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THE BREEDING ECOLOGY OF CAPE GLOSSY STARLINGS AT A NEST SITE IN THE KALAHARI

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Introduction

The Cape Glossy Starling *Lamprotornis nitens* is by far the widest distributed Lamprotornis-starling (the genus name is German for a bright or shining bird) found in the southern African sub-region. This species exhibits a monogamous mating system observed between September and March, when tree cavities or fence posts are used as nest sites (Craig, 2005). Occurring in wooded savannah, the Cape Glossy Starling feeds mainly on fruit, insects, nectar and, scraps from tables and even takes ectoparasites from mammals (Faere and Craig, 1998).

A single Cape Glossy Starling nest was observed at a golf course on the rim of the Kalahari, Northern Cape Province, South Africa. The course is nestled within one of two known Camelthorn *Vachellia erioloba* forests (Liversidge, 2000). In South Africa, this arid forest ecosystem is nationally protected. Contrary to belief, golf courses are known to have higher bird and insect species richness than nearby farmland (Tanner and Gange, 2005).

Methods

Throughout the observation period, adult bird behaviour was recorded near the nest, time between feeds (inter-feed time) and food items brought to the chicks. Observations were conducted from inside a vehicle parked approximately five metres from the nest. These observation periods spanned over the hottest times of the day, 12:00-15:00 during late October-/early November 2012. The birds were habituated to humans and vehicles, as the nest was placed inside a large Camelthorn tree adjacent to a putting green and intersection where daily traffic volumes were high. These individuals were approachable, tolerating human presence up to one metre before flushing.

The following variables were recorded for this nest site:

1. Tree species in which the nest site occurred;
2. Tree height;
3. Diameter of trunk at breast height (1,4 m above ground);
4. Canopy area (area the canopy covers on the ground; m^2);
5. Minimum canopy height;
6. Height of nest above ground;
7. Direction of nest entrance (e.g. north-west);
8. Inter-feed time;
9. Food items brought to the nest.

Vegetative characteristics were measured using a measuring tape and rangefinder, the latter accurate to 20 cm. These measurements were recorded in metres. Food items were identified by means of photographs and binoculars, prior to the birds entering the nest. Insect prey was identified down to order (e.g. Odonata: damselflies and dragonflies). Inter-feed times were recorded with a stopwatch and converted to seconds. The former were measured from the moment an adult bird left the nest after feeding the chicks, until an adult entered the nest with food. Calculations and analyses were performed using MS Excel and STATISTICA (StatSoft, 1997).

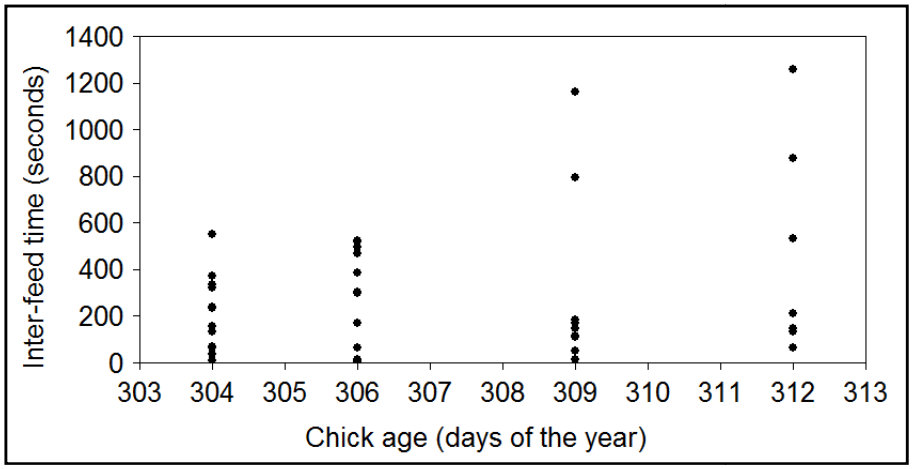

Fig 1 – A scattergram indicating a weak correlation between chick age and inter-feed time (r = 0.28, P = 0.08).

Results

The breeding pair observed in this study made use of a nesting hole possibly excavated by a barbet or woodpecker (family Lybiidae). The nest was placed in one of the main branches of a large, live Camelthorn tree (10,6 m tall) and situated 3,4 m above ground. The entrance hole faced at a downwards angle and north-west. The nest experienced full shade throughout the day as it was centred underneath the 157 m^2 canopy. The canopy's lower reaches extended to 3,2 m above ground (lower than the nesting hole) with a trunk diameter of 2.4 m. Ambient air temperature in direct sunlight was above 30°C during the observation periods however, a breeze was present during most of these times.

