Turquoise Dacnis *Dacnis hartlaubi*, further evidence of use of shade coffee plantations

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El Dacnis Turquesa es una especie endémica y vulnerable de Colombia con una distribución fragmentada y restringida y poblaciones bajas. Se ha observado en bordes de bosques en 13 sitios en los Andes entre 1.350 y 2.200 m de altitud. En un estudio de la avifauna en cafetales, censamos las aves e investigamos la composición y estructura de los sombríos en localidades situadas en Antioquia, Quindío, Caldas y Santander. El Dacnis Turquesa solamente se observó en dos cafetales con sombrío de Támesis, Antioquia, en siete ocasiones, entre febrero y abril de 1999. Solamente se observaron machos en grupos de dos o tres individuos o en bandadas mixtas. En estos sombríos predominaron los árboles *Inga* spp. y *Cordia alliodora*. Se encontraron diferencias estructurales entre los sombríos de Támesis en donde el dacnis estaba presente y ausente, lo que indicaría que la especie no prefiere los sombríos más altos, con más árboles o con dosel más denso. Sin embargo, solamente se observó en cafetales aledaños a fragmentos de bosque. Nuestras observaciones extienden el rango conocido para la especie y confirman la fragmentación de su distribución y población baja. Es necesario continuar los estudios sobre su ecología y comportamiento, su aparente segregación sexual y el uso que hacen de los fragmentos de bosque y cafetales. Esa información es necesaria para su conservación.

Introduction

Turquoise Dacnis *Dacnis hartlaubi* is a rare Colombian endemic with an apparently limited and disjunct distribution[2,4]. It is known from evergreen montane forest borders and secondary forest clearings, with scattered trees, in only 13 localities within the Colombian Andes, mostly at 1,350–2,200 m . Two sightings, one at 2,845 m and the other at 300 m, have been made outside this range. Three populations are known: one from six sites on the Pacific slope and adjacent eastern slope of the Western Cordillera (in the dry upper and lower Dagua Valley and Bosque Yotoco); another on the west slope of the Central Cordillera (near Calarcá, Quindío); and at six clustered sites on the west slope of the Eastern Cordillera (río Bogotá region: Laguna de Pedropalo, Bojacá and San Antonio del Tequendama)[4,10].

It is classified as Vulnerable[2,7,8] due to a suspected rapid population decline, small distribution and small population size, directly affected by severe fragmentation and habitat degradation. Stotz *et al.*[9] consider Turquoise Dacnis to have the highest conservation and research priorities. There is a paucity of recent information on the species' distribution, ecology and behaviour. We report several sightings from agricultural habitats in an area that represents a range extension for the species.

Methods

During a study of the avifauna of shade coffee plantations, we visited several coffee-producing areas in the Central Andes of Colombia. Bird population censuses on 25-m radius point counts were conducted[6], and records of all species seen in different types of shade coffee plantations, in January–August 1999, were made. We also identified shade trees in census circles and measured point elevation, tree height, crown diameter and height, and percentage of canopy cover, using a spherical densiometer. From this, we calculated crown area and volume. We compared variables describing the composition and structural characteristics of shade plantations, where Turquoise Dacnis was present and absent, with unpaired t tests.

Study area

Observations were conducted in four shade plantations at Veredas La Oculta and La Virgen, Támesis, Antioquia (05°45'N 75°42'W) on the east slope of the Western Cordillera, in February–April 1999. The plantations were at 1,200–1,600 m, forming a mosaic with banana plantations, pastures, patches of bamboo *Guadua* spp. and other natural vegetation types, in an area where shade coffee production predominates. Above 1,600 m, terrain is very steep and covered with fragments of natural vegetation and some secondary forest. Below 1,200 m, pasture is predominant. Plantations differed in composition and structural shade characteristics. We also conducted similar observations in 10 other plantations, within five other coffee regions of Colombia: at Génova and Buena Vista, in Quindío, at Manizales, Chinchiná and Supía, in Caldas, and Mesa de los Santos, in Santander.

Observations

Turquoise Dacnis was observed in two shade coffee plantations at Veredas La Oculta and La Virgen, Támesis, Antioquia, on seven different occasions in February–April 1999. We only observed males, ei-

ther alone, in groups of 2–3, or in foraging flocks composed of migrant and resident bird species.

At La Congoja (Veredas La Oculta), where we spent nine field days, we observed the species on four occasions: 4, 12, 23 and 25 February 1999 (i.e. on 44% of possible days). At La Virgen-Jimenez, where we spent 16 field days, we only observed it on three occasions: on 3 March and 11 and 14 April 1999 (19% of possible days). None was observed at the other two plantations studied in the same region, nor in plantations elsewhere in the Central and Eastern Cordilleras.

On at least three occasions, Turquoise Dacnis were seen in mixed-species foraging flocks with individuals of 21 other resident and migrant species, mostly warblers and tanagers. On 12 February, three males were within a mixed flock containing Red-headed Barbet *Eubucco bourcierii*, Streaked Xenops *Xenops rutilans*, Blackburnian *Dendroica fusca* and Cerulean Warblers *D. cerulea*, Green Honeycreeper *Chlorophanes spiza*, Blue-necked *Tangara cyanicollis*, Crimson-backed *Ramphocelus dimidiatus*, Flame-rumped *R. flamigerus* and Guira Tanagers *Hemithraupis guira*. On 23 February, a male was observed with a flock consisting of Squirrel Cuckoo *Piaya cayana*, Blue-hooded Euphonia *Euphonia musica*, Scarlet Tanager *Piranga rubra* and Yellow-backed Oriole *Icterus chrysater*. On 11 March, two were within a flock of Red-headed Barbet, Streak-headed Woodcreeper *Lepidocolaptes souleyetii*, Streaked Flycatcher *Myiodinastes maculatus*, Rufous-naped Greenlet *Hylophilus semibrunneus*, Northern *Icterus galbula* and Yellow-backed Orioles, Blackburnian, Cerulean and Black-and-white Warblers *Mniotilta varia*, Tropical Parula *Parula pitiayumi*, Bananaquit *Coereba flaveola*, Blue-necked, Blue-grey *Thraupis episcopus*, Crimson-backed, Scarlet and Guira Tanagers.

