A Field Guide
to the Bushcrickets, Wetas and Raspy Crickets of Tanzania and Kenya

Claudia Hemp

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with contributions from Andreas Hemp and Klaus-Gerhard Heller

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Front cover: Male *Aerotegmina megaloptera*, Kazimzumbwi Forest Reserve.

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Foreword

The Orthoptera are a relatively small group of insects, most diverse in the Tropics. Many people, having locusts in mind, think of Orthoptera as harmful insects that damage the crops of arid and semi-arid Africa. This, however, is a gross over-simplification. Many Orthoptera, especially the so-called bushcrickets, inhabit a great diversity of habitats and have developed wonderful adaptations of their body shape and colouration. For example, some change their form dramatically as they grow from larvae to adults. They may closely resemble an ant when they hatch (genus *Eurycorypha*), or mimic a poisonous beetle (genus *Plangia*), but later develop into a well-camouflaged adult. The majority of bushcrickets rely on camouflage and are thus rather inconspicuous. They are also perfect bioindicators, reflecting the habitat quality of e.g. forests. Forests, alas, are disappearing at an alarming rate in the tropics and with them their unique flora and fauna, including their marvelous bushcrickets. My own love for Orthoptera started when I was still a teenager. I observed grasshoppers, then of the genus *Chorthippus*, common inhabitants of grasslands in Upper Frankonia, Germany, where their various songs are the embodiment of summer. Later I had the chance to start to study Orthoptera in Africa, first on Kilimanjaro, where my husband and I arrived in October 1989, as students of the University of Bayreuth. We were catapulted into a totally new world of plants and insects. Conducting our ethnobotanical and zoological research laid the foundation of our knowledge of the plants and insects of East Africa.

My main interest was and is to illuminate mechanisms of speciation, but I soon found that in most areas of East Africa there is a wealth of undescribed species. Many of these newly detected species were bushcrickets (the Tettigonioidea), and most of them were restricted to single mountains or mountain ranges in the area. On the one hand, this situation represented a perfect opportunity to study speciation processes, on the other hand, it entailed a huge task in identifying, characterizing, and describing species new to science. Comparing my collected material with museum specimens in various entomological collections in Europe (immeasurable treasures of insects of the world!) – it soon became clear that much work remained to be done. Many species – even if not actually new to science – were known from only a few individuals, often only from the holotypes. Further, almost no information on these species was available except for their descriptions (apart from the work of some pioneers of tropical orthopterology such as David Ragge, producing revisions of small groups of bushcrickets, and describing numerous new species from the collections). The specimen labels often indicated only that individuals came from „German" or „British" East Africa, without providing more precise localities. Further, no photos of the beautiful living individuals were available for almost any bushcricket species, nor information on their nymphal stages. Together with my husband Andi, I felt an obligation to obtain more information on their habitat, and with Klaus-Gerhard Heller to study their often fascinating bioacoustics. With several colleagues (Wolfgang Wägele, Siegfrid Kehl, Stefan Küchler, Beata Grzywacz, Elzbieta Warchalowska-Sliwa) we also did cytogenetical and molecular work reconstructing their relationships. In parallel, I tried to photograph living individuals and to compile all available information on this poorly investigated group. The result is this book – though it probably still gives only a poor picture of the true biodiversity of bushcrickets of eastern Africa. A fully illustrated book showing living species and giving information on their habitat and biology is especially important to raise interest in a wider public, to whom I hope to show how special and beautiful many of these species are. I also hope that this book will contribute to their conservation since many of them – even though just newly described – are on the brink of extinction.

October 2020, Claudia Hemp

Photo opposite page: Tour into the Masai Steppe near Mt Lossogonoi in December 2014. From left to right: field assistants Elibariki Mmary and Erick Materu, Julian and Claudia Hemp, a Masai guest (Photo credit: Andreas Hemp).

Introduction

Bushcrickets, Wetas and Raspy Crickets of Tanzania and Kenya

Systematics

Bushcrickets (Great Britain) or **katydids** (North America, Australia and New Zealand) treated in this guide belong to the insect order Orthoptera, and here to the suborder Ensifera. Bushcrickets are distinguished from other groups of Orthoptera such as crickets (Grylloidea) and grasshoppers & allies (Caelifera) by the long antennae (of body length or longer) and a mostly conspicuous ovipositor of the females. Bushcrickets have long or reduced but hardened fore wings and are thus easily distinguished from Raspy Crickets (Gryllacrididae) with which they may be confused.

Wetas or **King Crickets** of East Africa belong to the family Anostostomatidae. East African taxa belong to the subfamilies Anostostomatinae (*Nasidius*) and Lutosinae (*Libanasa*). However, the systematic position is not solved yet and it seems possible that a new genus and subfamily could be erected for Tanzanian species listed in the Lutosinae as *Libanasa* (Johns & Hemp 2015). Another two genera with each one species are recorded for the area, *Henicus cephalotes* (Tanzania?: Anchieta) and *Nasidius pulchriventris* from the Ufipa plateau of Tanzania. Probably a new species of *Nasidius* occurs in the East Usambara to Uluguru Mountains.

Raspy Crickets (Gryllacridinae) are poorly collected and investigated in East Africa. There are large and fully winged species such as *Afroepacra* and *Stictogryllacris* but also small and fragile wingless species e. g. in the genera *Ametroides* or *Glomeremus*.

Ensifera / Tettigoniidea Tettigonioidea, Family Tettigoniidae

Bushcrickets

Subfamily Conocephalinae Burmeister, 1838
Subfamily Hetrodinae Brunner von Wattenwyl, 1878
Subfamily Hexacentrinae Karny, 1925
Subfamily Meconematinae Burmeister, 1838
Subfamily Mecopodinae Walker, 1871
Subfamily Phaneropterinae Burmeister, 1838
Subfamily Pseudophyllinae Burmeister, 1838
Subfamily Saginae Brunner von Wattenwyl, 1878

Superfamily Stenopelmatoidea

Wetas or King Crickets (Anostostomatidae)	
Genus *Libanasa*	Libanasas
Genus *Nasidius*	Big Faces
Raspy Crickets	(Gryllacrididae)
Genus *Afroepacra*	Afroepacras
Genus *Afroneanias*	Afroneanias
Genus *Ametroides*	Flightless Raspy Crickets
Genus *Atychogryllacris*	Short-winged Raspy Crickets
Genus *Glomeremus*	Flightless Raspy Crickets
Genus *Stictogryllacris*	Raspy Crickets

Insect Anatomy

In **Insects** or **Hexapoda** (-**hexa** means six and –**poda** feet, because of the six legs differentiating them from e. g. spiders and crustaceans which have more legs) the body is divided into three main parts: head, thorax (middle part) and abdomen (rear part consisting of usually 10 segments in bushcrickets & allies) (Fig. Intro 1). Males often have complicated external genitalia, useful characters to distinguish bushcrickets & allies on genus and species level (Fig. Intro 2). Females usually have a well-developed ovipositor (Fig. Intro 1) used to deposit eggs into the soil, place them between tissue layers of leaves, cut slits into stems of plants, place eggs under bark or glue them to the surface of leaves or branches. In some genera, the ovipositor can be greatly reduced e. g. in the genus *Catoptropteryx*. The head carries eyes, antennae and the mouthparts (Fig. Intro 3) while the thorax carries two pairs of wings (the hard fore wings or tegmina and the soft hind wings or alae which enables the insect to fly (Fig. Intro 4)), and three pairs of legs. The venation of the fore wings is characteristic, especially the course of subcosta and radius and their branches are stable at the genus level. The fastigium verticis (Fig. Intro 5, arrow) is an important character on genus level. It can be very broad (e. g. *Eurycorypha*) to narrow or forming a short to long conical structure (all Agraeciini). The forelegs carry the ears which can be open (Fig. Intro 7) or closed (conchate, Fig. Intro 8). The fore tibiae can be slightly or strongly inflated in this area and differently colored from the rest of the leg in various species. The hind legs are usually longer and thick at their bases enabling the insect to jump.

Bioacoustics
by Klaus-Gerhard Heller

Most bushcrickets produce calling songs that vary from very loud to faint, are monotonous or consist of different parts recognizable to the human ear. Some can be heard only by using a "bat detector" to modulate their ultrasonic sounds. The stridulatory apparatus (dorsal view, Fig. Intro 6, arrows) is located on the fore wing bases consisting of a stridulatory file (few to many sclerotized tiny teeth, Fig. Intro 9) on the left fore wing and a scraper on the right fore wing. The left fore wing with its stridulatory file moves over the scraper of the right fore wing. The typical male calling sound then is produced with the opening or closing movement of the tegmina. A so-called mirror (Fig. Intro 10, arrow) is often used to amplify the sound.

In the subfamily Phaneropterinae, most females answer to the male calling songs with their own acoustic signals. The male calling songs, ranging from very simple to extremely complex, are far more variable in Phaneropterinae than in other tettigoniid groups. Pseudophyllinae are not easily perceived in East Africa since the male calling songs resemble cricket sounds and are often not very loud (e. g. in *Acauloplax exigua*). In the subfamily Mecopodinae male calling songs can be extremely loud and heard at distances of hundreds of meters (*Anoedopoda*) or may be entirely ultrasonic (e. g. *Gymnoscirtes*). Conocephalinae usually have monotonous songs which are partly in the ultrasonic range and thus audible only very faintly if at all with the unaided ear (e. g. *Conocephalus*, all Karniellina). *Ruspolia* species usually sing at night and the songs of some of the species can be very loud and heard from a far distance (e. g. *Ruspolia differens*). Audible songs are also found in the tribe Agraeciini of Conocephalinae. Some *Afroanthracites* species (in the West Usambara Mountains) produce male calling songs clearly perceivable while most *Afroanthracites* and all *Afroagraecia* species sing in the ultrasonic range. Meconematinae calling songs are all in the ultrasonic range as far as they have been recorded in East Africa. Ever present at night is the monotonous male calling song of *Amytta* species. The male calling songs of Hetrodinae species are perceived with the unaided ear and consist of faint (e. g. *Spalacomimus talpa*) to loud (e. g. *Eugasteroides loricatus*) monotonous syllables produced at night. Hexacentrinae songs are very loud and produced by the males at night. Where *Aerotegmina* occurs the whole forest may be filled with the loud chirping sounds starting immediately after sunset. The *Aerotegmina* species of northern Tanzania and southern Kenya produce one of the loudest songs known in bushcrickets.

