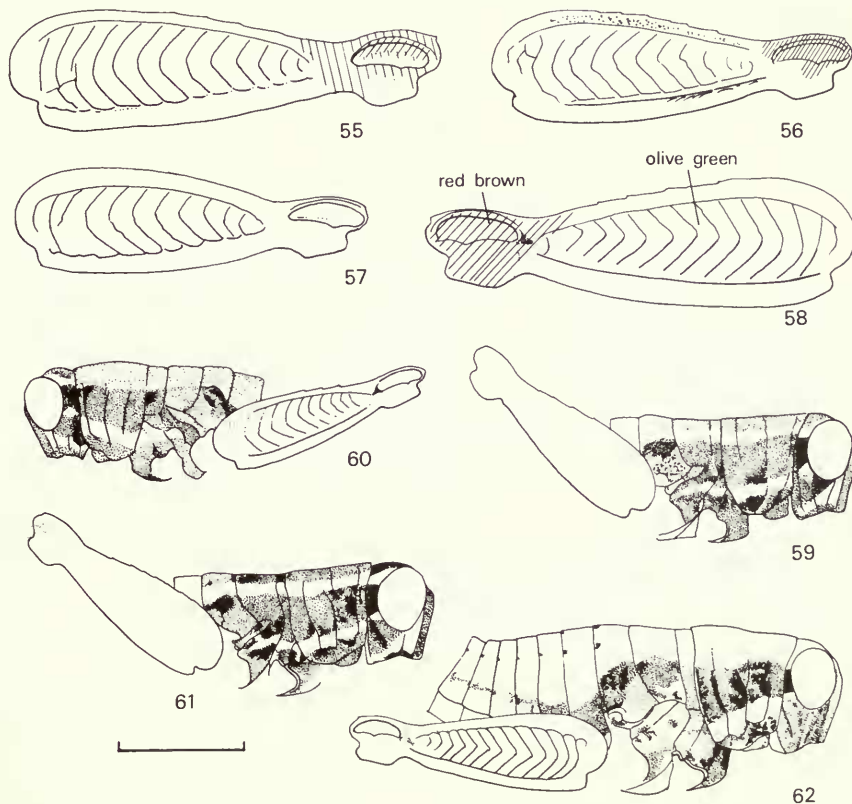
Males

- | | | |
|---|---|---------------------------------------|
| 1 | Knees of posterior femora blue | <i>R. usambaricum</i> (Ramme) (p. 16) |
| – | Knees of posterior femora red-brown | 2 |
| 2 | Posterior tibiae sooty brown in apical four-fifths | <i>R. wapugu</i> sp. n. (p. 19) |
| – | Posterior tibiae uniformly coloured or only with black or brown pigment at extreme tips | 3 |
| 3 | Supra-anal plate bearing fewer than 10 black teeth or denticles on disc (Fig. 42). Small insects without clear dorso-lateral light body stripes | <i>R. montanum</i> (Kevan) (p. 17) |
| – | Supra-anal plate with at least 14 black teeth or denticles on disc. Larger insects, usually with clear dorso-lateral body stripes | 4 |

- 4 Light body stripes white, upper and lower stripe viewed laterally being clearly delineated above. Smaller insects, body length under 15 mm. Hind tibiae bright blue *R. nguruense* sp. n. (p. 17)
- Light body stripes creamy to buff in colour with upper lateral stripe more poorly delineated on its upper margin. Large insects, body length never less than 16 mm. Hind tibiae dull green. *R. magnificum* sp. n. (p. 20)

Females

- 1 Hind tibiae uniform blue, spines black tipped 2
- Hind tibiae green with or without blue-black pigment 3
- 2 Hind knee lunules (Figs 55, 59) dark slaty blue, blacker above. Hind femur otherwise yellowish. Light dorso-lateral and lateral body stripes golden yellow in colour *R. usambaricum* (Ramme) (p. 16)
- Hind knee and lunules (Figs 56, 61) light brown. Hind femur dark olivaceous with dorsal part brown. Light dorso-lateral and lateral side stripes light ochreous brown *R. nguruense* sp. n. (p. 19)
- 3 Hind tibiae distally blue-black; proximal quarter green. Pronotum with weak but distinct convex carina dorsally *R. wapugu* sp. n. (p. 19)
- Hind tibiae light yellow-green. Pronotum dorsally lacking median carina and decumbent, concave in profile, or lightly convex, especially at rear 4
- 4 Hind femur 3.25 times longer than deep. Large insects; body length 18 mm. Upper carina of hind femur convex (Figs 58, 62) *R. magnificum* sp. n. (p. 20)
- Hind femur over 4.00 times longer than deep. Smaller insects with body length 15 mm. Upper carina of hind femur almost straight *R. montanum* (Kevan) (p. 17)



Figs 55–62 *Rhainopomma* species. 55–58, male posterior femora of (55) *R. usambaricum*; (56) *R. nguruense*; (57) *R. wapugu*; (58) *R. magnificum*. Scale line under Fig. 58 represents 1 mm and applies throughout. 59–62, lateral aspect of female head, thorax and hind femur of (59) *R. usambaricum*; (60) *R. wapugu*; (61) *R. nguruense*; (62) *R. magnificum*. Scale line under Fig. 61 represents 5 mm and applies throughout.

***Rhainopomma usambaricum* (Ramme) comb. n.**

(Figs 41, 46, 50, 55, 59, 63–65)

Adolfia usambarica Ramme, 1929: 305, figs 28b, 29b, 30a. Holotype ♂, TANZANIA: Amani, Usambara, iii.1906 (Vosseler) (MNHU, Berlin) [examined].

DIFFERENTIAL DIAGNOSIS. *Male.* Antennal segments 1–3 green, 10 and 13 white, rest black. Head (Fig. 41) with dorsal triangular occipital area black, frons and two stripes behind and from ventro-posterior edge of compound eye, dark brown. Vertex, a band round back edge of compound eye and lower half of genae, white. Pronotum dark brown with pair of dorso-lateral and lateral wide white bands, which are yellow in metazone. White pronotal bands continued along abdomen as yellow bands, abdominal sternites and sub-genital plate being yellow. Supra-anal plate (Fig. 50) green, with two pairs of basal and three pairs of submarginal black tubercles. Hind knees (Fig. 55) blue, knee lunules grey, rest of femur yellow-green. Fore and mid-femora yellow to green. Hind tibiae blue; spines white, black-tipped. Aedeagus (Figs 63–65) and epiphallus; aedeagal sheath pear-shaped from posterior aspect (Fig. 64) (like that of *R. nguruense*, *R. montanum* and *R. wapugu*), lateral epiphallic sclerites large in proportion to rest of epiphallus (unlike those of *R. montanum*, Fig. 69), with lower lophal lobe of epiphallus pointed but not hooked (Fig. 65, upper, left).

Female. Dark brown markings on head and pronotum as for male (Fig. 59), but equivalent white areas yellow, while median dorsal pronotal carina delineated with yellow. Fastigium of vertex (Fig. 46) black with yellow margins. Dorso-lateral yellow bands on body clearly marked back to at least abdominal tergite 1. Antennal markings similar to male, but black areas dark brown in this sex. All femora green, hind femora yellow on inner side. Hind knees and posterior tibiae dull blue.

MEASUREMENTS

	Males	Females
Head width	(13) 3.4–4.0, 3.64	(20) 4.0–5.0, 4.45
Inter-ocular distance	(14) 0.10–0.24,	(20) 0.34–0.49, 0.42
Posterior femur length	(14) 7.6–9.5, 8.37	(20) 9.3–11.0, 10.18
Posterior femur depth	(14) 2.0–2.7, 2.32	(20) 2.5–3.1, 2.85
Total length	(14) 13.4–17.3, 14.90	(20) 17.2–21.0, 18.90

MATERIAL EXAMINED

Tanzania: 1 ♀, same data as holotype (BMNH); 1 ♀, Amani, iv.1905 (BMNH); 3 ♂, Sigi nr Amani, 460 m, 11.vi.1937 (*E. Burt*) (BMNH); 7 ♂, 1 ♀, same locality but 24.vi.1937 (*E. Burt*) (BMNH); 4 ♂, 4 ♀, same locality but 29.v.1932 (*E. Burt*) (BMNH); 1 ♂, 1 ♀, same locality but 6.vii.1937 (*E. Burt*) (BMNH); 1 ♂, same locality but 4.ii.1937 (*E. Burt*) (BMNH); 3 ♂, 5 ♀, same locality but v.1937 (*E. Burt*) (BMNH); 1 ♂, Kwamtili plant, iii.1952 (*Phipps*) (BMNH); 1 ♂, 2 ♀, Ngomeni, Mlingano for., i.1953 (*Phipps*) (BMNH); 1 ♀, same locality but vii.1952 (*Phipps*) (BMNH); 5 ♂, 6 ♀, 1 nymph, E. Usambara Mts, Sigi nr Amani, [2–11].iv.1964 (*N. D. Jago*) (COPR, London); 1 ♂, 7 ♀, 3 nymphs, same locality, [18–31].xii.1965 (*N. D. Jago*) (BMNH); 1 ♂, 1 ♀ nymph, W. Usambara Mts, Mkusu for. res., 11.xi.1964 (*N. D. Jago*) (BMNH); 2 ♂, 1 ♀, E. Usambara Mts, Kwamkora for. res., 7.iv.1966 (*N. D. Jago*) (BMNH); 2 ♂, 1 ♀, E. Usambara Mts, Amani-Sigi for. res., xii.1966 (*N. D. Jago*) (BMNH); 1 ♂, 1 ♀, E. Usambara Mts, Amani Rest. Ho., 5.iv.1966 (*N. D. Jago*) (BMNH); 4 ♂, 4 ♀, E. Usambara Mts, nr Amani, 9.xi.1964 (*N. D. Jago*) (BMNH). **Kenya:** 1 ♂, 4 ♀, Shimba hills, iii.1941 (*Van Someren*) (BMNH).

DISCUSSION. *R. usambaricum* occupies wet lowland forest in the east Usambara mountains and immediately adjacent hills. Its ecological preference is typical for the other members of the genus, which also prefer wet, warm and sunny lowland forest, in contrast to upland habitats. *Chromous-ambilla* parallels it in having brightly coloured males, but differs in occupying degraded montane forest at higher altitudes in the hinterland of east Africa. *R. montanum* (see material studied) penetrates a little higher into the wetter warmer forest areas of the West Usambara massif and converges in appearance on *A. modicrus* to such an extent that for many years the two were confused taxonomically.

***Rhainopomma montanum* (Kevan) comb. n.**

(Figs 42, 51, 68, 69)

Usambilla montana Kevan, 1950: 211, fig. 3b. Holotype ♂, KENYA: Teita hills, 1370–1680 m, shrubby bushes and forest clearings, 24.xii.1945 (*Kevan*) (BMNH) [examined].

DIFFERENTIAL DIAGNOSIS. *Male.* Much smaller than *R. usambaricum*. Antennae with segments 1–3 green but rest dull brown, segments 8 and 12 being light in colour, cream or green. Head (Fig. 42) dark brown with black markings, at upper end of frons, around antennal sockets, a pair of spots just behind posterior end of groove of fastigium of vertex, a pair of dorso-lateral narrow post-ocular stripes and a broader one laterally behind compound eye, all black. Dorso-lateral light brown band on pronotum very narrow (contrasting with *R. usambaricum*) but lower lateral cream band wide (half depth of dark brown band above it). Rest of thorax and abdomen light brown above narrowly edged with lighter brown; black to dark brown laterally. Abdomen green below; subgenital plate green. Supra-anal plate green with only three pairs of callosities on disc; marginal callosity on each side continuous, unbroken (Fig. 51). Fore and mid-legs dark green; hind femora (like Fig. 58) dark green, knees light brown. Posterior tibiae black at the extreme tip, rest green but light brown adjacent to knee. Spines white with black tips.

Female. Small with proportions of inter-ocular space much like those of *R. magnificum* (Fig. 49). Body and head light brown dorsally with only a faint trace of a fine line of lighter colour along each side. Dark brown to black lateral pronotal band similar to that in Fig. 60, but lower lateral light brown to cream band deeper than in *R. wapugu* (half depth of dark band) and upper edge of dark lateral band on segments 1 and 2 of abdomen forming a smooth curve, not angulate. Lateral parts of tergites 1–5 with dark brown or black markings. Hind femora uniformly red-brown, or yellow on inner and lower sides, green on outer area with knee red brown. Hind tibiae green, spines green with black tips; extreme tip of tibiae black, part near to hind knee light brown. Fore and midlegs green or brown.

