

Olfactory communication in southern white rhinoceros (*Ceratotherium simum simum*) - observations and trials on free ranging rhinos at the Game Breeding Centre in Lichtenburg, South Africa

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Olfactory communication plays an important role in the reproduction of white rhinos (*Ceratotherium simum simum*). The alpha-bull marks his territory and hence his mating privilege with faeces and urine marks (Scent- matching- hypothesis). In situation where there is no competitor for the bull and no choice of males for the females, as often observed in zoos, a sibling like relationship develops between the bull and the cows which can lead to a complete stop of reproduction. The idea is to stimulate the presence of another alpha bull by introducing his faeces into the territory of the "single male". We tested the following hypotheses:

- 1) The "single male" marks his territory more often when samples of other males were introduced
- 2) The "single male" and the females are more active (moving, flehmen) after introduction of the samples

The study was conducted at the Game Breeding Centre Lichtenburg in South Africa, which housed a single breeding male and 5 adult females.

To test the hypotheses, we used 2 faecal samples from 2 captive males (Pretoria and Johannesburg Zoo) and 2 samples from free ranging male rhinos (Bela Bela Reserve and Welgevonden Private Game Reserve) and moss as a control sample. The samples were not frozen during the transport. During 2 trial intervals, the samples were placed 2 times a week (sample selection according to a rotational system) at 2 frequently used dung heaps. Control samples were introduced alternating to the different dung samples and only once a week. The frequency of markings and the position of markings in an area of 50 - 100 m² were documented via GPS. To establish the activity of the adult animals (1,5) each individual was observed 20 minutes daily using the focal-animal sampling method. Activities like locomotion, resting, flehmen, secure the surrounding, marking, excreting and social behaviour were documented. The frequency of markings did not differ after introduction of the faecal samples of captive and free ranging male rhinos ($p = 0.64$). Additionally there was no difference in the activity or the behaviour, of the bull and the females. These results do not confirm the hypotheses above. The reasons for the negative results might be due to low concentrations of olfactory signals. Furthermore one sample came from a subadult bull which was possibly not pubescent at the time of sampling.

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