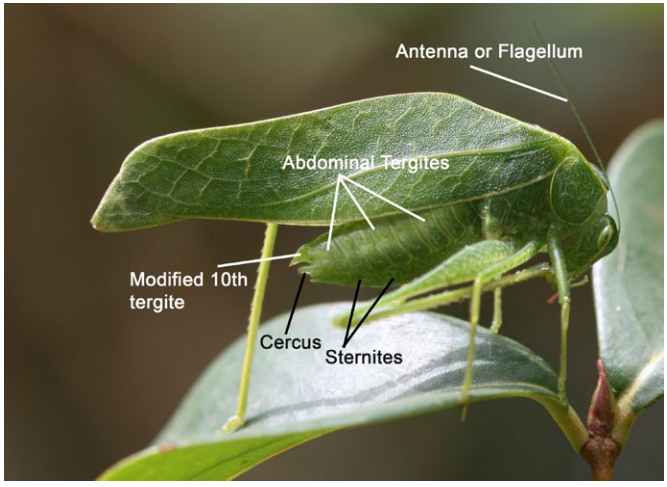

Fig. Intro 2. Body parts: Male *Eurycorypha meruensis*.

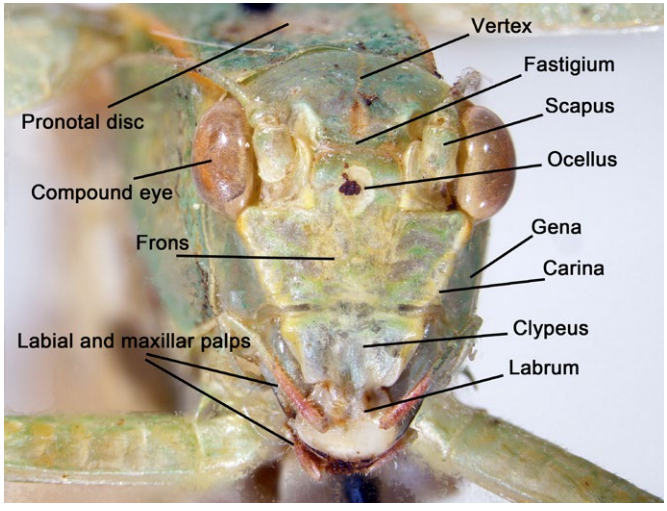

Fig. Intro 3. Body parts: Face of *Eurycorypha combretoides*.

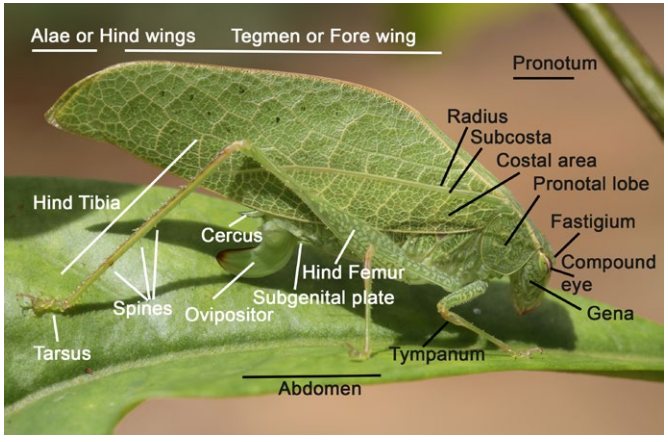

Fig. Intro 1. Body parts: female *Eurycorypha combretoides*.

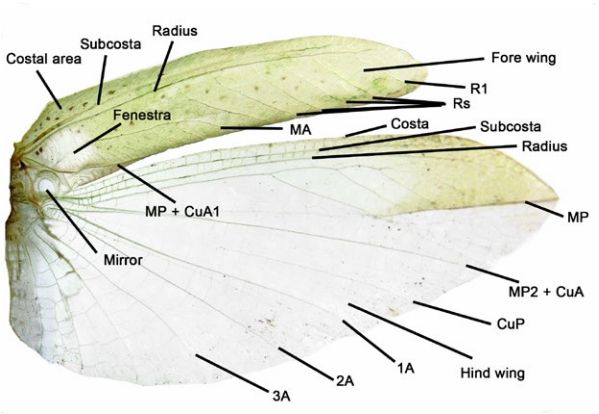

Fig. Intro 4. Veins of fore wing (tegmen) and hind wing (ala).

Fig. Intro 7. Open ear or tympanum on fore tibia.

Fig. Intro 5. The fastigium verticis is an important character to identify many groups. The arrow points on the conical fastigium verticis of *Afroagraecia brachyptera*.

Fig. Intro 8. Conchate (closed) tympanum (arrow) (*Spalacomimus verruciferus*).

Fig. Intro 6. A. Stridulatory area on left fore wing (arrow) (*Debrona cervina*).

B. Enlarged image of stridulatory file from dorsal side of left tegmen of *Debrona cervina*.

Fig. Intro 9. Stridulatory file on the underside of the left tegmen (*Lunidia acuticercata*).

Fig. Intro 10. Mirror (arrow) for amplifying sound (*Aerotegmina kilimandjarica*).

History of Orthoptera Research in East Africa

First intensive collections giving an overview of the Orthoptera fauna of Mt Kilimanjaro and adjacent areas were made by a Swedish Expedition beginning of the last century (Sjöstedt 1910) recording 34 Tettigonioidea and 71 Acridomorpha species for the whole mountain massif, including Mt Meru and parts of the Usambara and Pare Mountains. Sjöstedt also compiled lists of Orthoptera collected on various expeditions (1912; 1918) and described numerous African taxa, especially in Caelifera. An early collector also describing species and providing faunal lists in the area was Gerstäcker (1869). Redtenbacher (1891), Rehn (1901; 1914), Karny, Karsch, Brunner v. Wattenwyl, Beier, Weidner, and Kaltenbach all contributed greatly to the knowledge of the Tettigonoidea diversity of eastern Africa, working mainly on museum material. Brunner von Wattenwyl compiled major lists of Phaneropterinae and Pseudophyllinae, describing taxa and also providing keys (1878; 1891; 1895) and also F. Karsch compiled faunal lists and described numerous taxa from Africa (1887 a, b; 1888 a–e; 1890; 1892; 1896; 1898) with a special focus on Mecopodinae, Meconematinae, and Phaneropterinae. H. Karny mainly worked on Conocephalinae (1907; 1909; 1912 a, b), and Listroscelidinae (1912 c) and compiled faunal lists of expeditions led to various areas of Africa (e. g. 1907; 1915; 1929). M. Beier focused on Pseudophyllinae and Meconematinae (e. g. 1944; 1954; 1965; 1967) while Weidner revised African Hetrodinae (1941; 1955). Kaltenbach (1970, 1972) provided valuable papers on African Saginae while Chopard provided faunal lists (1921; 1932; 1936; 1938; 1943; 1945) and described taxa, mainly in Phaneropterinae (e. g. 1954; Chopard & Kevan 1954).

Focusing on African bushcrickets the British orthopterologist David Ragge contributed greatly to the knowledge of this group, revising and describing numerous genera and species (1956 a, b; 1960 a, b; 1961 a, b; 1962 a, b; 1964; 1969) and published a comprehensive list of Phaneropteridae with open tympana in 1980 also describing various new genera and species and providing keys. Revisions of single genera also giving keys to the species were made by e. g. Huxley (1970) (*Catoptropteryx*), Bailey (1975) (*Ruspolia*), and Glenn (1991) (*Enyaliopsis*).

Hemp (2013 a) published an annotated list of Tettigonoidea recording 57 Tettigoniidae and 6 Gryllacridinae species for Mt Kilimanjaro and additional species were listed for this mountain and a list provided for the East Usambara Mountains and additional species described for East Africa (Hemp 2013 b). Numerous new taxa were described, genera revised and studies on the ecology, acoustics, chromosomes and molecular phylogenies prepared from 2001 onwards (Heller & Hemp 2014; 2017; 2018; Hemp & Heller 2017 a, b; 2019 a, b; Heller et al. 2010; 2014; 2015; 2017; Hemp 2001a–c; 2002a, b; 2005 a, b; 2006 a, b; 2007; 2009; 2010; 2011; 2013 a–c; 2015; 2016; 2017 a–d; 2020 a, b; Hemp et al. 2009; 2010 a–d; 2012; 2013 a, b; 2014; 2015 a–c; 2016 a, b; 2017 a–c; 2018 a, b; 2019; Hemp & Hemp 2003; 2008; 2018; 2011; 2018; Voje et al. 2009; Warchalowska-Sliva et al. 2015; Grzywacz et al. 2015) focusing on the Phaneropterinae genera *Eurycorypha*, *Plangia*, *Ectomoptera*, *Dioncomena*, *Lunidia*, *Monticolaria*, *Parapyrrhicia*, *Gonatoxia*, *Odonturoides*, and *Tropidonotacris*, the East African Acrometopini, the East African Agraeciini (Conocephalinae), African Hetrodinae, the Mecopodinae genus *Philoscirtus*, the Hexacentrinae genus *Aerotegmina* and the Meconematinae genera *Amytta*, *Afrophisis* and *Phlugidia*. Two papers were published on the genus *Libanasa* trying to clarify their taxonomic status within Anostostomatidae and describing a new species (Johns & Hemp 2015; Hemp & Johns 2015). New genera were erected on taxa from the rapidly vanishing lowland wet forests, *Pseudotomias* in Pseudophyllinae and *Pseudopreussia,* and *Materuana* in Phaneropterinae.

Biodiversity, Bioindication, and Conservation

Bushcrickets, grasshoppers, and allies are often perceived only as being pests although only a handful of species are recorded occasionally causing damage to crops. The majority of bushcricket species & allies are inconspicuous and are rarely seen as they resemble leaves and are thus perfectly camouflaged in the vegetation.

