A Rapid Survey of Katydids (Insecta: Orthoptera: Tettigoniidae) in Northwestern Guinea's Boké Préfecture

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Chapter 5

A rapid survey of katydids (Insecta: Orthoptera: Tettigoniidae) in northwestern Guinea's Boké Préfecture

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SUMMARY

- 15 species of Tettigoniidae were collected, of which one is possibly new to science, and three are new to Guinea
- Species richness and abundance of individual species were extremely low due to unfavorable climatic conditions (the end of the dry season) combined with heavy anthropogenic impact on the surveyed habitats

INTRODUCTION

The third survey of katydids (Tettigoniidae) of Guinea, a part of a rapid assessment of the biotic diversity of selected parts of the country, was conducted in April and May 2005 in northwestern Boké Préfecture of Guinée Maritime. This survey followed two previous surveys conducted in 2002 (Naskrecki 2004) and 2003 (Naskrecki in prep.) at a number of sites within Guinée Forestière. Combined with previously published records of the Tettigoniidae of Guinea (principally Chopard 1954), they resulted in confirmed records of 102 species of these insects. The present survey, which recorded only 15 species, adds three additional species to the list of katydids of Guinea, bringing the total number of species known from this country to 105. This number must be considered very preliminary, and representing but a fraction of the actual species diversity, which may include as many as 200-250 species. Large portions of the country still remain unexplored in terms of their insect faunal composition, and high elevation areas in the western and central parts of the country are undoubtedly home to many species not yet recorded from Guinea. Upper levels of the rainforest canopies in the eastern part of Guinea have also never been sampled, and it is expected that numerous canopy species of Phaneropterinae and Pseudophyllinae are to be found there.

METHODS AND SITES

Three standard methods were used to collect katydids during the current survey: visual search at dusk and night, attraction to ultraviolet (UV) and fluorescent lights, and listening to calls of acoustically active males. In addition, random net sweeping was used during the day in grassy habitats, with repeated sweeps of 10-15 m long and 2 m wide transects. Representatives of all encountered species were collected and voucher specimens were preserved in 95% alcohol. These specimens will be deposited in the collections of the Museum of Comparative Zoology, Harvard University and the Academy of Natural Sciences of Philadelphia (the latter will also become the official repository of the holotype of a possible new species encountered during the present survey upon its formal description.)

In addition to physical collection of specimens, stridulation of acoustic species was recorded using the Sony Digital Disc recorder, with Senheizer directional microphone. These recording are essential to establish the identity of cryptic species of the genera *Ruspolia* and *Anoedopoda*, where morphological characters alone may not be sufficient for positive species identification. Virtually all encountered species were photographed, and these images will

be available online in the database of the world's katydids (Naskrecki and Otte 2004).

The survey covered the following five collecting sites:

1. Site 1: Sarabaya (10°45.242'N, 14°26.981'W) - habitats sampled within this site consisted mostly of dry, secondary forest (presumably at least 8 years old) and a small fragment of a more humid forest alongside dried bed of a river; in addition, katydids were collected in banana plantations, rice fields, and alongside roads.
2. Site 2: Taïgbé West (island), nr. Kamsar (10°36.508'N, 14°36.232'W) - katydids were searched for within remaining patches of seasonally humid forest of the island, grasslands, and at landside edges of mangrove vegetation.
3. Site 3: Tarénsa, nr. Kamsar (10°44.122'N, 14°33.559'W) - only one, small patch of secondary forest was sampled at this site; a small, permanent pool of fresh water accounted for a higher humidity of this site and the presence of several species of Araceae in the understory of the forest.
4. Site 4: Kataméne, nr. Kamsar (10°52.433'N, 14°22.709'W) – habitats sampled at this site included small patches of a secondary dry forest, vegetable gardens, rice fields, and grassy vegetation alongside roads.
5. Site 5: Boulléré, nr. Sangaredi (11°6.558"N, 13°57.401'W) – the dominant habitat at this site consisted of frequently burned savanna woodland, dominated by *Lophira lanceolata* (Ochnaceae); in addition, katydids were sampled within remnants of gallery forests along several small streams and permanent pools.

