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UCT research examines future and past of baboons

UCT Zoology PhD graduand Tali Hoffman provides the first detailed investigation into the conflict over space between baboons and humans in the Cape Peninsula, while Archaeology doctoral graduand Riashna Sithaldeen explains how climate and landscape might have guided the evolution of the species.

The need to rearrange living room

Hoffman's PhD thesis, *The spatial ecology of the chacma baboons (Papio ursinus) of the Cape Peninsula, South Africa: towards improved management and conservation strategies,* reveals that extensive land transformation has geographically isolated, fragmented and reduced the size of the local chacma baboon population in the Cape Peninsula and is perceived to be a major driver of current human-baboon conflict

Using a combination of GPS technology and behavioural observations, Hoffman quantified the home range size, habitat preferences, daily ranging patterns and diet of nine of the 12 troops present on the Peninsula in 2007. Using hurdle models, she ascertained that the key landscape features influencing baboon distribution patterns at the population level were low altitudes, steep slopes and human-modified habitats. The combination of these variables provided baboons with access to high-quality natural and anthropogenic food sources in close proximity to suitable sleeping sites. In summary, she advises that the most sustainable way to manage baboons in the Cape Peninsula is through improved landscape conservation and resource management. More broadly, this study highlights the complexities of wildlife conservation at the interface of natural and human-modified habitats and shows how an understanding of wildlife spatial ecology can assist in improving wildlife management and conservation efforts.

Hoffman completed her BSc and BSc (Hons) degrees at UCT. She commenced her Master's in 2007 and upgraded the degree to a PhD in 2008. During this time she lectured at UCT and other tertiary institutions, won three awards at local conferences and was employed

part-time as a presenter for a wildlife series. Her supervisor is Associate Professor Justin O'Riain in the Zoology Department at UCT.

A look at where baboons came from

Sithaldeen's PhD thesis, *Phylogeny and phylogeography of the chacma baboon (Papio ursinus): the role of landscape in shaping contemporary genetic structure of the chacma baboon,* focuses on the evolution of the southern African species with the goal of understanding the role that climate and landscape change played in structuring its diversity. She collected samples from 261 baboons from some 30 localities across southern Africa, from which DNA was extracted and sequenced. Phylogenetic and phylogeographic techniques were then used to examine past population dynamics across space and through time.

Results indicate that chacma baboons split into two major lineages around 1.6 million years ago, coincident with the aridification and expansion of the Kalahari Desert, with further substructuring suggesting a complex evolutionary history. This initial divergence was likely the result of a period of genetic isolation between more northerly and southerly populations.

The southerly lineage appears to have undergone a sudden expansion event, probably out of the southwestern Cape, around 15,000 years ago, coincident with the last glacial maximum. The results of this study support a model of climatically and geographically driven diversification for *Papio urisinus,* in which population contractions and expansions have played a significant role in shaping regional genetic structure within the species.

Sithaldeen was born in KwaZulu-Natal. After a year-long internship as a student geologist with a gold mining company on the Witwatersrand, she entered UCT, where she received a BSc in Geology and Archaeology in 2001. In 2002 she completed her BSc (Hons) in Quaternary Science with a focus on palaeo-environmental reconstruction. She is now in her fourth year as a lecturer in UCT's Science Academic Development Programme, in which she teaches a course on the Foundation Principles of the Biological and Earth Sciences. Her supervisor is Associate Professor R Ackermann.

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Please note: Information in this release is based on the supervisor's citation for the PhD thesis. UCT advises journalists to obtain a copy of the thesis and/or interview the PhD graduate to verify and expand on this information.

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