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A NOTABLE HYBRID WOODPECKER (*CAMPEPHILUS LEUCOPOGON* X *C. MELANOLEUCUS*) (AVES: PICIDAE) FROM PARAGUAY

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Un notable híbrido carpintero (*Campephilus leucopogon* x *C. melanoleucus*) (Aves: Picidae) de Paraguay.

Key words: Cream-backed Woodpecker, *Campephilus leucopogon*, Crimson-crested Woodpecker, *Campephilus melanoleucus*, allopatry, hybridization, parapatry, Picidae.

INTRODUCTION

The genus *Campephilus* (Picidae) comprises 11 species of large, often conspicuous woodpeckers showing typically a distinctive combination of a largely red head and black-and-white body plumage (Frugis *et al.* 1988, Winkler *et al.* 1995). A close relationship to the Asian genera *Blythipicus*, *Chrysocolaptes*, and *Reinwardtipicus*, as suggested by morphological data, was supported by the multi-locus analysis of Fuchs *et al.* (2013), who also concluded that the nuclear genome of *Campephilus* was likely the mixture of two unrelated lineages comprised of an introgression of melanerpine genes. Winkler *et al.* (2014) placed the genus in the tribe Campephilini along with

Blythipicus and *Chrysocolaptes*. Fleischer *et al.* (2006) suggested the Crimson-bellied Woodpecker (*C. haematogaster*) to be the basal species in the group and suggested a South American origin for the genus.

Three species have been documented as occurring in allopatry in Paraguay. The Cream-backed Woodpecker (*Campephilus leucopogon*) is considered endemic to the Chaco region of south-central South America (Short 1975). In Paraguay, it is distributed largely west of the Rio Paraguay with only marginal occurrence east of the river in Departments Ñeembucú, Paraguari, San Pedro, Misiones and extreme western Itapúa (Guyra Paraguay 2005). The Robust Woodpecker (*Campephilus robustus*) is endemic to the subtropical humid

Atlantic Forests (Guyra Paraguay 2004), with its Paraguayan distribution confined to the historical extent of these highly endangered forests in the central and eastern Oriental region of the country (Guyra Paraguay 2005). The third species, the Crimson-crested Woodpecker (*Campephilus melanoleucus*), is less habitat-specific but broadly attached to the eastern watershed of the Paraguay River. It occurs in semi-open areas of the Cerrado zone and its transition to humid Chaco in the northern Oriental region, south to the gallery forests and Mesopotamian grasslands of southern Paraguay with only marginal occurrence in the humid Chaco and Pantanal regions west of the Rio Paraguay. It is absent from the Atlantic Forest and the Dry Chaco regions, and has been generally considered to occur in allopatry with the other two species. Short (1982) suggested that *C. melanoleucus* is ecologically separated from *C. leucopogon* in zones of close geographical contact in Paraguay, with the former preferring more humid, riverine forest and densely forested hills, and the latter drier and flatter chaco woodlands.

Recent field observations confirm that the distributions of *C. leucopogon* and *C. melanoleucus* overlap more extensively in Paraguay than previously thought, with both species occurring at low densities in the Paraguay river watershed and east along the banks of the Paraná River to at least Isla Yacyretá (politically in Itapúa Department, though geographically closer to Misiones Department) (Guyra Paraguay 2005). A slight overlap of ranges has also been documented in extreme eastern Formosa Province, Argentina (Contreras *et al.* 2014), close to the Paraguayan border with Ñeembucú Department, and a similar pattern of marginal overlap may perhaps be expected in neighboring Corrientes Province on the southern banks of the Paraná River.

During a review of the bird specimens housed in the IBIS collection of the Univer-

sity of Pilar, Ñeembucú Department, Paraguay, we were able to identify two specimens of *Campephilus*, belonging to *C. leucopogon* and *C. melanoleucus*, and an additional, apparently adult male specimen showing characteristics of both species from the same locality (Estancia San Antonio, Tacuaras, Ñeembucú Department, Paraguay). As the latter suggests being of hybrid origin (*C. leucopogon* x *C. melanoleucus*), here we present a detailed description of that specimen.

