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Joint evolution of specialization and dispersal in structured metapopulations

I propose a metapopulation model [1] that is mechanistically based on individual level processes and thus suitable for evolutionary analysis. I use adaptive dynamics [2] to study the joint evolution of dispersal and specialization in resource utilization in the case with consumers facing a trade-off between abilities to consume two different but nutritionally equivalent resources. I illustrate the evolutionary scenarios that are possible in this model. Moreover, I illustrate how different ecological parameters affect evolutionary dynamics. As the main result [3], I show that joint evolution may result in evolutionarily stable coexistence of three phenotypes, two specialists and a generalist, in a metapopulation comprising several patch types.

References

[1] Nurmi and Parvinen, 2008, *On the evolution of specialization with a mechanistic underpinning in metapopulations* Theor. Pop. Biol. **73** 222–243.

[2] Geritz et al, 1998, *Evolutionary Singular Strategies and the Adaptive Growth and Branching of the Evolutionary Tree* Evol. Ecol. **12** 35–57.

[3] Nurmi and Parvinen. *Joint evolution of specialization and dispersal in structured metapopulations.* J. Theor. Biol. In press.