

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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tum (tomato) fruits. Tomato plants were grown during summer in the open field and two types of polytunnels, PT1 (UV-A 1.45 mV cm<sup>-2</sup>, UV-B 3.84 μV cm<sup>-2</sup>, PAR 750 μmol m<sup>-2</sup> s<sup>-1</sup>) and PT2 (UV-A 0.37 mV cm<sup>-2</sup>, UV-B 0.03 μV cm<sup>-2</sup>, PAR 760 μmol m<sup>-2</sup> s<sup>-1</sup>) and fruits were taken in august. The contents of lycopene, β-carotene and flavonoids (quercetin and kaempferol) were determined by HPLC in the tomato exocarp and pulp. Regardless of UV radiation exposure, higher amounts of lycopene, flavonoids and β-carotene were measured in exocarp compared to the pulp. Accumulation of phenolics, in both exocarp and pulp was the highest in fruits collected in the field. Similarly, the concentration of epidermal flavonoids was the highest in the leaves of plants from the open field. These results support the protective functions of flavonoids as UV-screens and antioxidants from high PAR. Moreover, the content of lycopene was the highest in exocarp and β-carotene in the pulp of fruits exposed to full ambiental UV radiation doses, compared to fruits collected in the polytunnels. The results implicate that the controlled exposure to solar UV radiation during crop growth may be used as a stimulator of biosynthesis of compounds with high antioxidative capacity thus improving the fruit quality and nutritional value.

**Keywords:** UV radiation, *Lycopersicon esculentum*, pigments, flavonoids

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## Volatile compounds of golden fern (*Asplenium ceterach* L.) detected during the process of rehydration

PP8-51

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Volatile organic compounds (VOC) emitted by fronds of desiccation tolerant fern *Asplenium ceterach* L. during the rehydration process were investigated. Head-space GC-MS analysis was used in order to determine the volatile compounds in dry and rehydrated sample of golden fern. It was found that the VOC profile of golden fern is based mainly on isomeric heptadienals (over 25%) and decadienals (over 20%), other linear aldehydes, alcohols and related compounds. Aerial parts of fresh and dry fronds do not contain monoterpene-, sesquiterpene- and diterpene-type hydrocarbons or corresponding terpenoids. In order to determine the composition of the VOC during the process of rehydration, we have applied proton-transfer reaction mass spectrometry (PTR-MS). PTR-MS is a sensitive technique that allows real-time detection of VOCs emitted from plants. We have used dry plants to establish a base line and then distilled water was added to induce hydration process of the golden fern plant. Masses in the range from m/z 21 to m/z 300 were measured with dwell time of 200 ms and for the time period of 24 hours. The experiment was repeated for five plants. PTR-MS measurements revealed that the amounts of compounds, determined by head-space GC-MS, generally exhibit a significant increase after addition of water. After about 20 hours the values measured by PTR-MS for these masses are reduced to a new base line that corresponds to the rehydrated plant.

**Keywords:** golden fern, rehydration, PTR-MS, headspace GC-MS

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