METHODS

The specimen in question was analyzed following a protocol developed by Graves (1990) to ascertain the identity of doubtful taxa (mostly represented by unique specimens; i.e., hummingbirds), including an approach towards parentage in putative avian hybrids. Based on our working hypothesis of a hybrid origin for the specimen, observed phenological characters were assigned either to one or both parental species, or to neither of them (1 = *C. leucopogon*; 2 = *C. melanoleucus*; 3 = both species; 4 = neither species). Color descriptions follow Ridgway (1912). A morphometrical analysis was not performed because of the almost complete overlap in these characters between two of the putative parent species (*C. melanoleucus*, *C. robustus*). and the extensive overlap between both of these species and *C. leucopogon*, a situation which would render results inconclusive for determining parenthood. Examined specimens are all housed in the IBIS Collection, Universidad Nacional del Pilar, Pilar, Ñeembucú, Paraguay (see appendix).

RESULTS

Specimen data. Adult male *Campephilus leucopogon* x *C. melanoleucus* (EBÑ 000139); Estancia San Antonio, Tacuaras, Ñeembucú Department, Paraguay (26°46'59"S, 57°55'0.1"W); col-



FIG. 1. Adult male hybrid specimen *Campephilus leucopogon* x *C. melanoleucus* (EBÑ 000139); Estancia San Antonio, Tacuaras, Ñeembucú Department, Paraguay. Dorsal view (above) and ventral view (below).

lected on 10 July 1993 by Andrés Oscar Contreras Chialchia, prepared by Yolanda E. Davies (Fig. 1). Measurements obtained from specimen label: total length 357 mm; wing span 616 mm; body mass 246 g. Additional measurements made by authors: wing minimum chord 187 mm; tarsus 34 mm; tail 103 mm; exposed culmen 53 mm; head and bill 92 mm; bill width across base of nares 16 mm; bill depth across base of nares 14 mm.

Diagnosis. (1 = *C. leucopogon*; 2 = *C. melanoleucus*; 3 = both species; 4 = neither species). Crested head (3) and neck carmine (4) with black-over-white spot on lower ear coverts (3) and white spot at base of lower mandible (2). Right side of head shows greater predominance of black in the spot on the ear coverts and traces of black above and below the eye (4). Chin black (2), with traces of black streaking on sides of lower neck, becoming heavier

towards the mantle (4). Mantle and upper back white (1), irregularly suffused with black where it meets the neck (4). Lower back and rump black (3), odd feathers at the base of the upper back being black with broad capucine buff barring (4). Rest of upperwing (1) and tail solidly black (3). Underwing and bases of flight feathers extensively white (2). Rest of flight feathers black, some of the inner primaries and secondaries showing broad greyish inner edges (2). Breast and ventral side black (1), irregularly barred with capucine buff on the belly (4), extending irregularly on the flanks to the sides of the lower breast (4). Vent (1) and underside of tail black (3). Bill light ochraceous-salmon (3), tinged with greyish near the base of the lower mandible (4). Legs black (3). The collectors did not note the iris color.

DISCUSSION

Based on an analysis of geographical affinities, known ecological isolation in the genus, intermediate plumage characters and the presence of specimens of putative parental species from the same locality in the examined collection (cf. Graves 1990) we were able to determine the parenthood of a hybrid woodpecker specimen as *Campephilus leucopogon* x *C. melanoleucus*. *Campephilus robustus* could be excluded as a possible parental species because its known Paraguayan distribution is allopatric from the other two, being endemic to the Atlantic Forest, a habitat quite different from the semi-open areas which the other two species inhabit.