This guide is an attempt to provide an overview of the **Bushcricket**, **Weta**, and **Raspy Cricket** fauna of parts of Tanzania and Kenya, highlighting the enormous diversity of these interesting groups of insects. Many species are endemic to the area, meaning that some of the species are only found in a very restricted area, mostly confined to single mountains or mountain ranges. Many species are dependent on forest habitats and are thus endangered by clearing or burning of forested areas and encroachment by human settlement.

Therefore, when treating species restricted to an area or being endemic to mountains and mountain ranges the conservation status following the nomenclature of the IUCN red list is suggested.

Thus species are vulnerable, endangered, or critically endangered depending e. g. on how many populations are known and how fast the habitats which the species require are vanishing in East Africa.

Various bushcricket species are excellent bioindicators because many species have narrow ecological niches in which they can live and thus define their habitats very precisely. Thus the presence/absence of certain species in an area quickly provides information about the quality of a given forest for example. A rapidly increasing human population impacts pristine forest habitats of East Africa by cutting, burning, and using also steepest slopes as rangeland for life stock these days. For example, the vegetation type "Obstgartensteppe" is almost lost on Mt Kilimanjaro. The presence of species such as the **Great Ridgeback** (*Tropidonotacris grandis*) indicates dry deciduous forest or the habitat type "Obstgartensteppe"(orchard steppe) that are vanishing rapidly in East Africa. Coastal and lowland forests, once a contiguous belt along the Kenyan and Tanzanian coasts and lowland wet forests at the foothills of mountain ranges and mountains are almost entirely cleared away today, only a few patches, mostly more or less protected forest reserves, are left. With them, a unique flora and fauna disappear replaced by scrub and grassland harboring at the most widespread species (Gereau et al. 2016).

Fig. Intro 11. Map of East Africa with mountains and mountain ranges indicated.

Area covered in this guide

The range of this guide covers northern Tanzania and southern to central Kenya, coastal Tanzania, and many species of central Tanzania (Map, Fig. Intro 11). Genera restricted to East Africa are covered by keys to all known species e. g. the Karniellina genera *Phlesirtes* and *Fulvoscirtes*.

Climate and Vegetation

by Andreas Hemp

(adapted from Jago´s Grasshoppers of East and North East Africa Vol 1 (2015) (Ed. Rowell, Hemp C. & Harvey)

Climate

The climate of East Africa is characterized by a typical equatorial daytime climate that is modified by elevation and exposure. Average diurnal ranges of temperature (5–8 °C at the coast, 8–11 °C inland) are higher than the mean annual range of 4 °C. Although East Africa lies in the tropics, very high daytime temperatures are reached only in limited areas because most of the plateau lands lie at over 1000 m. Temperatures of 40 °C are very rare and occur normally only in the Rift Valley. Mean annual temperature decreases from 27 °C at the coastal belt near sea level and the coastal islands to -7.1 °C at 5895 m on Kilimanjaro summit with a lapse rate of about 0.5–0.7 °C per 100 m. In particular, the climate of the alpine regions of East Africa is characterized by a very pronounced day-time climate with a massive diurnal variation. This was described by Hedberg (1964) as 'summer every day and winter every night'. Frost can occur during clear nights throughout the year at elevations above 2700 m and snow can cover the vegetation above about 3800 m for days at a time. The rainfall of East Africa depends mainly on the prevailing winds, which are governed by the seasonal movement of the intertropical convergence zone (ITCZ) but rainfall is also influenced by sea surface temperature dynamics. The ITCZ, a broad, low-pressure zone where the subtropical NE and SE trade winds meet resulting in convectional rainfall follows the sun's movements with about one month's lag. In East Africa, the SE trade winds dominate from May to October, while the NE trade winds dominate from November to April. Sea surface temperature dynamics, mainly in the Pacific (ENSO) and Indian Ocean (Indian Ocean Dipole, IOD) also influence the climate of East Africa. In addition, the large lakes of East Africa and the varied topography also modify wind flow and rain distribution in the highlands. The wet seasons are associated with the period of change in direction of the prevailing wind. Two rainy seasons are discernable near the equator between 3–4 ° N and S latitude (Rwanda, Uganda, Kenya, Tanzania), the "short rains" from November to December and the "long rains" from March to May, while there is only one rainy season further N and S. In northern Kenya and Uganda the main rainy season continues from April to August, in Ethiopia from April to September, while in central and southern Tanzania the rains begin from November onwards continuing into April, followed by a well-marked dry season. East Africa is anomalously dry. About 66 % of East Africa suffers from drought for six months of the year, while only 2 % of the area has a reliable rainfall of >50 mm every month, and e. g. only some 4 % of Tanzania has >1250 mm of rainfall annually. Only 15 % of Kenya receives a reliable 750 mm per year, adequate for crop production, compared with 50 % of Tanzania and 75 % of Uganda (Glover et al. 1954). Generally, the mountains stand out as wet areas and they are usually wetter on their south-eastern faces. However, only a few mountain areas have perhumid climate conditions, receiving more than 2500 mm, e. g. Kilimanjaro, or Ruwenzori. Generally, East African mountains have dry foothills where the maximum rainfall occurs somewhere below 2500 m, depending on the elevation at which the wet monsoon interacts with the dry trade winds. For example, the mean annual precipitation at the foothills of the southern slopes of Kilimanjaro is 500–600 mm, at 2200 m it is partly more than 3000 mm, at 3000 m (approximating the upper forest boundary) it is 1350 mm and at 4000 m it declines to 600 mm. Except for such humid mountains, most areas of East Africa belong to the zone of a seasonal dry tropical climate. Conditions inland from the coast up to the Eastern Rift highlands are semi-arid. The driest areas are the semi-deserts of North Kenya around Lake Turkana and Somalia receiving an unreliable average under 250 mm per year, which are due to the high temperatures and the corresponding high evaporation. Only the "alpine deserts" of Kilimanjaro above 4500 m a.s.l. receive a similar low precipitation, but have a humid climate regime due to the much lower temperatures and evaporation. Thus, East Africa comprises areas along a huge climatic gradient ranging from warm tropical lowland to cold afroalpine temperature regimes and from arid to perhumid conditions.

Vegetation

Coastal vegetation

The vegetation of the sea coast is confined to a narrow strip of 5–10 km with an annual rainfall of about 1000–1400 mm. Sand dunes, coastal bushland and forest, coastal savanna, and mangrove swamps are a feature of some parts of the coastline of Somalia, Kenya, and Tanzania. However, this area has been densely settled for many centuries and therefore is mostly occupied by commercial plantations of coconut palms and sisal, smallholders' fields with Manihot and maize and degraded overgrazed grasslands. An interesting array of typical East African coastline vegetation can be still seen in the Sadaani National Park between Pangani and Dar es Salaam in Tanzania: sand dunes with the long-creeping (and pan-tropical) *Ipomoea pes-caprae* (Convolvulaceae), salt marshes with the fern *Acrostichum aureum* and coastal savanna with *Borassus* and *Hyphaene* palms. A very typical feature of (sub)tropical coastlines are mangrove forests, which grow between high and low tide levels in sheltered situations in estuaries and on exposed coast protected by coral reefs or islands. The most extensive and species-rich mangrove forests occur round the mouth of Rufiji and Pangani River in Tanzania, and around Lamu in North Kenya. Mangrove shows a very distinct zonation of the dominant trees with *Sonneratia* on the open coast, followed by *Rhizophora*,

Ceriops and *Avicennia*. This zonation is caused mainly by water level and salinity.

Coastal bushland and scrub forest on fossil coral reef limestone ("coral rag") with *Pandanus*, *Pemphis*, *Sideroxylon inerme*, and *Surregada zanzibarensis* fringes the sand dunes and mangroves on the Tanzanian and Kenyan coast. Coastal vegetation is generally poor in specially adapted Orthoptera. No specially-adapted Orthoptera have been recorded so far from mangrove habitats.

Savanna

Stretching inland from the coast, savanna vegetation (grassland with a more or less dense shrub and tree layer) covers large areas of East Africa (two-thirds of Kenya) at low to medium elevations (50–1400 m) and 250–900 mm precipitation. This vegetation formation typical of Africa was shaped by the long-lasting influence of humans (pastoralism, fire) and wild herbivores. The semi-desert vegetation of the driest areas of northern Kenya and Somalia, receiving only about 250 mm erratic and unreliable rainfall, consists of isolated tufts of grass (*Aristida*) and occasional low, partly thorny bushes (*Commiphora*, *Acacia*, *Sericomopsis*).

With increasing precipitation further south vegetation cover becomes denser. With an (erratic and unreliable) rainfall of 500–700 mm a year savanna grasslands dominated by acacias (*A. tortilis*, *A. seyal*, *A. nilotica*, *A. senegal*, *A. hockii*, *A. mellifera*) have their greatest development in a broad belt, which encircles Kenya's highlands, extending north to Somalia and south to northern Tanzania (Seregenti, Ngorongoro, Masai steppe). After the rainy season, the ground is more or less covered (depending on the cover of shrubs and trees) by grasses (*Pennisetum*, *Hyparrhenia*, *Andropogon*, *Heteropogon contortus*, *Themeda triandra*, *Eragrostis*), sedges (*Cyperus niveus*, *C. amomodorus*) and bulbous lilies (*Hypoxis*, *Crinum*, *Chlorophytum*, *Gladiolus*). On frequently waterlogged black cotton soil the gall acacias (*A. drepanolobium* and *A. seyal* var. *fistulosa*) are common. An increase in rainfall favors wooded savanna grasslands in Kenya, Uganda, Rwanda, and Tanzania dominated by deciduous trees and bushes such as *Commiphora*, *Terminalia*, *Boscia*, *Lannea*, *Ozoroa*, *Sclerocarya* and *Grewia*, as well as *Acacia* spp. The fruit tree-like appearance of the stunted woody species – mainly belonging to Combretaceae, Burseraceae and Anacardiaceae – inspired the first botanists to describe this vegetation formation as "Obstgartensteppe" (orchard-steppe). In these areas, the presence or absence of elephants is often the deciding factor between forest or grassland.