RESULTS

Compared to the two previous RAP surveys conducted in 2002 and 2003 the present one produced drastically lower number of collected/observed species: 15 species representing 11 genera were recorded. The two main reasons that contributed to the exceptionally low number of observed species were the prolonged dry season in the spring of 2005, and an exceptionally high degree of anthropogenic degradation of all surveyed habitats. The collecting activity was conducted between April 23rd and May 10th, during which period, as well as for many weeks before, there was no precipitation. At the end of the dry season populations of katydids (as well as many other insect groups) reach their lowest levels, and even if nymphs or adults are present in the area their activity is restricted to occasional feeding, and virtually no stridulation of these insects can be heard. This drastically reduces the chances of detecting the presence of many species, most of which are highly cryptic, and not attracted to lights or baits. Within West African Tettigoniidae only certain members of the Phaneropterinae and a few of the Conocephalinae are known to be attracted to lights. During the current survey not a single individual of the Tettigoniidae was attracted to lights during ten nights when both UV and regular fluorescent lights (mostly the latter) were used at the collecting sites between approximately 19:30 and 22:30 each night.
None of the visited sites could be considered to be "natural" i. e., with low impact of human activity. All sites exhibited strong to exceptionally strong effects of anthropogenic change, in the extreme cases being the result of recent and frequent fires. Even sites that were not directly affected by fires, such as gallery forests along rivers, were severely impacted by the loss of surrounding "buffer" vegetation, resulting in much lower than usual humidity of such sites.
A full list of recorded taxa is given in Table 5.1, and below I comment only on new or interesting species.

Subfamily Phaneropterinae

Phaneroptera nana sparsa Stal, 1857 – This species was first recorded in Guinea by Steinmann (1966) (from Conakry, under the name *Ph. africana* Steinman). It is a widely distributed species, known from western Palaearctic and the entire continent of Africa. It is often associated with disturbed and/or anthropogenic habitats, such as orchards and plantations, and may have been introduced to some areas with seedlings or fruit. During this survey a single male of *Ph. nana sparsa* was collected from a banana plantation at Site 1.

Tylopsis ampla Ragge, 1964 – This species has been known so far only from Angola (Ragge 1964) and its finding in Guinea represents a significant extension of its known range. A single male was collected feeding on *Acacia* sp. along a sandy road at Site 1.

Arantia excelsior Karsch, 1888 – This large, folivorous species, originally described from Sierra Leone, was first recorded from Guinea by Chopard (1954) from Mt. Nimba region, and by Naskrecki (in prep.) from Forêt Classée Déré. A single female nymph was found at Site 2 on April 30th 2005, and it underwent its ultimate molt on May 3rd.

Subfamily Conocephalinae

Conocephalus conocephalus (L., 1767) – This pan-African species was ubiquitous at all sites in open, grassy, and often extremely disturbed habitats. It was the only species of katydids active during the day, although males were heard stridulating also at dusk and early parts of the nights, presumably because of the extremely high (35°C and above) temperatures during the day. It is a primarily graminivorous species, feeding on seeds and flowers of a wide range of grasses.

Conocephalus carbonarius Redtenbacher, 1891 – While no physical specimen of this species has been collected, a single male was heard singing in the understory of a secondary forest at Site 1 among *Sansevieria* sp. grasses. This species, originally described from Ghana, was recorded in Guinea by Chopard (1954) and Naskrecki (2004; in prep.). The current record is the westernmost one for this species.

Table 5.1. A check-list of species of Tettigoniidae collected in Boké Préfecture in April-May 2005.

