

Diatom 14: 41-49 (英文)

大塚泰介：何殻を数えるべきか？ II. 多様性指数を算出する場合

Taisuke Ohtsuka : How many frustules should we count? II. To calculate diversity indices.

#### Abstract

Necessary sample sizes, and adequate estimators, to estimate diversity indices are discussed. Three samples of epilithic diatom communities collected from different rivers were used to decide the necessary sample sizes. From each sample, 14400 frustules were counted. Using these samples, three indices of diversity were examined : Shannon-Wiener's index, Simpson's index, and Itow-Morisita's index. Some unbiased estimators of each index were also examined. These unbiased estimators usually reduced the bias of the standard estimators. However, the variance of unbiased estimators was always larger than that of the standard estimators. Judging from the mean-square error (MSE), the two unbiased estimators (Morisita's and jackknife estimators) of Shannon-Wiener's index were better than the standard estimates. In contrast, the standard estimator of Simpson's or Itow-Morisita's index was better than the unbiased estimators. When the sample size was 400, the square-root of MSE was usually <5% of Shannon-Wiener's index, and it was always <10% of Simpson's or Itow-Morisita's index.

Key index words

diatom community sample, diversity index, sample size, unbiased estimator.