In damp areas (in particular on the coast) the dichotomously branched Doum palm (*Hyphaene coriacea*) grows partly together with the African fan palm (*Borassus aethiopum*) and here and there Baobab (*Adansonia digitata*). Around the shores of the lakes in the Rift valley, the fever tree *Acacia xanthophloea* forms distinct monotypic woodlands. On steep slopes and rocky habitats, large succulents such as *Euphorbia obovata*, *quinquecostata* or *candelabrum* occur. The above-described types of savanna vegetation occur in large areas of East Africa, in particular inside the national parks (e. g. Queen Elizabeth, Kidepo Valley, Lake Mburo, Tsavo, Amboseli, Serengeti). Outside of such protected areas savanna becomes more and more overgrazed and degraded or is converted into agricultural fields or plantations.

Savanna habitats belong to the most important habitats for Orthoptera. Although most species found in typical savanna are widespread, extending from the West African Sahel to the coasts of Somalia and Eritrea, some are restricted to East Africa, and also local endemics occur, mostly in the vicinity of mountains.

Miombo woodlands

With an increasing tree height and cover these open vegetation types change into woodlands, where trees reach a height of 15 m, with the crowns just touching to form an open canopy, in contrast to forest with a deeply closed canopy. Such Miombo or *Brachystegia-Julbernardia* woodlands consists of deciduous trees such as *Brachystegia*,

Fig. Climate 1. Savanna woodlands around Mt Kasigau in southern Kenya.

Fig. Climate 2. Miombo woodland in the Mpwapwa District of central Tanzania. Miombo woodlands are vanishing rapidly in East Africa.

Julbernardia, *Isoberlinia*, *Afzelia*, *Terminalia*, *Lonchocarpus*, *Combretum* and *Markhamia* and have many species in common with savanna ecosystems but grade into seasonal closed dry forest. Miombo woodlands are one of the most extensive vegetation types in Africa apart from the forests of the Congo Basin covering 2.7 million km² and extending from southern Tanzania and southern Democratic Republic of Congo (DRC) in the north to the northern provinces of South Africa, and across the continent from Angola through Zambia to Malawi and Mozambique. This vegetation formation comprises about 80 % of the natural vegetation in Zambia and 50 % of Tanzania, whereas it is strikingly absent from Kenya and Uganda. Miombo woodlands extend from sea level up to 1600 m in areas of 500–1200 mm annual rainfall in central and southern Tanzania. Miombo vegetation structure and species composition is greatly influenced by fire. It has been estimated that Miombo constitutes the largest single area regularly burned in the world (1 million km² per year). Burning and cutting and conversion into agricultural fields and tobacco plantations are rapidly destroying increasing areas of Miombo woodlands.

Aquatic vegetation

Aquatic vegetation along shallow freshwater lake shores consists of deep reed swamps, mainly of papyrus (*Cyperus papyrus*), other sedges and rushes such as *Eleocharis*, *Typha domingensis*, but also grasses (*Leersia*, *Oryza*) and ferns (*Thelypterus confluens*). Extensive papyrus swamps can be seen fringing Lake Victoria, Lake Kyoga, Lake Naivasha, or Lake Jipe at the border between Tanzania and Kenya. The saline lakes are fringed by a much narrower belt of *Cyperus laevigatus*. The floating and submersed freshwater vegetation is characterized by *Nymphaea*, *Potamogeton*, *Ceratophyllum*, *Utricularia,* and *Ottelia*. The surface of slowly moving rivers and canals, but also of sheltered bays of the major lakes can be completely covered by plants such as *Pistia* (Araceae), and water ferns such as *Salvinia* and *Azolla*, or introduced species such as water hyacinth (*Eichhornia*, Pontaderiaceae) causing grave problems in some areas. In marked contrast to the situation in the Neotropics, there are no African grasshoppers specialized on this floating vegetation. Swampy areas and moist grasslands are generally poor in Orthoptera.

Forests

i. Lowland forests

Due to climatic restrictions and human impact not more than 5 % of East Africa's surface is closed forest. These forest relicts are mainly confined to mountains. In the lowlands (below 800 m) only few patches of forest remain, either occurring at the base of the Eastern Arc Mountains and of the SW plateau of the Ethiopian highlands or as remnants of the former widespread coastal forest strip, or on the Congo/Ugandan border. Apart from the Eastern Arc Mountains, precipitation in the coastal region is 700–1400 mm per year with an evaporation that exceeds rainfall for most of the year. Therefore, the coastal forests are mainly dry semi-deciduous or semi-evergreen, partly evergreen ("tropical dry forests"), growing on low hills and in riverine situations along the coast from southern Somalia down to Mozambique. Repeated fires in combination with clearance for cultivation have caused an extensive loss of forest. In Somalia, Kenya and Tanzania only about 800 km² of coastal forest remain. In Somalia remnants of these forests are found in the southern coastal plains, e. g. along the west bank of the Juba River.

In Kenya larger patches of coastal forests still exist in the area of the Shimba Hills Arabuko Sokoke National Park, and in Tanzania e. g. inside the Gendagenda Forest Reserve and in Kazimzumbwi Forest Reserve and on the Pugu Hills (latter Tanzanian forest reserves rapidly declining though). Typical trees include *Tabernaemontana pachysiphon*, *Antiaris toxicaria*, *Trichilia emetica*, and *Bombax rhodognaphalon*, and many forest stands are dominated by legumes (*Cynometra*, *Craibia*, *Julbernardia*, *Berlinia*, *Brachystegia*). Many plants and animals are endemic. Since some of these genera and species occur also in the Guineo-Congolian rain forests the Eastern African coastal dry forest are perhaps relicts of a former pan-African lowland forest. Dry semi-deciduous forests similar in physiognomy and composition exist in the Baro lowlands of western Ethiopia. Deciduous dry forests harbor a high diversity of Orthoptera, especially in Ensifera. Orthoptera dependent on this kind of habitat are therefore highly endangered these days, as was suggested for the phaneropterine *Tropidonotacris grandis*. *Allaga ambigua* (Catantopinae) occurs in this habitat, a species listed on the IUCN red list of threatened species. From the coastal plains at an elevation of 100–400 m a.s.l. rise the mountains of the Eastern Arc, a disjunct range of old metamorphic mountains in south-eastern Kenya and eastern Tanzania. At the base of these mountains below 800 m a.s.l. (Ulugurus, Udzungwas and East Usambaras), where precipitation increases to over 2000 mm, some of the few existing patches of relict lowland rainforest in East Africa occur. Located in the transition from coastal dry forest to the wet submontane forests they harbor elements of the coastal forests but differ completely in physiognomy and structure with a tall canopy of about 40 m and emergents to 50 m. Typical tree species are *Antiaris toxicaria*, *Funtumia africana*, *Angylocalyx braunii*, *Afrosersalisia cerasifera*, and *Pachystela msoslo* with a very high number of endemic species.

ii. Submontane forests

Continuing upwards from the lowland forest, the montane forests of East Africa can be divided into several elevational belts. Apart from temperature, precipitation is the main factor determining forest zonation (structure and species composition). Submontane forests cover the foothills of the East African mountains. Due to dense human settlements in such situations, only few relicts in particular of moist evergreen forests are left. At the Eastern Arc Mountains located in the low Tanzanian coastal plains they start at 800 m, ranging to 1250–1400 m. On the East Usambaras, Ngurus and Ulugurus such submon-

tane moist forests are botanically very rich and consist of *Allanblackia stuhlmannii*, *Cephalosphaera usambarensis*, *Beilschmiedia kweo*, *Parinari excelsa* and *Newtonia buchananii*, receiving a well-distributed rainfall of more than 1800 mm. Further inland, the submontane zones occur at about 1100–1700 mm. The Taita Hills and Mt Kasigau in Kenya, both belonging to the Eastern Arc Mountains, have small remnants of submontane forests dominated by *Newtonia buchananii* in an elevation between 1100 m and 1700 m.

The submontane forests of the Eastern Arc Mountains are also one of the most species-rich areas for bushcrickets, especially in Phaneropterinae but also for Pseudophyllinae and Meconematinae. Thus almost every range of these Eastern Arc Mountains harbors endemic species e. g. in *Gonatoxia*, *Parapyrrhicia*, *Eurycorypha*, *Plangia*, *Dioncomena*, *Pseudotomias*, *Afrophisis*, *Phlugidia* or *Amytta*.

In the cultivated submontane zone of the wet southern slopes of Mt Kilimanjaro forest is restricted to deep valleys and gorges. These forests, although of very small extent (15 km²), are of great biogeographical and palaeobotanical importance: they resemble very much the highly diverse moist forests of the Pare and Usambara Mountains. Typical trees are *Entandrophragma excelsum* (Meliaceae, growing up to over 80 m – at present the tallest tree of Africa), *Heinsenia diervilleoides* and *Mitragyna rubrostipulata* (both Rubiaceae), *Newtonia buchananii* (Mimosaceae), *Leptonychia usambarensis* (Sterculiaceae), *Strombosia scheffleri* (Loganiaceae), *Dasylepis integra* (Flacourtiaceae) and *Garcinia tanzaniensis* (Hypericaceae).

On the drier northern mountain slopes, semi-deciduous or deciduous dry (succulent) forest types occur in the submontane zone. With a rainfall of 600–800 mm deciduous trees and succulents dominate (*Commiphora*, *Uvaria*, *Grewia*, *Combretum*, *Lonchocarpus*, *Euphorbia*) together with *Lecaniodiscus fraxinifolius* and *Teclea simplicifolius*. The shrub layer of these forests is very dense. Such forests grade into savanna woodlands e. g. at the foothills of the Pare Mts and the Taita Hills. Higher rainfall (800–1100 mm) favors the growth of semi-evergreen *Croton-Calodendrum* forests, e. g. on the western slopes below 1600 meters and on the northern slopes below 2000 meters of Kilimanjaro and in the Kenyan highlands around Nairobi, Ngong and Nyeri, as well as in northern Kenya on isolated mountains e. g. on the Matthews Range. Such relatively dry submontane forests are dominated by *Olea europaea* ssp. *africana* (Oleaceae), *Croton megalocarpus* (Euphorbiaceae), *Calodendrum capense* (Rutaceae), *Diospyros abyssinica* (Ebenaceae), and *Brachylaena huillensis* (Asteraceae).

iii. Montane forests

The montane forests in East Africa above 1600 m lie mainly on the lower slopes of the major mountains, and in Kenya, e. g. the Cherengani Hills. Kilimanjaro in Tanzania has the most extensive forest gradient in elevation and climate and can therefore serve as an example of forest zonation in East Africa. On the wet southern slopes, the dominant tree species is camphor (*Ocotea usambarensis*; Lauraceae). Moist evergreen camphor forests cover an area of about 220 km² at

Fig. Climate 3. Montane forest rich in palm trees in the Taita Hills, Kenya at 1700 m.

