Global patterns of insect diversity, distribution and evolutionary distinctness

Carlos Lopez-Vaamonde*[1,2]

[1]Unité de Zoologie Forestière, INRA, Orléans – Institut national de la recherche agronomique (INRA) : UR0633 – France

[2]Institut de Recherche sur la Biologie de l'Insecte (IRBI) – CNRS : UMR7261, Université François Rabelais - Tours – Avenue Monge 37200 TOURS, France

Abstract

Large-scale patterns of species diversity, distribution and evolutionary distinctness serve as the basis for conservation strategies and for developing theoretical models needed to predict the impact of global changes on biodiversity. However, all global species-level macroecology studies to date were carried out in vertebrates or plants, and nothing is known at that scale for insects, the most diverse group of terrestrial organisms. The ACTIAS project proposes to bridge that gap for the first time through a global-scale macroecology analysis of two of the best-documented families of moths. Benefiting from the wealth of diversity, distribution, ecology and phylogeny information available, including a DNA-barcode database for 95% of the world species, we use spatial distribution modeling methods to document the distribution of diversity and of its evolutionary distinctness, and to highlight areas where these are concentrated and most threatened.

Because the spatial and temporal dynamics of speciation are expected to cause disparities in the observed patterns, we explore the role of species-traits in shaping current diversity and distributions by combining traits and comparative phylogeographic analyses in New World species. These results can provide an objective ground for fine-tuning theoretical models within subgroups and for their test in other regions of the globe.

Keywords: biodiversity, macroevolution

*Speaker