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Grande salle de réunion

IS RECOVERY MORE IMPORTANT THAN RESISTANCE?

ELEVATIONAL DISEASE DISTRIBUTION IN A NATURAL PLANT PATHOGEN SYSTEM: INSIGHTS FROM GENETIC VARIATION AVOIDANCE AND RECOVERY RESISTANCE

par

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- Factors governing species distributions have become a central topic of discussion on the potential impacts of global climate change. The distribution of parasitic organisms is particularly important, as emerging and re-emerging infectious diseases are predicted to increasingly threaten public health, agriculture and biodiversity. Experimental evidence for the ecological and evolutionary factors that may determine disease distributions in natural systems is sparse. In particular, the intimate association of species-specific parasites with their hosts, often having long and entwined evolutionary histories, is sometimes characterized by a co-evolutionary arms race which may also play an important role in shaping where disease is found.
- Here, we investigated evolutionary factors that may contribute to the restricted distribution of anther-smut disease caused by *Microbotryum* spp. in high-elevation populations of its widespread host species, *Silene vulgaris*, in the alpine region of eastern France. Controlled laboratory inoculations were conducted in host populations from along four replicate transects to test the hypothesis that the pathogen is excluded from lower elevations by physiological resistance in the host.
- We found that high-elevation hosts were actually more likely to have higher rates of avoidance resistance (*i.e.*, lower rates of successful infection, classically used to test for "resistance" in this system), rates of recovery resistance (*i.e.*, delay or clearance disease following infection) were higher in diseased plants originating from lower elevations.
- Consistent with previous studies, we also found little variation in infectivity of fungal strains across elevation. These results indicate that spatial structure in host recovery resistance may contribute to the restricted distribution of anther-smut disease in *S. vulgaris*, whereas the contrary pattern of avoidance resistance may instead result from – rather than cause – the selective pressure of the sterilizing fungus' current elevational range.