ACTA
AMAZONICA | http://dx.doi.org/10.1590/1809-4392201903521

SHORT COMMUNICATION

Nestling development and data on nests and eggs of *Topaza pella* (Aves, Trochilidae) in Amapá state, northern Brazil

Pedro Ferreira FRANÇA[1*], Wirley Almeida SANTOS[2], Carlos Eduardo COSTA-CAMPOS[3], Edson Varga LOPES[1, 4]

[1] Universidade Federal do Oeste do Pará, Programa de Pós-Graduação em Biodiversidade (PPGBEES), Instituto de Ciências e Tecnologia das Águas (Unidade Amazônia), Av. Mendonça Furtado 2946, 68040-470, Santarém, Pará, Brazil

[2] Secretaria municipal de Turismo de Serra do Navio, Rua A1 533A, 68948-000 Serra do Navio, Amapá, Brazil

[3] Universidade Federal do Amapá, Departamento de Ciências Biológicas e da Saúde, Laboratório de Zoologia. Rod. Juscelino Kubitschek, km 02, Jardim Marco Zero, 68903-419 Macapá, Amapá, Brazil

[4] Universidade Federal do Oeste do Pará, Instituto de Biodiversidade e Floresta, Laboratório de Ecologia e Conservação (LabeCon), Rua Vera Paz, s/n, 68035-110 Santarém, Pará, Brazil

* Corresponding author: francaornito@hotmail.com; https://orcid.org/0000-0002-7234-8765

ABSTRACT

The Crimson Topaz, *Topaza pella,* is the least known of the two hummingbird species of this exclusively Amazonian trochilid genus, that also includes *T. pyra*. Most available information on *T. pella* nests, young and reproductive behavior is based on anecdotal observations from Guyana in the 1930s and 1950s. Here, we provide new data on nest description, eggs and parental care of *T. pella*, and the growth and development of two nestlings over a 22-day period. We studied four nests in areas of dense *terra firme* forest in the state of Amapá, Brazil. All nests were in forked branches of shrubs over water bodies, and had a cup-like form. One nest contained two elongated white eggs, and another, two nestlings, which had their development recorded until they left the nest.

KEYWORDS: Amazonia, hummingbirds, reproduction, Crimson Topaz, parental care

Desenvolvimento de filhotes e dados de ninhos e ovos de *Topaza pella* (Aves, Trochilidae) no Amapá, norte do Brasil

RESUMO

O beija-flor-brilho-de-fogo, *Topaza pella* é o menos conhecido das duas espécies de beija-flor desse gênero exclusivamente amazônico, que também inclui *T. pyra*. A maioria das informações disponíveis sobre ninhos, jovens e comportamento reprodutivo de *T. pella* é anedótica, a partir de observações na Guiana nas décadas de 1930 e 1950. Nós fornecemos novos dados, descrevendo o ninho, ovos, cuidado parental e o desenvolvimento de dois filhotes de *T. pella* ao longo de 22 dias. Estudamos quatro ninhos encontrados em áreas de floresta densa de terra firme no estado do Amapá, Brasil. Todos os ninhos estavam em galhos bifurcados, inclinados verticalmente sobre corpos d'água e apresentaram formato de cesto baixo. Em um dos ninhos registramos dois ovos alongados de cor branca e, em outro, encontramos dois filhotes, que tiveram seu desenvolvimento registrado até deixarem o ninho.

PALAVRAS-CHAVE: Amazônia, beija-flor, reprodução, beija-flor-brilho-de-fogo, cuidado parental

Topaza is a hummingbird genus with only two known species, *Topaza pyra* (Gould, 1846) and *Topaza pella* (Linnaeus, 1758), both endemic to the Amazon region (Sick 1997; Piacentini *et al.* 2015). According to a recent revision, *T. pella* ranges from eastern Venezuela, through the Guyanas, Suriname, and into the Brazilian Amazonian states of Roraima, Amazonas, Rondônia, Amapá and Pará (Hu *et al.* 2000). Subsequent records, however, have extended the range of the species into northern Mato Grosso state, on the southern border of the Brazilian Amazon (Davis and Olmstead 2010).

