

Observations on Nesting Care Behaviour and Diet of the Orange-breasted Trogon

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Introduction

The Orange-breasted Trogon *Harpactes oreskios* (Kesumba Harimau) has a wide distribution from South China, Myanmar, Indochina, Thailand, Peninsular Malaysia to parts of Borneo and Indonesia (Wells 1999; Collar & de Juana 2020). Although a detailed account of nesting behaviour has been documented from Thailand (Steward & Pierce 2011), locally only three nests have been reported with limited details (Wells 1999; Wells 2007).

We report two nesting episodes, one of which had continual, almost daily, observations, allowing us to document various aspects of the species' breeding biology, including nest-site selection, nest construction, parental role division, feeding patterns, nestling diet, and parental care behaviour until the young successfully fledged.

Disclosure on Nest Observations

After the second nest was discovered, it was observed by a number of individuals over time until the nestlings fledged. A pop-up hide was created with a screen and observers stayed at a distance of approximately 20 meters from the nest. Long lens and videography equipment was used. Close up images of the nest interior was only done by the authors and limited to a few critical images. The adults appeared to be comfortable with being observed and did not show any alarm.

Observations

Nest One

On 01 May 2026 we observed Orange-breasted Trogons excavating a nest at Bukit Ayer, Perlis, Malaysia at a fruit orchard with plants such as the Durian *Durio sp.*, Dokong *Lansium domesticum*, and Rambutan *Nephelium lappaceum*. The nest site selected was the top of a dead, broken tree trunk, approximately 15 meters high (Plate 1), which we could view from an elevated position. Nest excavation was carried out gradually, using the bill to tear and excavate softened wood. Both the male and female excavated the nest. Sadly, the dead tree trunk broke and the site was abandoned.

Nest Two

Choice of Nest Location and Structure

A second nest was discovered on 11 May 2026 with eggs already laid. The nest was located in the same fruit orchard described above. The nest site selected was a decaying tree branch, approximately 1.5 meters high and 15 cm in diameter. It is likely that the nest was made in a Rambutan tree that has died. The nest was constructed within a broken branch that lacked dense surrounding foliage or twigs (Plate 2). The nest cavity was estimated to have an entrance diameter of approximately 8-10 cm and a depth of about 8 cm.



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Plate 1: Nest 1 - A male Orange-breasted Trogon in the process of constructing its nest, carefully excavating a cavity in a decaying tree stump using its bill. Perlis, Malaysia, 01 May 2026.



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Plate 2: Nest 2 - Overview of nest with juvenile (left) and adult (right) in nest. Perlis, Malaysia, May-June 2026.

Timelines of Nesting Observations and Outcome

11 May 2026	Nest discovered with eggs
21 May 2026	First chick hatched
01 June 2026	Juveniles fledged

Incubation Period

When we discovered the nest, it already has three eggs so we are uncertain when incubation started. Incubation behaviour was particularly interesting. While inside the cavity, the incubating adult positioned its head facing the nest entrance, with the tail held almost vertically upward. When disturbed or alerted to a potential threat, the bird would flatten its head and bill against the front portion of the cavity, reducing its visibility from outside (Plate 3).



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Plate 3: Orange-breasted Trogon incubating postures. Left female (27 May 2026), right male (11 May 2026). Perlis, Malaysia.

During the incubation period, the male appeared to undertake the majority of daytime incubation duties, whereas the female typically assumed incubation responsibilities during the late afternoon and throughout the night. The female enters the nest to care for the chicks while waiting for the male to return. She does not stay at the nest throughout the daytime during the incubation period; only the male does. This pattern suggests a division of parental responsibilities to ensure optimal incubation conditions. We did not observe the incubating adult being fed at any time by the other adult. The incubation duration was more than 10 days.

Nestling Period

Of the three eggs only two hatched. The first chick hatched on 21 May 2026 (Plate 4). During the first nine days after hatching, the female remained almost all the time inside the nest cavity, brooding and protecting the chicks. During this period, the male was primarily responsible for finding food and bringing it to the nest, where it was passed to the female to feed the chicks (Plate 5). We also observed that food items passed by the male to the female were not always fed directly to the chicks. When there was surplus food or when the chicks were already satiated, the female would consume the remaining prey herself. On several occasions, particularly during the early nestling stage, the female was seen feeding a portion of the prey to the chicks before swallowing the left-over food. This behaviour may help maximise energy efficiency while ensuring that the nutritional needs of the growing chicks are met. This continued from day one to day nine, with the male occasionally substituting for the female, possibly giving her time to feed, bathe or rest.



Plate 4: Sequential images of Orange-breasted Trogon eggs and nestlings (11 May, 21 May, 25 May, 2026). Perlis, Malaysia.

