

Freshwater herring had salty origin

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East Africa's Lake Tanganyika has a highly diverse fauna which closely resembles marine animals. A researcher at the University of Zurich has traced the origins of the freshwater herring of the Lake to a marine invasion which occurred in West Africa 25 to 50 million years ago, coincident with a major oceanic incursion into the region. The ancient freshwater capture of marine organisms may help to explain the origins of other species unique to this Lake. The findings are published this week in the journal *PLoS ONE*.

Lake Tanganyika in East Africa is the oldest of the African Great Lakes and has the highest diversity of endemic species of any lake in the region. Its unique marine-like crabs, shrimps, snails and fishes led early researchers to suggest that the Lake must have once been directly connected to the ocean. More recent geophysical reconstructions clearly show that Lake Tanganyika originated through rifting in the African continent and was never directly connected to the sea.

While the history of the Lake basin is now well understood, the origins of the highly specialized and unique fauna of Lake Tanganyika have remained a puzzle. "The absence of closely-related species outside of Lake Tanganyika has made it extremely difficult to determine when the Lake was colonized and how much of its diversity arose within its borders", explains Tony Wilson. As the herring of Lake Tanganyika belong to a large group of freshwater fishes distributed throughout western and southern Africa, they offer one of the best opportunities to trace the evolutionary ancestry of members of the Lake's fauna.

The analysis of DNA data by Wilson’s team allowed the construction of the evolutionary tree of African herring, which clearly shows that the herring of West Africa colonized freshwater 25 to 50 million years ago, at the time of a massive marine incursion in the region. These freshwater colonists subsequently spread across central Africa, reaching Lake Tanganyika in the early stages of its formation.

“Although Lake Tanganyika was never directly connected to the ocean,” explains Wilson, “the endemic herring of the Lake are the products of a marine invasion that occurred long ago”. The extent of this marine incursion raises the possibility that other members of the endemic fauna of the Lake may also have marine origins.

Citation: Wilson AB, Teugels GG, Meyer A (2008) Marine Incursion: The Freshwater Herring of Lake Tanganyika Are the Product of a Marine Invasion into West Africa. *PLoS ONE* 3(4): e1979.
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