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Two new species of *Amytta* Karsch (Orthoptera: Meconematinae) from East Africa (Tanzania, Mt. Kilimanjaro)

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Abstract

Two new species of the genus *Amytta* (Meconematinae) are described from the submontane and montane forest of Mt. Kilimanjaro, Tanzania (East Africa). Notes on habitat demands of the species and the occurrence of syntopic Saltatoria are given.

Key words

Orthoptera, Meconematinae, new species, katydid

Introduction

Mt. Kilimanjaro, Tanzania has a variety of ecological zones due to its enormous altitudinal range of about 5000 m and a precipitation which varies with altitude and exposition of the mountain massif. To date, 179 Saltatoria species are recorded from that volcano, of which 31 are described from Kilimanjaro localities (Gerstäcker 1869; Karsch 1896; Kevan 1955; Karny 1915; Sjöstedt 1909, 1923; Ramme 1929, 1931; Weidner 1941; Hemp, unpubl.). Twelve Saltatoria species are endemic to the Mt. Kilimanjaro massif, 10 species to both Mt. Kilimanjaro and Mt. Meru /Monduli Range; for the latter massifs only 4 endemics are known (Sjöstedt 1909; Johnston 1956, 1968; Dirsh 1965; Descamps 1977; Hemp 2001).

The Meconematinae are represented in Africa by 16 genera and 65 species (Otte 1997). Most genera are geographically restricted. Five genera with 13 species occur in southern Africa, two genera with 3 species in central Africa. Most species (30) in 6 genera occur in central and western Africa. Only one monotypic genus is known from North Africa. The genus *Anepitacta* with 12 species shows the widest distribution from West Africa over Central to southern Africa.

The genus *Amytta* shows a disjunct distribution of its 5 species. *A. planicollis* Chopard, 1954, and *A. brevipennis* Chopard, 1945, are West (Central) African species, while *A. pellucida* Karsch, 1888, *A. abbreviata* Beier, 1967, and *A. ukamica* Beier, 1965, are described from the East African countries Kenya and Tanzania (Karsch 1888; Chopard 1945; Beier 1965, 1967). The only genus restricted to East Africa, *Afroconema*, is known by one species from Ethiopia (Gorochov 1993).

Specimens are deposited in the Natural History Museum (London, UK) [NHM], in the Entomological Department of the National Museums of Kenya (Nairobi) [NMK] and in the personal collection of the author [CCH].

Results

***Amytta kilimandjarica* n. sp.**
(Figs 1-3)

Holotype.— **Male**: Tanzania, Mt. Kilimanjaro southern slope, montane forest above Kidia/Old Moshi 1710 m, beaten from *Rourea thomsonii* bush, 3-XII-1999 (C. Hemp coll.) [NHM].

Paratypes.— Tanzania, all Mt. Kilimanjaro. 1 ♀, southern slope, montane forest above Kidia/Old Moshi, 1710 m, beaten from *R. thomsonii* bush, 3-XII-1999 (C. Hemp coll.) [NHM]; 1 ♂, south-western slope, submontane forest Mrusunga Valley, 1600 m, XII-1999 (C. Hemp coll.) [NMK]; 1 ♀, western slope, submontane forest near Lerongo Hill 1800 m, II-2000 (C. Hemp coll.) [NMK].

Further material all Mt. Kilimanjaro (all C. Hemp coll.) [CCH]. 4 ♂♂, 2 ♀♀, 5 nymphs, southern slopes, beaten from *Agauria salicifolia* in disturbed forest above Kidia, 1710 m, XI-1999, XII-2000, II-2001; 1 ♀, 2 nymphs, southern slopes, beaten from *Agauria salicifolia* and *Rytigynia schuhmannii* in disturbed forest above Uchau, 1730 m, XII-2000; 2 ♀♀, 8 nymphs, southern slopes, beaten from bushes in disturbed submontane forest Mrusunga Valley, 1600 m, XII-1999; 1 ♀ south western slopes, beaten from small tree in indigenous *Olea* forest near Lerongo Hill, 1800 m, II-2000; 1 ♀, south western slopes, indigenous *Olea* forest above Siha, 1850 m, II-2000; 1 ♀, northern slopes, Kilimanjaro Timbers, beaten from small tree in disturbed forest, 2080 m, III-2001; 1 ♀, northern slopes, *Cassipourea* forest above Ikasua village, 2500 m, IV-2001.

