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(22nd SPPS Meeting)

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POSTER PRESENTATIONS

Flower color polymorphism in *Iris pumila* - Why we definitely need *in situ* reflectance spectroscopy in population analysis and evolutionary studies of this model system

PP3-1

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Dwarf bearded iris - *Iris pumila* L. is a perennial clonal plant that exhibits huge flower colour polymorphism with white, yellow and various shades of purple and violet flowers. Maintenance of such polymorphism is very interesting evolutionary question in its own right. Moreover, flower colour is also used in determining individual clones, their size and population diversity - all very important aspects of further population and evolutionary studies on this model system. However, visual identification or use of digitalized images, while being a necessary first step, is not sufficient for this task. They are often subjective, dependent on light conditions, and covering only part of the spectrum - one that is visible to humans. In published papers that utilized flower colour in *I. pumila*, number of analyzed different colour variants ranged from nine to only three colour classes. Chemical analysis of different colour variants is a very useful tool and has also been applied, but it is hardly applicable for most population level analyses. We therefore consider portable reflectance spectrometer as the best available tool for those multiple tasks, and present preliminary results of its application *in situ* with wavelengths chosen to match the visible spectrum of *I. pumila* main pollinators.

Keywords: flower colour polymorphism, spectroscopy, reflectance, *Iris pumila*

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Characterization of ns rapeseed germplasm collection based on the content of fatty acids and tocopherols

PP3-2

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Rapeseed (*Brassica napus* L.) is the most common source of vegetable oils in Europe. One of the main breeding objectives is to create rapeseed genotypes with highly appreciated nutritional characteristics. The aim of this study was to investigate fatty acid and tocopherol constituents (α-, β-, γ-tocopherols) in a collection of 49 NS rapeseed genotypes and to identify genotypes with desired content of fatty acids and tocopherols using multivariate statistical methods: principal

component, cluster and two-way cluster analysis. Principal Component Analysis revealed 5 PC components with Eigen value >1, which explained 78.70% of the total variability. The PC analysis identified oil quality traits that contributed most to the variation of analyzed genotypes and can be used for facilitating the selection of desirable characteristics in rapeseed breeding. Both cluster analysis and two-way cluster analysis helped the identification of genotypes with similar fatty acid and tocopherol composition. Two main groups could be identified on the dendrogram, the first having two genotypes and the second comprising 44 genotypes. Three genotypes did not belong to any group. The extent of variation within the breeding material was clearly illustrated and the genotypes from one side, and analyzed oil quality traits from the other side, were effectively classified on the heatmap. The obtained results confirmed that classification and characterization of rapeseed germplasm and the selection of superior genotypes for commercialization or as parents in future hybridization program can be effectively performed by using multivariate analysis.

Keywords: rapeseed, fatty acids, tocopherols, multivariate analysis

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Do pollinators prefer bigger floral organs? A case study on *Iris pumila* L.

PP3-3

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Angiosperm flowers serve as an advertisement for pollinators and are, therefore, believed to be shaped by pollinator-mediated selection. The large flower size, which is one of the distinct characteristics of the genus *Iris*, might have evolved under the strong selective pressures imposed by pollinators, either because larger flowers indicate more rewards or because the pollinators can detect them from a greater distance. To test the role of visual floral signals in attracting pollinators and, consequently, pollination efficiency, we compared the phenotypic expressions of flower height and centroid size of petaloid floral organs: falls, standards and style arms, as well as anthocyanin absorption between naturally pollinated and non-pollinated flowers of *I. pumila* plants grown in a common-garden experiment. Our results indicated that *I. pumila* pollinators generally preferred taller flowers with greater organ sizes compared to the alternative ones. However, the direction of pollinator-mediated selection appeared to be strongly flower organ-specific: positive on fall, negative on style arm and neutral on standard size. The observed results are in agreement with the functions that each of these floral structures has in the pollination process: standards are a long-distance reward signals, falls are landing platform for pollinating insects, while style arms, as upper parts of the pollination tunnels, promote pollen deposition. We failed to corroborate the existence of pollinator-mediated selection on anthocyanin absorption. This suggested that some other aspects of flower colour might be more attractive to insect pollinators, or that different biotic or abiotic factors could account for the maintenance of flower colour polymorphism in *I. pumila*.

Keywords: floral organ size, anthocyanins, pollinator attraction, *Iris pumila*

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