

# First description of the eggs and nestlings of Powerful Woodpecker (*Campephilus pollens*)

PRIMERA DESCRIPCIÓN DEL NIDO Y LOS POLLUELOS DEL CARPINTERO PODEROSO (*CAMPEPHILUS POLLENS*)

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## Abstract

Virtually nothing is known about the breeding biology of the Powerful Woodpecker (*Campephilous pollens*), an uncommon resident of montane regions from Venezuela to Peru. Here we describe for the first time, the nest, eggs and nestlings. Based on observations of two cavity nests from northeastern Ecuador we report an estimated incubation period of at least 16 days and a nestling period of 34-37 days. Both adults incubated the eggs and cared for the young, but we did not quantify the proportional investment of each sex. One nest successfully fledged a single young after laying a clutch of two eggs. A second nest failed after the nestling died, possibly from the effects of falling ash from a nearby volcanic eruption.

**Keywords:** breeding biology, cloud forest, Ecuador, fledling, eggs, nest.

## Resumen

Poco se conoce sobre la biología reproductiva del Carpintero poderoso (*Campephilus pollens*), una especie residente poco común en áreas montañosas desde Venezuela a Perú. Describimos por primera vez, el nido, huevo, y pichones de esta especie. Estimamos un periodo de incubación de al menos 16 días y un periodo de cría de 34-37 días, basados en observaciones de dos cavidades-nido en el noreste de Ecuador. Ambos adultos incubaron y atendieron los pichones, sin embargo no fue posible estimar la inversión proporcional de casa sexo. De uno de los nidos, solo salió un pichón del nido a partir de una puesta de dos huevos. El segundo nido fracasó después de que murió el único pichón, tal vez por el efecto de la caída de cenizas volcánicas en el área.

**Palabras clave:** biología reproductiva, bosque nublado, Ecuador, huevo, nido, pichón.

## Introduction

The Powerful Woodpecker (*Campephilus pollens*) inhabits montane forests and forest borders, at elevations of 900-3600 m.a.s.l, from Venezuela to Peru (Winkler *et al.* 1995, Hilty & Brown 1986, Winkler & Christie 2002). Only one of the two recognized subspecies (Winkler & Christie 2002), ssp. *pollens*, is found in Ecuador, mostly at elevations from 1700 to 2600 m.a.s.l (Ridgely & Greenfield 2001). This large, timid woodpecker inhabits mature forests and forest borders, generally foraging low on tree trunks but also climbing into the subcanopy (Hilty & Brown 1986, Ridgely & Greenfield 2001). Virtually nothing is known of its breeding biology, but it is said to excavate nesting cavities high (e.g. 7 m) in trunks or telephone poles (Christie *et al.* 1995, Winkler & Christie 2002). In Colombia, Fjeldså & Krabbe (1990) mention eggs in

November to March and Hilty & Brown (1986) report a female excavating a cavity in early August, but the eggs and nestling of Powerful Woodpecker remain undescribed. Here we present the first observations, from north-eastern Ecuador, on the eggs and nestlings of this poorly known species. We made all observations at Yanayacu Biological Station and Center for Creative Studies (00°36 S, 77°53 W, 2100 m.a.s.l), located 5 km west of Cosanga, adjacent to Cabañas San Isidro, Napo Province, Ecuador.

We found two nests, one on 27 October 2002 (hereafter “October nest”) and one 22 May 2008 (hereafter “May nest”). When first encountered, the October nest contained a single, mid-aged nestling and the May nest contained two eggs. We accessed the October nest by placing a ladder against a nearby tree and the May nest by climbing the tree with a harness.

**Nests.** Both nests were unlined cavities (except for wood-chips) in dead trunks at the edges of primary forest (Fig. 1). The nests were 5.5 and 14 m above the ground, respectively. The October nest was 29 cm deep, from the lower lip of the entrance to the bottom, and 16 cm wide internally, measured at the level of the entrance and from

side to side in relation to the entrance hole. The entrance was 11 cm tall by 9 cm wide. The May nest, measured in the same way, had an internal cavity 39 cm deep and 14 cm in diameter with an entrance hole similar in size to the first nest.



Figure 1. Nest hole of Powerful Woodpecker in May 2008 at the Yanayacu Biological Station, Napo, Ecuador. The adult female can be seen leaving the hole on the left (Photo: J. Simbaña).

**Eggs and incubation.** At the May nest, on 22 May 2008 we flushed the female from the nest at 09:00 h. At the time, we noted that the male was nearby, but were unable to check the contents of the nest. Three days later, at 12:30, we again flushed the female from the nest. At this time, the nest contained two all-white eggs (Fig. 2).

