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## **Notes on the natural history of the Ibadan Malimbe *Malimbus ibadanensis*, a threatened Nigerian endemic**

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### **Summary**

We present new observations on the natural history of the endangered Ibadan Malimbe. The song was tape recorded for the first time and a frequency spectogram is presented. Breeding was observed between May and July. Nests were constructed by one or two males and taller trees were preferred for nesting. Nests were placed in trees containing nests of Red-headed Malimbe *Malimbus rubricollis* and Fork-tailed Drongo *Dicrurus adsimilis* and were visited by other malimbés of the same and/or other species. Ibadan Malimbés were commonly found in mixed species flocks.

### **Résumé**

**Notes sur l'histoire naturelle du Malimbe d'Ibadan *Malimbus ibadanensis*, espèce menacée du Nigéria.** Nous donnons de nouvelles observations sur l'histoire naturelle du Malimbe d'Ibadan qui est menacé. Le chant a été enregistré pour la première fois et l'on donne un spectre de fréquences. La reproduction a été observée entre mai et juillet. Les nids étaient construits par un ou deux mâles de préférence dans des arbres élevés. Les nids se trouvaient dans des arbres qui portaient déjà des nids du Malimbe à tête rouge *Malimbus rubricollis* et du Drongo brillant *Dicrurus adsimilis* et étaient visités par d'autres malimbés de la même espèce ou d'une autre. Les Malimbés d'Ibadan se trouvaient habituellement dans des vols de diverses espèces.

### **Introduction**

The Ibadan Malimbe *Malimbus ibadanensis* is a poorly known species endemic to a small region of SW Nigeria and is considered to be Endangered (Birdlife International 2000). Data are limited, but a shortage of recent sight records suggests low densities and probably a recent range contraction (Johns 1996). A survey for the species during 2000–2 recorded Ibadan Malimbés at 20 forest sites in the Ibadan area and suggested

that increasing forest fragmentation might be limiting distribution (Manu *et al.* in press). This paper reports observations of the natural history of the Ibadan Malimbe during this survey, to clarify the causal link between forest fragmentation and the apparent decline, as well as providing other biological information.

Information on the natural history of the Ibadan Malimbe, Nigeria's most threatened endemic bird is limited (Fry & Keith 2004). It may best be described as a forest edge species. The original specimens were collected in an Ibadan garden (Elgood 1975). Examination of the stomach contents of three specimens revealed vegetable matter, mainly fruit fibres of oil palm, and numerous insect fragments notably tailor ants (Elgood 1958). Very few nests have been observed. Nesting has been recorded in February, May, June, September, October and December (Elgood *et al.* 1994). Nests are retort shaped (Crook 1960). Two contiguous nests being built by males were noted in an *Albizia* sp. tree (Elgood 1975). In 1988, A.P. Leventis (pers. comm.) found a nesting site in a *Parkia biglobosa* tree in a small farm where cassava *Manihot utilisima* and sweet potatoes *Ipomoea batatas* were growing in degraded forest scrub. The nests were *c.* 15 m above the ground near the tip of one of the branches and were inaccessible to humans. Malimbés were seen to strip oil palm leaves for nest construction and tendrils of some climbing plants were also utilised. Observations of breeding activity suggest incubation and fledgling periods of two weeks each, as is typical for passerines of this size (Elgood 1975). Ibadan Malimbés have been observed nesting in association with other weavers. A Yellow-mantled Weaver *Ploceus tricolor* was observed removing nesting material from an Ibadan Malimbe nest that was later abandoned (A.P. Leventis pers. comm.). Ibadan Malimbés have also been recorded nesting with Yellow-mantled Weavers on a *Ceiba pentandra* (C. Williams pers. comm.), but this nest was also abandoned.

Most early sightings of Ibadan Malimbés were in association with Red-headed Malimbés *M. rubricollis* (Elgood 1958). In 1987, however, an adult male was seen feeding a juvenile male together with one other adult, in a mixed species party with Red-headed Malimbés, Red-vented Malimbés *M. scutatus*, Blue-billed Malimbés *M. nitens* and several other species, on the edge of a secondary woodland near Ibadan (Ash 1991).

We describe the call, nesting behaviour and habitat, and mixed species associations of the Ibadan Malimbe.

