

Competition breeds new fish species, study finds

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Competition may play an important role during the evolution of new species, but empirical evidence for this is scarce, despite being implicit in Charles Darwin's work and support from theoretical studies.

Dr Martin Genner from Bristol's School of Biological Sciences and colleagues used population genetics and [experimental evidence](#) to demonstrate a role for competition that leads to the differentiation of new species within the highly diverse cichlid fishes of Lake Tanganyika in East Africa.

They found that the [cichlid fish](#) *Telmatochromis temporalis* shows two genetically distinct ecomorphs (local varieties of a species whose appearance is determined by its ecological environment), that strongly differ in [body size](#) and the habitat in which they live.

Dr Genner said: "We found large-sized individuals living along the rocky shoreline of Lake Tanganyika and, in the vicinity of these shores, we found small-sized individuals, roughly half the size of the large ones, that live and breed in accumulations of empty snail shells found on sand."

According to the study, the bigger [fish](#) outcompete the smaller ones, driving them away from the preferred rocky habitats and into the neighbouring sand, where the smaller fish find shelter for themselves and their eggs in empty snail shells.

"In effect, big and small fish use different habitats; and because of this

habitat segregation, fish usually mate with individuals of similar size. There is virtually no genetic exchange between the large- and small-bodied ectomorphs," Dr Genner commented.

Speciation occurs when genetic differences between groups of individuals accumulate over time. In the case of *Telmatochromis* there are no obvious obstacles to the movement and interaction of individuals. But, the non-random mating between large- and small-bodied fish sets the stage for the evolutionary play.

Dr Genner said: "The relevance of our work is that it provides experimental evidence that competition for space drives differential mating in cichlid fish and, in time, leads to the formation of new species. Nature has its ways – from body size differences to the formation of new species. And clearly, size does matter for *Telmatochromis* and for fish diversity."

Provided by University of Bristol

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