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THE BIRD FAUNA OF BURURI FOREST, BURUNDI

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Among the different forests still present on the Zaire-Nile divide in western Rwanda and Burundi, Bururi Forest has received very little attention until recently. The few data found in the faunistic catalogue of Schouteden (1966) that relate to Bururi Forest refer mostly to birds collected there by A. Prigogine in 1956. J. P. Vande weghe visited this forest for a few days every year from mid-1977 and in March 1983 spent two weeks visiting intensively all the different valleys and running transects throughout the altitudinal gradient. From July to October 1983, B. Loiselle censused the avifauna on three western slopes and one eastern slope at four different elevations.

In spite of these efforts, we are confident that the bird list of Bururi Forest is incomplete and that a few more species will be added in the future. Any additions however, will not change the general picture of the fauna and we believe that a preliminary report is urgently needed, especially because the forest has recently been declared a reserve by the Burundi government.

STUDY AREA

LOCATION

The Bururi Forest is located on the Bururi Mountain, between Bururi township and the shores of Lake Tanganyika. It covers an area of about 1600 ha and the center of the forest is located at about 3°56'S and 29°35'E (Fig. 1). Most of the main forest block occupies the western slopes of the north-south ridge of Mount Bururi, but also extends eastward over the ridge onto the upperparts of the eastern slopes, where isolated smaller forest patches are found in the head of some ravines (Fig. 2). Bururi Forest ranges in elevation from about 1700 m in Sikuvyaye Valley to just over 2300 m at the top of Mount Bururi. To the southeast of the Bururi-Rumonge road, the main forest block is extended by the narrow riparian forest strips of the upper Sikuvyaye Valley, situated between 1700 and 1900 m.

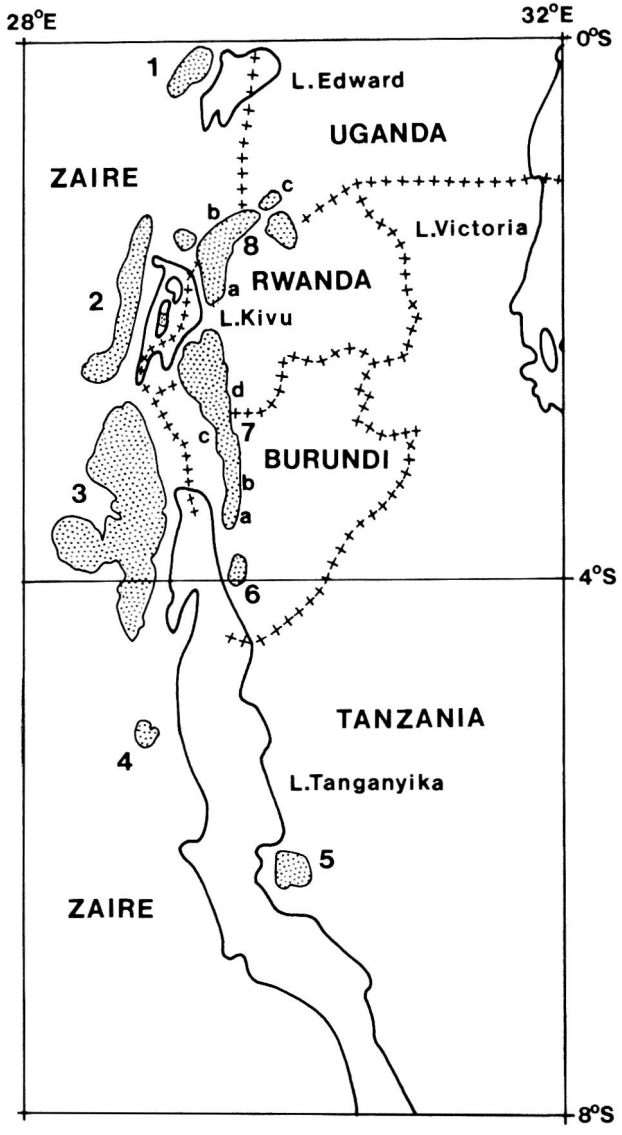

Fig. 1. Central and southern part of Central African Highlands :

(1) Mountains West of LakeEdward
(2) Kahuzi-Biega Range
(3) Itombwe Range
(4) Mount Kabobo
(5) Mount Kungwe-Mahare
(6) Mount Bururi
(7) Teza-Nyungwe Range :
  (a) Mount Heha
  (b) Ijenda Forests
  (c) Teza Forests
  (d) Nyungwe Forest
(8) Volcano Range :
  (a) Gishwati Forest
  (b) Volcanoes
  (c) Bwindi (= Impenetrable) Forest