MEASUREMENTS

	Males	Females
Head width	(27) 2.7–3.0, 2.87	(31) 3.3–3.8, 3.80
Inter-ocular distance	(27) 0.18–0.30, 0.22	(31) 0.34–0.63, 0.48
Posterior femur length	(26) 6.1–7.0, 6.40	(31) 7.1–9.7, 8.07
Posterior femur depth	(26) 1.6–2.0, 1.79	(31) 2.1–2.4, 2.22
Total length	(26) 11.1–13.2, 11.74	(29) 13.8–20.3, 15.65

MATERIAL EXAMINED

Kenya: 4 ♂, 5 ♀, 1 ♀ nymph, Taita hills, vi.1948 (*Van Someren*) (BMNH); 1 ♀, Kenya colony, 1921 (*A. F. J. Gedye*) (BMNH); 26 ♂, 29 ♀, 9 nymphs, Taita farmers' training centre, 8 km S. of Wundonyi, 6.v.1975 (*I. A. D. & A. Robertson*) (COPR, London). **Tanzania:** 6 ♂, 7 ♀, W. Usambara Mts, forest above Mazumbai, 8.vii.1967; 3 ♂, 1 ♀, same locality, nr irrigation canal, 8.vi.1963; 2 ♂, 2 ♀, 1 ♂, 2 ♀ nymphs, W. Usambara Mts, Amboni estate, below Mazumbai, 8.vii.1967; 6 ♂, 2 ♀, Mombo-Same rd, foot of S. Pare Mts, Gonja, wet forest, 13.xi.1964; 3 ♂, 3 ♀, W. Usambara Mts, Mazumbai F. Res., vi.1967; 1 ♂, W. Usambara Mts, nr Bumbuli, Mazumbai, 1.i.1967; 15 ♂, 1 ♀, W. Usambara Mts, Sumamagamba F. Res., 12.xi.1964; 14 ♂, 8 ♀, W. Usambara Mts, Mkusu F. Res., 11.xi.1964; 1 ♂, W. Usambara Mts, Lushoto-Shume rd, 9.7 km from Lushoto, 11.xi.1964; 6 ♂, 4 ♀, W. Usambara Mts, Lushoto, 1670 m, 8.vii.1967; 1 ♂, 3 ♀, W. Usambara Mts, nr Shume, 11.xi.1964; 1 ♀, W. Usambara Mts, Lushoto arboretum, 11.xi.1964; 6 ♂, 8 ♀, W. Usambara Mts, Mazumbai, secondary regrowth in quinine plantation, 8.vii.1963. (All (*Jago*); all in BMNH except last COPR, London.)

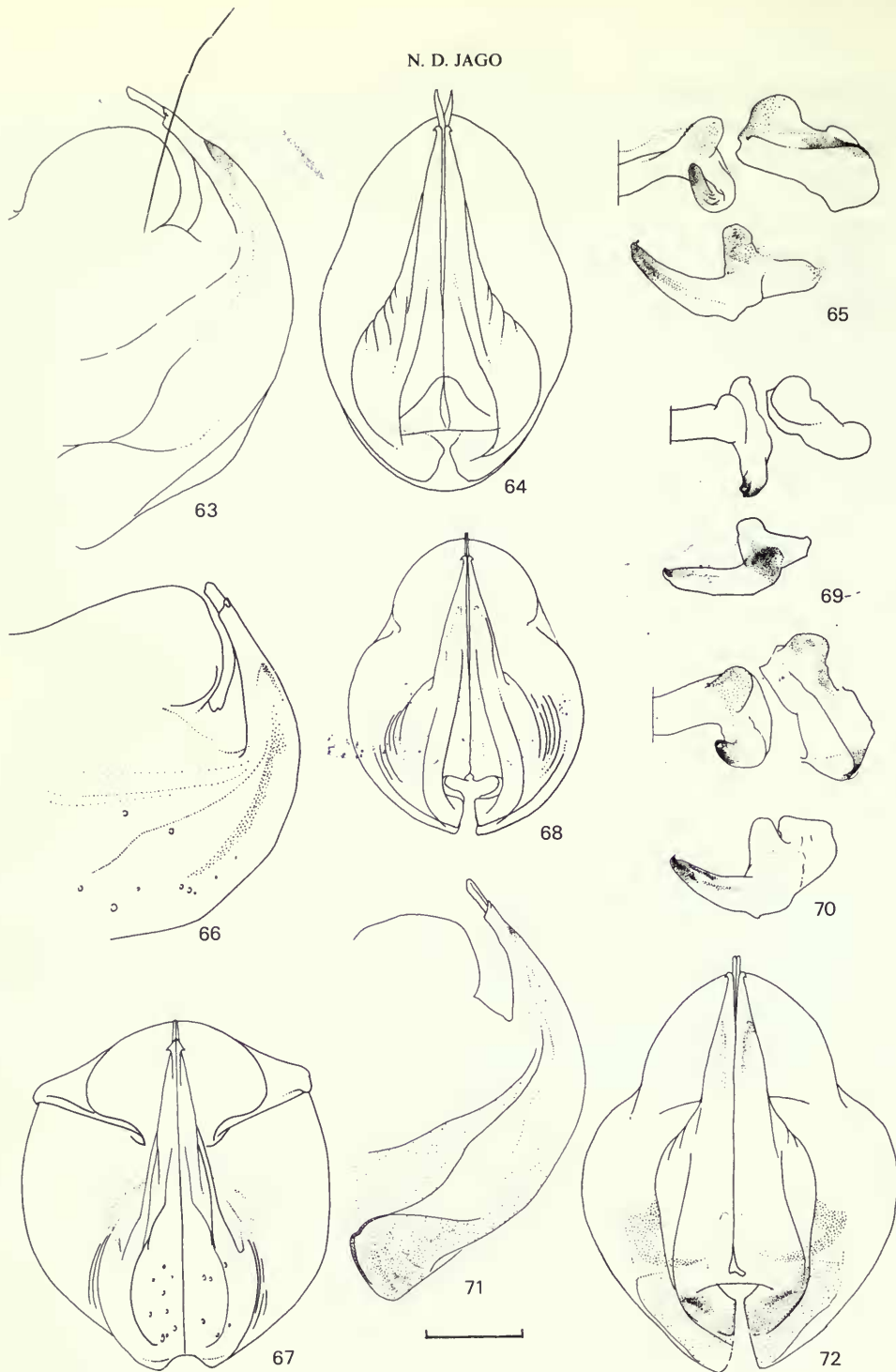
DISCUSSION. Recorded eating *Commellina* species (*A. and I. A. D. Robertson*, pers. comm.) in its Taita hills habitat in Kenya. Here the partial cultivation of a hill slope at the edge of cultivated land offered a particularly favourable habitat, partly shaded by an *Albizia* species and palms. Like its sister genus *Usambilla* this genus is favoured by the opening up of primary forest and population density may be very high, e.g. 100+/square metre. This may contribute to the attack by *Usambilla* on exotics planted in the course of forestry in such areas.

Rhainopomma nguruense sp. n.

(Figs 43, 52, 56, 61, 66, 67)

Holotype ♂, **Tanzania:** E. foot Nguru Mts, Mtibwa Forest Reserve, nr Turiani, 7.xi.1964 (*N. D. Jago*) (BMNH).

DIFFERENTIAL DIAGNOSIS. *Male.* Segments 1–3 of antennae green; other segments black, except segments 10 and 14 which are white. Colour pattern on head as in *R. usambaricum*, but fastigium between eyes marginally narrower (Fig. 43). Light pronotal stripes white but otherwise pattern as in *R. usambaricum*. Meso- and metathorax dark brown, light body stripes white to pink. Posterior third of abdomen, including sub-genital



Figs 63–72 Phallic complex in males of *Rhainopomma* species. 63, left lateral aspect of *R. usambaricum*. 64, posterior apical aspect of *R. usambaricum*. 65, epiphallus of *R. usambaricum*—upper right half and lateral plate, lower from right side. 66, left lateral aspect of *R. nguruense*. 67, posterior apical aspect of *R. nguruense*. 68, posterior apical aspect of *R. montanum*. 69, epiphallus of *R. montanum*—upper right half and lateral plate, lower from right side. 70, epiphallus of *R. magnificum*—upper right half and lateral plate, lower from right side. 71, left lateral aspect of *R. magnificum*. 72, posterior apical aspect of *R. magnificum*. Scale line under Fig. 71 represents 0.5 mm and applies throughout.

plate, pale green. Supra-anal plate (Fig. 52) with two pairs of basal tubercles and two or three pairs on disc (therefore resembling Fig. 53). Posterior femora green with knees red-brown (Fig. 56). Fore and mid-legs entirely green. Posterior tibiae light red-brown near knee and black at extreme tip; rest blue with black tipped white spines. Aedeagal complex (Figs 66, 67) showing aedeagal valves less sharply deflexed forwards than in *R. usambaricum* (Fig. 63) but more elongate than those of *R. montanum* (Fig. 68). Epiphallus like that of *R. usambaricum* (Fig. 65).

Female. Body colour and pattern (Fig. 61) like that of *R. usambaricum* but light body stripes white, not yellow. Median dorsal pale line weak or absent. Hind femora yellow to green; knees brown. Posterior tibiae pale blue, brown near knee, brown at extreme tip and with red-tipped white spines.

MEASUREMENTS

	Males		Females	
Head width	(23)	3.6–4.5, 3.79	(18)	4.2–4.7, 4.54
Interocular distance	(23)	0.16–0.30, 0.23	(18)	0.46–0.59, 0.53
Posterior femur length	(23)	7.2–8.5, 7.96	(18)	8.5–10.5, 9.86
Posterior femur depth	(23)	2.1–2.6, 2.36	(18)	2.7–3.2, 2.92
Total length	(23)	14.0–15.8, 15.03	(18)	17.1–20.0, 18.71

MATERIAL EXAMINED

Paratypes. **Tanzania:** 16 ♂, 10 ♀, 6 nymphs, same data as holotype but [5–7.]xi.1964 (BMNH); 1 ♂, same data as holotype (BMNH); 1 ♂, same data but 7.xi.1964; 5 ♂, 5 ♀, 3 nymphs, same data but 5.xi.1964 (COPR, London).

DISCUSSION. This species is closely similar to *R. usambaricum* and was probably derived from common stock. Isolation in the adjacent but ecologically isolated forests of the east Usambara and Nguru mountains would explain the divergence between the two species.

Rhainopomma wapugu sp. n.

(Figs 44, 53, 57, 60)

Holotype ♂, **Tanzania:** Pugu hills, SW. of Dar es Salaam, 11.iii.1967 (*N. D. Jago*) (BMNH).

DIFFERENTIAL DIAGNOSIS. *Male.* Antennal segments 1–5 cream to light brown; rest dark brown excepting segments 10 and 14 which are white. Interocular space narrowest for genus (Fig. 44). Pattern similar to that of *R. usambaricum* but light areas white to pink, while dark areas are dark red-brown. Fore and mid-legs entirely green. Hind femora (Fig. 57) light green with light brown genicular part. Hind tibiae light brown near knee. Distal three-quarters dark brown, remaining proximal section green. Tip of abdomen pale green. Supra-anal plate (Fig. 53) with two pairs of basal tubercles and three pairs of tubercles on disc; apical tongue rather large, two-fifths length of whole plate when measured on mid-line.

Female. Antennal segments 1–3, apical parts of 4, 5 and 6, whole of 9, 11 and 15 white, rest black. Dorso-lateral light body stripes weak, narrow, thus differing from *R. usambaricum* and *R. nguruense*, but resembling *R. montanum*. Dorsal side of head with pair of black triangular marks on either side of dorsal mid-line. Dark brown lateral stripes (Fig. 60) about 3 times deeper than lower light pink side stripe and angulate on tergite 1 of abdomen. Fore and mid-legs green, femora brown dorsally. Hind femora light brown above and internally with large grey spot at base; outer area green; lower outer area yellow; knee entirely red-brown. Colour of hind tibiae as for male.

MEASUREMENTS

	Males		Female
	Holotype	Paratype	Paratype
Head width	3.4	3.6	4.37
Inter-ocular distance	0.15	0.17	0.48
Posterior femur length	7.2	7.2	9.54
Posterior femur depth	2.1	2.1	2.77
Total length	13.7	13.4	17.72

MATERIAL EXAMINED

Paratypes. **Tanzania:** 1 ♂, 1 ♀, data as holotype (BMNH).

Rhainopomma magnificentum sp. n.

(Figs 45, 49, 54, 58, 62, 70–72)

Holotype ♂, **Tanzania**: Mombo-Same rd, foot of S. Pare Mts, Gonja, wet forest, 13.xi.1964 (*N. D. Jago*) (BMNH).

DIFFERENTIAL DIAGNOSIS. *Male.* Large species, total length about 17 mm. Antennae green in basal half, darkening to brown distally with light cream tip. Vertex and occiput (Fig. 43) with relatively wide ocular interspace, dark brown dorsally and on frons. Cream area between frons and sub-ocular sulcus; gena dark brown bordered above by very narrow cream stripe from rear of compound eye to back of occiput. Pronotum and body back to tergite 3 of abdomen with dark brown dorsal stripe bordered laterally by bold dull yellow bands equal in width to that on pronotal side lobe (unlike female where lateral pale stripe like that of male but dorsolateral pale band lacking (Fig. 62)). Fore and mid-legs green. Hind femora green with knees light brown (Fig. 58). Hind tibiae light green, light brown at each extremity and with black-tipped green spines. Abdomen, including supra-anal plate, brown above, green below. Sub-genital plate green. Supra-anal plate (Fig. 54) with up to seven pairs of non-marginal tubercles; much wider than long. Base of aedeagus (Figs 71, 72) parallel-sided, not flask-shaped. Epiphallus with well-developed hook on apex of ventral lophi and large anterior projection of upper lophal lobe (Fig. 70).

Female. Head and body light brown above. Antennae like those in male. Dark black band behind compound eye bordered with narrow cream stripe ventrally (Fig. 62). Upper margin of dark brown side stripe with distinct up-curved zone at front of pronotal prozona and above side of thoracic tergite III and abdominal tergite I. Black zone extends from abdominal tergite I along side of tergites to back of segment 4. Ovipositor valvulae greenish. Fore and mid-legs green. Hind femora and tibiae as in male, but femora light brown dorsally. Large insects for the group (see measurements).

