

## Bootstrap confidence intervals for Shannon biodiversity index

L. Pla<sup>1</sup> y S. D. Matteucci<sup>2</sup>

### Abstract

Whatever the index used to quantify biodiversity, An aspect that has received little attention in biodiversity studies is that of associating estimated indexes with confidence levels. One option could be the "bootstrap" method. (which do not require normality assumption and may be used with any sample size.) The aim is to choose the best approach to construct bootstrap confidence intervals (BCI) with known probability (1- $\alpha$ ) for the Shannon biodiversity index ( $H'$ ). Six Falcón State dry tropical forest Beard formations were chosen to compare four bootstrap techniques. For each combination, B=5000 bootstrap samples were generated to calculate an CI estimate of 95% for the following methods: the standard BDC, the simple percentile BCI, the percentile difference BCI and the bias corrected BCI percentile. The comparison was based on interval length and shape. The 185 selected sites had biodiversity indexes from  $H'=0.557$  to  $H'=4.097$  and richness from 8 to 129 species. Empirical distribution showed a slightly positive asymmetry. The percentile bias corrected method stood up in practice to the theoretical expectations, and its results are consistent with various sizes of the original sample. The percentile bias corrected procedure reproduces the asymmetric empirical distribution with shape index of: 0.458 for desert, 0.501 for thorn woodland, 0.548 for seasonal forest, 0.652 for cactus scrub, 0.659 for gallery forest and 0.914 for dry evergreen bushland. This method may be applied to other biodiversity indexes in order to establish average confidence levels in point estimation.

**Key words:** Re-sampling, Beard formations, tropical dry forests, Falcón, Venezuela

---

Recibido el 3-6-2000 ● Aceptado el 12-6-2001

1. Departamento de Ambiente y Tecnología Agrícola - Universidad Nacional Experimental 'Francisco de Miranda'. Apdo. 7434, Coro 4101, Venezuela. E-mail: laura@reacciu.ve

2. Investigador independiente de CONICET, Centro de Estudios Avanzados - Universidad de Buenos Aires, J.E. Uriburu 950, 1 piso, Capital Federal 1114, Argentina. E-mail: smatt@arnet.com.ar