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February / février 2010

Bull. Nigerian
Orn.Soc.11(40)

THE NORTHERN LIMITS OF FRINGING FOREST BIRDS IN NORTH CENTRAL STATE, NIGERIA

by C.H.Fry

Received 1 August 1975

By 'fringing forest' I mean the narrow and dense tree and shrub growth that is commonly found along watercourses in the Northern Guinea Savanna zone and in adjacent biomes. Typically, fringing forest is sharply demarcated floristically and physiognomically from adjacent woodland (Lamb 1943), which has poorer access to soil water, and it constitutes a distinctive habitat often known by its Hausa name kurmi (Jones 1963). Keay (1960) described the fringing forest of Anara Forest Reserve (near Kaduna) as a narrow strip that remains relatively moist all year, with some residual pools in the dry season, and the palm Raphia sudanica and scrambling tree Syzygium guineense dominant in the tunnel-like understory of darkly evergreen forest. In places, fringing forest may be as narrow as 4½ - 6½ m, consisting mainly of Raphia, but usually with an outer zone of better drained ground growing Vitex domiana, Khaya senegalensis, Diospyros mespiliformis and Parinari kerstingii as the main emergents, up to 25 m high, above a dense low stratum composed of numerous species (Keay 1960). Elsewhere fringing forest may become confluent with a more extensive forest growing on moist soil, comparable with the drier forests of southern Nigeria, with the trees Ceiba pentandra, Antiaris africana, Albizia zygia and Phyllanthus discoideus, and Kershaw (1968) used the term fringing forest for such growth around the bases of inselbergs.

In North Central State about 30 bird species are virtually confined in the dry season to the 'dark tunnel' kurmis, and they constitute a most interesting element of essentially southern species in the avifauna. During the rains many of them are found in the more open and better-illuminated type of fringing forest. Several are migrant, and in the wet season extend even further to the north, in such closed kurmis or more open forests as they can find.

During February and March 1975 I made a systematic effort to assess the northern limits of these birds, by spending at least one afternoon, night and morning at each of four kurmis, recording the birds by observation and netting. Easily accessible kurmis in North Central State are limited in number, especially in the more northern part of the State towards the Sudan Savanna zone; but having visited kurmis at Danbagudu for another purpose on 9 February, I was able to select kurmis at approximately 25 seconds of latitude intervals, and work them progressively northwards during the next few weeks. The findings are presented in Table 1, which includes my previous years' dry-season and 'spring' observations at Anara Forest Reserve and Dunbi Woods.

The Sites

(1) Danbagudu 9-10 February; 20-21 February (with Ms M.E.Gartshore)
(10° 19' N, 07° 46' E; about 65 km by road ESE of Kaduna)

Three kurmis run more or less parallel and about 2 km apart. Two were about 10 m wide and 2 km long, and the third, starting at Danbagudu village, was exceptionally wide, up to 100 m, in places with moderately undisturbed shrubby understorey, elsewhere with separated boles, open at ground level and free of passage. Two of the kurmis were aerial-sprayed with different tsetse-control insecticides between my first and second visits, the third (near Kufana village) being a control. This resulted in substantial bird mortality. In addition the Kufana and Danbagudu kurmis had been heavily damaged by tree cutting and burning, a process continuing unabated during both of my visits.

(2) Anara Forest Reserve 1-2 March (with Mr D. Johnson)
(10° 44' N, 07° 33' E; about 25 km by road NNE of Kaduna)

The principal kurmi within Anara F.R. runs through a long-abandoned village, the only obvious evidences for which are the remains of perimeter walls and ditches, Datura plants, and an avenue of huge Cassia trees now deep in a continuous forest of Anogeissus schimperi, Khaya senegalensis, Ceiba pentandra, Adansonia digitata, etc. The kurmi is at least 2 km long, starts narrow but well structured and, through the village, becomes broad and merges imperceptibly with drier forest in and around the village. For most of its length it adjoins mature Guinea Savanna woodland, and the Reserve shows little evidence of recent disturbance. The vegetation is fully described by Keay (loc. cit.).

I visited Anara F.R. several times from 1962 to 1967. On the present visit I saw or heard nearly all the expected kurmi species, and also came across three that I had not hitherto recorded, despite observation being impeded by exceptionally heavy harmattan haze.

