



Evolution: The secret of cichlid strips

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More than a thousand cichlids live in lakes in East Africa. Again and again species develop longitudinal stripes, lose them in the meantime and show them again. What is evolution doing there?



Cichlids stand on vertical stripes. Again and again, this pattern prevails in the colorful fish family. But evolutionary adaptation is not permanent. The stripes also disappear sometimes, after a few generations but then reappear. Researchers have now investigated how this works.

Cichlids have developed independently in different lakes in East Africa. Alone in Lake Victoria, the second largest freshwater lake on Earth, live 500 to 600 species. There are more than 1200 species native to Lake Malawi and Lake Tanganyika.

"Cichlids are perfect for exploring evolution," says Axel Meyer from the University of Konstanz. "The species in a lake differ greatly in their social behavior, body shape and colors, and at the same time, fish with similar characteristics have evolved in the different lakes."

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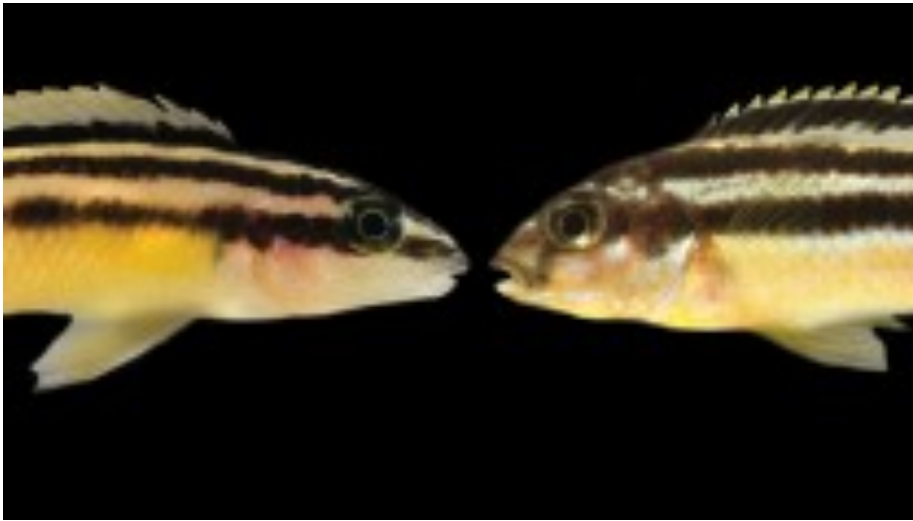
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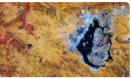
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Apparently, representatives of the fish family adapt themselves again and again in a similar way to certain environmental conditions. The evolution repeats itself. This also applies within the same species, the scientists now report in the journal "Science". But why do species show stripes over generations, lose them again, and show them again?

Switch for strip drawing

Claudius Kratochwil, a colleague in Meyer's lab, and colleagues have found a genetic switch that can be used to switch off the stripes in the fish. This switch, a gene named "agrp2", is found in all cichlids, but is not active everywhere.

If the gene code is read in a way, it produces a protein that suppresses the stripe drawing. The fish then has no horizontal stripes. On the other hand, when the researchers cut the gene out of an actually streak-free cichlid with the gene scissors Crispr, it suddenly showed the pattern. Thus it was proven that "agrp2" suppresses banding.

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As a reminder: The gene switch is found in all cichlids - including in very distantly related species. This could explain why the stripe evolution in all lakes is similar and goes comparatively fast in the course of evolution, write Kratochwil and colleagues.



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As far back as 125 years ago, the Belgian paleontologist Louis Dollo had assumed that characteristics that disappear in a species in the course of evolution, never return. This does not always apply and the researchers can now explain in cichlids, why that is.

REF: <http://www.spiegel.de/wissenschaft/natur/buntbarsche-das-geheimnis-der-streifen-evolution-a-1234503.html>

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