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Ecological and endocrinological investigations of female mate choice in free ranging white rhinoceros (*Ceratotherium simum simum*)

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Studies on free-living white rhinoceros showed that females preferentially mate more often with territorial α -bulls than with non-territorial β -bulls (Owen-Smith 1973). However it is not known yet whether females further select among the territorial males. A high degree of inbreeding resulting from strict female choice could reduce the genetic diversity of the species. Rhinos already experienced a genetic bottleneck at the turn of the century. Further reduction of the genetic variability could lead to a diminished fertility and viability. For management of the species further knowledge of mating pattern is therefore extremely important. Without knowing the degree of mate choice, one could misjudge the number of breeding animals (= effective population size) in a population, and could underestimate the problem of inbreeding.

Therefore it was aimed to assess female mate choice in white rhinoceros and to determine factors influencing pairing success of territorial males. The study was carried out on a private game farm in South Africa which housed a well growing population of white rhinoceros. Various body and horn measurements as well as the concentration of testosterone in their faeces were established and compared with male reproductive success. The properties of male territories such as territory size, vegetation structure and food quality were determined and their influence on animal distribution was assessed. Subsequently genetic analyses of fatherhood were conducted to correlate animal distribution with pairing success of the males. Genetic analyses of fatherhood revealed that all territorial males reproduced successfully. However variations in number of offspring's per male and in frequency of animals in male territories did exist. This suggested a skew in reproductive success between territorial males. Body and horn sizes and faecal testosterone concentrations were not connected with the differences in male mating success. Morphological characteristics of males were more likely to play a role in intra-sexual competition for territories. Females showed to mate with the males in whose territory they spent most of their time. This suggested that male territories attracted females indirectly through the territory they held. The frequency of the main food resource, the frequency of highly selected feeding plants by females and the concentration of crude protein in the forage did not differ between male territories. Territory size, vegetation structure and tree species composition were likely to influence animal numbers in territories and thus mating success.