MEASUREMENTS

	Males	Females
Head width	(5) 4.1–4.4, 4.28	(3) 5.1, 5.1, 4.4*
Inter-ocular distance	(5) 0.29–0.32, 0.31	(3) 0.79, 0.84, 0.69*
Posterior femur length	(5) 9.0–9.8, 9.28	(3) 11.1, 11.7, 9.4*
Posterior femur depth	(5) 2.6–2.9, 2.74	(3) 3.5, 3.4, 2.8*
Total length	(5) 16.0–18.7, 17.57	(3) 21.8, 21.5, 18.2*

* Specimen from slightly higher elevation at Soni.

MATERIAL EXAMINED

Paratypes. **Tanzania**: 3 ♂, 2 ♀, 1 nymph, same data as holotype (1 ♂, 1 ♀, COPR, London; rest BMNH); 1 ♂, data as holotype but 10.vi.1967; 1 ♀, Soni, 17.xi.1950 (*J. Phipps*) (BMNH).

USAMBILLA Sjöstedt

Usambilla Sjöstedt, 1909: 191. Type-species: *Usambilla olivacea* Sjöstedt, by original designation.

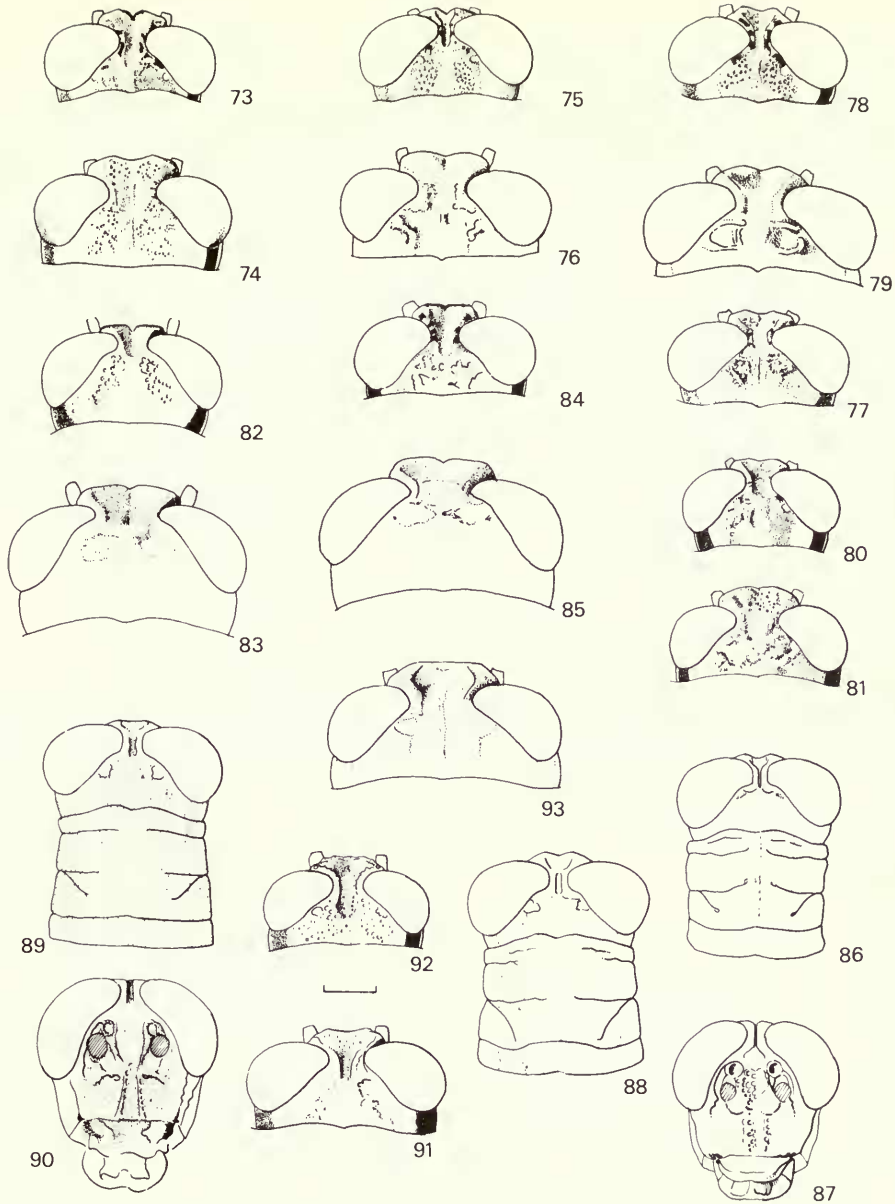
Adolfia Rehn, 1914: 147. Type-species: *Adolfia insolita* Rehn, 1914: 148, by original designation. [Homonym of *Adolfia* Guerich, 1909 (Brachiopoda).]

Rehnula Uvarov, 1939: 457. [Replacement name for *Adolfia* Rehn.] [Synonymized by Dirsh, 1956: 152.]

DIFFERENTIAL DIAGNOSIS. *Male.* Vertex with narrow (Fig. 86) to wide (Fig. 92) inter-ocular sulculus. Frons depressed (Figs 90, 91) with frontal ridge almost flat, hardly elevated. Dorsal pronotal carinula moderately developed to weak or absent. Supra-anal plate, but not ninth abdominal tergite, armed with marginal callosities as well as elevated black nodules on disc (Figs 94–101). Epiphallus simple, lacking true ancorae but with hook-like ventro-lateral lophus (Figs 144, 145, 150, 131, 134, 137, 140) terminating in one, two or four hooks. Penis valves with lateral barbs situated short of apex (Fig. 133).

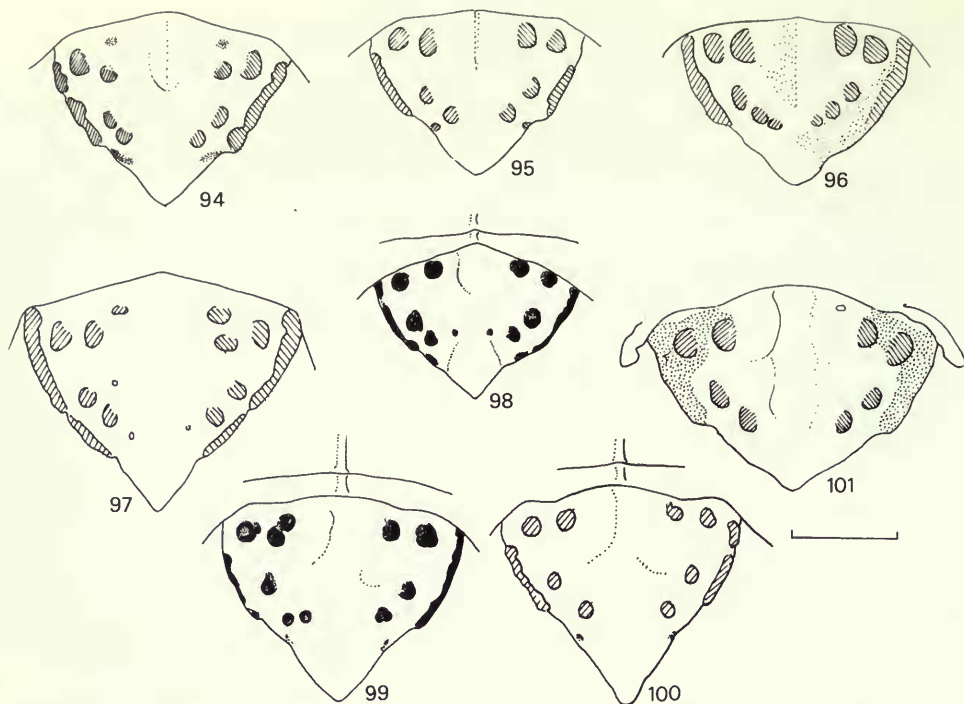
Female. Vertex proportionately wider than male, but with no special generic facies. Ventral ovipositor valves unspecialised (Figs 148, 149), not shovel-shaped as in *Chromousambilla* (Fig. 24).

DISCUSSION. The genus is known from predominantly upland areas of eastern Zaire, Ruanda, the forests of Uganda, south-western, central and northern Tanzania and the southern half of Kenya. The species occupy a wide range of ecological niches. Thus *U. haematogramma* lives in the upper Ufipa plateau forest margins, but *U. insolita* and *U. sagonai* in clearings in the wettest tropical forests of Ruanda, Zaire and Uganda. *U. turgidicrus* lives in upland scrub and woodland in



Figs 73–93 Dorsal or frontal aspect of head of *Usambilla* species. 73, male *U. turgidicus turgidicus*. 74, female, same. 75, male *U. oraria*. 76, female, same. 77, male *U. affinis affinis*, Morogoro. 78, male *U. affinis kikomboensis*, Ilonga. 79, female, same. 80, male *U. emaliensis*. 81, female, same. 82, male *U. chlorophrygana*. 83, female, same. 84, male *U. leptophrygana*. 85, female, same. 86, male *U. insolita* paratype, Kwidschiwi I. 87, same, frontal aspect. 88, male *U. sagonai sagonai*, Rwanda. 89, male *U. sagonai fractolineata*. 90, same, frontal aspect. 91, female, same. 92, male *U. haematogramma*. 93, female, same. Scale line under Fig. 92 represents 1.0 mm and applies throughout.

Kenya and northern Tanzania (*Combretum*, *Commiphora* and *Acacia* or *Juniperus* associations), while *U. leptophrygana* and *U. chlorophrygana* occupy drier warmer woodland at lower altitudes. The ecological diversity is matched by subspecific variation in several species, suggesting active speciation in progress.



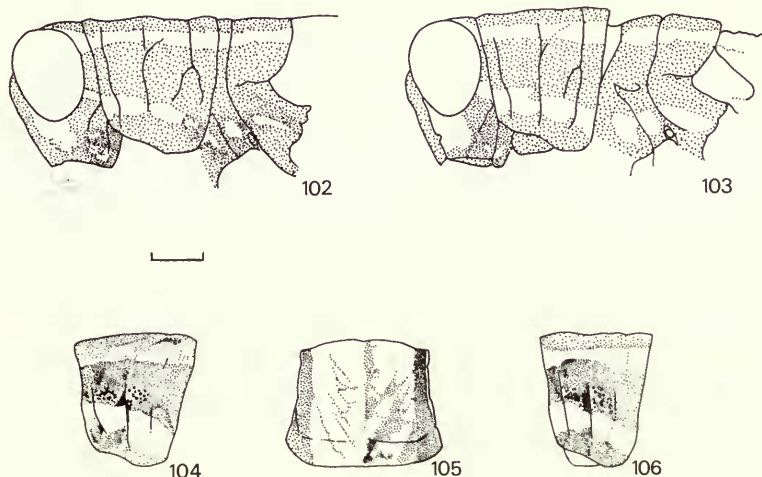
Figs 94–101 Male supra-anal plate of *Usambilla* species. 94, *U. turgidicrus*. 95, *U. oraria*. 96, *U. affinis*. 97, *U. leptophrygana*. 98, *U. insolita*. 99, *U. sagonai sagonai*. 100, *U. sagonai fractolineata*. 101, *U. haematogramma*. Scale line under Fig. 101 represents 0.5 mm and applies throughout.

