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Carpathians as major geographic barriers shaping the phylogeographic history of *Erythronium dens-canis* (Liliaceae) in Europe: insights from plastid DNA sequences

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The impact of Quaternary climate events on intraspecific history of deciduous forest herbs remains poorly understood when compared with the arctic-alpine plant species which have been extensively studied in the last decade.

Erythronium dens-canis L. is disjunctly distributed from the Iberian Peninsula to Ukraine without extending above the Alps. It is a typical deciduous forest geophyte inhabiting also mesophytic meadows in the subalpine belt. It remains thus challenging to test its past presence in regions which have been hypothesised to be characterised by cold and dry steppe vegetation during Quaternary climate fluctuations.

We studied the plastid *rpl32-trnL* IGS sequence variation in an initial sample set of *E. dens-canis* originating from different parts of the species range, using *E. caucasicum* and *E. sibiricum* samples as outgroups. Although based only on a modest dataset (12 sequences from 12 populations), parsimony network and phylogenetic tree analyses uncovered a striking phylogeographic pattern and recognition of a 'Transylvanian', and a 'non-Transylvanian' lineage suggesting the long standing isolation of species within the Transylvanian basin. Genetic distances (in terms of number of mutations) between the Transylvanian, non-Transylvanian samples and *E. caucasicum*, are broadly equal suggesting an early split probably in the late Tertiary. Samples from the Iron Gates and Oltenia region of Romania, south-western Hungary and the Iberian Peninsula shared one single haplotype, whereas the five samples sequenced from Transylvania are clustered to four haplotypes. The haplotype richness from Transylvania is suggestive for the past existence of several local refugia. Moreover, the Transylvanian populations are confidently subdivided according to the tepal colour: white flowered populations (*E. dens-canis* var. *niveum*) from Apuseni Mts. are grouped together as compared with the pink flowered populations from different parts of Transylvania.

Ongoing denser sampling of the species and endeavours aiming to study a nuclear DNA region will hopefully reveal the species' complete phylogeographic history.

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Festuca pseudodalmatica Krajina consideration: the Volcanic Carpathians or European steppe zone?

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While revising genus *Festuca* L. (Poaceae) within the flora of Ukraine and conducting comparative analysis of obtained data from neighboring territories, it was revealed that consideration (conception) of *F. pseudodalmatica* species in different parts of Europe varies significantly.

According to Russian school (Alexeev, 1975; Tzvelev, 1976), *F. pseudodalmatica* traditionally is considered as cerulea fescue with higher stems, longer leaves, bigger spikelet than of *F. valesiaca* and also with possible fusion of sclerenchyma strands. The distribution area is considerably wide: European steppe zone until Ural, Western Siberia, Caucasus, Asia Minor, Mediterranean.

At the same time, according to the protologue and the traditions of Western European schools, *F. pseudodalmatica* additionally differs by the longer inflorescences and the confluence of sclerenchyma strands is not described anywhere. However, distribution of the species is limited to a small territory along the inner side of the Carpathians (Krajina, 1930; Májovský, 1955; Beldie, 1972; David and Záchenská, 2010; Dúbravková, 2010).

We studied more than 100 populations of *F. valesiaca* agg. in Ukraine. The typical specimens of *F. pseudodalmatica* (according to protologue) occurred exclusively in the region of the Volcanic Carpathians [Lovachka Mt. and Chorna Gora (Black Mountain)] in the rocky xerothermic meadows, considered to be relict by many authors. The remaining blue-gray "large" populations appear to be morphologically a very heterogeneous material.

To authors' consideration, East European *F. pseudodalmatica* tends to be a fake aggregated taxon. Perhaps, it is confused with similar "small" species not described yet and possibly of hybrid origin. However, it is also possible that data about the species in Western Europe lacks and its peculiarities in the eastern part of distribution area are not considered. Yet, we prefer first hypothesis.

REFERENCES

- ALEXEEV EB. 1975. Narrow-leaved fescues (*Festuca* L.) of European part of the USSR. *Novosti Sistematiki Vysshikh Rastenii* 12: 11-43.
- BELDIE A. 1972. *Festuca* L. In: *Flora României*, Bucureşti: 459-559.
- DÚBRÁVKOVÁ D, CHYTRÝ M, WILLNER W, ILLYÉS E, JANIŠOVÁ M, and KÁLLAYNE SZERÉNYI J. 2010. Dry grasslands in the Western Carpathians and the northern Pannonian Basin: a numerical classification. *Preslia* 82: 165-221.
- KRAJINA V. 1930. *Festuca*. Schedae ad floram cecoslovenicam exsiccata. *Acta Botanica Bohemica* 9: 184-220.
- MÁJOVSKÝ J. 1955. Asociácia *Festuca pseudodalmatica*-*Potentilla arenaria* na východnom Slovensku. *Biológia* 10: 659-677.
- TZVELEV NN. 1976. *Poaceae* USSR. Nauka, Leningrad: 382-417.