
Drivers of spider assemblages in Hawaiian forest fragments (kipuka)

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Abstract

Kipuka are small Hawaiian tropical forest fragments surrounded by recent lava flows. Many of these kipuka are rich ecosystems that have been previously investigated for their importance for native passerine birds, plants (trees and ferns) and picture-winged flies (e.g. Muir & Price 2008 // *Molecular Phylogenetics and Evolution* 47: 1173-1180). However, these kipuka are threatened by several factors, including invasions by rats. Here, we assessed how assemblages of spiders, a taxon of generalist predators ecologically dominant in a large variety of habitats, were structured over space (sampling outside and inside kipuka of different sizes) and time (comparison with a similar study from 1998: Vandergast & Gillespie 2004 // *Environmental Entomology* 33: 1296-1305). Fieldwork (standardized hand-collection by night) was carried out near the Mauna Loa volcano (at an altitude of 1500m asl) on the Big Island of Hawaii, the youngest and largest island of the Hawaiian Archipelago, in April 2016. A total of 702 spiders was collected, representing 6 families and 26 (morpho-)species. We found that the number of individuals was linearly correlated with the area of sampled forests, suggesting that kipuka act, at least partly, as separate islands for these arthropods. Species richness and abundance of endemic spiders both dramatically decreased as the distance to the kipuka increased, with no more influence of the kipuka after 20m (result from 1998). Surprisingly, the number of non-native spider species substantially increased over the last 20 years, possibly due to an enhanced road traffic along the renovated highway (Saddle Road) that may have increased the spread of introduced species. The impact of these new generalist predators on the structure and functioning of kipuka is currently investigated using NGS techniques.

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