On the effects of migration and spatial heterogeneity on single and multiple species. (English summary)


Summary: “We first investigate in a logistic model the effects of migration and spatial heterogeneity of the environment on the total population size at equilibrium of a single species. Our study shows that (i) the total population size is maximized at some intermediate migration rate, and hence is a non-monotone function of the migration rate, and (ii) heterogeneity of the environment increases the population size. In the second part of this paper, these findings are applied to ecological invasions. For a two-species Lotka-Volterra competition model with migration, we show that (a) without migration, the invading species eliminates the resident species at every point of the habitat, whereas when migration is present, for certain ranges of migration rates the invader may be eliminated when it is rare, and (b) without migration, the two species can coexist at every point of the habitat, whereas when migration is present, for some ranges of migration rates one of the species is extinguished for all initial conditions.”

References

12. Y. Du, Effects of a degeneracy in the competition model, Part I. Classical and


Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.

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