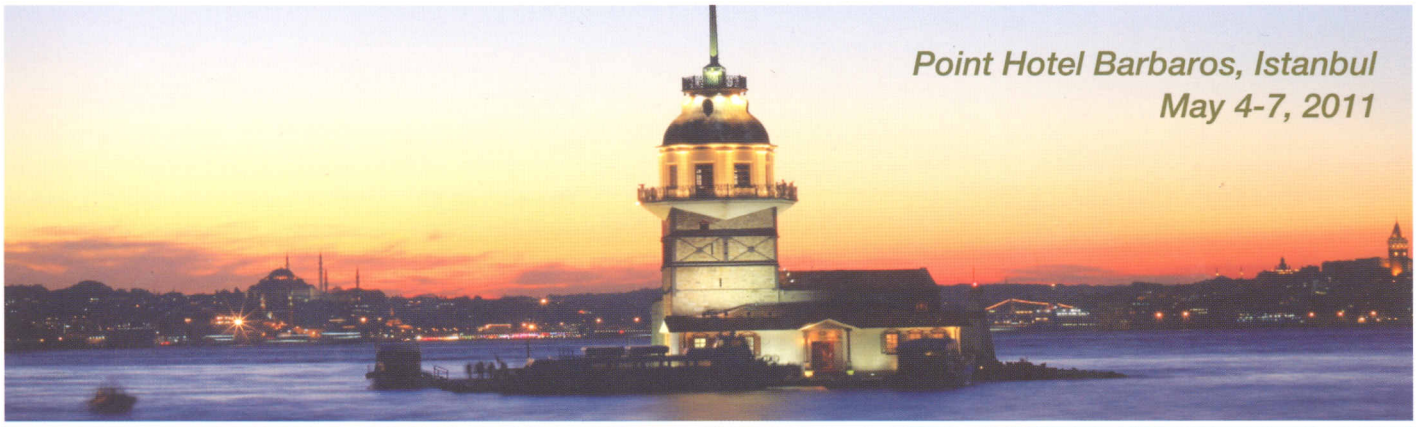
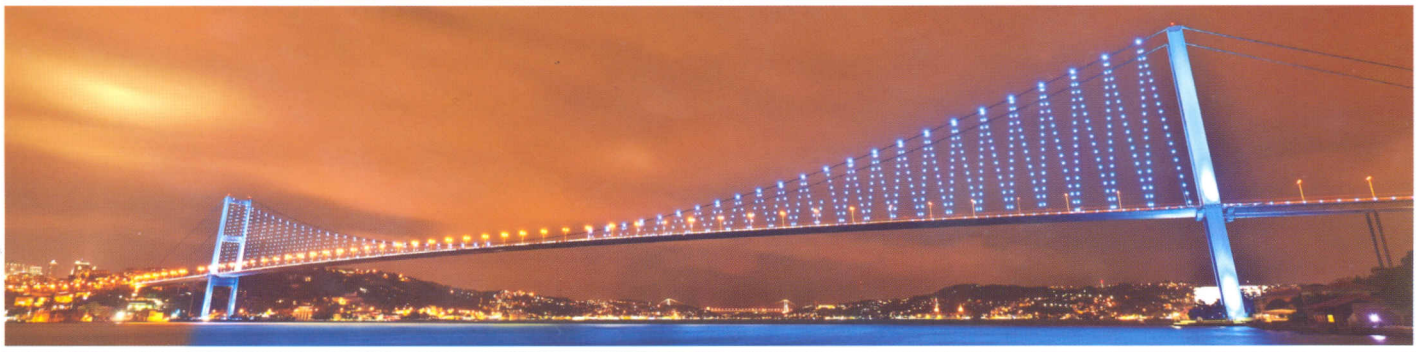
# 9.

## Plant GEM Istanbul 2011
## Plant Genomics European Meetings


**The Plant Genomics European Meeting (Plant GEM) meets global challenges.**



*Point Hotel Barbaros, Istanbul*
*May 4-7, 2011*



**ABSTRACT BOOK**

P05

## THE MITIGATING EFFECTS OF NITRIC OXIDE AND HYDROGEN PEROXIDE PRE-TREATMENTS TO SALT-STRESSED STRAWBERRY PLANTS

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Nitric oxide (NO) and hydrogen peroxide (H2O2) are reactive nitrogen and oxygen species with a well-documented signaling role necessary for maintenance of cell redox homeostasis. In the present study we tested whether hydroponic pre-treatment of strawberry (Fragaria x ananassa cv. Camarosa) roots to H2O2 (10 mM for 8 h) and sodium nitroprusside (SNP - NO donor; 100 μM for 48 h), could induce long lasting priming effects and tolerance to subsequent exposure to 100 mM NaCl for 8 d. Both root pre-treatments resulted in significantly reduced leaf chlorophyll degradation, ion leakage and lipid peroxidation levels in comparison with plants directly subjected to salt stress, suggesting a systemic mitigating effect of NO and H2O2 pre-treatments to cellular damage resulting from abiotic stress factors. Furthermore, both pre-treatments lead to reduced de novo synthesis of NO and H2O2 in leaves following salt stress, minimizing oxidative and nitrosative stress in strawberry plants. Finally, an NaCl stress-induced decrease in the ascorbate and glutathione redox state was partially prevented by both pre-treatments, providing strong evidence that H2O2 and NO elicit increased systemic antioxidant activity in strawberry plants under salt stress conditions.

P06

## MORPHOLOGICAL, GENETIC AND CYTOGENETIC VARIABILITY OF GYMNADENIA CONOPSEA AGG

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To resolve taxonomic position and differentiation of the related species of genera Gymnadenia, a detailed study of the morphology, chromosome numbers, genetic variability and distribution of these taxa in the european areas was carried out. In totally, we analyzed 43 populations of Gymnadenia conopsea agg. (G. conopsea, G. montana, G. alpina and other minority cytotypes), Gymnadenia odoratissima and Gymnadenia densiflora from the Czech Republic, Slovakia, Austria, Italy. One of the presumption for polyploid research in natural systems is knowledge of the geographic distribution of cytotypes. DAPI flow cytometry accompanied with confirmatory chromosome counts was used to determine ploidy level in 3577 Gymnadenia individuals from 43 populations. The fine-scale spatial pattern in cytotype distribution (intra- and interploidy associations) was analyzed by univariate and bivariate K-functions. Gymnadenia tissues undergo a progressively partial endoreplication, which accounts for ~60% and ~75% of the total genome in G. conopsea and G. densiflora, respectively. Two majority (4x, 8x) and three minority (6x, 10x, 12x) cytotypes were found, often in mixed-ploidy populations (harbouring up to all five different ploidy levels). The sampling was designed to cover as much morphological variation as possible and results of morphometric analyses confirmed a good morphological separation between G. densiflora and G. conopsea. Principal component analysis, unweighted pair-group method using arithmetic averages and complete linkage cluster analysis were performed, using population samples characterized by the mean values of characters as operational taxonomic units. For the detection of inter- and intraspecific genetic variation we used AFLP, PCR-RFLP cpDNA, ISSR and SSR markers. AFLP and SSR were able to detect polymorphisms with higher efficiency than PCR-RFLP cpDNA and ISSR markers.