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ABSTRACTS

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02-07 Poster

"WHERE'S MY MUMMY?" EVOLUTIONARY AND CONSERVATION IMPLICATIONS OF CALF SWAPPING IN THE WHITE RHINOCEROS

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Sophisticated recognition mechanisms between parents and offspring are essential when parental investment is large and social organisation may lead to identification errors. Adaptations for mother-offspring recognition vary widely across taxa, directly influencing individual fitness by preventing costly maternal investment in offspring that are not their own. In this study we report the incidence of calf swapping among females in two isolated populations of southern white rhinoceroses (*Ceratotherium simum simum*). Persecution of rhinoceros species and resultant precipitous declines in population numbers has forced conservation to focus on establishing protected reserves and game parks. These approaches have enabled southern white rhino to recover from ~100 individuals at the beginning of the 20th century to ~11 500 individuals today. Ten microsatellite markers were analysed to assign parentage in two seeded populations, where field observations suggested the occurrence of calf swapping. Allelic mismatches at more than one locus were discovered in 6/20 maternal/offspring combinations in Welgevonden Reserve, South Africa, and 5/33 in Matobo National Park, Zimbabwe. This subspecies is characterised by low levels of genetic diversity (mean values of 2.63 alleles / locus and heterozygosity of 0.39) such that the genotypes of a number of adult females may match a particular calf; therefore these mismatches are noteworthy. Current unnaturally high population densities, resulting from restricted dispersal and high fecundity, necessitate management intervention. Historically, white rhino were naturally widely dispersed and we hypothesize that contemporary population densities contribute towards occurrences of calf swapping in extant populations.

02-08 Poster

SEX, GENOTYPIC DIVERSITY AND THE SURVIVAL OF PARTHENOGENETIC FLATWORM POPULATIONS

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One explanation for the success of sexual reproduction is that sex increases the efficacy of natural selection. Fusion of gametes and recombination lead to fitness variance among offspring which then offers a wider target for natural selection. Consequently, adaptation to changing environments is accelerated and population mean fitness will increase, which in turn decreases the likelihood of population extinction.

In the present study we investigated whether rare sex is accompanied by increase in variation and mean of fitness in natural subpopulations of parthenogenetic forms of the planarian flatworm *Schmidtea polychroa*. Parthenogenetic *S. polychroa* mainly reproduces clonally with occasional sexual reproduction leading to a substantial increase of genotypic diversity and telltale signatures in the population genetic structure. We correlated genotypic diversity, used as a reliable estimate for rare sex, with fitness attributes of six genetically differentiated locations within one meta-population. Results indicate strong, positive correlations of genotypic diversity with variance as well as with mean total offspring number produced during a five-week period.

We conclude that occasional sex and increased genotypic diversity facilitate adaptation to fluctuating environments and may therefore explain the survival and persistence of parthenogenetic populations.