

Functional Plant Biology

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| <p>A calcium sensor-interacting protein kinase negatively regulates salt stress tolerance in rice (<i>Oryza sativa</i>)
Xiao-Lan Rao, Xiu-Hong Zhang, Rong-Jun Li, Hai-Tao Shi and Ying-Tang Lu</p> | 441–450 | <p>Protein kinases are signal transduction factors that play a central role in acclimation. In this study, the function of a calcium sensor-interacting protein kinase, OsCIPK03, was characterised as a negative regulator of salt stress tolerance in rice.</p> |
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| <p>Transcriptome profiling of soybean root tips
Farzad Haerizadeh, Mohan B. Singh and Prem L. Bhalla</p> | 451–461 | <p>Soybean, a major legume crop, displays the basic open-type root apical meristem, while most studied root systems of <i>Arabidopsis thaliana</i> have the closed-type root apical meristem. This paper explores the nature of the gene networks regulating soybean root development and biology by investigating the gene expression of its root tip.</p> |
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| <p>Analysis of global host gene expression during the primary phase of the <i>Arabidopsis thaliana</i>–<i>Plasmodiophora brassicae</i> interaction
Arati Agarwal, Vijay Kaul, Robert Faggian, James E. Rookes, Jutta Ludwig-Müller and David M. Cahill</p> | 462–478 | <p>Analysis of gene expression changes in <i>Arabidopsis thaliana</i>, conducted at the early stages of infection with <i>Plasmodiophora brassicae</i>, discovered new information on the components of host-pathogen compatibility. Suppression of defense-related genes during invasion and colonisation by the pathogen appears to be necessary for the pathogen to establish within host roots.</p> |
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| <p>Analysis of differentially expressed genes in leaf rust infected bread wheat involving seedling resistance gene <i>Lr28</i>
Raman Dhariwal, Shailendra Vyas, Govindraj R. Bhaganagare, Shailendra K. Jha, Jitendra P. Khurana, Akhilesh K. Tyagi, Kumble V. Prabhu, Harindra S. Balyan and Pushpendra K. Gupta</p> | 479–492 | <p>In bread wheat, transcriptome analysis for leaf rust resistance conferred by <i>Lr28</i> gene was conducted using cDNA-AFLP. The majority of the differential transcripts exhibited highest expression at 96 h post inoculation and were involved in functions like signal transduction, protein synthesis and metabolism. Some novel genes with unknown functions were also identified.</p> |
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| <p>Revisiting the role of organic acids in the bicarbonate tolerance of zinc-efficient rice genotypes
Michael T. Rose, Terry J. Rose, Juan Pariasca-Tanaka, Widodo and Matthias Wissuwa</p> | 493–504 | <p>This paper rejects the hypothesis that Zn-efficient rice genotypes perform better under bicarbonate stress than Zn-inefficient rice genotypes through enhanced malate and citrate efflux from roots, <i>per se</i>. Rather, it is proposed that tolerance to bicarbonate is associated with minimising oxidative stress and root leakage, whilst maintaining malate, but not citrate, efflux.</p> |
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Cover illustration: *Arabidopsis thaliana* plants treated with salicylic acid display reduction in clubroot disease (*Plasmodiophora brassicae*) (see Agarwal *et al.* pp. 462–478). (Upper): clubroot disease symptoms in control, untreated and SA-treated *A. thaliana* plants (left to right); (Lower left): untreated and non-inoculated control plants; (Lower centre): untreated and inoculated plants show severe clubroot disease; (Lower right): SA-treated and inoculated plants show a reduction in disease severity. Photographs by Arati Agarwal.

Nutritional and isotopic relationships of selected
Bornean tropical mistletoe–host associations
in Brunei Darussalam

*Kushan U. Tennakoon, Wang H. Chak
and Jay F. Bolin*

505–513

Basic assumptions regarding mistletoe physiology may be dependent on the climate of the ecosystem in which they occur and few tropical mistletoes have been examined. We investigated nutritional and isotopic relationships of 12 tropical mistletoe–host associations from Borneo to understand the nutrient, $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ partitioning between hosts and parasites.

Intense storms and the delivery of materials
that relieve nutrient limitations in mangroves
of an arid zone estuary

*Catherine E. Lovelock, Ilka C. Feller,
Maria Fernanda Adame, Ruth Reef,
Helen M. Penrose, Lili Wei and Marilyn C. Ball*

514–522

Tropical cyclones can be devastating to ecosystems, but they can also result in pulses of freshwater and sediments delivered in floodwaters to the coastal zone. Field experiments found that nutrients delivered during a cyclone in the arid zone of Western Australia stimulated mangrove growth. Predicted future reductions in the frequency of cyclones may negatively affect the productivity of these ecosystems.

Can changes in leaf water potential be assessed
spectrally?

*Salah Elsayed, Bodo Mistele
and Urs Schmidhalter*

523–533

The accuracy of spectrometric measurements to detect changes in leaf water potential was tested. Significant relationships between leaf water potential and new spectral indices were detected in leaf water content of wheat and maize. The exact relationships found, however, were influenced strongly by the date of measurement or water stress induced.