ADAPTATIONS TO TREE-GOUGING IN THE ANTERIOR MASTICATORY APPARATUS OF MARMOSETS (*CALLITHRIX*).

Russell Hogg (Postdoctoral Lecturer)

(Matthew J. Ravosa PhD)
School of Medicine, Department of Pathology & Anatomical Sciences
Christopher J. Vinyard, PhD
Northeastern Ohio University, College of Medicine,
Department of Anatomy and Neurobiology
Timothy M. Ryan, PhD
Pennsylvania State University, College of the Liberal Arts,
Department of Anthropology

Although all genera of Callitrichinae engage in exudativory to some degree, marmosets (*Callithrix*, *Cebuella*) take advantage of exudates to the greatest extent. To facilitate exudate feeding, marmosets use their anterior teeth to gouge holes in bark and actively stimulate gum flow. As such, their anterior mandibular teeth possess specialized adaptations such as thickened labial enamel. Marmosets also show masticatory features that facilitate increased gape, but do not appear to generate relatively large bite forces during gouging. However, even without increased bite force the anterior teeth of gougers likely experience different loading patterns compared to non-gouging platyrrhines. Specifically, one might expect that the anterior teeth and symphysis of marmosets are adapted to accommodate relatively high stresses linked to dissipating forces from yield-resistant and tough tree barks.

This study uses histological data from thin-sectioned teeth, microCT data of jaws and teeth, and macroscale tests of simulated symphyseal loads to compare the micro- and macro-architecture of the anterior masticatory apparatus in *Callithrix* and *Saguinus* (as well as the outgroup *Saimiri*). *Callithrix* differs from the other genera in that its canine enamel possesses a much higher degree of decussation, and its anterior tooth roots are larger relative to alveolar bone volume. However, simulated jaw loading suggests a reduced ability to withstand external forces in the marmoset symphysis. The contrast between increased load-resistance ability in the anterior dentition versus relatively reduced symphyseal strength suggests both a potentially complex loading environment during gouging and a mosaic pattern of dentofacial adaptations to this derived biting behavior.