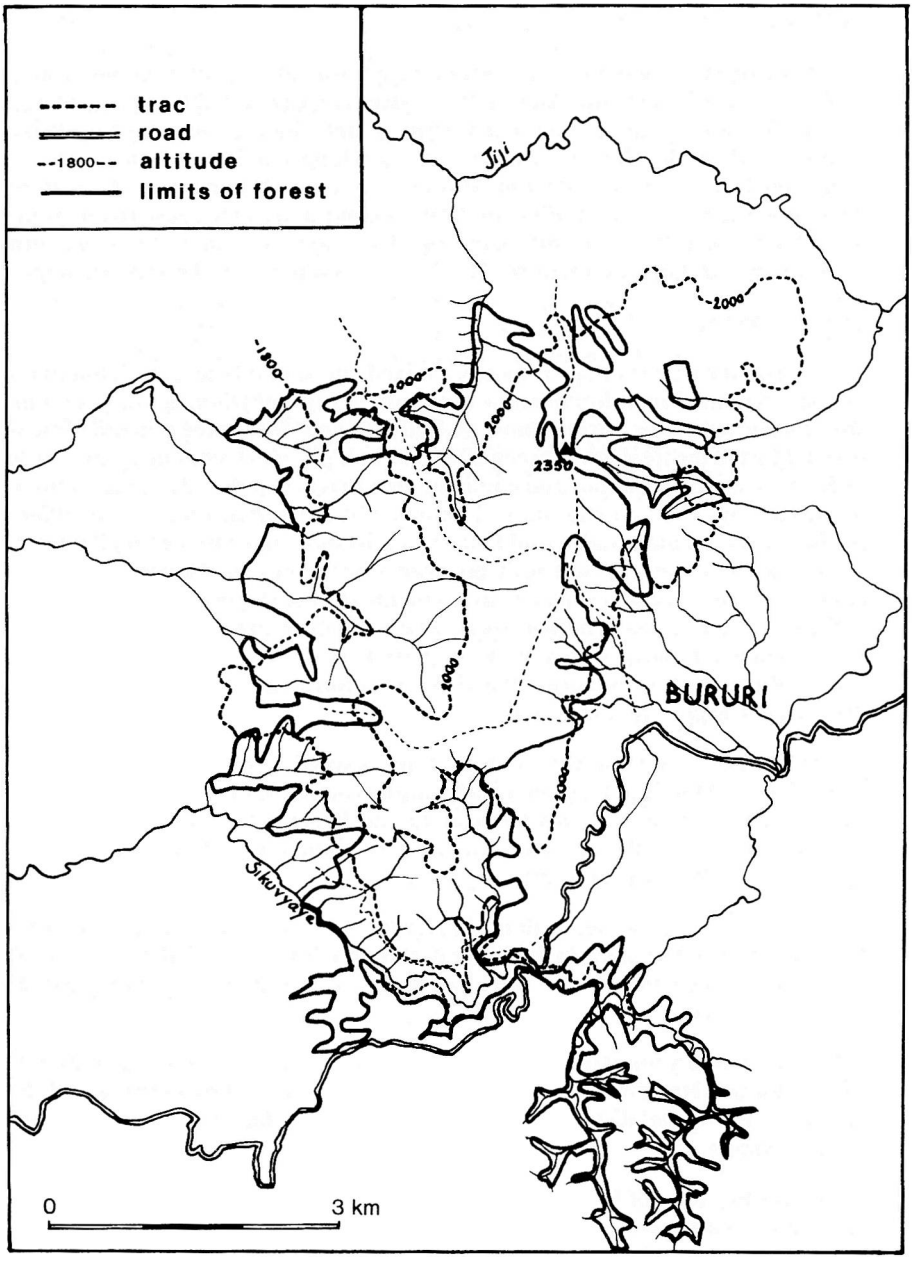

Fig. 2. Bururi Forest

CLIMATE

Areas surrounding the forest receive a mean annual rainfall of about 1200 to 1400 m. Although the main block on the western slope is probably somewhat wetter, this forest is subjected to a much dryer climate than the forests of northern Burundi or Rwanda. The dry season also is much longer and extends in most years over about five months, lasting from May until October. Dominant winds are from the southeast, thereby accounting for the drier conditions on the eastern and southern slopes. Mist effect is visible on the top of the mountain, on the upper western slope above 2200 m, and often scattered at all elevations on the western slope.

VEGETATION

Forest on the western slope is mostly a mixed, moist montane forest. Dominant tree species are *Entandrophragma excelsum*, *Chrysophyllum gorungosanum*, *Strombosia scheffleri*, *Symphonia globulifera* and *Macaranga neomildbreadiana*. Most of the trees are between 20 and 30 m high, with some emergeants at 40 m. Some trees are deciduous and epiphytic growth is very reduced or totally absent in the canopy. The mid-stratum is dominated by *Myrianthus holstii*, *Schefflera* sp., *Neoboutonia macrocalyx* and *Dracaena afro-montana*. On the broad flat ridges the forest is quite dense with an open understorey of *Alchornea hirtella*. However, there are many small clearings on the steeper slopes and in the hollows of the valley heads, where herbaceous vegetation is overgrown with a thick layer of vines. When compared with vegetation present at similar altitudes in Nyungwe Forest (Rwanda), the diversity of trees is lower at Bururi and the forest has a much drier aspect, especially the canopy.

The canopy is much lower and trees rarely exceed 12 m on the upper slopes above 2200 m. Dominant species are *Myrianthus holstii*, *Dracaena afro-montana*, *Syzygium guineense*, *Xymalos monospora* and *Bersama ugandensis*. Epyphyts, mostly lichens from the genus *Usnea*, are very abundant and the forest has the appearence of a real mist forest.

The forest is much wetter, with many *Newtonia buchannani*, *Carapa grandifolia* and *Albizia gummifera* in the lower parts of the Sikuvyaye Valley, below 1800 m. This forest segment also is much more disturbed, especially the riparian forests south of the road.

Remnants of dry forest occur on a few narrow ridges at the southern extremity of Mount Bururi. However, most of the dry forest was cleared by burning and the remnants are quite disturbed. Dominant trees are *Ficalhoa laurifolia* and *Faurea saligna*.

The eastern edge of Bururi Forest is bordered by extensive areas of montane grasslands and seems quite stable, despite some encroachment by burning. Montane grasslands are the dominant vegetation of most of the Bututsi Plateau situated between 1900 and 2000 m and are probably not completely secondary, because their flora is a rich one. By contrast, the western edge is subjected to active clearing

by farmers. Before clearing, moist forest, extended almost to the lake level, cutting as narrow riverine strips through the Miombo woodlands (below 1200 m) to reach the periguinean forest along the lake (775 m). The forests of Mount Bururi have been isolated from other montane forests to the north by the low valley of the Mullembwe where the Zaire-Nile divide does not go above 1900 m.

SPECIES LIST

The list of species given here includes only the birds occurring inside forest, including dry forests. The species list includes 129 species, of which 116 are believed to be breeding residents (Table 1). Scientific names are according to Devillers (1976-1980). Vernacular names are according to Britton (1980).

Table 1. Bird species list for Bururi Forest. Faunistic origin (SF), ecological classification (SE), status (ST), and altitudinal limits (AMIN, AMAX) are provided. Subspecies is also provided if known. "(*)" following species name indicates species are discussed further in the appendix. "(E)" indicates species are endemic to the Central African highlands.