(3) Dunbi Woods
(10° 50' N, 07° 35' E; about 25 km SSW of Zaria)

Not visited by me in February-March 1975, but I totalled some 50 hours observation and netting there in 1962-1967. The woods were formerly an excellent example of Kershaw's (1968) inselberg-base fringing forest, but (despite special protection afforded by its present Reserve status) felling for fuelwood and cattle browsing have almost destroyed Dunbi Woods as a habitat of kurmi wildlife.

(4) Gubuchi 8-9 March (with Ms M.E.Gartshore)
(11° 12' N, 08° 01' E; 35 km direct and 75 km by road ENE of Zaria)

The Kuhugu watercourse drains into the Galma River from the south, and its kurmi appears on the December 1963 air survey photograph (Figure 1) as a typical, dense strip of forest about 2 km long, starting at about 15 m wide and irregularly broadening towards the Galma, where the fringing forest merges into dense Guinea Savanna woodland. The photograph shows

no evidence of agriculture 12 years ago within 1 km to the east or 1½ km to the west. But to-day the woods are in process of being felled for fuel and farming, with a majority of the trees already removed; and in the kurmi many fine mahoganies and other trees have been felled and burned in situ.

However, several marker bird species were found in Kuhugu kurmi, and a few also in dense,shady thickets of the shrub Syzygium guineense growing nearby along the banks of the Galma. Other kurmis, within the Kurmin Kogi Forest Reserve on the north bank of the Galma, were not investigated but are probably much less adversely affected than Kuhugu.

(5) Mazaure Forest Reserve 28-29 March (with Dr J. Huff)
(11° 32' N, 07° 39' E; about 55 km by road north of Zaria)

The densest stands of timber were found along the right bank of the Sheka riverbed, and observations were also made in dense woods 5 km to the east on the Danhankala riverbed (see Nigeria 1:250,000 map Sheet 21 edtn. 1, 1970). The woods here are not 'dark tunnels' but the more open fringing forest of Kershaw (1968), with little evidence of recent human disturbance.

KURMI BIRD HABIT AND HABITAT

Kurmi bird species have to be defined in relation to latitude and to season.

Latitude

Further south in Nigeria the species which I think of as 'kurmi birds' in Northern Guinea savanna are more eurytopic, i.e. they occur in a variety of woodland, thicket and forest-edge situations. In the northern part of the North Central State these species occur only in the densest woods and are therefore very locally distributed; further south they are much more widespread. Presumably they are intolerant of one or a combination of physical factors like high shade temperature, low humidity or high illumination, variables which impose pregressively greater restriction at increasing latitudes in the Guinea and Sudan savannas.

In one of the very few good kurmis near Kano, at Gaya Forest Reserve 65 km ENE of that city, Mr R.E.Sharland informs me that he has recorded Violet-tipped Coursers Cursorius chalcopterus, Violet Turacos Musophaga violacea, Swallow-tailed Bee-eaters Merops hirundineus, Black Wood-Hoopoes Phoeniculus aterrimus, Lesser Honey-guides Indicator minor, Orange-breasted Bush-Shrikes Malaconotus sulfureopectus, Black Flycatchers Melaenornis edolioides and Red-tailed Lavendar Waxbills Estrilda caerulescens. He has not observed any of these species anywhere else in the Kano district and so regards them as 'kurmi birds'. But at Zaria I would not regard any of them as kurmi species except the Violet Turaco (Swallow-tailed Bee-eaters have never been recorded near Zaria).

