

Sex stimulates speciation (among other things)

Charles Darwin proposed that sexual selection was responsible for the evolution of such bright and conspicuous traits as the large antlers of male deer and the greatly enlarged tail feathers of male peacocks. Those traits are especially exaggerated in species in which individuals of one sex—usually males—compete for opportunities to mate with individuals of the opposite sex—usually females. Exaggerated traits evolve if they confer an advantage, either in competition among males for access to females, or in stimulating and attracting discriminating females.

In addition to leading to conspicuous male ornaments such as antlers and plumage, recent evidence suggests that sexual selection may also increase the rate at which new species form. Evidence for this effect of sexual selection comes from comparing the number of species found in sister clades, that is, clades that share a common ancestor. Because they share a common ancestor, sister clades have been evolving independently from one another for the same length of time. The rate at which species have formed in the two clades can be estimated by comparing the number of species in them today.

Birds with promiscuous mating systems offer some of the best examples of both of these effects of sexual selection. In many of these species males assemble in display grounds and females come there to choose with whom to copulate. After mating, the females of many species build their nests, lay their eggs, and raise their offspring with no help from the males. And in most of these species, the males have evolved bright plumage and often ornaments such as long tail feathers. In contrast, in monogamous species that form pair bonds and share the responsibilities of raising young, individuals of both sexes tend to have dull plumage and to look alike.

As an example of this phenomenon, there are about 320 species of hummingbirds in the Americas, all of

which are promiscuous. However, there are only 103 species of swifts (sister clade to the hummingbirds), even though swifts are found worldwide. Male and female swifts form monogamous pair bonds and look alike.

Why does sexual selection stimulate the divergence of a lineage into many species? A likely reason is that random mutations result in different plumage elaborations in different parts of the range of a species. Thus, local populations of a species may develop unique male plumage patterns, each of which is favored by sexual selection in that area. Females may not respond positively to an immigrant male whose plumage differs from the pattern to which they are normally attracted.

The origin of new species—the splitting and divergence of a single lineage into distinct species—is one of the most important phenomena in biological science. Charles Darwin recognized its preeminence when he chose the title of his most famous book. But without the underlying knowledge supplied by modern genetics, Darwin was primarily viewing the consequences of speciation, not its underlying causes, and he recognized that as well. We are still looking for the answers to many questions about speciation, a process Darwin referred to as «the mystery of mysteries».

Answer the questions

- May sexual selection also increase the rate at which new species form?
- Why does sexual selection stimulate the divergence of a lineage into many species?



AUDIO

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A Male Swift Swifts are the sister clade of hummingbirds. Swifts form pair bonds and the male and female, who look much alike, raise the young together. Thus the most successful males are those that help their mates raise the most offspring. There are only 103 species of swifts, even though they are found worldwide.



A Male Hummingbird More than 300 species of hummingbirds are found in the Americas. Hummingbird males are promiscuous. They compete with other males for mates, and males with the most successful display will usually inseminate the most females and thus sire the most offspring.

