

Female multiple mating observed for raccoons (*Procyon lotor* L.) in the German lowlands

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The complex social system of raccoons (*Procyon lotor* Linné, 1758) includes high social tolerance as well as a poorly understood fission-fusion-system. To find out how their mating system is affected by this complex sociality, we monitored 53 reproductive (29 adult males, 24 adult females) radiocollared raccoons during the 2006-2009 mating seasons and beyond to investigate consortship behaviour and mating strategies for this allochthone carnivore. Additionally we genotyped reproductive raccoons (n=53) and their progeny (n=40) to determine paternity as result for male mating success. These studies are part of a research project about population ecology of raccoons in a bog and swamp area of the German lowlands (www.projekt-waschbaer.de), where the estimated population density of 4-6 raccoons/100ha (litter included) is relatively high.

Spatial analysis of male and female distribution yielded an extensive intersexual spatial overlap with one male overlapping up to three female home ranges. Determined as den sharing, consortship events occurred between up to four females per male within a mating season and females consorted with up to three males during an estrus period. The number of multiple mating events varied with weather conditions, whereas male excursions and consortships decreased during a cold mating season. Beside this weather-dependent impact, observed intersexual den sharing events outside the mating season suggest that an increased familiarity within the population could influence females mate choice in favour of resident than passing males.

Genetic analysis of 8 microsatellite-loci with an average of 7,75 alleles (min.: 4, max.: 20) per locus provided an observed heterozygosity of 0,633 versus an expected heterozygosity of 0,603 which indicates a genetic exchange in the observed population. For 5 of 6 litters the paternity tests resulted in more than one potential father and until now a reliable multiple paternity could be documented for one litter.

As supposed and observed in studies on raccoons in North America we could confirm a promiscuous breeding system for both sexes, but to explain female multiple mating we have to gain more data. Possible benefits of this strategy could be an increased heterozygosity, an increased litter size, avoidance of infanticide, genetically diverse offspring or increased fitness and the occurrence of multiple mating in raccoons is supposed to be influenced by population density beside social and climatic impacts. Furthermore female multiple mating and female mate choice might be affected by various mechanisms of the Major Histocompatibility Complex (MHC). Therefore additional studies have to be done to understand this complex mating strategy in raccoons and other mammals.

Type of presentation: **poster presentation**