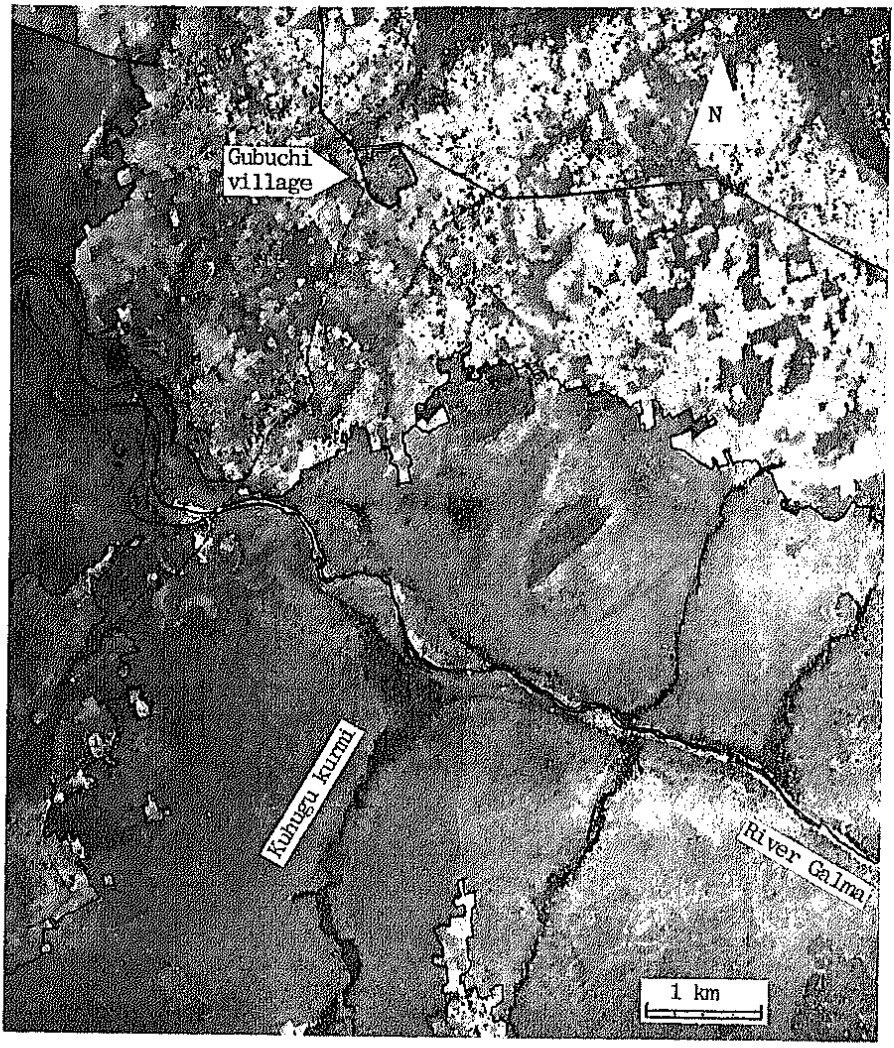

Figure 1. Aerial photograph of Kuhugu kurmi, Gubuchi, to show fringing forests (December 1963). (Courtesy Federal Survey Department.)

To afford greater definition of topographical detail the photograph has been lightly retouched in ink.

Season

Much as physical factors vary with latitude, so at any given latitude do they change with season. At Zaria, for instance,some species which are 'kurmi birds' insofar as they are pretty much restricted to kurmis during the dry season nevertheless become more generally spread around the countryside in the rains, e.g. Violet Turaco, Blackcap Babbler Turdoides reinwardii and Yellow-throated Leaf-love Chlorocichla flavicollis. Lesser amelioration of the climate, in "spring" at Zaria (mid February to April) when trees come into leaf in advance of the first rains, serves to release some species (for instance, Olive Thrush Turdus pelios) from the more dense and shadier habitats to which they are confined during the dry season.

Sunbirds

If, as seems likely, most kurmi species shun bright illumination and associated climatic variables, sunbirds, spending much of their time feeding at blossoms growing in the sunniest extremities of trees, are atypical. Kurmi sunbirds are stenotopic (habitat-tied) probably because of reliance for food upon flowering trees found only in kurmis.

Migration

One species listed in Table 1 is a visitor from the Palaearctic (Pied Flycatcher Ficedula hypoleuca). Others are established intra-African migrants in Nigeria (Paradise Flycatcher Terpsiphone viridis, Snowy-headed Robin-Chat Cossypha niveicapilla, Red-shouldered Cuckoo-Shrike Campephaga phoenicea, Variable Sunbird Nectarinia venusta) (Fry 1971, Elgood, Fry & Dowsett 1973). Many of the other species are likely to be migratory too, which is suggested for some by the speed with which they have re-invaded tsetse-sprayed areas (Koeman et al.1971 and Koeman, pers. comm.) .

THE SPECIES

From the foregoing it will be clear that a particular species is unlikely to be a 'kurmi bird' at all places and all seasons. But in North Central State in the late dry season the 30 species listed in Table 1 are quite typical of that habitat, some (Blue-breasted Kingfisher Halcyon malimbica, Wattle-eye Platysteira cyanea, Blue Flycatcher Trochocercus longicauda, White-crowned Robin-Chat Cossypha albicapilla, Oriole Warbler Hypergerus atriceps, Green-headed Sunbird Nectarinia verticalis) more distinctively so than others (Violet Turaco, Olive Thrush).

