

FEATURE ARTICLES

ADAPTIVE MODIFICATION OF TAIL STRUCTURE IN RELATION TO BODY MASS AND BUCKLING IN WOODCREEPERS

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Manuscript received 14 June 2001; accepted 16 January 2002.

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Abstract. We assessed the relationship between function and tail structure of woodcreepers (Dendrocolaptidae) and Neotropical ovenbirds (Furnariidae) using a comparative analysis of independent contrasts. Because woodcreepers are scansorial (they use their tail for body support), we predicted that the structure of the rectrix rachis should be reinforced both at the tip and at the base, whereas the nonscansorial Neotropical ovenbirds should lack reinforcement of the rectrix tips. For each species, we measured the length of the rachis of the medial rectrix and its diameter both at the tip and base of the feather. Rachis diameters were positively associated with body mass in both groups as expected if tail structure were a simple allometric product of body size. However, woodcreepers had larger rachis diameters for a given body mass and higher slopes in the allometric regressions than Neotropical ovenbirds. In addition, we found positive relationships between rachis width at both the tip and base of the rectrix and tail length in woodcreepers, but in Neotropical ovenbirds only rachis width at the base was associated with tail length. These results considered together are consistent with the hypothesis that the tip of the woodcreeper tail rachis is adapted to both support body mass and to prevent Euler buckling failure.

Key words: Dendrocolaptidae, Euler buckling, Furnariidae, scansorial, tail morphology.