Key to species and subspecies

Males

- 1 Ocular interspace dorsally more than 2.5 times width of first antennal segment (Fig. 92). Lateral black side stripe narrowly edged above with red pigment (as in Fig. 129, ♀). Supra-anal plate (Fig. 101) with broad black area confluent with both basal tubercles on each side. Hind femora light olive green, knee light orange-brown *U. haematogramma* sp. n. (p. 36)
- Ocular interspace narrower, almost twice width of basal antennal segment. Never with red stripe delineating upper edge of lateral black stripe. Supra-anal plate with marginal rugosity, but black pigment never confluent with basal tubercles 2
- 2 Interocular distance dorsally equal to width of basal antennal segment (Figs 75, 86, 87). Supra-anal plate with no more than a pair of basal tubercles on each side (Figs 95, 98) 3
- Interocular distance at least 1.5 times width of basal antennal segment. Supra-anal plate with two pairs of basal tubercles (Figs 96, 99, 100, 152) or up to three basal tubercles on each side (Figs 94, 97, 99) 4
- 3 Hind femur (Fig. 116) more than 3 times longer than deep. (Rwanda and Zaire (?)) *U. insolita* (Rehn) (p. 34)
- Hind femur (Fig. 108) very stocky and thickened from side to side, length to depth ratio about 2.6. Subgenital plate very short (Fig. 95) and folding under parameres which are received into impressions on its upper surface. Subgenital plate protrudes beyond supra-anal plate by about length of that plate as seen from above (in *U. insolita* projecting by roughly twice length of supra-anal plate). (Coastal Kenya and NE. Tanzania) *U. oraria* sp. n. (p. 32)
- 4 Dorso-lateral and light lateral body stripes (Figs 102, 103) bright yellow in life. Hind tibiae blue. Fore and mid-femora conspicuously hairy above and below. Frons declivate, hardly protruding as seen from above (Figs 88, 89). Median pronotal carinae absent or feeble 5
- Dorso-lateral light body stripes; if present, dull grey, light brown but never bright yellow. Hind tibiae yellowish or greenish, with or without black pigment distally and ventrad. Frons declivate or decidedly protruding (Figs 73, 82). Fore and mid femora almost without hairs above. Median pronotal carina weakly to strongly developed (Fig. 105) 6

- 5 Yellow genal stripe continuous to back of occiput *U. sagonai sagonai* (Ramme) (p. 35)
- Yellow genal stripe interrupted between back of gena and occiput. (Figs 102, 103) *U. sagonai fractolineata* subsp. n. (p. 36)
- 6 Hind femora bearing conspicuous black markings (Fig. 115) and of a uniform light brown colour. Frons protruding (Fig. 84) and incised as seen from above. Fastigium of vertex concave anteriorly. Posterior tibiae sooty below and towards tip *U. leptophrygana* sp. n. (p. 34)
- Hind femora immaculate or with light markings dorsally at base (Fig. 107), or with a light pregenicular spot (Figs 109, 110). Frons declivate, protruding or decumbent. Fastigium of vertex deeply to shallowly concave anteriorly. 7
- 7 Lateral dark brown side stripe intense, angularly bent in outline dorso-anteriorly on pronotum (Fig. 106). Frons in profile and from above (Fig. 73) seen to be very produced at its upper end, forming two tubercles which form margins of deeply incised fastigium of vertex. Hind femora light brown with or without darker mottling. Median dorsal pronotal carinula and its continuation on tergites of abdomen weak to strong. Posterior tibiae sooty below and towards tip 8
- Lateral dark brown side stripe with smooth upper outline (Fig. 104). Frons in profile and from above protruding (Figs 77, 78, 82) to strongly declivate and downwardly sloped (Fig. 90). Hind femora tending to be green with knee orange-brown. Median dorsal carinula of pronotum weak (Figs 104, 105) to absent. Posterior tibiae unicolorous without black colour below 9
- 8 Hind femur very short and plump, length to depth about 3.0. (Vicinity of W. Usambara Mts) *U. turgidicus olivacea* Sjöstedt (p. 27)
- Hind femur less robust, length to depth ratio 3.3–3.4 *U. turgidicus turgidicus* (Karsch) (p. 25)
- 9 Larger insects, body length just over 15 mm. Length to depth of hind femur (Fig. 113) about 3.40–3.50 *U. chlorophrygana* sp. n. (p. 32)
- Smaller insects, body length just under 13 mm at most. Frons only weakly incised as seen from above (Figs 77, 78, 80). Femur length to depth ratio 3.32–3.66 10
- 10 Pronotum lacking median dorsal carinula except for metazonal tubercle 11
- Pronotum with clear median dorsal carinula (Fig. 105) in prozona and metazona. Hind femur slender (Fig. 112) with outer area green and rest tending to be brownish *U. emaliensis* sp. n. (p. 30)
- 11 Length to depth ratio of hind femur 3.3–3.4 *U. affinis affinis* Kevan & Knipper (p. 29)
- Length to depth ratio of hind femur about 3.6 *U. affinis kikomboensis* subsp. n. (p. 30)



Figs 102–106 Lateral or dorsal aspect head and/or pronotum of male *Usambilla* species. 102, *U. sagonai fractolineata*, Uganda, Mpanga (darker form). 103, same, Uganda, Mpanga (lighter form). 104, *U. emaliensis*. 105, same, from above. 106, *U. turgidicus turgidicus*. Scale line under Fig. 102 represents 1 mm and applies throughout.

Females

Females of *U. insolita* were not available for study; females of *U. affinis affinis* and *U. affinis kikomboensis* cannot be differentiated.

- | | | |
|---|--|--|
| 1 | Lateral black side stripe bordered above with crimson (Fig. 129). Fastigium of vertex very broad and lightly indented | <i>U. haematogramma</i> sp. n. (p. 36) |
| — | Lateral black side stripe, if present, never bordered above with red. Fastigium of vertex much narrower and more deeply incised | 2 |
| 2 | Hind tibiae blue. (Colour very variable. No difference between races.) | <i>U. sagonai</i> (Ramme) (p. 35) |
| — | Hind tibiae light brown, greenish brown, green or ochraceous | 3 |
| 3 | Interocular space dorsally 4 times width of basal antennal segment (Figs 76, 79, 81) | 4 |
| — | Interocular space dorsally 5 times width of basal antennal segment (Figs 74, 83, 85) | 6 |
| 4 | Pronotal median carina dorsally very pronounced (Fig. 125), hind femora very slender, length to depth ratio about 3.6 | <i>U. emaliensis</i> sp. n. (p. 30) |
| — | Median pronotal carina weak. Hind femur much more robust, length to depth ratio 3.0-3.2 | 5 |
| 5 | Profile of pronotal carina and thorax curved (Fig. 121). Dark lateral side stripe with upper edge markedly bent in prozona. Hind femur length to depth ratio around 3.0. Hind tibiae completely black ventrally in mature (?) specimens, yellowish-ochraceous dorsally | <i>U. oraria</i> sp. n. (p. 32) |
| — | Profile of pronotal carina flatter (Figs. 122, 123, 124). Lateral side stripe, if developed, with anterior upper border almost straight. Length to depth ratio of hind femur about 3.2. Hind tibiae uniformly yellowish | <i>U. affinis</i> Kevan & Knipper (p. 28) |
| 6 | Frons markedly produced in profile (Figs 119, 120). Pronotal carina moderately strong, whole disc tectiform | 7 |
| — | Frons less strongly produced in profile (Figs 126, 127). Median pronotal carina almost undeveloped, disc depressed | 8 |
| 7 | Hind femur more robust, length to depth ratio roughly 3.0 or less. Pronotum wrinkled and punctate above (Fig. 120) | <i>U. turgidicus olivacea</i> Sjöstedt (p. 27) |
| — | Hind femur more slender, length to depth ratio about 3.2. Pronotum not wrinkled, finely punctate (Fig. 119). | <i>U. turgidicus turgidicus</i> Karsch (p. 25) |
| 8 | Large insects, body length more than 20 mm. Probably lack lateral body stripe. Posterior femora dull olivaceous with knee light brown (Figs 83, 126) | <i>U. chlorophrygana</i> sp. n. (p. 33) |
| — | Smaller rugose insects, body length about 18 mm. Lateral side stripes weak except on first abdominal tergite and latero-anterior part of pronotum (Fig. 127). Posterior femora brown with darker mottling | <i>U. leptophrygana</i> sp. n. (p. 34) |

***Usambilla turgidicus* (Karsch)**

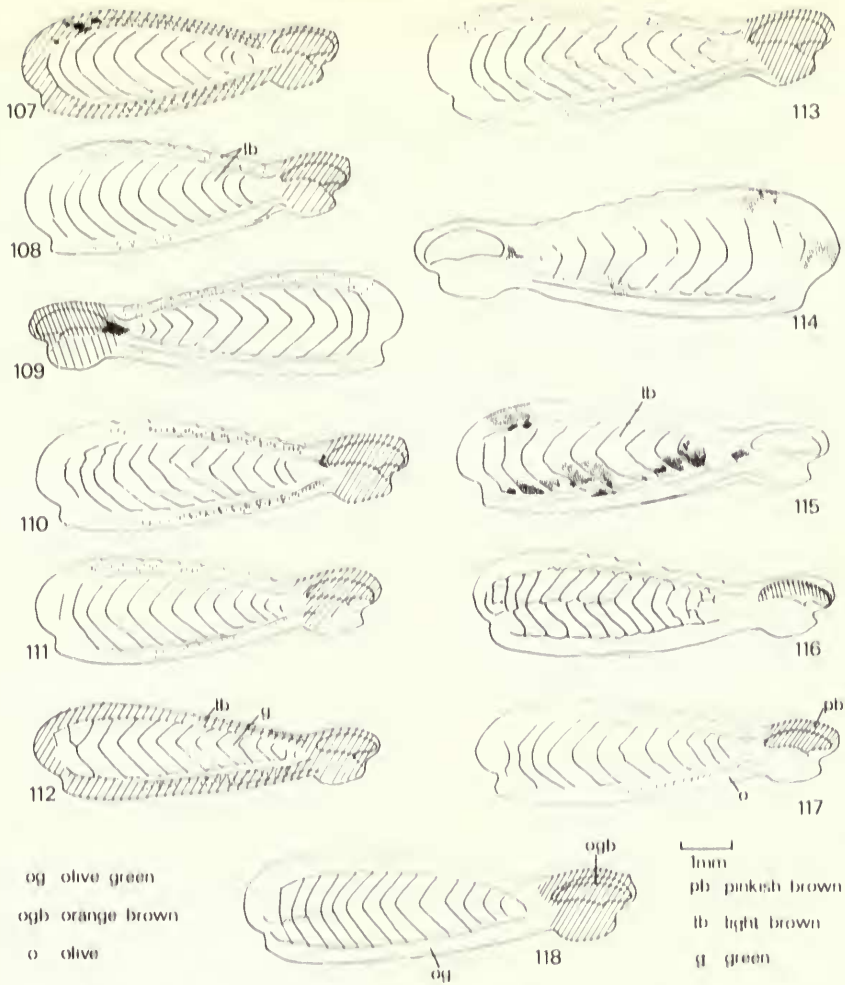
(Figs 73, 74, 94, 106, 107, 119, 120, 131-133)

Lentula turgidicus Karsch, 1896: 280.

DIFFERENTIAL DIAGNOSIS. *Male.* Head with deeply grooved fastigium of vertex forming a knotch at its point of contact with upper end of frons (Fig. 73). Head transversely angulate at level of back end of median fastigial sulculus, occiput being wrinkled and pitted. Sides of vertex in front of eyes and area of ocellus on each side protruding. Pronotum lightly tectiform on disc with low median carinula. Upper edge of dark lateral pronotal side stripe showing sharp angular change of direction between sulculi one and two. Dorsolateral light brown to creamy stripes extending to tergite 8. Sides of tergites 1-6 of abdomen shiny black. Supra-anal plate (Fig. 94) with four pairs of strong black nodules on disc, two weaker ones at base. Epiphallal lophus with four teeth (Fig. 131). Penis valves (Figs 132, 133) directed forwards at about 45° to long axis of body.

Fore and midlegs light olive brown. Hind femora speckled blackish dorso-anteriorly (Fig. 107), with or without black comma in front of knee lunule. Hind tibiae light olive brown, spines black-tipped. Hind tibiae sooty black or darker brown ventrally in apical two-thirds or half. Lateral dark stripe on pronotal side lobe extended boldly along side of meso- and metathorax.

Female. Stocky (Fig. 119) with vertex and frontal ridge which meet in a raised protruding shelf in front of compound eyes. Pronotum lightly tectiform above, with a lateral dark side stripe with an angular upper profile in front of second sulculus and fading abruptly behind (Fig. 119). Lateral band on thoracic segments obscure; dark band intensified on abdominal segments 1-6, black and shiny on segments 2-6. Black area on side of abdominal segment 1 variable in size.



Figs 107–118 Posterior femora of male *Usambilla* species. 107, *U. turgidicus olivacea*, L/D 3.00, Mombasa. 108, *U. oraria*, L/D 2.97, Mombasa. 109, *U. affinis kikomboensis*, L/D 3.6, Kikombo. 110, same, L/D 3.36, Ilonga. 111, *U. affinis affinis*, L/D 3.28, Uluguru Mts. 112, *U. emaliensis*, L/D 3.66, Emali range. 113, *U. chlorophrygana*, L/D 3.46, Kikombo, Mpwapwa. 114, *U. chlorophrygana*, dark form, L/D 3.26, 10 mls N. of Ussure. 115, *U. leptophrygana*, L/D 3.32. 116, *U. insolita* L/D 3.45. 117, *U. sagonai fractolineata*, L/D 3.47. 118, *U. haematogramma*, L/D 3.55, Ufipa. Scale line under Fig. 112 represents 1 mm and applies throughout.

