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ROLE OF VOCAL TRACT MORPHOLOGY IN DETERMINING SPECIES-SPECIFIC VOCAL PATTERNS

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Models of vocal production based on the relationship between the vocal tract area function and the formant output has been the most common framework in voice research for understanding speech production in humans and can be successfully applied to the study of non-human primate vocal production. In this work we used vocal tract computational modeling to investigate the potential of nasal tract and oral tract resonance in generating acoustic cues of species-specificity. We collected morphological measurements of the supralaryngeal cavities in the ring-tailed lemur (*Lemur catta*), the gentle lemurs (*Hapalemur griseus* ssp.), the greater bamboo lemur (*Prolemur simus*), the true lemurs (*Eulemur* spp.), the ruffed lemurs (*Varecia* spp.) and the sifakas (*Propithecus* spp.). We also derived information from anatomical descriptions of the vocal tract of the indri (*Indri indri*). We calculated area functions for each *taxon* to generate anatomically based computational models of the vocal tracts. We have then investigated inter- and intra-specific variation analyzing the acoustic responses of the computational models and comparing these outputs with formants measured from natural sounds. Results showed that most of the congeneric *taxa* had remarkable similarities in vocal tract size and shape. While the acoustic effects of articulatory variation (e.g. mouth opening) require further investigations, nasal cavities clearly play an important role in shaping spectral characteristics of lemur vocalizations.

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