

Predicting mating systems in tree squirrels using social organization models of ground-dwelling sciurids

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Mating systems have been classically defined by the number of mates per male or female (Emlen and Oring 1977) with most mammals classified as polygynous (1 male mates with several females); however, descriptions of behavioral interactions or number of observed copulations may not be an accurate indicator of the mating system and recent molecular evidence suggests many mammals may be polygynandrous (both sexes mate multiply), particularly sciurids. In polygynous mating systems, ecological factors create aggregations of reproductive females where males are likely to succeed in monopolizing mating opportunities; however, where males are unable to monopolize mating opportunities, mating systems instead tend to be polygynandrous, where neither sex is restricted to a single mate within a breeding season (Emlen and Oring 1977). Many recent molecular studies on various ground sciurid species have shown higher levels of polygynandry than previously thought. We evaluated established social organization models of ground-dwelling sciurids, which are based on life history traits including adult body size, length of annual active

period, and percentage of adult-juvenile overlap, and genetically determined mating systems. We found that the social organization of a species (level of aggregation) typically correlates with the mating system and the degree of polygynandry. Specifically, we found a negative relationship between increasing levels of sociality with litter size and the average percentage of multiple paternity within a litter (Munroe and Koprowski 2011). Using these established social organization models we calculated the social index for several tree and flying squirrel species and make predictions about the mating systems and reproductive ecology for these species.

Emlen, S. T, and L. W. Oring. 1977. Ecology, sexual selection, and the evolution of mating systems. *Science* 197:215-222.

Munroe, K. E., and J. L. Koprowski. 2011. "Genetic mating system of Round-tailed ground squirrels (*Spermophilus tereticaudus*): not just another polygynous ground squirrel." *Behavioral Ecology and Sociobiology* 65:1811-1824.