



EXPLORING THE BRYOPHYTE FLORA USING FERN SPECIES-RICHNESS HOTSPOTS

A mohaflóra feltárása harasztfajgazdagsági gócpontok alapján

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Bryophytes are often inconspicuous and difficult to detect, whereas ferns are larger and more readily observable. We evaluated whether local hotspots of fern species richness can be used to guide bryofloristic surveys in the Mecsek Mountains, southern Hungary. The approach was examined in two complementary studies using one-square-metre plots, with the results evaluated against earlier detailed bryofloristic surveys of the same areas. First, we assessed its effectiveness in forested valleys, with particular emphasis on the detection of rare and protected bryophytes. Second, we tested whether it is also applicable in built-up areas.

At each sampling location, fern species were identified in the field, while collected bryophytes were identified under laboratory conditions. We examined relationships between fern and bryophyte richness, compared species composition and ecological characteristics between habitat types, and tested whether individual fern species or co-occurring fern assemblages indicated bryophyte occurrences more frequently than expected. Pairwise associations were analysed using probabilistic co-occurrence models, while fern combinations were evaluated as joint-presence predictors of bryophyte occurrence using binomial generalized linear models. Community composition was explored by non-metric multi-dimensional scaling.

Targeting local fern-richness hotspots enabled time-efficient detection of a substantial proportion of the bryophyte flora in forested valleys, including rare and protected species that are otherwise difficult to locate. The approach also proved useful in urban environments and yielded floristic records not documented by the earlier detailed surveys. Maximum fern richness did not differ significantly between urban and near-natural habitats, although the mean number of fern species was lower in built-up areas. In neither habitat type was bryophyte richness directly related to fern richness. Nevertheless, urban and near-natural assemblages differed clearly in species composition. Urban sites were characterized mainly by more light-demanding species tolerant of drier and more base-rich conditions. Strong positive associations between individual fern and bryophyte species were uncommon, whereas fern species combinations provided a larger number of informative predictions.

Our results indicate that fern-richness hotspots are effective survey targets despite the absence of a direct richness relationship between the two plant groups. This method can therefore complement conventional bryophyte surveys in both forested and urban landscapes.