Description.— Small, uniformly light yellowish green; preserved insect tawny. Behind the eyes two lateral yellow lines, continuing entire pronotum length, fading in preserved insect. Eyes reddish brown. Tegmina meeting in middle, with brownish lines along the vannal area.

Tegmina shortened, tectiform with reduced venation. Stridulatory area hidden under pronotum. Alae reduced to narrow lobes covered by tegmina. Mid tibiae mostly with 5 outer and 4 inner spines (in some specimens 4 outer and 4

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inner).

Last tergite large, epiproct divided into two hemispherical areas, posterior margin broadly triangularly incised. Cerci diffentiated into two lobes, outer expanded shovel-like, inner twisted into three-dimensionally inflated apex (Fig. 1). Subgenital plate emarginate, with dorso-ventrally flattened, blade-like, slightly down-curved, pubescent styles (Fig. 2).

Female: as male, except for fore tibiae with 4 outer and 4 inner spines. Ovipositor of female narrow and smooth, only slightly up-curved (Fig. 3).

Measurements.— Ranges in mm. Males (n = 6); total length: 10.5-12.2; median length of pronotum: 3.8-4.8; length of hind femur: 6.5-8.0; median length of visible tegmina: 2.1-2.5. Females (n = 10); total length: 17.0-20.0; median length of pronotum: 3.5-3.9; length of hind femur: 7.0-8.0; median length of visible tegmina: 2.6-3.3; length of ovipositor: 7.5-8.0.

Specimens of *Amytta kilimandjarica* (Figs 7, 8) were collected on the southern slopes of Mt. Kilimanjaro at the lower forest border. Some of the specimens were beaten from shrubs of *Rourea thomsonii*, *Rytigynia schuhmannii* and *Agauria salicifolia* in a disturbed patch of montane forest at 1710 m above Kidia (Old Moshi). On the western slopes it was found in forest communities of *Olea africana*, at 1800 m (above Lerongo Hill) and 1850 m (above Siha). A small area of submontane gorge forest at 1600 m is left on the southern slopes in the steep Mrusunga Valley and there this species was found under leaves of various shrubs. On the northern side of Mt. Kilimanjaro it was beaten from a small tree in a patch of indigenous forest at 2080 m (site of the former sawmill Kilimanjaro Timbers). Besides adults there were always nymphs as well.

In the disturbed montane forest above Kidia (Old Moshi) at 1710 m, *Anthracites montium* Sjöstedt (1909), *Monticolaria kilimandjarica* Sjöstedt (1909), *Melidia kenyensis* Chopard (1954) and *Aerotegmina kilimandjarica* n.sp.[1] were found on the same shrubs and trees.

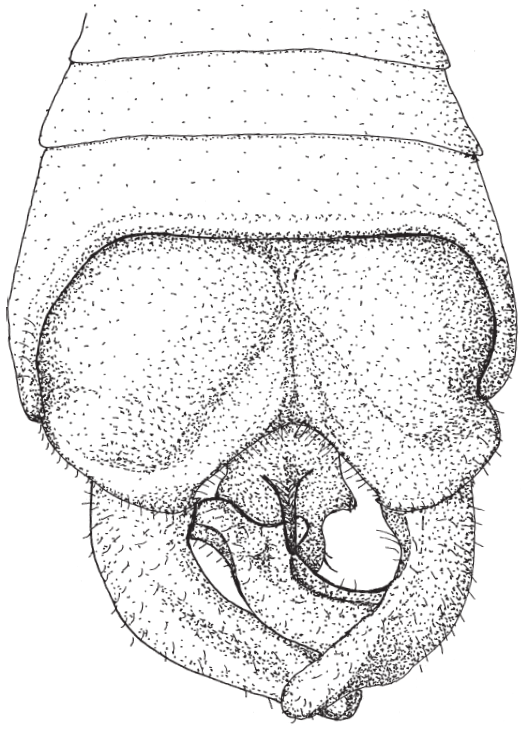


Fig. 1. Dorsal view of male abdominal apex of *Amytta kilimandjarica*.

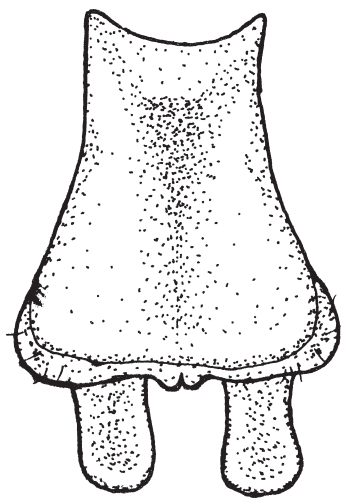


Fig. 2. Ventral view of male subgenital plate of *Amytta kilimandjarica*.

