

CLIFFORD, A. B.; WITMER, L. M.; Ohio University, DBS; Ohio University, DBMS: Nasal Structures in Moose (Cervidae: *Alces*)

Moose are a species of deer possessing a conspicuous overhanging muzzle. The functional significance of this apomorphic proboscis has remained obscure, and thus, we studied the anatomy of moose noses in an attempt to shed light on its enigmatic function. We examined two calves, one adult bull, and one adult cow from Newfoundland, Canada, using gross dissection and sectioning aided by radio-opaque barium/latex injection on one calf and computed tomography (CT) on that calf and the bull. We used whitetail deer for outgroup comparison and veterinary literature available for other ruminants for naming structures and determination of common anatomical substrates. In many respects, such as in vasculature and nerves, moose closely resemble other ruminants. Externally, moose noses have highly enlarged and modified nostrils, and the rhinarium has become small and triangular. Nasal cartilages are expanded caudally, taking the position of some of the bones forming the retracted naris. Just caudal to the nostrils, the nasal cartilages are expanded laterally to form a pulley mechanism with the tendons of the maxillolabial muscles. The caudal part of the nostril forms a slitlike structure that results from a mobile joint between dorsal lateral and accessory cartilages and specialized musculature. The mucosal folds in the nasal vestibule are also specialized into a series of enlarged spaces and blindsacs. The osteological correlates of this specialized soft-tissue anatomy relate more to conformational changes than to discrete structures. Recognizing that vertebrate noses are multifunctional, we suggest that relocation of the nostrils and a novel nostril closing mechanism have driven proboscis evolution in moose.