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## Abstract:

Prehensile tails, capable of suspending the entire body weight of an animal, have evolved in parallel in New World monkeys (Platyrrhini): once in the Atelinae (Alouatta, Ateles, Brachyteles, Lagothrix), and once in the Cebinae (Cebus, Sapajus). Structurally, the prehensile tails of atelines and cebines share morphological features that distinguish them from non-prehensile tails, including longer proximal tail regions, well-developed hemal processes, robust caudal vertebrae resistant to higher torsional and bending stresses, and caudal musculature capable of producing higher contractile forces. The functional significance of shape variation in the articular surfaces of caudal vertebral bodies, however, is relatively less well understood. Given that tail use differs considerably among prehensile and non-prehensile anthropoids, it is reasonable to predict that caudal vertebral body articular surface area and shape will respond to use-specific patterns of mechanical loading. We examine the potential for intervertebral articular surface contour curvature and relative surface area to discriminate between prehensile- and nonprehensile-tailed platyrrhines and cercopithecoids. The proximal and distal intervertebral articular surfaces of the first (Ca1), transitional (TV) and longest (LV) caudal vertebrae were examined for individuals representing 10 anthropoid taxa with differential patterns of tail-use. Study results reveal significant morphological differences consistent with the functional demands of unique patterns of tail use for all vertebral elements sampled. Prehensile-tailed platyrrhines that more frequently use their tails in suspension (atelines) had significantly larger and more convex intervertebral articular surfaces than all nonprehensile-tailed anthropoids examined here, although the intervertebral articular surface contour curvatures of large, terrestrial cercopithecoids (i.e. Papio) converge on the ateline condition. Prehensile-tailed platyrrhines that more often use their tails in tripod bracing postures (cebines) are morphologically intermediate between atelines and nonprehensile tailed anthropoids.

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