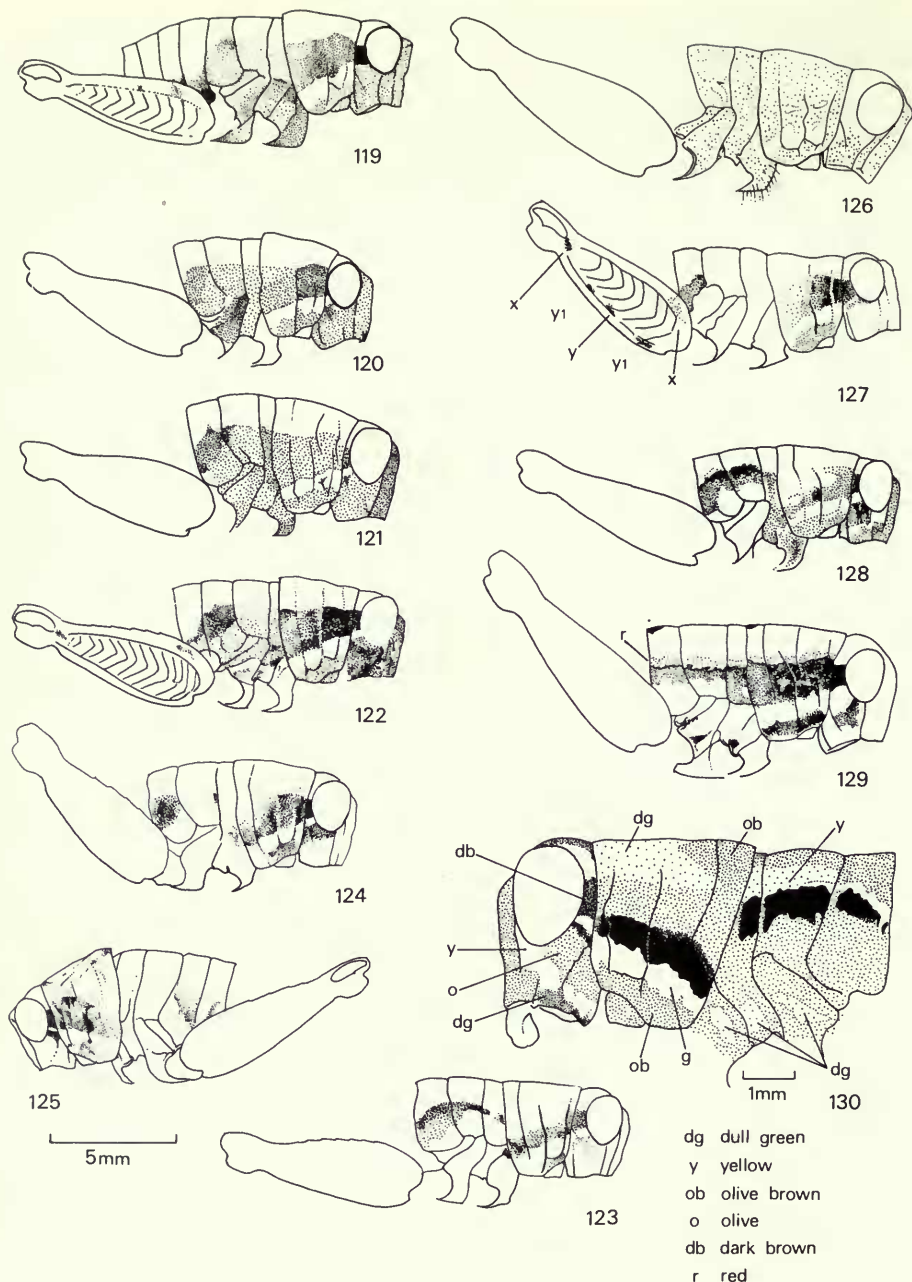
Ventral valves of ovipositor simple, pointed. General colour grey to rufesce dark brown with black to blackish pronotal side stripe, bordered below by short curved grey stripe, separated from ventral margin of side lobe by a band of dark brown or grey of roughly same depth.

***Usambilla turgidicus turgidicus* (Karsch)**

(Figs 73, 74, 94, 106, 119, 131–133)

Lentula turgidicus Karsch, 1896: 280. Holotype ♂, KENYA: Kitui (MNHU, Berlin) [examined].

DIFFERENTIAL DIAGNOSIS. Male hind femora less robust than in subsp. *olivacea*, length to depth ratio 3.3–3.4. Female similarly more elongate with slimmer femora, above ratio 3.2. Pronotum not wrinkled, finely punctate (Fig. 119).



Figs 119–130 Lateral aspect of head, thorax and posterior femur of female *Usambilla* species. 119, *U. t. turgidicus* (S2794). 120, *U. t. olivacea*, W. Usambara. 121, *U. oraria*, Kenya, Rabai. 122, *U. affinis kikomboensis*, Ilonga. 123, same, lighter form. 124, same, intermediate form. 125, *U. emaliensis*. 126, *U. chlorophrygana*. 127, *U. leptophrygana*. 128, *U. sagonai fractolineata*. 129, *U. haematogramma*. 130, *U. sagonai sagonai*. Scale line under Fig. 125 represents 5 mm and applies to Figs 119–129. Scale line under Fig. 130 represents 1 mm and applies to that figure.

MEASUREMENTS

	Males		Females	
Head width	(17)	2.9–3.5, 3.37	(29)	3.7–4.2, 4.01
Posterior femur length	(17)	6.3–7.9, 7.23	(28)	7.4–9.4, 8.50
Posterior femur depth	(17)	1.8–2.4, 2.20	(28)	2.5–3.0, 2.68
Body length	(16)	12.3–15.0, 13.75	(27)	14.8–18.1, 16.69

MATERIAL EXAMINED

Kenya: 1 ♀, Mtunguni hill nr Tulia, Kitui distr., 150 m, 01°12'S, 38°02'E, hillside with *Combretum*, *Commiphora* and *Acacia* woodland, 28.iv.1975 (*Robertson & Robertson*) (COPR, London); 1 ♂, 1 ♀, nr Kibwezi, 5 km SE. of Mbuinzau, 02°24'S, 37°55'E, 940 m, lichens and spiney vegetation on recent lava, 5.v.1975 (*Robertson & Robertson*); 1 ♂, 1 ♀, 5 km N. of Mwatate, Wundangi rd, 03°27'S, 38°22'E, 910 m, fairly dense scrub woodland, 6.v.1975 (*Robertson & Robertson*) (COPR, London); 15 ♂, 25 ♀, Mtunguni hill, 01°12'S, 38°02'E to 01°13'S, 38°02'E, nr Tulia, Kitui distr., 910 m, heavy juniper woodland and plantations, 10.v.1975 (*Robertson & Robertson*) (5 ♂, 4 ♀, BMNH; rest COPR, London); 1 ♀, Athi R. crossing, 25.6 km NNE. of Kibwezi, 430 m, 22.vii.1934 (*Vanderbilt Exped. Kenya Africa, Rehn*) (BMNH); 1 ♂, 1 ♀, S. Pare Mts, hillside above Gonja, c. 1000 m, [12–16] vi.1974 (*Hollis*) (BMNH).

DISCUSSION. More material of the nominate subspecies is required before the true junction between the subspecies can be determined.

Usambilla turgidicrus olivacea (Sjöstedt) stat. n.

(Figs 107, 120)

Usambilla olivacea Sjöstedt, 1909: 186, 192. Holotype ♀, TANZANIA: Usambara, Mombo, vi. (*Sjöstedt*) (NR, Stockholm) [examined].

DIFFERENTIAL DIAGNOSIS. Male with hind femur length to depth ratio 3. Female with hind femur length to depth ratio 3 or less. Pronotum wrinkled and punctate above (Fig. 120). Subspecies markedly more stocky than nominate race. Male genitalia identical.

MEASUREMENTS

	Male		Females	
			Holotype	
Head width	3.19	4.3	(4.8)	4.20
Posterior femur length	6.66	3.7	(4.0)	8.68
Posterior femur depth	2.25	9.3	(10.0)	2.90
Body length	12.31	14.7	(17.0)	16.15

The female holotype measurements in parentheses are those published by Sjöstedt.

MATERIAL EXAMINED

Tanzania: 1 ♂, 1 ♀, Mombo, 9.vii.1967 (*Jago*) (BMNH).

DISCUSSION. The dimensions of the holotype published by Sjöstedt do not tally with the accurate modern ones. It is possible that his optical technique gave consistent overestimates. The holotype is thus a smaller insect than published measurements would indicate. *U. turgidicrus olivacea* represents the southernmost outliers of the nominate race.

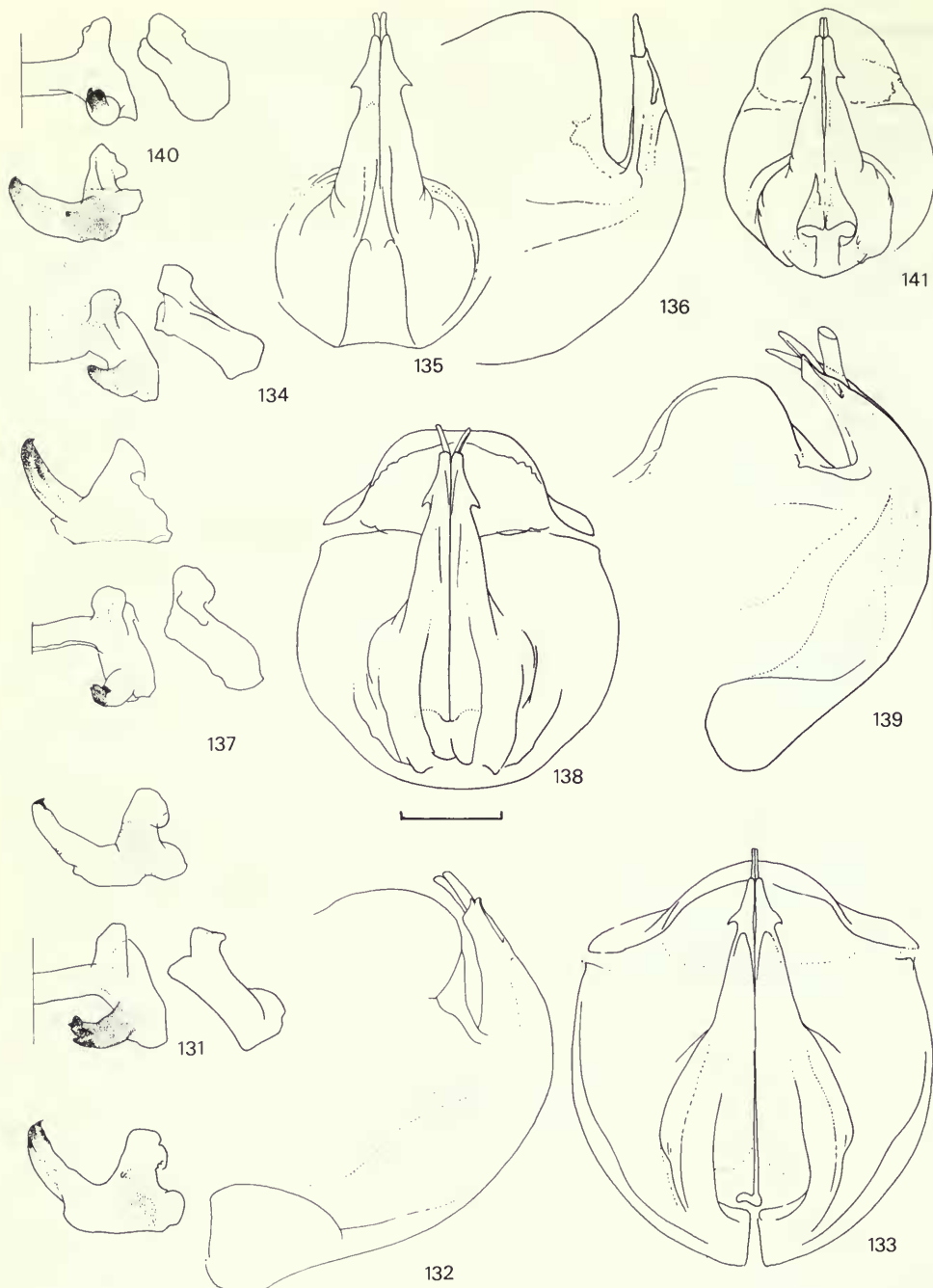
In life the specimens from Mombo had a light silvery side stripe, the female being light grey in colour. Both have darkened considerably and are now brown.

Usambilla affinis Kevan & Knipper

(Figs 77–79, 96, 109–111, 122–124, 134–136)

Usambilla affinis Kevan & Knipper, 1961: 372.

DIFFERENTIAL DIAGNOSIS. *Male.* Fastigium of vertex (Figs 77, 78) with margins diverging forward, lightly emarginate in front and with deeply to lightly impressed interocular groove (lightest in subsp. *affinis* to deepest in subsp. *kikomboensis*). Front end of fastigium pitted and sculptured. Frontal ridge and whole of



Figs 131–141 Phallic complex of male *Usambilla* species. 131, epiphallus of *U. turgidicrus turgidicrus*—upper right half and lateral plate, lower from right side. 132, same, aedeagus, left lateral aspect. 133, same, posterior apical aspect. 134, epiphallus of *U. affinis affinis* (Uluguru Mts)—upper right half and lateral plate, lower from right side. 135, same, aedeagus, posterior apical aspect. 136, same, left lateral aspect. 137, epiphallus of *U. emaliensis* (Emali range)—upper right half and lateral plate, lower from right side. 138, same, aedeagus, posterior apical aspect. 139, same, left lateral aspect with spermatophore in situ. 140, epiphallus of *U. oraria*—upper right half and lateral plate, lower from right side. 141, same, aedeagus, posterior apical aspect. Scale line under Fig. 138 represents 0.5 mm and applies throughout.

frons evenly punctate and more protruding than *U. oraria*, but less so than in *U. turgidicus*. Pronotum hardly to weakly tectiform above with pronotal carina absent to moderate. Abdominal tergites lightly carinulate dorsally. Supra-anal plate with marginal callosities (Fig. 96) and four to five pairs of tubercles, two or three pairs being distal. Penis sheath and valves apically vertical (Fig. 136). Epiphallus with lophal process ending in a simple hook (Fig. 134). Ancorae absent.

Female. Fastigium of vertex sloping forwards in a smooth convexity to meet upper part of frontal ridge (Figs 79, 122, 123, 124). Pronotum and abdominal tergites quite sharply carinulate dorsally. Tips of ventral ovipositor valves triangular, pointed.

