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Reproductive Biology

Evaluation of fertility of the captive female northern white rhinoceros population (*Ceratotherium simum cottoni*)

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The Northern white rhinoceros (*Ceratotherium simum cottoni*) is the most endangered large mammal species in the world with a remaining wild population of ~ 30 animals. Poaching and political instability are the major threats to the long-term survival of this critically small population. Due to the extremely low number of individuals genetic diversity is diminished and successful captive breeding management becomes increasingly important. Some mammal populations are already extinct in the wild, yet their genetic potential is still represented in captive populations. Despite fifty-three years of rhino reproduction management in captivity, so far only three F1 and one F2 generation offsprings have been produced. To investigate the possible reasons of their reproductive failure reproductive assessment was performed by transrectal ultrasound examination. This method was previously established as an appropriate method for fertility diagnosis in females of another subspecies, the Southern white rhino (*Ceratotherium simum sinum*) and was performed in all (n=6) non-reproducing captive northern white rhinoceroses. Assessment and classification of sonographically detected lesions were based on the comparison with reference data obtained from the Southern subspecies in a previous study (n=35).

A broad range of lesions was detected in the northern white rhino population. Cystic hyperplasia, chronic endometritis, uterine tumours, polyps and para-ovarian cysts were identified. Considering the gravity of the lesions and advanced age of the females the remaining breeding potential was regarded as minimal to none. Therefore, five out of six female captive northern white rhinoceros were considered post reproductive, representing 36 % of the world female population. Unless further assisted reproduction technologies such as ovum pick up, in-vitro fertilisation or embryo transfer are developed, the genetic potential of these northern white rhino will be lost soon.