

## Observations on the hatchlings, eggs and incubation of the Masked Trogon *Trogon personatus* in eastern Ecuador

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La reproducción del Trogon Enmascarado *Trogon personatus* es poco conocida. Aquí presentamos los primeros datos ecuatorianos sobre la anidación de esta especie. *Trogon personatus* anida adentro de troncos secos y la puesta es de dos huevos blancos. Ambos sexos incuban los huevos por un periodo de 18 días. La cobertura de los huevos es mayor al 90% del día, con el macho incubando la mayoría del día y la hembra pasando la noche en el nido.

Masked Trogon *Trogon personatus* inhabits subtropical evergreen forests at 700–3,600 m, from Venezuela south to central Bolivia<sup>3</sup>. Despite this relatively broad range, little has been published on its ecology or natural history. The only accounts include a nest 3 m above ground in a rotting trunk which contained two all-white eggs in March, in south-east Colombia<sup>2,3</sup>, and a fledgling (race *assimilis*) observed in July in north-west Ecuador<sup>1</sup>. Nine subspecies of Masked Trogon are recognised<sup>3</sup>, with both races *personatus* and *temperatus* occurring on the east Andean slope in Ecuador<sup>4</sup>. Here we provide the first detailed account of the breeding biology of race *personatus* in north-east Ecuador.

### Study site and methods

All observations were made at Yanayacu Biological Station and Center for Creative Studies (00°35'S 77°53'W; 2,100 m), adjacent to Cabañas San Isidro, prov. Napo, north-east Ecuador. At one nest, found on 13 September 2006 during laying (see below), we placed a HOBO H08–031–08 data logger in the nest, recording both ambient temperature outside the nest and temperature below the eggs inside the nest at two-minute intervals. Subsequently, we estimated periods of nest attendance by comparing these temperature readings. Additionally, we individually marked both eggs and periodically weighed them during incubation. We recorded weight to the nearest 1 mg, calibrating the scale for unevenness using a standard 50 g weight.

### Nest sites, nest fate and seasonality

In 2006, we found three active nests, all during the dry season in the Yanayacu region. The first was being excavated on 7 September, at which time an adult female was flushed from an apparently finished cavity. Though the nest was not monitored closely, no eggs or nestlings were observed, and we presume it failed. On 13 September we found a nest containing a single egg, and eventually a complete clutch of two eggs, both of which hatched. The nestlings were later found partially consumed inside the nest, with a large amount of adult female

plumage scattered about the nesting area. Finally, we found a nest on 30 November containing two eggs, one of which was already pipped. Two days later it held two nestlings, which died of unknown causes. All nests were excavated in the soft, rotting wood of vertical decaying tree trunks. Mean ( $\pm$ SD) height above the ground of the three nests was  $3.7 \pm 0.7$  m. All were located well within primary forest, in areas with little *Chusquea* bamboo.

### Eggs

The four eggs (Fig. 1) we observed in two different nests were immaculate white, with a very pale bluish tinge. Eggs from the first clutch measured  $29.2 \times 22.8$  and  $27.4 \times 22.7$  mm. Fresh weight of the first egg, measured before the second was laid, was 8.510 g. The second egg weighed 7.8 g approximately 2–3 days after it was laid. Over a 13-day period during the middle of incubation, eggs in this clutch lost 1.2% and 1.1% of their mass per day, respectively. Eggs from the second clutch measured  $27.7 \times 23.4$  and  $28.4 \times 23.6$  mm. One to two days prior to hatching the eggs in this clutch weighed 7.2 and 7.4 g, suggesting that Schönwetter's<sup>5</sup> estimation of 7.1 g for this species' eggs may have been slightly low.

