

LAND USE CHANGE, DISPERSAL, SELECTION, AND ADAPTATION IN SWAZILAND

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I have been always passionate about management and conservation of wildlife species and sustainable use of natural resources for the better livelihood. In order to achieve this, I believe it is imperative to preserve our natural resources. Hence one way to preserve them is to study them and understand the dynamic changes. I did my masters degree in Environmental Resource Management and Conservation the University of Swaziland and my research on the impacts of cattle and wildlife grazing on small mammal communities at Telperion Nature Reserve in Mpumalanga province, South Africa was published the *Journal of African Zoology* this year.

The small mammal communities in grasslands grazed by domesticated or wild ungulates were similar in abundance, species richness, diversity and demographic parameters, likely due to the fact that vegetation structure of the two grazing systems was also similar. We used generalized linear models to show that rock and

grass cover were plausible predictors of small mammal abundance in this system. Rock cover showed a positive relationship with small mammal abundance whilst grass cover showed a negative relationship. Our observations suggest that at the scale of our study and with the current stocking densities, wild and domesticated ungulates have similar impacts on the small mammal community.

Currently, I am investigating how land use change through urban and agricultural development exacerbate dispersal and gene selection, phenotypic plasticity and adaptation in the most abundant rodent pest in sub-Saharan Africa (*Mastomys natalensis*). The natal multi-mammate mouse (*M. natalensis*) is the most destructive vertebrate pest causing up to 80% losses in maize crop production and carries several zoonotic pathogens of human concern such as arena and papilloma virus. Intensive ecological work indicated that environmental factors investigated independently does not explain the patterns of distribution in *M. natalensis*.

Genetic work using microsatellites showed no isolation by distance at continental scale. Unfortunately, the influence of environmental factors modelled with land use change on gene selection, phenotypic plasticity and adaptation remains unclear, yet this may be vital in pest management and public health strategies.

Transcriptomic work on species will empower and improve our insight and detail understanding of mechanisms behind the population dynamic, gene selection which drives dispersal and adaptation of these mice. Having such genetic resources will improve the pest management strategies and modelling of potential disease outbreaks especially in urban areas where these species come in contact with people. This will also help in investigating presence of potential genes making this species resistant to chemical control measures such as rodenticides.

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