Functional Plant Biology

Contents

Volume 36 Issue 5 2009

Evans Review: Cell wall biosynthesis and the Growth of the green alga Chara corallina is controlled by molecular mechanism of plant enlargement recently discovered reactions involving polygalacturonic acid, a John S. Boyer 383-394 cell wall pectin, being delivered to the wall and cross-linking with calcium. The reactions connect growth to wall biosynthesis, and this review indicates that the reactions could underlie growth in all terrestrial plants. Goldacre Paper: Recognition events Recognition interactions between host plant immune and host-pathogen co-evolution in gene-for-gene receptors and pathogen avirulence proteins determine the resistance to flax rust outcome of infection. Here we examine the molecular basis Peter Dodds and Peter Thrall 395-408 of this recognition in the flax rust disease system and how variation in the underlying genes affects epidemiology in natural populations. Review: Copper in plants: acquisition, transport Copper is an essential metal for plants. Copper deficiency and interactions and excess copper alter essential functions in plant Inmaculada Yruela 409-430 metabolism. Research on mechanisms of copper acquisition, distribution and transport are contributing to the understanding of copper homeostasis in plants and the response to copper stress. This review gives an overview of the current knowledge. Cell-line-dependent sorting of recombinant phytase Plant cell cultures provide a viable and promising alternative for in cell cultures of Medicago truncatula the production of recombinant proteins over more conventional Pablo González-Melendi, Ana Sofia Pires platforms such as microbial or animal cell cultures. This report and Rita Abranches 431-441 describes the subcellular sorting of a recombinant protein in four independent transgenic cell lines of Medicago truncatula, and highlights the importance of understanding trafficking of recombinant proteins in plants. Molecular cloning, expression and mapping Expression analysis and mapping of the translational initiation of the translational initiation factor eIF1 gene factor *eIF1* gene in rice was studied. The gene is upregulated by in Orvza sativa salt, ABA and osmotic stress and is mapped to chromosome 1 of Latha Rangan, Anusuya Rout, Medhavi Sudarshan rice. The gene shows a sequence similarity with eIF1 of other and Glenn Gregorio 442-452 species and might provide an indicator for monitoring a stressresponsive mechanism that operates in rice.

Cover illustration: A new approach to cell growth and wall assembly indicates that turgor pressure moves large polysaccharides into cell walls, shown here with yellow-green dextran that moves from the interior to the exterior of an isolated *Chara wall* (red) when turgor is 0.5 MPa (left) but not 0.05 MPa (right). Bar is 100 µm (see Boyer *et al.* pp. 383–394).

Differential photosynthetic performance and photoprotection mechanisms of three Mediterranean evergreen oaks under severe drought stress <i>José Javier Peguero-Pina</i> ,		Drought-mediated changes in photosynthetic-related parameters allowed the characterisation of specific photo-protective mechanisms. <i>Quercus suber</i> downregulated ETR closing PSII reaction centres and increased the potentially oxidative damage. <i>Q. coccifera</i> and <i>Q. ilex</i> ssp. <i>ballota</i> seem more able to withstand
Domingo Sancho-Knapik, Fermín Morales, Jaume Flexas and Eustaquio Gil-Pelegrín	453–462	drought because they decreased further ETR photo-inactivating PSII centres (evidenced by their low predawn F_V/F_M ratios), questioning the consideration of Mediterranean evergreen oaks as a homogeneous physiological group.
Changes in quinic acid metabolism during fruit development in three kiwifruit species <i>Ken B. Marsh, Helen L. Boldingh,</i> <i>Rebecca S. Shilton and William A. Laing</i>	463–470	In a study of quinic acid storage and metabolism in different kiwifruit species, the quinate dehydrogenase and shikimate dehydrogenase activities and gene expression levels were compared during fruit development and aspects of the control of the high level of quinic acid $(1-2\%)$ in kiwifruit are discussed.
Functional transition in the floral receptacle of the sacred lotus (<i>Nelumbo nucifera</i>): from thermogenesis to photosynthesis <i>Rebecca E. Miller, Jennifer R. Watling</i> <i>and Sharon A. Robinson</i>	471–480	The receptacle of the sacred lotus is the main source of heat during the thermogenic stage of floral development. Following anthesis, it enlarges, greens and becomes a fully functional photosynthetic organ. We investigated development of photosynthetic traits during this unusual functional transition.