Plate 6 shows images of nestlings. Between days ten and twelve after hatching, notable behavioural changes were observed. As the nestlings grew larger and occupied most of the cavity space, both parents ceased entering the nest regularly. Instead, food was delivered directly at the nest entrance (Plate 7). This behaviour reduced disturbance within the increasingly confined nest chamber while simultaneously encouraged the young to move closer to the entrance.

Upon approaching the nest, either the male or female carrying food will often give a few short calls, such as "tutt, tutt, tutt", likely signalling their arrival to their mate. The individual inside the nest will then emerge and leave the nest, allowing the feeding exchange and parental duty shift to take place.



Plate 5: Male bringing food to female and female feeding nestlings. Perlis, Malaysia, 28 May 2026.



Plate 6: Images of Orange-breasted Trogon nestlings 30 May 2026 morning, 01 June 2026 morning, 01 June 2026 evening. Perlis, Malaysia.

Both adults occasionally used a horizontal branch at a staging tree, a distance of 1 meter from the nest to wait for the partner to bring food for the nestlings. At times both adults arrived at the nest at the same time, or one adult arrived while the other was feeding. We observed the male Orange-breasted Trogon attempting to deliver food to the nestlings, but the female remained at the nest entrance. Despite calling repeatedly and circling the nest, he was forced

to wait until she moved away. This behaviour was observed several times in the days leading up to fledging.



Plate 7: Adults bringing food to older nestlings. Perlis, Malaysia, 27 May 2026.

Throughout the observation period, both adults also displayed alternating resting behaviour. Between approximately 1200 and 1430 hrs, one adult would often leave the nest area to bathe or forage for itself, while the other remained nearby as a guard. This behaviour ensured continuous nest surveillance without compromising the adults' own maintenance requirements.

During our observations, which concluded at 1700 hrs each day, the female was typically still present at the nest in the late afternoon. It is possible that she remained with the chicks throughout the night, providing protection and helping to regulate their body temperature. It is also possible, the male stayed nearby, keeping watch and helping to guard the nest territory.

Feeding Behaviour, Frequency and Food Items

Feeding frequency increased progressively as the nestlings grew. On the second day after hatching, only two to three feeding visits were recorded. By the fourth day, feeding frequency increased to six visits in the morning and three in the afternoon. On the sixth day, feeding activity rose to eight morning visits and four afternoon visits. Feeding activity peaked between day eight and ten after hatching, with nine feeding visits recorded in the morning and five in the afternoon. This increase was likely associated with the rapid growth of the nestlings and their increasing energy demands.

Table 1. Frequency of feeding Orange-breasted Trogon nestling.

Date	Days after hatching	Feeding frequency	
		Morning	Afternoon
21 May 2026	2	2-3 times	Nil
23 May 2026	4	6 times	3 times
25 May 2026	6	8 times	4 times
27 May 2026	8-10	9 times	5-6 times
01 June 2026	12 (last day in nest)	4 times	1 time (last feed in nest)

The nestling diet consisted of a variety of arthropods delivered by the adults, with spiders *Arachnida*, caterpillars *Lepidoptera*, katydids *Tettigoniidae*, grasshoppers *Caelifera*, stick insects *Phasmatodea* and mantises *Mantodea* being the most frequently observed prey items (Plate 8 & 9). The diversity of prey items suggests that the species is an opportunistic predator exploiting available food resources within its habitat. The inclusion of relatively large prey such as grasshoppers, mantises, and stick insects also indicates the adults' ability to secure high-energy food items to support nestling development. No small reptiles, other vertebrate prey or fruit were observed being delivered to the nestlings during the period of observation.



Plate 8: Composite image of some of the prey items fed to nestlings. Perlis, Malaysia, May 2026.

The size of the prey did not appear to change significantly throughout the nesting period; however, the feeding method varied. When bringing larger prey items, such as caterpillars, the female would often feed only a portion to the chicks or extract the softer contents and fluids before offering them. Any remaining portion was usually consumed by the female. All prey

items brought to the nest could be observed clearly from the beginning of the observation. However, no fixed pattern was detected in the types of food delivered, as they varied considerably from one feeding visit to another.

During the second week after hatching, prolonged dry weather may have reduced prey availability, making food more difficult to locate. As a result, there were occasions when either the male or female took more than an hour before returning to the nest with food. This suggests that environmental conditions can have a significant influence on foraging efficiency and feeding frequency.



Plate 9: Stick insect and katydid prey fed to nestlings. Perlis, Malaysia, May 2026.

Faecal Sacs and Removal

No observations or photographic evidence were obtained to confirm whether the parents removed the chicks' faecal sacs from the nest. It is possible that the parents consumed them in the nest, a behaviour commonly observed in many bird species during the nestling stage.

