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Great Blue Turacos *Corythaeola cristata* eating filamentous algae in Gabon

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Summary

In the past, feeding on filamentous algae by the Great Blue Turaco *Corythaeola cristata* was thought to be relatively rare. At a swampy clearing in Gabon, a group of Great Blue Turacos regularly consumed filamentous algae for up to 1 h at a time, on over half of the 26 days that observers were present at the clearing. This behaviour may supply important amounts of protein and/or sodium to the birds' diet.

Résumé

Touracos géants *Corythaeola cristata* se nourrissant des algues filamenteuses au Gabon. Auparavant, le fait pour le Touraco géant *Corythaeola cristata* de consommer des algues filamenteuses était considéré comme relativement rare. Dans une clairière marécageuse au Gabon, un groupe de Touracos géants consommait régulièrement des algues filamenteuses, la prise alimentaire durant jusqu'à une heure, et ceci pendant plus de la moitié des jours de présence des observateurs. Ce comportement est susceptible d'apporter des quantités importantes de protéines et/ou de sodium dans la nourriture des oiseaux.

Introduction

Great Blue Turacos *Corythaeola cristata* have long been recognized as the most folivorous of the turacos. Up to 25% of their diet was composed of leaves in the Nyungwe National Park, Rwanda (Sun 1995, Sun & Moermond 1997), where they were occasionally observed feeding on aquatic plants, including algae (Sun *et al.* 1997).

In Central Africa, swampy clearings dominated by sedges and grasses (*baïs*) are relatively widespread. Some of these clearings are also mineral-rich, attracting large

mammals and birds, which feed on both the soil and the nutritious vegetation (Klaus-Hugi *et al.* 1998, Magliocca & Gautier-Hion 2002, May 2004, Ruggiero & Eves 1998). Filamentous green algae are common in the water of small ponds and streams within these clearings (Ruggiero & Eves 1998), their growth probably encouraged by the droppings and urine of the large mammals frequenting such sites.

Since the mid 1990s, a number of *baïs* have been studied in Central African Republic, Republic of Congo, Cameroon, and Gabon. The objective is usually research and monitoring of the large mammals using these sites. Observations are often carried out from a raised platform at the edge of the clearing, which provides the opportunity for recording behaviour otherwise rarely seen (*e.g.* Maisels 2003). Great Blue Turacos were seen feeding on the ground in marshy areas of similar clearings in the Republic of Congo (in Odzala NP, at the clearing known as "Moba" in September 1996) and in the Central African Republic (in Mongambé clearing in the Dzanga NP, in January 2000). On the first occasion they were clearly feeding on aquatic algae, and were probably doing so on the second. Here we present evidence that algae-feeding can be an important daily activity and, by implication, provide an important dietary component.

Methods

A small forest clearing "Djidji Baï", in central Gabon (0°10.618´S, 12°21.983´E) was monitored for wildlife visits between May and July 2007. The clearing is *c.* 150 m across, dominated by sedges and grasses, and has a small, clear-water stream running along one side. A wooden platform, built at the edge of the clearing and immediately over the stream, affords excellent views.

Data were collected over a period of 26 days. Observations were made between c. 5h50 when it became light enough to see, until nightfall (between 18h30 and 19h00, depending on cloud cover). Total observation time was 133.5 h, (mean 5.1 h per day), of which *c.* 71 h were in the mornings and 63 h in the afternoons.

Results

A group of up to five Great Blue Turacos was regularly seen at the clearing, feeding on the filamentous green algae growing in the stream below the platform. The birds were only *c.* 15 m from the observers and could be clearly seen (Fig. 1). Fallen dead branches offered perching posts immediately above the water. They fed while standing in the running water, occasionally jumping onto dead branches to perch. We assume the turacos were the same individuals each time, as they are known to live in groups within a large home range (Sun & Moermond 1997), but of course without individually ringing the birds we cannot be certain of this.

