

Re-thinking plant and insect diversity

October 13 2015

New research by biologists at the University of York shows that plant and insect diversity is more loosely linked than scientists previously believed.

Insects and flowering plants are two of the most diverse groups of organism on the planet. For a long time the richness of these two lineages has been regarded as linked, with plant-feeding insect groups considered unusually species rich compared with their nearest relatives.

In a new analysis, based on the most complete tree of insect relationships to date, researchers at the University have shown that there is not a simple relationship between insect [diet](#) and diversity.

Scientists have often been intrigued by the fact there are some incredibly rich plant-feeding insect groups, such as butterflies and weevils, while other groups are not so diverse.

True weevils are a family of plant-feeding beetles with over 40,000 species , while some families of fly only have a dozen or so.

The new analysis suggests that, rather than a simple, predictable relationship between diet and diversification, other factors must instead play a greater role in explaining diversity.

The study, published in the *American Naturalist*, aimed to explore whether feeding on plants, and their diet more generally, affects the diversity of insects.

James Rainford, a PhD graduate from the Biology Department said:
"Insects are massively species rich. The figure you often hear is that they make up half of all described species.

"We wanted to explore how species are distributed between different insect groups, because not all groups of insects are species rich. What kinds of groups are rich should tell you why they are.

"We found that there is not a consistent association between plant feeding and high [species richness](#), which was a bit of a surprise.

"We coded all the different groups for what they feed on and then looked more closely at which diets are consistently associated with higher or lower richness.

"The overall conclusion was none of them are. Diet doesn't seem to structure species richness."

Dr Peter Mayhew, also from the Biology Department, said: "The great thing about science is that new work can force you to re-consider what you previously took for granted. We think our work should do that for the relationship between insect diet and species richness.

"We did find that different diets evolve at different times through evolutionary history and are gained and lost at different rates, and that might help explain why some dietary classes are very species rich. But it doesn't appear to be due to general differences in the rate at which they diversify.

"More likely there is a complex relationship between diet and the rate of diversification. It might be that to become very species rich on a particular diet, you need to use a particular kind of niche, or you need a particular adaptation that other groups don't have. This more complex

picture is going to take a lot of working out. "

More information: Rainford JL, Mayhew PJ(2015) Data from: "Diet evolution and clade richness in Hexapoda: a phylogenetic study of higher taxa." *Dryad Digital Repository*. [dx.doi.org/10.5061/dryad.6f75v](https://doi.org/10.5061/dryad.6f75v)

Provided by University of York

Citation: Re-thinking plant and insect diversity (2015, October 13) retrieved 15 May 2024 from <https://phys.org/news/2015-10-re-thinking-insect-diversity.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.