On our return at 15:45 h on 26 May, the female was again flushed. At this time we removed the eggs for closer examination. They measured 34.4 x 22.4 and 31.7 x 22.2 mm, and weighed 8.82 and 8.63 g, respectively. On 31 May we flushed the female at 10:30, at which time it still contained two eggs.



Figure 2. Complete clutch of Powerful Woodpecker in May 2008 at the Yanayacu Biological Station, Napo, Ecuador (Photo: J. Simbaña).

Ten days later, we flushed the male at 15:30 h, at which time the nest contained two nestlings weighing 12.4 and 6.1 g. The mostly-intact remains of both eggs were still in the nest, and we believe the second nestling had hatched that morning and the larger one had hatched the day before. This gives a minimum incubation period of 16 days (from laying to hatching of the last egg). If the nest already contained both eggs when we originally encountered it, this gives an incubation period of at least 19 days.

**Nestlings.** Due to equipment limitations, we were unable to weigh nestlings after the first weighing described above. On 10 June, both nestlings were entirely pink, including bills and legs (Fig. 3). Their mouth-linings were similarly pink, while the swollen rictal flanges were slightly paler and the tips of both mandibles were bright white. On 18 June, only a single nestling remained, presumably the older one. At this time the nestling was dark-skinned (including legs and feet), with wing pin-feathers broken through the skin 1-3 mm, and with contour feathers just beginning to emerge through the skin (Fig. 4). Irides were dark black. The bill had

darkened to black but retained the bright white mandibular tips. The mouth lining remained pale pink, but the rictal flanges were now bright white. The eyes were slits, but remained mostly closed. On 27 June the single chick's eyes were open and contour feathers had broken their sheaths: cinnamon on the back, black on the crown, red on the crest, and black with cinnamon tips on the flanks and belly (Fig. 5). Wing pin feathers were also with their sheaths broken. The legs had darkened to nearly black, but the bill, gape, and mouth lining remained unchanged. We removed the chick for the last time on 12 July at 17:30 h (Fig. 6). At this time it was quite similar in plumage to an adult male but with reduced red on the head, and iris coloration was still much darker than an adult's. The bill remained dark, and retained a white tip only on the upper mandible. The inflated rictal flanges were gone. Upon our final visit, on 16 July, the nest was empty, and we presume that it was successful. Given that the surviving chick was likely the older one, having hatched on 11 June, this gives a minimum nestling period of 34 days, and a maximum of 37 days.

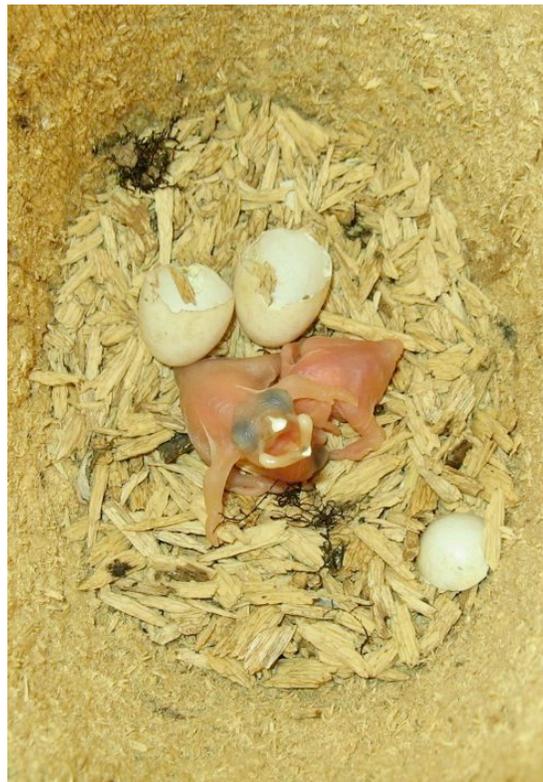


Figure 3. Recently hatched nestlings of Powerful Woodpecker in June 2008 at the Yanayacu Biological Station, Napo, Ecuador (Photo: J. Simbaña).



Figure 4. Single, ca. 9-day-old, nestling of Powerful Woodpecker in May 2008 at the Yanayacu Biological Station, Napo, Ecuador (Photo: J. Simbaña).



Figure 5. Single, ca. 18-day-old, nestling of Powerful Woodpecker in May 2008 at the Yanayacu Biological Station, Napo, Ecuador (Photo: J. Simbaña).



**Figure 6.** Single, ca. 33-day-old, nestling of Powerful Woodpecker in May 2008 at the Yanayacu Biological Station, Napo, Ecuador (Photo: by J. Simbaña).