Species	SF[a]	SE[b]	ST[c]	AMIN[d]	AMAX	Subspecies
Bostrychia hagedash	E	N	RB	TG	TG	*nilotica*
Gypohierax angolensis	E	O	V	TG	1900	
Polyboroides typus	E	?	RB	TG	TG	
Accipiter melanoleucus	E	O	RB	TG	TG	*melanoleucus*
Accipiter rufiventris	E	O*	RB	TG	TG	*rufiventris*
Accipiter tachiro	E	O	RB	RG	TG	*sparsimfasciatus*
Buteo augur	E	N*	RB	TG	TG	
Buteo tachardus (*)	E	F*	?			*oreophilus*
Lophaetus occipitalis	E	N	RB	TG	1900	
Stephanoaetus coronatus	E	F	RB	TG	TG	
Francolinus squamatus	E	F	RB	TG	2000	?
Columba arquatrix	E	F*	RB	TG	TG	*arquatrix*
Streptopelia lugens	E	N	RB	1800	TG	*lugens*
Streptopelia semitorquata	E	N	RB	TG	TG	
Aplopelia larvata	E	F*	RB	TG	TG	?
Turtur afer	E	N	RB	TG	TG	*kilimensis*
Turtur tympanistria	E	F	RB	TG	TG	*tympanistria*
Treron australis	E	O	RB	TG	TG	*gibberifrons*
Tauraco livingstonei	E	F	RB	TG	TG	*livingstonei*
Musophaga rossae	E	N	RB	TG	TG	
Clamator levaillanti	E	N	VB	TG	TG	
Cuculus canorus	P	N	V	TG	TG	*canorus*
Cuculus solitarius	E	O	VB	TG	TG	
Cuculus clamosus	E	F	? N	TG	2000	?
Cercococcyx montanus	E	F*	RB	TG	TG	*montanus*

Species	SF[a]	SE[b]	ST[c]	AMIN[d]	AMAX	Subspecies
Chrysococcyx klaas	E	N	RB	TG	TG	
Chrysococcyx cupreus	E	F	RB	TG	1900	
Ceuthmochares aereus	E	?	RB	TG	TG	*aereus*
Strix woodfordii	E	F	RB	TG	TG	?
Bubo africanus	E	N	RB	TG	TG	?
Caprimulgus poliocephalus	E	N*	RB	TG	TG	*ruwenzorii*
Schoutedenapus myoptilus	E	F*	??	TG	TG	?
Colius striatus	E	N	RB	TG	TG	*kiwuensis*
Apaloderma narina	E	F	RB	TG	TG	*narina*
Apaloderma vittatum	E	F*	RB	TG	2100	*camerunensis*
Halcyon leucocephala	E	N	V	TG	TG	*pallidiventris*
Merops oreobates	E	F*	RB	TG	1900	
Phoeniculus bollei	E	F	RB	TG	TG	*jacksoni*
Tockus alboterminatus	E	O	RB	TG	TG	*geloensis*
Bycanistes subcylindricus	E	F	RB	TG	TG	*subquadratus*
Pogoniulus bilineatus	E	O	RB	TG	TG	*jacksoni*
Indicator minor	E	N	RB	TG	2200	?
Campethera tullbergii	E	F*	RB	TG	TG	*taeniolaema*
Dendropicos fuscescens	E	N	RB	TG	TG	?
Dendropicos griseocephalus	E	F*	RB	TG	TG	*ruwenzori*
Hirundo senegalensis	E	N	RB	TG	TG	*monteiri*
Psalidoprocne pristoptera	E	F*	RB	TG	TG	*ruwenzori*
Psalidoprocne albiceps	E	N	V	TG	TG	
Oriolus auratus	E	N	V	TG	TG	*notatus*
Oriolus percivali	E	F*	RB	TG	TG	
Trichastoma pyrrhopterum	E	F*	RB	TG	TG	?
Kakamega poliothorax	E	F*	RB	TG	TG	
Alcippe abyssinica	E	F*	RB	TG	TG	*atriceps*
Coracina caesia	E	F*	RB	TG	TG	*pura*
Campephaga flava	E	N	V	TG	TG	
Pycnonotus barbatus	E	N	RB	TG	TG	*tricolor*
Andropadus gracilirostris	E	F	RB	TG	TG	*congensis*
Andropadus latirostris	E	F	RB	TG	TG	*eugenius*
Andropadus masukuensis	E	F*	RB	TG	1900	?
Phyllastrephus flavostriatus	E	F*	RB	TG	TG	*olivaceogriseus*
Phyllastrephus placidus	E	F*	RB	TG	2200	*sucosus*
Cercotrichas hartlaubi	E	N	RB	TG	1900	
Alethe poliophrys (E)	E	F*	RB	TG	TG	
Alethe poliocephala (*)	E	F	RB	TG	TG	*vandeweghei*
Pogonocichla stellata	E	F*	RB	1800	TG	?
Cossypha natalensis	E	N	V	TG	??	?
Cossypha niveicapilla	E	N	RB	TG	1800	*melanota*
Sheppardia aequatorialis	E	F*	RB	TG	TG	*aequatorialis*
Turdus abyssinicus	E	F*	RB	TG	TG	*bambusicola*