[1] (Hemp, this volume, 2001).

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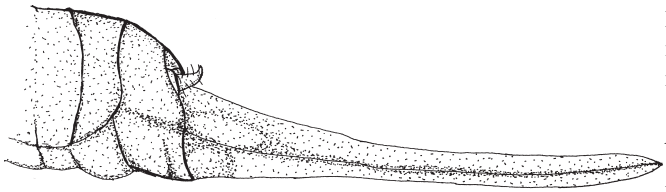


Fig. 3. Lateral view of ovipositor of *Amytta kilimandjarica*.

***Amytta olindo* n. sp.**
(Figs 4-6)

Holotype.— **Male**: Tanzania, Mt. Kilimanjaro southern slope, disturbed forest above Kidia / Old Moshi 1710 m, II-2000 (C. Hemp coll.) [NHM].

Paratypes.— Tanzania, all Mt. Kilimanjaro; 1 ♀, southern slope, Mbokomu/Old Moshi, border plantation belt, montane forest in lush vegetation below bushes, 1900 m, I-1999 (C. Hemp coll.)[NHM]; 1 ♂, southern slope of Mt. Kilimanjaro, in lush undergrowth vegetation of disturbed forest above Kidia / Old Moshi, 1710 m, XI-1999 (C. Hemp coll.)[NMK]; 1 ♀, southern slope, in lush undergrowth vegetation of disturbed forest above Kidia / Old Moshi, 1710 m, XI-1999 (C. Hemp coll.) [NMK].

Further material all Mt. Kilimanjaro (all C. Hemp coll.) [CCH]. 1 ♂, 2 ♀♀, southern slopes, edge of high altitude meadow in lush vegetation, Mbokomu, 1900 m, I-1999; 6 ♂♂, 5 ♀♀, 6 nymphs, southern slopes, edge of high altitude meadow in lush vegetation above Kidia 1710 m, 1900 m, XI-1999, II-2000, I-2001, II-2001, IV-2001; 2 ♂♂, 6 ♀♀, 8 ♀ nymphs, southern slopes in banana-coffee plantation, Kidia 1430 m, 1550 m, II-2000, I-2001, III-2001; 1 ♂, 1 ♀, southern slopes, forest edge at Mweka Gate, 1650 m, III-2000; 2 ♀♀ southern slopes at Lyamungu, coffee-banana plantation 1600 m, XII-2000; 1 ♀, 6 nymphs, northern slopes, Kilimanjaro Timbers, in lush vegetation of forest clearing, 1825-2060 m, III-2001; 1 ♂, 1 ♀, northern slopes, bushland above Ikasua village 1900 m, IV-2001.

Description.— Small, uniformly light yellowish green; preserved insects tawny. From behind eyes two lateral yellow lines, continue along the length of pronotum. Eyes reddish brown. Antennae about 2.5 times longer than body length. Cuticle of pronotum shiny with short scattered hairs. Tegmina meeting in middle, with brownish lines along vannal area, shortened, tectiform with reduced venation. Stridulatory area hidden under pronotum. Alae reduced to narrow lobes covered by tegmina. Mid tibiae mostly with 5 outer and 4 inner spines (sometimes 4 outer and 4 inner). Epiproct large, posterior margin triangularly incised medially. Cercus with symmetrical, basal blade-like projections forming a hollow space. Apex of cerci curved inward and extending into long slim projections (Fig. 4). Surface of subgenital plate less smooth, more textured than in *A. kilimandjarica*; styles elongate, flattened down-curved, almost half the length of subgenital plate (Fig. 5).

Female: as male, except for fore tibiae with 4 outer and 4 inner spines. Ovipositor of female slender and smooth, nearly straight (Fig. 6).

Measurements.— Ranges in mm. Males (n = 13); total length: 12.0-14.0; median length of pronotum: 4.0-4.5; length of hind femur: 7.0-8.0; visible median length of tegmina: 1.9-3.0. Females (n = 18); total length: 18.5-22.5; median length of pronotum: 3.2-4.0; length of hind femur: 7.5-9.5; visible median length of tegmina: 2.5-3.0; length of ovipositor: 8.0-9.0.

