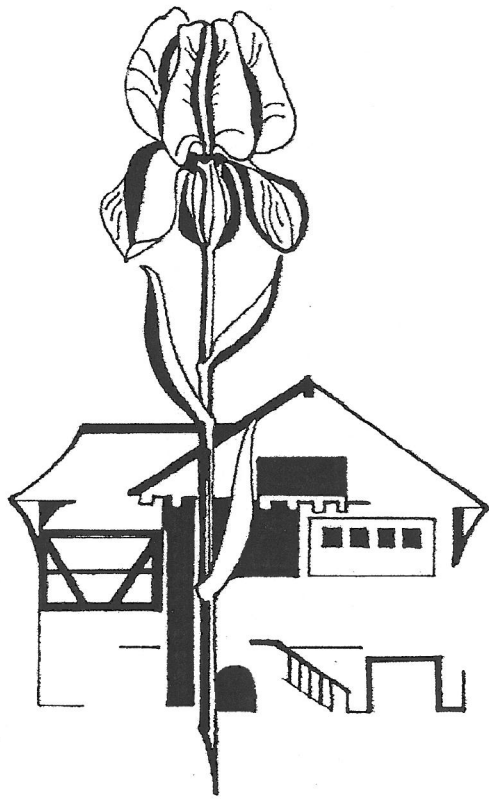


# Kurzfassungen der Vorträge und Poster



**14.**

## **ÖSTERREICHISCHES BOTANIKERTREFFEN**

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## PHYLOGENY AND BIOGEOGRAPHY OF THE *EUPHORBIA VILLOSA* GROUP (EUPHORBIACEAE) IN EUROPE

### Phylogenie und Biogeographie der *Euphorbia villosa* Gruppe (Euphorbiaceae) in Europa

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*Euphorbia* is one of the largest genera of seed plants with mostly tropical distribution. Around 100 species are native to Europe (*Euphorbia* subgenus *Esula*), with the highest diversity in Southern Europe. The members of the *Euphorbia villosa* group (sometimes referred to as *E. palustris* group) are, in contrast to most other species of *Euphorbia*, mesophilous plants growing in damp habitats. Alongside *E. villosa* Waldst. & Kit. ex Willd. and *E. palustris* L. (sometimes considered conspecific with *E. velenovskyi* Bornm. from southeastern Europe), which are widely distributed, there are endemic taxa in the Northeastern Alps in Austria (*E. austriaca* A. Kern.) and the Carpathians (*E. sojakii* (Chrtek & Křísa) Dubovik, *E. carpatica* Woł.); and *E. semivillosa* Prokh. replaces *E. villosa* in easternmost Europe. The circumscription and taxonomic status of the (endemic) taxa has been debated in the past, and the relationships among them are poorly understood.

We have used nuclear ribosomal ITS (internal transcribed spacer) and plastid *trnT-trnF* sequences from almost 30 populations to infer the phylogenetic position of the *E. villosa* group within *Euphorbia* and, additionally, AFLP fingerprinting to test the relationships among the taxa and link them with their distributions.

*Euphorbia villosa* group is supported as monophyletic with moderate (parsimony analyses of the plastid data) to good support (ITS data, Bayesian analyses of the plastid data), nested within the clade largely corresponding to the *Euphorbia* sect. *Tulocarpa* (Raf.) Prokh. (syn. *E. sect. Helioscopia* Dumort, sect. *Tithymalus* Scop. subsect. *Galarrhaei* Boiss.). The relationships to the other members of the section are unresolved. *Euphorbia velenovskyi* is no member of the *E. villosa* group, as it is positioned elsewhere in sect. *Tulocarpa*. The ITS phylogeny infers *E. pilosa* L. from Asia as sister of the European members of the *E. villosa* group (other Asian species likely belonging to this group were not included in our study, and *E. pilosa* was not included in our *trnT-trnF* phylogeny). *Euphorbia palustris* is sister to all other European taxa with good support in the ITS phylogeny, whereas the relationships among the latter are unresolved. In the plastid phylogeny *Euphorbia palustris* is nested within other taxa of the group, possibly as a result of ancient hybridisation, and the relationships within the group are unresolved. This is in line with the AFLP data, indicating no clear geographic or taxonomic structure within the group, whereas *E. palustris* is clearly divergent.

Our results suggest that the endemic taxa, such as *E. austriaca* or *E. carpatica*, do not form independent evolutionary lineages, and their characteristic morphology different from *E. villosa*, is a result of other factors, e.g., positive selection in certain genes, differential expression of genes, or epigenetic changes. The results are similar as in the case of the *Heliosperma pusillum* (Waldst. & Kit.) Rchb. group, where morphological differentiation into low- and high- elevation taxa is not supported by molecular data. Further studies are needed to explain such patterns and better understand the role of different mechanisms contributing to the formation of distinct morphological/ecological populations that are phylogenetically not supported.