Species	SF[a]	SE[b]	ST[c]	AMIN[d]	AMAX	Subspecies
Zoothera tanganjicae (E)	E	F*	RB	TG	2200	
Phylloscopus laetus (*)	E	F*	RB	TG	TG	*laetus*
Phylloscopus trochylus	P	N	V	TG	TG	*acredula*
Prinia leucopogon	E	F	RB	TG	1900	*reichenowi*
Apalis argentea (E) (*)	E	F*	RB	1700	1900	?
Apalis cinerea	E	F*	RB	TG	TG	*cinerea*
Apalis jacksoni	E	F*	RB	TG	TG	*jacksoni*
Apalis porphyrolaema	E	F*	RB	1900	TG	?
Apalis ruwenzori (E)	E	F*	RB	TG	TG	*catiodes*
Camaroptera brachyura	E	N	RB	TG	TG	?
Sylvietta leucophrys	E	F*	RB	TG	TG	*chloronota*
Cisticola chubbi	E	N*	RB	TG	TG	*chubbi*
Muscicapa adusta	E	F*	RB	TG	2000	*pumila*
Melaenornis chocolatina	E	F*	RB	TG	2100	*toruensis*
Batis diops (E)	E	F*	RB	TG	TG	
Batis molitor	E	N	RB	TG	TG	*puella*
Platysteira peltata	E	N	RB	TG	2200	*mentalis*
Elminia albicauda	E	N	RB	TG	2100	
Trochocercus cyanomelas	E	F	RB	TG	TG	*vivax*
Terpsiphone viridis (*)	E	O	RB	TG	TG	*kivuensis*
Tchagra australis	E	N	RB	TG	TG	*emini*
Laniarius luehderi	E	N	RB	TG	TG	luehderi
Malaconotus dohertyi	E	N	RB	1800	TG	
Malaconotus sulphureopectus	E	N	RB	TG	TG	?
Lanius mackinnoni	E	F	RB	TG	TG	
Poeoptera stuhlmanni	E	F*	RB	TG	TG	
Onychognatus tenuirostris	E	O*	RB	TG	TG	*theresae*
Onychognatus walleri	E	F*	RB	TG	TG	*elgonensis*
Anthreptes collaris	E	O	RB	TG	TG	*garguensis*
Nectarinia alinae (E)	E	F*	RB	TG	TG	*alinae*
Nectarinia famosa	E	N*	RB	1900	TG	?
Nectarinia kilimensis	E	N	RB	TG	TG	*kilimensis*
Nectarinia olivacea	E	F	RB	TG	TG	*cephaelis*
Nectarinia preussi	E	F*	RB	TG	TG	*kikuyuensis*
Nectarinia purpureiventris (E)	E	F*	RB	1900	TG	
Nectarinia regia	E	F*	RB	TG	TG	*kivuensis*
Nectarinia senegalensis	E	N	RB	TG	1900	*aequatorialis*
Nectarinia stuhlmanni (E)	E	O*	RB	2100	TG	?
Nectarinia venusta (*)	E	N	RB	TG	TG	?
Nectarinia verticalis	E	F	RB	TG	TG	?
Zosterops senegalensis	E	O	RB	TG	TG	*scotti*
Ploceus alienus (E)	E	F*	RB	TG	TG	
Ploceus baglafecht	E	O*	RB	TG	TG	*stuhlmanni*
Ploceus melanogaster	E	F*	RB	TG	TG	*stephanophorus*

Species	SF[a]	SE[b]	ST[c]	AMIN[d]	AMAX	Subspecies
Ploceus nigricollis	E	N	RB	TG	TG	*nigricollis*
Clytospiza cinereovinacea	E	N	RB	TG	TG	
Mandingoa nitidula	E	N	RB	TG	2200	?
Cryptospiza jacksoni (E)	E	F*	RB	TG	TG	
Spermophaga ruficapilla	E	F	RB	TG	2100	
Lagonosticta rubricata	E	N	RB	TG	TG	*congica*
Estrilda melanotis	E	N*	RB	TG	TG	*kilimensis*
Estrilda nonnula	E	F	RB	TG	2100	*nonnula*
Nigrita canicapilla	E	F	RB	TG	1900	*schistacea*
Lonchura bicolor	E	N	RB	TG	2000	*poensis*
Lonchura cucullata	E	N	RB	TG	TG	*scutata*
Serinus burtoni	E	F*	RB	TG	2100	*tanganjicae*
Serinus canicollis (*)	E	N*	??			*flavivertex*
Serinus citrinelloides	E	N	RB	TG	TG	*frontalis*
Serinus striolatus	E	N*	RB	TG	TG	*kivuensis*
Emberiza flaviventris	E	N	RB	TG	TG	*flaviventris*

[a] "E" for Ethiopian, "P" for Palearctic.
[b] Ecological classification *sensu* Moreau (1970) : "N" for non-forest, "F" for forest, "O" for birds occurring in forest and outside forest. "*" for montane species.
[c] "R" for resident, "B" for breeding, "V" for visitor.
[d] Lowest altitudinal limit (AMIN) and highest altitudinal limit (AMAX) are rounded to the lower and upper hundred meters. "TG" indicates limit falls together with terminus of altitudinal gradient.

DISCUSSION

The Bururi Forest is a part of the Central African montane forest belt, situated on the mountain ranges that border the Albertine Rift on both sides. Outermost sites of this highland area are the Lendu Plateau and Ruwenzori in the north, Mount Kabobo and Mount Kungwe in the south. The center of the area is constituted by the highlands around Lake Kivu (Kahuzi-Biega, Nyungwe and Volcanoes), but the most extensive and richest part is the Itombwe Forest, west of Lake Tanganyika (Fig. 1).

Bururi Forest has a somewhat isolated position in this extensive complex. It is separated from western forests by Lake Tanganyika and from Nyungwe-Teza Forest by a gap of about 60 km. A large part of this gap is probably artificial, because there are indications of a continuous montane forest belt, south to about Mount Heha or Tora. Nevertheless, between Tora and Bururi, over a distance of about 15 km, the Zaire-Nile divide falls well below 2000 m in the Mulembwe Valley. Moreover, that valley is somewhat drier than Mount Bururi or than the area of Tora, with an average annual rainfall of probably only 1250 mm.