Coloration of male and female more divergent in the closely allied *U. emaliensis* than in *U. affinis*. Male in general with yellowish to creamy markings at border of compound eye dorsally, on front of fastigium of vertex, below compound eye straddling fronto-genal suture. Lateral dark brown stripe variable in intensity, usually extending weakly onto side of abdomen. Light side stripes pale yellowish to creamy white, lowermost band separated from ventral margin of pronotal side lobe by darker pigment (Fig. 104) and extending across epimera and episterna of thoracic segments 2 and 3 as a whitish band. Fore and mid legs light olivaceous green. Hind femora green with ginger-brown knees (Figs 109–111). Very faint brown comma-shaped marking in front of genicular lunule. Female light brown above with darker median dorsal area, side stripe dark brown (but variable, see Figs 122, 123, 124). Hind femora light olivaceous green with dorso-basal brownish spot and weak sigmoid mark in front of outer and inner knee lunule. Knees light ginger-brown. Hind tibiae, as in male, light yellow-green with spines black-tipped.

Note. In both male and female upper profile of lateral dark pronotal side stripe forms a smooth convex curve (Fig. 124) unlike that in *U. turgidicus* (Fig. 119).

DISCUSSION. This species forms a north-south cline in which the southernmost populations have short stumpy hind femora (subsp. *affinis*), the northernmost having slender hind femora. Separating the components of the cline is difficult, though zoogeographically the nominate subspecies probably occurs in the Uluguru Mts and southwards, while subsp. *kikomboensis* probably occurs in scattered pockets from Ilonga through Kikombo to the west Usambaras.

Usambilla affinis affinis Kevan & Knipper

(Figs 77, 96, 111, 134–136)

Usambilla affinis Kevan & Knipper, 1961: 372, fig. 3, pl. 3, ff. 3–7. Holotype ♂, TANZANIA: Morogoro, Morningside, 31.vii.1954 (*Phipps*) (BMNH) [examined].

DIFFERENTIAL DIAGNOSIS. *Male.* Main difference in proportions of hind femur, its length to depth ratio at 3.3–3.4 being less than in subsp. *kikomboensis*. Males tend to have dark dorso-lateral body lines brown. Penis sheath and aedeagus erect, set at right-angles to long axis of body (Figs 135, 136).

Females cannot be differentiated from other subspecies.

MEASUREMENTS

	Males	Females
Head width	(3) 3.45, 3.38, 3.74	(3) 4.18, 4.08, 4.48
Posterior femur length	(3) 7.24, 6.99, 7.48	(3) 9.14, 8.30, 9.10
Posterior femur depth	(3) 2.21, 2.89, 3.12	(3) 3.00, 2.65, 2.95
Body length	(3) 12.3, 12.93, 14.79	(3) 16.5, 17.22, 17.24

MATERIAL EXAMINED

Tanzania: 1 ♀, Morogoro, 1954 (*Phipps*) (paratype of *Usambilla affinis* Kevan & Knipper) (BMNH); 1 ♂, Morogoro, 1320 m, 24.xi.1939 (*E. Burt*) (BMNH); 1 ♂, 1 ♀, Morogoro, xi.1939 (*E. Burt*) (BMNH); 2 ♂, Morogoro, 8.iii.1955 (*Phipps*) (BMNH); 1 ♀, Morogoro, 4.xii.1939 (*E. Burt*); 1 ♂, Uluguru Mts, W. side, 1.6 km S. of Mgeta, 25.x.1964 (*Jago*) (COPR, London); 1 nymph, Uluguru Mts, W. side, Bunduki For. Res., fishing camp, [20–23].x.1964 (*Jago*) (COPR, London).

DISCUSSION. The habitats of this subspecies in the Uluguru Mts are characterised by abundant tree ferns and tree lilies, relatively high rainfall and abundant sunshine.

Usambilla affinis kikomboensis subsp. n.

(Figs 78, 79, 109, 110, 122–124)

Holotype ♂, **Tanzania**: Ilonga, 16.vi.1967 (Jago) (BMNH).

DIFFERENTIAL DIAGNOSIS. *Male.* Hind femora length to depth ratio about 3.6. More brightly marked than nominate subspecies, with dark brown stripes in that subspecies replaced by black and light body stripes golden yellow. Penis sheath and aedeagal valves directed vertically (as in Fig. 136).

Female. Pigmentation variable (Figs 122–124). Frons sloping upwards with a gentle angular change into fastigium of vertex. Face dark brown with black and cream spots or patches. Dark side stripe, when fully developed (Fig. 122), with a gently sinuous upper margin (may be reduced to a dark oblique bar, Fig. 123).

MEASUREMENTS

	Males	Females
Head width	(14) 3.5–3.7, 3.63	(5) 4.1–4.5, 4.25
Posterior femur length	(14) 7.4–8.0, 7.85	(5) 8.9–9.3, 9.13
Posterior femur depth	(14) 2.3–2.9, 2.41	(5) 2.6–3.0, 2.79
Body length	(14) 13.2–15.0, 14.18	(5) 16.9–17.3, 17.13

MATERIAL EXAMINED

Paratypes. **Tanzania**: 12 ♂, 5 ♀, same data as holotype (5 ♂, 3 ♀, COPR, London, rest BMNH); 1 ♀, Mpwapwa, Mt Wilkins, 1460 m, 10.iv.1938 (*E. Burt*) (BMNH); 1 ♂, Kikombo, Mpwapwa, 18.ix.1947 (BMNH).

Usambilla emaliensis sp. n.

(Figs 80, 81, 105, 106, 112, 125, 137–139)

Holotype ♂, **Kenya**: Emali range, Sultan Hamud, 1210–1790 m, iii.1940 (BMNH).

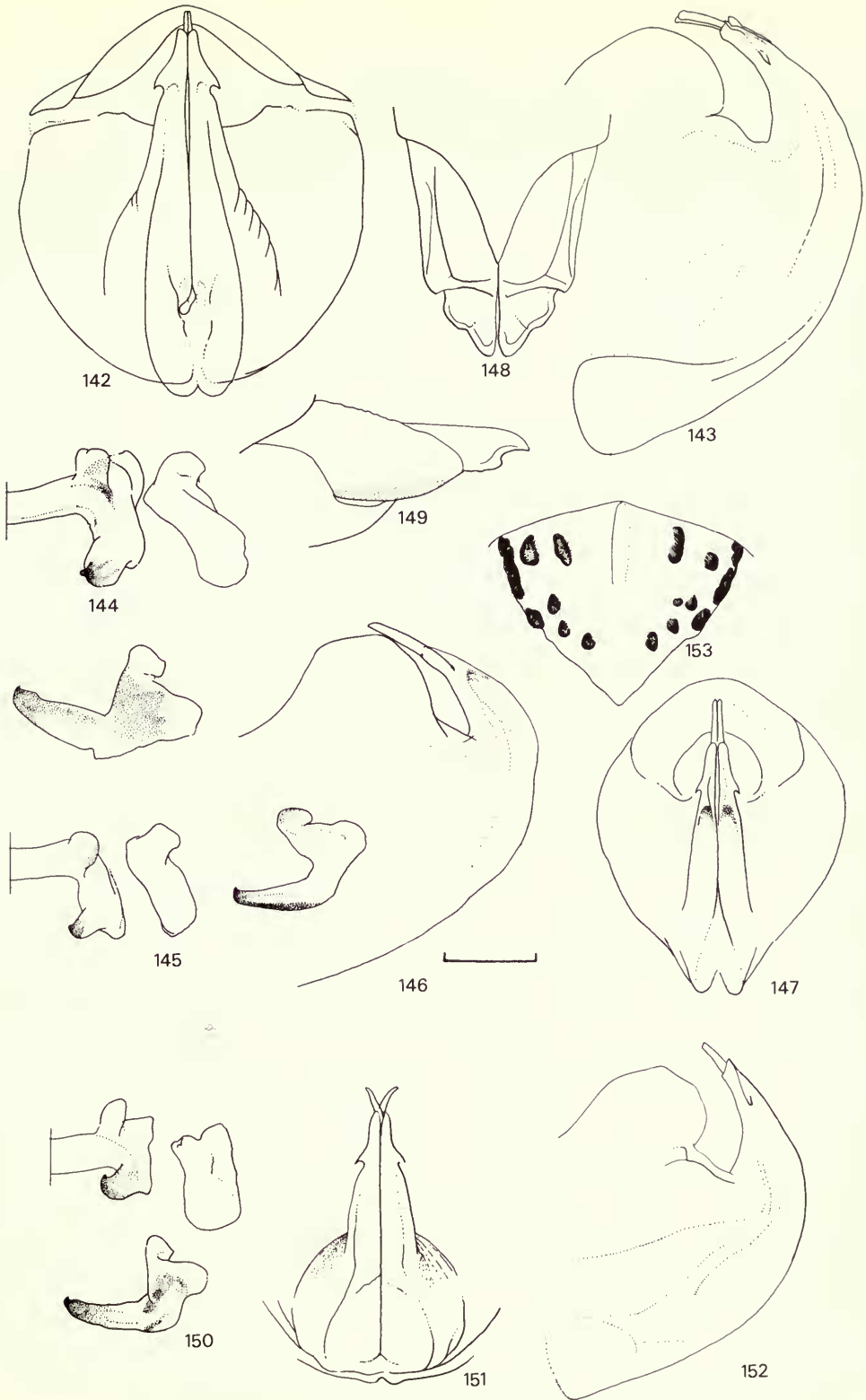
DIFFERENTIAL DIAGNOSIS. *Male.* Penis sheath bent in a smooth arc capitad as in *U. turgidicrus* (cf. Figs 132, 139). Epiphallal lophus bifurcate at tip (up to four teeth in *U. turgidicrus*) (Fig. 137). Form of frons and vertex much as in *U. turgidicrus* but otherwise differing as follows: upper margins of dark lateral body stripe smooth in profile (Fig. 104), not angulate as in Fig. 106; pronotal median carina forming a higher crest (Fig. 105) than in *U. turgidicrus*, in this respect near to *U. affinis*; hind femur (Fig. 112) distinctly green in outer and lower outer areas (always light brown with darker mottling in nominate subspecies of *U. turgidicrus*); length to depth ratio about 3.66 (only about 3.30 in nominate subspecies of *U. affinis*); frontal ridge (Figs 80, 81) weakly incised, unlike *U. turgidicrus* but like *U. affinis*.

Female. With much more pronounced pronotal crest than *U. turgidicrus* (Fig. 125). Hind femur much more long and slender (Fig. 125) (length to depth ratio 3.6; this ratio in subspecies of *U. turgidicrus* 3.2 or less).

MEASUREMENTS

	Male holotype	Female paratype
Head width	3.20	3.75
Posterior femur length	7.36	9.05
Posterior femur depth	2.00	2.56
Body length	13.46	15.78

Figs 142–153 Phallic complex of male *Usambilla* species. 142, *U. chlorophrygana* aedeagus, posterior apical aspect. 143, same, left lateral aspect. 144, same, epiphallus—upper right half and lateral plate, lower from right side. 145, epiphallus of *U. sagonai sagonai* (Kibale forest)—left right half and lateral plate, right—right lateral aspect. 146, same, aedeagus, left lateral aspect. 147, same, posterior apical aspect. 148, 149, *U. sagonai sagonai* female, ventral ovipositor valves from below and left side respectively. 150–152, *U. insolita* male (150) epiphallus—upper right half and lateral plate, lower right lateral aspect; (151) aedeagus, posterior apical aspect; (152) aedeagus, left lateral aspect. 153, supra-anal plate of *U. chlorophrygana* male. Scale line under Fig. 146 represents 0.5 mm and applies throughout.



MATERIAL EXAMINED

Paratype. **Kenya**: 1 ♀, same data as holotype (in copula) (BMNH).

DISCUSSION. This species may represent an isolated offshoot of *U. affinis* with which it shares the form of the vertex and pronotum. The very slender hind femora and high pronotal crest are, however, unique.

Usambilla oraria sp. n.

(Figs 75, 76, 95, 108, 121, 140, 141)

Holotype ♂, **Kenya**: Mombasa, [3-4.]vii.1939 (*E. Burt*) (BMNH).

DIFFERENTIAL DIAGNOSIS. *Male*. Vertex very narrow between compound eyes dorsally (Fig. 75), frontal ridge depressed, hardly protruding. Dark body stripes dark reddish brown; light longitudinal stripes creamy white. Lower lateral light band extending across epimera and episterna of thoracic segments 2 and 3. Hind femora very squatt and inflated, length to depth ratio less than three (Fig. 108). Supra-anal plate (Fig. 95) very simple with four pairs of black callosities on the disc. Subgenital plate very short, folding under parameres for which there are two concave depressions in upper surface of subgenital plate itself. Cingular sheath small, rather abruptly tapered (Fig. 141) compared with *U. affinis* (Fig. 135). Epiphallus with bifurcate lophi (Fig. 140).

Female. Fastigium of vertex shallowly concave; frons hardly produced. Occiput with two large rugose ovoid depressions just behind back end of interocular groove. In lateral aspect with smooth convex dorsal profile giving a hump-backed appearance. Pronotum quite strongly tectiform. Hind femur short and stocky, length to depth ratio less than 3 (Fig. 121). Ventral ovipositor valves pointed.

General coloration light brown and dark brown pattern in both sexes. Hind femora unicolorous light brown (Fig. 108), though in darker females with dark comma anterior to knee lunules and marks on dorso-anterior part. Hind tibiae light ochrous brown, often blackish below, with black-tipped tibial spines.

