

Bigger horns equal better genes

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Size matters. At least, it does to an alpine ibex.

According to a team of international researchers, mature, male alpine ibex demonstrate a correlation between horn growth and genetic diversity. Past research studies have shown that greater genetic diversity correlates with a greater chance of survival.

"The size of the horns reliably advertises the genetic quality of the ibex—and the bigger, the better," said Dr. David Coltman, an evolutionary geneticist at the University of Alberta and co-author of the study, which was published this month in the journal *Molecular Ecology*.

The researchers found that horn sizes among younger ibex (one- to six-years-old) are relatively similar regardless of their genetic diversity. However, once the ibex mature to the age when they begin competing for reproductive mates (7 to 12), horn length varies according to genetic diversity: the greater the diversity, the greater the length of the horns.

The researchers believe the horn length discrepancies are evidence to support the mutation accumulation theory of ageing, which is the idea that, because natural selection weakens with age, genetic mutations have effects that accumulate over time. Therefore, differences in genetic quality become more apparent as an organism ages.

Coltman noted that his study, which incorporated genetic samples from more than 150 ibex, took into account the fact that environmental factors also play a role in determining ibex horn size.

The ibex's horns are considered a "secondary sexual trait". Researchers believe the horns help males successfully mate because they display genetic quality to females and also help to "win" physical battles and achieve high social rank among their competitors.

"We've learned from other species, such as deer and sheep, that horn or antler size can be a good indicator of an individual's quality and reproductive success," Coltman said. "We wanted to see if the same could be said for alpine ibex, and we found that it can."

The researchers were particularly intrigued about the ibex's horns because they are costly for an ibex to produce and maintain.

"[The horns] require a lot of energy to build and then carry around. They can be a meter long and are quite heavy, and the ibex carries them for their lifetime, unlike antlers which are shed every year. They also cause the ibex to lose heat in winter, because their core is heavily vascularized."

Found exclusively in the Alps mountain range in Europe, alpine ibex were hunted almost to extinction about a century ago for sport and the purported pharmacological properties of their horns. The last survivors were protected in an Italian national park, and the species has slowly repopulated and today is no longer considered endangered.

Source: University of Alberta

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