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EGG REJECTION BY GREEN WOOD-HOOPOE
PHOENICULUS PURPUREUS

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Avian brood parasitism is a fascinating arms race between host and parasite and has been extensively studied in numerous specific host-parasite interactions (Rothstein 1990; Langmore et al. 2003). Most studies have a northern hemisphere bias and little is known about the intricacies of many African brood parasite relationships (Short and Horne 2001). Many of these interactions involve those between families endemic to the Afrotropics, for example honeyguides (Indicatoridae) and Old World barbets (Lybiidae) (Maclean 1990).

Numerous anecdotal accounts exist for the sub-region although some detailed work has been done, including pioneering work on Greater Honeyguides Indicator indicator (Spottiswoode and Colebrook-Robjent 2007; Spottiswoode and Koorevaar 2012). An important component of this brood-parasite struggle is the ability of a host to recognise a parasites egg (Davies and Brooke 1989; Aviles et al. 2004). However, in the first line of defence one might expect a strategy to evolve in which initial access to the nest by the parasite is prevented by the host, and that in cases where birds breed cooperatively a strategy of nest/clutch protection may operate more effectively (Brown 1987; Stacey and Koenig 1990; Canestrari et al. 2009). In this report I present an incident of honeyguide egg recognition and rejection by breeding Green Wood-Hoopoes Phoeniculus purpureus.

As part of a long term study on cavity nesting birds I have considered the opportunity of recording brood parasite-host interactions. At a site near Nelspruit (S25°34.367’ E31°10.883’ altitude = 800-1,000 m a.s.l.), during 17-18 September 2011, I erected a total of 30 x PVC pipe nest-boxes. These included 10 nest-boxes each of different sizes (Table 1; Fig 1). Each nest-box had a cap attached at the top and bottom, with the bottom cap glued, and holes drilled to allow water drainage. The entry hole was cut >two-thirds of the pipe height and all nest-boxes were painted with a grey enamel paint (Fig 1). A strip of carpet was glued to the inside of the nest box leading from the entrance hole to the bottom of the nest; this was to provide birds with a surface to grip onto so that they could enter and exit the nest with ease. The top cap was not glued, to allow for easy inspection of nest contents. When erected, coarse gravel was placed into the bottom of each nest box and lined with dry grass and leaves. Nest boxes were attached to selected sites in groups of six nest boxes (2 large, 2 medium, 2 small, see Table 1). This gave five sites with six nest-boxes at each site. The nest-boxes were attached to the tree with wire.

Table 1. Details of nest box dimensions and height erected.

<table>
<thead>
<tr>
<th>Size</th>
<th>Pipe diameter (cm)</th>
<th>Pipe height (cm)</th>
<th>Entrance Diameter (cm)</th>
<th>Height of nest-boxes (mean metres ± SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large</td>
<td>16</td>
<td>52</td>
<td>5.1</td>
<td>3.65 ± 0.96</td>
</tr>
<tr>
<td>Medium</td>
<td>14</td>
<td>46.1</td>
<td>4</td>
<td>3.63 ± 1.61</td>
</tr>
<tr>
<td>Small</td>
<td>11</td>
<td>41</td>
<td>3</td>
<td>2.90 ± 1.04</td>
</tr>
</tbody>
</table>

Less than a month later after erection (15 October 2011) one of the nest-boxes (M3, ht = 6.12 m, in a Sclerocarya birrea, Fig 2) was
inspected and a clutch, that appeared to have been depredated, was observed (Figure 2a). The light-blue coloured eggs with a textured shell and tiny bumps on the surface, an unlined nest cavity, and size comparisons compared to dimensions presented in Tarboton (2011), suggested Green Wood-Hoopoe, whilst those of the white eggs (only one was measurable) suggested a honeyguide egg. Greater and Lesser Honeyguide *Indicator minor* are recorded at the site and the Green Wood-Hoopoe is recorded as an occasional host of Greater Honeyguide (Tarboton 2011; Table 2). The Cape Glossy Starling was considered as a possible candidate of the depredated eggs as it has similar coloured eggs to the wood-hoopoe but they are smooth and a nest is constructed in the cavity (Tarboton 2011). The Cape Glossy Starling was recorded breeding in a nest-box nearby (c. 5 m away in a Flat-crown Albizia *Albizia adianthifolia*, L3, ht = 4.84 m), during a later inspection of the nest-boxes (11 December 2011), with three nestlings. Additional support for this identification is given by a breeding event of Green Wood-Hoopoe on 11 December 2011 where a clutch of four blue and one white egg was observed in a
The egg, which could be interesting to have observed how the honeyguide Lybiuserved on 11-operative for. Although it might appear easier to-laying–hoopoe, Greater–hoopoe, and on
), because no egg shells were found in the nest
collared Barbets)). To confirm that the egg was still
parasites, even in co-
torquatus does not appear aggressive, unlike Black-
to have observed how the honeyguide
recognition of a different colour or size egg in a dark cavity may be
breeding species, in cases where the defences are breached,
defend a cavity nest from brood-
Rothstein and Robinson 1998)
colour, or eggs laid at the wrong time
recognition my placing dummy eggs in a breeding wood-hoopoe
fields during different stages of the breeding cycle.
Table 2. Comparison of egg sizes of Green Wood-hoopoe, Greater
Honeyguide, and Lesser Honeyguide, compared to clutches observed in
nest-boxes at Pullen Farm. Dimensions give actual measurements for
measurable remains of depredated eggs, or mean (minimum – maximum)
for data from Tarboton (2011).

<table>
<thead>
<tr>
<th>Species</th>
<th>Clutch size</th>
<th>Egg size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Length</td>
</tr>
<tr>
<td>Green Wood-Hoopoe</td>
<td>3-4 (2-5, rarely 6)</td>
<td>24.9 (22.2-29.2)</td>
</tr>
<tr>
<td>Blue eggs (this study)</td>
<td></td>
<td>broken</td>
</tr>
<tr>
<td>Greater Honeyguide</td>
<td>1+</td>
<td>24.3 (21.0-26.0)</td>
</tr>
<tr>
<td>Lesser Honeyguide</td>
<td>1+</td>
<td>21.5 (20.0-24.0)</td>
</tr>
<tr>
<td>White eggs</td>
<td></td>
<td>23.2</td>
</tr>
</tbody>
</table>

Other boxes that were also in use during this field trip included
Southern Black Tit Parus niger; two nestlings were observed on 11
December 2011 (nest M1, ht = 1.95 m, in a Searsia sp.) and fledged
the following day.
Fig 3 - Clutch of hatched/depredated eggs (possibly 3 x Green Wood-Hoopoe and 2 x honeyguide eggs; see Table 2 for egg size comparisons).

This study will soon be supplemented with natural log nest-boxes. These might encourage numerous other cavity nesting species in the area, e.g. Violet-backed Starling *Cinnyricinclus leucogaster*, Black-collared Barbet, Narina Trogon *Apaloderma narina*, that have so far shown no interest in the PVC nest-boxes.

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Fig 4 - Clutch of Green Wood-Hoopoe eggs with possible honeyguide egg.

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References