Currently, the information available on the reproductive ecology of the Crimson Topaz, *T. pella* is sparse and fragmented, and the majority is derived from observations made in the early twentieth century in what was then British Guiana (now Guyana) (Nicholson 1931; Davis 1958), with

CITE AS: França, P.; Santos, W.A.; Costa-Campos, C.E.; Lopes, E.V. 2020. Nestling development and data on nests and eggs of *Topaza pella* (Aves, Trochilidae) in Amapá state, northern Brazil. *Acta Amazonica* 50: 138-141.

the exception of the observations by Borges *et al*. (2004) from central Amazonia. The Crimson Topaz is the largest hummingbird in Brazil, with about 20 cm in total length, of which over half is tail (Sick 1997). It inhabits primary forest, being most frequently observed near streams (Davis 1958). The species is known to reproduce from January to April and July to November in Guyana; and from August to December in northern Brazil (Grantsau 1988). Male displays to females include zigzag flights, followed by a rapid plunge to where the female is perched, then the male hovers in front of the female, opening and closing the tail, and ruffling the feathers of the gular region in a way that causes them to change color (Sick 1997; Borges *et al*. 2004). Females build nests on branches (perpendicular, simple or forked) suspended at between 40 to 50 cm above the surface forest streams (Nicholson 1931). Nests have the form of a low cup (Simon and Pacheco 2005), and are constructed from the fibres surrounding *Bombax* seeds, while the nest exterior is covered with cobwebs (Schuchmann 1982; Grantsau 1988). Recorded clutch size is consistently of two eggs, white in color, and incubation duration may exceed 23 days (Nicholson 1931).

Here, we provide additional data on reproductive habitat and season, nest size, structure and location, nesting dates, clutch size and egg color and size of *T. pella* in the state of Amapá, in northern Brazil, and provide, for the first time, a description of nestling development from hatching to fledging.

Our observations were made in two areas on the southeastern Guiana Shield, in the state of Amapá, in the Amazon region of Brazil. One area was in the municipality of Serra do Navio (0°54'N, 51°59'W) (Serra do Navio from now on). The other area was within a conservation unit, the Reserva Extrativista Beija-Flor-Brilho-de-Fogo (RESEX from now on), in the municipality of Pedra Branca do Amapari (0°49'N, 52°11'W). The title of the RESEX is derived from the common name for *T. pella* in Portuguese, due to the abundance of the species in the area. Both areas are covered by dense *terra firme* forest, with floodplain forests along rivers, and are drained by the Amapari River (Drummond *et al*. 2008).

We found four nests overall, one in Serra do Navio, on 4th June 2013 (Nest 1), and three in RESEX in September and October 2013 (Nest 2, 3 and 4). All nests were located in dense *terra firme* forest, on the branches of shrubs that, in all cases, were overhanging forest streams approxinately 3 m wide and 1.2 m deep, all affluents of the River Amapari. We measured the three RESEX nests (Table 1). Nest 2 contained two eggs, of which we measured one. Nest 1 contained two recently-hatched nestlings. We monitored this nest daily for 22 days, between 14:00 and 15:00 h, which allowed us to record parental care, nestling development, and the period of nestling residence prior to leaving the nest. In September, Nest 2 contained two eggs, while Nest 3 contained one nestling. In October, we collected Nests 2, 3, and 4 along with the branches to which they were attached. All three nests were already abandoned, and were deposited in the Zoology Laboratory at Universidade Federal do Amapá.

All nests had the form of a low cup with a forked base (see Simon and Pacheco 2005 for nest type categories). The nests were made of a soft, elastic, fibrous material, formed from *Bombax* seed fibers, mixed with a liquid. Sick (1997) suggested that *T. pella* might use nectar, saliva or sap to glue the fibrous materials together. The nest was secured to the twig by an extension of the nest body, which partly covered the support branch, and by a secondary covering of spider webs, similar to the third class of Trochilid nests described by Ruschi (1949) (Figure 1a).

The eggs found in Nest 2 were elongated and white. Measurements from one egg were 14.6 mm × 10.4 mm, with an inverted pole (Figure 1b). We decided not to measure both eggs, so as not to interfere overly with the reproductive process of the female. At this same nest, we observed the female incubating the eggs, with part of her body outside the nest.

Nestling development was recorded over the entire 22-day period during which we monitored Nest 1. When the nestlings hatched, their eyes were closed, they had yellow beaks and lacked down, which only appeared on the second day of monitoring (Figure 2a). By the 5th day, the nestlings had increased in size, and down was more evenly spread across the body (Figure 2b). By the 9th day their bodies had gained more muscle, the wings had taken shape and the skin became more firmer and darker (Figure 2c). On the 12th day, the skin of both nestlings was darker, and pin feathers had begun to appear (Figure 2d). The nestlings' eyes opened only on or about day 16 and, at the same time, the beak became greyer and the first feathers appeared (Figure 2f). On the 20th day, nestling bodies were fully covered in feathers (Figure 2h). On the 22nd day, the wing feathers were longer and nestling plumage appeared similar to that of an adult female (Figure 2i). Both nestlings left the nest on the 23rd day, even though they still had very short tails. During the entire period, only the female was observed feeding the nestlings.

