

SPECIAL FEATURE: INVASIONS AND INFECTIONS

Indirect effects of parasites in invasions

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Introduced species can disrupt biological communities and alter biodiversity worldwide when they spread extensively in novel habitats. Biological invasions are an increasing problem in this changing world, and ecologists are now considering the factors – environmental, man-made and biological – that influence their outcome. Recent research shows that parasites are a key factor influencing the success and impact of biological invasions by plants and animals. They can facilitate or limit invasions, and positively or negatively affect both native and invasive species. Parasites not only affect their host directly (by increasing mortality or reducing growth and reproduction), they also affect their hosts indirectly by altering interactions such as competition, herbivory and predation between different species. These indirect effects may occur because the parasite causes a reduction in host numbers or because the parasite causes changes in the host life history, morphology or behaviour.

We investigate the importance of these indirect interactions for invasion success, and the extent to which these effects ramify throughout communities and influence ecosystems undergoing biological invasion. A review of plant and animal invasions reveals the importance of parasites in mediating both competitive and consumer-resource interactions between native and invasive species. These interactions are influenced both by parasites already present in the native range and parasites that have hitch-hiked with



Invasive species disrupt communities in all habitats including freshwaters where invaders affect community structure and biodiversity.

Picture provided by authors

invasive hosts, and also by loss of parasites in invading host populations. The indirect effects of parasitic infection are important at a range of biological scales from within an individual host to the whole ecosystem.

We call for an interdisciplinary approach integrating community ecology, evolution and immunology to better understand these interactions in order to predict and manage the outcomes of biological invasions.