Worldwide invasion by Ulex europeus: a history of ecology, evolution and sociology.

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Abstract

The common gorse, *Ulex europaeus*, is an emblematic and beloved species in its area of origin (Western Europe); it was introduced in numerous regions of the world during the 19th Century due to its agricultural uses. Today, it is considered as a major invasive in a wide range of climates and altitudes (from sub-antarctic to inter-tropical zones). To understand how this species has moved from a useful status to that of a major invasive, and how it managed to adapt to such a wide range of climates, we have undertaken a long-term comparative study combining ecological, evolutionary and sociological approaches.
The studies made in its area of origin have allowed us to understand the colonizing properties and adaptability of gorse, showing its productivity, genetic diversity and evolutionary potential. The comparison with invaded areas (especially New Zealand and Reunion Island) has highlighted the evolution of several life-history traits, often toward an increased growth and reproduction. These evolutions could not be directly related to enemy release, but led us to propose a new hypothesis: the "Relaxation of Genetic Constraints". The sociological approach has explored the introduction, naturalization and geographical expansion of gorse, in relation to its past and current uses, and to the interaction between its biological properties and the socio-economic status of the colonized areas. This led us to propose the concept of "invasive niche" which we define as the sum of the natural and social conditions that lead a species to be considered invasive in a given socio-ecosystem.

Keywords: gorse, biological invasion, evolvability, interdisciplinarity, socio, ecosystem

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