

Tiny treetop flowers foster incredible beetle biodiversity

December 3 2020, by Caroline S. Chaboo



Using a specialized crane, the team was able to collect beetles from the very top of the forest canopy. Credit: Susan Kirmse, [CC BY-ND](#)

Biologists have long known that rainforest treetops support a huge number of beetle species, but why these canopies are so rich in beetle

diversity has [remained a mystery](#). New research by my colleague [Susan Kirmse](#) and [me](#) shows that flowering trees play a critical role in maintaining this diversity, and that beetles may be among the most diverse pollinators in the animal kingdom.

We carried out a one-year study in a remote part of the Amazon rainforest in Venezuela. We used a specially built crane to collect a total of 6,698 adult beetles representing 859 [species](#). These were gathered from 45 individual trees of 23 different tree species.

We were surprised to discover that the majority of these beetles—647, or 75.3% of species found – [were living on flowering trees](#). In fact, 527 [beetle species](#) in 41 families were associated exclusively with [flowers](#). Interestingly, the majority of these species—almost 60% – were exclusively found on trees that produce lots of small white flowers.

Overall, this discovery shows that flowering trees are likely among the most important drivers for maintaining the high [diversity](#) of beetles in rainforests. But this relationship goes both ways. Our study also suggests that beetles may be among the most underappreciated pollinators in tropical forests.

Why it matters

Tropical rainforests are the very heart of Earth's biodiversity. They harbor about [65% to 75% of all terrestrial species](#), including the most tree species and the most insects.

After finding such a tight relationship between beetles and flowering trees, we wondered: How many beetle species could be involved in pollination in the Amazon? Our study found an average of 26.35 unique beetle species for every species of tree. With an estimated [16,000 Amazonian tree species](#), this suggests that there might be more species

of flower-visiting beetles than any other insects on Earth, potentially surpassing by far the [20,000 species of bees](#) and the [19,000 species of butterflies](#).

Our study shows that flowering tree species play an important role as [diversity hotspots in tropical rainforest canopies](#). For policymakers and biologists hoping to preserve or restore rainforests, promoting the cultivation of trees and other plants—especially those with lots of small white flowers that beetles love—could help to maintain species-rich communities. Flowers are a very important resource, providing food and shelter for thousands of insects in addition to beetles. Thus, preserving plant diversity or selecting many different indigenous [tree species](#) for reforestation can enhance the diversity of insects.



Beetles like the *Griburius auricapillus* are just some of the hundreds of species that can be found in treetops. Credit: Susan Kirmse, [CC BY-ND](#)

What still isn't known

Our research was the first to describe this tight relationship between beetles and [rainforest](#) trees, especially with trees that produce thousands of small, simple flowers. But how this association came to be is still unclear.

Many of the beetle species were found only on trees with this particular type of flower. The trees get an obvious benefit: pollination. But what specifically these [trees](#) offer to the beetles requires further study. The [simpler flowers are easier for beetles to access](#), but is the appeal food, like petals, pollen or nectar? Or maybe a home to find mates or lay eggs for the young to grow?

What's next

To fight the worldwide rapid [declines in insect diversity](#), researchers and conservationists must understand the ecological connections between insects and their food plants. [Long-term studies](#), particularly in research plots like the one we used in Venezuela, allow researchers to collect layers of information that help unravel the complexity of diversity.

Yet such sites rely on political interest and stability. [Political instability in Venezuela](#) is preventing our fieldwork from continuing at the Venezuela plot.

While we can't return to our study site in Venezuela, it is clear that researchers must work together to understand the mysteries of life on Earth. But biologists are racing the clock as large rainforests are destroyed forever.

This article is republished from [The Conversation](#) under a Creative Commons license. Read the [original article](#).

Provided by The Conversation

Citation: Tiny treetop flowers foster incredible beetle biodiversity (2020, December 3) retrieved 12 July 2024 from <https://phys.org/news/2020-12-tiny-treetop-foster-incredible-beetle.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.