Based on the above description of nestling plumage development, it appears that the nestling found on 28 October was around 10-11 days old (Fig. 7). At this time its bill (from nares to tip) measured 10.2 mm and its tarsus was 21.5 mm long. Contour feathers were just breaking their sheaths. Wing pin feathers were around 2.5 mm long but were unbroken. We visited this nest again on 1 November, at which time the bill was 11.0 mm long and the tarsus was 25.5 mm. Pin feathers were just breaking, with roughly 1 mm of feather outside the

sheath. This suggests that wing feathers break their sheaths around day 14. On 5 November the nestling's bill was 12.6 mm and the tarsus was 30.7 mm long. On 8 November the bill was 13.2 mm and the tarsus was 31.7 mm. Upon our final visit (13 Nov), when the nestling was found dead, the bill was still ca. 13 mm, but the tarsal length had increased to 34.6 mm. This suggests that it died sometime after 8 November, at around 24 days of age. Unfortunately we were unable to make a specimen of the dead nestling.



**Figure 7.** An estimated 10-11-day-old nestling of Powerful Woodpecker in October 2002 at the Yanayacu Biological Station, Napo, Ecuador (Photo: H. F. Greeney).

**Adult behavior and parental care.** On all four visits to the May nest during the nestling period we flushed the male from the nest. The first two visits were during the afternoon (12:30 and 15:30, respectively), while the second two were just after 17:30, at which time the adult was likely in the nest to roost for the night (see below). At the October nest we encountered an adult in the nest on only three occasions: once the female and twice the male. Subsequent to fledging of the single nestling, we visited the nest twice (17:30 h on 25 July, 17:45 h on 28 July). In both cases, shortly after our arrival, two birds (of unknown sex) arrived at the nest to roost. Upon our final visit on 2 August (at 18:30 h), the male and an unidentified individual were inside the nest. These observations show that the nest is used as a roost after fledging, and that during this time the birds retire for the day around 17:30 h.

**Nest success.** The October nest contained a single nestling and the May nest contained 2 eggs. The October nest failed after a heavy rain, when we found the nestling dead with large sores on its belly and neck. Interestingly this failure occurred after the eruption of the nearby volcano, Vulcán Reventador. We feel that it is possible that ash-fall from this eruption may have caused failure of this nest through the development of skin lesions and clogging of the nares as described for two other species nesting during this time in the vicinity of Yanayacu (Greeney *et al.* 2005, Hannely & Greeney 2008). The May nest lost one young early in the nestling period, but successfully fledged the other.

## Conclusions

Clutch size at one nest was confirmed as two eggs. Hatching was asynchronous, however, and one nestling was lost. It is possible that something similar occurred at the other nest, found while it contained a single, mid-aged nestling. Further observations are needed to determine the normal clutch size in this species. Nest site selection and form, as well as a clutch size of two, are similar to described breeding habits of other *Campephilus* woodpeckers (e.g., Skutch 1969, Kilham 1972, 1977, Ojeda 2004).

While comparative data are scant, it appears that nestling and incubation periods of Powerful Woodpecker are similar to those described for other *Campephilus* sp. for which data are available. The presumed-extinct Ivory-billed Woodpecker (*C. principalis*) incubates for around 20 days and takes *ca.* 35 days to fledge (Bendire 1895, 1900; Bent 1939, Winkler & Christie 2002).

Similarly, the Megellanic Woodpecker (*C. megellanicus*) incubates for roughly 20 days, but has a slightly longer (45 day) nestling period (Ojeda 2004). The Powerful Woodpecker appears, however, to have a longer nesting cycle than the similarly sized species of *Dryocopus* woodpeckers for which these aspects are described (Winkler & Christie 2002).

The two records of breeding presented here from northeastern Ecuador might suggest year-round breeding for this species. It should be pointed out, however, that species once thought to breed year-round may actually have two well-defined breeding peaks in this area (Greeney 2008). Thus, more breeding records are needed from this area and from others, before any conclusions should be reached concerning seasonality of reproduction.

The death of the nestling at the October 2002 nest is interesting in light of other reports on enclosed-nest breeding birds from this area during the same time. The eruption of Reventador Volcano, situated only *ca.* 50 km to the north, had recently caused a light ash-fall in the area during September of 2002. Descriptions of other nests during this time, both of which were flycatchers breeding in enclosed mossy nests, suggests that other species in the area may have suffered detrimental effects from the acidity of falling volcanic ash (Greeney *et al.* 2005, Hannely & Greeney 2008). Other species breeding during this time, which built open-cup nests, appeared less effected by the ash (Greeney unpubl.). We encourage other researchers, with opportunities to study the biotic effects of volcanic eruptions, to take note of this discrepancy and to investigate the possible differences in effects on birds using differing types of nests.

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