

Regulation of jasmonate (JA) perception in *Arabidopsis thaliana*
Devoto and Turner (pp. 329–337) review the functions of biologically active JAs, the post-translational control of JA responses and the influence on JA responses of other signalling pathways such as those regulated by ethylene, salicylic acid and auxin. Similarities in the regulation of systemic JA signalling between arabidopsis and tomato support the use of arabidopsis as a model to study JA signalling.



Shoot size-structure of mature trees

The size-structure and number of current-year shoots produced by a mature crown reflect the requirements of an individual tree at any particular stage in its development. **Suzuki (pp. 339–347)** reveals how these two characteristics of a current-year shoot population contribute to effective leaf expansion and minimize the cumulative costs of non-photosynthetic tissues.



Genome size in *Lupinus* phylogeny

The usefulness of nuclear DNA content in phylogenetic studies is increasing. **Naganowska et al. (pp. 349–355)** examine 2C DNA values in 18 taxa of *Lupinus*

(*Fabaceae*) by flow cytometry. Statistical analysis resulted in a grouping that supports the taxonomic classification and throws light on aspects of the evolution of the genus.



Irradiance and assimilate partitioning into rice spikelets

Low intensity daylight at the early phase of panicle development in rice often results in poor grain yield. **Okawa et al. (pp. 357–364)** show that when plants experience short-term shading (3–4 d) during grain development, the allocation of carbon, particularly to inferior spikelets is strongly depressed. The effect is especially marked at full heading.



Escape from browsers

Browsers reduce plant survival and maintain survivors in a juvenile stage. Using experimental exclusions, **Martínez and López-Portillo (pp. 365–375)** demonstrate that jackrabbits induce changes in small mesquites that result in a spiny, compact bush. Although the plant undercompensates for intense browsing, one or a few stems escape from this armour through growth, thereby increasing the likelihood of reproduction.



Caper leaf structure and function

The internal architecture of young and fully expanded leaves of *Capparis spi-*

nosa and certain physiological characteristics are described by **Rhizopoulou and Psaras (pp. 377–383)**. They show that the leaves of this summer-growing Mediterranean shrub are thick, amphistomatic and homobaric and possess a multilayered mesophyll. In combination with leaf water status, these features are thought to enhance rates of transpiration and photosynthesis.



Summer leaf senescence in *Pistacia lentiscus*

Summer leaf senescence is highly regulated and allows remobilization of nutrients to young developing leaves, which aids plant survival during adverse climatic conditions. **Munné-Bosch and Peñuelas (pp. 385–391)** show that, in *P. lentiscus* leaves, photo- and antioxidant protection maintain chloroplast function (i.e. nutrient remobilization) during the first stages of leaf senescence, while a severe loss of antioxidant defences occurs later, resulting in severe oxidative stress. A relationship between oxidative stress and the progression of leaf senescence is therefore identified.



CAM induction and de-epoxidation of xanthophyll protect PDII reaction centres during early stages of soil drying

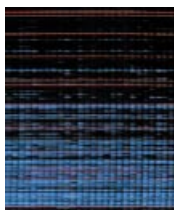
Switching from a C3 to CAM by *Talinum triangulare* slows daytime dehydration by reducing stomatal apertures while retaining strong electron flow through the photosynthetic apparatus and permitting carbon fixation at night. **Pieters et al. (pp. 393–399)** show that the content of labile PSII reaction centres is maintained in

association with energy dissipation mediated by the xanthophyll cycle. The system is shown to stand mild water stress with more severe water deficits leading to a loss of reaction centre protein.



Pathogenesis-related enzyme activity increases during wet-storage of recalcitrant seeds

Unless the inoculum can be eliminated or minimized, fungal proliferation during wet-storage of tropical recalcitrant seeds curtails their longevity. **Anguelova-Merhar et al. (pp. 401–408)** show that while newly shed *Avicennia marina* seeds have little β -1,3-glucanase and chitinase activity, the levels of both enzymes increase significantly in the short-term. This delays rather than prevents the manifestation of disease when seeds are subsequently inoculated with *Fusarium moniliforme*. In contrast, when newly shed seeds are inoculated, the effects of this pathogen are rapidly lethal. In neither case is a hypersensitive response apparent in *A. marina* seeds.



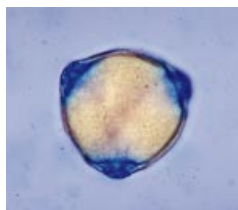
Genetic diversity of a pantropical tree

The amount and partitioning of genetic diversity are critical to the evolutionary potential of a species or population. **Tang et al. (pp. 409–414)** assess genetic variation within and among populations of a pantropical species. They highlight the effects of life history, gene flow and ecogeographic environments on genetic diversity and structure.



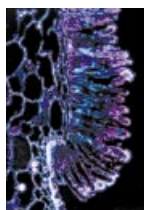
Genetic and developmental control of fruit growth

Cell number at anthesis is shown by **Bertin et al. (pp. 415–424)** to determine differences in fruit size between two near-isogenic tomato lines. It also explains differences in size between basal and tip fruits within an inflorescence. However, reducing sink competition masks these differences by increasing fruit cell size whereas DNA endoreduplication patterns are unchanged.



Pollen aperture structures

Pollen has enduring value in providing diagnostic features for assessing relationships between plants. **Banks (pp. 425–435)** utilizes various techniques to explore legume pollen apertures, with particular focus on unusual structures found beneath the endoaperture ('Zwischenkörper') that are composed of pectic substances. These are discussed in relation to their developmental origins, terminology and function, and caesalpinoid legume systematics.



β -D-Glucosidase and glucovanillin in vanilla bean

Vanilla flavour results primarily from the release of aromatic vanillin via the enzymatic hydrolysis of its non-volatile precursor, glucovanillin. This is brought

about by an endogenous, vanilla bean β -D-glucosidase. Using quantitative analyses and light microscopy, **Odoux et al. (pp. 437–444)** show that β -D-glucosidase and glucovanillin are predominantly located in different cellular compartments of vanilla bean placental tissue.



The sex life of a 'primitive' angiosperm

The successful dispersal of pollen by both the nectarless male and bisexual flowers of *Trimenia moorei* (ANITA group) exploits air currents and small insects (especially hover flies) as vectors at Australian sites. **Bernhardt et al. (pp. 445–458)** identify a floral fragrance, rich in 2-phenylethanol, which may stimulate an insect to touch the receptive stigma with its pollen-coated proboscis. The dry-type stigma is shown to recognize and reject self-pollinations.



Female flower and cupule in Balanopaceae, an enigmatic rosid family

The Balanopaceae is an enigmatic family of eudicots of disputed systematic position. To help resolve the problem, **Merino Sutter and Endress (pp. 459–469)** use features of the structure and development of female flowers and cupules. These are described here for the first time. The results show that both organs are different from those present in the Fagaceae and are more in accordance with the Euphorbiaceae, a position also suggested recently by molecular studies.