

## Notes on the life history of *Harpactes whiteheadi* (Aves: Trogonidae), with a description of the juvenile plumage

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**Abstract.** We describe the juvenile plumage of *Harpactes whiteheadi* (Trogonidae) based on a specimen obtained on 28 June 2014 in Mount Mulu National Park, Sarawak, Malaysia. The bird was identified as a juvenile by the presence of a bursa of Fabricius, extensive simultaneous moult of body and wings, and an un-ossified cranium. The bird's stomach contained a mix of mostly plant material and some insect parts. At 1280 m, *H. whiteheadi* occurred syntopically with *H. oreskios*, and often formed loose associations with *Garrulax* spp., *Coracina larvata*, and *Calyptomena whiteheadi*.

**Key words.** juvenile plumage, Mount Mulu, diet, Whitehead's Trogon

### INTRODUCTION

*Harpactes whiteheadi* (Whitehead's Trogon; Trogonidae) is endemic to the montane forests of northeastern Borneo (600–1800 m). On 28 June 2014, while surveying the birds of Mt. Mulu National Park, Sarawak, Malaysia (Burner et al., 2016), we mist-netted and collected a juvenile *H. whiteheadi* and an adult female in the same net in primary forest at approximately 1300 m along the Summit Trail (04.0379°N, 114.8808°E). An adult male was in attendance.

During our four-day stay at 1300 m, we regularly encountered *H. whiteheadi*, usually in pairs. They were often loosely associated with a larger mixed-species flock, which included Sunda cuckooshrike (*Coracina larvata*), Whitehead's broadbill (*Calyptomena whiteheadi*), and chestnut-hooded (*Garrulax treacheri*) and Sunda laughingthrushes (*G. palliatus*). The flock would usually pass over a ridge at some point during the morning, and its trogons tended to feed low in the forest relative to the other species. A pair of orange-breasted trogons (*H. oreskios*) was found feeding in exactly the same location on 29 June 2014, without any apparent distinction in feeding mode or height within the forest, as has been noticed in other species of *Harpactes* (Steward et al., 2013).

Here, we describe a juvenile *H. whiteheadi*, including morphometric measurements, plumage, skin and bill coloration, internal characteristics, and stomach contents.

### DESCRIPTION JUVENILE BIRD

Measurements of the juvenile specimen (Fig. 1) are as follows, with mean measurements of adult specimens (n=2) provided in parentheses: body length 240 mm, wing span 409 mm (428 mm), wing chord 128 mm in moult (132.5 mm), length of longest primary 104 mm, tail length 120 mm including moult (182.5 mm), and head length 42.0 mm. Bill measurements are as follows: total culmen length 17.0 mm (19.8 mm), exposed culmen 15.0 mm, from tip to nostril 11 mm (14 mm), bill depth at the widest point 7.9 mm (10.4 mm), bill width at the front of the nares 8.0 mm, and bill depth at front of nares 8.0 mm. Tarsal length was 13.7 mm (14.5 mm). Overall, the juvenile's measurements were smaller than those of the two adult specimens examined, but this may be due in part to its moult.

In respect to plumage color, most of the upper body was greenish brown, fading to dark brown towards the head. Wings were mostly brownish black with conspicuous white feather shafts; secondary coverts had black barring. There was a hint of a dark moustache on the head. The bill was uniformly dark grey to dull black. The lower half of the ventral side of the body and flanks were dull orange, fading to dull yellowish brown above the legs. Rectrices were dull black, with outer three rectrices white. The tarsi (not fresh) were grey above, fading to light pink below, and the toes were light pink. Before collection, the orbital ring, gape and parts of the upper mandible were bright blue. The juvenile plumage of the species differs from the adult male in overall coloration (brownish instead of red), and lack of black throat and grey upper breast. It differs from the adult female by the lack of a black throat and grey upper breast. It differs from both adults by greater restriction of blue colouring on and around the bill, although this may represent an intermediate stage of development. Sheldon et al. (2001:152) noted that in young males of apparently intermediate development "cinnamon feathers are mixed in with red on the head".

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Fig. 1. Juvenile female *Harpactes whiteheadi*: A, ventral; B, dorsal; and C, pin feathers on underwing (Photograph by: Vivien L. Chua).

The juvenile bird had only light body fat, and its stomach contained mostly unidentified highly digested plant material (plant material was mostly finely ground, but including some small stems) with a very few finely ground insect parts.

We determined this specimen to be a juvenile by size of the bursa of Fabricius ( $11 \times 4$  mm). The bursa of Fabricius is an organ that produces B-cells important to the bird's immune system, and generally grows until about 3–8 weeks of age, and regresses thereafter, atrophying completely by 6 months (Glick, 1983). Its size indicated that our bird was younger than 6 months of age. Several other characteristics also signaled immaturity: the bird was a female with minute ova; its skull was 10% ossified (although skull ossification is not necessarily considered a reliable measure of age in non-passerines); and it had pin feathers and heavy simultaneous moult over the entire body and wings (including newly moulted primaries). Sharpe (1890) described the nestlings of the species as having a plumage similar to adult females, except that the entire ventral sides of the birds are uniformly colored; male nestlings have crimson feathers mixed in with the brown plumage of back and breast (Sheldon et al., 2001). We observed that female juvenile plumage is similar to

nestling plumage (as described by Sharpe, 1890), except that contrast is greater between the upper and lower underparts.

#### LIFE HISTORY

Asian trogons of the genus *Harpactes* are mainly insectivorous (Steward & Pierce, 2011). Just as in other species of *Harpactes* (Collar & de Juana, 2013), however, *H. whiteheadi* seems at least occasionally to eat plant material, this was also the case in our specimen. Of three other LSUMZ specimens of *H. whiteheadi* (all adult females), the stomach of one (Mount Mulu) also seemed to have exclusively held plant matter and seeds, whereas those of two others (Mount Mulu and Mount Trus Madi) held insect parts (Coleoptera and Phasmatodea). Birds from Mount Mulu were all captured during June/July of 2014, so we cannot infer any apparent relation between dietary preference and time of year.

The collection of a juvenile in late June agrees with previous observations of family parties of the species in July and nesting in April (Robson, 1996). A used nest from Mount Mulu dates from 28 April 1878 (Smythies, 1999), and a female with active ovary was found on 23 March 1983

near Rinangisan (Sheldon et al., 2001) in the Crocker Range of Sabah. A female in breeding condition from the Kelabit highlands in October (Smythies, 1957) does not fit this pattern, and may indicate multiple annual broods or geographic variation in timing of breeding.

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