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The birds of a montane forest mosaic in Big Babanki area, Bamenda Highlands, Cameroon

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Summary

We surveyed a non-protected montane forest mosaic in Bamenda Highlands, Cameroon, in the periods 11 Nov to 17 Dec 2003 and 22 Nov to 7 Dec 2005. We summarise information on abundance, habitat use, vocalisation and breeding activity of 109 bird species. Despite considerable forest fragmentation, species confined to montane forest constituted a substantial part of the bird community, including 12 species endemic to the Cameroon Mountains. However, we did not record several forest specialists such as Bar-tailed Trogon *Apaloderma vittatum* and Cameroon Olive Greenbul *Phyllastrephus poensis*, which are reported as relatively common in the large forest block of Mt Oku, and which appear to be sensitive to forest fragmentation. On the other hand, we recorded Great Blue Turaco *Corythaeola cristata*, which has been considered extinct on Mt Oku due to forest clearing. We recorded one Red Kite *Milvus milvus*, which is the southernmost observation of this Palaearctic migrant in Africa and the first for Cameroon. In the beginning of the dry season, the vast majority of recorded bird species sang and we confirmed breeding of many passerines.

Résumé

Les oiseaux d'une forêt de montagne en mosaïque dans la région du Big Babanki, Monts Bamenda, Cameroun. Nous avons étudié une forêt de montagne en mosaïque non protégée dans les Monts Bamenda.au Cameroun,

pour les périodes des 11 nov au 17 déc 2003 et 22 nov au 7 déc 2005. Nous résumons les données sur la densité, l'utilisation de l'habitat, les vocalisations et l'activité reproductrice de 109 espèces d'oiseaux. Malgré une fragmentation considérable de la forêt, les espèces liées à la forêt de montagne formaient une part importante de la communauté avienne, y compris 12 espèces endémiques aux monts camerounais. Cependant, nous n'avons pu observer plusieurs spécialistes de la forêt tels que le Trogon à queue barrée *Apaloderma vittatum* et le Bulbul olivâtre *Phyllastrephus poensis*, qui sont considérés comme assez communs dans le grand bloc forestier du Mt Oku, et qui semblent sensibles à la fragmentation de la forêt. En revanche, nous avons observé le Touraco géant *Corythaeola cristata*, considéré comme éteint sur le Mt Oku à cause de la déforestation. Nous avons observé un Milan royal *Milvus milvus*, l'observation la plus méridionale de ce migrateur paléarctique en Afrique et la première pour le Cameroun. Au début de la saison sèche, l'immense majorité des espèces observées chantait et nous avons pu confirmer la reproduction de beaucoup de passereaux.

Introduction

West African forests are considered to be among the most important hotspots of global biodiversity and endemism (Orme *et al*. 2005). Most of them are lowland. The Cameroon Mountains form the only range in W Africa of sufficient hight and extent for the development of a specific afromontane community (Tye 1986). Owing to their climatic stability and long-term isolation, the Cameroon Mountains host many unique life forms (Fjeldså & Lovett 1997). The area contains 28 restricted-range bird species making it the third richest endemic bird area in mainland Africa (Stattersfield *et al*. 1998). During the Quaternary, montane forests expanded to lower altitudes during glacials and retreated back to smaller fragments at higher altitudes during periods of climatic optima (Elenga *et al*. 2000). Recently, montane forests are confined to altitudes above 1600 m a.s.l (Thomas 1986).

Besides Mt Cameroon and Mt Kupe, the Bamenda Highlands are the most diverse and important area in the region (Graham *et al*. 2005). Unfortunately, intensive logging has reduced formerly continuous forests to isolated fragments during recent decades (ICBP 1992). Remaining montane forest patches are mostly confined to steep slopes of valleys. The largest one is found on the slopes of Mt Oku and covers about 9000 ha (the Kilum-Ijim forest, Forboseh & Maisels 2000). This forest remnant maintains the largest populations of montane endemic species within the area (Fishpool & Evans 2001) and attracts therefore considerable attention of ornithologists and conservationists (Stuart 1986, Fotso 1996, 2001, Dowsett-Lemaire & Dowsett 1998, Thomas *et al*. 2000, McKay & Coulthard 2000, Forboseh *et al*. 2003, Reif *et al*. 2006, 2007). However, small patches of montane forests are still

scattered throughout the cultivated landscape of the Bamenda Highlands. Our survey was carried out in a non-protected montane forest mosaic southwest of Mt. Oku. The aim of this article is to summarise information on abundance, habitat use, vocalisations and breeding activity of birds recorded in the area.