## Methods

Bird surveys of 52 forest patches within the historical range of Ibadan Malimbe were carried out between January 2000 and March 2002 (Manu *et al.* in press). Line transects (Bibby *et al.* 2000) were conducted during the early morning (4 h, starting soon after dawn) by walking slowly along predetermined routes (existing forest trails) and recording all bird species. Ibadan Malimbe activity, the identity of any associated birds, height of the bird above ground level when first seen and height of the canopy were recorded.

Multiple visits were made to forest patches in search of nest sites. Nests were identified as Ibadan Malimbe nests if they were solitary, with long spouts and in trees other than palms (Crook 1960). Two-hour observations were conducted at nests, to determine if they were active. The one active nest found was observed for 32 h (mean observation period  $2.4 \pm 0.5$  (SE) h over 14 days), during which the activities of Ibadan Malimbés and other species were recorded. For each tree containing an Ibadan Malimbe nest, we recorded the species, height and circumference at breast height (CBH) of all trees within a 10 x 10 m quadrat centred on the nest tree. These measurements were compared with those from a randomly located 10 x 10 m plot in the same forest patch.

## Results

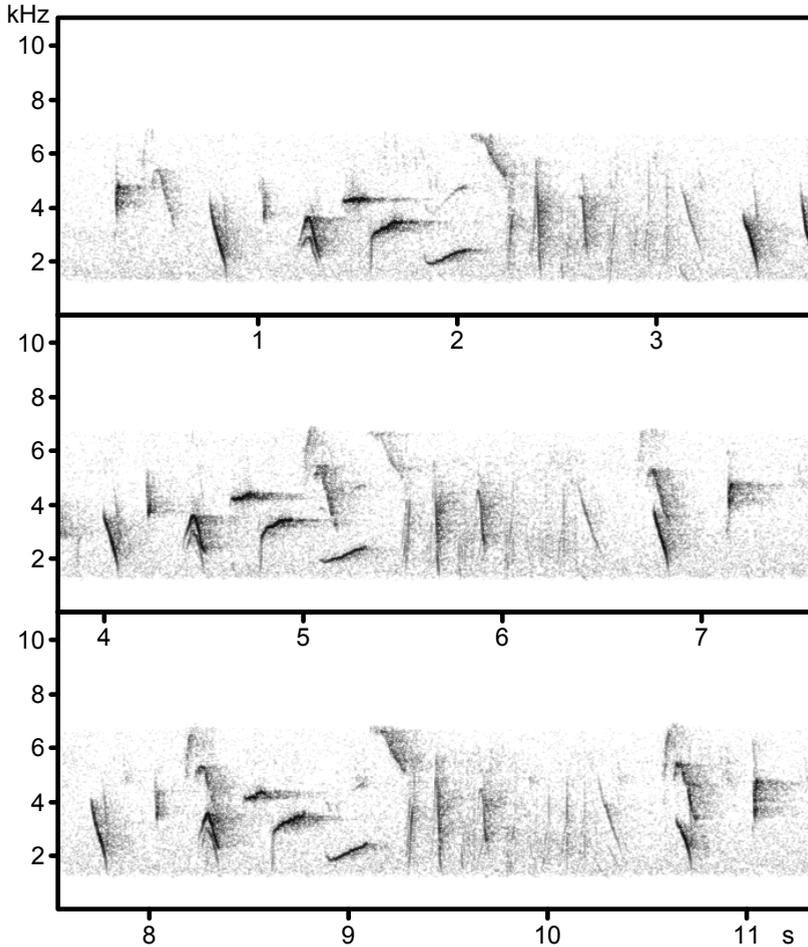
### Calls

On 27 Jun 2001, a male and female Ibadan Malimbe were heard calling from a perch 15 m high at a nest site in Moniya ( $7^{\circ}33.188'N$ ,  $3^{\circ}55.826'E$ ). The call of the female was quieter than that of the male. The song of the male had a frequency range of 2000–7500 kHz, and involved a repeated phrase that consisted of multiple syllables, most of which are frequency modulated (Fig. 1). The song is repeated non-stop for about 1 min. Tapes were made of the calls of both sexes, and deposited in the British Museum Sound Archive.

Both male and female called frequently during the nest-building period. The male often displayed to the female by raising his breast and nape feathers, flapping his wings while calling, and holding his wings open.