Shade characteristics

In both plantations where Turquoise Dacnis was observed, *Inga* spp. and *Cordia alliodora* were the two most common shade-tree species. In La Congoja, *Cordia alliodora* represented 44.9% of shade trees, *Inga* spp. 32.9%, avocados *Persea americana* 7.7%, *Cedrela odorata* 3.1% and fruits such as mangos *Mangifera indica* and oranges *Citrus* spp. 7.1%. At La Virgen-Jiménez, *Inga* spp. represented 48.3%, *Cordia alliodora* 40.4%, and avocado, mango, orange and guava *Psidium guajava* 7.8%. *Cordia* and *Cedrela* are used for timber purposes. Different types of banana *Musa* spp., as well as 10 other species of tree, were present in small percentages (<1%) at one or both sites. Mean shade-tree density was 110.9 trees/ha in La Congoja and 94.9 trees/ha in La Virgen-Jiménez. Mean tree height was 13.22 m and 14.49 m, and canopy cover 48.3% and 68.8% in La Congoja and La Virgen-Jiménez.

Some differences exist in structural characteristics between plantations where Turquoise Dacnis was present and absent. Mean number of trees per census point, mean tree height, crown area and volume were significantly greater in plantations where Turquoise Dacnis was absent ($p<0.05$). Canopy cover was lower in plantations where the species was present (62.2%) than where it was absent (68.8%), but these differences were not significant. Differences in the mean number of *Inga* and *Cordia* trees per point were not significant. However, plantations where Turquoise Dacnis was absent had a much greater mean number of *Cedrela* trees per point (13.3) than where it was present (1.4). Mean elevation of census points was greater in plantations where the species was present. Coffee plantations in the Támesis region, where Turquoise Dacnis was observed, bordered patches of secondary vegetation. However, perhaps significantly, neither of the other two plantations in this region, nor those located in Quindío, Caldas and Santander, were adjacent to forests.

Discussion

Our observations extend the known range of Turquoise Dacnis to 125 km north of Calarcá, on the opposite side of the Cauca Valley, or 215 km north of Bosque Yotoco on the same slope of the Western Cordillera. The area is within the altitudinal range of most previous observations, but the species has only once previously been recorded in shade coffee plantations[2].

Our observations appear to confirm the species' very fragmented distribution. It was not recorded in shade coffee plantations in areas near to where the species has previously been reported. For instance, we did not see it near Génova and Buena Vista, Quindío, less than 40 km south of Calarcá, nor near Manizales, Chinchiná, and Supía, Caldas, which are between Calarcá and Támesis (Fig. 1), although given the species' rarity it is possible that our surveys failed to record it at some of these localities.

Although recorded on seven of 21 days spent in the Támesis area, the species did not appear numerous, as at other sites[2,10], except at Laguna de Pedropalo, where it is common[10]. The results of fixed-radius point counts in both plantations indicate that the populations of Turquoise Dacnis were low. Of 67 species recorded at La Congoja, Turquoise Dacnis was in the third least numerous group of species, and among the second least numerous group of 78 species recorded at La Virgen-Jiménez.

Studies of the avifauna of shade coffee plantations throughout the Neotropics have demonstrated that they provide significant habitat for birds[3] and are especially important in areas heavily affected by deforestation[5]. However, not all plantations provide equally important habitat for birds[1,3]. The

differences we noted among plantations where Turquoise Dacnis was present and absent do not indicate that it prefers denser plantations with taller trees or larger crown areas, which would suggest that it is a species of forest borders and clearings.

Elevation differences between plantations where Turquoise Dacnis was present and absent may not indicate a preference for higher elevations. Mean elevation between census points in plantations where the species was present was only 193.3 m higher than at those where it was absent. However, Veredas La Oculta and La Virgen, where Turquoise Dacnis was seen, are bordered by steep areas covered with patches of forest and natural vegetation, which may be a crucial determinant in the species' utilisation of these plantations. We did not study birds in these habitats, but it would be interesting to determine their importance to Turquoise Dacnis and other bird species.

We do not consider the reasons why we only observed males (although it is possible that nondescript dull females may have been overlooked), or whether this supports the theory of sex segregation by altitude[4]. We only observed a total of 10 individuals. It would be interesting to study whether females favour patches of natural vegetation and whether either sex performs seasonal movements.

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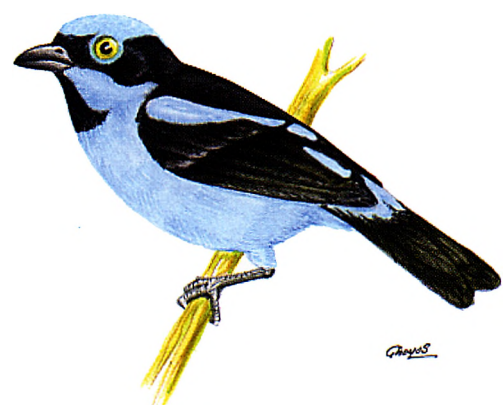

Figure 1. Turquoise Dacnis *Dacnis hartlaubi* (Gonzalo Hoyos)