
Functional diversity of neotropical mangrove pollinators and their responses to land use change

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Abstract

Pollinators are declining as a result of anthropization. Despite the great importance that mangrove ecosystems have for human welfare, little is known about what is happening with mangrove pollinators and it is evident that its genetic diversity is been lost from degradation. This work evaluates for the first time the effects of mangrove patch areas and the surrounding landscape on the pollinator's composition of the four dominant mangrove species in Colombia's Caribbean coast. A total of 819 pollinator individuals, distributed in 30 families and 162 morphospecies, were collected in the study area. Sarcophagidae was diverse (28 spp.), followed by Crabronidae (15), Vespidae (15), Syrphidae (13), Halictidae (11), and Apidae (10). Vespidae was abundant (n=215), followed by Apidae (n=174), Crabronidae (n=103), Syrphidae (n=73), Sarcophagidae (n=66), Oedemeridae (n=46) and Halictidae (n=29). *Polybia occidentalis venezuelana* and *Apis mellifera* were abundant with 121 and 101 individuals, respectively; other species included less than 39 individuals. Pollinator communities were mainly represented by small and medium-sized, predators, saprophagous and florivorous, no-social, and no-nesting species. Pollinators in *Rhizophora mangle* were very scarce, meanwhile, *Conocarpus erectus* denoted a trend of niche differentiation, *Avicennia germinans*, and *Laguncularia racemosa* had similar functional compositions. Overall pollinator's abundance and richness did not change by mangrove patch area or landscape composition. However, the richness of ground-nesting wasps decreased, while the degree of specialization increased with mangrove patch areas. Urban areas negatively affected predators, big-sized species, and ground-nesting wasps. Changes in cropland areas surrounding mangrove forests did not affect the abundance, richness, and functional composition of mangrove pollinators, therefore, the implication of interaction network will be discussed in a conservation context.

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