Amytta olindo (Figs 9, 10) is a species found in lush vegetation of forest edges, along paths and shady edges of montane meadows. In the submontane and lower montane zone of the southern slopes, it was noted at altitudes of 1300-1800 m in the areas of Old Moshi, Uchira and Kibosho, inhabiting shady and humid herbaceous vegetation under the canopy of banana-coffee plantations. It was collected at the same localities as *A. kilimandjarica* above Kidia at 1710 m in montane meadows and the undergrowth of disturbed forest, also in the submontane gorge forest of the Mrusunga valley (1600 m), at Mbokomu of the southern slopes (1900 m) and at the forest edge of the Mweka Gate (1650 m). At the northern side of Mt. Kilimanjaro it inhabits lush vegetation of clearings and road edges in the montane forest. It was noted from 1825 m (lower forest border along road to Kilimanjaro Timbers) to about 1950 m. Above the Masai Village Ikasua on the central northern slopes, individuals were attracted from surrounding bushland to fire at

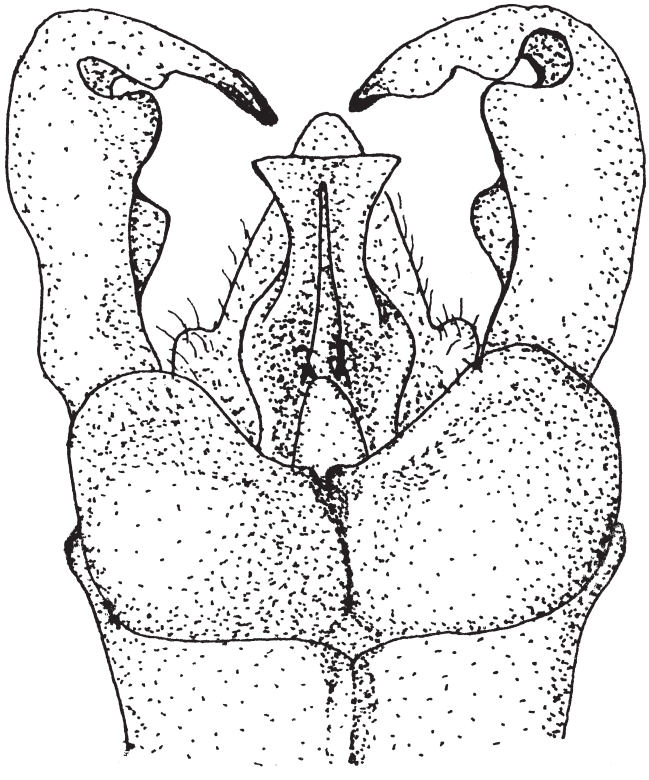


Fig. 4. Dorsal view of male abdominal apex of *Amytta olindo*.

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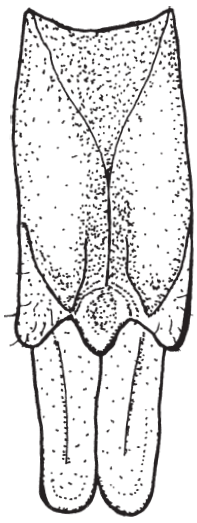


Fig. 5. Ventral view of male subgenital plate of *Amytta olindo*.

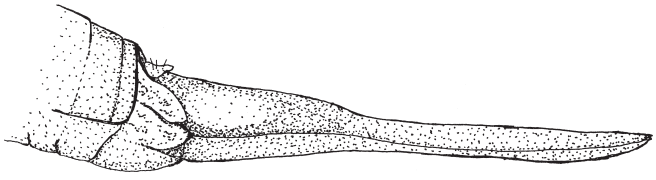


Fig. 6. Lateral view of ovipositor of *Amytta olindo*.

1900 m.

These light greenish katydids were found in the montane meadows of the southern slopes together with *Parepistaurus deses deses* Karsch (Karsch 1896) *Conocephalus (Xiphidion) kilimandjaricus* (Sjöstedt) (Sjöstedt 1909) and *C. kibonotense* (Sjöstedt) (Sjöstedt 1909), *Altiusambilla modicicrus* (Karsch) (Karsch 1896) and *Ixalidium sjöstedti* Kevan (Kevan 1950). In the plantation belt the species shares its habitat with almost the same species as on the montane meadows, namely *A. modicicrus*, *I. sjöstedti* and *P. deses deses*. In clearings on the northern side of Mt. Kilimanjaro it occurs together with *A. modicicrus*, *Phyteumas purpurascens* (Karsch) (Karsch 1896), *P. deses deses*, *Gymnobothroides levipes* (Karsch) (Karsch 1896), *C. kibonotense*, *Horatosphaga heteromorpha* (Karsch) (Karsch 1888), and *Monticolaria kilimandjarica*. In bushland on the central northern slopes (1900 m) it lives syntopically with *G. levipes*, *H. heteromorpha*, *Heteropternis couloniana* (Saussure) (Saussure 1884) and *Catantops momboensis* Sjöstedt (Sjöstedt 1931).