Study Area and Methods

The study was performed in the area named My Ogade near the villages of Big Babanki and Kedjom-Keku, Bamenda Highlands, North-West Province, Cameroon (6°5′26′′N, 10°18′9′′E; 2200 m a.s.l.). The area is a part of the Mt Oku massif and is 21 km northeast of Bamenda, 27 km southwest of Mt Oku and 5 km west of Mbi crater (Fig. 1). It covers *c.* 1 km^2 and comprises a mosaic of montane grasslands, pastures, fields, montane forest and forested corridors along streams. The montane forest was represented by two medium-sized patches (*c.* 20 ha together) and several small fragments (0.1–1 ha). In this area, there is a single wet season from March/April to mid-November (Tye 1986), with annual rainfall on Mt Oku *c.* 2100 mm (Tye 1992).

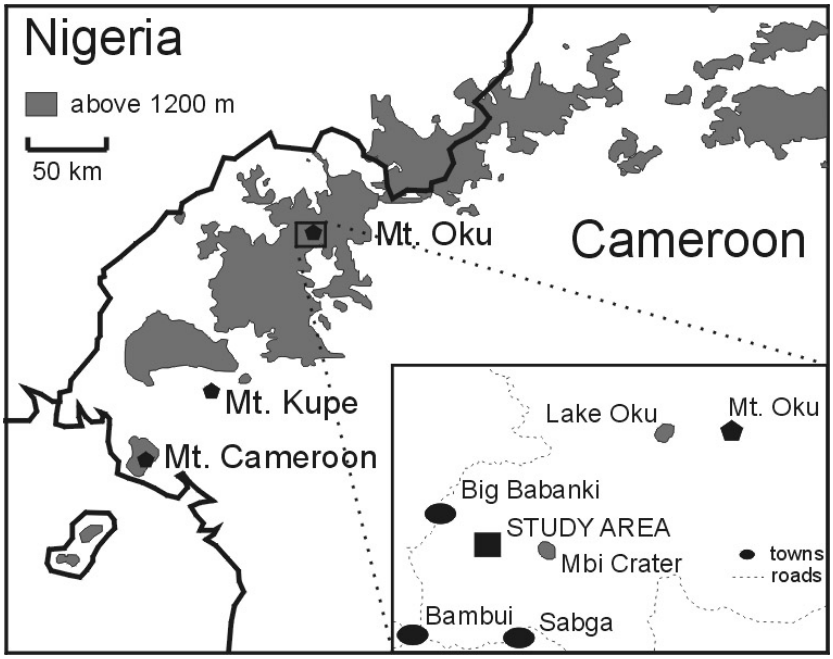

Figure 1. Location of the study area in the Cameroon Mountains.

Observations were made at the beginning of dry season, in the periods 11 Nov to 17 Dec 2003 and 22 Nov to 7 Dec 2005. We camped within the study area and observed birds continuously from dawn to dusk each day. Calls were also recorded after dusk. Relative abundance, habitat use, voice activity and breeding activity of all bird species were recorded.

