
The Pacific basin as a laboratory to study islands disharmony

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Abstract

Biogeographers and naturalists have long observed and documented disharmony in islands, i.e. the compositional distinctiveness of islands compared to the mainland, but the first quantification of this concept is only very recent. A previous study on the world’s island floras showed a mixed effect of dispersal and environmental and biotic filtering, presenting disharmony as a useful entry point to understand the structure of island assemblages. In our study, we used the Pacific basin as a study system to test, at fine spatial grain, how the processes of dispersal and environmental and biotic filtering can result in disharmony in island faunas. We measured the diversity and proportion of families within the terrestrial orders of mammals, birds, and amphibians from their distribution ranges. The Pacific basin, bounded by continental margins, can bring new insights into disharmony because of the high diversity of geological and geomorphological attributes of its 1179 islands, and their complex history of dispersal events. This complex spatial matrix requires a robust statistical framework to disentangle the potential confounding spatial effects in the study area, the island characteristics, and the potential species pools. The first results of the models show how different potential source regions can shed light on the processes resulting in disharmony. Our work provides a contribution to a better understanding of spatial effects on disharmony.

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