

SOCIAL AND REPRODUCTIVE BEHAVIOUR OF CRITICALLY ENDANGERED NORTHERN WHITE RHINOCEROS (*CERATOTHERIUM COTTONI*) IN A ZOOLOGICAL GARDEN

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Group composition may be an important factor for optimal welfare and reproduction of socially living mammals. Northern and southern white rhinos are the most social of all rhinoceros species, and females, sub-adults and juveniles live in groups. However, white rhinos in zoological gardens are often kept in small numbers and they cannot change their companions as often as they do in the wild. White rhinos have low reproductive success in captivity and social interactions between the animals, especially their increased agonistic behaviour, might be one of the reasons. Therefore, appropriate group composition and/or a change of social relationships in white rhino herds might have a positive effect and increase reproduction of the captive rhinos. However, studies experimentally investigating the influence of changes in group structure on the social and reproductive behaviour of captive rhinos are missing. The northern white rhino is currently on the brink of extinction with only seven animals known to survive. We studied the social and reproductive behaviour of a group of northern white rhinos (one male, five females) in zoological garden Dvůr Králové in 2005. The most often observed agonistic activities among the animals were threat, snarl and clash of horns. The agonistic behaviour was most frequently directed from the females towards the male and agonistic activities between the females were rarely recorded. In the middle of our study, one of the females (the oldest one and the only one wild-born) was separated from the herd. Following her separation, the agonistic behaviour between the other rhinos significantly increased. In addition, play behaviour, especially between the male and females also increased. However, play behaviour is observed in adult male-female interactions in the wild only very rarely. We did not register any changes in socio-positive behaviour. Social dominance among the females, which might affect reproduction of subordinate animals, was not found. The presence of an old and experienced wild-born female in the herd during our study might have had a positive influence on the social interactions between other animals. Our results show that the composition of a white rhino group in captivity can have significant influence on the social interactions between the rhinos. Better knowledge of appropriate composition of white rhino groups in zoological gardens in terms of age, sex and wild or zoo origin might therefore improve animals' well-being and also increase a chance for their reproduction.

Social and reproductive behaviour of critically endangered northern white rhinoceros (*Ceratotherium cottoni*) in a zoological garden



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Introduction



- Northern white rhinos in captivity and in the wild
- Northern white rhinoceros – formerly subspecies of the white rhino (taxonomic revision: Groves, Fernando and Robovský, 2010)
- Low reproduction in captivity
- Behaviour:
 - Increased agonistic behaviour in captivity
 - Sociality
 - Dominance hierarchy?



Methods



- Zoological garden Dvůr Králové, 3 000 m² enclosure
- Breeding situation in the zoo
- Jul – Nov 2005
- Before our study started:



3 adult females +
1 subadult female

+ Adult female **NESÁRÍ**



1 month later

+ Adult bull **SUNI**



1 month later

Our study started



Methods

- Agonistic, cohesive (= socio-positive) and play behaviour

In the middle of our study, NESÁRÍ was separated from the group:

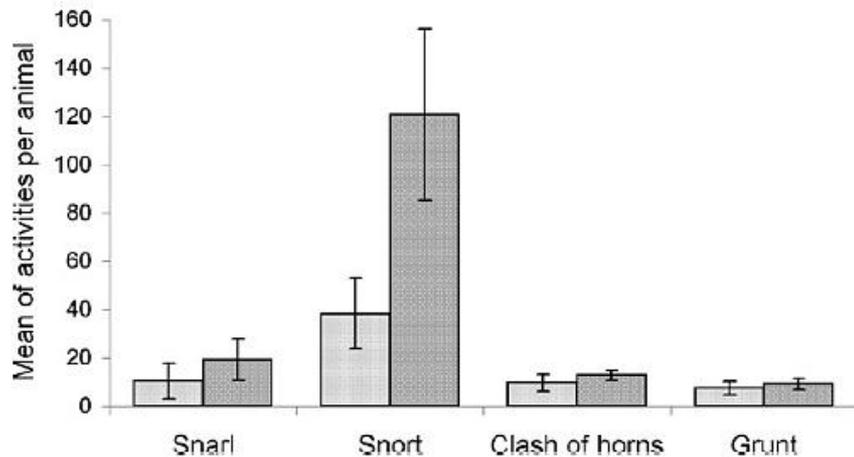
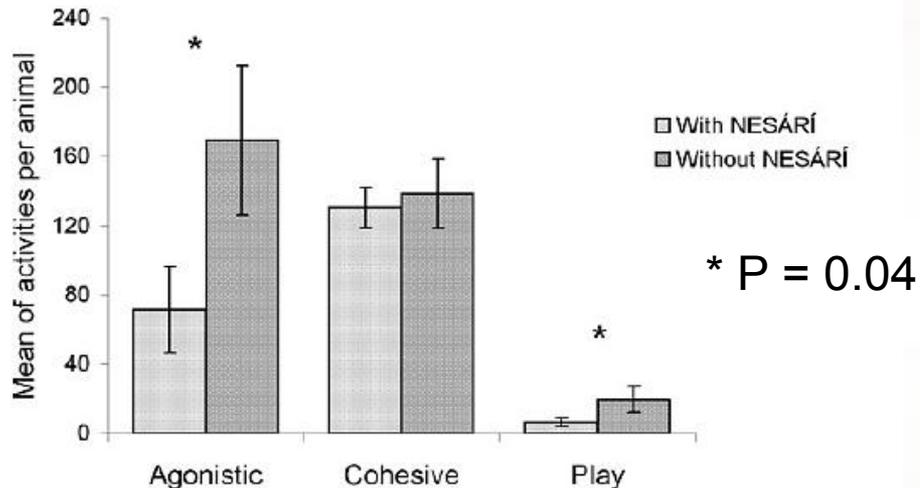
- Observations: before NESÁRÍ was separated (99 h 50 min) and after the separation (94 h 10 min)
- Scale scores to assess potential dominance hierarchy (following Jameson et al. 1999)



