*Journal of Mammalogy,* 89(3):729–742, 2008

# ENAMEL MICROWEAR IN CAVIOMORPH RODENTS

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We developed a new data set of enamel microwear for extant caviomorph rodents (i.e., South American hystricognaths) and inferred the diet of an extinct taxon, *Neoreomys australis*, from data on microwear. To evaluate frequencies of wear features (pits and scratches) in caviomorphs, we employed low-magnification microwear, which has been used successfully by others to distinguish among the diets of ungulates, primates, and sciurid rodents. We developed 3 broad dietary categories for caviomorphs based on behavioral observations reported in the literature: fruit–leaf, fruit–seed, and grass–leaf. Caviomorphs in general all exhibited wear features indicative of processing hard objects (e.g., seed predation, eating hard fruits, and consuming exogenous grit). Among our grass–leaf group, we identified an exogenous-grit subgroup that included fossorial and dust-bathing taxa. We used a discriminant function analysis of wear features to examine post hoc classification of the caviomorph taxa into the 3 dietary categories. Ours is the 1st study to quantify the distribution of microwear features among modern caviomorph rodents; it has the potential to clarify the diets of modern forms that have little behavioral data as well as to infer the diets of extinct species.

Key words: caviomorph rodents, diet groups, dietary inference, hypsodonty, microwear, paleodiets

During its long period of isolation, the mammalian fauna of South America included numerous endemic lineages and radiations, most of which are now extinct. The caviomorph rodents of South America were arguably the most successful group to survive the stresses of both environmental changes and competition from North American mammals after the Plio–Pleistocene faunal interchange (Flynn and Wyss 1998; Simpson 1980; Webb 1978, 1991). The caviomorphs are a diverse radiation of rodents that fill niches typically occupied by nonrodents (e.g., small forest deer, hyraxes, pygmy hippopotamus, and rabbits) on other continents (Bourlière 1973; Dubost 1988; Mares and Ojeda 1982). Caviomorpha, as a group, mostly includes large neotropical forms; no species weigh $<90$ g and the largest living rodent, the capybara (*Hydrochoeris*) is a caviomorph (Dubost 1988; Mora et al. 2003).

Dietary information for living caviomorph rodents is generally limited to isolated reports of feeding behavior for 1 or a few individuals and is not based upon long-term studies that can indicate dietary variation due to seasonality, geography, or other limiting factors. Most caviomorph rodents are generally cryptic, do not live in gregarious social groups, and are difficult to observe in the wild (Dubost 1988). Consequently, unlike most primates and ungulates, which have well-known dietary ecologies, caviomorph rodents have not been categorized into broad dietary groups. Placing these rodents into broad dietary categories allows researchers to assess trophic diversity patterns among caviomorphs and to evaluate trophic structures within their corresponding mammal communities. Establishing a series of ecologically meaningful dietary categories for modern caviomorph rodents also facilitates dietary inference for extinct caviomorphs.

Rodents are an important element of late Paleogene and Neogene South American fossil mammal faunas and they can provide important paleoecological and biostratigraphic information (Flynn et al. 2003; Kramarz and Bellosi 2005; Pascual and Ortiz Jaureguizar 1990; Tauber 1997; Vucetich 1986; Vucetich et al. 1999). Extinct caviomorphs have been the subject of numerous taxonomic studies, but there have been few paleobiological studies (Flynn et al. 2003; Walton 1997). These latter studies are hampered by the paucity of natural history and functional data for living taxa (Emmons and Feer 1997; Mares and Ojeda 1982; Rensberger 1978).

Crown height (hypsodonty) has been used as a proxy for diet in fossil rodents, suggesting that rodents with tall tooth crowns ate more-abrasive foods than those with shorter crowns (Kay and Madden 1997; Vianney-Liaud 1991; Williams and Kay 2001). Both abrasive diets (grazing) and grit have been shown to play an important role in the evolution of tall crowns for rodents and ungulates; hypsodonty in rodents also has been used to infer paleoenvironments (Croft et al. 2004; Flynn et al. 2003; Janis 1988; Kramarz and Bellosi 2005; Vianney-Liaud 1991; Williams and Kay 2001). Nevertheless, a hypsodont

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