



# XVII OPTIMA Meeting

20-23 September 2023  
Erice, Italy

ABSTRACTS



Università  
degli Studi  
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Oral Presentations, Posters

*Organized by:*

OPTIMA (Organization for the Phyto-Taxonomic Investigation of the Mediterranean Area)

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*PLANTA* – Mediterranean Center for Research, Documentation and Training

OPTIMA (Organization for the Phyto-Taxonomic Investigation of the Mediterranean Area)

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**Abstracts**

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## **Adaptive plasticity in regeneration traits of *Echium vulgare* (Boraginaceae) from contrasting habitats: a preliminary study**

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Over time, studies of plants growing in contrasting environmental conditions were refined by considering the intraspecific functional trait variability (ITV) and related trade-offs, providing useful insights into species adaptive capacity. In nature, edaphically stressful habitats provide unique opportunities to study the factors and mechanisms promoting ITV. Among these habitats, the serpentine outcrops represent edaphic islands characterized by extreme physical-chemical anomalies: low Ca/Mg ratio, pH values ranging from basic to ultrabasic, nutrient deficiency, especially in nitrogen and phosphorus, phytotoxic concentrations of metals, dark soils subject to extreme heat and drought during summer. In such context, a previous study detected a relevant ITV in *Silene paradoxa* leaf traits, with the populations from serpentine sites showing traits polarised towards the stress-tolerant adaptive strategy.

In this preliminary study, we aimed to evaluate the intraspecific variability of the regenerative traits Seed Mass and Germination Rate in three populations of *Echium vulgare* growing across stressful and non-stressful environments. The fruits were collected from 75 and 30 individuals from, respectively, serpentine outcrops of Monte Ferrato (Italy; hereafter MFER) and Librazhd (Albania; hereafter ALB). Fruits were also collected from 50 plants on Monte Amiata (Italy; hereafter, MAMI) on non-serpentine soil. On average, the plants collected were 15 cm in height in MFER and 40 cm in MAMI and ALB. To evaluate variations in seed mass, 80 mericarps were randomly selected for each population (MFERR, ALB, MAMI), and weighed using an analytical balance. Germination rates were tested by placing ten replicates of 8 mericarps per provenance in seed germination boxes with filter paper moistened with deionized water. Germination boxes were placed in a growth chamber with a 12h/12h day-night cycle with a constant temperature of 20° C and 59% relative humidity. The duration of the germination test was 30 days, with a daily frequency of surveys. All the seedlings were transferred to pots with neutral soil and propagated for future surveys.

A non-parametric Kruskal Wallis test was performed to compare seed mass among populations, and showed significant differences between ALB and MFERR. MFER showed the lower seed mass values. No differences in seed mass were evidenced in relation to the native soil type. As for germination rate, soil type significantly affected the variability among populations, with the MAMI population clearly showing a lower percentage of germination and a later germination compared with the other two provenances, MFER and ALB.