

Additional information on the breeding biology of the Black-and-white Tanager (*Conothraupis speculigera*) in Ecuador

Johan Ingels

Galgenberglaan 9, B-9070 Belgium

E-mail: johan.ingels@skynet.be

Abstract

I present information about the breeding habitat of the Black-and-white Tanager (*Conothraupis speculigera*) in the province of Loja, Ecuador. Quantitative data on nest composition and egg coloration and variation, is provided. Nest parasitism is also documented.

Key words: breeding biology, *Conothraupis speculigera*, eggs, nest, parasitism.

Resumen

Presento información sobre la biología reproductiva de la Tangara Negriblanca (*Conothraupis speculigera*) en la provincia de Loja, Ecuador. Datos cuantitativos acerca de la composición del nido y la coloración y variación en huevos son proporcionados. Un caso de parasitismo es también documentado.

Palabras Clave: biología reproductiva, *Conothraupis speculigera*, huevos, nido, parasitismo.

Introduction

The Black-and-white Tanager *Conothraupis speculigera* is found west of the Andes from Pichincha to Loja in Ecuador, southward to La Libertad in Peru, and east of the Andes at Morona-Santiago in Ecuador (Ridgely & Greenfield 2001), Amazonas and Acre in Brazil (Stotz 1990, Sick 1993), Amazonas, Cajamarca, San Martín, Ucayali, Pasco and Madre de Dios in Peru and La Paz in Bolivia (Hennessey et al. 2003). It breeds during the middle to later part of the rainy season, approximately December to May, in seasonally arid areas on the slopes of the Andes and in inter-Andean valleys in southwestern Ecuador and northwestern Peru. During the dry season of June to November, it is not present at breeding sites and records indicate that it disperses into humid lowland Amazonia of eastern Peru, with a few records also from southeastern Ecuador, western Brazil and northwestern Bolivia (Isler & Isler 1999, Restall et al. 2006, Witt 2005).

Carriker (1934) provided the first breeding record when he collected a female in reproductive condition in April 1933, near Samne (07°59'S, 78°41'W), department of La Libertad, Perú. The tanager was flushed from a thicket of rank grass and weeds growing on a steep slope above an irrigation ditch. He was unable to locate the nest but suspected that it was placed on or near the

ground since no nest was found higher up in the shrubbery frequented by this tanager.

Greeney et al. (2006) found a Black-and-white Tanager nest with three eggs, situated 1.4 m above the ground in a 1.8 m tall Urticaceae shrub on 10 March 2004, and another, containing two eggs with developing embryos, on 12 March 2005 at the Jocotoco Foundation reserve near Yungilla (03°13'S, 79°16'W) in Ecuador. This second nest was situated c.0.6 m above the ground, in an area of scrubby and thorny, second growth. The nest, shown as Fig. 1 in their paper, was an untidy, loosely woven cup of pale sticks and leaf petioles, with an untidy lining of black fungal rhizomorphs. In this paper, I present additional information about the breeding biology of the Black-and-white Tanager, with quantitative data on 16 nests and 38 eggs in Ecuador.

Methods

In 1987 the Western Foundation of Vertebrate Zoology (Camarillo, CA, U.S.A.) initiated a project to study the breeding biology of the birds of Ecuador. Early results were published by Kiff et al. (1989) and Marín & Carrión (1991, 1994). I worked from 2 until 5 March 1989, west of Catacocha (04°02'S, 79°47'W, altitude c.1000 m.a.s.l.), and from 18 until 30 March 1991, south of Pindal (04°07'S, 80°06'W, altitude c.800 m.a.s.l.) and

southwest of Sabanilla (04°12'S, 80°08'W, altitude c.500 m.a.s.l.), both near Celica in the province of Loja.

During morning hours, nests were found by carefully checking shrubbery and hedgerows in areas where males were singing. Random searches without using playback were performed in what I thought was habitat preferred by Black-and-white Tanagers, i.e. in agricultural areas with cornfields and pastures with low shrubbery, separated by hedgerows.

Eggs were weighed to the nearest 0.01 g with an Ohaus 10.10-10 metric balance, and dimensions of eggs and nests were measured with caliper and sliding caliper to the nearest 0.01 mm and 1 mm respectively. Eggs were blown with a blowpipe through one hole made on the side with an egg drill.