The Zaire-Nile divide descends towards Kigoma and the Malagarasy River to the south (Fig. 1), rising again above 2000 m at Mount Kungwe. Across this 220 km wide gap the altitude is mostly between 1000 and 1500 m, but just south of Bururi there are still some isolated montane forest patches. Most of these isolated patches however, are very small and situated in the heads of well watered valleys or deep gulleys. They have an obvious riparian character, are unconnected today and were probably never connected by moist evergreen vegetation in the recent past. Further to the south, from just above Kigoma to the base of Mount Kungwe the natural vegetation was, and still is, mostly Miombo woodland. The forests of Mount Kungwe are thus strongly isolated, not only from those of Bururi, but also from the main belt of the Central African highlands. The bird fauna of Mount Kungwe is consequently relatively poor, but shows some influence from the southern Tanzanian highlands and a high rate of endemism on subspecific level (Moreau, 1941a, 1941b and 1943 ; Ulfstrand and Lamprey, 1960).

According to this situation we propose to compare the bird fauna of Bururi with those of the forests situated to the north and to the south, especially with the bird fauna of the Nyungwe Forest (Vande weghe, in prep.) in Rwanda and northern Burundi.

Table 2. Comparison between the composition of the bird fauna at Bururi Forest and at Nyungwe Forest. "*" indicates montane species. See Table 1 for description of other symbols.

	Bururi Forest*				Nyungwe Forest			
	N	%	N	%	N	%	N	%
F	21	16.3			48	26.8		
F*	43	33.3			73	40.8		
Subtotal			64	49.6			121	67.6
O	10	7.8			18	10.1		
O*	4	3.1			6	3.3		
Subtotal			14	10.9			24	13.4
N	42	32.5			25	14.0		
N*	9	7.0			9	5.0		
Subtotal			51	39.5		34	19.0	
Total	129		129		179		179	

* The X^2-test shows that the observed distribution of bird groups at Bururi and at Nyungwe is significantly different ($P < 0.001$) when calculated on the six main groups or on the subtotals.

GENERAL PATTERN OF THE FAUNA

When we consider only the birds living inside the forest, either open or closed, moist or dry, we see that the total number of species at Bururi is only 72% of that found at Nyungwe (Table 2). According to the theory of island biogeography (*e.g.* MacArthur and Wilson, 1972 ; Diamond, 1975 ; Schoener, 1976) this could be explained, at least partially, by the much smaller area of Bururi Forest (1500 instead of 100000 ha), its more contracted altitudinal gradient (600 m instead of 1350 m) and its rather uniform vegetation.

In addition to a low total number of species, the bird fauna of Bururi also is characterised by a very low number of forest species (*sensu* Moreau, 1966), absolutely as well as relatively. However, the absolute and relative number of non-forest birds is much higher in Bururi than in Nyungwe (Table 2), suggesting that the impoverished forest bird fauna at Bururi has been replaced partially by birds from surrounding woodlands. Birds that cannot be categorized as forest or non-forest are more numerous in Nyungwe, but their relative abundance is nearly the same in the two forests.

ZOOGEOGRAPHY

The lack of lowland forest species can be understood easily. Very little forest is left below 2000 m, or especially 1800 m, and apart from riparian growth, the forests below Bururi, along Lake Tanganyika, were not moist evergreen forests but semi-deciduous forests or periguinean tropophilous forests (*sensu* Lebrun and Gilbert, 1954 ; Lewalle, 1972). Situated on the eastern shores of Lake Tanganyika, these forests were very isolated from other identical forests from southern and southeastern Zaire. They probably had a very impoverished bird fauna, because in the last remnants of such a forest at Kigwena, apart from the Little Greenbul, *Andropadus virens*, no bird has been found that does not also exist in most of the typical riparian forests of southern Burundi (Gaugris *et al.*, 1981).

Bururi Forest has, on the other hand, two species which are not present at Nyungwe : Livingstone's Turaco, *Tauraco livingstonei*, which replaces the Black-billed Turaco, *T. schuetti*, and the Brown-chested Alethe, *Alethe poliocephala*. Although the Alethe is known from lowland forests west of the Rift Valley in Zaire (Prigogine, 1980b, 1984), both species are absent from the Central African highlands and represent a definite southern or south-eastern influence.

The lack of montane forest birds is, on strictly zoogeographic grounds, more difficult to explain. Only 43 of the 75 montane species existing at Nyungwe were found to occur regularly at Bururi. However, seven of 32 missing species still exist in very small forest remnants near Ijenda or on Mount Heha (Table 3). These areas were visited on very few occasions and we may reasonnably suppose that more of the « missing » species will be found there. Therefore, area effects alone can not explain the loss of bird species at Bururi Forest when compared with the forest of Nyungwe and Teza. We suggest that the Mulembwe Valley may be broad

enough to act as an impassable barrier to many species. Alternatively, the higher annual rainfall at Mt. Heha may have allowed the colonisation and establishment of certain species which may otherwise be excluded from the drier Bururi Forest. Karr's (1982) work in lowland forest in Panama shows that some bird species are dependent on moist refugia in the forest during the dry season. If similar ecological pressures are present in African systems then these moist refugia may be in critically short supply or not present during the prolonged dry season at Bururi. That is, even if these species occasionally have crossed the Mulembwe Valley, they may not have been able to become established at Bururi.

If we compare the montane forest bird fauna of Bururi with that of Kungwe-Mahari (Table 3) we see that the latter is still much more impoverished and contain only 11 species. All these species exist in Bururi, except the Yellow-throated Woodland Warbler, *Phylloscopus ruficapilla*, Bocage's Ground Robin, *Cossypha bocagei*, and the Yellow-bellied Wattle-eye, *Platysteira concreta*. The warbler however is a foreign element to the Central African montane bird fauna and represents a link with the eastern and southern Tanzanian montane fauna. The robin also is a southern element east of the Rift Valley. The flycatcher is a quiet unobtrusive bird and has perhaps still to be discovered at Bururi. All Central African montane birds lacking at Bururi are absent also from Kungwe-Mahari. The only puzzling species that requires more information is the Mountain Buzzard, *Buteo tachardus* (see appendix).

Table 3. Distribution of mountain forest birds along the southeastern branch of the Central African highlands, from southwestern Rwanda to northwestern Burundi. "*" indicates the bird is present ; "-" indicates the bird is absent, although its altitudinal niche is represented ; " " indicates the bird has not to be expected, because of the lack of its altitudinal niche. The total number of species found in each forest is given, compared to the total number of species, which could be found.

