

Sexual Selection Not Just for Males Anymore

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Cooperative breeding meerkats are the picture of communal living. Ironically, Earthwatch-supported researcher Prof Timothy Clutton-Brock has found that competition for breeding success leads to selection for greater size and aggressiveness in female meerkats. Credit: Diane Troppoli/Earthwatch Institute

The antlers of a bull elk, the great bulk of a male elephant seal, the lion's mane, have all evolved due to competition for reproductive success. These products of "sexual selection" are typically found in male animals. Meerkats, however, turn this pattern on its head.

In a recent issue of the journal *Nature*, Earthwatch-supported scientist Prof. Timothy Clutton-Brock (University of Cambridge) and colleagues describe how female meerkats compete more intensely than males for breeding opportunities. This results in secondary sexual characters and behaviors more often found in males, such as an increase in size,

aggressiveness, and testosterone level.

“Variation in female reproductive success is unusually large in cooperative breeders,” said Clutton-Brock, principal investigator of Earthwatch’s Meerkats of the Kalahari project. Meerkats live in the arid savannahs of southern Africa, where they breed cooperatively in groups of 3 to 50. This means that all of the members of that group work together to raise and protect their pups, most of which are the offspring of the dominant pair.

A dominant female meerkat usually monopolizes reproduction in the group for up to ten years, producing an average of 17 pups that survive their first year. As a consequence, several other females in the group are producing no pups at all during that time period. This extreme variation in reproductive success is what leads to the relative greater size and aggressiveness of dominant females, and female meerkats in general. Dominant males, by comparison, fathered an average of only 8.9 pups.

“Meerkats are ideal models for exploring sexual selection independent of parental investment, because they are cooperative breeders,” said Clutton Brock. Previous studies suggested that males were the object of sexual selection because they usually invested less energy in their offspring than their female counterparts. Without the full-time job of rearing their young, males are more often free to strut and shove and preen to maximum effect.

Cooperatively breeding meerkats provided the opportunity for Clutton Brock and colleagues to take a fresh look at sexual selection. “It is feasible to measure individual differences in breeding success over long periods with unusual accuracy,” said Clutton Brock.

The authors suggest that these findings, and other examples of cooperative breeders, call for an examination of definitions of sexual

selection. Current use tends to emphasize competition between males for mates. The alternative proposed by the authors is to return to Darwin's description that involves competition for reproductive opportunities, a broader definition that could include competition between cooperatively breeding females.

For the past four years, teams of Earthwatch volunteers have helped Prof. Clutton-Brock and his colleagues investigate the social behavior of meerkats at Kuruman River Reserve, South Africa. These volunteers are not only contributing to new findings in behavioral ecology, but are helping to support the conservation of meerkats and other African wildlife.

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