

==== POSTER ABSTRACTS ====

Photosynthetic Response Under Long-Term Drought Stress in Somatic Hybrids Between Potato and *Solanum Bulbocastanum*

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Potato (*Solanum tuberosum*) is a sensitive plant to biotic and abiotic stress, some of the main stress factors affecting potato yield being the drought stress and the late blight disease caused by *Phytophthora infestans*. In order to obtain resistant cultivars to late blight somatic hybrids between cultivated potato and *Solanum bulbocastanum*, carrying two broad spectrum resistance genes against late blight (*Rpi-blb1* and *Rpi-blb3*), were produced previously by protoplast electrofusion (Rákosy-Tican *et al.*, 2015). Somatic hybrids which proved to be resistant to late blight were screened also for drought stress tolerance and the long-term drought stress effect on the plant photosynthesis was verified.

Photosynthesis is a very sensitive process, the presence of an abiotic or biotic stressor leading to several deviations from its normal progress. Therefore, it can be used as an indicator of overall plant fitness. In the first stage of experiment somatic hybrids were pre-selected for drought tolerant genotypes *in vitro*. Taking into account the obtained results genotypes which proved to be drought tolerant and resistant to late blight were selected. These genotypes were introduced on a plant phenotyping platform at Biological Research Centre Szeged, Hungary, where the biomass accumulation under long-term drought was monitored. In the beginning and in the end of the experiment long-term drought stress effect on plant photosynthesis was quantified. Somatic hybrids and the *S. bulbocastanum* parent proved to be tolerant to the applied moderate drought. The integrity of the system

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which directs the light energy from the antenna to PSII was not affected, moreover due to the drought stress the photosynthetic pigments reorganized and their density increased around the active reaction centre in the second measurement. The calculated effective quantum yield revealed that the carbon fixation is negatively affected only by the end of the experiment, these findings sustaining the results obtained from biomass accumulation measurements. In the drought stressed group the quantity of excess energy which was dissipated by non-photochemical process (Non-Photochemical Quenching) was decreased from the first measurement to the second measurement event, that suggests the plants used more efficiently the energy by photochemical process in the end of experiment.

Based on the measurements the effect of drought stress on photosynthesis is more accentuated in the beginning of the experiment, the tolerant clones having the capacity to adapt and by the end the photosynthesis parameters were stabilized. All measured parameters proved that in the somatic hybrids and *S. bulbocastanum* the photosynthesis was enhanced at the beginning of moderate drought stress.

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