A tale of two diversities

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Abstract

Efficient management of biodiversity aims at allocating conservation efforts in order to maximize diversity. Defining a diversity criterion is however far to be trivial; there is not one but several indices that can be used as biodiversity measures. This paper elicits and compares two in situ criterions for biodiversity conservation, based on two biodiversity indices stemming from different disciplines: Weitzman's index in economics and Rao's index in ecology. Both indices combines differently pieces of information about (1) species survival probability, and (2) measures of dissimilarity between species. In order to truly have in situ protection criterions, we add another layer of information about (3) the ecological interactions between species. Considering a simple three species ecosystem, we show that choosing one criterion or the other has policy implications, for they sometimes deliver diverging protection recommendations. We unravel the role played by the elements (1), (2) and (3) in the rankings, which allows us to highlight some specificities of the in situ criterions. Remarkably, other things equal, Weitzman's in situ ranking tends to favor "robust" species, while Rao's in situ ranking gives priority to "fragile" species.

Keywords: conservation priorities, ecological interactions, biodiversity indices

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