The positioning of all four nests on branches overhanging water bodies is in agreement with the observation made by

Table 1. Measurements of three nests of the Crimson Topaz hummingbird, *Topaza pella*, from the Reserva Extrativista Beija-Flor-Brilho-de-Fogo (RESEX), Amapá State, Brazil.

	Nest 2	Nest 3	Nest 4
Date nest found	18 Sep 2013	18 Sep 2013	11 Oct 2013
Height above water surface (cm)	49	53	50
Nest height (mm)	52.6	44.2	46.1
Maximum and minimum diameter (mm)	56.6 x 33.6	56.2 x 39.6	52.9 x 46.0
Depth of cavity center (mm)	34.4	28.1	28.8

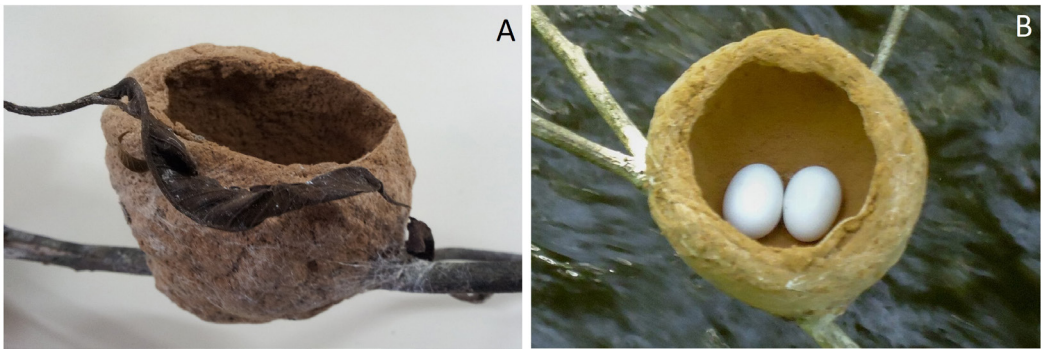

Figure 1. A – Low-cup nest of *Topaza pella* from the Reserva Extratavista Beija-Flor-Brilho-de-Fogo (RESEX), Amapá State, Brazil, attached to a supporting twig, with an outer covering of cobweb; **B** – Two eggs in a nest at the same location. This figure is in color in the electronic version.

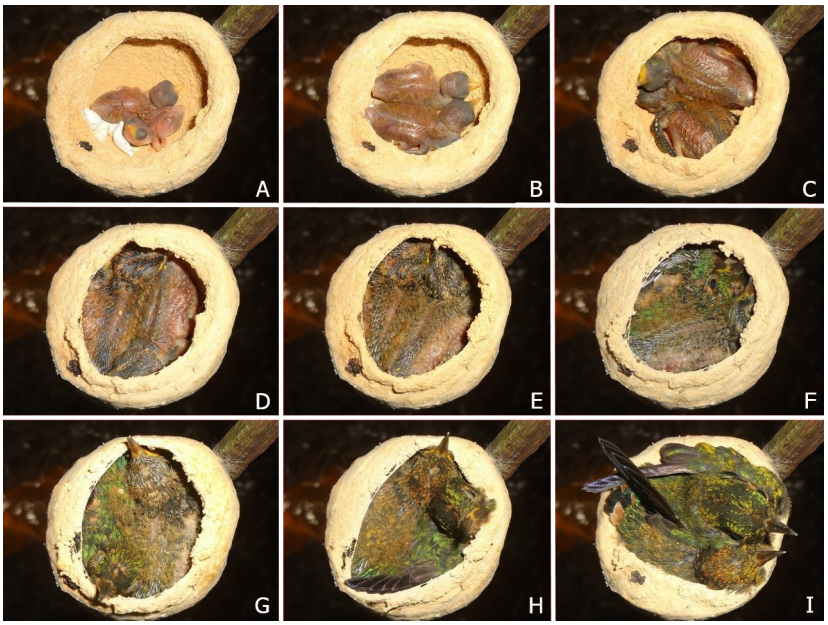

Figure 2. Nestling development sequence of two young of Crimson Topaz, *Topaza pella* over 22 days in June 2013. A – 2nd day of monitoring; B – 5th day; C – 9th day; D – 12th day; E – 14th day; F – 16th day; G – 18th day; H – 20th day; I – 22nd day. This figure is in color in the electronic version.

