



CHAPTER 11

QUANTIFYING SUBSPECIES ANALYSIS: A CASE STUDY OF MORPHOMETRIC VARIATION AND SUBSPECIES IN THE WOODCREEPER GENUS *DENDROCOLAPTES*

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ABSTRACT.—Many authors have criticized the use of subspecies, but most of this criticism has been directed at the inconsistent treatment of subspecies rather than the inutility of diagnosable populations. To assess the validity of a taxon, one must include in the analysis those characters used in the original diagnosis and remember that different character sets may lack geographic concordance. We examined morphometric variation using 3,027 specimens representing all five species and 30 subspecies in the woodcreeper genus *Dendrocolaptes* (Dendrocolaptinae). Most subspecies in the genus differ in plumage patterns and coloration, but a few taxa were described using characters of size and structure. We sought to assess quantitatively, on the basis of the *D*-statistic (Patten and Unitt 2002), those subspecies described using mensural characters, to quantify morphological variation, and to examine the influence of ecological correlates in the genus. Males average slightly larger than females but have a less massive bill. *Dendrocolaptes certhia* has a wider bill than *D. sanctithomae*, and *D. picumnus puncticollis* has a slimmer bill than other *D. picumnus*. Although previously considered a subspecies-group within *D. certhia*, *D. sanctithomae* has a shorter and slimmer bill that appears to reflect a greater dependence on foraging over army ants; these species also differ vocally and in plumage. Bill length in Middle American populations of *D. sanctithomae* varies as a smooth cline and, when combined with weak and potentially clinal variation in plumage and bill coloration documented in an earlier study of plumage variation, our data failed to support the recognition of *D. s. nigrirostris* and *D. s. colombianus*. Amazonian, montane, and Chaco representatives of *D. picumnus* differ structurally, but subspecies differ little morphometrically within each region. *Dendrocolaptes hoffmannsi* broadly overlaps Amazonian *D. picumnus* morphometrically, but its plumage patterns are distinctive. The only subspecies in this complex described exclusively on the basis of mensural characters, *D. p. casaresi*, appears to be slightly larger than *D. p. pallescens*, but we had too few specimens to assess diagnosability. We conclude that reanalysis of described subspecies using quantitative, statistical methods will provide a clearer starting point for studies of biogeography, migration, and other aspects of evolutionary biology than will subspecies based solely on qualitative judgment.

Key words: *Dendrocolaptes*, *D*-statistic, ecological correlates, morphometrics, quantitative analysis, subspecies diagnosis, woodcreepers.

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