The birds were observed for a total of four hours and 40 minutes. Overall, it took the birds on average 291±46 seconds (mean±standard error of the mean) to deliver food items to the chicks. The longest bout between feeds was 1 260 seconds on one occasion and the chicks received a second helping within five seconds, on another occasion.

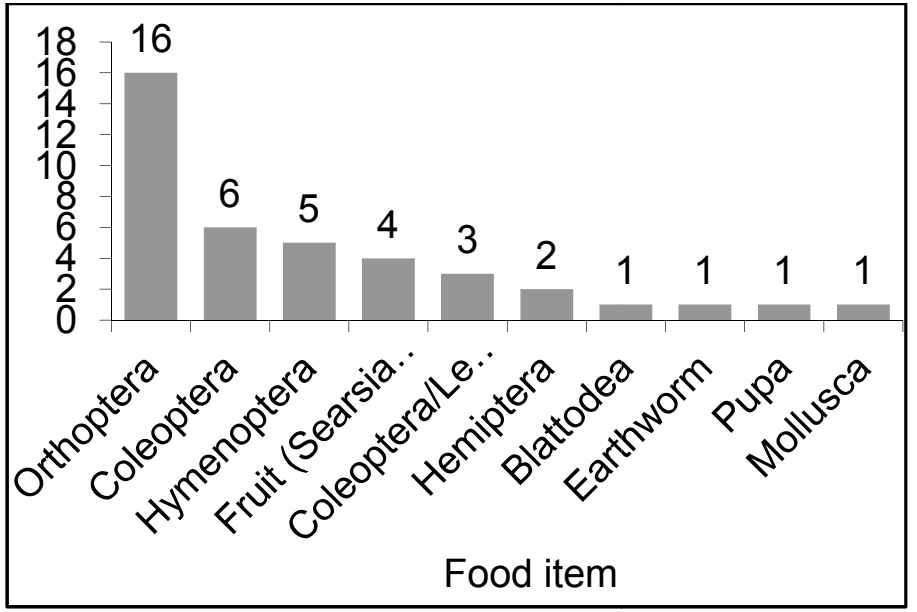

Fig 2 – Histogram showing the frequency distribution of food items brought to the nest and fed to the chicks. Unknown items are not included.

The correlation coefficient shows a weak relationship between inter-feed time and chick age (Figure 1). The Kruskal-Wallis test result also, shows no significant difference for mean inter-feed time as the chicks aged ($H_{3,42}$ = 1.41, P > 0.05).

Ten different categories and 49 individual food items were identified and fed to the chicks. For analyses, the food items were grouped into orders (for Insecta) and included Orthoptera (grasshoppers and/or locusts) constituting for most of the food items (32.65%).

Fig 3 – A Cape Glossy Starling ready to feed its chicks bugs, a food item not recorded in other studies.

Other food items included the orders Hymenoptera (ants; 10.20%), Coleoptera (beetles; 12.24%), Coleoptera/Lepidoptera larva (beetle, butterfly or moth larva; 6.12%), Hemiptera (bugs; 4.08%) and lastly, fruits of a current *Searsia* plant (8.16%). Unknown items or unidentifiable items constituted for 18.36% of the items brought to nest and fed to the chicks. Blattodea (cockroaches), an earthworm, mollusc (slug) and a pupa, were fed to the chicks on single occasions respectively of one another (Fig 2).

Two perches were favoured by the adults apart from the nesting tree. These were located at 27 m and 35 m from the tree respectively. The faecal sacs of the young were removed from the nest and deposited on the ground approximately 45-54 m from the nest. Another three nests were located in the surrounding forest ecosystem at the time of this study. Of the five nests (including the study-nest) two were in cavities excavated by other birds, one nest behind the bark of a tree, another in a hollow, wooden fence post, and the last in a natural cavity of a dead tree. The nest positioned behind tree bark was placed under the large canopy of a live tree, less than 100 m from the study-nest.

Discussion

Cape Glossy Starling feeds on many items including six of the ten groups recorded in this study (Fig 2; Craig 2005, Craig and Faere 2009). The observations at this study showed that this species also provide their chicks with bugs from the order Hemiptera (Fig 3), cockroaches, earthworms and even molluscs. The Hemipteran species recorded here, was identified as a member of the Coreidae family and are phytophagous (feeding on plants). The common name ‘twig wilters’, refer to this invertebrate’s ability to cause wilting and die-back of plant shoots. Some members of this family are regarded as serious pests in gardens and cause massive losses in bean harvest and citrus production (Scholtz and Holm, 2008).

Conclusion

Four of the six food items recorded in this study, have not been

noted in other studies. This is a first account of such food items brought to the nest and fed to the chicks of Cape Glossy Starlings. Moreover, Cape Glossy Starlings may be seen as pest controllers as they were recorded feeding on twig wilters, some members of this insect family regarded as serious garden- and agricultural pests.

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