Bite force in the African *Fukomys* mole-rats (Bathyergidae, Rodentia).

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In an ecomorphological context bite force measurements are used as a proxy to estimate biting performance. We compared two approaches for gauging bite force in a study of inter- and intraspecific variation in African mole-rats. *Fukomys* (syn. *Cryptomys*) are chisel-tooth diggers which excavate extensive tunnel systems along which they forage for geophytes. Their obligatory subterranean activities as well as agonistic encounters require an efficient jaw apparatus. Firstly in vivo measurements were compared with data obtained from a static bite model. Maximal bite force data were collected in several species of the *Fukomys* radiation from the Zambezian region using a Kistler force transducer. The bite model used PCSA, mass, density and insertion coordinates of the jaw muscles as input data. Secondly results of the bite force trials were related to skull size and skull shape variation using landmark-based geometric morphometrics. Results: 1. the giant mole-rat (*F. mechowii*) has the highest mass-specific bite force among extant mammals, 2. cross-breeds between chromosomal species of the *F. micklemi* clade show a negative heterotic effect, larger animals producing the lower bite-force and 3. interspecific comparisons among *Fukomys* show subtle but significant differences in cranial shape, which may help explain observed differences in maximal bite force between *Fukomys* species. Taken together our results provide evidence that considerable variation in the whole jaw apparatus among *Fukomys* is present in spite of the thresholds set by the underground environment. Changes in the form of the skull are related to biting performance and hence may have an adaptive value.

Key words: adaptation, biting performance, geometric morphometrics