Species	Ny[a]	Tz[b]	Ij[c]	He[d]	Bu[e]	Ku[f]
Buteo tachardus	*	*	-	-	?	?
Francolinus nobilis	*	*	-	-	-	-
Columba arquatrix	*	*	-	-	*	-
Aplopelia larvata	*	*	-	-	*	*
Tauraco johnstoni	*	*	-	-	-	-
Cercococcyx montanus	*	*	-	-	*	-
Glaucidium albertinum	*	-			-	-
Schoutedenapus myoptilus	*	*	-	-	*	-
Apaloderma vittatum	*	*	-	-	*	-
Merops oreobates	*	*	*	*	*	-
Pogoniulus coryphaeus	*	-	-	-	-	-
Indicator pumilio	*	-	-	-	-	-
Campethera tullbergi	*	*	*	-	*	*
Dendropicus griseocephalus	*	*	*	*	*	-
Psalidoprocne holomelaena	*	*	*	*	*	-

Species	Ny[a]	Tz[b]	Ij[c]	He[d]	Bu[e]	Ku[f]
Oriolus percivali	*	*	*	-	*	*
Parus fasciiventer	*	*	-	-	-	-
Trichastoma pyrrhopterum	*	*	*	-	*	-
Kakamega poliothorax	*	*	-	-	*	-
Alcippe abyssinica	*	*	*	*	*	*
Lioptilus rufocinctus	*	-	-	-	-	-
Coracina caesia	*	*	-	-	*	-
Andropadus masukuensis	*	-			*	*
A. tephrolaemus	*	*	*	-	-	-
Phyllastrephus flavostriatus	*	*	*	-	*	*
P. placidus	*	*	*		*	-
Alethe poliophrys	*	*	*	-	*	-
Pogonocichla stellata	*	*	*	*	*	-
Dessonornis archeri	*	*	*	-	-	-
Cossypha bocagei	-	-			-	*
C. roberti	*	-			-	-
Sheppardia aequatorialis	*	*	-	-	*	-
Turdus abyssinicus	*	*	*	*	*	-
Zoothera tanganjicae	*	*	-	-	*	-
Bradypterus barrattii	*	-	-	-	-	-
B. cinnamomeus	*	*	*	-	-	-
Chloropeta similis	*	*	*	*	-	-
Phylloscopus laetus	*	*	*	*	*	-
P. ruficapilla	-	-	-	-	-	*
Apalis argentea	*	-	-	-	*	*
A. binotata	*	*	*	-	-	-
A. cinerea	*	*	*	*	*	-
A. jacksoni	*	*	*	-	*	-
A. porphyrolaema	*	*	*	*	*	-
A. ruwenzori	*	*	*	-	*	-
Graueria vittata	*	-	-	-	-	-
Hemitesia neumanni	*	-			-	-
Sylvietta leucophrys	*	*	*	-	*	-
Muscicapa adusta	*	*	*	*	*	-
Melaenornis ardesiaca	*	-	-		-	-
M. chocolatina	*	*	*	*	*	-
Batis diops	*	*	*	-	*	-
Platysteira concreta	*	-			-	*
Trochocercus albonotatus	*	*	-	-	-	-
T. albiventris	*	-			-	-
Dryoscopus gambensis	*	*	-	-	-	-
Laniarius poensis	*	*	-	-	-	-
Malaconotus lagdeni	*	-	-	-	-	-
M. dohertyi	*	*	*	*	*	-

Species	Ny[a]	Tz[b]	Ij[c]	He[d]	Bu[e]	Ku[f]
M. multicolor	*	-			-	-
Poeoptera stuhlmanni	*	*	*	-	*	-
Onychognatus walleri	*	*	*	-	*	-
Cinnyricinclus sharpii	*	-	-	-	-	-
Nectarinia alinae	*	*	*	-	*	-
N. preussi	*	*	*	*	*	-
N. purpureiventris	*	*	*	-	*	-
N. regia	*	*	*	*	*	*
Ploceus alienus	*	*	*	-	*	-
P. insignis	*	-	-	-	-	-
P. melanogaster	*	*	*		*	-
Cryptospiza jacksoni	*	*	*	*	*	-
Cryptospiza reichenovii	*	*	-	-	-	-
C. salvadorii	*	*	-	-	-	-
C. shelleyi	*	*	*	-	-	-
Estrilda kandti	*	*	*	*	-	-
Serinus burtoni	*	*	*	-	*	-
Linurgus olivaceus	*	*	-		-	-

[a] Nyungwe in Rwanda, and forests north of Rwegura in Burundi (Vande weghe, in prep. ; Gaugris, 1976 ; Gaugris *et al.*, 1981) ;
[b] Teza (Gaugris, 1976, Gaugris *et al.*, 1981) ;
[c] Ijenda (Gaugris *et al.*, 1981) ;
[d] Mount Heha (Gaugris *et al.*, 1981) ;
[e] Mount Bururi ;
[f] Mount Kungwe in Tanzania (Moreau, 1943 ; Ulfstrand and Lamprey, 1960).

One particularly interesting species found at Bururi is the Kungwe Apalis, *Apalis argentea* (see appendix). The nominate race of this bird is known only from Mount Kungwe (Britton, 1980), while the race *eidos* is only known from Idjwi Island in Lake Kivu (Prigogine, 1967) and from Nyungwe Forest in Rwanda (Vande weghe, 1974). The finding of the species at Bururi fills, at least partially, the distributional gap between both its races. This species belongs to the Central African montane forest bird fauna and is endemic to the southeastern branch of that complex area. Ecologically, this species is primarily found in dry ridge forest, independent of forest location (Vande weghe, in prep.).

Among non-forest birds the Black-throated Wattle-eye, *Platysteira peltata*, found at Bururi, replaces the Wattle-eye, *Platysteira cyanea*, and represents the only southern influence.