Discussion and Diagnoses

The genus *Amytta* was erected by Karsch (1888) on *Amytta pellucida* from Usambara. Species of this genus are characterized by open tympana of the fore tibiae, a conical fastigium verticis, globose, prominent eyes and a subcylindrical pronotum. The fore tibiae are armed with 4 inner and 5 outer spines. The cerci of the males are deeply incised into two branches; the ovipositor of the females is smooth and, straight or slightly up-curved (Karsch 1888; Beier 1965). Species of *Amytta* are tiny and light greenish with long antennae. All these characters are also found in the species *A. olindo* and *A. kilimandjarica* occurring on Mt. Kilimanjaro, which puts them in this genus.

Among the 5 species previously arranged under *Amytta*, there was only one with reduced wings, *A. abbreviata*. It was described from Kenya between Nairobi and Limuru at 2000 m. Both new species differ from *A. abbreviata* in the shape of the male cerci. In *A. abbreviata* these are rather stout and the two branches hardly differentiated, while in *A. kilimandjarica* they are highly modified into an outer branch which is expanded, shovel-like, and an inner one, with a three-dimensionally inflated apex. In *A. olindo* each cercus is basally expanded, forming space for the elongate apices of the other. Furthermore the asymmetrical cercal spines found in *A. abbreviata* (Beier 1967) are absent in both *A. kilimandjarica* and *A. olindo*.

Two more *Amytta* species occur in Tanzania, *A. pellucida* (Ukami Mts, East Usambara) and *A. ukamica* (Ukami Mts). Both are long-winged, the alae slightly surpassing the tegmina. *A. pellucida* has blunt broad and nearly straight cerci, which are expanded at their posterior ends. The subgenital plate is produced and as long as the cerci (Beier 1965). In both *A. olindo* and *A. kilimandjarica* the cerci are differentiated into two branches and the subgenital plate is shorter. *A. ukamica* has slender cerci, which are inwardly curved and differentiated into two branches. One of the cercal branches is expanded while the other is slim and pointed. The posterior margin of the last tergite bears a process (Beier 1965). Cercal shape is different in both *A. olindo* and *A. kilimandjarica* and a process of the last tergite is absent in the Kilimanjaro species.

The general habitus of *A. kilimandjarica* and *A. olindo* is very similar. Morphological differences concern the male abdominal terminalia. The epiproct of *A. kilimandjarica* is longer and more convex dorsally while in *A. olindo* it is less elevated and the distance from the posterior margin of the last abdominal tergite to the incised posterior margin of the epiproct is shorter. The cerci of *A. kilimandjarica* are divided into two branches, a blunt outer one and an inner branch which is twisted and has the apex inflated. In *A. olindo* the dorsal and inner margins of the cerci are expanded forming a concave inner surface. The apex is curved mediad and prolonged. The styles of the subgenital plate of *A. olindo* are nearly half the length of the subgenital plate, while in *A. kilimandjarica* they are small rounded lobes.

Females of *A. kilimandjarica* and *A. olindo* cannot be separated with certainty. The body size and the length of the ovipositor of most specimens of *A. kilimandjarica* are smaller (body length ~ 18 mm, ovipositor ~ 7.5 mm) than in the majority of female *A. olindo* (body length of most specimens ~ 19.5 mm, ovipositor ~ 8.5 mm).

These new species occupy different habitats. *A. olindo* was exclusively collected in open habitats on the ground in lush vegetation while *A. kilimandjarica* lives on bushes and trees, mostly hidden under leaves.

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References

Beier M. 1965. Die afrikanischen Arten der Gattungsgruppe *„Amytta"* Karsch. Beiträge zur Entomologie 15: 203-242.

Beier M. 1967. Neue Beiträge zur Kenntnis der Gattungsgruppe *Amytta* Karsch (Orth. Meconematinae). EOS 42: 305-310.

Chopard 1954. Orthopteroides recueillis dans les montagnes du cameroun par la mission Lepesme, Paulian, Villiers. Revue Francaise d´Entomologie 11: 156-178.

Descamps M. 1977. Monographie des Thericleidae (Orthoptera Acridomorpha Eumastacoidea). Musee Royal de L´Afrique Centrale-Tervuren, Belgique. Annales 8, Sciences Zoologiques 216. 475 pp.

