Mysterious Fish: Researchers decipher coelacanth genome

Now it's geneticists succeeded to read the genome of this species. In the journal "Nature" they tell of how they allowed the study of this genome insights into the evolutionary history of a destiny moment. It is precisely the coelacanth is particularly interesting for evolutionary biologists. The reason is that he is a man remarkably similar. Among fishes, the lungfish are only Homo sapiens kinship closer. However, their genetic makeup is so huge that so far no researcher to approach ventures decryption.

But what a condemned to stagnation? What was the spark for the other fireworks of innovation? Answers to such questions, the researchers hope that the study of the coelacanth genome. No doubt: The landfall of vertebrates was one of the important decisions in the history of animal life on the planet Earth - and also a fateful chapter in the history of the human species.

Obviously, the adaptation to the inhospitable habitat country was not easy. Often in the history of life, it would have given the chance. Again and again fish learned to survive in dried ponds. Again and again, they acquired the ability to breathe air. But mostly failed the leap into dryness. Only once managed the permanent shore leave - as the descendants of that original coelacanth crawled ashore.

They were thus able to identify a gene switch called "Island 1" in the genome of the coelacanth, which apparently represented a first step towards the hand. In fact revealed in the coelacanth first features that seem like a kind of foreshadowing of later limb development: while salmon, tuna or pike maneuver with thin rays fins through the water, the coelacanth owes its exceptional maneuverability his bony, my muscles tipped fins. How well "Island 1" is suitable for the formation of limbs, was in the genetics lab: Built-In mouse, this gene switch controls the formation of fully functional mouse limbs.

Even things that the skeleton does not reveal, in the genome can be identified with the thing - such as the modified urea on land exchange: fish produce ammonia, which quickly escapes into the surrounding water. On land, however, it accumulates in the body and acts quickly toxic. Therefore, the conversion of urea was necessary. The evolutionary change of an enzyme that controls this process, the researchers were able to reconstruct the genome of the coelacanth.

Even though these are all details. One explanation for the amazing innovation of land vertebrates and the enigmatic stagnation of the coelacanth they do not deliver. Involved in the genetic analysis of the evolutionary biologist Axel Meyer from Constance is convinced that the answer to the riddle is not in the genes themselves but in their control. Researchers know that there are thousands of gene switches in the genome. Exactly where these are hidden and how they work, but they do not know in most cases. "The grammar of these switches to understand," says Meyer, "is the holy grail of our subject." Similar article can be found here

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