

DNA reveals giant squid had brush with death

Genetic uniformity shows legendary kraken to be remarkably vulnerable.

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The fearsome sea monster of Greek and Norse tales — and the creature that fought Captain Nemo in *20,000 Leagues Under the Sea* — was once driven close to extinction, gene sequencing suggests. The genetic uniformity of giant squid across distant oceans hints at a past evolutionary bottleneck, but also at low resiliency toward future crises.

The finding comes from an analysis of tissue samples from 43 giant squid (*Architeuthis* spp.) from around the world. The samples came mostly from dead squid that had been found washed up on beaches or floating on the ocean surface, although a few came from animals that were accidentally caught by deep-sea trawlers.

When the researchers looked closely at the mitochondrial DNA of the creatures, they noticed something remarkable. Irrespective of where they came from — be it be it California, Japan, South Africa, New Zealand or somewhere else — the squid were genetically very similar.

In fact, the diversity of *Architeuthis* is lower than that for any other marine animal, except one — the basking shark *Cetorhinus maximus*, whose current population is thought to have rebounded from a small number of individuals. At first, says Thomas Gilbert, a geneticist at the University of Copenhagen and an author of the study, “When we found that the global genetic diversity of the giant squid was this low, we figured we had made an error.” But then the team checked their numbers again and saw that they were correct.

Same species

The findings not only make it clear that all giant squid around the world are the same species, but they also hint that, like the basking shark, the animals came close to extinction at some point in the not too distant past. The results are published in *Proceedings of the Royal Society B*¹.

The finding really makes you wonder, says Phillip Morin, a molecular geneticist at the Southwest Fisheries Science Center in La Jolla, California. “What could possibly have caused giant squid to vanish on such a global scale? And what changed that allowed them to spread



David Paul/Museum Victoria

Giant squid such as this one are genetically remarkably similar throughout the world.



again?”

“It is really damned hard to say” what is responsible for the population crash, says Gilbert. “I just can’t conceive of predation being responsible. If anything, I’d put my money on changes in ocean conditions somehow altering the nutrient-rich deep waters that these animals need.”

Clues to the low diversity may be found through studies of the animals’ main predator. “What’s fascinating is that sperm whales, a globally distributed and (formerly) abundant predator of giant squid, also exhibit extremely low genetic diversity. It would be very interesting to compare patterns and timings of this low diversity and see if they correspond to some historic event,” says Morin.

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- References

1. Winkelmann, I. *et al. Proc. R. Soc. B* <http://dx.doi.org/10.1098/rspb.2013.0273> (2013).