We use the abundance categories of Stuart & Jensen (1986): + = species observed occasionally within the study area (less than one bird recorded per observer per day); 1 = one bird or a pair recorded per observer per day; 2 = 3–6 birds recorded per observer per day; 3 = 7–15 birds recorded per observer per day; 4 = >15 birds recorded per observer per day; 5 = so abundant that it can be seen or heard constantly. We ascribe habitat use to ten categories: 1 = patches of primary montane forest dominated mainly by *Shefflera abysinica*, *S. manii*, *Bersama abyssinica*, *Syzygium staudtii*, *Carapa grandiflora* and *Ixora foliosa*; 2 = disturbed patches of montane forest (*e.g*. burned), forest clearings and edges, secondary forest; 3 = shrubby corridors along streams, gallery forest connecting patches of montane forest; 4 = scrubland (*Hypericum lanceolatum* and *Lasiosiphon glaucum* dominate) without tall trees; 5 = mainly *Pteridium aquilinium* fern with solitary shrubs; 6 = intensively grazed pastures dominated by *Sporobolus africanus* and *Pennisetum cladestinum* with sparse shrubs and ferns; 7 = lightly grazed pastures, tall grasslands dominated by *Hyparrhenia* sp.; 8 = rocky grasslands; 9 = rocks, rocky slopes; 10 = birds only passing through the study area. We recognized three categories of voice activity: 0 = no vocalisations; 1 = calls only; 2 = singing males or territorial calls. We recognized four categories of probability of breeding: 0 = no breeding activity (did not hold a territory and did not sing); 1 = possible breeding (a pair repeatedly observed at a site, duet calls or singing male recorded); 2 = probable breeding (alarm calls in the vicinity of a nest, a pair building a nest *etc*.); 3 = confirmed breeding (a nest with eggs or nestlings found). Status is indicated as: R = resident; E = Cameroon Mountains endemic; M = Palaearctic migrant. We follow the taxonomic sequence and scientific names of Borrow & Demey (2001).

Results

We recorded 109 species in the study area, including montane forest species, Cameroon Mountains endemics, birds of savanna woodlands and Palaearctic migrants (Table 1).

Discussion

Despite considerable reduction of montane forest in the study area, forest species constituted a substantial part of the bird community. However, we did not record the forest specialists Bar-tailed Trogon *Apaloderma vittatum* and Cameroon Olive

Table 1. Residence status (RS), abundance (A), habitats (H), vocal activity (V) and breeding activity (B) of birds in the study area. Species not listed by Fotso (2001) are indicated by an asterisk. See Methods for key.

	RS	A	H	V	B
Scopidae					
Scopus umbretta Hamerkop	R	+	10	0	0
Accipitridae					
Pernis apivorus European Honey Buzzard	M	+	10	0	0
Macheiramphus alcinus Bat Hawk	R	+	10	0	0
**Milvus milvus* Red Kite	M	+	10	0	0
M. migrans Black Kite	R	+	10	0	0
Gypohierax angolensis Palm-nut Vulture	R	+	10	0	0
Necrosyrtes monachus Hooded Vulture	R	+	10	0	0
Gyps africanus African White-backed Vulture	R	2–4	10	0	0
Polyboroides typus African Harrier Hawk	R	+	10	0	0
Circus aeruginosus Eurasian Marsh Harrier	M	+,1	5,6,7	0	0
Accipiter melanoleucus Black Sparrowhawk	R	1	1,2	2	1
Buteo auguralis Red-necked Buzzard	R	1–2	2,5,6	2	1
Aquila rapax Tawny Eagle	R	+	10	2	0
A. wahlbergi Wahlberg's Eagle	R	+	10	2	0
Lophaetus occipitalis Long-crested Eagle	R	1	1,2	2	1
Falconidae					
Falco tinnunculus Common Kestrel	R	+,1	4,5,6,7	2	0
F. biarmicus Lanner Falcon	R	+	6,7,8,9	2	0
F. peregrinus Peregrine Falcon	R	+,1	6,7,8,9	2	0
Phasianidae					
Francolinus squamatus Scaly Francolin	R	3	2,3,4,5,6	2	3
Columbidae					
Treron calvus African Green Pigeon	R	+	2	2	0
Turtur tympanistria Tambourine Dove	R	3	1,2,3	2	2
Columba sjostedti Cameroon Olive Pigeon	E	+	1,2	0	0
Streptopelia semitorquata Red-eyed Dove	R	+	4	2	0
Musophagidae					
Corythaeola cristata Great Blue Turaco	R	3	1,2	2	0
Tauraco bannermani Bannerman's Turaco	E	3	1,2	2	1
Cuculidae					
Chrysococcyx klaas Klaas's Cuckoo	R	+,1	2,4	2	1
Caprimulgidae					
**Caprimulgus nigriscapularis* Black-shouldered Nightjar	R	2–3	1,2	2	1
C. tristigma Freckled Nightjar	R	1–2	2,9	2	1
Apodidae					
Apus barbatus African Black Swift	R	+,3	9,10	1	0