The specimen reported here represents the first evidence of intrageneric hybridization in the genus *Campephilus* (cf. McCarthy 2006). The specimen is notable for exhibiting a surprising mixture of characteristics clearly attributable to both parent species rather than a series of largely intermediate characteristics. In particular, the upper surface of the wings

and body is closely reminiscent of *C. leucopogon* whilst the undersurface of the wings recalls *C. melanoleucus* in the extensive areas of white and lack of cinnamon barring on the flight feathers. Remarkably, however, capucine buff barring is present on the lower ventral part of the otherwise *C. leucopogon*-like body, a character present in the genus only in the widely allopatric *C. pollens*. The head is rather more intermediate in appearance, the extensive areas of red strongly recall a male *C. leucopogon* (though red extends to the neck), but the influence of *C. melanoleucus* is clearly present in the black chin and white spot at the base of the bill. Black streaking on the neck is residually present in both parent species (neither of which show red in this area of the plumage), but traces of the white longitudinal line of adult *C. melanoleucus* are lacking.

Short (1982) considered *C. leucopogon* to be of uncertain affinities within *Campephilus*, and he did not assign it to the *C. melanoleucus* superspecies (additionally comprising *C. gayaquilensis* and *C. guatemalensis*). This superspecies arrangement was subsequently followed by Fjeldså & Krabbe (1990), Sibley & Monroe (1990), and Winkler & Christie (2002). Based on mtDNA sequences Fleischer *et al.* (2006) found the southern *Campephilus* taxa (excluding the basal *C. haematogaster*) to branch together in a single clade, with *C. leucopogon* most closely-related to *C. rubricollis*, and the traditional superspecies arrangement for *C. melanoleucus* supported. Though *C. melanoleucus* shares a parapatric contact zone with *C. guatemalensis* in Panama and with *C. gayaquilensis* in the Andes of southwestern Colombia, Ecuador, and northern Peru, no hybrids between these species have been reported to date (McCarthy 2006).

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of the specimen, who, having dedicated his life to the study of natural history in Paraguay, passed away in June 2013; Paraguay is a poorer place without him. I thank also Julio Contreras for access to the IBIS collection and for his support, generosity, and friendship. André Weller and two anonymous reviewers provided useful comments to improve the manuscript. This note complements the pioneering studies on Picidae by Lester Short in this region of South America.

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APPENDIX

Specimens examined:

Campephilus leucopogon x *Campephilus melanoleucus* (1): EBN 000139, male (Estancia San Antonio, Tacuaras, Ñeembucú Department, Paraguay; 10 July 1993).

Campephilus leucopogon (8): 93.SP0332, female (no data); 93.OP096, male (no locality; 15 October 1995); 97.MP0253 female (no data); CE-002812, female (Paso de los Libres, Güemes, Chaco, Argentina; 22 August 1986); CE-002830 male (Pozo Colorado, Presidente Hayes Department, Paraguay; 28 September 1986); CE-006635 male (6 km E Casco, Estancia Guy, Presidente Hayes Department, Paraguay; 9 December 1990); CE-008774 male (Estancia San Antonio, Tacuaras, Ñeembucú Department, Paraguay; 6 September 1993); CE-009039 female (Arroyo Montuoso y Ruta Nacional IV, Ñeembucú Department, Paraguay; 16 July 1993).

Campephilus melanoleucus (2): 93.SP0331, female (no data); CE-008473, male (Estancia San Antonio, Tacuaras, Ñeembucú Department, Paraguay; 4 September 1993).

Campephilus robustus (1): CE-008427, male (Cerro León, A. del Valle, Cainguas, Misiones, Argentina; 16 February 1993).

Basic description of males of parent species (terminology following Erize *et al.* 2006):

Campephilus leucopogon: Head and neck red, with exception of black over white spot on ear coverts. Back cream, rest of body, and wings black. Underwing buffy-cinnamon and base of flight feathers cinnamon. Bill ivory.

Campephilus melanoleucus: Head red, with white patch at base of bill and black over white spot on ear coverts. Chin, throat, neck and breast black, with white line down sides of neck continuing to form a white V-shape across the scapulars. Rest of upperparts, rump, and tail black. Underwing and basal half of flight feathers white. Belly and vent barred black-and-white. Bill bone-white.