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## Description of the nest and parental care of Spotted Tanager *Tangara punctata*

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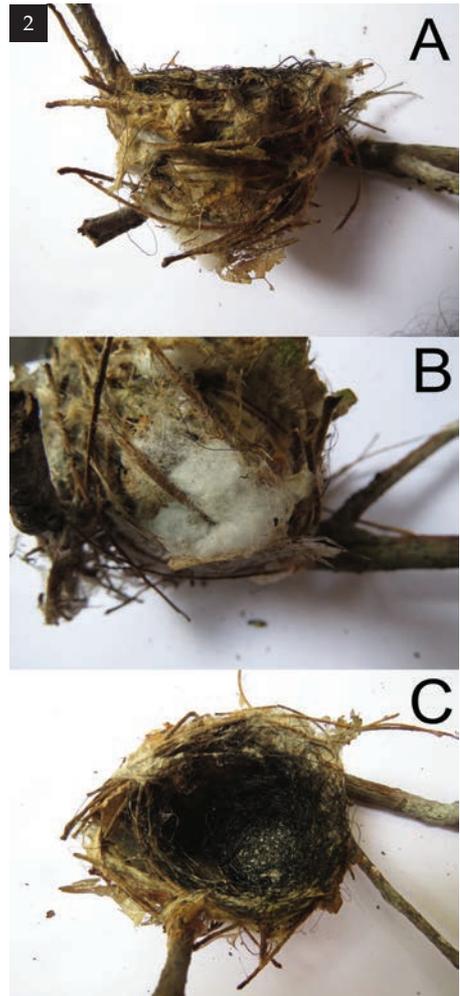
Spotted Tanager *Tangara punctata* is a small, mainly green and black-spotted thraupid found in Venezuela, the Guianas, Ecuador, Peru, Bolivia and much of Amazonian Brazil (Isler & Isler 1987, Hilty 2011, Pansacula & Burns 2012). Five subspecies are recognised, with *T. p. punctata* in Amazonia and the others in the Andes (Hilty 2011, Pansacula & Burns 2012). Besides differences in plumage and habitat, a molecular study revealed significant genetic differentiation between populations from Amazonia and the Andes (Burns & Naoki 2004), suggesting that more than one species might be recognised within *T. punctata* (Pansacula & Burns 2012). In Amazonia, the species occurs in *terra firme* forest and savanna. It feeds on fruits and arthropods, mainly in the canopy, but can descend lower (Isler & Isler 1987, Hilty 2011).

Isler & Isler (1987) reported that, for most tanagers, little is known concerning basic aspects of their reproductive behaviour. For c.15 of the 49 species of *Tangara*, no information on breeding biology is available and even for the other species available data are incomplete or based on observations made in captivity (Hilty 2011). According to Pansacula & Burns (2012) many aspects of the biology of *T. punctata* are little known, and its reproductive biology wholly unknown. Here, we present the first description of a *T. punctata* nest, with notes on the egg and parental care.



Figure 1. Spotted Tanager *Tangara punctata* nest in the canopy of a *Protium heptaphyllum* tree, Museu da Amazônia, Manaus, Amazonas, Brazil, February 2016 (Tomaz Nascimento de Melo)

Figure 2. Side view of the Spotted Tanager *Tangara punctata* nest (A), detail of the *Ceiba pentandra* seed down used in its construction (B) and view of the incubation chamber (C) (Tomaz Nascimento de Melo)



Data were collected at the Museu da Amazônia (MUSA; 03°00'S, 59°56'W), on the north-east edge of the city of Manaus, Amazonas, Brazil. The MUSA covers 200 ha within the Adolfo Ducke Forest Reserve, a 10,000-ha fragment of *terra firme* forest administered by the Instituto Nacional de Pesquisas da Amazônia (INPA). The fragment's southern boundary, where the MUSA is located, is subject to anthropogenic pressure, including fires and garbage dumping by local residents. The climate is classified as tropical humid, with relative humidity of 75–86% and annual rainfall of 1,750–2,500 mm. The wet season is between November and May, with peak rains in March–April. The dry season is in June–October; September is the hottest and driest month. Mean annual temperature is 26°C, fluctuating up to 8°C during the day (Baccaro *et al.* 2008).

Photographic documentation was obtained using a GoPro Hero 4 camera attached to a 4 m-stick, supported by a branch close to the nest, and a Canon SX50 HS camera, with 50× zoom. Observations were made from the tower, using



Figure 3. Adult Spotted Tanager *Tangara punctata* with nestling, Museu da Amazônia, Manaus, Amazonas, Brazil, February 2016 (Renata da Silva Xavier)

binoculars, at a distance of *c.*5 m from a platform 2 m above the nest. Once the breeding attempt had finished, the nest was subsequently collected.

On 13 February 2016, while conducting observations from a 28 m-platform of the canopy tower at the MUSA, an adult *T. punctata* was observed at a nest on a 28 m-high *Protium heptaphyllum* Burseraceae (Fig. 1). The nest was well concealed by the tree's leaves, and was 26 m above ground, *c.*5 m from the tower and 50 cm from the tree's outermost branches. The nest tree is located at the edge of the clearing surrounding the tower and 500 m from the fragment edge.

