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Experimental study of bone modification by captive caracal (*Caracal caracal*); a model for fossil assemblage analysis

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Abstract

Medium-size animals such as rabbits and hares are common occurrences in fossil assemblages, and make up a large part of the diet of many carnivores. However their mode of accumulation, especially in African localities is poorly understood. This investigation undertook experimental feeding of domestic rabbit carcasses to captive caracal (*Caracal caracal*), in order to create a taphonomic model of bone modifications that can be applied to fossil assemblages. We investigated the modification patterns of both the feeding refuse (non-ingested) and the scatological remains. The anatomical composition, breakage patterns, digestive modifications and tooth marks are described. The caracals preferentially fed on high yield parts of the rabbit carcass and discarded low yield parts like the cranium and feet, a pattern that has been observed in wild and captive coyotes when food resources are abundant. Rabbit remains from the caracal displayed poor survival, relative to other small carnivores. Fragmentation in the scat assemblage was high. Bones were extensively but lightly digested and carnivore tooth marks were frequent. This investigation provides a model of bone modification in a carnivore that while common in fossil localities has received little taphonomic attention. The study also exhibits how detailed actualistic investigations can provide information that may aid palaeoecological interpretations.

Keywords: taphonomy, carnivore, fossil, experiment, rabbit, felid, palaeoecology.

1. Introduction

An important goal of faunal analysis in archaeological or palaeontological research is to reconstruct the history of an assemblage. Insights into the processes responsible for the accumulation of faunal remains are often inferred through diagnostic bone surface modification and skeletal element patterning. In African palaeontological sites, carnivores have been implicated as the major accumulators of many vertebrate fossil assemblages (Adams *et al.* 2007; Brain, 1981; de Ruiter *et al.* 2008; Geraards, 2006; Lacruz *et al.* 2002; Pickering *et al.* 2004; Reynolds & Kibii, 2011). Rodents and birds of prey are also known to contribute animal remains (Avery *et al.* 1997; Berger & Clarke, 1995; Fernández-Jalvo & Andrews, 1992; Klein *et al.* 2007; McGraw *et al.* 2006; Souttou *et al.* 2012). Attempts to determine the predominant predators or processes responsible for bone accumulation