Our information still is not complete at the subspecific level, but most species at Bururi are represented by the same subspecies as at Nyungwe or Teza. The Yellow-rumped Tinkerbird, *Pogoniulus bilineatus*, well documented by Prigogine

(1980a) and Vande weghe (1980), as showing a southern or eastern influence at Bururi is one of the few exceptions. Subspecific endemism has not been found, although the newly described race *vandeweghei* of the Brown-chested Alethe (Prigogine, 1984) will become endemic to Bururi after the last forest remnants of southeast Rwanda have disappeared.

In the field however, it appears that some birds do not have the same vocalisations at Bururi as at Nyungwe. This was especially obvious in the case of the Red-faced Woodland Warbler, *Phylloscopus laetus* (see appendix), and could indicate genetic isolation. Also data collected from birds mist-netted at both Nyungwe and Bururi indicate morphological separation between the two populations of some species (Blake *et al.*, in prep.).

ECOLOGICAL DISTRIBUTION

We do not have the information nor is it the purpose of this paper to give a detailed account of ecological distributions, but a few striking facts are worth mentioning.

Some species, although present at Bururi, are exceedingly rare compared to Nyungwe or Teza. The Dusky Flycatcher, *Muscicapa adusta*, and the White-eyed Slaty Flycatcher, *Melaenornis chocolatina*, can be found everywhere, but are common only in the Sikuvyaye Valley. The White-starred Forest Robin, *Pogonocichla stellata*, and the Purple-breasted Sunbird, *Nectarinia purpureiventris*, are rare everywhere. The very low density of the two flycatchers that forage in open areas is striking compared to the relative abundance of other flycatchers that forage inside the forest, *e.g.*, *Batis*, *Trochocercus* or *Platysteira*.

On the other hand, many species seem to have higher densities at Bururi than at Nyungwe. This is especially true for the Equatorial Akalat, *Sheppardia aequatorialis*, and the Grey Apalis, *Apalis cinerea*. Other species, like Lühder's Bush Shrike, *Laniarius luehderi*, Ross's Turaco, *Musophaga rossae*, Green-backed Camaroptera, *Camaroptera brachyura*, Brown-headed Bush Shrike, *Tchagra australis*, Yellow-billed Coucal, *Ceuthmochares aereus*, and the Crested Flycatcher, *Trochocercus cyanomelas*, are to be found everywhere at Bururi, while they are restricted to secondary growth, forest edges or relict forest strips outside the main forest belt at Nyungwe. Still other species existing inside the Bururi Forest were never seen inside Nyungwe, although they can be found in its immediate vicinity : Levaillant's Cuckoo, *Clamator levaillantii*, Sulphur-breasted Bush Shrike, *Malaconotus sulphureopectus*, Black-necked Weaver, *Ploceus nigricollis*, Green-backed Twinspot, *Mandingoa nitidula*, and the Golden-breasted Bunting, *Emberiza flaviventris*.

Last but not least, we found that six species at least occur at higher altitudinal levels at Bururi than at Nyungwe (Table 4). Some species also seem to have a lower altitudinal limit, but more information is needed.

If the total number of species is reduced at Bururi and if some species seem to be limited by some ecological factor, these few observations also show that many spe-

cies have an expanded niche, in habitat choice as well as altitude. This likely explains how some species, like the Brown-chested Alethe and the Red-throated Alethe, can be found together in Bururi, while in most other places they are separated, either altitudinally or by habitat choice (Vande weghe, in prep. ; Prigogine, 1980b, 1984 ; Britton, 1980). This also indicates that release of diffuse competition may be more important than direct interspecific competition in structuring Bururi Forest community.

Table 4. Species with different altitudinal upperlimit at Nyungwe Forest and at Bururi Forest.

Species	Nyungwe Forest	Bururi Forest
Streptopelia semitorquata	2100 m	2300 m
Musophaga rossae	1600 m	2300 m
Ceuthmochares aereus	1900 m	2300 m
Phyllastrephus placidus	2000 m	2200 m
Camaroptera brachyura	1900 m	2300 m
Laniarius luehderi	2000 m	2300 m

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SUMMARY

Bururi Forest Reserve in southern Burundi is known to contain 129 bird species. One of the southernmost montane forests of the Zaire-Nile divide, Bururi Forest contains considerably fewer species than forests in northern Burundi and Rwanda. This species paucity is due in part to its small size, contracted altitudinal range, and its uniform vegetation. Bururi Forest contains significantly fewer forest birds but more non-forest birds than Nyungwe Forest, a large montane forest to the north. Two species found at Bururi and not at Nyungwe represent a southern or southeastern influence. Species missing at Bururi include lowland forest birds and many birds restricted to montane forests. Absence of these species is most likely due to isolations from lowland forest or other montane forests. We suggest that the dry Mulembwe Valley acts as a barrier to colonisation of montane birds at Bururi from northern richer, montane forests of the Zaire-Nile divide. Although nearly all species shared at Nyungwe and Bururi are believed to be of the same subspecies, we found differences in the vocalisations and morphology between the two populations of some species. Finally we discuss the ecological distributions of a few species and suggest the expanded niche exhibited by some species at Bururi allows for their coexistence, whereas at Nyungwe they are separated by either habitat or altitude.

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APPENDIX

Mountain Buzzard, *Buteo tachardus*. - Gaugris (*et al.*, 1980) state that this species exists on the Zaire-Nile Divide south to Bururi, based on a single bird seen on 2 July 1977 in the Sikuvyaye Valley by J.-P. Vande weghe. Subsequently this species has never been recorded again in the same area. This bird is not secretive and we conclude that it is not a resident at Bururi and the

single observation there involved a straggler from the north. More observation will show if this is a regular phenomenon or not. The species is known from Mount Mahari (Britton, 1980).

