



Article

Mutualisms in a changing world: an evolutionary perspective. 8

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Evaluations

Evaluated by [Fabio Bulleri](#) and [Ferdinando Boero](#) NEW EVALUATION

This paper provides a fresh perspective on evolutionary effects of global climate changes on mutualism, a class of species interactions that has existed since the beginning of life. We sense that this paper will inspire ecologists, evolutionary biologists and conservation practitioners.

Although negative species interactions are often viewed as the main drivers of community structure, in the last two decades, positive species interactions have received growing recognition for their role in the functioning of a plethora of natural systems. This paper examines how current anthropogenic disturbances and global climate changes could alter the evolutionary trajectories of mutualisms, formulating (and providing hints to address them) two key questions: i) are mutualistic interactions resilient or flexible enough to withstand current human perturbations?; ii) if they cannot, in their current state, can rapid evolution preserve partnerships over the decadal temporal scales characterizing human perturbations?

A number of scenarios are proposed (with illuminating examples) to illustrate potential evolutionary responses to human disturbances, including switches to antagonism or alternative partners, as well as loss or reinforcement of mutualism. The authors then attempt to identify features of mutualistic interactions that are likely to promote their own persistence, such as lack of strict dependence, ability to evolve rapidly to changing conditions, partnerships that enable the exploitation of new niches or to broaden tolerance to changing conditions, control over partners, tolerance of short-term costs associated with mutualism and the intrinsic ability of partners to buffer against fluctuations in environmental conditions. Laudably, this comprehensive account is written without losing sight of the complex array of species interactions operating in real ecological systems. The authors conclude by identifying the most promising research avenues for advancing our ability to anticipate future scenarios of mutualistic-interaction breakdowns, and highlighting major hurdles to their conservation. In summary, this paper provides a modern perspective on a class of species interactions that has existed since the beginning of life and will inspire ecologists, evolutionary biologists and conservation practitioners.

Competing interests: None declared

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Rating 8
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