Kilimanjaro. In the lower areas (1800–2200 m) *Ocotea usambarensis* is associated with *Agauria salicifolia* (Ericaceae), *Macaranga kilimanjarica* (Euphorbiaceae), *Syzygium guineense* (Myrtaceae), and *Polyscias fulva* (Araliaceae). Between 2200–2500 m is the main habitat of camphor where pure stands exist. Here humidity reaches its maximum with an annual precipitation partly exceeding 3000 mm, indicated by the wealth of epiphytes and ferns, in particular filmy ferns and tree ferns. In gorges and long streams, *Afrocrania volkensii* (Cornaceae) is an important constituent of the tree layer. Higher up the Gymnosperm *Podocarpus latifolius* (Podocarpaceae) starts to prevail, replacing *Ocotea* with an increasing altitude between 2500 and 2800 m. Above, between 2800–3200 m, *Podocarpus latifolius*, *Hagenia abyssinica* (Rosaceae) and *Prunus africana* (Rosaceae) form the tree canopy. Monodominant stands of *Erica excelsa* (Ericaceae) play also an important role in this upper montane zone, replacing *Podocarpus* and *Hagenia* forests after fire, forming the actual upper closed forest line at 3200 m. However, small remnants and burnt forests indicate that the upper closed forest line reached much higher up recently (1997); remnants of subalpine *Erica trimera* forests with tree heights up to 10 m mark the former and potential upper closed forest line at above 4000 m, representing today the highest situated forests in Africa. The montane forests of the northern and western slopes are completely different in species composition and structure due to lower precipitation. The lower and middle montane forest types (1600–2500 m) on the eastern, northern, and western slopes extending over 280 km² are characterized by *Cassipourea malosana* (Rhizophoraceae), *Teclea simplicifolia* (Rutaceae), *Fagaropsis angolensis* (Rutaceae) and *Olea capensis*. *Cassipourea forests* on the south western slope with species of *Ocotea* forests and *Dasylepis integra* (Flacourtiaceae) in the tree layer represent an intermediate forest type. Similar *Ocotea* forests prevail in the nearby Taita Hills, and the Pare and Usambara Mountains under similar climatic conditions. Between 2500 m and 3100 m *Juniperus procera* (Juniperaceae), *Podocarpus latifolius* and *falcatus*, *Nuxia congesta*, and *Hagenia abyssinica* are dominant tree species on

the northern slope. A similar forest zonation can be found on the other high mountains reaching over 4000 m, e. g. Mt Meru, Mt Kenya, Mt Elgon and the Karamoja Mountains, the Aberdares, the Virunga volcanoes and the Ethiopian highlands. However, only on Mt Kenya do extensive camphor forests like those on Kilimanjaro exist, the other mountains possibly being too dry to support *Ocotea usambarensis*. In Uganda, *Ocotea usambarensis* does not occur at all, even on the very wet Ruwenzori.

A typical component of most high mountains in East Africa are dense bamboo forests, which cover vast areas on the wet mountain slopes above 2500 m, e. g. on Mt Kenya, Mt Elgon, Ruwenzori, the Virunga volcanoes and the Aberdares. A striking feature of the forests of Kilimanjaro is the absence of such a bamboo zone. Bamboo stands are favored by elephants and buffaloes. On Kilimanjaro these megaherbivores occur on the northern slopes, where it is too dry for a bamboo zone to develop. They are excluded from the wet southern slope forests by deep gorges and by humans, who have cultivated the foothills for at least 2000 years. This interplay of biotic and abiotic factors could explain not only the lack of a bamboo zone on Kilimanjaro but also offers possible explanations for diversity and endemism patterns of this mountain. Kilimanjaro's forests can, therefore, serve as a striking example of the large and long-lasting influence of both animals and humans on the African landscape. Bamboo forests do not generally serve as good habitat for Orthoptera, so this vegetation unit is comparatively poor.

Tropical forests worldwide are threatened by many factors associated with human population pressure and climate change, but Afromontane forests may be particularly vulnerable because they are located in areas long favored by human occupation and where human population growth rate is high (e. g. currently 3.24 % / annum in Uganda, 3.28 % / annum in Burundi, 4.12 % / annum in South Sudan). Major threats to Afromontane forests include forest clearance or fragmentation by fire for agriculture, tea plantations, grazing or mining, logging, selective harvesting, and hunting. With an annual forest clearance of about 150,000 to 200,000 ha, the forest cover of Ethiopia was reduced to 16 % during the 1950s and to 2.7 % by 1989. Ethiopian montane forests are now reduced to small patches of high elevation *Podocarpus* and *Juniperus* covering less than 1 % of the area.

Alpine vegetation

The flora and vegetation of the tropical-alpine regions found above the montane forests on the African mountains is sharply distinct from that of the surrounding tropical lowlands. The mountains on which this flora occurs form a series of isolated 'sky-islands' or 'archipelago-like regions'. The affinities of this African tropical-alpine flora is closer to the temperate Eurasian than to the surrounding Afrotropical flora. Alpine environments of East African mountains (e. g. Simien and Bale Mts in Ethiopia, Mt Kenya, the Aberdares, Mt Elgon in Kenya/Uganda, Ruwenzori, and the Virunga volcanoes in Uganda/Rwanda, Mt Kilimanjaro and Mt Meru in Tanzania) are famous for their endemic and charismatic taxa, such as the giant *Lobelia*, *Dendrosenecio* and shrubby *Alchemilla*, *Helichrysum* and *Hypericum* with very special growth forms. Hedberg (1964) stresses the enormous physiological strain on plants in this region, that in the mornings may experience sunlit, transpiring leaves while the root system is still frozen. The upper limit of the Afroalpine belt is defined by the absence of a vegetation cover, or the presence of a permanent snowline (= nival zone), which occurs at about 4500–5000 m. The lower boundary of any alpine zone is commonly defined by the presence of a tree line, which is e. g. at 4000 m on Kilimanjaro. Between tree line and the closed forest line normally lies a transitional vegetation zone of several hundred meters in elevation.

This subalpine zone between the broad-leaf montane forest and the alpine *Helichrysum* scrub vegetation corresponds closely to the "ericaceous belt" and is a result of recurring fires or – on Mt Elgon or in Ethiopia – of fire and grazing.

The vegetation of the subalpine zone consists of ericaceous shrublands, which represent different regeneration stages of burnt *Hagenia*, *Podocarpus,* and *Erica excelsa* forests. Due to the open canopy of the shrub layer (*Erica arborea*, *E. trimera*, *Protea caffra*, *Stoebe kilimandscharica*, *Anthospermum usambarense* and *Adenocarpus mannii*) many alpine species occur in alpine *Helichrysum* scrub. In areas with a high fire frequency, tussock grasslands ("moorlands") with *Festuca*, and giant lobelias are widespread, e. g. on the Aberdares, on the south-eastern slope of Mt Kilimanjaro, Mt Elgon, and Mt Kenya. In contrast to the dry moorlands, *Carex* bogs – an important habitat of *Dendrosenecio* – occur on wet sites along streams or water sources. Between 3900–4000 m and 4500 m alpine dwarf scrub covers huge areas, where *Helichrysum* and *Senecio* are dominant and rich in species.

Alpine habitats are usually almost devoid of Orthoptera except for a few endemic species adapted to high altitudes (e. g. from the Pyrgomorphid genus *Parasphena*).

Fig. Climate 4. *Erica* and *Helichrysum* vegetation around a swampy area with *Dendrosenecio* at 3800 m on the southern slopes of Mt Kilimanjaro.

Species List of the Bushcrickets, Wetas and Raspy Crickets of Tanzania and Kenya

Tettigoniidae

Conocephalinae	**Spiny-headed, Meadow and Coneheaded Bushcrickets**
Agraeciini	**Agraeciine Bushcrickets**
Afroagraecia bloyeti (Brongniart, 1897)	Bloyet´s Afroagraecia
Afroagraecia brachyptera Hemp & Ingrisch, 2013	Short-winged Afroagraecia
Afroagraecia kisarawe Hemp, 2017	Kisarawe Afroagraecia
Afroagraecia flava Hemp, 2019	Yellow Afroagraecia
Afroagraecia furcata Hemp, 2019	Forked Afroagraecia
Afroagraecia jozani Hemp, 2019	Jozani Afroagraecia
Afroagraecia mangula Hemp, 2017	Udzungwa Afroagraecia
Afroagraecia nguruensis Hemp, 2019	Nguru Afroagraecia
Afroagraecia panteli (Karny, 1907)	Pantel´s Afroagraecia
Afroagraecia pwania Hemp & Ingrisch, 2013	Coastal Afroagraecia
Afroagraecia sansibara (Redtenbacher, 1891)	Zanzibar Afroagraecia
Afroagraecia shimbaensis Hemp, 2013	Shimba Hills Afroagraecia
Afroanthracites discolor Hemp et al., 2013	Colourful Afroanthracites
Afroanthracites guttatus Hemp, 2019	North Pare Afroanthracites
Afroanthracites inopinatus Hemp, 2019	Unexpected Afroanthracites
Afroanthracites jagoi Ünal & Hemp, 2013	Jago´s Afroanthracites
Afroanthracites lineatus Hemp, 2019	Striped Afroanthracites
Afroanthracites lutindi Hemp, 2015	Lutindi Afroanthracites
Afroanthracites maculatus Hemp, 2019	South Pare Afroanthracites
Afroanthracites magamba Hemp, 2019	Magamba Afroanthracites
Afroanthracites montium (Sjöstedt, 1909)	Montane Afroanthracites
Afroanthracites ngologolo Hemp, 2017	Udzungwa Afroanthracites
Afroanthracites nguru Hemp, 2017	Nguru Afroanthracites
Afroanthracites pommeri Hemp, 2019	Pommer´s Afroanthracites
Afroanthracites pseudodiscolor Hemp, 2015	Lutindi colourful Afroanthracites
Afroanthracites uluguruensis Hemp & Ünal, 2013	Uluguru Afroanthracites
Afroanthracites usambaricus (Sjöstedt, 1913)	West Usambara Afroanthracites
Afroanthracites viridis Hemp et al., 2013	Green Afroanthracites
Dendrobia amaniensis Hemp & Ingrisch, 2017	Amani Tree Summiteer
Dendrobia octopunctata Hemp, 2017	Eight-dotted Tree Summiteer
Dendrobia plagata Hemp, 2019	Nguru Tree Summiteer

