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LOSS OF INCISOR ENAMEL IN MARMOSETS

The loss of enamel from surfaces of incisor and cheek teeth, which enhances the shearing and/or sharpening efficiency of these teeth, has occurred a number of times in the evolution of mammals. Among primates in particular, enamel is absent from lingual surfaces of the upper and lower incisors of the aye-aye (*Daubentonia*), and from the mandibular incisors of several genera of Old World cercopithecine monkeys (Delson, 1973). Another convergent case of such loss involves the mandibular incisors of the Neotropical marmosets *Cebuella pygmaea*, *Callithrix jacchus*, and *C. argentata*, which lack enamel lingually.

Scanning electron micrographs (Fig. 1) of the apical one-half of sagittally sectioned medial lower incisors show the contrast between the distribution of enamel over the crown in *Cebuella* and in the tamarin, *Saguinus* sp., a near relative of *Cebuella* and *Callithrix*. *Cebuella* exhibits a great thickness of buccal enamel, the broad whitish belt overlying the darker dentine. In *Saguinus*, buccal enamel is absolutely and relatively thinner, and under higher magnification appears structurally identical to lingual enamel. A thin linear junction is visible at the dentoenamel transition beneath the enveloping enamel sheath. The lingual side of the incisor of *Cebuella*, as higher magnification and additional specimens confirm, lacks all traces of enamel. The narrow band visible in the photograph and the highlighted apicobuccal margin are artifacts of

FIG. 1.—Scanning electron micrographs of sagittally sectioned, virtually unworn, lower medial incisors of (left) *Saguinus* sp. (AMNH 97,283) and (right) *Cebuella pygmaea* (AMNH 74,361). Buccal is to left, apical margin to top of photograph. Vertical bars represent 1 mm.

preparation and orientation. Examination of the ultrastructure of the lingual surface demonstrates its uniformity with the dentine and reveals no dentoenamel junction.

The adaptive significance of this loss of lingual enamel and hypertrophy of buccal enamel in *Cebuella* and *Callithrix* relates to their feeding habits—the incisors are used as a gouge and scraper to pierce the bark and cambium of preferred trees in order to stimulate a flow of exudate, an important component of their respective diets (Kinzey et al., 1975; Coimbra-Filho and Mittermeier, 1976; Ramirez et al., 1978). As in rodents, differential wear of the softer dentine lingually serves to maintain a chisel-like edge to these teeth. Several distinguishing features of the marmoset anterior dentition, such as narrow symphyseal region, staggered incisor-canine series, and nonspatulate incisor crowns, often regarded as evidence of their phyletic primitiveness (Hershkovitz, 1970; 1971), are parts of a functionally interrelated adaptive complex related to exudativory (Rosenberger, 1977). Both the loss of enamel and these morphological features are best considered to be correlated apomorphies. Despite the recent remarks of Coimbra-Filho and Mittermeier (1976), the marmoset exudativorous feeding complex involves neither a novel incisor honing mechanism nor allometrically low-crowned canines (unpublished data). Thus, regardless of their small body size, marmosets should no longer be treated as primitive living platyrrhines or as analogs of ancestral anthropoid primates.

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