Fledging Observations

On 01 June 2026, during the morning prior to fledging, feeding activity declined markedly, with only four feeding visits recorded in the morning and a single visit in the afternoon. On the same day, both adult birds were observed vocalising more frequently near the nest entrance, a behaviour that may have served to encourage the nestlings to undertake their first flight. Despite the reduction in feeding activity, the female continued to exhibit strong parental care. She was observed entering the nest cavity during rainfall, presumably to shelter and protect the nestlings from adverse weather conditions.

Behavioural changes in the nestlings on the final day before fledging were particularly noteworthy. During the morning, the nestlings appeared relatively inactive and showed little

indication that they were preparing to leave the nest. However, by the afternoon, following a period of rainfall and the final feeding visit by the male, both adults became increasingly vocal, prompting a noticeable increase in nestling activity. At approximately 1545 hrs, the first nestling successfully made its maiden flight from the nest, followed by the second nestling roughly thirty minutes later (Plate 10). The nesting period was 12 days.

Based on our observations, we believe that both fledglings were likely males. This assumption is based on the plumage characteristics observed on the back of the head and body. The orange coloration appeared brighter, while the head showed a more pronounced yellowish tone, traits commonly associated with male birds.

One day after fledging, we returned to locate the young birds and to gather additional data. We successfully found one of the fledglings, while the other was not observed. Observations were conducted for approximately one hour under heavy rain conditions. Both adult birds continued to provide parental care in a manner similar to when the chicks were still in the nest. The male was observed actively foraging for food, while the female remained near the fledgling. Upon the male's return, the female would then leave to forage, taking turns in caring for and feeding the young bird. This coordinated parental behaviour highlights the strong biparental care exhibited by the Orange-breasted Trogan even after the fledging stage.



Plate 10: Composite image of fledgling. Perlis, Malaysia, 01 June 2026.

Interaction with Other Birds and Animals

Both adults displayed highly aggressive nest-defence behaviour against potential threats. The presence of squirrels, langurs, or raptors approaching the nesting area frequently triggered an immediate response. The adults emitted alarm calls distinct from their normal vocalisations and performed direct aerial attacks on intruders that approached the nesting tree. Such

behaviour demonstrates a high degree of parental investment in safeguarding eggs and nestlings throughout the breeding period.

Discussion

In the Thailand study, out of 17 nests only 8% were successful (Steward & Pierce 2011). Hence, we were pleased that the nest episode we observed was successful. Table 1 compares our observations with those of Steward & Pierce (2011). The nesting site and structure, egg clutch size, diet for juveniles, nestling period and problem with predators are in agreement. Steward & Pierce (2011) reported food-passing to the female in only ~3% of male deliveries but we observed this more often. The breeding timing in Thailand is from January to March while ours was May–June. But Wells (1999) notes one nesting in April.

Our observations add information about incubation threat posture, entrance-delivery to older nestlings, the female eating surplus prey, fledgling sexing, and post-fledgling biparental care.

Table 1: Comparison of our observations with those of Steward & Pierce (2011).

Feature	Nests at Bukit Ayer, Perlis, 2026	Steward & Pierce, Nest at Khao Yai National Park, Thailand, 2011
Nest height	~1.5 m	Mean 2.1 m (0.7–3.5 m, n = 19)
Substrate	Decaying broken branch (likely dead rambutan, <i>Nephelium lappaceum</i>)	Rotten stumps / rotten appendages of live trees; once a broken branch
Entrance width	~8–10 cm	8–10 cm (n = 4)
Cavity depth	8 cm	Shallow, <5 cm deep; entrance-to-back ~11 cm
Excavation	Both sexes	Both sexes
Clutch / hatching	3 eggs; 2 hatched	2–3 eggs (mean 2.4); unhatched eggs documented
Incubation roles	Male by day; female late afternoon and night	Male by day; only female overnight
Incubation period	Uncertain	17–18 d (n = 2)
Brooding / food-passing	Female broods days 1–9; male frequently passes food to female	Female broods overnight; food-passing in ~3% of male deliveries at nests
Provisioning	Male-led; increases with age; entrance delivery for older chicks	Male > female; male share rises toward fledging
Diet	Araneae, Lepidoptera, Orthoptera (katydids, grasshoppers), Phasmatodea, Mantodea; large, single items	Phasmatodea, Orthoptera, Lepidoptera larvae (dominant); Mantodea, Hemiptera; large, single items; stick insect prey also documented by Wells (2007)
Nestling period	12 d	12–14 d (minimum 12)



Feature	Nests at Bukit Ayer, Perlis, 2026	Steward & Pierce, Nest at Khao Yai National Park, Thailand, 2011
Predators defended against	Squirrels, langurs, raptors	Squirrels, raptor (goshawk), macaques, snakes, conspecific
Breeding timing	May–June	Jan–Mar at Khao Yai; later in Thai-Malay Peninsula (Wells 1999)
Outcome	Successful (2 fledged)	~8% nest success

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