Observations on a nest of Hyacinth Visorbearer *Augastes scutatus*

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Foram feitas observações em um ninho do beija-flor-de-gravata-verde *Augastes scutatus* em uma localidade de campo rupestre na Serra do Cipó, Minas Gerais. Apenas uma fêmea desta espécie foi observada cuidando dos ninhegos. Durante as observações foram registrados ataques de um indivíduo de beija-flor-tesoura *Eupetomena macroura* ao ninho de *A. scutatus*. Pela primeira vez são descritos os comportamentos de cuidado parental e a evolução da plumagem do ninhego de *A. scutatus*.

Introduction

Life histories of the endemic bird species of the Espinhaço range in south-east Brazil (Endemic Bird Area 073[15]) are poorly known, with some exceptions[2,4,6,7,8,9,16–19]. Hyacinth Visorbearer *Augastes scutatus*, a near-threatened species[1], is restricted to *campos rupestres* of the Espinhaço[10,11,13–15]. Apart from a description of the nest[4,5,9,11], virtually nothing is known of its breeding biology. This paper describes observations at a nest of this little-known hummingbird.

Material and methods

Observations were undertaken on 23, 26 and 29 June and 3, 6, 9, 11 and 16 July 1999, totalling 37 hours. The nest was watched with 8 x 40 binoculars from a distance of 12 m. Activity was described in a notebook. Furthermore, we filmed and photographed all behaviours which occurred at a distance of 4 m or less from the nest. We did not measure the nestlings to avoid stress to the birds. Only when a nestling left the nest did we catch it to study its plumage in more detail.

Site description

The study area lies at 1,100 m, in the Serra do Cipó (19°17'S 43°35'W), municipality of Santana do Riacho, Minas Gerais[16]. Vegetation is *campos rupestres*, with rocky outcrops supporting cacti *Cephalocereus* sp., 'canelas-de-ema' *Barbacenia flava*, *Vellozia* spp., 'sempre-vivas' *Paepalanthus* sp. and bromeliads (*Aechmea* sp., *Vriesea* sp., *Tillandsia* sp.). Species composition is completed by various herbs and shrubs, principally *Irlbachia* sp., *Coccoloba cereifera*, *Byrsonima verbascifolia* and species of Asteraceae, Lamiaceae and Melastomataceae. Shrubs and trees are scattered, being represented mainly by 'barbatimão' *Stryphnodendron adstringens*, 'quaresma-branca' *Trembleya laniflora*, 'pau-santo' *Kielmeyera petiolaris* and *Vochysia* sp.

Nest description

The nest was found on 23 June, when it contained two 1–2-day-old nestlings. On 26 June only one nestling was present in the nest. The cup-shaped nest was placed within a fork of a *Trembleya laniflora* (Melastomataceae), 2.05 m above ground. The external surface comprised small plant filaments, petioles and leaf fragments, of a yellowish or cream tone, from shrubs and trees of *campo rupestre*, mosses, and filaments of spider web. The interior was mainly lined with white-coloured kapok, possibly from the cactus *Cephalocereus* sp. The nest measured: 29 mm internal diameter, 54 mm external diameter, 26 mm internal depth and 47 mm external height. Its features were similar to those described by Ruschi[9,11] and Grantsau[4,5], although higher above ground[4,9].

Female behaviour

The female Hyacinth Visorbearer brooded the nestlings, with its head and tail outside the nest (Fig. 1). On 3 July we observed the female arrive at the nest at 17h42; it soon became almost motionless, with its beak in a horizontal position, until darkness fell. When the nestling was older, on 9 July, we observed the female levering it, with the bill, to one side of the nest, where its head protruded above the rim. In windy conditions, the female stayed in the nest, with its head down and its tail up. On 9 July, at 16h26, rain started to fall and the female brooded the nestling for at least 12 minutes. Sometimes, the female was observed arranging the nest's internal material.

Before leaving the nest, the female always beat its wings for c.1 second and flew to *campo rupestre*, sometimes vocalising *tilp-tilp*. When departing, it generally perched on shrubs 7–15 m from the nest, sometimes vocalising *ti-ti-chip-chip* or *chip-chip-chip* while preening. When perched, it used the bill to preen the back, rump, wings, breast, belly and vent, and its feet to preen the ear-coverts and face. It also wiped its bill on its perch. When preening, it bristled the feathers (Fig. 2) and fanned the tail, sometimes opening one wing, shaking the body and tail later, and occasionally beating its wings. These behaviours are very similar to those described for males[16]. The bird was also observed to use grass stems and rocky outcrops during preening.