MEASUREMENTS

	Male	Females
Head width	3.50 (3)	4.5-5.3, 4.79
Posterior femur length	6.95 (3)	8.4-9.0, 8.74
Posterior femur depth	2.35 (3)	2.7-3.1, 2.93
Body length	11.53 (3)	15.6-17.1, 16.54

MATERIAL EXAMINED

Paratypes. **Kenya**: 2 ♂, Mombasa, [3-4.]vii.1939 (*E. Burt*) (BMNH) [compared with holotype of *U. turgidicrus* by V. M. Dirsh]; 1 ♀, Mombasa, on *Vernonia hildebrandti*, 12.iii.1969 (BMNH); 1 ♀, Rabai, viii.1937 (*Van Someren*) (BMNH); 3 ♀, Arabuko for., 17 km W. of Malindi, 03°13'S, 39°56'E, 61 m, 11.vi.1975 (*Robertson & Robertson*) (COPR, London); 1 ♀, Arabuko-Sokoce For. Res., Jilore track, c.50 m, [2-3.]vi.1974 (*Hollis*) (BMNH). **Tanzania**: 2 ♀, Mlingano, Ngomeni, v.1952 (*Phipps*) (BMNH); 1 ♀, W. Usambara, Sumamagamba F. Res., 12.xi.1964 (*Jago*) (BMNH).

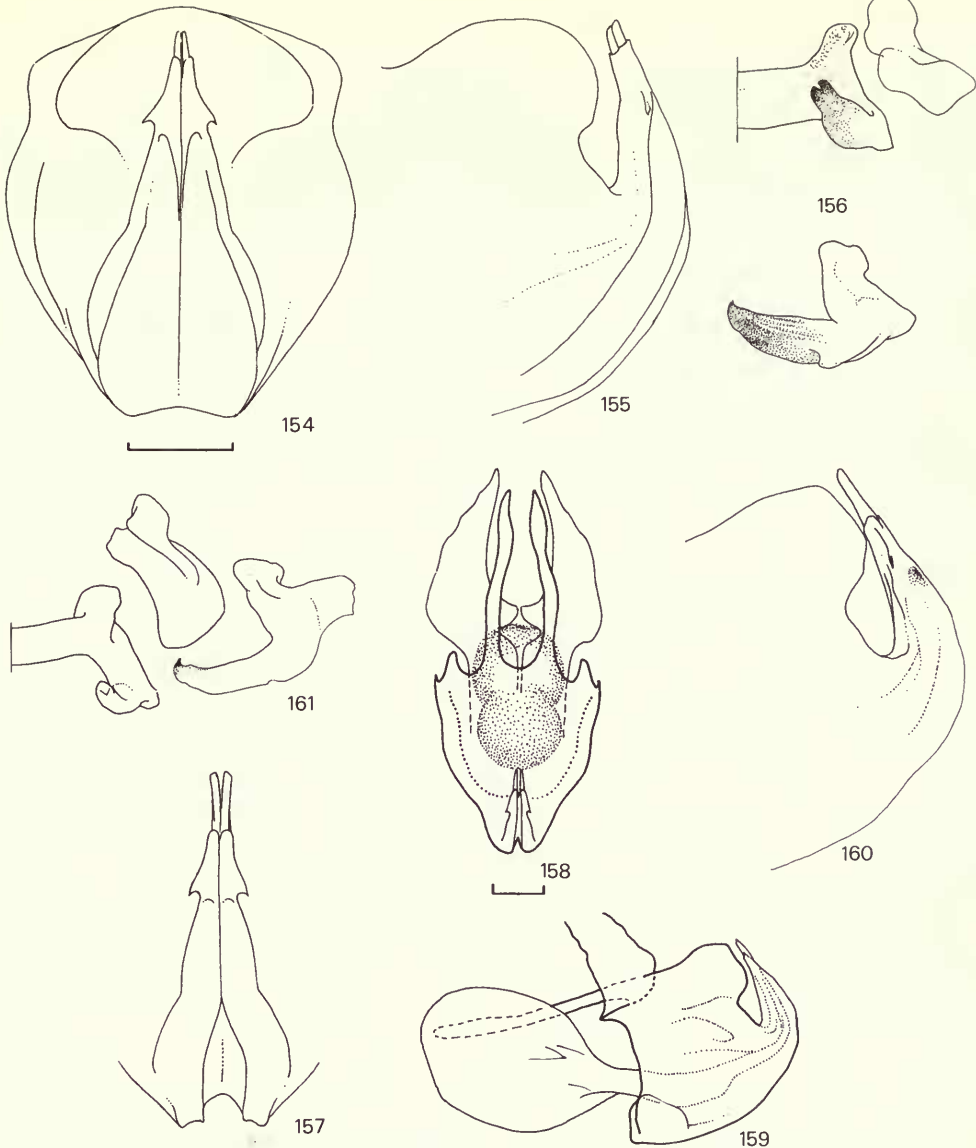
DISCUSSION. Probably one of the most truncated grasshoppers in proportion to its width known to science. It has a largely coastal forest distribution, with enclaves in piedmont forest in the west Usambara mountains. It belongs to the *affinis*-group of species.

Usambilla chlorophrygana sp. n.

(Figs 82, 83, 113, 114, 126, 142-144)

Holotype ♂, **Tanzania**: Kikombo, Mpwapwa, 16.iv.1947 (*E. Burt*) (BMNH).

DIFFERENTIAL DIAGNOSIS. *Male*. Large for the genus (see measurements). Fastigium of vertex strongly declivate, frons only protruding slightly in front of eyes. Anterior part of fastigium heavily pitted. Occiput with two oblique echelons of finely pitted cuticle terminating just behind interocular groove in two flat depressions (Fig. 82). Frons and genae wrinkled and punctate. Pronotum finely punctate with weak or obsolete dorsal carinula. Dorso-lateral and lateral light body stripes dull yellowish brown, upper band weak dorsad. Lateral creamy stripe extending across epimera and episterna of meso- and metathorax. Supra-anal plate with at least 3 pairs of distal black tubercles on disc (Fig. 153). Penis sheath strongly decurved capitad (Fig. 143) so that valves point forward. Epiphallus with bifurcate lophi simple; single hook at apex (Fig. 144).



Figs 154–161 Phallic complex of male *Usambilla* species. 154, *U. haematogramma* aedeagus, posterior apical aspect. 155, same, left lateral aspect. 156, same, epiphallus—upper right side and lateral plate, lower right lateral aspect. 157, *U. leptophrygana*, aedeagus, posterior apical aspect. 158, same, entire complex less epiphallus from above showing shape of ectophallic sheath and apodemes plus position of ejaculatory sacs (shaded). 159, same, entire complex less epiphallus, left lateral profile, showing broad flat spatulate anterior penis valves. 160, same, aedeagus left lateral view. 161, same, epiphallus—left right half and lateral plate, right lateral aspect. Scale lines represent 0.5 mm. Line under Fig. 154 applies to all except Figs 158, 159, to which scale line under Fig. 158 applies.

Female. Large (Fig. 126) with cuticle finely pitted. Female paratype badly discoloured but probably with light band of shiny cuticle across lower edge of pronotal side lobe.

Fastigium very wide, almost flat and punctate anteriorly (Fig. 83). Ovipositor valves apically pointed as in Fig. 188.

General coloration of male olivaceous brown with creamy orange dorso-lateral and lateral side stripes. Hind femora light green; knees light red-brown (Fig. 113). Hind tibiae light yellow-green to yellow, with black spines.

MEASUREMENTS

	Male holotype	Female allotype
Head width	3.71	4.88
Posterior femur length	7.88	10.92
Posterior femur depth	2.51	3.15
Body length	15.36	20.89

MATERIAL EXAMINED

Paratypes. **Tanzania**: 2 ♀, same data as holotype (BMNH); 1 ♂, data as holotype but 17.iv.1947 (*E. Burt*) (BMNH); 1 ♂, data as holotype but 18.iv.1947 (*E. Burt*) (BMNH); 1 ♂, data as holotype but 19.iv.1947 (*E. Burt*); 2 ♂, Mpwapwa, Mt Wilkins, 1213 m, 4.iv.1938 (*E. Burt*) (BMNH); 2 ♂, 1 ♀, 16.1 km N. of Ussure, Msigiri road, 12.iv.1936 (*E. Burt*) (1 ♂, 1 ♀, COPR, London; 1 ♂, BMNH).

DISCUSSION. The name of this new species is derived from the Greek 'chloros'—green and 'phryganos'—twig or stick.

Usambilla leptophrygana sp. n.

(Figs 84, 85, 97, 115, 127, 157–161)

Holotype ♂, **Tanzania**: 70.8 km N. of Dodoma, 18.vi.1967 (*N. D. Jago*) (BMNH).

DIFFERENTIAL DIAGNOSIS. *Males*. Distinctive (Fig. 127) with well-marked to faint dark brown side stripe and conspicuous black markings on posterior femora (Fig. 115). Frons weakly to strongly incised in front (Fig. 84); fastigium of vertex excavate but much more produced than the similar *U. chlorophrygana* (Fig. 82). Overall colour light brown with dark markings. Hind femora not green in our series. Supra-anal plate with three basal tubercles on each side (Fig. 97) (see *U. chlorophrygana*, Fig. 153). Epiphallic lophus with single apical hook (Fig. 161), anterior penis valves (Figs 158, 159) typical for genus and illustrated here as representative, being flattened and vertically orientated. Aedeagal valves sloping strongly capitad (Figs 157, 159, 160).

Female. Dark pronotal side band weak, fading behind pronotal metazone and only intensifying just behind tympanum. Hind femur with pre-genicular black spot and dorso-basal spot always present, but row of three dark spots along lower outer carina variably developed (Fig. 127). Overall colour dull brown with darker brown markings. Median pronotal carina present, if weak, throughout.

MEASUREMENTS

	Males		Females	
Head width	(3)	3.5–3.6, 3.58	(5)	4.1–4.5, 4.31
Posterior femur length	(3)	7.7–8.4, 8.01	(5)	8.4–9.8, 9.19
Posterior femur depth	(3)	2.3–2.5, 2.41	(5)	2.8–3.1, 2.95
Body length	(3)	14.2–15.2, 14.81	(5)	16.4–18.5, 17.58

MATERIAL EXAMINED

Paratypes. **Tanzania**: 3 ♀, same data as holotype but 16.vi.1967 (BMNH); 1 ♂, 2 ♀, Old Shinyanga, (1–8).iii.1947 (*E. Burt*) (BMNH); 3 ♂, same data, 7.iii.1947 (BMNH); 3 ♂, same data, iii.1947 (BMNH); 1 ♂, same data, 12.iv.1947 (BMNH); 11 ♂, 5 ♀, same data, early iii.1947 (1 ♂, 1 ♀, COPR, London; rest BMNH); 7 ♂, Old Shinyanga, 30.iii.1947 (*E. Burt*) (BMNH); 1 ♂, 1 ♀, same data 30.iv.1947 (BMNH); 1 ♂, Old Shinyanga, block 9, 23.v.1956 (*E. Burt*) (BMNH); 2 ♂, same data, [22–24].iii.1948 (*E. Burt*); 1 ♀, same data, 24.iv.1948 (*E. Burt*) (COPR, London); 3 ♂, Mkwemi, 17.7 km W. of Kahama, 29.iii.1947 (*E. Burt*) (BMNH); 1 ♀, Ruaha N. P., 15.iii.1966 (*Vesey-FitzGerald*) (BMNH).

DISCUSSION. The name of this species is derived from the Greek 'leptos'—slender, 'phryganos'—a twig.

Usambilla insolita (Rehn)

(Figs 86, 98, 150, 151)

Adolfia insolita Rehn, 1914: 148. Holotype ♂, CONGO: L. Kivu, Kwidschwi I. (MNHU, Berlin).

DIFFERENTIAL DIAGNOSIS. Only male paratype examined (ex alcohol). Very similar to *U. sagonai* (see Figs 86, 87, 88, 90). Differs in having a much narrower vertex and frontal ridge hardly produced forwards. Zone of dark brown or black pigment in *U. sagonai* (Fig. 90) apparently absent in *U. insolita*, but this may be due to

loss of colour after attempted preservation in alcohol. Supra-anal plate similar to that of *U. oraria* (Fig. 98) but differing in having subgenital plate extending much further beyond tip of supra-anal plate (see key, couplet 3) and hind femur more slender (see Figs 108, *oraria*; 116, *insolita*). Epiphallus (Fig. 150) with stout hook at tip of ventral lophi and penis apex curved in an arc cephalad (Figs 151, 152).

General colour pattern unknown.

MEASUREMENTS

	Male
Head width	3.32
Posterior femur length	7.51
Posterior femur depth	2.07
Body length	13.53

MATERIAL EXAMINED

Paratype. **Congo**: 1 ♂, Kwidschwi I., Lake Kivu, ix.1907 (*Adolf Friedrich Duke of Mecklenberg Expdn*) (COPR, London).

DISCUSSION. There is clear confusion in the original descriptions of species allocated to *Adolfia* by Ramme (1929) so that his expansion of *U. insolita* to include material from modern Zaire and the Ruwenzori region must be open to doubt. The paratype (topotype) examined here is different in detail from *U. sagonai* and is probably a species confined to the Kivu area only. It is replaced in Uganda by *U. sagonai*.