Species	Site 1 Sarabaya	Site 2 Taïgbé Ouest	Site 3 Tarénsa	Site 4 Kataméne	Site 5 Boulléré	New to science	New to Guinea
Conocephalinae							
Conocephalus conocephalus	X	X	X	X	X		
Conocephalus carbonarius	X*)						
Ruspolia sp. 3		X	X	X	X		
Pseudorhynchus sp.	X*)			X			
Mecopodinae							
Afromecopoda cf. *austera*	X					Peut-être	oui
Anoedopoda lamellata		X		X*)			oui
Phaneropterinae							
Phaneroptera nana sparsa	X						
Phaneroptera sp.	X						
Tylopsis ampla	X						oui
Arantia excelsior		X					
Eurycorypha sp.	X						
Pseudophyllinae							
Mormotus clavaticercus			X				
Mormotus sp. 1	X				X		
Mormotus sp. 2	X						
Habrocomes sp. 1		X					
	10	5	3	4	3	1	3
Total number of species	**15**						

* stridulation heard but no specimen collected

Ruspolia sp 3. – A single species of *Ruspolia* was collected and heard in open, grassy habitats at most visited sites. Its call was consistent with recordings of a yet unidentified species of *Ruspolia* collected and recorded in the Simandou Range of South-eastern part of Guinea. Both green and straw brown color morphs were observed, although brown individuals were significantly more abundant.

Subfamily Pseudophyllinae

Mormotus spp. – *M. clavaticercus* Karsch, 1891 and two yet unidentified species of *Mormotus* were collected at Sites 1 and 5. This genus includes obligate forest species, usually associated with humid, evergreen forests, and their finding in dry, highly disturbed secondary forests was rather surprising. A single female of *Mormotus* sp 1 was found hiding in a termite mound of *Cubitermes* sp. (Kolo Yéo, pers. comm.), an interesting and never before observed behavior among this group of insects.

Habrocomes sp. – A single male of a yet unidentified species of *Habrocomes* was collected at night on a tree trunk at the edge of a seasonal freshwater pool at Site 2. The individual exhibited signs of old age (missing appendages, worn wings), but still produced a defensive stridulation upon its capture. This indicates that adult individuals of this species are capable of surviving the entire dry season, and perhaps are able to court and mate again at the onset of the new rainy season.

Subfamily Mecopodinae

Afromecopoda cf. *austera* – Numerous individuals of *Afromecopoda* were collected in leaf litter and among large, unidentified Araceae along dried river bed at Site 1. This genus includes three known West African species, all associated with low forest vegetation. The collected specimens strongly resemble *A. austera* (Karsch, 1893), a species known only from Togo highlands, in their overall appearance, coloration, and the structure of the female subgenital plate. However, their tegmina are significantly shorter and narrower than in the type specimens of *A. austera*, and the ovipositors of females appear to be straighter than those of the types. Considering potentially low dispersal abilities of these non-volant insects and the lack of forest corridors joining Togo Highlands with the coastal forests of Guinea it appears unlikely that the two populations represent the same species. A detailed comparison of the collected specimens and all existing syntypes of *A. austera* will hopefully provide more conclusive evidence of the status of the newly found population.

Anoedopoda lamellata (Linnaeus, 1758) – Individuals of *A. lamellata* were collected and recorded in forest fragments at Sites 2 and 4. They were active at night in dense, shrubby vegetation and exhibited morphological and acoustic characteristics consistent with populations of this species in Central and Southern Africa, but clearly different from those found

among *Anoedopoda* found in afromontane savannas of the Simandou Range of South-eastern Guinea. This adds support to the notion postulated by Naskrecki (2004) that the Simandou populations of *Anoedopoda* are morphologically and behaviorally different from populations of *Anoedopoda* in other parts of Africa. A genetic study is now underway to help clarify the status of the two forms of *Anoedopoda* found in Guinea.

CONSERVATION RECOMMENDATIONS

Considering the exceptionally poor results of the current survey, combined with the very high anthropogenic impact witnessed at all visited sites, it is difficult to present any meaningful conservation recommendations concerning the katydid fauna. The most interesting find of the survey, a possibly new species of *Afromecopoda*, was found at the least impacted site (Sarabaya), one that is already listed as an Important Bird Area (IBA) and will likely receive a more formal form of protection based on the work of Guinée Écologie with local populations.

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