How likely is speciation in neutral ecology ?

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1 Introduction

How patterns of biodiversity arise through ecological and evolutionary processes is a central question in modern ecology. According to Hubbell's neutral theory of biodiversity (NTB), patterns of biodiversity such as species-abundance distributions can be explained by the balance between speciation, dispersal and random extinction. The neutral theory provides a good fit to species distribution curves, and it has been extended in several ways. The neutral theory has been shown to be flexible enough to fit nearly any distribution, but it is often regarded as a valid starting point and an interesting null hypothesis for community ecology.

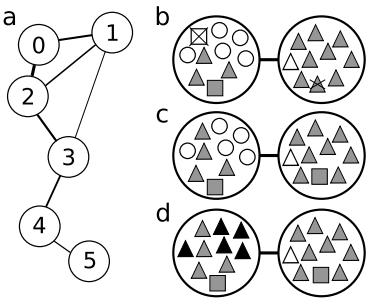

Figure 1: **The metacommunity as a graph of local communities. Each community is connected by dispersal to one or more communities.**

While a lot has been said about the assumption of ecological equivalence, much less attention has been given to the speciation mode, which is sometime seen as the theory's weakest point. In recent years, some studies altered the speciation model within neutral ecology. However, nothing has been done to relate the theory to population genetics and known models of speciation, despite the fact that, as Etienne et al. noted, such a mechanistic model could eventually force us to reject neutrality. The neutral theory with point speciation has also been criticized for predicting too many rare species,