### Nesting

Seven nests were found, in five separate trees, of which one was active. A pair attended this nest on 2 June 2001. Two weeks later they abandoned it and started to construct a new nest in the same tree. On average they spent  $2.2 \pm 0.6$  (SE) h each morning ( $n = 14$  days) working on the nest and calling nearby. The nest was mainly built by one male with assistance from a second male on two occasions. The pair flew away for periods of *c.* 30 min, when they could often still be heard and were presumed to be foraging. They were generally absent from the nest from mid-day until late afternoon. During the evenings of 2 Jun (16h32–17h32), 3 Jun (17h14–18h45), 5 Jun (17h00–18h20) and 27 Jun (16h30–17h30) the pair returned to the nest, called around it, foraged and then flew away, usually in company of a pair of Yellow-mantled Weavers. The new nest was half built when it was also abandoned. The malimbés were last observed at the nest on 4 Jul. Within the same period Ibadan Malimbe nests were sighted in four other forest patches within 50 km of one another. In one site, two nests were found in one tree. Although Ibadan Malimbés were seen around the nest trees in these four sites, no activity was observed around the nests.



**Figure 1.** Frequency spectograms for Ibadan Malimbe, recorded at Moniya nest site, 27 Jun 2001 from 6h39–7h19 at Moniya. The song is repeated three times, with each repetition on a separate line.

All the nests, each fixed firmly on a small twig, were of a similar shape to a Red-vented Malimbe nest, with a well-pronounced spout. The spout was shorter (15–20 cm) than that of Red-vented Malimbe, inverted and bent over the nest chamber. Nest materials included stems and tendrils of climbing plants. Four of the nest trees were *Ceiba pentandra*, measuring 18–22 m high and with CBH 117–250 cm, while the other was a *Celtis zenkeri* 22 m high with

CBH 133 cm. One site (Moniya) was dominated by Oil Palm *Elaeis guineensis*, while the others were dominated by *Celtis zenkeri*, *Strombosia grandifolia*, *Cola gigantea*, and *Albizia zygia* that are typical of primary forest. Some of these trees had their main branches broken probably from windfall. The vegetation around the sites was not significantly different from that in the immediate nest areas, although statistical power was limited by sample size. Nests were placed 15–20 m high in the trees. Although nests were placed in taller trees than the average within the vicinity, this difference was not significant, and the CBH in the vicinity of the nest did not differ from the average in random locations (Wilcoxon matched pairs tests: tree height  $z = -1.60$ ,  $P = 0.11$ ,  $n = 5$ ; CBH  $z = -0.54$ ,  $P = 0.59$ ,  $n = 5$ ).

#### **Association with other birds at the nest site**

Two of the five Ibadan Malimbe nest trees also contained Red-headed Malimbe nests, one 3 m above the Ibadan Malimbe nest and one 3 m below. The Red-headed Malimbe nests were not active. Fork-tailed Drongos were also nesting in two of the five Ibadan Malimbe nest trees; their nests were usually at the end of small branches away from the main crown and lower than those of the Malimbés. Red-vented Malimbés, Yellow-mantled Weavers and Red-headed Malimbés were observed around the Ibadan Malimbe nesting area at Moniya, while Crested Malimbe *M. malimbicus* was observed once at the same site. On one occasion, one Red-headed Malimbe spent 2 min. apparently constructing a nest that was being built by Ibadan Malimbés. The bird remained in the nest tree for a further 3 min. before leaving.

On three occasions at the Moniya nest site, Ibadan Malimbés attempting to enter their nests were chased away by drongos that were incubating eggs in the same tree. The malimbés flew around, calling continuously. Twelve days later the Ibadan Malimbés were working on a new nest in the same tree, the old nest having been abandoned. The two nests disappeared during August. The branch on which they were placed was intact. In September the nest in Arikoko ( $7^{\circ}17.888'N$ ,  $4^{\circ}15.886'E$ ) also disappeared.

#### **Behaviour in bird parties**

Ibadan Malimbés were encountered 33 times on transects in 19 forest patches and once flying over a site. Most of them were in mixed species flocks, most frequently with Red-headed Malimbés (48% of encounters), Yellow mantled weavers (42%) and drongos (14%) (Table 2). In almost all encounters, Ibadan Malimbés were quietly searching leaves, flowers, dead leaf clusters, pod clusters or other dry fruits for insects and larvae. The other species in the party were relatively noisy. The Ibadan Malimbés foraged 6–25 m above the ground.

