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Reconstructing the paleoecology of Taung, South Africa from low magnification of dental microwear features in fossil primates

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ABSTRACT

Taung, South Africa yielded the first Pliocene Hominini fossil, *Australopithecus africanus*, recovered from a lime quarry in 1924. To identify whether the habitat of the site differed from present-day conditions, dietary preferences of fossil papionins from Taung, including *Parapapio antiquus* (n = 8), *Papio izodi* (n = 12), and indeterminate specimens (n = 10) were examined under low magnification to discern patterns of dental microwear. The comparative fossil sample from Sterkfontein Member 4 includes *Parapapio broomi* (n = 10) and *Parapapio jonesi* (n = 5). Extant *Papio ursinus* (n = 20), a savanna-dwelling baboon from South Africa, provides a modern analogue. Six dental use-wear scars on the paracone of the second molar (M^2) were recorded and the data analyzed using ANOVA with Tukey's test to detect whether group differences were present for each feature; linear regression identified significant covariation of microwear features. Principal components analysis and discriminant function analysis were utilized to identify species-specific dietary signals. Extant *Papio ursinus* is separated from the extinct taxa solely by a relatively greater number of fine scratches with respect to the other microwear features. *Papio izodi* overlaps primarily with extant *Papio* and secondarily with *Parapapio*, which forms a more discrete grouping that includes *Parapapio antiquus* from Taung. A wetter, more closed environment is suggested for Taung and Sterkfontein Member 4 compared to the habitat of present-day central South Africa.