Results

The first nest of the Black-and-white Tanager was discovered in a *quebrada* (a gorge) north of the road Catacocha-La Empalme, c.26 km southwest of Playas near Catacocha. The nest with three fresh eggs was discovered on 4 March 1989, c.2 m up the steep side of the bottom trail in the well-wooded *quebrada* with large trees (*Ceiba* and *Ficus* spp.) and dense deciduous understorey, at an altitude of c.1000 m.a.s.l. The nest was built c.50 cm above the ground in a low open bush and well visible from all sides. The identity of the nesting birds was established when first the nesting female followed by two adult males attracted by the distress calls of the female, were captured in a mistnet set alongside the nest site. All three adults were collected (WFVZ 46340, female; 46341, male; 48806, male) as were the nest and eggs (WFVZ 158391). Both males collected had well-developed testes (8 x 5 mm) and the female had a largest follicle of 3 mm diameter. In the same *quebrada* where I discovered the nest, at least three more males were singing. Although I found four singing males, I did not see more females than the one collected. However, it is known that the drab coloured and inconspicuous females are shy and retiring (O'Neill 1966). Although I searched in other areas along the bottom trail, I could locate only a single nest.

In March 1991 nests and eggs of Black-and-white Tanagers were collected 3 km south of Pindal (collection numbers : WFVZ 162192, 162193, 162194, 162199, 162200, 162201, 162206 and 162207) and 4 km southwest of Sabanilla (collection numbers : WFVZ

162191, 162196, 162197, 162198, 162202, 162203, 162204 and 162205).

Nesting habitat -- Typical habitat is located in agricultural areas in the foothills of the Andes between the villages of Pindal and Sabanilla, respectively 16 km south and 22 km southwest of Celica, cornfields and pastures, often separated by hedgerows, dominate, alternated with fallow lands and stretches of low shrubbery. Pastures are often patchily overgrown with shrubby weeds, leafy bushes, and both thornless and thorny *Acacia* thickets. Tree stumps with saplings were often found in pastures and hedgerows. Black-and-white Tanagers were always the most common species in this habitat of cornfields and pastures with shrubbery, separated by hedgerows. Sometimes up to 10 males were heard singing, from posts atop large shrubs or trees growing in pastures or hedgerows. Once two males were singing within a distance of 5 m from each other. On its breeding ground, a male sings loudly while perched conspicuously, sitting fairly erect with head raised and wings slightly drooped. Singing males rise the headfeathers, so that the white base become visible (Witt 2005, Lebbin 2005, 2006). The song is a loud series of ringing double notes *chee-ong*, repeated three to six times (Ridgely & Greenfield 2001, Witt 2006). Nests were often found near male singing posts. Other birds nesting in the same habitat at that time were : Wing-barred Seedeater *Sporophila americana*, Black-and-white Seedeater *S. luctuosa*, Parrot-billed Seedeater *S. peruviana*, Chestnut-throated Seedeater *S. telasco*, Peruvian Meadowlark, *Sturnella bellicosa* and Blue-back Grassquit, *Volatinia jacarina*.

Nest site and nests -- Of 16 nests found, 3 (20%) were constructed in saplings on a treestump, 4 (25%) in a hedgerow and 9 (55%) in shrubbery in a pasture. The mean nest height (n = 16) was 1.10 ± 0.5 m. Four nests were constructed as low as c.0.5 m in low shrubby weeds. Three nests were situated at c.1.75 m in bushes as high as 2.0 to 2.5 m. The remaining 9 nests were built at heights between 0.5 and 1.75 m. Of the 16 nests found, 12 (75%) were well hidden, i.e. not directly visible without opening the shrub, bush or saplings.

Nests had the following external dimensions (n = 10): diameter: 110 ± 3 mm (100–117 mm) and height: 71 ± 14 mm (47-96 mm). Nest cups had the following dimensions (n = 10): diameter: 66 ± 7 mm (61-70 mm) and depth: 49 ± 5 mm (35-60 mm).

All 16 nests found had the same structure and consisted of an untidy, loosely woven cup of pale, greyish sticks and leaf petioles, with an untidy lining of

brown and/or black fungal rhizomorphs as described by Greeney et al. (2006) (Fig. 1).



Fig. 1. Nests of the Black-and-white Tanager (*Conotraupis speculigera*) illustrating the typical structure of a loosely woven cup of pale greyish sticks and leaf petioles, lined with brown and/or black fungal rhizomorphs. Upper left: WFVZ 162194, upper right: WFVZ 162198, lower left: WFVZ 162192, lower right: WFVZ 162193 (Photo: R. Corado).

Eggs, egg weight and egg size -- Eggs were laid on consecutive days. They are non-glossy and have a whitish to pale bluish ground colour, with few to many reddish-brown and blackish speckles and blotches, sometimes distributed fairly evenly, but sometimes slightly to mostly concentrated at the blunt end (Fig. 2). Egg shape is between oval and long oval. The mean

weight of fresh eggs (n = 30) was 3.07 ± 0.33 g. The lightest egg weighed 2.50 g and the heaviest one, 3.83 g. Mean length of eggs (n = 38) was 21.89 ± 1.15 mm and mean breadth was 16.33 ± 0.44 mm (range = 25.34 - 19.68 x 16.94 - 15.51 mm). The smallest egg measured 19.68 x 15.51 mm.