Conocephalini, Conocephalina	**Meadow Bushcrickets**
Conocephalus (*Megalotheca*) *phasma* Gorochov & Ld Moral, 2004	East African Rifle-shaped Meadow Bushcricket
Conocephalus (*Anisoptera*) *maculatus* (Le Guillou, 1841)	Mottled Meadow Bushcricket
Conocephalus (*Anisoptera*) *iris* (Serville, 1839)	Rainbow Meadow Bushcricket
Conocephalus (*Conocephalus*) *conocephalus* (Linné, 1767)	Common Meadow Bushcricket

Conocephalini, Karniellina	
Acanthoscirtes albostriatus Hemp, 2012	White-striped Thorny Meadow Hopper
Chortoscirtes masaicus Hemp, 2010	Masai Brown Meadow Hopper

Chortoscirtes meruensis (Sjöstedt, 1909)	Meru Brown Meadow Hopper
Chortoscirtes pseudomeruensis Hemp, 2010	East Kilimanjaro Brown Meadow Hopper
Chortoscirtes puguensis Hemp, 2010	Pugu Brown Meadow Hopper
Chortoscirtes serengeti Hemp, 2010	Serengeti Brown Meadow Hopper
Fulvoscirtes fulvotaitensis Hemp, 2012	Taita Orange Meadow Hopper
Fulvoscirtes fulvus Hemp, 2012	Bright Orange Meadow Hopper
Fulvoscirtes kilimandjaricus (Sjöstedt, 1909)	South Kilimanjaro Orange Meadow Hopper
Fulvoscirtes laticercus Hemp, 2012	Sabuk Orange Meadow Hopper
Fulvoscirtes legumishera Hemp, 2012	North Kilimanjaro Orange Meadow Hopper
Fulvoscirtes manyara Hemp, 2012	Manyara Orange Meadow Hopper
Fulvoscirtes sylvaticus Hemp, 2012	Forest Orange Meadow Hopper
Fulvoscirtes viridis Hemp, 2012	Green Orange Meadow Hopper
Melanoscirtes kibonotensis (Sjöstedt, 1909)	Kibonoto Black Meadow Hopper
Melanoscirtes shengenae Hemp, 2010	South Pare Black Meadow Hopper
Melanoscirtes taitensis Hemp, 2010	Taita Black Meadow Hopper
Melanoscirtes usambaricus Hemp, 2010	Usambara Black Meadow Hopper
Phlesirtes brachiatus Uvarov, 1924	Short Montane Meadow Hopper
Phlesirtes chyuluensis Hemp, 2017	Chyulu Montane Meadow Hopper
Phlesirtes elgonensis Hemp, 2017	Elgon Montane Meadow Hopper
Phlesirtes githunguri Hemp, 2017	Githunguri Montane Meadow Hopper
Phlesirtes gladiolus Hemp, 2017	Flower Montane Meadow Hopper
Phlesirtes hanangensis Hemp, 2017	Hanang Montane Meadow Hopper
Phlesirtes keniensis Hemp, 2017	Kenya Montane Meadow Hopper
Phlesirtes kilimontanus Hemp, 2017	Kilimanjaro Montane Meadow Hopper
Phlesirtes laikipiaensis Hemp, 2017	Laikipia Montane Meadow Hopper
Phlesirtes latifrons Chopard, 1954	Broad-headed Montane Meadow Hopper
Phlesirtes limuru Hemp, 2017	Limuru Montane Meadow Hopper
Phlesirtes mauensis Hemp, 2017	Mau Montane Meadow Hopper
Phlesirtes melanocercus Hemp, 2017	Black Montane Meadow Hopper
Phlesirtes merumontanus (Sjöstedt, 1909)	Northern Tanzanian Montane Meadow Hopper
Phlesirtes ngongensis Hemp, 2017	Ngong Montane Meadow Hopper
Phlesirtes ngorongoroensis Hemp, 2017	Ngorongoro Montane Meadow Hopper
Phlesirtes nou Hemp, 2017	Nou Montane Meadow Hopper
Phlesirtes timboroa Hemp, 2017	Timboroa Montane Meadow Hopper

Copiphorini	**Cone-headed Bushcrickets**
Lanista varelai Bolívar, 1906	Varela´s Mimicking Snout Nose
Pseudorhynchus pungens pungens (Schaum, 1853)	Stabbing Mimicking Snout Nose
Ruspolia differens (Serville, 1839)	Variable Conehead
Ruspolia fuscopunctata (Karny, 1907)	Brown-dotted Conehead
Ruspolia exigua (Bolivar, 1922)	Montane Conehead

Hetrodinae	**Armoured Ground Bushcrickets**
Enyaliopsis bloyeti (Lucas, 1885)	Bloyet´s Armoured Ground Bushcricket
Enyaliopsis carolinus Sjöstedt, 1913	Caroline´s Armoured Ground Bushcricket
Enyaliopsis ephippiatus (Gerstäcker, 1869)	Saddled Armoured Ground Bushcricket
Enyaliopsis jennae Glenn, 1991	Jenna´s Armoured Ground Bushcricket

Enyaliopsis sp.	Mpwapwa Armoured Ground Bushcricket
Eugasteroides loricatus loricatus (Gerstaecker, 1869)	Tank Armoured Ground Bushcricket
Gymnoproctus rammei Weidner, 1941	Ramme´s Armoured Ground Bushcricket
Gymnoproctus sculpturatus Schmidt, 1990	Sculptured Armoured Ground Bushcricket
Gymnoproctus similis Weidner, 1955	Striped Armoured Ground Bushcricket
Spalacomimus magnus (La Baume, 1911)	Large Armoured Ground Bushcricket
Spalacomimus stettinensis Weidner, 1941	Von Stetten´s Armoured Ground Bushcricket
Spalacomimus talpa (Gerstäcker, 1869)	Smooth Armoured Ground Bushcricket
Spalacomimus verruciferus (Karsch, 1887)	Warty Armoured Ground Bushcricket

Hexacentrinae	**Fierce Predatory Bushcrickets**
Aerotegmina kilimandjarica Hemp, 2001	Kilimanjaro Balloon
Aerotegmina megaloptera Hemp, 2013	Coastal Balloon
Aerotegmina shengenae Hemp, 2006	South Pare Balloon
Aerotegmina taitensis Hemp, 2013	Taita Balloon
Aerotegmina vociferator Hemp, 2018	Whistling Balloon

Meconematinae	**Vibrating Bushcrickets**
Afrophisis flagellata Hemp, 2013	Flagellate Spider Bushcricket
Afrophisis kisarawe Hemp, 2013	Kisarawe Spider Bushcricket
Afrophisis mazumbaiensis Hemp, 2013	Mazumbai Spider Bushcricket
Afrophisis pseudoflagellata Hemp, 2013	Pseudoflagellate Spider Bushcricket
Afrophisis tanzanica Jin & Kevan, 1991	Tanzanian Spider Bushcricket
Afrophisis undosa Hemp, 2017	Wavy Spider Bushcricket
Amytta abbreviata Karsch, 1888	Short Delicate Vibrating Bushcricket
Amytta digitata Hemp, 2017	Lutindi Delicate Vibrating Bushcricket
Amytta hanangensis Hemp, 2017	Hanang Delicate Vibrating Bushcricket
Amytta judithae Hemp, 2017	Judith´s Delicate Vibrating Bushcricket
Amytta kilimandjarica Hemp, 2001	Kilimanjaro Delicate Vibrating Bushcricket
Amytta kilomeni Hemp, 2017	North Pare Delicate Vibrating Bushcricket
Amytta meruensis Hemp, 2017	Meru Delicate Vibrating Bushcricket
Amytta merumontana Hemp, 2017	Merumontane Delicate Vibrating Bushcricket
Amytta mramba Hemp, 2017	Mramba Delicate Vibrating Bushcricket
Amytta olindo Hemp, 2001	Pale Delicate Vibrating Bushcricket
Amytta pellucida Karsch, 1888	Long-winged Delicate Vibrating Bushcricket
Amytta savannae Hemp, 2017	Savanna Delicate Vibrating Bushcricket
Amytta taitensis Hemp, 2007	Taita Delicate Vibrating Bushcricket
Amytta ukamica Beier, 1965	Ukami Delicate Vibrating Bushcricket
Phlugidia africana Kevan & Jin, 1993	East African Phlugidia
Phlugidia ampendiculata Hemp, 2017	Pendant Phlugidia
Phlugidia kisarawe Hemp, 2017	Kisarawe Phlugidia
Phlugidia obtusicercus Hemp, 2013	Blunt-tipped Phlugidia
Phlugidia planicercus Hemp, 2013	Flattened Phlugidia
Phlugidia usambarica Hemp, 2002	Usambara Phlugidia

Saginae	**Stick or Predatory Bushcrickets**
Clonia (*Clonia*) *jagoi* Kaltenbach, 1971	Jago´s Clonia

Mecopodinae	**Brown Ground or Long-legged Bushcrickets**
Anoedopoda lamellata (Linné, 1758)	Smooth Noisy Brown Ground Bushcricket
Apteroscirtus cristatus Hemp, 2013	Scaly Flightless Brown Ground Bushcricket
Apteroscirtus densissimus Hemp, 2020	Stout Flightless Brown Ground Bushcricket
Apteroscirtus planidorsatus Hemp, 2013	Smooth Flightless Brown Ground Bushcricket
Gymnoscirtus corifterus Hemp, 2020	Wingless Naked Brown Ground Bushcricket
Gymnoscirtus unguiculatus Karsch, 1888	Common Naked Brown Ground Bushcricket
Philoscirtus cordipennis ssp. Karsch, 1896	East Usambara & Nguru Rugose Long-legged Bushcricket
Philoscirtus viridulus Hemp, 2014	Green Rugose Long-legged Bushcricket

