Estimating Biodiversity Indices

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Abstract

In this talk, statistical models and estimation procedures for estimating a variety of biodiversity indices are reviewed. The following topics are included:

(1) Species richness estimation: estimating the number of species in a community (or assemblage) based either on observed species frequencies or on multiple incidence data.
(2) Shared species richness: estimating the number of shared species for two communities based on sample data from each community.
(3) Prediction: predicting the number of new species that would be discovered in a second survey, based on frequency data from an initial survey.
(4) Diversity indices: estimating various diversity indices including Shannon's entropy index and Simpson's index in a community.
(5) . The incidence-based indices include the classic Jaccard and Sorenson indices, and the abundance-based indices include the Bray-Curtis, Morisita-Horn and two newly developed abundance-based Jaccard and Sorenson indices.

Program SPADE (Species Prediction And Diversity Estimation) developed by Chao and Shen (2003) is introduced to analyze various data sets. Program SPADE along with User's Guide can be freely downloaded from Anne Chao's website at http://chao.stat.nthu.edu.tw/softwareCE.html