	RS	A	H	V	B
Coliidae					
Colius striatus Speckled Mousebird	R	3–4	2,3,4,5	2	0
Alcedinidae					
Alcedo leucogaster White-bellied Kingfisher	R	+	2	1	0
Meropidae					
Merops variegatus Blue-breasted Bee-eater	R	+	4,5	1	0
Capitonidae					
Pogoniulus coryphaeus Western Green Tinkerbird	R	3	1,2,3	2	1
P. bilineatus Yellow-rumped Tinkerbird	R	2	1,2,3	2	1
Indicatoridae					
Indicator indicator Greater Honeyguide	R	+	4	0	0
I. minor Lesser Honeyguide	R	+	2,3,4	0	0
**I. exilis* Least Honeyguide	R	+	2,3,4	0	0
Picidae					
**Jynx ruficollis* Red-throated Wryneck	R	+	2	2	1
Dendropicos fuscescens Cardinal Woodpecker	R	1	2,4	2	1
D. elliotii Elliot's Woodpecker	R	1	2	2	1
D. goertae Grey Woodpecker	R	1–2	2	2	1
Hirundinidae					
Psalidoprocne pristoptera Black Saw-wing	R	+,1–4	10	1	0
Hirundo fuligula Rock Martin	R	2-3	9,10	1	0
H. rustica Barn Swallow	M	+,3	4,5,6,7	0	0
Delichon urbicum Common House Martin	M	+,3	4,5,6,7	0	0
Motacillidae					
Motacilla flava Yellow Wagtail	M	1–2	6	2	0
Anthus cinnamomeus Grassland Pipit	R	1	6,7,8	2	1
A. trivialis Tree Pipit	M	1	4,6	1	0
Campephagidae					
Campephaga petiti Petit's Cuckoo-shrike	R	+	2	0	0
Coracina caesia Grey Cuckoo-shrike	R	+	1,2	0	0
Pycnonotidae					
Andropadus montanus Cameroon Mountane Greenbul	E	3	1,2,3	2	1
A. tephrolaemus Western Mountain Greenbul	E	3	1,2,3	2	1
Pycnonotus barbatus Common Bulbul		3–4	2,3,4,5	2	1
Turdidae					
Cossypha isabellae Mountain Robin Chat	E	1	1,2,3	2	0
C. niveicapilla Snowy-crowned Robin Chat	R	+	1,2,3	0	0
Cercotrichas hartlaubi Brown-backed Scrub Robin	R	+	4,7	2	1
Saxicola torquatus Common Stonechat	R	4	2,3,4,5,6,7	2	2
Oenanthe sp. Wheatear sp.	M	+	6	0	0