Results



➤ Behaviour before x after the separation (Wilcoxon paired test)



Snarl (P = 0.04)

Snort (P = 0.07)

Clash of horns (P = 0.22)

Grunt (P = 0.27)

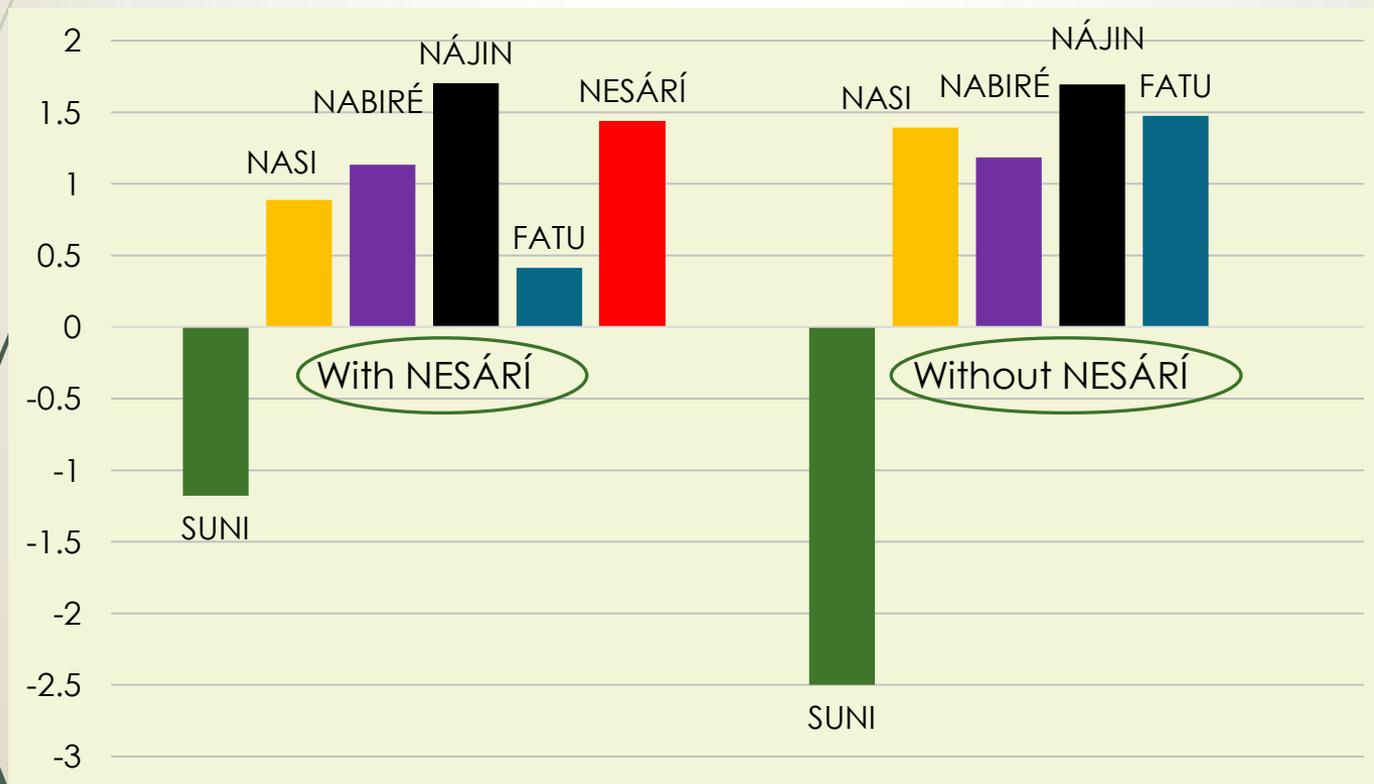


After Bonferroni correction non-significant (for P = 0.0125)



Results

- Scale scores to assess potential dominance hierarchy
- 73% of all agonistic activities were directed towards the bull SUNI



Results: Reproduction



- Interest of the bull in females: 5x before NESÁRÍ was separated, 2x after her separation
- No mating occurred



Conclusion



- Separation of NESÁRÍ influenced the behaviour of other rhinos
- Increased agonistic behaviour ➔ increased stress (Meister 1997) ➔ lower chance for reproduction?
- Dominance hierarchy was not found
- NESÁRÍ (33 years, wild-born)
- Captive-born females are more likely to reproduce in the presence than in the absence of a wild-born female (Swaisgood et al. 2007)
- More studies on this topic are needed





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Thank you for
your attention

