

Functional Plant Biology

Contents

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<p><i>Evans Review: Plant cell walls: the skeleton of the plant world</i> Monika S. Doblin, Filomena Pettolino and Antony Bacic</p>	357–381	<p>Understanding biosynthesis and assembly of walls is essential to understanding their role in growth and development as well the advancement of biomass-based industries, such as biofuels, functional foods and forestry. This review focuses on wall polysaccharide synthesis and assembly with a brief overview of the role of the wall–plasma membrane–cytoskeleton continuum in growth regulation.</p>
<p><i>Review: Evolutionary advantages of secreted peptide signalling molecules in plants</i> Janet I. Wheeler and Helen R. Irving</p>	382–394	<p>Plant peptide signals regulate meristem organogenesis, growth and recognise imminent danger. How do peptide signals manage all these functions? Diverse signalling peptide families have been identified with emerging common features that contribute to their functionality. Interestingly, plants commit high levels of nitrogen rich amino acids to signalling peptides reflecting their importance to plant function.</p>
<p>Monitoring of cold and light stress impact on photosynthesis by using the laser induced fluorescence transient (LIFT) approach Roland Pieruschka, Denis Klimov, Zbigniew S. Kolber and Joseph A. Berry</p>	395–402	<p>A recently developed laser induced fluorescence transient (LIFT) technique for remote measurement of photosynthetic efficiency was extensively tested under laboratory conditions and in a field experiment monitoring the combined effect of low temperatures and high light intensity on a variety of plants during the early winter in California.</p>
<p>Do changes in light direction affect absorption profiles in leaves? Craig R. Brodersen and Thomas C. Vogelmann</p>	403–412	<p>This study on the directionality of incident light suggests an additional level of complexity in the basic understanding of leaf optics. Diffuse, direct and low-angle light do not penetrate into leaves equally, yielding absorption profiles that could decouple internal light distribution and photosynthetic capacity under different light conditions.</p>
<p>Regulation and recovery of sink strength in rice plants grown under changes in light intensity Tanguy Lafarge, Célia Seassau, Meryll Martin, Crisanta Bueno, Anne Clément-Vidal, Eva Schreck and Delphine Luquet</p>	413–428	<p>The high plasticity of the rice plant in response to shading was highlighted here during the vegetative phase: the reduction in organ vigour and in soluble sugar concentration occurred first before the effect was visible on tillering and leaf elongation. All the processes resumed after the net removal.</p>

Cover illustration: Cross section through a 22 DAP barley grain showing thick-walled aleurone cells and starch filled endosperm cells stained with toluidine blue (left) or labelled with arabinoxylan LM11 (Plant Probes) antibody (right). Note: arabinoxylan labeling appears white against a dark background due to silver enhancement of gold particles (see Doblin *et al.* pp. 357–381).

<p>Linking stem diameter variations to sap flow, turgor and water potential in tomato Tom De Swaef and Kathy Steppe</p>	429–438	<p>Via a semi-seasonal and diurnal analysis of the response of sap flow and stem diameter, the influence of plant age, fruit load and water status on stem diameter variations was distinguished. Tomato stems, in contrast with trees, maintained growth while transpiring because of a large difference between turgor and yield threshold.</p>
<p>Melting the secrets of gelatinisation temperature in rice Rosa P. Cuevas, Venea D. Daygon, Henry M. Corpuz, Leilani Nora, Russell F. Reinke, Daniel L. E. Waters and Melissa A. Fitzgerald</p>	439–447	<p>Gelatinisation temperature is a key trait measured in rice breeding programs. In this study, the authors used two populations of rice varieties to investigate the associations among various measures of gelatinisation temperature, and to explore the structural and the genetic factors governing the three classes of rice gelatinisation temperature.</p>
<p>A quantitative genetics approach to nitrogen use efficiency in sugarcane Alex Whan, Nicole Robinson, Prakash Lakshmanan, Susanne Schmidt and Karen Aitken</p>	448–454	<p>To ensure sustainability of the Australian sugarcane industry, the development of cultivars with improved nitrogen use efficiency is a priority. To improve understanding of the genetic basis for variation in nitrogen traits in sugarcane, we studied a sugarcane genetic mapping population for QTL controlling biomass and physiological traits.</p>
<p>Effect of short- and long-term phosphate stress on the non-phosphorylating pathway of mitochondrial electron transport in <i>Arabidopsis thaliana</i> Vivek Vijayraghavan and Kathleen Soole</p>	455–466	<p>Phosphate deprivation in <i>Arabidopsis</i> seedlings leads to upregulation of an abbreviated mitochondrial electron transport chain comprising the non-phosphorylating NAD(P)H dehydrogenases, NDA2 and NDB2 and alternative oxidase. Electron flow through this non-phosphorylating pathway, during phosphate deprivation lowered oxidative damage of tissues and can potentially maintain flux through upstream biochemical pathways.</p>
<p>Carbon isotope discrimination as a tracer of functional traits in a mediterranean macchia plant community Christiane Werner and Cristina Máguas</p>	467–477	<p>Carbon isotope discrimination ($\Delta^{13}\text{C}$) is a common measure of water use efficiency (WUE). However, $\Delta^{13}\text{C}$ was markedly determined by phenology and leaf structure, which constrains its applicability as an indicator of WUE. Nevertheless, $\Delta^{13}\text{C}$ provided a good classification of functional groups of macchia species, by integrating structural, functional and phenological attributes.</p>

Corrigendum to:

Mitochondrial enzymes and citrate transporter contribute to the aluminium-induced citrate secretion from soybean (*Glycine max*) roots
Muyun Xu, Jiangfeng You, Ningning Hou, Hongmei Zhang, Guang Chen and Zhenming Yang [Vol. 37, No. 4 (2010) pp. 285–295] 478