Usambilla sagonai (Ramme)

(Figs 88, 89, 90, 99, 100, 102, 103, 117, 128, 130, 145–149)

DIFFERENTIAL DIAGNOSIS. *Male.* Differing from all other *Usambilla* species by the following combination of characters: dorso-lateral and light lateral body stripes (Figs 102, 103) bright yellow; hind tibiae blue; frons only very slightly produced forwards as seen from above (Figs 88, 89); hind femora green, knee lunules light reddish brown (Fig. 117); supra-anal plate (Figs 99, 100) open to variation but in general with two pairs of basal black tubercles and two pairs of black tubercles near margin at centre of disc; frontal ridge less coarsely pitted than that of *U. insolita* (Figs 87, 90); penis valves sharply curved cephalad (Figs 146, 147); epiphallallic lophi with single apical hook (Fig. 145).

Generally brightly coloured species found in wet evergreen forest. Oblique yellow stripe across gena from base of eye complete or broken (subsp. *fractolineata*, Figs 102, 103).

Female. Ovipositor valvulae unspecialised; bluntly pointed (Figs 148, 149). Brightly coloured in various complex shades of green and brown (Fig. 130). In the darkest forms lateral pronotal lobe and area across thoracic segments II and III plus abdominal tergite 1 bear shining black bands. In more lightly pigmented specimens the black areas may be replaced by brown or dark green (Fig. 128). Side of pronotum, below dark band, bright yellow.

In both sexes pronotum is smoothly arched dorsally with median dorsal carinula weak or absent and cuticle finely punctate. In general appearance they converge on *Rhainopomma* species but have a wider inter-ocular groove, and, of course, apical barbs of the male aedeagus are preapical.

Usambilla sagonai sagonai Ramme

(Figs 88, 99, 130, 145–149)

Adolfia sagonai Ramme, 1929: 305, fig. 28c. Holotype ♂, ZAIRE; Lakes Region (MRAC, Tervuren) [examined].

DIFFERENTIAL DIAGNOSIS. Differs from subsp. *fractolineata* by possessing a yellow genal stripe which is entire.

MEASUREMENTS

	Males	Females
Head width	(12) 3.1–3.7, 3.46	(9) 3.8–4.1, 3.96
Posterior femur length	(12) 7.0–8.6, 7.95	(9) 8.4–9.4, 8.95
Posterior femur depth	(12) 2.0–3.5, 2.43	(9) 2.5–2.9, 2.60
Body length	(12) 12.4–15.0, 14.18	(9) 15.7–16.9, 16.44

MATERIAL EXAMINED

Zaire: 1 ♂, 2 ♀, La Chute For., Rutchuru, 7.viii.1949 (*E. Burt*) (BMNH). **Rwanda:** 2 ♂, Kisenye, 10.viii.1949 (*E. Burt*) (BMNH). **Uganda:** 1 ♀, Toro, 1.6 km E. of Bundebugyo, 9.viii.1964 (*Jago*) (BMNH); 1 ♀, Kamanve, 17.ix.33 (*Johnston*) (BMNH); 1 ♀, Kilembe, 1370 m, xii.1934–i.1935 (*F. W. Edwards*) (BMNH); 1 ♂, Gaba, 18.x.1931 (*G. H. E. Hopkins*) (BMNH); 1 ♂, Nsagu, 3.ix.1933 (*Johnston*) (misdet. as *U. insolita* Rehn by B. P. Uvarov) (BMNH); 1 ♂, Ruwenzori, 1610 m, 1913 (*Scott-Elliott*) (misdet. *Adolfia insolita* Rehn by Ramme) (BMNH); 8 ♂, 6 ♀, Toro, SE. of Ft Portal, Kibale for. res., 30°25'E, 0°30'N, [13–16.]viii.1964 (*Jago*) (2 ♂, 2 ♀, COPR, London; rest BMNH); 1 ♂, 1 ♀, same data, 30.iv.1967 (*Jago*) (BMNH); 1 ♀, Ruwenzori, between road and Nyabitaba hut below 2610 m, 27.vi.1963 (*P. & P. Carter*) (BMNH). **Kenya:** 1 ♂, 1 ♀, Kakamega For. Statn, c. 1520 m, [18–19.]vii.1974 (*Hollis*) (BMNH).

DISCUSSION. The recent discovery of this subspecies in Kenya extends its known distribution to the forests of the east side of Lake Victoria. It is possible that the nominate race occurs south and west of the lake while subsp. *fractolineata* represents an isolated series of populations on its northern side in the Mabira to Mpanga forest blocks of the Nile drainage and northwards to Lake Albert.

Usambilla sagonai fractolineata subsp. n.

(Figs 89, 90, 100, 102, 103, 117, 128)

Holotype ♂, **Uganda:** Buganda, Mpanga F. Res., km 33.8 Kampala–Masaka road, 32°20'E, 0°15'N, [2–3.]viii.1964 (*Jago*) (BMNH).

DIFFERENTIAL DIAGNOSIS. Differing from nominate subspecies only in respect of the broken lateral yellow band across the gena in the male (Figs 102, 103).

MEASUREMENTS

	Males	Females
Head width	(24) 3.3–4.4, 3.71	(29) 3.8–4.4, 4.09
Posterior femur length	(24) 7.4–8.9, 8.09	(29) 8.1–9.8, 9.18
Posterior femur depth	(24) 2.1–2.4, 2.24	(29) 2.3–2.9, 2.58
Body length	(24) 13.6–15.5, 14.65	(29) 15.7–18.9, 17.15

MATERIAL EXAMINED

Paratypes. **Uganda:** 4 ♀, 1 nymph, Bunyoro, W. of Masindi, Budongo F. Res., 31°30'E, 1°48'N, [25–27.]viii.1964 (*Jago*) (BMNH); 6 ♂, 2 ♀, Buganda, Mabira F. Res., nr Jinja, 33°0'E, 0°25'N, 27.iv.1967 (*Jago*) (BMNH); 10 ♂, 16 ♀, 7 nymphs, same data as holotype (COPR, London); 1 ♂, 1 ♀, Mpanga F. Res., nr Kampala, 30.viii.1969 (*E. S. Brown*) (BMNH); 1 ♀, Mpanga F. Res., 1210 m (BMNH); 1 ♂, Bunyoro, Lake Albert, Butiaba, [26–28.]viii.1964 (*Jago*) (BMNH); 1 ♂, 3 ♀, Bunyoro, Bugoma F. Res., S. of Hoima, 31°0'E, 1°15'N, [29–31.]viii.1964 (*Jago*) (BMNH); 4 ♂, 2 ♀, Mubende, Mubende reservoir, 19.viii.1964 (*Jago*) (BMNH).

Usambilla haematogramma sp. n.

(Figs 92, 93, 101, 118, 129, 154–156)

Holotype ♂, **Tanzania:** Ufipa plateau, 25.8 km NNW. of Sumbawanga, Mkundi plantation, [16–27.]v.1966 (*Jago*) (BMNH).

DIFFERENTIAL DIAGNOSIS. *Male.* Inter-ocular groove and fastigium of vertex wide (Fig. 92), frontal ridge flat. Antennae longer than head and pronotum. Hind femora (Fig. 118) entirely pale green, except knee which is light brown; hind tibiae light green, dark brown in apical half on inner and lower side, spines black-tipped. Supra-anal plate (Fig. 101) with dark lateral infuscate areas and four pairs of simple tubercles. Colour, as for females (Fig. 129), distinctive—body pale emerald green with median dorsal black line above and broad black line on each side from behind compound eye to back of tergite 8 of abdomen. This lateral line demarcated above by a red line extending from front of pronotum to at least rear of tergite 1 of abdomen; demarcated below by a dull yellow band bordered with black ventrally. Cerci conical with narrow pre-apical black annulus. Subgenital plate pale green. Aedeagal valves (Figs 154, 155) gently curved capitad; epiphallallic lophi (Fig. 156) apically bifurcate.

Female. Colour as for male (Fig. 129) and in this respect unusual for the genus. Combination of colours unique. Note that mid-dorsal black line may be very faint or absent.

MEASUREMENTS

	Males	Females
Head width	(35) 3.3–3.5, 3.37	(25) 4.1–4.8, 4.20
Posterior femur length	(35) 7.5–9.2, 8.29	(24) 9.0–11.9, 10.42
Posterior femur depth	(35) 2.1–2.7, 2.27	(24) 2.9–3.2, 2.88
Body length	(35) 13.9–17.5, 15.18	(24) 17.8–21.7, 19.45

MATERIAL EXAMINED

Paratypes. **Tanzania**: 2 ♂, 3 ♀, 4 nymphs, Ilemba gap, 12.iii.1959 (*Vesey-FitzGerald*); 4 ♂, 2 ♀, 1 nymph, Nsangu, 2120 m, 13.iii.1959 (*Vesey-FitzGerald*); 6 ♂, 3 ♀, Ufipa escarpment, [6–9.]vii.1948 (*Waloff*); 2 ♂, Malonje, Ufipa, 8.iv.1951 (*Vesey-FitzGerald*); 1 ♀, Mpui, 100 km N. of Abercorn, 17.vi.1947 (*B. P. Uvarov*); 3 ♂, 5 ♀, Ufipa plateau, 25.8 km NNW. of Sumbawanga, Mkundi, [16–27.]v.1966 (*Jago*); 2 ♂, 6 ♀, E. of Sumbawanga, Mbisi F. Res., [23–29.]v.1966 (*Jago*), 9 ♂, 3 ♀, 19.3 km E. of Sumbawanga, Malonje Mt, plateau grassland, disused road to Mpui, [24–28.]v.1966 (*Jago*); 2 ♂, 2 ♀, Rukwa valley, 8 km W. of Muse, bottom descent Red Locust road, 26.v.1966 (*Jago*); 10 ♂, 5 ♀, Mbisi For. Res., v.1966 (*Jago*); 9 ♂, 2 ♀, Ufipa, Nsangu F. Res., Sumbawanga-Mpui road, 28.v.1966 (*Jago*). (Last series COPR, London; rest BMNH.)

DISCUSSION. The species derives its name from the Greek 'haematos'—bloody, 'grammos'—a line, emphasising the distinctive dorso-lateral orange-red line which delineates the upper margin of the black lateral stripe. The general coloration is very similar to that of members of the genus *Lentula* but the phallic complex shows that *U. haematogramma* has a strong affinity with the *olivacea*-group of lentulids.

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Index

Synonyms are in *italics*; principal references are in **bold**.

- Acacia 10, 21, 27
Adolfia 20
affinis 21, 22, 23, 24, 25, **27**, 28, 29, 30, 32
Albizzia 17
Altiusambilla 1, 3, **12**
Aresceutica 13
aspera, Achyranthes 8
- Bacteracris 5
Basutacris 4
Betiscoides 5
burtii, Chromousambilla 2, 4, 6, 7, 8, **9**
burtii, Physocrobylus 10
- Catantopinae 13
chlorophrygana 21, 23, 24, 25, 26, 30, 31, **32**, 34
Chromothericles 1
Chromousambilla 1, 3, 5, 16, 20
Combretum 21, 27
Commelina 17
Commiphora 21, 27
cylindricollis 10, 11, **12**
- Devylideria 4
- emaliensis 13, 21, 23, 24, 25, 26, 28, 29, **30**
Eremidium 4
Erlangea 8
- fractolineata 21, 22, 23, 25, 26, 35, **36**
- Gymnidium 4
- haematogramma 8, 20, 21, 22, 24, 25, 26, 33, **36**
Helwigacris 5
hookeri, Pseudarthria 8
- insolita 20, 21, 22, 25, 30, 31, **34**, 35
Kalaharicus 3
Karruacris 3
Karruia 4
kikomboensis 21, 23, 25, 26, 27, 29, **30**
- latestriata 2, 4, 5, **6**, 7, 8, 9, 10
Lentula 3, 12, 37
leptophrygana 21, 22, 23, 24, 25, 26, 33, **34**
magnificum 14, 15, 17, 18, **20**
Malawia 1, 3
Mecostiboides 3
Mecostibus 1, 2, 3
Microusambilla 1, 3, **10**, 12
modicrus 1, 2, 11, **12**, 13, 16
montanum 2, 13, 14, 15, **16**, 18, 19
mweruensis 2, 4, 5, 6, 7, 8, **9**
- nguruense 14, 15, 16, **17**, 18
Nyassacris 1, 3
- olivacea, Usambilla, 20, 23, 24, 25, 26, **27**
olivacea, Lentula 37
oraria 21, 22, 24, 25, 26, 28, **32**, 35
- Paralentula 3
patula, Pinus 1, 13
peruviana, Physalis 8
Plagiotriptus 1
- Qachasia 5
- Rhainopomma 1, 4, 12, 35
Rehnula 20
robertsoni 2, 4, 6, 7, 8, 9, **10**
- ragonai 20, 21, 22, 23, 24, 26, 30, 31, 34, **35**
Serpusia 13
Shelfordites 3
steppia, Bidens 8
stuhlmanni, Pycnostachys (?) 8
Swaziacris 4
Sygrus 3, 12
- turgidicus 20, 21, 22, 23, **24**, 25, 26, 28, 29, 30
- usambaricum 13, 14, 15, **16**, 17, 18, 19
Usambilla 1, 2, 4, 5, 10, 13, 17, 20
- verticillaris, Hypoestes 8
veseyi 2, 4, 5, 6, 7, **8**, 9, 10
- wapugu 14, 15, 16, 17, **19**