

Cryptic diversity in European *Gentianella* section *Gentianella* (Gentianaceae)

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Gentianella section *Gentianella* (Gentianeae, Swertiinae) includes ca. 20 taxa in Europe of which the majority is found in and around the Alps. Most taxa are highly variable due to ecological polymorphism among populations in different habitats and in part due to seasonal dimorphism. Investigations from reproductive biology, common garden experiments, morphology, nrDNA, cpDNA, and AFLP have revealed various patterns of divergence and in some cases disagreement between genetic and morphological data.

Genetic data (AFLP) in contrast to morphology indicate clear differentiation into two cryptic species within the widespread *G. germanica* agg. resulting in *G. rhaetica* in the Eastern Alps and *G. germanica* s.str. in northern Central Europe. These allopatric cryptic or sibling species appear to have been separated by Pleistocene climatic oscillations. Extensive patterns of haplotype sharing were observed in the cpDNA RFLP data. Both hybridization or introgression as well as incomplete lineage sorting can generate such patterns. It is, however, difficult to distinguish between these two processes. In the case of *Gentianella* reticulate evolution (introgression) may explain such patterns to a high degree as well as the often found morphological uncertainties or gradients on range margins of several taxa. AFLP data provided evidence for various scenarios of introgression and reticulate evolution among *G. rhaetica*, *G. obtusifolia*, and *G. austriaca* in the eastern Alps. Such reticulate patterns and/or ancient polymorphism towards southeastern Europe may be the reason for unclear relationships within *G. austriaca* agg. and its relation to other taxa especially in south-eastern Europe. The significance of those various cryptic patterns for conservation is discussed.

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