

Hydraulic traits of *Juniperus communis* L. across elevations and European populations

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1 – BACKGROUND

Hydraulic safety } Plant hydraulics → determines the susceptibility to drought, and therefore plant vitality and species distribution
 Hydraulic efficiency }

Species' hydraulic plasticity → suitable to detect species' performance under changing climatic conditions

Plasticity depends on:

- Phenotype } Analyses →
- Genotype }
- Elevational transect
- Common-garden

Powerful approaches to explore the inter/intra-specific plasticity of traits (Körner 2007, Xiankui and Chuankuan 2018)

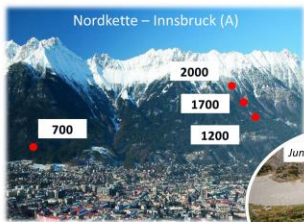
2 – OBJECTIVES

Analyses of the intra-specific hydraulic variability (hydraulic safety and efficiency) of *Juniperus communis* L. in terms of

- genome plasticity (through provenances experiment)
- phenotypic plasticity (through elevational transect)

3 – METHODS

ELEVATIONAL TRANSECT



PROVENANCES



Hydraulic safety (Vulnerability curves → P12-50-88)



Hydraulic efficiency (Ks)



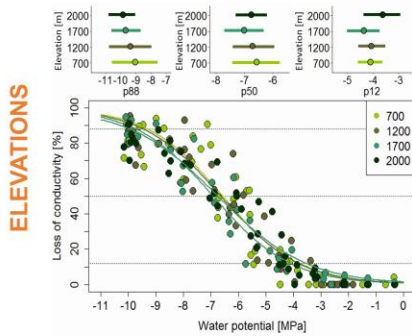
Flow meter (Sperry et al. 1998)

STATISTIC:

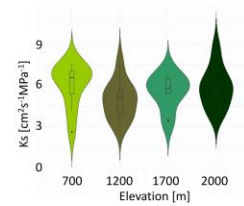
Anova + Tukey-post-hoc test

4 – RESULTS

HYDRAULIC SAFETY

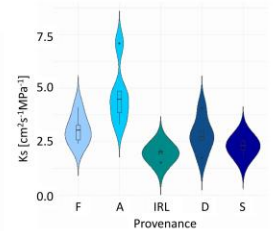
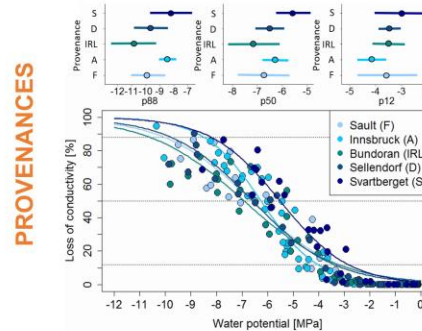


HYDRAULIC EFFICIENCY



Tukey-post-hoc test &

ANOVA: No significant differences between elevations for P12 - P50 - P88 and Ks



ANOVA: No significant differences between provenances for P12 - P50 - P88 and Ks

Tukey-post-hoc test:

- Irish provenance was the less vulnerable (P50 – P88)
- Swedish provenances was the most vulnerable (P50 – P88)
 - Austrian provenance was the most efficient

5 – DISCUSSION & CONCLUSION

- Common juniper is highly resistant to drought and showed surprisingly homogenous hydraulic traits
- Neither relevant genotypic nor phenotypic plasticity in studied hydraulic traits was observed
- However, due to its overall high drought resistant, Common Juniper can be considered as less susceptible to the effects of a warmer climate

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