The list is thought to be exhaustive of kurmi species in this area and season; other (migratory) species may occur in and be practically restricted to kurmis at other seasons.

Table 1. Northern limits of kurmi birds in North Central State

	Lat. N					
	Danbagudu 10° 19'	Anara 10° 44'	Dunbi 10° 50'	Gubuchi 11° 12'	Mazaure 11° 32'	Other records north of 10° N in Nigeria *
Blue-spotted Wood-Dove		o				
Green Pigeon	o					
Violet Turaco	o	o	o	o		1,8,9,15,17,18
Guinea Turaco		o				
Blue-breasted Kingfisher	o	o	o	o		3,5,8
African Wood-Owl	o					
Cardinal Woodpecker	o	o				2,8,9,14
Blackcap Babbler	f	o	o	o		5,7
Yellow-thr. Leaf-love	c	o	o			1,5,8,10 (rains)
Leaf-love	o	o				
Pied Flycatcher	o	o	o			5
Wattle-eye	f	c		o		3,5,8
Blue Flycatcher	c	o				formerly 6; 9
Paradise Flycatcher	o	f	o	o		8,9,12,13,19 (rains),20
Olive Thrush	o	o	f	o	o	4,8,9,16
White-crowned Robin-Chat	c-f	o		o		2,3,8
Snowy-headed Robin-Chat	o	o	o			5,9,16,20
Grey-winged Robin-Chat						3
Yellow-chested Apalis		o	o			
Oriole-Warbler	o	o	o	o		3,5,8
Red-faced Cisticola	o			o		5
Red-should' Cuckoo-Shrike	o		o	o		6,8,9,11,16
Square-tailed Drongo	o	o	o			
Tropical Boubou	o	o				
Splendid Sunbird	o					
Variable Sunbird	c	c	f			1,16 (rains), 21
Green-headed Sunbird	f	o	f			3,5
Violet-backed Sunbird	o	o	o			1, near 7 (11° 20' N)
Black-necked Weaver	o	o	o			5
Grey-headed Olive-back	o			o		1,3

c = common; f = frequent; o = observed

* 1 Kari 10° 43'N,08° 55'E
2 Ririwai 10° 43'N, 08° 45'E
3 Old Birnin Gwarri 11° 01'N,06°47'E
4 Bunga 11°04'N,09°38'E
5 Zaria For.Res.11°07'N,07°44'E
6 Samaru 11°08'N,07°37'E
7 Shika 11°11'N,07°33'E
8 Aliya 11°15'N,10°45'E
9 Komadugu Gana R.,10°15'N,10°10'E
10 Birnin Kudu 11°25'N,09°30'E

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NOTES ON SPECIES

BLUE-SPOTTED WOOD-DOVE Turtur afer Likely to occur further north than Anara. Great interest attaches to the relationship of this dove with its sibling species T. abyssinica, which has the same song, habits and plumage. In Anara Forest Reserve the two species have discrete habitats but live within metres of each other.

AFRICAN WOOD-OWL Ciccaba woodfordi Identified only by voice : several were calling at Danbagudu all night long. I learnt the call of this species in Kenya in 1972, and any doubts that I had at Danbagudu were immediately dissipated when I listened to a recording by Keith (1971) in April 1975. I believe this is the first record from 'Northern Nigeria'.

GREY-WINGED ROBIN-CHAT Cossypha polioptera Not recorded during the present survey, but included on the strength of a bird netted at Old Birnin Gwarri in 1964 (Fry 1965).

Records of the above three species and of the Green Pigeon Treron australis, Guinea Turaco Tauraco persa, Tropical Boubou Laniarius ferrugineus and Splendid Sunbird Nectarinia coccinigaster, made during this field study, represent substantial extensions of range to the north.

DISCUSSION

Some of the records in the final column of Table 1 refer to the wet season, and thus are not entirely comparable with my dry-season records from the five kurmis I investigated. The following Table shows the numbers of species at each of the five kurmis (A), with the numbers that

Table 2.

