Null and neutral are different

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Null versus neutral models: what's the difference?

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The neutral model posits that random variation in extinction and speciation events, coupled with limited dispersal, can account for many community properties, including the relative abundance distribution. There are important analogies between this model in ecology and a three-tiered hierarchy of models in evolution (Hardy Weinburg, drift, drift and selection). Because it invokes random processes and is used in statistical tests of empirical data, the neutral model can be interpreted as a specialized form of a null model. However, the application and interpretation of neutral models differs from that of standard null models in three important ways: 1) whereas most null models incorporate species-level constraints that are often associated with niche differences, the neutral model assumes that all species are functionally equivalent. 2) Null models are usually fit with constraints that are measured directly from the data set itself. In contrast, the neutral model requires parameters for speciation, extinction, and migration rates that are almost never measured directly, so their might be viewed as a mechanism that contributes to pattern along with other processes. Alternatively, the fit of data to the neutral model can be compared to the fit to other process-based models that are not based on neutrality assumptions. Finally, the neutral model can also be tested directly if its parameters can be estimated independently of the test data. However, these approaches may require more data than are often available. For these reasons, simple null model tests will continue to be important in the evaluation of the neutral model.

The neutral model (Bell 2000, Hubbell 2001) has generated great interest and controversy among ecologists. Some of these debates echo earlier controversies in the 1980s over null model analysis (Gotelli and Graves 1996). Indeed, Enquist et al. (2002) have claimed that the

A test of the unified neutral theory of biodiversity

- Assumption that Zero-sum multinomial (ZSM) distribution fits better the data
- Comparison of neutral (ZSM) with a null assumption (Lognormal)
- ZSM fail to fit empirical data better 95% of the time