
High importance of indirect evolutionary rescue in a small food web

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Résumé

Evolutionary rescue may allow species to survive environmental change, but how this mechanism operates in food webs is poorly understood. I investigated evolutionary rescue in a small model food web of two prey and two predator species, where prey were negatively impacted by environmental change. By systematically allowing evolution of each single species, I studied how its adaptation affects persistence of itself and others. The results show that the impact of evolution is highly species-specific and not necessarily positive: only one species, the specialist predator, consistently had a positive impact on overall persistence. Most strikingly, evolution overwhelmingly affected other species: rescue of others (indirect rescue) was far more frequent than self-rescue, and negative effects were nearly always indirect. This demonstrates that evolutionary rescue in food webs is inextricably bound up with species interactions, as the effects of evolution in one species ripple through the entire community. It is therefore critically important to consider the food web context in efforts to understand how species may survive global change.

Mots-Clés: evolutionary rescue, rapid evolution, climate change, eco, evolutionary feedbacks

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