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The iterative process of plant species inventorying for obtaining reliable biodiversity patterns

Silvia C. Aranda, Helena Hespanhol, Nídia Homem, Paulo A. V. Borges, Jorge M. Lobo, Rosalina Gabriel

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Abstract

We require representative data of species occurrence to explain plant diversity patterns, but most of the available information is incomplete and biased. To improve our knowledge, we suggest that species inventorying should be an iterative process encompassing the following: (1) the detection of taxonomic and geographical gaps; (2) the planning of a survey design to reduce such gaps; and (3) the evaluation of field sampling results. Here, we focus on the latter phase for the bryophytes of Terceira Island (Azores) for which we have previously estimated < 1% of the area as well surveyed based on historical collections. To examine the performance of our stratified survey based on two factors (land use and environmental regions), we used rarefaction curves, ANOVA tests and bootstrap sampling. We recorded 40% of all the species known for the island and presented eight new citations. The species assemblages remained similar between historical and current inventories. Most localities had completeness values > 85%, but we always exceeded the optimal sampling effort. Land uses and environmental regions affected species diversity, but, unexpectedly, to a different degree. Our study illustrates the difficulties of planning field surveys to obtain reliable biodiversity patterns, even when prior information and standardized sampling protocols are explicitly considered. © 2015 The Linnean Society of London, *Botanical Journal of the Linnean Society*, 2015, 177, 491–503.