

Why are there so many more species of insects? Because insects have been here longer

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J. B. S. Haldane once famously quipped that "God is inordinately fond of beetles." Results of a study by Mark A. McPeck of Dartmouth College and Jonathan M. Brown of Grinnell College suggest that this fondness was expressed not by making so many, but rather by allowing them to persist for so long.

In a study appearing in the April issue of the *American Naturalist*, McPeck and Brown show that many insect groups like beetles and butterflies have fantastic numbers of species because these groups are so old. In contrast, less diverse groups, like mammals and birds, are evolutionarily younger.

This is a surprisingly simple answer to a fundamental biological puzzle. They accumulated data from molecular phylogenies (which date the evolutionary relationships among species using genetic information) and from the fossil record to ask whether groups with more species today had accumulated species at faster rates. Animals as diverse as mollusks, insects, spiders, fish, amphibians, reptiles, birds, and mammals appear to have accumulated new species at surprisingly similar rates over evolutionary time.

Groups with more species were simply those that had survived longer. Their analyses thus identify time as a primary determinant of species diversity patterns across animals. Given the unprecedented extinction

rates that the Earth's biota are currently experiencing, these findings are also quite sobering. We are rapidly losing what it has taken nature hundreds of millions of years to construct, and only time can repair it.

Citation: Mark A. McPeck and Jonathan M. Brown, "Clade Age and Not Diversification Rate Explains Species Richness among Animal Taxa" *The American Naturalist*, volume 169 (2007), pages E97–E106 DOI: 10.1086/512135

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