

Researchers reconsider roles of second-rank hyena males

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Spotted hyenas live in female-dominated groups of up to 100 individuals and express highly complex social behaviour. Credit: Eve Davidian/IZW

Males that don't leave home are not second-class, but can breed as

successfully as their more adventurous competitors that leave home, according to a new long-term study on spotted hyenas. The results from a research team of the Leibniz Institute for Zoo and Wildlife Research (IZW) in Berlin, Germany were published in the open access journal *Science Advances*.

In most mammals, there are two kinds of males: those that stay at home and those that disperse from home to breed elsewhere. Stay-home males were generally considered as 'losers' that failed to join another group and that father few offspring. The new study now demonstrates for the first time among group-living mammals that stay-home (philopatric) males and dispersers are not inherently different and have similar reproductive success. The study further shows that their choice to stay at home or leave home is the outcome of a process during which all males answer the same question: which group offers the best fitness prospects? Whether a spotted hyena male stays at home or hits the road simply depends on whether his birth clan or another clan contains more young females when he wants to start breeding.

The scientists monitored the entire population of [spotted hyenas](#) inhabiting the Ngorongoro Crater in Tanzania over the past 20 years. They combined two decades of demographic data from the eight clans with data on the behaviour, survival, and reproductive success of more than 250 males to investigate the causes and fitness consequences of male clan choice.

In natural populations, group sizes and the number of young females fluctuate due to chance and environmental effects. Thus, if there are more than two groups, the home group is less likely to contain the highest number of young females than a non-home group. As expected, most hyena males in the Ngorongoro Crater dispersed to another clan. Yet, the team found that more males stayed at home than expected based on the distribution of young females only, suggesting that staying at

home comes with advantages.

The main advantage is provided by their mothers. In the matriarchal system of spotted hyenas, females can influence the competition among males. "Mothers provide social support to their stay-home sons and ensure they acquire a high social rank among breeding males. This gives the mama's boys privileged access to both food and females, allowing them to invest a lot of time consorting females," explains Eve Davidian, a doctorate candidate from the IZW. And this pays off. Genetic paternity analyses showed that stay-home males father their first cubs at a younger age than dispersers and father almost exclusively cubs with high-ranking females—females of high reproductive value because they are most successful at rearing offspring. This is the first empirical evidence in a group-living mammal, that stay-home males can be at least as successful as dispersers.

Dispersal is a key driver of ecological and evolutionary processes, yet scientists still do not fully understand why individuals of the same sex of a species differ in their propensity to disperse. By showing that dispersal patterns can be shaped by the distribution of breeding partners across groups, the study expands our understanding of the processes leading to the coexistence of philopatry and dispersal within a sex.

Spotted hyenas live in female-dominated groups of up to 100 individuals and express highly complex social behaviour. Due to the anatomy of their outer sexual organs, female spotted hyenas have complete control over mating. And they have very clear ideas about which males to choose as fathers of their offspring: young females prefer males that were born or that joined their clan after the female was born. They thereby effectively avoid incestuous breeding with their father and older brothers. In addition, older females preferentially choose sires that developed a friendly, long-term relationship with them. The fitness prospects and clan choice of male spotted hyenas are strongly influenced

by these female mate preferences. A young male willing to breed stands the best chances to father cubs if he establishes himself in the clan with the highest number of young females.

More information: E. Davidian et al. Why do some males choose to breed at home when most other males disperse?, *Science Advances* (2016). [DOI: 10.1126/sciadv.1501236](https://doi.org/10.1126/sciadv.1501236)

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