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Editorial

Review: Cytosolic ion exchange dynamics: insights into the mechanisms of component ion fluxes and their measurement

Dev T. Britto and Herbert J. Kronzucker 355–363

This review summarizes several important papers from groups who measured fluxes and cytosolic pools of nitrogen, potassium and calcium in plant cells. A novel analysis of these results is presented in light of substrate turnover kinetics, which are typically neglected, and yet yield surprisingly firm, possibly even radical, conclusions about the relative accuracy of conflicting models of ion transport.

Root-derived *trans*-zeatin riboside and abscisic acid in drought-stressed and rewatered sunflower plants: interaction in the control of leaf diffusive resistance?

Hauke Hansen and Karl Dörffling 365–375

The function of abscisic acid as a signal between roots and shoots under soil water deficit is well established, but evidence for a suggested role of cytokinins as negative signals is lacking. This paper discusses changes in abscisic acid and *trans*-zeatin riboside, the predominant cytokinin in xylem sap of sunflower plants.

Steady-state water relations of soybean seedling roots

Ricardo Murphy 377–389

A four-compartment model of plant roots is extended and tested. It is concluded that apoplastic flow is negligible, that external resistances influence the offset in pressure-volume curves, and that root resistance is negligible compared to stem elongation-zone resistance. Unusual behavior at high volume flow rates is discussed.

Photosynthesis of coppicing poplar clones in a free-air CO₂ enrichment (FACE) experiment in a short-rotation forest

Mark J. Hovenden 391–400

The paper deals with the photosynthetic responses of clones of three poplar species to elevated CO₂ concentrations. The unique data are from plants in a short rotation forest that had been grown under elevated CO₂ from planting for three years and then harvested and allowed to coppice.

Analysis of local and systemic spread of the crucifer-infecting TMV-Cg virus in tobacco and several *Arabidopsis thaliana* ecotypes

Patricio Arce-Johnson, Consuelo Medina, Hal S. Padgett, Wilson Huanca and Carmen Espinoza 401–408

These authors report the cloning of the Tobacco Mosaic Virus (TMV)-Cg virus. They tested several ecotypes of *Arabidopsis* against the virus, and found fast virus spread in comparison to the common strain of TMV-U1. A hybrid virus containing the TMV-Cg movement protein in the TMV-U1 genome was also constructed.

Cover illustration: An endoxylanase (CpaXYL1) is expressed during papaya fruit ripening related softening. The cDNA clone codes for a 64.96-kDa peptide though the isolated protein was 32.5 kDa. Photograph provided by Dr Richard Manshardt (see Chen and Paull, pp. 433–441).

A H₂O₂-forming peroxidase rather than a NAD(P)H-dependent O₂[•] synthase may be the major player in cell death responses controlled by the *Pto*–*Fen* complex following fenthion treatment

**Margherita G. De Biasi, Stefania Astolfi,
Andrea Acampora, Sabrina Zuchi, Valentina Fonzo,
Enrico Santangelo, Riccardo Caccia, Maurizio Badiani
and Gian Piero Soressi** 409–417

Artificial infection by endophytes affects growth and mycorrhizal colonisation of *Lolium perenne*

Joachim Müller 419–424

Epidermal cell division and cell elongation in two *Aegilops* species with contrasting leaf elongation rates

**Lieve Bultynck, Fabio Fiorani,
Elizabeth Van Volkenburgh and Hans Lambers** 435–432

Endoxylanase expressed during papaya fruit ripening: purification, cloning and characterization

Nancy Jung Chen and Robert E. Paull 433–441

A suite of novel promoters and terminators for plant biotechnology

**Petra H. D. Schünmann, Danny J. Llewellyn,
Brian Surin, Petra Boevink, Robert C. De Feyter
and Peter M. Waterhouse** 443–452

A suite of novel promoters and terminators for plant biotechnology II. The pPLEX series for use in monocots

**Petra H. D. Schünmann, Brian Surin and
Peter M. Waterhouse** 453–460

Absciscic acid influences the susceptibility of *Arabidopsis thaliana* to *Pseudomonas syringae* pv. *tomato* and *Peronospora parasitica*

Peter G. Mohr and David M. Cahill 461–469

The phenotype imposed by the *Pto*/*Fen* gene family and by a foreign glucose oxidase (*Gox*) gene is studied by exposing to fenthion untransformed near isogenic tomato lines and their *Gox*-transformants. The observed intraspecific differential sensitivity to fenthion might depend on hyperproduction of H₂O₂, caused by a sustained H₂O₂-forming peroxidase activity.

This paper relates intriguing findings concerning the inhibition of endomycorrhiza formation by endophyte infection in grasses, and their effects on growth. These effects may be due to systemic resistance induced by the endophyte or to the release of secondary compounds that may interfere with the colonisation by other organisms.

This paper describes epidermal cellular dynamics of epidermal cells underlying differences in elongating leaves leaf elongation rate (LER) of between *Aegilops tauschii* and *Aegilops caudata*, wild relatives of which are related to the agronomically important *Triticum* (wheat). The authors found that the greater Leaf Elongation Rate (LER) in the third leaf of *Ae. tauschii* (compared to *Ae. Ccaudata*, and attribute this) was associated with to a larger leaf growth zone leaf meristem and more simultaneously elongating cells.

This paper reports the isolation of an endoxylanase and its cDNA from ripening papaya fruit. This is the first reported purification of an endoxylanase from a dicot that has high homology with one of the twelve predicted in *Arabidopsis*. Endoxylanase expression coincides with softening in varieties with differential softening patterns.

This first of this pair of papers describes a suite of plant expression vectors (pPLEX vectors), containing promoters derived from the subterranean clover stunt virus (SCSV), for directing transgene expression in dicot species. Various promoter–gene combinations were assessed in tobacco, potato and cotton, and used to produce herbicide- and insecticide-resistant cotton. The second paper describes various modifications of the promoters for use in monocot species, and their assessment in rice.

These authors use various approaches to study the role of abscisic acid (ABA) in controlling plant–pathogen interactions. The use of defined mutants and different experimental treatments has shown that endogenous ABA concentration influences both the susceptibility and resistance of *Arabidopsis* to certain pathogens.