Origin, diversity and endemism of the Neotropical Syrphidae: implication for conservation of rare and threated genera

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Abstract

The Neotropical region is well known for its rich biodiversity and constant conservation efforts. The region is characterized by a complex vegetation structure, heterogeneous topography, and singular geographical history, with recognition of 53 biogeographical provinces and seven hotspots. The region has been an obligatory route for many organisms, providing ecological opportunities for the establishment, adaptation, and permanence of a specialized fauna, whose origin and diversification constitute a hot research topic, but with a large gap in conservation status of its fauna.
The greatest diversity of Syrphidae occurs in the Neotropical region, with 1560 species (76.8% endemic), but with a large number of species still waiting to be discovered and/or described. Despite its exuberant richness, the region is facing anthropogenic pressures, putting at risk the survival of its species and the maintenance of the ecosystem services provided. Since the Neotropical region is considered one of the most threatened on Earth, biodiversity research is a priority to help design conservation actions.

In order to produce a comprehensive red-list, and identify target species for conservation, we developed a database with the currently valid Neotropical species of Syrphidae, including 129 genera, and 1535 species. Our analysis suggests that in terms of origin and diversity, the Neotropical fauna is composed of 4 distinctive elements: 83 Neotropical endemic genera (1182 spp, 76.8%), 29 Palearctic genera (205 spp, 13.5%), 12 Nearctic genera (146 spp, 9.6%), and a single Oriental genus (1 sp, 0.1%).

We identify cryptic genera whose species composition, rarity, and distinctive biogeographic patterns will be a starting point to assess the threats status in the Neotropical region.
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