Several times it visited flowers of *Barbacenia flava* and two species of Asteraceae and Lamiaceae.

Visits to *Barbacenia flava* were also reported by Sazima[12] at Serra do Cipó. On other occasions it was observed gleaning small insects from the surface of leaves, mainly of *Coccoloba cereifera* and *Trembleya laniflora*. Additionally, insects were taken during an 'aerial hawk'[3]. Generally, following visits to flowers or insect catching, it returned to feed the nestling.

When returning to the nest, the female vocalised *tilp-tilp* and perched on the nest rim (Fig. 3) and it would: 1) feed the nestling, without brooding (41.53%; n = 49), 2) feed and brood the nestling (39.83%; n = 47), or 3) brood the nestling, without feeding it (18.64%; n = 22). In the first case, the female returned to *campo rupestre* (97.96%; n = 48), or perched on a branch in the same shrub as the nest (2.04%; n = 1). It fed the nestling from the nest rim, inserting its bill into that of the nestling, moving its head forward and back (Fig. 4). Mean duration of visits to the nest (including feeding time) by the female decreased during nestling development (Fig. 5), but we found no clear pattern of visiting rates to the nest, although it was noted that in most nest visits the female fed the nestling (Table 1).

Nestling development and behaviour

On 23 June there were two nestlings, one slightly larger than the other. Both had their eyes closed, yellowish bills with a black upper mandible tip, pink throat skin, rest of body black, with a few brown plumes on the back. On 26 June, only one nestling remained; it had the same colour pattern, but was larger. On 29 June, it was again larger, with brown plumes in the back, dark grey tarsi, upper mandible almost all black, with only the sides, close to the base, having any yellow coloration. On 3 July, its eyes were still closed, but dark blue feather sheaths were evident on the mantle, with cream-coloured apices, indicating emergent barbs. Remige sheaths were also dark blue. The upper mandible was as previously observed and the lower mandible was yellowish with a black tip. On 6 July the eyes were open and could be seen to possess a dark iris. The feathers were better developed, still with brown plumes on the back, the same bill pattern and black tarsi. On 9 July it was significantly larger, with a metallic green back and some brown plumes, the forehead and crown were green, finely barred cream, and the throat feathers were pale grey, and it had a buffy malar, dark iris and dark grey eyelid skin. On 11 July the bill was longer and the feathering was continuing to develop.

During all observations, when the female approached the nest, the nestling lifted its head towards the adult to take food, moving its head forward and back according to the female's movements.

The nestling left the nest on 16 July, according to a local resident. That afternoon, the young was perched in a shrub, 12 m from the nest (Figs. 6–8). Its bill, wings and tail were still shorter than that of the adult, and it had metallic green rectrices (still not totally unsheathed), black remiges, a metallic green mantle with some brown plumes, forehead and crown green, finely barred cream, a white spot behind the eye, buffy malar, dark grey ear-coverts, grey throat with a few narrow white stripes, white throat collar, interrupted in the centre by grey, grey underparts with some blue feathering close to the wing bend, and white vent. It had a dark iris, black upper mandible with the basal sides yellow, lower mandible yellowish with a black tip, and black tarsi. At 13h25, we observed the female gleaning insects from the surface of leaves (including shrubs of *Coccoloba cereifera*) and perching in a shrub of *campo rupestre*. It gave a sharp *chip-chip* and fed the young. Feeding behaviour was similar to that observed at the nest. The young bird moved its head forward and back, according to the adult's movements. The same behaviour was also observed at 13h33 and 13h38.

Table 1. Visiting rates at a nest of Hyacinth Visorbearer *Augastes scutatus*. Observations on 23 June were truncated, and are omitted here. F = Visits with food; W = Visits without food. [a] = Hours with attacks from Swallow-tailed Hummingbird *Eupetomena macroura*. [b] = Hour with rain.

