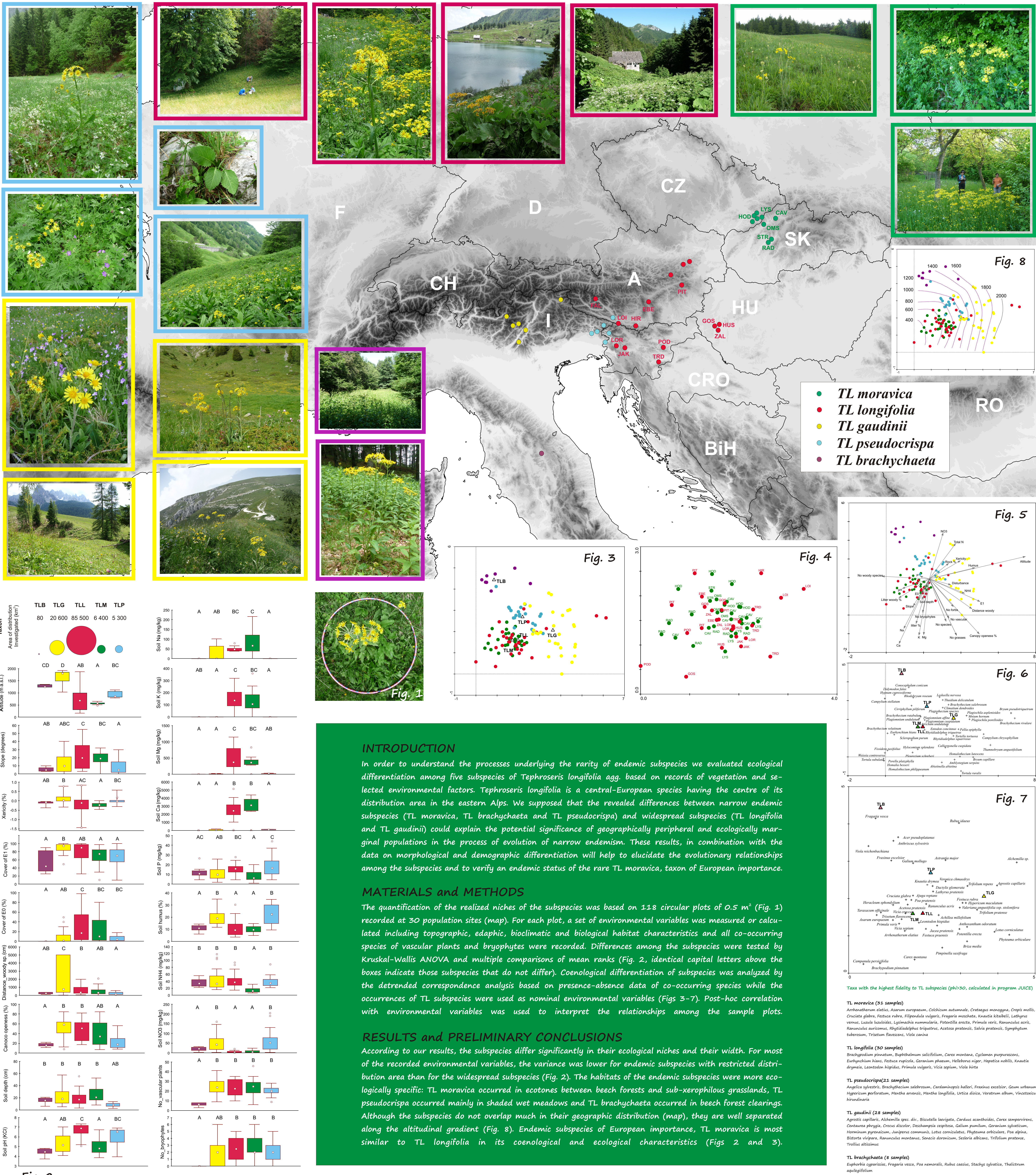




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Phytosociological and ecological interspecific differentiation within *Tephrosia longifolia* agg. Do endemic and widespread subspecies differ in their ecological niches?

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INTRODUCTION

In order to understand the processes underlying the rarity of endemic subspecies we evaluated ecological differentiation among five subspecies of *Tephrosia longifolia* agg. based on records of vegetation and selected environmental factors. *Tephrosia longifolia* is a central-European species having the centre of its distribution area in the eastern Alps. We supposed that the revealed differences between narrow endemic subspecies (TL *moravica*, TL *brachychaeta* and TL *pseudocrispa*) and widespread subspecies (TL *longifolia* and TL *gaudinii*) could explain the potential significance of geographically peripheral and ecologically marginal populations in the process of evolution of narrow endemism. These results, in combination with the data on morphological and demographic differentiation will help to elucidate the evolutionary relationships among the subspecies and to verify an endemic status of the rare TL *moravica*, taxon of European importance.

MATERIALS and METHODS

The quantification of the realized niches of the subspecies was based on 118 circular plots of 0.5 m² (Fig. 1) recorded at 30 population sites (map). For each plot, a set of environmental variables was measured or calculated including topographic, edaphic, bioclimatic and biological habitat characteristics and all co-occurring species of vascular plants and bryophytes were recorded. Differences among the subspecies were tested by Kruskal-Wallis ANOVA and multiple comparisons of mean ranks (Fig. 2, identical capital letters above the boxes indicate those subspecies that do not differ). Coenological differentiation of subspecies was analyzed by the detrended correspondence analysis based on presence-absence data of co-occurring species while the occurrences of TL subspecies were used as nominal environmental variables (Figs 3–7). Post-hoc correlation with environmental variables was used to interpret the relationships among the sample plots.

RESULTS and PRELIMINARY CONCLUSIONS

According to our results, the subspecies differ significantly in their ecological niches and their width. For most of the recorded environmental variables, the variance was lower for endemic subspecies with restricted distribution area than for the widespread subspecies (Fig. 2). The habitats of the endemic subspecies were more ecologically specific: TL *moravica* occurred in ecotones between beech forests and sub-xerophilous grasslands, TL *pseudocrispa* occurred mainly in shaded wet meadows and TL *brachychaeta* occurred in beech forest clearings. Although the subspecies do not overlap much in their geographic distribution (map), they are well separated along the altitudinal gradient (Fig. 8). Endemic subspecies of European importance, TL *moravica* is most similar to TL *longifolia* in its coenological and ecological characteristics (Figs 2 and 3).

Fig. 2 (median, 25–75 percentiles, non-outlier range and outliers)



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