Nicholson (1931). The form, structure, and means of nest attachment, all follow the patterns described for the species by Schuchmann (1982) and Grantsau (1988), although this species does not cover the nest with fragments of lichens or mosses, as do many members of the family (Ruschi 1949). Although overlapping somewhat with records described by Grantsau (1988) from the north of Brazil (August-December), the nesting period of *T. pella* at our study area is more in keeping with that for populations in the Guianas (July-November). It is important to note that the part of northern Brazil where the majority of existing data concerning *T. pella* has been obtained is bisected by the Equator, so that some of the locations lie in the southern, and others in the northern hemisphere. Hence, despite their proximity, seasonal patterns may vary between sites more extensively than their close proximity might suggest.

Clutch size, color, and egg form all follow the patterns and characteristics described by Nicholson (1931) for the species, which invariably consists of two matte white elliptical eggs. However, size corresponds more to the findings of Grantsau (1988) (18 mm × 11.5 mm), than those of Nicholson (1931) (24 mm in length). Parental care (incubation, nestling provision and nest maintenance) was carried out solely by the female, as reported by Sick (1997) to be the case for all species of the family Trochilidae. That nestlings remained in the nest for 22 days is similar to what Nicholson (1931) reported – a fledging period of some 23-24 days for two nests encountered at Moraballi Creek, British Guiana, in August-November 1929.

This is the first detailed observation of the nestling development of *T. pella*, including photographic documentation. Our study supplements existing information

concerning the species. However, knowledge gaps remain to be filled, including duration of the incubation period and territorial defense. Consequently, we encourage researchers and birders to seek out additional information on the reproductive ecology of *T. pella*.

ACKNOWLEDGMENTS

We thank Universidade Federal do Amapá and Secretaria Municipal do Meio Ambiente (SEMAM) of Pedra Branca do Amapari for logistic support in the field. Adrian Barnett helped with the English. We also thank the anonymous reviewers and the editor for helpful suggestions, which greatly improved the manuscript.

REFERENCES

Borges, S.H.; Stouffer, P.C.; Carvalhaes, A.M.P. 2004. Comportamento de "lek" em *Topaza pella* (Aves: Trochilidae) na Amazônia Central. In: Cintra, R. (Ed.). *História Natural, Ecologia e Conservação de Algumas Espécies de Plantas e Animais da Amazônia*, 2nd ed. Editora INPA, Manaus, p.249–253.

Davis, B.J.W.; Olmstead, S.T. 2010. Aves, Apodiformes, Trochilidae, *Topaza pella* (Linnaeus, 1758): a range reinforcement in Amazonian Brazil. *Check List*, 6: 397.

Davis, T.A.W. 1958. The displays and nests of three forest hummingbirds of British Guiana. *Ibis*, 100: 31–39.

Drummond, J.A.; de Castro Dias, T.C.A.; Brito, D.M.C. 2008. *Atlas das Unidades de Conservação do Estado do Amapá*. MMA/ICMBio/AP - GEA/SEMA - MPEA, Macapá, 129p.

Grantsau, R. 1988. *Os Beija-flores do Brasil*. Expressão e Cultura, Rio de Janeiro, 233p.

Hu, D.-S.; Joseph, L.; Agro, D. 2000. Distribution, variation, and taxonomy of *Topaza* hummingbirds (Aves: Trochilidae). *Ornitologia Neotropical*, 11: 123–142.

Nicholson, E.M. 1931. Field-notes on the Guiana King Hummingbird. *Ibis*, 73: 534–553.

Piacentini, V. de Q.; Aleixo, A.; Agne, C.E.; Maurício, G.N.; Pacheco, J.F.; Bravo, G.A.; *et al*. 2015. Annotated checklist of the birds of Brazil by the Brazilian Ornithological Records Committee/Lista comentada das aves do Brasil pelo Comitê Brasileiro de Registros Ornitológicos. *Revista Brasileira de Ornitologia*, 23: 91-298.

Ruschi, A. 1949. A classificação dos ninhos de trochilídeos. *Boletim do Museu de Biologia Prof. Mello-Leitão*, 3: 1–119.

Schuchmann, V.K. 1982. Zur Biologie des Königskolibris (*Topaza pella*). *Trochilus*, 3: 56–93.

Sick, H. 1997. *Ornitologia Brasileira*. Editora Nova Fronteira, Rio de janeiro, 862p.

Simon, J.E.; Pacheco, S. 2005. On the standardization of nest descriptions of neotropical birds. *Revista Brasileira de Ornitologia*, 13: 143–154.

RECEIVED: 02/10/2019
ACCEPTED: 23/01/2020
ASSOCIATE EDITOR: Sérgio H. Borges