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Salinity effects on chloroplast PSII performance  
in glycophytes and halophytes

**William J. Percey, Andrew McMinn,  
Jayakumar Bose, Michael C. Breadmore,  
Rosanne M. Guijt and Sergey Shabala**

1003–1015

This paper investigates effect of salinity stress and K<sup>+</sup> nutrition on photosynthetic parameters of isolated chloroplasts and shows that chloroplasts' ability to regulate ion transport across the envelope and thylakoid membranes play a critical role in leaf photosynthetic performance under salinity.

Potassium fluxes and reactive oxygen species  
production as potential indicators of salt  
tolerance in *Cucumis sativus*

**Mirvat Redwan, Francesco Spinelli, Lucia Marti,  
Matthias Weiland, Emily Palm, Elisa Azzarello  
and Stefano Mancuso**

1016–1027

Salt stress has a high impact on crop yield, with current global annual losses being around US\$27 billion. Among horticulture crops, cucumber (*Cucumis sativus*) is considered a moderately salt-sensitive species. Here, we report a study on two cultivars of cucumber with different tolerance to salt. The ability of roots to retain K and produce reactive O species is important for salt tolerance screening and plant breeding programmes.

Proteomic responses in shoots of the facultative  
halophyte *Aeluropus litoralis* (Poaceae)  
under NaCl salt stress

**Wassim Azri, Zouhaier Barhoumi, Farhat Chibani,  
Manel Borji, Mouna Bessrouer and Ahmed Mliki**

1028–1047

Very little is known about the adaptation mechanism of *A. litoralis* under saline conditions. In this study, we investigated salt tolerance mechanisms adopted by this halophyte. Proteomic analyses revealed that the reduction of proteins related to photosynthesis and induction of proteins involved in glycolysis activity and TCA cycle and energy metabolism could be the main mechanisms for salt tolerance in *A. litoralis*.

Comparison of full-length and conserved segments  
of wheat dehydrin DHN-5 overexpressed in *Arabidopsis*  
*thaliana* showed different responses to abiotic and  
biotic stress

**Marwa Drira, Moez Hanin, Khaled Masmoudi  
and Faïçal Brini**

1048–1060

Dehydrin proteins play a key role in stress tolerance in plants. The aim of this work was to highlight the role of the different conserved domains of a wheat dehydrin (DHN-5) overexpressed in *Arabidopsis* transgenic plants. We showed that DHN-5 via its K-segments may play a role in the improvement of tolerance to abiotic and biotic stress. It remains to be seen the effect of the over-expressing of DHN-5 in the development of crops with multiple stress tolerances.

Protection by light against heat stress in leaves  
of tropical crassulacean acid metabolism plants  
containing high acid levels

**G. Heinrich Krause, Klaus Winter, Barbara Krause  
and Aurelio Virgo**

1061–1069

Plants exhibiting crassulacean acid metabolism are highly heat sensitive in the dark when malic acid has accumulated in cell vacuoles overnight. The present investigation on *Clusia* and *Agave* shows that light effectively eliminates the increased heat sensitivity seen at high acid levels. It is concluded that in the dark, heat-induced efflux of malic acid from vacuoles causes damage to leaf tissue, particularly to chloroplasts, whereas under illumination, damage is avoided by turnover of the acid during photosynthetic metabolism.

*Cover illustration:* Reactive oxygen species (ROS) and salt tolerance in cucumber seedling roots (see Redwan *et al.* pp. 1016–1027). 2',7'-Dichlorofluorescein staining was used to detect peroxides generated in response to 3 h treatment of 100 mM of salt by confocal microscopy analysis in Polan. Scale bar = 50µm. Image by Lucia Marti, Elisa Azzarello and Mathias Weiland.

Genetic variation in Fe toxicity tolerance is associated with the regulation of translocation and chelation of iron along with antioxidant defence in shoots of rice

**Ahmad Humayan Kabir, Most Champa Begum, Ariful Haque, Ruhul Amin, A. M. Swaraz, Syed Ali Haider, Nishit Kumar Paul and Mohammad Monzur Hossain**

1070–1081

Iron toxicity is harmful to plants. The aim of this study was to characterise the mechanisms underlying differential Fe-toxicity tolerance in wheat. From our results we propose that Fe-toxicity tolerance in wheat is shoot based and is mainly associated with the regulation of translocation and chelation of Fe together with increased antioxidant defence in shoots.

Co-ordinated performance of leaf hydraulics and economics in 10 Chinese temperate tree species

**Ying Jin, Chuankuan Wang, Zhenghu Zhou and Zhimin Li**

1082–1090

Leaf trait correlations are important for understanding carbon–water–nutrient couplings in plant functional biology. We investigated leaf hydraulics and economic traits for 10 Chinese temperate tree species, and found a tight co-ordination between these two suits of traits. This co-ordinated performance plays an important role in determining plant ecological strategies and supports the ‘fast–slow’ leaf economics spectrum.

Molecular cloning and functional characterisation of the tomato E3 ubiquitin ligase *SIBAH1* gene

**Shu-Mei Zhou, Sai-Han Wang, Chao Lin, Yun-Zhi Song, Xin-Xin Zheng, Feng-Ming Song and Chang-Xiang Zhu**

1091–1101

In this study we isolated the *SIBAH1* gene from tomato. *SIBAH1* possesses E3 ubiquitin ligase enzyme activity. *SIBAH1* was localised in the nucleus, cytoplasm and plasma membrane. *SIBAH1*-silencing enhanced resistance to *Botrytis cinerea*.