Phaneropterinae	**Leaf or Broad-winged Bushcrickets**
Acrometopini	
Altihoratosphaga basalis Hemp, 2017	Ancient Dotted Bushcricket
Altihoratosphaga chenene Hemp, 2017	Chenene Dotted Bushcricket
Altihoratosphaga hanangensis Hemp et al., 2010	Hanang Dotted Bushcricket
Altihoratosphaga helleri Hemp, 2017	Heller´s Dotted Bushcricket
Altihoratosphaga montivaga (Sjöstedt, 1909)	Montane Dotted Bushcricket
Altihoratosphaga nomima (Karsch, 1896)	Mpwapwa Dotted Bushcricket
Altihoratosphaga nou Hemp, 2006	Manyara Dotted Bushcricket
Altihoratosphaga simbo Hemp, 2017	Simbo Dotted Bushcricket
Horatosphaga heteromorpha (Karsch, 1888)	Variable Grass Bushcricket
Horatosphaga laticerca Hemp, 2019	Ladle Grass Bushcricket
Horatosphaga leggei (Kirby, 1909)	Legge´s Grass Bushcricket
Horatosphaga parensis Hemp, 2002	Pare Grass Bushcricket
Horatosphaga regularis (Bolivar, 1922)	Regular Grass Bushcricket
Horatosphaga sabuk Hemp, 2006	Sabuk Grass Bushcricket
Horatosphaga scalata Hemp, 2019	Ladder Grass Bushcricket
Lamecosoma miombo Hemp, 2017	Miombo Elongate Grass Bushcricket
Lamecosoma inerme Ragge, 1961	Unarmed Elongate Grass Bushcricket
Peronura clavigera Karsch, 1888	Common Plump Bushcricket
Peronura hildebrandtiana Karsch, 1889	Taita Plump Bushcricket
Peronura uguenoensis Hemp, 2002	Pare Plump Bushcricket
Peronura usambarica Hemp, 2017	Usambara Plump Bushcricket
Peronura wottae Hemp, 2019	Wotta Plump Bushcricket
Peronurella centralis Hemp, 2017	Common Fragile Plump Bushcricket
Teneraspha chyuluensis Hemp, 2017	Chyulu Fragile Grass Bushcricket
Teneraspha hanangensis Hemp, 2017	Hanang Fragile Grass Bushcricket
Teneraspha meruensis (Sjöstedt, 1909)	Meru Fragile Grass Bushcricket
Teneraspha mpwapwae Hemp, 2019	Mpwapwa Fragile Grass Bushcricket
Teneraspha nanyuki Hemp, 2017	Nanyuki Fragile Grass Bushcricket
Teneraspha tenera Hemp, 2007	Ngong Fragile Grass Bushcricket
Amblycoryphini	
Eurycorypha annexata Hemp, 2017	Coupling Ant-mimicking Bushcricket
Eurycorypha binasuta Hemp, 2017	Two-nosed Ant-mimicking Bushcricket
Eurycorypha combretoides Hemp, 2013	Bushwillow Ant-mimicking Bushcricket
Eurycorypha conclusa Hemp, 2013	Round-winged Ant-mimicking Bushcricket

Eurycorypha curviflava Hemp, 2017	White-spotted Ant-mimicking Bushcricket
Eurycorypha divertata Hemp, 2017	Divergent Ant-mimicking Bushcricket
Eurycorypha elongata Hemp, 2017	Elongated Ant-mimicking Bushcricket
Eurycorypha flexata Hemp, 2017	Bent Ant-mimicking Bushcricket
Eurycorypha kenyensis Massa, 2016	Kenya Ant-mimicking Bushcricket
Eurycoryoha kevani Chopard, 1954	Kevan´s Ant-mimicking Bushcricket
Eurycorypha ligata Hemp, 2017	Hoe-shaped Ant-mimicking Bushcricket
Eurycorypha meruensis Sjöstedt, 1909	Meru Ant-mimicking Bushcricket
Eurycorypha pianofortis Hemp, 2017	Piano-songed Ant-mimicking Bushcricket
Eurycorypha pseudomeruensis Hemp, 2017	False Meru Ant-mimicking Bushcricket
Eurycorypha pseudovaria Hemp, 2017	False Variable Ant-mimicking Bushcricket
Eurycorypha punctipennis Chopard, 1938	Dotted Ant-mimicking Bushcricket
Eurycorypha resonans Hemp, 2013	Resonant Ant-mimicking Bushcricket
Eurycorypha simillima Chopard, 1954	Even Ant-mimicking Bushcricket
Eurycorypha varia Brunner v. Wattenwyl, 1891	Variable Ant-mimicking Bushcricket
Eurycorypha victoriae Hemp, 2017	Lake Victoria Ant-mimicking Bushcricket
Plangia amaniensis Hemp, 2017	Amani Plangia
Plangia sp.	Coastal Plangia
Plangia multimaculata Hemp, 2015	Spotted Plangia
Plangia satiscaerulea Hemp, 2015	Green Plangia
Plangia variacantans Hemp, 2017	Variable Singing Plangia
Catoptropterigini	
Catoptropteryx aurita Huxley, 1970	Eastern Orange-spot
Ducetiini	
Ducetia biramosa (Karsch, 1888)	Smooth Pectinated Bushcricket
Ducetia punctipennis (Gerstäcker, 1869)	Spotted Pectinated Bushcricket
Ducetia sp.	Mpwapwa Pectinated Bushcricket
Holochlorini	
Arantia fasciata (Walker, 1869)	Striped-eyed Arantia
Arantia tanzanica Hemp & Massa, 2017	Tanzania Arantia
Gonatoxia furcata Hemp, 2016	Forked Yellow Surprise
Gonatoxia helleri Hemp, 2016	Heller´s Yellow Surprise
Gonatoxia immaculata Karsch, 1889	Unspotted Yellow Surprise
Gonatoxia maculata Karsch, 1888	Spotted Yellow Surprise
Gonatoxia sp.	Coastal Yellow Surprise
Odontoturini	
Monticolaria kilimandjarica Sjöstedt, 1909	Kilimanjaro Mountain Walker
Monticolaria manyara Hemp, 2010	Manyara Mountain Walker
Monticolaria meruensis Sjöstedt, 1909	Meru Mountain Walker
Odonturoides hanangensis Hemp, 2009	Hanang Odonturoides
Odonturoides insolitus Ragge, 1980	Curious Odonturoides
Odonturoides jagoi Ragge, 1980	Jago´s Odonturoides
Odonturoides plasoni (Ebner, 1915)	Shielded Odonturoides

Otiaphysini	
Debrona cervina Walker, 1870	Broad-winged Debrona

Pardalotini	
Poecilogramma striatifemur Karsch, 1887	White-striped Poecilogramma

Phaneropterini	
Dioncomena jagoi Ragge, 1980	Jago´s Jewel
Dioncomena ornata Brunner v. Wattenwyl, 1878	Blue Jewel
Dioncomena tanneri Ragge, 1980	Tanner´s Jewel
Dioncomena scutellata Hemp, 2017	Flappy Jewel
Dioncomena sp.	Udzungwa Jewel
Dioncomena sp.	Uluguru Jewel
Dioncomena zernyi Ragge, 1980	Zernyi´s Jewel
Kefalia grafika Hemp, 2019	Graphic Kefalia
Kefalia laeta Hemp, 2019	Colourful Kefalia
Kefalia omorpha Hemp, 2019	Beautiful Kefalia
Melidia laminata Chopard, 1954	Fragile Savanna Bushcricket
Melidia adfinia Hemp, 2019	Miombo Savanna Bushcricket
Parapyrrhicia abdita Hemp, 2016	Hidden Glinting Eye
Parapyrrhicia acutilobata Ragge, 1980	Pointed Glinting Eye
Parapyrrhicia diamantina Hemp, 2016	Diamond Glinting Eye
Parapyrrhicia globulata Hemp, 2016	Uluguru Glinting Eye
Parapyrrhicia litipo Hemp, 2016	Litipo Glinting Eye
Parapyrrhicia niloensis Hemp, 2016	Nilo Glinting Eye
Parapyrrhicia zanzibarica Brunner v. Wattenwyl, 1891	Zanzibar Glinting Eye
Phaneroptera sparsa (Stål, 1857)	African sickle-bearing Bushcricket

Terpnistrini	
Diogena fausta (Burmeister, 1838)	Gracious Acacia Bushcricket
Gelotopoia amabilis Hemp, 2013	Beautiful Two-coloured Bushcricket
Terpnistria zebrata (Serville, 1839)	Striped Acacia Bushcricket

Tylopsidini	
Tylopsis continua (Walker, 1869)	Brown-striped Lily Bushcricket
Tylopsis dispar Sjöstedt, 1909	Uneven Lily Bushcricket
Tylopsis rubrescens Kirby, 1900	Red Lily Bushcricket

Ungrouped Phaneropterinae	
Ectomoptera nepicauda Ragge, 1980	Fragile Cut-away
Eulioptera bilobata-complex	Bilobate False Sickle-bearing Bushcrickets
Eulioptera excavata Hemp, 2019	Excavated False Sickle-bearing Bushcricket
Eulioptera montana Ragge, 1980	Chyulu False Sickle-bearing Bushcricket
Eulioptera monticola Ragge, 1980	Montane False Sickle-bearing Bushcricket
Eulioptera reticulata planilima Ragge, 1980	Reticulate False Sickle-bearing Bushcricket
Euryastes jagoi Ragge, 1980	Usambara Inflated Tree Bushcricket
Lunidia acuticercata Hemp, 2017	Coastal Halfmoon

Lunidia bicercata Hemp, 2017	Uluguru Halfmoon
Lunidia viridis Hemp, 2010	Green Halfmoon
Materuana eriki Hemp, 2017	Erik´s Red Eye
Meruterrana elegans Sjöstedt, 1912	Elegant Yellow-Black Bushcricket
Oxyecous apertus Ragge, 1956	Bluegreen Flat-Thorn
Oxyecous magnus Ragge, 1956	Great Flat-Thorn
Oxyecous undulatus Ragge, 1956	Wavy Flat-Thorn
Pseudopreussia flavifolia Hemp, 2017	Coastal Yellow Leaf
Sentia communa Hemp, 2019	Common Sentia
Tropidonotacris grandis Ragge, 1957	Great Ridgeback