	Danbagudu	Anara	Dunbi	Gubuchi	Mazaure	More northerly records
(A)	26	23	16	11	1	
(B)	30	27	21	19	8	7

Table 1 legend cont./

11 Dan Gora For.Res. 11°34'N,08°11'E
12 Maburtata 11°47'N,10°43'E
13 Maiduguri 11°49'N,13°09'E
14 Gadau 11°50'N,10°12'E
15 Maska 11°50'N,07°23'E
16 Kano 12°00'N,08°32'E
17 Biban Baki 12°30'N,05°15'E
18 Gaya For.Res. 12°30'N,08°48'E
19 Kazaure 12°39'N,08°25'E
20 Sokoto 13°03'N,05°15'E
21 Malamfatori 13°37'N,13°23'E

Observers : 1,2,3,12,14 P.Blasdale; 8 Rijksen & Koeman (1970); 13 P.Ward; 16,18,19 R.E.Sharland; 21 A. & J.Hopson; remainder CHF.

might be expected by adding those species with other more northerly records than mine (B). I have made no attempt to correct the figures in (B) to allow for the well-known shifts to north or south of the vegetation zones at various longitudes, and so the values are gross only. They suggest, however, a marked diminution in the number of essentially southern species in the avifauna at a latitude between those of Gubuchi ($11\frac{1}{4}^{o}$ N) and Mazaure ($11\frac{1}{2}^{o}$ N). Since at this longitude the border between the Guinea and Sudan savanna zones falls at approximately 11^{o} 25' N (and continues about the level $11-11\frac{1}{2}^{o}$ N across much of northern Nigeria), values (B) in Table 2 indicate what was to be anticipated, that the northerly limits of most of the 'Northern Guinea savanna kurmi' species of birds fall at or somewhat south of the interface between that zone and Sudan savanna. The seven kurmi birds that have been recorded north of $11\frac{1}{2}^{o}$, incidentally, are nearly all highly migratory.

Acknowledgements

My interest in kurmis and their birds was aroused upon visiting, at the invitation of Dr J. Koeman of Wegeningen Agricultural University, Holland, his students Mr H. de Jongh and Ms P. Spliethoff at Danbagudu. Here they were evaluating the effects upon wildlife of experimental tsetse spraying operations, and I am most grateful for their kindness and hospitality during both of my visits. Ms Beryl Turner of Ahmadu Bello University kindly provided me with maps and information about the kurmis. I am grateful for the companionship and help in the field of Ms M.E.Gartshore, Dr Jane Huff and Mr David Johnson, and I thank Professor B.J.Harris for allowing me the use of facilities (particularly transport) at A.B.U. Dept. of Biological Sciences.

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Appendix

During the kurmi field studies some scarce species were noted in adjacent mature savanna woodland, as follows :

SMALLER BANDED HARRIER-EAGLE Circaetus cinerascens. One, Danbagudu, 10 Feb.

EUROPEAN TURTLE-DOVE Streptopelia turtur. 35-50, Galma R. by Gubuchi.

ADAMAWAU TURTLE-DOVE S. lugens. Several pairs and singles seen at Danbagudu and Kufana, in kurmis and farm parkland (CHF, Ms M.E. Gartshore, Mr H. de Jongh, Ms P.Spliethoff. Identified by plumage features and by the distinctive song, heard once. A notable westward extension of range.

RED-FACED LOVEBIRD Agapornis pullaria. One, brought in freshly dead, Danbagugu, 20 Febr.

GREY-RUMPED SWALLOW Hirundo griseopyga. c.7 over a burnt fadama by the Galma R. near Gubuchi.

WHITE-THROATED CUCKOO-SHRIKE Coracina pectoralis. 3, Danbagudu; 1+, Anara.

YELLOW-BELLIED FLYCATCHER Hyliota flavigaster. Scarce, Danbagugu, Anara.

GREY TIT-FLYCATCHER Myioparus plumbeus. Three separately, Anara.

VIOLET-TIPPED COURSER Cursorius chalcopterus. One,Danbagudu,20 Feb.

Systematic names not already given in the text (Table 1)

Cardinal Woodpecker Dendropicos fuscescens, Leaf-love Phyllastrephus scandens, Yellow-chested Apalis Apalis flavida, Oriole Warbler Hypergerus atriceps, Red-faced Cisticola Cisticola erythrops, Square-tailed Drongo Dicrurus ludwigii, Tropical Boubou Laniarius ferrugineus, Violet-backed Sunbird Anthreptes longuemarei, Black-necked Weaver Ploceus nigricollis, Grey-headed Oliveback Nesocharis capistrata.

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