

Evolving complex food webs

Alan McKane

School of Physics and Astronomy, University of Manchester
M13 9PL Manchester, U. K.

Abstract

We review the properties of a model which links together the ecological modelling of food web structure with the evolutionary modelling of speciation and extinction events. The model describes the dynamics of ecological communities on an evolutionary timescale. Species are defined as sets of characteristic features, and these features are used to determine interaction scores between species. A realistic population dynamics, which incorporates these scores, is used to determine the changes in population sizes on ecological time scales and so determine mean population sizes. Various properties of the model webs are measured and compared with data on real food webs. We will then present some recent results obtained in the context of this model. These include a study of the robustness of the web structure to changes in the way the model is constructed, an investigation into the possibility of still obtaining reasonable web structure without the introduction of features into the model, and the nature of island webs obtained by immigration from a large mainland.