Pseudophyllinae	**False-Leaf Bushcrickets**
Acauloplax exigua Karsch, 1891	Fragile False-Leaf
Cymatomera denticollis Schaum, 1853	Common Bark Bushcricket
Cymatomera paradoxa Gerstäcker, 1869	Spiny Bark Bushcricket
Cymatomera viridimaculata Hemp, 2013	Green Bark Bushcricket
Cymatomerella muta Beier, 1954	Plump Bark Bushcricket
Cymatomerella morula Hemp, 2019	Black Bark Bushcricket
Cymatomerella pardopunctata Hemp, 2013	Leopard Bark Bushcricket
Pseudotomias kisarawe Hemp, 2016	Coastal False-leaf
Pseudotomias usambaricus Hemp, 2016	Usambara False-leaf
Stenampyx viridiflavus Hemp, 2020	East African Short Tushy
Zabalius ophthalmicus (Walker, 1869)	East African Zabalius

Anostostomatidae	**Wetas or King Crickets**
Libanasa brachyura Karny, 1928	East Africa Weta
Libanasa kilomeni Hemp & Johns, 2015	Pare Weta
Nasidius sp.	Big Face Weta

Gryllacrididae/Gryllacridinae	**Raspy Crickets**
Afroepacra kuhlgatzi Griffini, 1912	Kuhlgatz´ Afroepacra
Afroneanias scheffleri (Griffini, 1908)	Scheffler´s Raspy Cricket
Ametroides kibonotensis (Sjöstedt, 1910)	Kibonoto Flightless Raspy Cricket
Ametroides nigrifacies (Sjöstedt, 1910)	Three-dotted Flightless Raspy Cricket
Ametroides innotatus Karny, 1929	Coastal Flightless Raspy Cricket
Atychogryllacris holdhausi (Griffini, 1912)	Holdhaus´ Short-winged Raspy Cricket
Glomeremus falcifer (Sjöstedt, 1910)	Inflated Flightless Raspy Cricket
Glomeremus kilimandjaricus (Sjöstedt, 1910)	Kilimanjaro Flightless Raspy Cricket
Stictogryllacris kilimandjarica (Sjöstedt, 1910)	Kilimanjaro Raspy Cricket
Stictogryllacris meruensis (Sjöstedt, 1910)	Meru Raspy Cricket
Stictogryllacris vosseleri (Griffini, 1908)	Vosseler´s Raspy Cricket
Stictogryllacris fuelleborni (Griffini, 1908)	Fülleborn´s Raspy Cricket
Stictogryllacris laetitia laetitia (Kirby, 1906)	Happy Raspy Cricket

Family Tettigoniidae

Subfamily Conocephalinae
Meadow and Cone-headed Bushcrickets

Conocephalinae are world-wide distributed and currently subdivided into five tribes of which the Agraeciini, Copiphorini, Euchonchophorini and Conocephalini have representatives in Africa. In Tanzania and Kenya species from three tribes are recorded.

Key to tribes, genera and species of East African Conocephalinae (males) (adapted from OSFO)

1	Fastigium width narrow, usually narrower than first antennal segment (scapus)	**Agraeciini**	**3**
1´	Fastigium width broader than scapus		**2**
2	Fastigium elongated into cone	**Copiphorini**	**4**
2´	Fastigium not significantly elongated	**Conocephalini**	
3	Tegmina almost fully covered by pronotum, reduced, alae absent	***Afroanthracites***	
3´	Tegmina not covered by pronotum, shortened or fully developed, alae present		**6**
4	Fastigium elongated into long process		**5**
4´	Fastigium with short process	***Ruspolia***	
5	Elongated part of fastigium stout, about half the length of head	***Lanista varelei***	
5´	Elongated part of fastigium more slender almost as long as head	***Pseudorhynchus pungens***	
6	Fastigium verticis blunt, almost rectangular	***Dendrobia***	
6´	Fastigium verticis conical	***Afroagraecia***	

Fig. Agr 1. Female **Short-winged Afroagraecia**, one of the species with shortened tegmina.

Tribe Agraeciini

The African Agraeciini are represented with three genera in the area, *Afroanthracites, Afroagraecia,* and *Dendrobia*.

Genus *Afroagraecia* Afroagraecias

The genus *Afroagraecia* contains 13 species, 12 occur in the area, one short-winged species was recently described from Mozambique. They are divided into two groups: the short-winged species *A. brachyptera*, *A. bloyeti, A. panteli* and *A. flava* occurring in inland Tanzania and the long-winged species *A. sansibara*, *A. jozani*, *A. furcata*, *A. pwania*, *A.kisarawe*, *A. shimbaensis, A. mangula,* and *A. nguruensis* all occurring in lowland wet forests except for *A. nguruensis*.

Identification: Medium-sized insects of light brown to dark brown colour with a triangle-shaped dark fascia on the face and a dark broad fascia on dorsum of head and pronotal disc in most species. Tegmina and alae shortened, as long as the abdomen or slightly longer. The female ovipositor is long and slender and only slightly up-curved.

Key to the species of *Afroagraecia* (males)

1	Tegmina shortened, not surpassing abdominal segment 4		**2**
1´	Tegmina surpassing abdominal segment 4, about body length or longer		**6**
2	Tegmina not surpassing abdominal tergite 2		**4**
2´	Tegmina surpassing abdominal tergite 2		**3**
3	Face uniformly coloured, without fascia. Tegmina reaching abdominal tergite 4; Udzungwa Mountains	***A. flava***	
3´	Face with dark fascia; Kilimanjaro and northern part of Eastern Arc Mts	***A. brachyptera***	
4	Tegmina almost reaching posterior margin of abdominal tergite 1; fascia of face well-developed to obsolete		**5**
4´	Tegmina about half of length of abdominal tergite 1. Fascia of face well-developed; Mozambique	***A. muagurai***	
5	Apical two spines of male cerci slender and of equal length. Central Tanzania	***A. panteli***	
5´	Male cerci with one apical spine and two stout subapical ones. Tanzania, Kondoa	***A. bloyeti***	
6	Tegmina longer than body length. Face with faint or without fascia; Shimba Hills	***A. shimbaensis***	
6´	Tegmina about body length or slightly shorter		**7**
7	Head and pronotum with pitch black fascia; Zanzibar	***A. jozani***	
7´	Head and pronotum with brown to dark brown or without fascia		**8**
8	Face without fascia; Kazimzumbwi Forest Reserve	***A. furcata***	
8´	Face with dark brown fascia		**9**
9	Cerci at base with long and slender inner process; East Usambara and coast	***A. pwania***	
9´	Cerci at base with short spine or dent or finger-like process or process lacking		**10**
10	Cerci at base with acute process; Udzungwa Mts	***A. mangula***	
10´	Cerci at base not acute but with rounded apex		**11**
11	Cerci at base with finger-like, thin process; Nguru Mts	***A. nguruensis***	
11´	Cerci at base with stout process		**12**
12	Cerci at base with stout process or process lacking; small body size; Kazimzumbwi Forest Reserve	***A. kisarawe***	
12´	Cerci at base with stout process; larger body size; Zanzibar	***A. sansibara***	

Afroagraecia bloyeti
Bloyet´s Afroagraecia

Identification: Medium-sized, uniformly light to medium brown. Tegmina and wings reduced to lobes, reaching to posterior margin of abdominal tergite 1.
Biology: Night active, predaceous.
Habitat: Miombo woodlands and dry deciduous forests.
Distribution: Known only from the type locality Kondoa in central Tanzania.

Afroagraecia brachyptera
Short-winged Afroagraecia

Identification: Medium-sized (body length 2.3–2.7 cm), uniformly light to medium brown, dorsally with a median dark to black fascia from head over the entire disc of the pronotum and a black triangle on the face. Tegmina and wings shortened, reaching to the posterior margin of abdominal tergite 2 or slightly surpassing it.
Biology: Night active, predaceous. Seasonal species present during the warm period of the year from approximately October to April/May.
Song: Long series of syllables or of pairs of syllables, mostly in the ultrasonic range.
Habitat: Submontane bushland and home gardens in the submontane zone and deciduous dry forest.
Distribution: Northern Tanzania. Kilimanjaro, North and South Pare Mountains.

Fig. Agr 2. Face of **Short-winged Afroagraecia** with a black triangle-shaped fascia, typical for most *Afroagraecia* species.

Fig. Agr 3. Male **Short-winged Afroagraecia** known from a few localities in northern Tanzania.

Afroagraecia flava
Yellow Afroagraecia

Identification: Comparatively large with an overall yellow colour. Face uniformly yellowish to tawny. Tegmina abbreviated, reaching to about abdominal segment 4.
Biology: Night active, predaceous.
Habitat: Montane forest.
Distribution: Known only from the holotype in the Gologolo Mts of the Udzungwa Mountains National Park in Tanzania.

Figs. Agr 4 & 5. Face of the **Yellow Afroagraecia** (above) and lateral view on male (left), the only known specimen of this species so far. The Gologolo Mts were screened several times for this species but without the success of obtaining more specimens.

Afroagraecia furcata
Forked Afroagraecia

Identification: Beside *Afroagraecia jozani* the only species with forked male cerci.
Biology: Night active, predaceous.
Habitat: Coastal forest.
Distribution: Only known from Kazimzumbwi Forest Reserve near Dar es Salaam.
Conservation status: Critically endangered.
Remarks: *A. furcata* and *A. jozani* are morphological sister pairs and a result of a spread of a common ancestor from mainland Africa to Zanzibar during times when Zanzibar had connection via land bridges with the mainland.

Afroagraecia jozani
Jozani Afroagraecia

Identification: Sister species to *A. furcata* on the mainland. Differentiated from *A. furcata* by more thorns or dents on the male cerci. Easily recognized by its pitch black fascia on head and abdomen and a black fascia on the face. *A. furcata* has a light brown often obsolete fascia on head and pronotum and no fascia on the face.
Biology: Night active, predaceous.
Habitat: Coastal forest.
Distribution: Known only from Jozani Forest National Park on Zanzibar but very likely more widespread on Zanzibar in suitable habitats.