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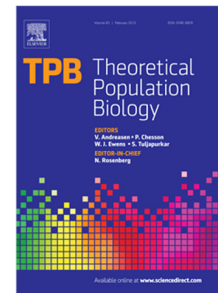
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Asymmetric dispersal in the multi-patch logistic equation

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Abstract

The standard model for the dynamics of a fragmented density-dependent population is built from several local logistic models coupled by migrations. First introduced in the 1970s and used in innumerable articles, this standard model applied to a two-patch situation has never been fully analyzed. Here, we complete this analysis and we delineate the conditions under which fragmentation associated with dispersal is either favorable or unfavorable to total population abundance. We pay special attention to the case of asymmetric dispersal, i.e., the situation in which the dispersal rate from patch 1 to patch 2 is not equal to the dispersal rate from patch 2 to patch 1. We show that this asymmetry can have a crucial quantitative influence on the effect of dispersal.

1 Introduction

We deal here with population dynamics of a fragmented population. This is a problem with potentially very important applied aspects. For example, in conservation ecology,

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