### Incubation

By using a data logger to record incubation, we were unable to record the proportion of incubation duties for which each sex was responsible. Furthermore, when adults change places rapidly at the nest, coverage of the eggs appears continuous using this method. During seven visits made to the nest between 10h15 and 16h15 during incubation, we always found the male attending the eggs; the single occasion that we visited the nest at 17h00, we flushed the female. These data suggest that Masked Trogon partitions the incubation duties like other species, as described by Skutch<sup>6–10</sup>, the female spending time on the nest in the morning, evening and through the night. We occasionally recorded a break in coverage between 08h00 and 09h30, suggesting the adults switched during this period. Patterns of incubation recorded on the

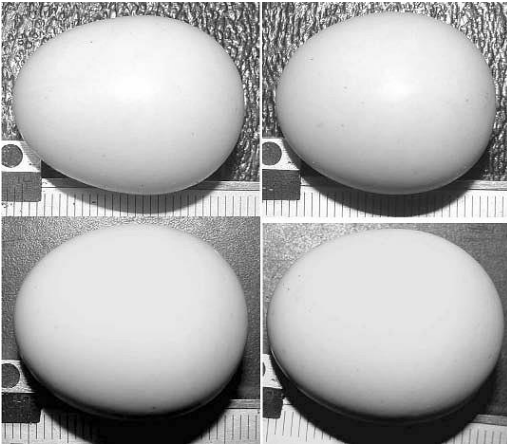


Figure 1. Eggs of Masked Trogon *Trogon personatus*, Yanayacu Biological Station, Napo, Ecuador; each row represents a complete clutch from two different nests (Harold F. Greeney)

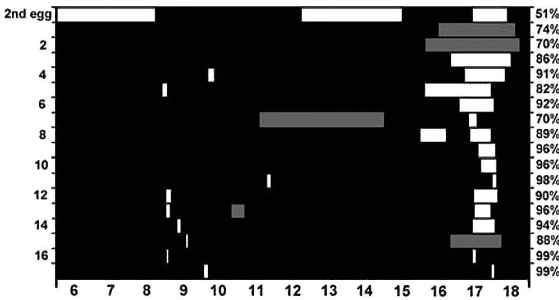


Figure 2. Incubation rhythms of Masked Trogon *Trogon personatus* at Yanayacu Biological Station, Napo, Ecuador. Black areas represent periods where an adult was present at the nest, and white areas periods of absence. Off-bouts where the adult was flushed by an observer in grey. Attendance is shown from 05h30 to 18h30 each day, with percentage coverage (daylight hours = 06h00–18h00) to the right and the day of incubation since clutch completion on the left.



Figure 3. Nestling Masked Trogon *Trogon personatus* on day of hatching, Yanayacu Biological Station, Napo, Ecuador (Harold F. Greeney)

temperature data logger are shown in Fig. 2, and are generally similar to those described for other trogons. Incubation at one nest, from laying of the first egg until the hatching of the first nestling, was 18 days.

### Nestlings

The eggs at the first nest hatched one day apart and those at the second on the same day. Nestlings at the second nest were discovered, with egg shells still in the nest, at 10h45 on 2 December. At this time they weighed 5.8 and 6.2 g. The nestlings were pink-skinned and naked (Fig. 3), with subcutaneous, prominently developing feather tracts in the capital, dorsal, sternal, and cural areas. Their bills were flesh-coloured, darkening to black subapically. Mandible tips were pale grey, with prominent white egg teeth.

### Adult behaviour at the nest

Though we did not record adult behaviour at the nest in the detail of Skutch's many accounts<sup>6–10</sup>, we did note that, when flushed, the male Masked Trogon would remain silently in the vicinity, sometimes perching just 4–5 m distant. Unlike Skutch's description of the vocal behaviour of Baird's Trogon *T. bairdii*<sup>9</sup>, however, the Masked Trogon was always silent. Also, whilst Skutch<sup>9</sup> observed that Baird's Trogon never threatened him nor made broken-wing displays during his presence at the nest, we noted a distinctive departure from the nest by the male Masked Trogon. On five of seven times the male flushed from the nest, the bird dropped from the opening downwards in the direction of the observer, spreading and fluttering the wings and tail, whereupon, often after approaching to within 1 m of the observer, the male flew silently to a nearby perch. We are unsure, however, whether to interpret this as a threat or distraction. The male always remained on the nest until we were within 1–3 m ( $n=5$ , mean flush distance =  $2.1 \pm 0.7$  m).

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