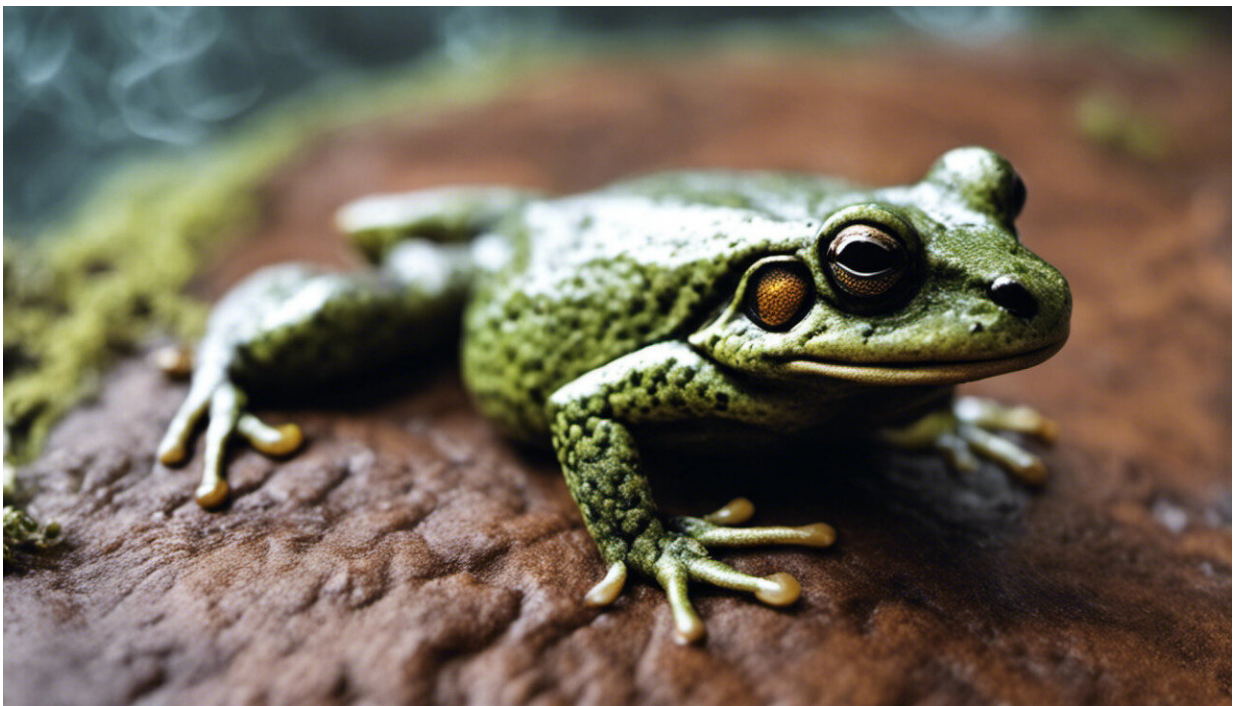


New amphibian family tree indicates they evolved tens of millions of years later than previously thought

September 1 2023



Credit: AI-generated image ([disclaimer](#))

Researchers, including Jeff Streicher, Senior Curator in Charge, Amphibians and Reptiles at the Natural History Museum, London, have unveiled the most extensive evolutionary tree of frogs (anuran amphibians) to date. This comprehensive phylogeny, based on hundreds

of genetic markers and a staggering 5,242 frog species, is set to transform our understanding of these fascinating creatures.

The study, "Frog phylogeny: a time-calibrated, species-level tree based on hundreds of loci and 5,242 species," is published in *Molecular Phylogenetics and Evolution*.

The new research has also shifted the possible start date for when living frogs began evolving. According to Jeff Streicher, a lead author on the paper, "Previously the group was thought to have begun to split into the thousands of species we see today around 210 or 220 million years ago. Our new analysis suggests instead that this date was around 180 million years ago. Finding that frogs are younger means that they diversified into thousands of species more rapidly than was thought before."

Frogs, with their diverse natural histories, have always been a subject of fascination for biologists and nature enthusiasts alike. However, previous attempts to create comprehensive phylogenies for these creatures were limited by the types of genetic data being used.

In this study, researchers addressed these limitations by developing an expansive family tree that combined [genetic data](#) from phylogenomic studies with hundreds of [genetic markers](#) that included only a few species, and data from hundreds of small-scale studies of frogs that sometimes used only one or two markers but collectively included thousands of species. This novel approach allowed them to include an astonishing 5,242 [frog species](#), representing a remarkable 71% increase from previous family trees.

Jeff Streicher says, "Phylogenetic trees are the starting point for most studies looking at a specific group of animals, so it is essential they are as accurate and detailed as possible."

Dan Portik, lead author adds, "Here not only have we increased the data that the frog phylogenetic tree draws upon but we also developed new software to help improve those data."

The researchers developed software to make it easier to compare genes that evolve large differences between species.

John J. Wiens, the senior author and a Professor at the University of Arizona says, "Previous studies were afraid to combine phylogenomic datasets with hundreds of markers with data from many smaller studies with fewer markers. We showed that this is not only possible, but also leads to an improved family-level tree that can include thousands of species. This same approach could be applied to any group of organisms."

The study represents a significant leap forward in our understanding of frog evolution and provides a valuable resource for researchers and offers new avenues for the study of anuran amphibians. As the [scientific community](#) continues to explore and expand our knowledge of these remarkable creatures, this comprehensive phylogeny serves as a foundation for future discoveries.

More information: Daniel M. Portik et al, Frog phylogeny: A time-calibrated, species-level tree based on hundreds of loci and 5,242 species, *Molecular Phylogenetics and Evolution* (2023). [DOI: 10.1016/j.ympev.2023.107907](https://doi.org/10.1016/j.ympev.2023.107907)

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