



Habitat Influence on Territorial & Mate-guarding Calls of the Yellow-breasted Boubou (*Laniarius atroflavus*)

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Introduction

The Yellow-breasted Boubou (*Laniarius atroflavus*) is a bush-shrike endemic to the Afromontane forests of the Nigeria-Cameroon highlands¹. We investigated the influence of habitat on the vocalisation of this passerine.

L. atroflavus was studied in forest core, edge and riparian fragment habitats (fig. 1) to determine: i) the diversity of this species' vocal repertoire, ii) differences in

- call rate
- call duration
- pair responsiveness (duetting and mate guarding)
- bandwidth

across the three habitats.



Figure 1: Photographs showing each of the three habitats: core, edge, riparian.

Study Site

This study was conducted at the Ngelnyaki Forest Reserve in Taraba State, Nigeria. A recording point was established within a *L. atroflavus* territory in each of the three habitats (fig. 2).

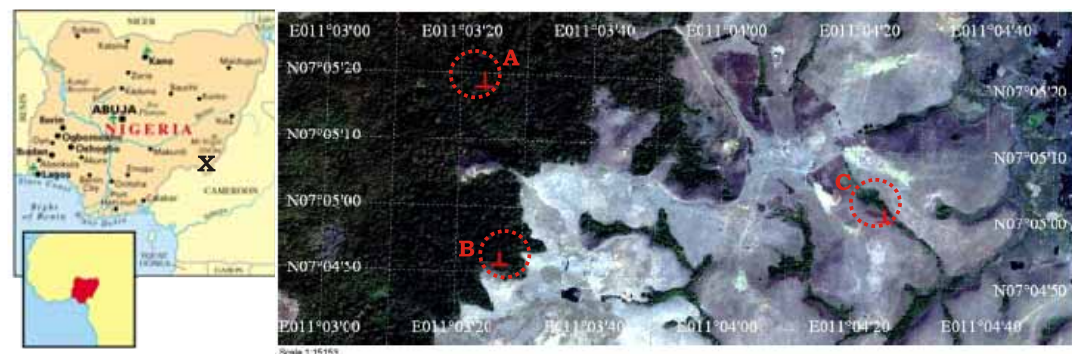


Figure 2: Study site, Ngelnyaki Forest Reserve (marked X) close to the Nigeria-Cameroon border, and satellite imagery of the recording points within each of the territories (broken circles) in the A, core; B, edge; and C, riparian habitats.

Early morning records (0530-0700 hr) were made, twice in each territory, between November 2009 and February 2010. This is the breeding season of the *L. atroflavus*.

Equipment

A Marantz PMD 661 recording unit was used and records were made in stereo at a 24-bit sample size and 48-kHz sample rate. Recordings were rendered in mono at a 16-bit sample size and 44-kHz sample rate for a smaller file size and easier analysis.

Analyses

The time of the first call in each recording was determined and the calls within a 10 minute sample period were identified. The selected calls were highlighted in Raven 1.3² and spectrogram measurements were collated for each call. The number of calls recorded in each habitat was core=62, edge=43, riparian=53. Measurements were pooled and statistically analysed using R³. Where needed, parameters were log transformed to ensure normal distribution.

Results

Calls Repertoire

Three types of calls were identified:

A "single-peaked" call that appears to serve a territory defense purpose with or without the response of the mate (fig. 3).

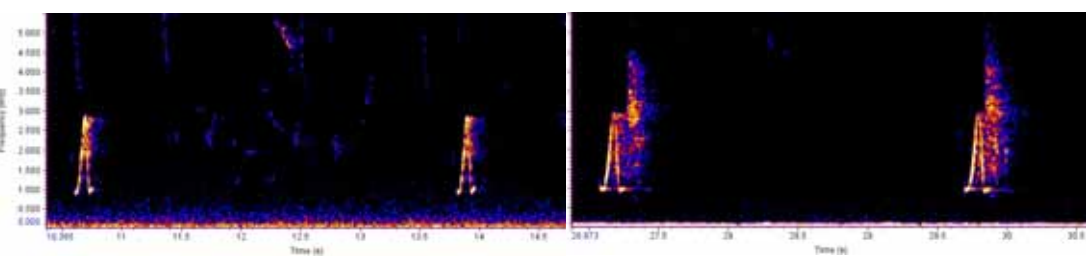


Figure 3: Spectrogram showing the territorial call of the *L. atroflavus*, first of one individual, then with the response of the pair.

A modulated, "twin-peaked" call that appears to serve more for mate-guarding and communication between the pair (fig. 4).

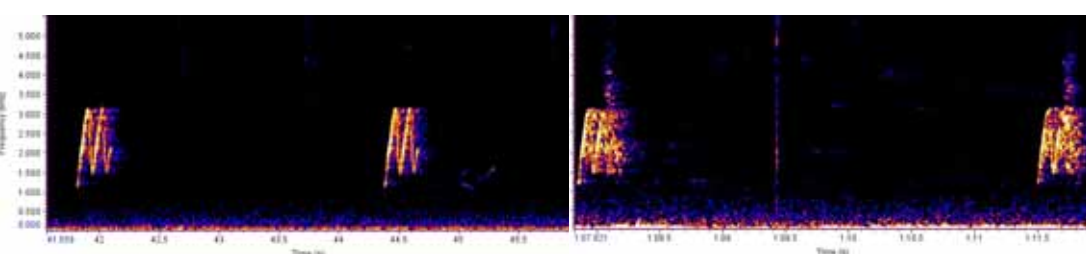


Figure 4: Spectrogram showing the mate-guarding call of the *L. atroflavus*, first of one individual, then with the response of the pair.