Date	F/W	Hour of day								
		9	10	11	12	13	14	15	16	17
26/06	F	1	3	2	2	1	2	-	-	-
	W	1	1	2	1	2	1	-	-	-
29/06	F	3	2[a]	2[a]	3[a]	3[a]	4[a]	3	-	-
	W	0	2	3	2	0	0	0	-	-
03/07	F	1	5	4	4	4	3	3	4	3
	W	2	0	0	1	0	0	0	0	1
06/07	F	-	-	1	2	2	3	4	2	-
	W	-	-	2	0	0	0	0	0	-
09/07	F	-	-	3	3	3	3	3	2[b]	-
	W	-	-	0	0	0	0	0	0	-
11/07	F	-	-	2	-	-	-	-	-	-
	W	-	-	0	-	-	-	-	-	-

Attacks by a Swallow-tailed Hummingbird

On 29 June, we observed a Swallow-tailed Hummingbird *Eupetomena macroura* attack the Hyacinth Visorbearer nest while the female was brooding the nestling. The first attack was at 10h55, when the Swallow-tailed Hummingbird mounted the female Hyacinth Visorbearer's back and pecked the latter's ventral region for 5 seconds, while the visorbearer grasped the nest with one foot, the rest of its body being suspended outside the nest. Following this, the female Hyacinth Visorbearer escaped and flew to the *campo rupestre*. At 11h04, the Swallow-tailed Hummingbird returned and flushed the female Hyacinth Visorbearer from the nest. At 11h45, the visorbearer was again attacked at the nest by the Swallow-tailed Hummingbird. This time, the Swallow-tailed Hummingbird perched on the nest rim and pecked the female Hyacinth Visorbearer's nape (Fig. 9). The Swallow-tailed Hummingbird then placed its feet on the female visorbearer's back, maintaining its balance by beating its wings. At 12h12, the Swallow-tailed Hummingbird again pecked at and flushed the female visorbearer from the nest, repeating this behaviour at 12h33. At 12h44, the Swallow-tailed Hummingbird hovered above the nest, flushing the visorbearer, and pecked at the nestling (Fig. 10). At 12h59, the female visorbearer was flushed by the Swallow-tailed Hummingbird again, on this occasion from a branch adjacent to the nest. The Swallow-tailed Hummingbird again pecked the nestling (Fig. 10). At 13h25, when the nestling was temporarily unguarded, the Swallow-tailed Hummingbird flew over the nest, but was pursued by the female visorbearer. At 13h42, the Swallow-tailed Hummingbird returned again, perched on the female visorbearer's mantle (Fig. 11) and pecked it several times before the visorbearer was able to escape. At 14h07, the Swallow-tailed Hummingbird again attacked the female at the nest, whereupon the visorbearer departed to the *campo rupestre*.

Following each attack, the female visorbearer performed an aerial display, with its tail spread and vocalising *trrrzz-trrrzz-trrrzz-trrrzz...*, perhaps to attract the Swallow-tailed Hummingbird's attention to itself. This display was also observed when the nestling was attacked. In the aftermath of an attack, the Swallow-tailed Hummingbird would perch near the nest, and the female visorbearer would attack and chase it. Frequently, the Swallow-tailed Hummingbird would counter-chase the female visorbearer.

On 3 July, the Swallow-tailed Hummingbird was observed near the visorbearer nest, without attacking it. On 9 July, we discovered a nest of the Swallow-tailed Hummingbird, c.20 m from that of the visorbearer, and 0.91 m above ground, in a horizontal branch of a 'murici' shrub (*Byrsonima* sp.). It measured 39.7 mm internal diameter, 51.6 mm external diameter, 26.6 mm internal depth and 28.5 mm external height. It contained two yellowish-white eggs, measuring 16.0 x 10.4 mm and 15.7 x 10.7 mm. We suspect that the Swallow-tailed Hummingbird curtailed its attacks because it was spending most of its time incubating.

Conclusions

Although Ruschi[9] reported that Hyacinth Visorbearer breeds in summer (December–February), the present nest was in winter. Grantsau[4,5] observed females constructing nests in July, also in winter, which accords with our observations.

Because the nestlings appeared recently hatched on 23 June, we suggest that Hyacinth Visorbearer nestlings remain in the nest for c.25 days. Our observations are the first of nestling Hyacinth Visorbearer and its development. The plumage of the young differs from the adult mainly in the head and throat (Figs. 6–8).

The reasons for the Swallow-tailed Hummingbird attacks are unclear, but we suspect that they were linked to competition for resources within a restricted area, where both species were nesting. Swallow-tailed Hummingbird also visited flowers used by the female Hyacinth Visorbearer, including *Barbacenia flava*. Thus, the former species may attempt to eliminate competitors from its breeding territory. As Hyacinth Visorbearer is a near-threatened species[1] with a restricted range, these agonistic behaviours may represent a minor threat, as *E. macroura* is one of the more abundant hummingbirds following increased urbanisation (pers. obs.), which, due to poorly planned ecotourism, is now occurring in Serra do Cipó and elsewhere in the southern Espinhaço[19]. Habitat modification is a critical threat to the species[16] and we recommend further field studies to better appreciate the biology and habitat requirements of this near-threatened hummingbird.

