Estimating the species richness by a Poisson-compound Gamma model – Online Supplementary

1 Confidence interval

For $\hat{N}_{PCG}$, we adopt a standard bootstrap approach for confidence interval estimation. Given data $n_1, \ldots, n_t$ and $\sum n_j = D$, let $g[j; \hat{G}_\alpha(\lambda)], j = 1, 2, \ldots$ be the fitted zero-truncated Poisson mixture probabilities. For each bootstrap sample, we generated $D$ observations from $g[j; \hat{G}_\alpha(\lambda)]$. The cross-validation procedure is applied to each bootstrap sample and $\hat{N}_{PCG}$ is calculated. The interval spanned by the 2.5th and 97.5th percentiles of $N$ estimates is regarded as the bootstrap confidence interval.

For the other four mixture-based estimators including $\hat{N}_{WL}, \hat{N}_{PCG_2}, \hat{N}_{PCG_3}$ and $\hat{N}_{FM}$, the same bootstrap procedure was followed.