The low cup / fork nest (*sensu* Simon & Pacheco 2005) was attached at its sides to three thin branches of the tree, but with no support below it. The external part of the nest was covered by dry leaves and thin dry rachises (Fig. 2A), bound by fibres of *Ceiba pentandra* (Malvaceae) seed down, which were also used to attach the nest to the substrate (Fig. 2B). The incubation chamber was covered by thin black rootlets (Fig. 2C). The nest had an external diameter of 69 × 67 mm and internal diameter of 44 × 50 mm. Nest height was 60 mm and the incubation chamber was 34 mm deep. It held a single nestling, eyes still closed, covered in grey down with a white bill, and one egg, white spotted brown, which was observed just once, in winds that moved the leaves concealing the nest.

On 14–15 February 2016, nest activity was monitored between 07.00 and 10.00 h, for a total of six hours; it was not possible to monitor activity in the subsequent days. Both adults provisioned the fledgling, however one only remained <1 minute in the nest tree, whereas the other brooded the nestling after feeding it (Fig. 3), staying in the nest 3–25 minutes (mean = 10.7 minutes, SD = 6.7, *n* = 9), during which time the bird constantly rearranged the nest interior using its bill. Adults were observed bringing food to the nestling 12 times, usually together, but twice just one of the adults fed the young. When arriving in the vicinity of the nest, the adults gave short calls and quickly headed to it. The young was not

observed vocalising. The nestling was fed small, unidentified fruits and arthropods; twice it consumed small caterpillars. On two occasions, one of the adults transferred food to the other, which was already at the nest, to feed the nestling. Consumption of faecal sacs by the adults was observed twice, but they were never seen to carry faecal sacs away from the nest.

Variations have been reported in materials used for nestbuilding among the species of *Tangara*, even between different nests of the same species. The *T. punctata* nest we observed was much like most nests described for the genus, except the globular nest of Green-naped Tanager *T. fucosa*, being cup-shaped and saddled between branches (or sited directly onto the substrate), well concealed by vegetation (Skutch 1954, 1981, Isler & Isler 1987, Gonzaga & Castiglioni 2005, Sheldon & Greeney 2007, Greeney *et al.* 2008, 2011, Kirwan 2011, Sheldon *et al.* 2014). Use of moss as the principal or secondary material has been reported in nests of several *Tangara* species (Skutch 1954, 1981, Isler & Isler 1987, Sheldon & Greeney 2007, Greeney *et al.* 2011, Sheldon *et al.* 2014), but was not found in that of *T. punctata*. A predominance of rachises in the outer layer and dark roots in the nest's lining has also been reported in the nest of Speckled Tanager *T. guttata chrysophrys* (Skutch 1954), which species also does not use moss in the construction. These two species are considered to be very close relatives (Burns & Naoki 2004) and, in this case, choice of material may indicate shared behaviour, rather than simple availability of materials (Gonzaga & Castiglioni 2005). *Ceiba pentandra* seed down was used to bind the other materials and attach the nest to the substrate in place of cobwebs, which are commonly used by congenics.

Our observations of parental care partially correspond to those of other *Tangara*. Although some studies have reported pairs of adults being helped by others to feed the nestlings (Skutch 1954, Skutch 1961, Snow & Collins 1962, Long & Heath 1994, Sick 1997), we only ever observed two individuals bringing food to the nest simultaneously, as also reported by Sheldon & Greeney (2007) for Beryl-spangled Tanager *T. nigroviridis*. However, the number of adults feeding the young can vary in the same species (Skutch 1961), so more observations are required to determine what is normal in this respect for *T. punctata*. As in many other species of *Tangara*, during our observations both adults visited the nest simultaneously to feed the young (Skutch 1954, Sheldon & Greeney 2007, Sheldon *et al.* 2014), although this behaviour was not observed by Kirwan (2011) for Green-and-gold Tanager *T. schrankii*. Skutch (1954) reported that simultaneous visits reflect the behaviour of *Tangara* pairs that always keep together while foraging.

According to Skutch (1954) and Sheldon *et al.* (2014), in other species of *Tangara* brooding is more frequent during the first days of life, when the nestlings still lack down. During our brief observations, it was possible to observe that the nestling was not feathered, explaining the mean *c.*11 minutes of brooding observed following each feed, similar to the observations of Sheldon *et al.* (2014) for Flame-faced Tanager *T. parzudakii* during the first days of life. Brooding period, however, appears to vary between species, with short durations reported by Sheldon & Greeney (2007) for *T. nigroviridis*, even when nestlings are very small.

Consumption of faecal sacs by the adults, observed in our study, corresponds to behaviour described by Skutch (1981) and Long & Heath (1994) for several other *Tangara*. Skutch (1981) reported that during the first days of life, consumption of faecal sacs is more frequent, but as nestlings grow the adults start to carry faecal sacs away from the nest. However, Sheldon & Greeney (2007) did not find any relationship between the nestlings' age and consumption of faecal sacs by adults. Our observations also contrast with those by Gelis *et al.* (2006), who witnessed Golden Tanagers *T. arthus* removing faecal sacs from the nest when the young were very small, and Sheldon *et al.* (2014), who recorded such behaviour as typical in *T. parzudakii*.

Although differences exist between nest materials used by different species, the materials and characteristics of the *T. punctata* nest we found are unlike most other *Tangara* species' nests (Skutch 1954, 1981, Isler & Isler 1987, Sick 1997, Gonzaga & Castiglioni 2005, Sheldon & Greeney 2007, Greeney *et al.* 2008, Gussoni & Develey 2011, Hilty 2011, Kirwan 2011, Sheldon *et al.* 2014). The data presented here represent the first published information concerning the breeding biology of *T. punctata*. Nest descriptions for other species might prove interesting for understanding relationships among the genus *Tangara*.

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