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Figure 1. Female Hyacinth Visorbearer *Augastes scutatus* brooding the nestling (Marcelo Ferreira de Vasconcelos)

Figure 2. Preening behaviour of female Hyacinth Visorbearer *Augastes scutatus*. Note its feathers bristled (Marcelo Ferreira de Vasconcelos)

Figure 3. Female Hyacinth Visorbearer *Augastes scutatus* perched on the nest rim, having arrived from campo rupestre (Marcelo Ferreira de Vasconcelos)

Figure 4. Female Hyacinth Visorbearer *Augastes scutatus* feeding the nestling (Marcelo Ferreira de Vasconcelos)

Figure 5. Mean duration of female Hyacinth Visorbearer *Augastes scutatus* presence at the nest during the study period. Bars represent mean figures, vertical lines standard deviation. Data on 23 June and 11 July are incomplete and therfore omitted.

Figures 6–8. Young Hyacinth Visorbearer *Augastes scutatus* (Marcelo Ferreira de Vasconcelos)

Figure 9. Swallow-tailed Hummingbird *Eupetomena macroura* pecking female Hyacinth Visorbearer *Augastes scutatus* (Marcelo Ferreira de Vasconcelos)

Figure 10. Swallow-tailed Hummingbird *Eupetomena macroura* attacking nestling Hyacinth Visorbearer *Augastes scutatus* at the nest (Marcelo Ferreira de Vasconcelos).

Figure 11. Swallow-tailed Hummingbird *Eupetomena macroura* perching on back of female Hyacinth Visorbearer *Augastes scutatus* (Marcelo Ferreira de Vasconcelos).

Figure 1

Figure 2

Figure 3

Figure 4

Figure 6

Figure 7

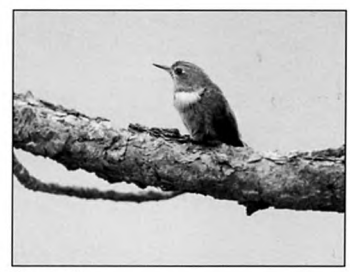

Figure 8

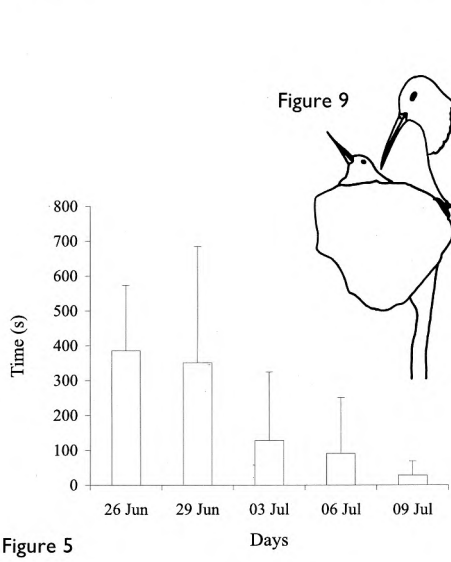

Figure 5

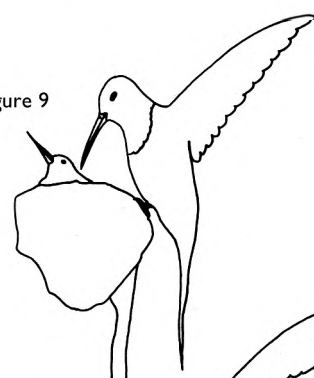

Figure 9

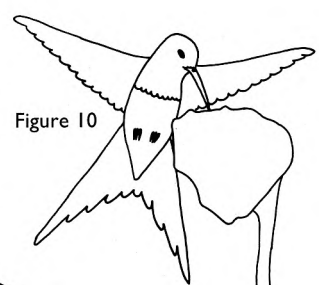

Figure 10

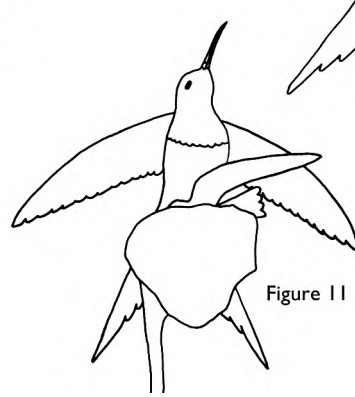

Figure 11