

Specialization of plant-hummingbird interactions along an altitudinal gradient in Costa Rica

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Summary

In order to understand the susceptibility of plant-pollinator relationships to global warming, I want to analyze the degree of specialization in mutualistic networks between understory plants and hummingbird pollinators at different altitudes in Costa Rica. I want to test whether specialization of plants and hummingbirds increases with altitude and whether this is related to pollen limitation of understory plants. I will carry out this study along two altitudinal transects at ten study sites in altitudes between 50 and 2050 m.a.s.l. During blooming peak, I will record the pollinator community of *Heliconia* spp. and other understory plants with hummingbird flowers using digital camcorders. To construct networks of plant-pollinator relationships, observation data will be complemented by an analysis of pollen grains sampled from mist-netted hummingbirds to assess trait complementarity. Studies of pollinator networks will be combined with experiments of pollen addition and hummingbird exclusion in a subset of plant species to determine pollen limitation and dependence on hummingbird pollinators. I hypothesize that network size and connectance decrease and pollen limitation increases at higher altitudes indicating that hummingbird pollinators depend on specific nectar plants and understory plants on specific pollinators. This would be an important finding in the context of global warming because it would indicate that plant-pollinator relationships in tropical mountains are not buffered at their altitudinal range margins and depend on synchronous altitudinal range shifts.