
Insular threat associations within taxa worldwide

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Abstract

The global loss of biodiversity can be attributed to numerous threats. While pioneer studies have investigated their relative importance, the majority of those studies are restricted to specific geographic regions and/or taxonomic groups and only consider a small subset of threats, generally in isolation despite their frequent interaction. Here, we investigated 11 major threats responsible for species decline on islands worldwide. We applied an innovative method of network analyses to disentangle the associations of multiple threats on vertebrates, invertebrates, and plants in 15 insular regions. Biological invasions, wildlife exploitation, and cultivation, either alone or in association, were found to be the three most important drivers of species extinction and decline on islands. Specifically, wildlife exploitation and cultivation are largely associated with the decline of threatened plants and terrestrial vertebrates, whereas biological invasions mostly threaten invertebrates and freshwater fish. Furthermore, biodiversity in the Indian Ocean and near the Asian coasts is mostly affected by wildlife exploitation and cultivation compared to biological invasions in the Pacific and Atlantic insular regions. We highlighted specific associations of threats at different scales, showing that the analysis of each threat in isolation might be inadequate for developing effective conservation policies and managements. Nevertheless, human-driven species' declines and extinction are usually evaluated solely from the taxonomic perspective missing both evolutionary and functional species' characteristics. Considering complementary diversity components is a next crucial step to better assess and understand the structure and composition of species assemblages, and also to determine relevant conservation priorities for maintaining ecological processes in a global change context.

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