	RS	A	H	V	B
Myrmecocichla cinnamomeiventris Cliff Chat	R	+	9	0	1
Turdus pelios African Thrush	R	2	1,2,3,4	1	0
Sylviidae					
Bradypterus bangwaensis Bangwa Forest Warbler	E	3	1,2,3	2	2
Chloropeta natalensis African Yellow Warbler	R	3	1,2,3	2	2
Cisticola chubbi Chubb's Cisticola	R	5	2,3,4,5,7	2	3
C. brunnescens Pectoral-patch Cisticola	R	2–3	6	2	3
Prinia subflava Tawny-flanked Prinia	R	1	7	2	1
Urolais epichlora Green Longtail	E	+	1	1	0
Apalis pulchra Black-collared Apalis	R	3	1,2,3	2	2
A. jacksoni Black-throated Apalis	R	+,1	2,4	2	2
A. cinerea Grey Apalis	R	3	1,2,3	2	1
Phylloscopus trochilus Willow Warbler	M	3	2,3,4,5	2	0
P. sibilatrix Wood Warbler	M	+	4	0	0
Sylvia borin Garden Warbler	M	+	2,3,4	0	0
Muscicapidae					
Muscicapa adusta African Dusky Flycatcher	R	1–2	1,2,3,4	2	3
Ficedula hypoleuca Pied Flycatcher	M	+	2,3,4	0	0
Monarchidae					
Elminia longicauda African Blue Flycatcher	R	+	3	0	0
E. albiventris White-bellied Crested Flycatcher	R	+,1–2	1,2	2	3
Platysteiridae					
Platysteira laticincta Banded Wattle-eye	E	+	1,2,3	0	0
Batis minor Black-headed Batis	R	+,1–2	2,4	2	1
Timaliidae					
Pseudoalcippe abyssinica African Hill Babbler	R	3	1,2,3	2	3
Paridae					
Parus albiventris White-bellied Tit	R	1–2	2,3,4	2	1
Nectariniidae					
Cyanomitra oritis Cameroon Sunbird	E	2–3	1,2,3	1	0
Cinnyris reichenowi Northern Double-collared Sunbird	R	5	1,2,3,4,5,6	2	3
C. bouvieri Orange-tufted Sunbird	R	3–4	2,3,4,5,6	2	3
C. coccinigaster Splendid Sunbird	R	+	3	0	0
Zosteropidae					
Zosterops senegalensis Yellow White-eye	R	3	2,3,4,5	2	3
Laniidae					
Lanius collaris Common Fiscal	R	+	5,6	0	0
L. mackinnoni Mackinnon's Shrike	R	1	4,5	2	1
Malaconotidae					
**Tchagra australis* Brown-crowned Tchagra	R	+,1	4,5,6	2	1

	RS	A	H	V	B
Laniarius atroflavus Yellow-breasted Boubou	E	4–5	1,2,3,4,5	2	3
Oriolidae					
Oriolus nigripennis Black-winged Oriole	R	1–2	1,2	2	1
Corvidae					
Corvus albus Pied Crow	R	1–3	6,10	1	0
Sturnidae					
Onychognathus walleri Waller's Starling	R	+	2,4	0	0
Ploceidae					
Ploceus baglafecht Baglafecht Weaver	R	2	2,3,4,5	2	1
P. bannermani Bannerman's Weaver	E	3	2,3,4	2	3
P. melanogaster Black-billed Weaver	R	1	1,2	0	0
P. insignis Brown-capped Weaver	R	+,1	1,2	2	1
Euplectes capensis Yellow Bishop	R	4	4,5,6	2	3
E. ardens Red-collared Widowbird	R	2	7	2	1
Estrildidae					
Nesocharis shelleyi Little Oliveback	E	1	2,3	0	2
Cryptospiza reichenowi Red-faced Crimsonwing	R	1–3	1,2,3	2	1
**Euschistospiza dybowski* Dybowski's Twinspot	R	1–2	2,3,4	0	0
**Lagonosticta rubricata* Blue-billed Firefinch	R	1–2	3,4,5,6	2	1
Spermestes bicolor Black-and-white Mannikin	R	1	4,7	0	0
Estrilda astrild Common Waxbill	R	4	4,5,6,7	2	2
E. nonnula Black-crowned Waxbill	R	4	4,5,6,7	2	3
Viduidae					
**Vidua macroura* Pin-tailed Whydah	R	+,1	4,5,6,7	2	1
Fringillidae					
Serinus mozambicus Yellow-fronted Canary	R	2	3,4,5,6	2	3
S. burtoni Thick-billed Seedeater	R	4	2,3,4,5,6	2	3
Linurgus olivaceus Oriole Finch	R	4	1,2,3,4,5,6	2	3
Emberizidae					
**Emberiza tahapisi* Cinnamon-breasted Rock Bunting	R	3–4	6,8	2	2

