

Serbian Plant Physiology Society

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Institute for Biological Research „Siniša Stanković”, University of Belgrade

# 2<sup>nd</sup> International Conference on Plant Biology

## 21<sup>th</sup> Symposium of the Serbian Plant Physiology Society

### COST ACTION FA1106 QUALITYFRUIT Workshop



Petnica Science Center, June 17-20, 2015

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## The variation pattern of antioxidative enzymes in wild populations of *Iris pumila* inhabiting contrasting light environments: a reciprocal transplant experiment

PP6-10

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High solar irradiation is abiotic factor that can cause oxidative stress in plants, especially when co-occurs with drought and elevated temperatures. To investigate the adaptive responses of major antioxidative enzymes, superoxide dismutase (SOD), ascorbate peroxidase (APX) and catalase (CAT) to high-light stress in *Iris pumila*, a rhizomatous perennial plant, we conducted a reciprocal transplant experiments within its natural habitats in the Deliblato Sands (Serbia). The leaf tissue of 20 reciprocally transplanted genotypes from two natural populations inhabiting an open and a shaded habitat were used for the immunoblot analyses of SOD, APX and CAT. In the open habitat, Cu/ZnSOD expressed two isozymes, whereas in the shaded one three Cu/ZnSOD isozymes were observed. The total amount of Cu/ZnSOD was lower in sun-exposed genotypes compared to their shaded counterparts. Conversely, the amount of MnSOD appeared to be greater in genotypes exposed to full sunlight than in those growing under the vegetation shade. The enzyme APX expressed three isozymes in all genotypes from both populations, but the total APX content was greater in leaves developing in full sun-light than in those from the vegetation shade. A small increase in the amount of CAT polypeptide was observed in genotypes growing in the shaded habitat compared to their counterparts growing in the open, in both populations. The results suggest that the adaptive response of *I. pumila* genotypes to high-light stress encompasses a concerted change in both the expression and the content of major antioxidative enzymes regardless of their population origin.

**Keywords:** high-light stress, antioxidative enzymes, reciprocal transplant experiment, *Iris pumila*

## Flowering and reproductive performance of *Iris variegata* genotypes in different light conditions

PP6-11

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Plants grown under canopy shade show a range of responses to the change in light quantity as well as in red/far-red ratio of the ambient light, i.e. light quality. These responses, known as the shade-avoidance syndrome, or near neighbor detection response, are characterized, among others, by changes in flowering phenology and reproductive output. The individual's flowering pattern is defined by the timing or temporal distribution of flowering (start of flowering, average flowering period), the duration of flowering, as well as the number of flowers produced. We analyzed the genetic variability and phenotypic plasticity of flowering pattern and reproductive success in 97 genotypes of *Iris variegata* originating from contrasting light habitats in Deliblato Sands and expressed under different experimental light conditions. Rhizome segments were taken from each of these clones and transplanted in the experimental garden near the Institute for Biological Re-

search in Belgrade. Significant differences between genotypes were found for two traits (start of flowering, average flowering time). Genotypes originating from open and understory habitats significantly differed in three traits (number of flowers, number of capsules/number of flowers, seed mass/capsule). Significant effect of light treatment was found for three traits (number of capsules/number of flowers, seed mass/capsule, average seed mass). Statistically significant correlations between explored traits were generally similar but also to some extent habitat- and treatment-specific. Comparing these results with research carried out on congeneric species we noted that there were similar responses for some traits, but also significant differences in some components of flowering and fruiting success.

**Keywords:** genetic variability, *Iris variegata*, light environment, flowering phenology, reproductive output

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