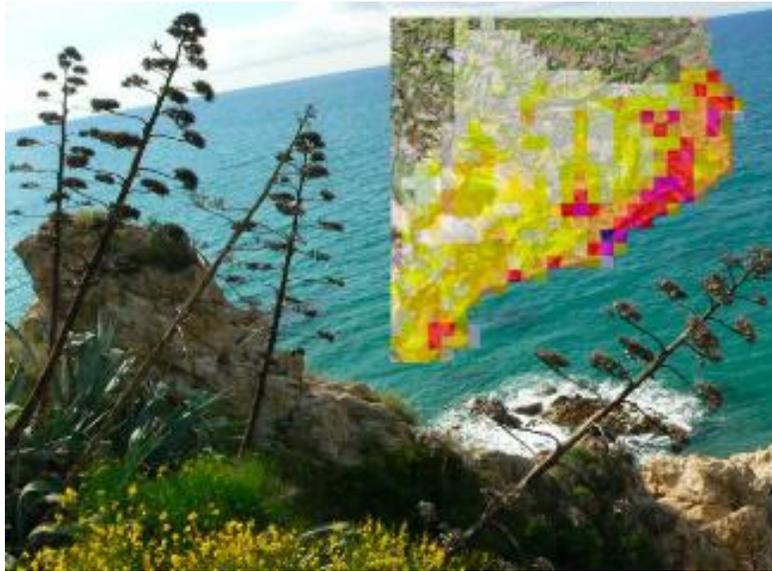


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Why areas with high diversity of plants are more invaded?



CREAF-UAB researchers have found why the high biodiversity areas, where less exotic plants invasion would be expected, have more exotic plants and, therefore, more invasion. The reasons for this are diverse, but human activity is the most prominent. Humans provoke sudden changes that allow exotic plants invade the high biodiversity areas that lose their "biotic resistance". Only studying in detail all these factors a fully understanding of exotic plants invasions will be achieved.

There are areas with high biodiversity, ie, very rich in species of plants, and other areas less so. Although in theory one would expect most biodiversity areas oppose more resistance to invasion by exotic plants, the opposite is observed: most diverse areas in native plants are also rich in exotic. Why?

There are shallow rooted plants and others with deep roots. There are plants that bloom in spring, while others do it in the fall. The fact that different plants possess different characteristics gives them the ability to use different resources. For example, the shallow roots absorb water

from the surface, while the deep-rooted plants use depth water. For this reason, communities that has high diversity of plants tend to use all available resources more efficiently. When an exotic plant is introduced into a community, it needs to use resources to survive. It was thought that rich communities invaded by exotic plant would leave no resources unused, and hence preventing the exotic plant to grow and establish in the area. There have been several controlled experiments showing this hypothesis called "biotic resistance": high biodiversity experimental plots are more resistant to invasion (or establishment of exotic species) than plots with low biodiversity. However, It seems that this is not the case in nature, but rather the contrary: When there are large areas with high biodiversity, those also present high invasion levels. Why experiments and observations show the opposite trends?

Researchers at CREAF have solved this paradox considering what common factors affect both native and exotic biodiversity. They found that some geographical factors, such as a favorable climate and a heterogeneous landscape are linked to high richness of native and exotic plants. But this does not explain the whole story. The most important factor explaining why areas with more native species also has more exotics is human activity. On one hand, human transport and release exotic plants, but also release many native plants such as weeds. In addition, areas of greatest human activity suffer more changes and disturbances, which change the availability and distribution of resources. Because plants can not rapidly adapt to these sudden changes, the "biotic resistance" of the community found in the experiments decreases. Only by studying in detail all the factors involved, we can understand the relationship between biodiversity and invasions.

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References

Bartomeus I., Sol, D., Pino J., Vicente, P., Font, X. (2011) Deconstructing the native-exotic richness relationship in plants. *Global Ecology and Biogeography* Volume 21, Issue 5, pages 524–533, May 2012

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