Cichlids: watching speciation in real time

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Cichlids belong to one of the largest fish families, with new species emerging all the time. These colourful, shimmering fish evolve so fast that Eawag researchers have now been able to practically observe them in the process of their evolution.

Within the space of several thousand years, one cichlid can evolve into hundreds of different species. These are the new findings of investigations in Victoria Lake, in Africa, where over 500 different cichlid species have emerged over the past 15,000 years. Now, for the first time ever, fish ecologists at Eawag have been able to observe the onset of such speciation – or adaptive radiation, as it is known – almost in real time. This unusual situation has been playing out in a crater lake in Tanzania, where cichlids of the genus *Astatotilapia* were introduced by humans around 50 years ago. The astounding thing is that, today, only a few decades later, the fish have already split into numerous different specialised forms.

On the basis of stomach analyses and stable isotopes, the researchers discovered that some of the cichlids being investigated were predominantly vegetarian, while others fed mostly on small fry or fish eggs. The fish also live at different depths and have different breeding colours. Admittedly, a general analysis of the situation indicates that we are not yet looking at actual individual species, as the genetic material is still too similar. The researchers estimate that in order for completely new species to evolve, it would take another few decades or even centuries.

Ole Seehausen, Head of the Department of Fish Ecology and Evolution, provides more in-depth insights into the cichlid research in Lake Chala in a

radio interview with Deutsche Rundfunk

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Lake Chala is a crater lake situated on the border between the African countries of Tanzania and Kenya.
(Photo: Florian N. Moser)

Original article

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ats associated with ecological and morphological expansion and the beginning
of phenotypic differentiation and potentially nascent speciation, consisten
t with the very early onset of an adaptive radiation process. Moreover, we d
emonstrate evidence of rugged phenotypic fitness surfaces, indicating that c
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https://www.eawag.ch/en/info/portal/news/news-archive/archive-detail/cichlids-watching-speciation-in-real-time