



SOCIAL BEHAVIOUR OF SOUTHERN WHITE RHINOCEROS (*CERATOTHERIUM SIMUM SIMUM*) IN FENCED RESERVES IN SOUTH AFRICA

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In southern Africa, an increasing number of white rhinos are kept in fenced reserves and farms. The populations are often small and the sex and age compositions are skewed. Experiences in the past have shown that these small populations do not breed very successfully. One of the reasons might be the high density of animals or the high density of animals of the same sex or age classes leading to an increase in aggression, especially when they are aggregating at feeding, drinking or resting places. It is important to monitor the social behaviour of animals in order to make sound management decisions. We studied the social behaviour of two white rhino populations living of different in the private reserve (Limpopo Province, n = 13) and in the Lichtenburg biodiversity conservation centre (North West Province, n = 8). The research was carried out from May to August 2008. Behavioural observations were conducted in the morning and late afternoon, when the rhinos were expected to be most active. The observation points were located at waterholes and winter feeding places (private reserve) and at favourite grazing and resting area of rhinos (Lichtenburg reserve). The groups of rhinos consisted of 1 bull, 5 cows, 3 subadults and 4 juveniles (private reserve) and of 1 bull, 5 cows, 1 subadult and 1 juvenile (Lichtenburg reserve). The behaviour of the rhinos was monitored using focal animal sampling. During the observations, the cohesive and agonistic (defensive and aggressive) behaviour was recorded.

Time spent in cohesive behaviour differed across the sex-age classes (private reserve: $p = 0.001$, Lichtenburg reserve: $p < 0.0001$). Direct contacts by head or horn were seldom observed between the animals. No cohesive behaviour was directed from the cows towards the bulls. The reactions of the recipients to the defensive behaviour during intergroup encounters in private reserve differed across the sex-age classes ($p < 0.0001$). The agonistic interactions between the rhinos under competitive conditions at feeding places in the private reserve were much more frequent than between the animals in Lichtenburg reserve; mainly when directed from a cow towards a bull or towards another cow. It is therefore very important to locate a sufficient number of feeding places at the reserves and to assure their good dispersion so that the rhinos are not aggregating in some parts of reserves. An increased aggression in rhinos when meeting in these areas might decrease their reproductive success.

WHITE RHINOCEROS PROJECT SUMMERY

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The mother and infant behaviour patterns within the first 24hours of the birth, in captive White Rhinoceros are poorly documented. Its importance for successful breeding of this species could reveal new guidelines for improvement of the species captive breeding programs. Breeding programs of the White Rhinoceros in the Zoos and wildlife parks around the world have shown highest success rate for wild born females.

In Knuthenborg Park and safari in Denmark a wild born female called Bertha gave birth to a calf in February 2008. The event was recorded on camera over a 10-12hour period after the birth. Unfortunately this calf was killed by the mother within this recorded timeframe.

The aim of the current study is to clarify the behaviour patterns between mother and infant in regards to frequency of each behaviour category, distance between them, orientation to each other, which box zone are most frequently used and the maintenance of proximity. If similar recordings are available these patterns will be compared to other females and their offspring of White



Rhinoceros in captivity. The results will hopefully shine some light on which behaviours are of most importance for the interaction between mother and calf to be successful and ensure the survival of the calf.

All 5 surviving species of Rhinoceros are faced with high threat of extinction due to illegal hunting for their horns. It is therefore of high interest for conservation of these species that captive breeding programs are successful. One of the steps in successful breeding is the post-partum period where strong bonds are formed between mother and infant. Failure of this bond formation can lead to rejection of offspring or in some circumstances infanticide by the mother. Knowledge of the behaviour between mother and infant in all Rhinoceros species could revile new clues and guidelines for successful breeding. This study investigated the behaviour pattern of a White Rhinoceros (*Ceratotherium simum simum*) female named Bertha and her newborn calf born in February 2008 in Knuthenborg Park and Safari in Denmark, and this mother's improvement to her second birth in December 2009. A weak comparing of this data to other first time mothers from Givskud Zoo in Denmark and Dublin Zoo in Ireland are conducted by behaviour analysis of video recordings of the events. The results show that Bertha's behaviour towards her calf is different to other first time mothers and that she only improve very little from the first birth to the second birth. The study does leave hope for improvement of Bertha's behaviour and suggest monitoring of early signs like licking and checking behaviour by the mother, and presence of aggressive behaviours towards the calf at any stage. The movement behaviour of the infant also needs close monitoring to identify early signs of the calf's likelihood of successful nursing and health issues. This study urge for more research on this field to unravel risks of behavioural coursed mortality of the infant.

INTER- AND INTRASPECIFIC INTERACTIONS AND SPACE UTILISATION OF WHITE RHINOCEROSES (*CERATOTHERIUM SIMUM*) IN A MIXED-SPECIES EXHIBIT WITH OTHER AFRICAN MAKROHERBIVORES

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Exhibits of mixed species with the same environmental needs are found in many zoological facilities but do not always meet the expectations of living peacefully side-by-side. In this study the utilisation of space and the interspecific interactions were observed for all the mammalian species of the exhibit, namely white rhinoceroses, Grant's zebras, elands, greater kudus, sable antelopes and springboks. Furthermore the activity patterns and intraspecific interactions of the subadult rhinos were part of the investigation.

This study took place in the 'ZOOM Erlebniswelt Gelsenkirchen', Germany, from July to October 2008. The enclosure 'Grassavanne' spans 23 000 m² whereof 5 000 m² are separated through a wall with little passages for all animals except the rhinos. Data was collected over 291 hours of observation by scan-, focal-animal- and behaviour-sampling.

Evaluation of the space utilisation showed that the enclosure was used completely by the inhabitants. The rhino-area and the northern part of the exhibit were visited less frequent and the proximity of the visitors was mostly avoided. In the morning nearly all species went to the forage places, at bad weather they seeked shelter in the entrances of the stables.

The acitivity patterns of the three subadult rhinos showed the same distribution as other zoo-kept rhinos. They were eating in the morning followed by a resting period. The remaining time outside was filled with different activities which were intermitted by several resting periods. Altogether they spent half of the time on the exhibit resting.

Intraspecific interactions of the rhinos were mainly made up of horn fights which are typical for subadult rhinoceroses. They mostly took place between the bull and one of the two cows. There was a pronounced hierarchy with one female on the top and the bull as the clearly inferior part. Interspecific interactions only made up a small part of the observations and took mainly place at the feeding sites where mostly the rhino cows fought with the adult eland bull. Besides the zebras showed spontaneous aggressiveness towards the calves of the antelopes. Apart from that there were