

# Diversification of land plants

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Mosses diversified in the shadow of flowering plants.  
Credit: G. Kite

Researchers have reconstructed phylogenetic relationships among all 706 families of land plants.

Some parts of the evolutionary history of land plants have been documented based on the fossil record and a few broad-scale phylogenetic analyses, especially focusing on angiosperms and ferns.

In new research published in [BMC Evolutionary Biology](#), Vincent Savolainen (Kew/Imperial College) and Omar Fiz (Imperial College), in collaboration with Harald Schneider ([Natural History Museum](#) London), have now reconstructed phylogenetic relationships among all 706 families of land plants using molecular data.

## Diversification rates and climate

The researchers dated the phylogeny using multiple fossils and a [molecular clock](#) technique. Applying various tests of diversification that take into account topology, branch length, numbers of extant species as well as extinction, they evaluated diversification rates through time.

They found evidence for the radiations of ferns and mosses in the shadow of angiosperms coinciding with the rather warm Cretaceous global climate. In contrast, gymnosperms and liverworts show a

signature of declining diversification rates during geological time periods of cool global climate.

This broad-scale phylogenetic analysis helps to reveal the successive waves of diversification that made up the diversity of [land plants](#) we see today.

**More information:** Fiz-Palacios, O., Schneider, H., Heinrichs, J. & Savolainen, V. (2011). Diversification of land plants: insights from a family-level phylogenetic analysis. [BMC Evolutionary Biology](#) 11: 341

Provided by Royal Botanic Gardens, Kew

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