Greenbul *Phyllastrepus poensis*, which were reported by Fotso (2001) as common in the large forest block of Mt Oku. Other forest species, *e.g.* Green Longtail, were much less abundant than in Kilum-Ijim forest on Mt Oku (Forboseh *et al*. 2003). We suppose that these species could be more sensitive to forest area reduction and that small fragments of disturbed forest are not able to maintain viable populations of them (see Newsome 1986, Newmark 1991). Green-breasted Bush-Shrike *Malaconotus gladiator*, which has been reported by Stuart & Jensen (1986) from Mt Oku, was not recently recorded by Fotso (2001) and we did not record it either. Thus, it seems to have disappeared from this part of the Bamenda Highlands.

On the other hand, we recorded Great Blue Turaco, which was reported by Fotso (2001) as extinct in the area due to forest clearing. During both our stays, groups of 2–10 individuals were seen and heard each morning and evening, moving between forest patches. This species is relatively common in the area, at least in the beginning of dry season.

We recorded (OS and DH) one specimen of Red Kite gliding over the area on 12 Nov 2003 at *c.* 100 m above the ground. We observed it from below under very good conditions for *c.* 3 min. and recorded characters typical for this species: proportionally longer wings and tail, more contrasting coloration and more deeply forked tail than Black Kite, which is common in the area. We are also familiar with both kite species from central Europe, so we consider the confusion very unlikely. This is the southernmost observation of this species in Africa, the first for Cameroon and the sixth for the whole of sub-Saharan Africa (see Borrow & Demey 2001). Some individuals may thus rarely overwinter in tropical W Africa.

In the beginning of dry season, most bird species sang and we confirmed breeding of many passerines. In general, our observations confirm the results of Fotso (1996), who concluded that most of the species which nest during the dry season are insectivorous, while the omnivores and frugivores (*i.e.* turacos, pigeons, mousebirds, greenbuls, thrushes) breed during the early wet season. However, we confirmed an earlier start of the breeding season for some bird species as compared to the findings of Fotso (1996), *i.e.* Scaly Francolin, White-bellied Crested Flycatcher, African Hill Babbler, Bannerman's Weaver and Oriole Finch. On the other hand, we are convinced that Cameroon Sunbird did not breed during our study periods, confirming the findings of Fotso (1996) who reported breeding of this sunbird only in April and June, *i.e.* during the rainy season. We recorded several juveniles of Cameroon Sunbird during November, which suggests that the breeding season of this species ends at the end of the wet season, *i.e.* during October.

We assembled quite a few breeding records of endemic and montane species in small forest patches (White-bellied Crested Flycatcher, African Hill Babbler, Black-collared Apalis, African Dusky Flycatcher) and shrubs or isolated trees outside the forest (Bannerman's Weaver, Oriole Finch, Yellow-breasted Boubou, Thick-billed Seedeater and Northern Double-collared Sunbird). However, many tropical species are long-lived and thus can survive for a relatively long time in small forest patches without sufficient reproductive success to ensure population maintenance, or they may immigrate from larger patches (Brooks *et al*. 1999, Marsden 2006). Typically, insectivore diversity and abundance decrease significantly following disturbance (Waltert *et al*. 2005, Grey *et al*. 2006) and forest specialists suffer from an increased proportion of forest edge in a fragmented landscape (Dale *et al*. 1999). However, we suggest that although the remaining small forest fragments and shrubby corridors along the streams possibly do not permit forest interior species to maintain viable populations in our study area, they still could be important for their role in promoting movement between larger patches. They may also act as breeding habitat for montane species less sensitive to forest area reduction.

The study area suffers from grazing and extensive wood cutting and farming. But the most damaging human activity is the setting of bush fires during the dry season. Burning not only prevents the slow process of forest regeneration, but kills the trees and changes the vegetation structure and microclimatic conditions at forest edges, which dry up and become more sensitive to fires during the next dry season. Not only the montane biota but also thousands of people, who are dependent on water from the mountains, are negatively affected by continuing rapid desiccation of the environment through deforestation.

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