

Matrilineal social structure of spotted hyenas



**ASSIGN
BUSTER**

The spotted hyena, *Crocuta crocuta*, has evolved a matrilineal society in which the females are more dominant and aggressive than males within the clans. Female and male behaviors come together to form a complex societal structure that promotes variability and reproductive success. This species is an exceptional example of matrilineal hierarchy and social organization as opposed to the regular male-dominant societal structure present in the case of most mammals. Scientists continue to study the spotted hyena for its remarkably sophisticated social behavior, which may be comparable to that of some primates and possibly even human beings (Jenks et al., 1995; Drea et al., 2002; Engh et al., 2002; East et al., 2003).

The spotted hyena, *Crocuta crocuta*, is a very intelligent animal that organizes itself into large clans of 50-80 members (Engh et al., 2002). While most mammals exhibit a male-dominant society where males fight for rank and the right to reproduce, the spotted hyena has developed a matrilineal society (Jenks et al., 1995). Females are more dominant and aggressive than males and pass on their rank to their offspring (Jenks et al., 1995; Engh et al., 2002). They are responsible for reproductive choice due to their dominant status (East et al., 2003). Males regularly travel to clans outside their natal society, despite the cost of access to food, for the chance of higher reproductive success (Engh et al., 2002). They also engage in specific favorable behaviors to entice females to choose to mate with them (East et al., 2003). All of these sophisticated behaviors have evolved to promote variability and overall success for the spotted hyena. Even more amazingly, the same social structure and behaviors of dominant-submissive interactions emerged within an isolated group of spotted hyenas raised in captivity (Jenks

et al., 1995). The spotted hyena is definitely a very unique case of societal arrangement (Engh et al., 2002). With further study, the evolution of this remarkable case of sex-role reversal and complex hierarchy may soon be fully understood. It may provide further insight into similar social arrangements seen with other animals such as primates (Jenks et al., 1995). The study of spotted hyenas may even provide insight into more primitive stages of human societal structure, especially where there are matrilineal cultures.

Females are without question the more dominant gender within spotted hyena clans and they exercise this dominance when it comes to reproduction (Engh et al., 2002; East et al., 2003). They are on average larger, more aggressive, and more violent than males within the clan (Engh et al., 2002). Their special anatomy - an enlarged clitoris through which copulation occurs - gives them full control over sexual activities and partners (East et al., 2003). There is no chance for forced copulation simply because the male hyena needs the female's full cooperation for proper coitus to occur (East et al., 2003). Theories for the evolution of this physical characteristic include (a) counter-evolution in the presence of high rates of forced copulation and (b) selection for overall more dominant and aggressive individuals resulting in masculinization (Drea et al., 2002). Since more dominant and aggressive females also attain a higher rank within the clan, they tend to be more successful in raising a larger number of young. A higher rank correlates to greater access to food and thus higher chances of survival for both mother and offspring (Engh et al., 2002).

Female spotted hyenas have multiple criteria for choosing mates. They prefer immigrant males to natal males, those born within the community – a possible measure for prevention of inbreeding (Engh et al., 2002). Even more amazingly, females generally prefer males of similar age, preventing sexual interactions with fathers or sons (East et al., 2002). Females also show preference for more submissive, less aggressive males (East et al., 2003). This selection for less aggressive males further emphasizes the sexual dimorphism, both in behavior and physical characteristics, present in this species. Females copulate with several males when in heat, possibly to dissuade males from infanticide (East et al., 2003). This behavior further increases variability – it is quite common to see single litters whose cubs can be traced to different fathers (Engh et al., 2002). It serves to confuse males and dissuade them from killing cubs that may or may not be their own – a complex behavior that shows foresight and intelligent thought (East et al., 2003). Female choice for less aggressive males and behavior to prevent infanticide may have evolved to counter the extremely high-risk pregnancies these animals go through due to their anatomy (Drea et al., 2002).

In a study conducted by Engh and colleagues (2002), the reproductive skew among male hyenas was investigated. One of the major discoveries was that immigrant males had an immense advantage over natal males. Over the 10-year period that one clan of hyenas was observed, it was found that immigrant males sired 97% of the cubs, while natal males only sired 3% (Engh et al., 2002). This explains the males' behavior of leaving natal clans and immigrating elsewhere: the cost of rank and access to food are highly outweighed by the reproductive benefits in a non-natal clan (Engh et al.,

2002). Within the group of immigrant males, it was found that rank did not have a statistically significant effect on a male's reproductive success. In fact, males a few ranks below the highest ranking immigrant had the most success in terms of cubs sired (Engh et al., 2002). In general, tenure - the measure of how long an immigrant male had been in the clan - was found to be a better indicator of reproductive success. The immigrant males' rates of producing cubs increased significantly the longer they remained in the clan, showing a strong correlation between tenure and reproductive success (Engh et al., 2002).

Male spotted hyenas are also observed to exhibit behaviors to make themselves more attractive to females. As found in a recent study by East and colleagues (2003), there was no reproductive advantage to harassing, shadowing, or defending females from other competition. In fact, males exhibiting these behaviors were often attacked or chased away by females and other clan members. Instead, males found significantly more reproductive success by fostering relationships with females over longer periods of time - a surprisingly complex behavior very close to that of humans (East et al., 2003). Having these friendly relationships also were seen to solidify the males' places within the clan hierarchy - once again, a very complex sociological behavior, especially when seen outside the order of primates (East et al., 2003).

The sophisticated system of hierarchy was even recreated in captivity by a group of previously unranked hyenas collected at infancy (Jenks et al., 1995). Amazingly, these young hyenas grouped themselves in a matrilineal hierarchy, as observed over the course of two generations (Jenks et al., <https://assignbuster.com/matrilineal-social-structure-of-spotted-hyenas/>

1995). This structuring occurred despite the lack of maternal input for the first generation, showing that social organization is programmed into the spotted hyena's behavioral patterns (Jenks et al., 1995). While the first generation had little to no maternal interaction to help rank them within the clan, they went on to influence their own offspring's place in the clan hierarchy, just as observed in wild clans (Jenks et al., 1995). The only significant difference between the experimental clan and wild clans was the speed at which the cubs' ranks stabilized within the community.

Experimental group cubs solidified their place much faster than those in the wild, possibly due to smaller numbers and less movement within the clan (Jenks et al., 1995).

The spotted hyena is a remarkable animal. It shows extremely complex behavior that leads to sophisticated social structure - something that is rarely seen in mammals outside of primates (Jenks et al., 1995). In fact, the matrilineal group structure of hyena clans is very similar to that of Old World primates (Jenks et al., 1995). The sense of organization in this manner is so strong within the hyena's evolved behavioral patterns that matrilineal structure is even seen to spontaneously emerge in isolated hyenas raised in captivity (Jenks et al., 1995). Complex sexual behaviors, such as the female's choice of partner based on immigrant status, tenure, and age, seem to promote the creation of this social structure (Engh et al., 2002; East et al., 2003). Carefully nurtured relationships between same- and opposite-sex individuals show the multifaceted interactions between clan members that also contribute to the development of matrilineal organization (East et al., 2003). Female dominance is even supported by biological mechanisms and

the altered anatomy of this species (Drea et al., 2002). With further study, the circumstances that led to the evolution of this unique system may soon be uncovered. This will provide insight not only into the spotted hyena's sociological history, but also into that of Old World primates and possibly even that of human beings. It is an exciting prospect that will hopefully emerge within the years to come.