A "trill" with lower and higher frequency harmonics that serves as an alarm call between the pair (fig. 5).

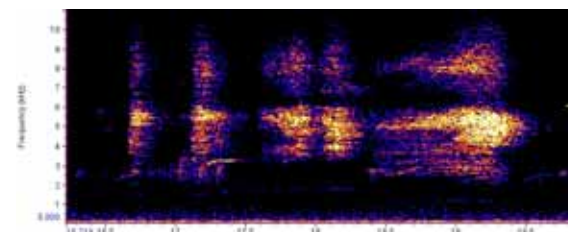
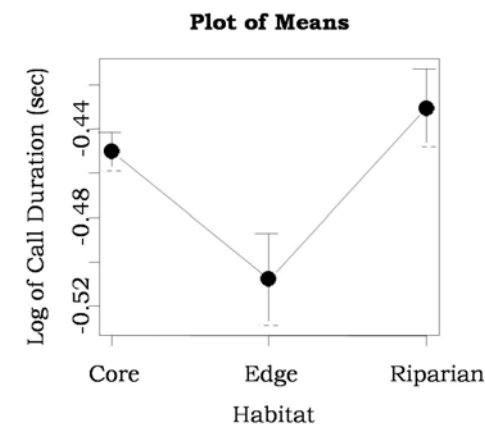
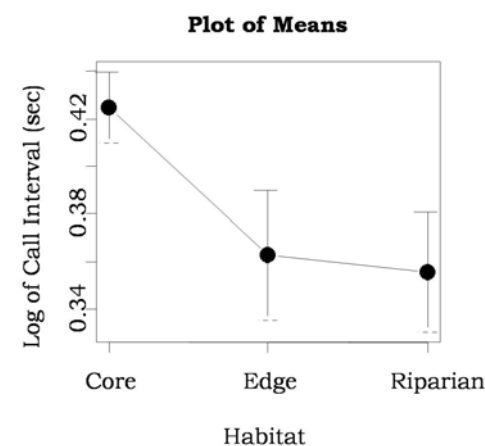


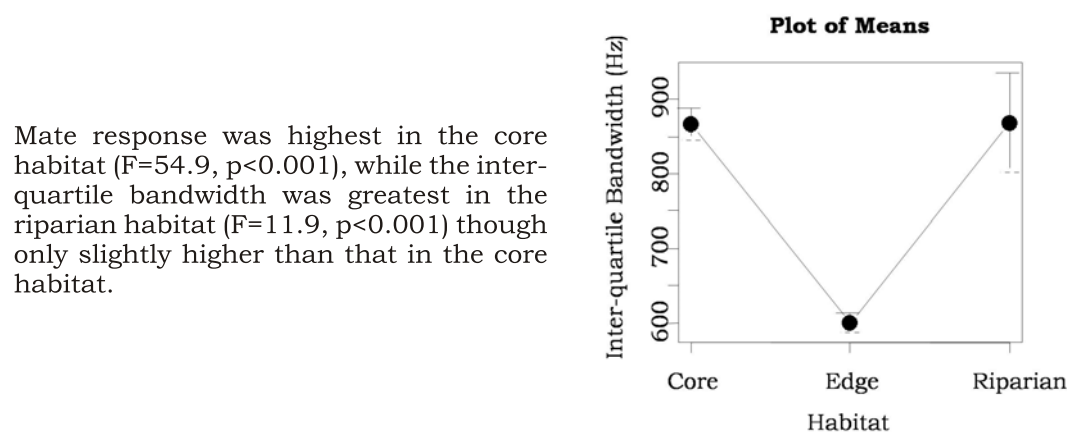
Figure 5: Spectrogram showing the alarm call of the *L. atroflavus*.

Habitat Effect

Call rate, measured as the shortness of intervals between calls, was shortest in the riparian habitat (F=3.3, p=0.04).



The average duration of calls was longest in the riparian habitat (F=6.1, p=0.003).



Mate response was highest in the core habitat (F=54.9, p<0.001), while the inter-quartile bandwidth was greatest in the riparian habitat (F=11.9, p<0.001) though only slightly higher than that in the core habitat.

Conclusion

Habitat does appear to influence some parameters of the territorial and mate-guarding calls of the *L. atroflavus*. The riparian pair exhibited the shortest intervals between the calls (highest call rate) and the longest duration of each call. The frequency bandwidth of their call was also the greatest of the three habitats, though similar to that of the pair in the core habitat. Mate response was highest in the core and remains to be investigated further.

The ongoing study will seek to expand these results and correlate them with fitness, habitat quality and other behavioural data.

Additional Information

The following audio files from the Macaulay archives⁴ were used: 161203, 161210, 161223, 161240, 161241, 161270 - and can be publicly accessed.

References

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