First quantification of the difference in spider diversity between tropical vs. temperate forests

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Abstract

High diversity in tropical compared to temperate regions has long intrigued ecologists. Terrestrial arthropods are among the most speciose orders in tropical rainforests. Previous studies show that arthropod herbivores account for much tropical diversity, yet differences in diversity of arthropod predators between tropical and temperate systems have not been quantified. Here, we present the first standardized tropical-temperate forest comparison of species richness and evenness for understory spiders, a dominant and mega-diverse taxa of generalist predators. Species richness was 13-82 times higher in tropical vs. temperate forests. Evenness was also higher with tropical assemblages having 12-55 times more common and 10-40 times more dominant species. By contrast, proportion of rare species were only up to two times greater than that of temperate measurements. These differences in diversity far surpass previous estimates, and exceed tropical-temperate difference for herbivorous taxa. Thus, the extreme diversity of arthropod predators is associated not only with the higher diversity of prey in tropical vs. temperate ecosystems, but probably also with increased diet breadth of understory spiders in the tropics. This work contradicts the widely accepted hypothesis that tropical diversity is associated with more specialization of predators.

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