### **Discussion**

All seven nests were high up in mature native trees, characteristic of mature unexploited forest (Richards 1939). The anthropogenic loss of such forest might be limiting the

availability of nesting sites for Ibadan Malimbés and forcing them to nest closer to other malimbés, weavers and drongos, thereby increasing the likelihood of competition for nest sites, nest materials or food. However, previous observations also suggest that Ibadan Malimbés associate with other Malimbés while nesting (Elgood 1975): two contiguous nests were built by a male with three other unoccupied nests adjacent, two of these being of weavers. Nevertheless, drongos defend their nesting areas aggressively and may have caused the abandonment of at least one Ibadan Malimbe nest in this study. Red-headed Malimbés were observed removing nest material from Yellow-mantled Weavers and vice versa, and Yellow-mantled weavers have been observed removing nest material from Ibadan Malimbe nests (A.P. Leventis pers. comm.). Ibadan Malimbe nests that disappeared during this study may have been pulled down by either the Yellow-mantled weavers or the Red-headed Malimbés that were nesting nearby.

**Table 2. Birds recorded moving through the forest in the same flock with Ibadan Malimbe (N = 33 observations); numbers are number of occasions.**

Green Turaco <i>Tauraco persa</i>	1
African Striped Cuckoo <i>Oxylophus levaillantii</i>	2
Emerald Cuckoo <i>Chrysococcyx cupreus</i>	1
Yellowbill <i>Ceuthmochares aereus</i>	1
Broad-billed Roller <i>Eurystomus glaucurus</i>	1
White-crested Hornbill <i>Tropicranus albocristatus</i>	1
Naked-faced Barbet <i>Gymnobucco calvus</i>	1
Hairy-breasted Barbet <i>Tricholaema hirsutu</i>	2
Spotted Honeyguide <i>Indicator maculatus</i>	1
Red-shouldered Cuckoo-shrike <i>Campephaga phoenicea</i>	2
Little Grey Greenbul <i>Andropadus gracilis</i>	1
Western Bearded Bulbul <i>Criniger barbatus</i>	1
Red-tailed Greenbul <i>C. calurus</i>	1
Common Bulbul <i>Pycnonotus barbatus</i>	1
Forest Flycatcher <i>Fraseria ocreata</i>	1
Red-bellied Paradise Flycatcher <i>Terpsiphone rufiventer</i>	1
African Paradise Flycatcher <i>T. viridis</i>	1
Collared Sunbird <i>Hedydipna collaris</i>	1
Sabine's Puffback Shrike <i>Dryoscopus sabinii</i>	1
Red-billed Helmet-Shrike <i>Prionops caniceps</i>	4
Fork-tailed Drongo <i>Dicrurus adsimilis</i>	11
Western Black-headed Oriole <i>Oriolus brachyrhynchus</i>	1
Black-winged Oriole <i>O. nigripennis</i>	4
Yellow-mantled Weaver <i>Ploceus tricolor</i>	14
Red-vented Malimbe <i>Malimbus scutatus</i>	5
Blue-billed Malimbe <i>M. nitens</i>	2
Crested Malimbe <i>M. malimbicus</i>	5
Red-headed Malimbe <i>M. rubricollis</i>	16
Grey-crowned Negrofinch <i>Nigrita canicapilla</i>	2

Early reports that Ibadan Malimbés associate only with Red-headed Malimbés (Elgood 1958) have been disproved (Ash 1991, this study). Increased association might be due to fragmentation and habitat loss. Some of the species found in association with Ibadan Malimbe, including Emerald Cuckoo, Broad-billed Roller, Green Turaco, Naked-faced Barbet and Spotted Honeyguide, are not usually found in mixed flocks. Alternatively, these associations with other species may be typical and long-running but just never recorded before.

Our observations suggest that Ibadan Malimbe may be suffering from nesting competition by other malimbés, weavers or drongos. Habitat loss and degradation may be forcing forest birds to compete for smaller patches of mature forest. Further observations are necessary to confirm this hypothesis.

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