Fig. 2. Egg clutches of the Black-and-white Tanager (*Conothraupis speculigera*) illustrating variation in ground colour and distribution of reddish-brown to blackish speckles and blotches. Upper left: WFVZ 162196, upper right: WFVZ 162199, lower left: WFVZ 162207, lower right: WFVZ 162205 (Photo: R. Corado).

Clutch size. -- I determined that a clutch was complete when I found traces of blood or developing embryos on blowing the eggs. Nine incubating clutches were collected, seven clutches of four eggs and two clutches of three eggs, which gives a mean clutch size of 3.8 eggs.

Presence of broodpatch. -- During the WFVZ project, eight Black-and-white Tanagers were collected in Ecuador, one juvenile male in female-like plumage on 3 August 1987 and 7 adults (5 males and 2 females) on 4 March 1989 (2-1) and 16 March 1991 (3-1).

The seven adult Black-and-white Tanagers were in breeding condition when collected. Males had testes of 8 – 7 x 5 – 4 mm and females had follicles 2 to 3 mm in diameter. Both females, but none of the males, had a large broodpatch.

Nest parasitism. -- In clutch WFVZ 162197, a complete clutch of 4 eggs, Lloyd F. Kiff (pers. com.) found one egg that clearly was not a *Conothraupis speculigera* egg. A close examination of other eggs in the WFVZ collection showed that this was an egg of the parasitic Shiny Cowbird, *Molothrus bonariensis*. In this parasitised clutch, 3 eggs have a whitish to pale bluish ground colour, with reddish-brown speckles distributed fairly evenly, but mostly concentrated at the blunt end. The cowbird egg has the same ground colour, however the brownish speckles are smaller and distributed more evenly over the egg (Fig. 3). It weighed 3.85 g, heavier than the heaviest tanager egg, measured 22.31 x 18.02 mm and had a more elliptical shape.



Fig. 3. Clutch of a Black-and-white Tanager (*Conothraupis speculigera*), WFVZ 162197, parasitised by a Shiny Cowbird (*Molothrus bonariensis*). The cowbird egg is the lower right one, quite different in shape and markings from the tanager eggs (Photo: R. Corado).

Discussion

In Ecuador, the Black-and-white Tanager is generally considered a locally common breeder during the rainy season, which most often lasts from December to May. It nests in scrubs and bushes and lower growth of deciduous woodland in the Andean foothills of Azuay, El Oro and Loja. During the remainder of the year, this tanager is largely if not entirely absent from the region where it breeds. The evidence now available indicates that the species is a long-distance and apparently a cross-Andean migrant from its breeding grounds in the west to its non-breeding grounds in the east (Greeney et al. 2006, Ridgely & Greenfield, 2001).

Breeding starts at the end of February, with an increase in reproductive activities in March. Only nests with eggs and no nests with nestlings were found in March, indicating that reproduction continues well into April and even May. Black-and-white Tanagers, feeding on insects and seeds, apparently benefit from the abundance of food in the second half of the rainy season. However, timing of reproduction greatly depends on the rainy season.

As suggested by Carriker (1934), nests are indeed mostly well hidden and constructed low in saplings, hedgerows and shrubbery, at heights between 0.5 and 1.75 m.

Normal clutch size for open cup nesting tanagers is two, rarely three eggs (Isler & Isler 1999). Clutch size of the Black-and-white Tanager, however, is sometimes three eggs (young females ?), normally four. This clutch size is large for a Neotropical tanager. Only the related White-rumped Tanager, *Cypsnagra hirundinacea*, is reported to lay 3 to 4 eggs. However, *Piranga* species breeding in North America usually lay up to four and even five eggs (Isler & Isler 1999). Why the nest found by Greeney et al. (2006) contained only 2 eggs with developing embryos is not clear. Predation of one or two eggs may have occurred.

My observations on the Black-and-white Tanager confirm the statement of Ridgely & Greenfield (2001) that this tanager cannot be viewed as being at risk, at least not in Ecuador. It has an obvious preference for disturbed and secondary areas, such as pastures with shrubbery and hedgerows in rural areas, at least during

the breeding season. In March 1991, it was the most common bird in this habitat in southwestern Loja, so much so that I called the region between Sabanilla, Pindal and Celica, “*Conothraupis* country”!

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