

Still capable of adapting: Researchers study genetic diversity of living fossils

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The morphology of coelacanths has not fundamentally changed since the Devonian age, that is, for about 400 million years. Nevertheless, these animals known as living fossils are able to genetically adapt to their environment.

This is described by PD Dr. Kathrin Lampert from the RUB's Department of [Animal Ecology](#), Evolution and [Biodiversity](#) along with colleagues from Würzburg, Bremen, Kiel and Dar es Salaam (Tanzania) in the journal *Current Biology*. "Coelacanths are rare and extremely endangered. Understanding the genetic diversity of these [animals](#) could help make preservation schemes against their extinction more effective" says the biologist.

Different populations in Africa studied

Previous genetic studies focused mainly on the biological relationships of coelacanths to lungfish and and vertebrates. In order to assess whether the fish are still able to adapt to new environmental conditions, however, you have to know the genetic diversity within the species. For this purpose, the research team examined 71 specimens from various sites on the east coast of Africa. The researchers analysed genetic markers from the nucleus and from the mitochondria, the powerhouses of the cells.

Geographical differences in the genetic makeup

The data generally revealed low [genetic diversity](#). As presumed, the evolution of these animals is only progressing slowly. Nevertheless, certain genetic patterns were only found in certain geographic regions. "We assume that the African coelacanth originally came from around the Comoros Islands, home to the largest known population" Lampert explains. Since then, however, two further, now independent populations have established themselves in South Africa and Tanzania. In addition, the animals around the Comoros belong to two genetically distinct groups. "We have thus been able to show that despite their slow evolutionary rate, coelacanths continue to develop and are potentially also able to adapt to new environmental conditions" says the RUB researcher. "The image of the coelacanth as a passive relic of bygone times should therefore be put into perspective".

Link between water and land

Coelacanths, *Latimeria chalumnae*, were regarded as extinct until Marjorie Courtenay-Latimer discovered a live specimen on a fishing boat in 1938. Since then, more than a hundred have been found off the coast of East Africa, most of them off the Comoros. There are probably only a few hundred specimens left in the world, which are seriously threatened with extinction. "Coelacanths are close relatives of the last common ancestor of fish and land vertebrates, and therefore of great scientific interest", says Kathrin Lampert. "By researching them, we hope to gain new insights into one of the major steps of [evolution](#): the colonisation of land."

More information: K.P. Lampert, H. Fricke, K. Hissmann, J. Schauer, K. Blassmann, B.P. Ngatunga, M. Scharl (2012): Population divergence in East African coelacanths, *Current Biology*, [doi: 10.1016/j.cub.2012.04.053](https://doi.org/10.1016/j.cub.2012.04.053)

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