Dirsh, V. M. 1965. The African Genera of Acridoidea. Antilocust Centre, London. 579 pp.

Gerstäcker A. 1869. Beitrag zur Insekten-Fauna von Zanzibar. No. II. Orthoptera et Neuroptera. Archiv für Naturgeschichte 35: 201-223.

Gorochov A. V. 1993. A contribution to the knowledge of the tribe Meconematini (Orthoptera: Tettigoniidae). Zoosystematica Rossica 2: 63-92.

Hemp C. 2001. *Aerotegmina*, a new genus of African Listroscelidinae (Orthoptera: Tettigoniidae). Journal of Orthoptera Research 10: 125-132.

Hemp C. In press. Comparison of the endemic Saltatoria fauna (Orthoptera) of Mt. Kilimanjaro, Mt. Meru and the Monduli Range. Journal of East African Natural History.

Johnston, H. B. 1956. Annotated catalogue of African grasshoppers. London: xxii+833 pp.

Johnston, H. B. 1968. Annotated catalogue of African grasshoppers. Supplement. London. xiv+448 pp.

Karny H. 1915. Ergebnisse der Forschungsreise des Herrn Dr. Adalbert Klaptocz nach Französisch Guinea. Zoologische Jahrbücher (Systematik) 40: 119-146.

Karsch, F. 1896. Neue Orthopteren aus dem tropischen Afrika. Stettiner Entomologische Zeitung 57: 242-359.

Karsch F. 1888. Die Meconemiden. Ein orthopterologischer Beitrag. Wiener Entomologische Zeitung 7: 159-162.

Kevan D. K. McE. 1955. East African Blattodea, Phasmatodea and Orthoptera. Ergebnisse der Deutschen Ostafrika-Expedition 1951/52, Gruppe Lindner, Stuttgart. Beiträge zur Entomologie 5: 472-485.

Otte, D. 1997. Orthoptera Species File. Tettigonoidea. The Orthopterist´s Society and The Academy of Natural Sciences, Philadelphia.

Ramme W. 1929. Afrikanische Acrididae. Revisionen und Beschreibungen wenig bekannter und neuer Gattungen und Arten. Mitteilungen aus dem Zoologischen Museum in Berlin 15: 247-492.

Ramme W. 1931. Ergänzungen und Berichtigungen zu meiner Arbeit "Afrikanische Acrididae" (Orth.). Mitteilungen aus dem Zoologischen Museum in Berlin 16: 918-947.

Sjöstedt, Y. 1909. In: Sjöstedt, Y (Ed.): Wissenschaftliche Ergebnisse der Schwedischen Zoologischen Expedition nach dem Kilimanjaro, dem Meru und den umgebenden Massaisteppen Deutsch-Ostafrikas 1905-1906. Locustodea: 125-148, Acridoidae: 149-200.

Sjöstedt Y. 1923. West- und Südafrikanische Acridiodeen. Arkiv för Zoologi 15: 1-21.

Weidner, H. 1941. Die Hetrodinae des Hamburgischen Zoologischen Museums und Instituts. Zoologischer Anzeiger 134: 268-295.

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Fig. 7. Habitus of male *Amytta kilimandjarica*.



Fig. 8. Habitus of female *Amytta kilimandjarica*.



Fig. 9. Habitus of male *Amytta olindo*.

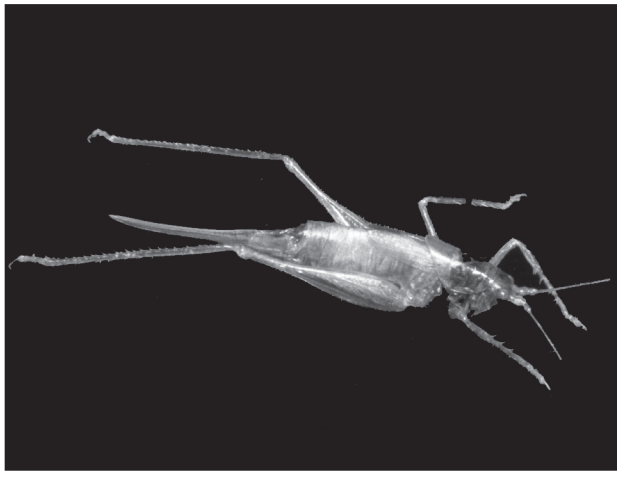


Fig. 10. Habitus of female *Amytta olindo*.

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