The turaco group visited the *baï* on 15 of the 26 observation days and was present for a mean of 36 min. per observation day or 11% (± 4%, 95% confidence limits) of the daylight time that the clearing was under observation. They spent long periods (range 3–60 min.; mean 20 min.) feeding on algae in the stream, comprising 78% of the total time that they were visible, and the rest of the time perched on branches. Feeding on algae comprised an average of 9% of the time the clearing was under observation per day. These are minimum figures, as they do not include feeding (or other) activity carried out whilst out of sight of the viewing platform. The birds were not seen to feed on anything else whilst in the clearing, but after feeding on algae, they usually flew across the clearing and vanished in the forest opposite the platform.

Fig. 1. Three Great Blue Turacos feeding on algae (dark patches in birds' shadows) below the viewing platform, Djidji Bai, June 2007. Photo: Prosper Motsaba. Colour photo may be seen at http://malimbus.free.fr/suppindex.htm.

Discussion

Brosset & Fry (1988) reported Great Blue Turacos feeding beside streams, apparently based on Malbrant & Maclatchy (1949). Gabonese hunters had reported to Malbrant

& Maclatchy (1949) that the species fed on green algae growing in pools of stagnant water. Fifty years later Rwandan hunters also reported this behaviour in clear or slow-flowing streams (Sun *et al.* 1997). Hunters in both countries said that they set traps specifically to catch them at these sites. Sun and his colleagues only rarely recorded this behaviour, because they were following focal birds to quantify their diet. Access to the narrow forest streams in which the aquatic plant-eating occurred was difficult in Rwanda, which the authors acknowledged caused a low estimate of the importance of aquatic plants to the birds' diet (<1%: Sun 1995). Our data show that this behaviour may be much more important than previously realised. Like Sun, we used the time allocated by birds to feeding on each food type as a proxy for intake, and we observed feeding on algae for 9% of the daylight hours sampled. We do not know the proportion of each day actually spent feeding and how much time is spent on other activities, but the daily time allocation to feeding on all types of food by two other species of turaco in Rwanda was only 8–15% (C. Sun unpubl. data, *in* Sun & Moermond 1997). If Great Blue Turacos spend up to 20% of their day actually feeding and if these were the same individuals each time, then clearly filamentous algae are a very important part of the diet, probably throughout the species' range. The behaviour has now been recorded in Rwanda, Central African Republic, Republic of Congo and Gabon.

Filamentous algae are known to be relatively rich in protein and minerals (Khan *et al.* 1996, Nwadiaro *et al.* 1990). The aquatic plants consumed by Great Blue Turacos (which included filamentous algae) analysed by Sun *et al.* (1997) were significantly richer in sodium than their two most important terrestrial leaf diet items. The ingestion of aquatic plants was hypothesised by the authors to be a way of detoxifying the leaves that they also consume: a common strategy in mammals (Kreulen 1985, Klaus-Hugi *et al.* 1998). This certainly seems to be the case for African Elephant *Loxodonta africana* (Houston *et al.* 2001), Black-and-white Colobus monkeys *Colobus guereza* (Oates 1978), and even mice (Freeland *et al.* (1985). Other detoxification methods used by birds were discussed by Diamond *et al.* (1999). In general, aquatic plants are richer in sodium than terrestrial leaves, and sodium content has been shown to be a significant parameter in choice of aquatic herbs by large herbivorous mammals (Belovsky 1981, Oates 1978, Stark 1986, Tracy & McNaughton 1995). However, filamentous algae are also usually richer in protein and lower in lignin than terrestrial leaves, and this may be another reason why turacos fed on algae. Sun *et al.* (1997) suggested otherwise, but this was partly because they thought that algae comprised a small part of the diet, and also because there were no great differences in either nitrogen or fibre content between the leaves eaten and those not eaten by this species. Analysis of filamentous algae from a small lake in N Congo (F. Maisels unpubl. data), showed that they contain *c.* 11% protein, with similar sodium concentrations to those found by Sun *et al.* (1997). Thus the birds may indeed be using the algae for protein as well as for sodium.

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