Brown-chested Alethe, *Alethe poliocephala*. - This species is common at Bururi at all altitudes and overlaps completely with the Red-throated Alethe, *Alethe poliophrys*. Both species were often seen together near ant columns and on two occasions (30 March 1983, 8 September 1984) were caught together in the same mist-net. Outside Bururi Forest the Brown-chested Alethe was found at Karehe Forest (Gaugris *et al.*, 1981) and in southeast Rwanda (Vande weghe, 1981). This population was found to be different from the other populations from East Africa or Zaire and described as *vandeweghei* (Progogine, 1984).

Red-faced Woodland Warbler, *Phylloscopus laetus*. - The song of this species at Bururi is quite different from what it is at Nyungwe. The structure is nearly the same, but the notes are much more detached and give a less « liquid » flow of sounds.

Kungwe Apalis, *Apalis argentea*. - JPV first saw an individual of this species on 28 March 1983 in a small remnant patch of dry forest on a ridge dominating the Sikuvyaye Valley at 1900 m. Its mantle showed an olive wash as can be seen in females and juveniles of the race *eidos*. A pair was discovered on 29 March in a similar dry forest at 1850 m. The parents were feeding young at the nest, indicating that the eggs had been laid in early March. The nest, situated in a dense foliaged tree with many lichens (*Usnea*) about 3.5 m from the ground, could not be examined in detail. The same day another singing male was found and on still another ridge a displaying pair. All the females seen had the olive wash on the back, but the males were silver-grey. Bururi population is probably very small because the suitable habitat for this species (dry forest) is very restricted.

The English venacular name retained by Britton (1980) seems to be not very adequate, because the stronghold of the species is probably the Nyungwe forest in Rwanda. Silver Apalis would be more suitable.

Paradise Flycatcher, *Terpsiphone viridis*. - Most of the birds seen in the Bururi Forest are not different from the birds which inhabit the more northern forests of Burundi or Rwanda. They have buff undertail coverts, dark edges to the flightfeathers, moderatly elongated central tail feathers, and clearly belong to the race *kivuensis*. South and east of the Bututsi Plateau however, the birds are quite different, with whitish undertail coverts and much more elongated central tail feathers. On 29 and 31 March 1983 several such birds were seen inside the Bururi Forest. More observations are needed to show if this indicates polymorphism of the local population, or if this has to be attributed to movements from nearby areas outside the forest.

Variable Sunbird, *Nectarinia venusta*. - The birds of the Bururi Forest have only a very slight reddish tinge on the upper breast. They seem to intergrade between the race *igneiventris* from Rwanda and northern Burundi, and the race *falkensteini*, found in southern and eastern Burundi (Schouteden, 1966).

Yellow-crowned Canary, *Serinus canicollis*. - We never have seen that species in or around the Bururi Forest, but it has been collected there by Prigogine (Schouteden, 1966).

RESUME

La réserve forestière de Bururi dans le sud du Burundi compte 129 espèces d'oiseaux. Située à l'extrême sud de la crête Zaïre-Nil, elle est nettement moins riche sur le plan ornithologique que les forêts du nord du Burundi ou du sud du Rwanda. Cette pauvreté peut être due à la superficie réduite du massif forestier, à son gradient altitudinal relativement court et à l'uniformité de sa végétation. La forêt de Bururi contient moins d'espèces forestières, mais plus d'espèces non-forestières que la forêt de Nyungwe au Rwanda. Deux espèces, présentes à Bururi et non à Nyungwe, constituent une influence du sud ou du sud-est. Les espèces manquantes à Bururi sont à la fois des espèces de forêt de basse altitude et des espèces de forêt montagnarde. Leur absence est probablement surtout le résultat de l'isolement des forêts de

Bururi. Nous suggérons que la vallée de la Mulembwe, relativement sèche, constitue une barrière et empêche la colonisation des forêts montagnardes de Bururi au départ des forêts plus riches, situées plus au nord sur la crête Zaïre-Nil. Bien que la plupart des espèces trouvées à Bururi et à Nyungwe, soient représentées par la même forme subspécifique, nous avons trouvé, pour plusieurs espèces, des différences dans les vocalisations et dans la morphologie des deux populations. Enfin, nous donnons quelques détails sur la distribution écologique de certaines espèces et nous suggérons que la niche écologique plus étendue observée chez certaines espèces à Bururi, autorise leur coexistence, alors qu'à Nyungwe elles sont séparées par l'habitat ou l'altitude.

SAMENVATTING

Het woudreservaat van Bururi in zuidelijk Burundi bevat 129 vogelsoorten. Als één van de meest zuidelijke woudmassieven van de Zaïre-Nijl kam, is het woud van Bururi duidelijk armer op ornithologisch gebied dan de meer noordelijk gelegen wouden in Burundi of Rwanda. Deze verarming kan het gevolg zijn van haar geringe oppervlakte, van haar relatief kleine hoogtegradient en van haar meer éénvormige vegetatie. Het woud van Bururi bevat op significante wijze minder woudvogelsoorten, maar meer soorten die onafhankelijk zijn van woud, dan het woud van Nyungwe in Rwanda. Twee soorten worden in Bururi aangetroffen, die afwezig zijn in Nyungwe. Zij vertegenwoordigen een zuidelijke of zuidoostelijke invloed. Ontbrekende soorten in Bururi behoren zowel tot laaglandwoud als tot bergwoud. Hun afwezigheid is meest waarschijnlijk te wijten aan isolatie van andere laagland- of bergwouden. We veronderstellen dat de vrij droge Mulembwe vallei een hinderpaal is tot colonisatie van het woud van Bururi, uitgaande van de veel rijkere wouden, meer ten noorden op de Zaïre-Nijl kam. Alhoewel bijna alle soorten, gemeenschappelijk aan Bururi en Nyungwe, in beide wouden door de zelfde geographische vorm worden vertegenwoordigd, hebben we toch gevonden dat voor sommige soorten beide populaties verschillen in vocalisaties of afmetingen. We geven ook enige observaties betreffende de ecologische distributie van enkele soorten en we veronderstellen dat de meer uitgebreide ecologische niche van enkele soorten in Bururi, hun coexistentie mogelijk maakt, terwijl zij in Nyungwe gescheiden worden door hoogte- of biotoopskeuze.

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