



Sphingolipid metabolism in *Arabidopsis thaliana* (Invited Review)

Although sphingolipids are known to play central roles in eukaryotic signalling networks, it is only recently that the importance of these lipids in plant biology has become apparent. **Dunn *et al.*** (pp. 483–497) review plant sphingolipid biology in a comparative context with *Saccharomyces cerevisiae*, and provide a post-genomic platform for further studies in *Arabidopsis thaliana*.



Lip anatomy and pollination mechanisms in Orchidaceae

Lip anatomy may reflect the pollination mechanisms of *Bulbophyllum* species. In support of this, **Teixeira *et al.*** (pp. 499–505) show odour glands in the lips of seven species, but nectaries only in the lips of those with wind-assisted fly pollination and where nectar is needed to lengthen insect retention. An absence of nectaries in the lips characterizes species in which the lip movement requires only gravity.



Molecular phylogenetic study in *Cardamine*

Reconstruction of the evolutionary history of polyploid complexes is a challenging task. **Marhold *et al.*** (pp. 507–520) explore phylogenetic

relationships of diploid taxa of three polyploid complexes of *Cardamine*, and reveal patterns indicating hybridization and reticulation. The results question whether standard phylogenetic analyses (even when combinations of markers are used) can adequately reconstruct relationships among closely related taxa in polyploid complexes.



Genetic variability of *Antirhea aromatica*

Extant populations of *Antirhea aromatica* are shown by **González-Astorga and Castillo-Campos** (pp. 521–528) to have higher genetic variability than other tropical tree species in areas characterized by high levels of fragmentation, environmental heterogeneity and a narrow geographical distribution. This suggests that *A. aromatica* should be considered as an indicator species with unexplored economic potential.



Microgeographic variation in the genome size

The underlying forces of ecogeographically correlated intraspecific variability in genome size are still controversial. Using carob trees (*Ceratonia siliqua*) growing on microclimatically contrasting opposite slopes, **Bureš *et al.*** (pp. 529–535) show that microclimate stress may play an important role in generating and maintaining divergence of genome size.



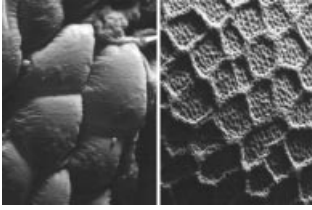
Floral development in Papilionoideae

Papilionoideae is the largest and most important subfamily of the Leguminosae. **Prenner** (pp. 537–545) identifies initiated but suppressed bracteoles as a ‘new’ character in the subfamily. In addition to the widely stated unidirectional pattern of organ formation, five different modes of sepal initiation are deduced from the spiral sequence of Caesalpinioideae.



Pistil abortion does not influence pollen production in olive

Andromonoecy (hermaphrodite and male flowers on the same plant) is thought to maximize fitness by optimizing reproductive resources between male and female functions. In olives (*Olea europaea*), andromonoecy derives from pistil abortion in less well-nurtured flowers. However, **Cuevas and Polito** (pp. 547–553) show that staminate and hermaphrodite flowers do not differ in the quantity or quality of their pollen, thereby maximizing viable pollen production in this anemophilous species.



Changes in coat micro-sculpture during seed development

Developmental differences between seed coats of amphidiploids and their putative parents in Brassica are described by **Zeng et al.** (pp. 555–566) using electron microscopy. Some accessions are shown to have developmental patterns intermediate between the two ancestors, while other accessions resemble only one of their ancestors.



Radiation use efficiency made simple

A simple method of estimating photosynthetic radiation use efficiency of canopies is proposed by **Rosati et al.** (pp. 567–574). It is based on the photosynthetic properties of a leaf at the top of the canopy and on the radiation incident over the canopy. This straightforward method successfully describes differences in photosynthetic radiation use efficiency in relation to crop, season, nutrient status and daily incident radiation.



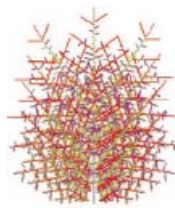
KRPs expression in the Arabidopsis shoot apex

Kip-related proteins (KRPs) are negative regulators of cell division in eukaryotes. Although only recently discovered in plants, their *in planta* function is as yet unclear. **Ormenese et al.** (pp. 575–580) compare the spatial expression of all seven *KRP* genes in shoot apices of *Arabidopsis thaliana*. They provide evidence for different expression pattern groups and suggest differential roles for the various KRPs.



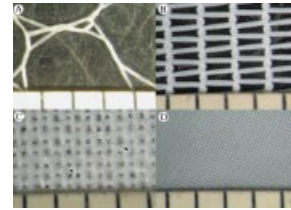
Vitis vinifera–phylloxera interaction

Phylloxera is an aphid-like insect that feeds on grape roots and induces galls. **Kellow et al.** (pp. 581–590) show that the galls (nodosities) appear to function as nutrient reservoirs and that phylloxera attack does not elicit detectable defence responses by host roots.



'GREENLAB' simulates plant development from germination to maturity

A mathematical model that uses dual-cycle automaton is presented by **Yan et al.** (pp. 591–602) to visualize, in three dimensions, changes in plant growth and spatial geometry during the development of mature annuals or woody perennials. The model also has potential for predicting phenotypic plasticity.



Bags of exclusion depends on pore size (Technical Note)

The permeability of pollination bags to wind-borne pollen has important consequences in studies of pollination and reproductive biology. **Neal and Anderson** (pp. 603–607) examine the characteristics of four fabric types commonly used in the construction of pollination bags. Cotton muslin with a pore size of approx. 200 μm is shown to be generally effective.



New case of bat pollination in Bignoniaceae (Short Communication)

In contrast to bat-pollinated Old World Bignoniaceae, chiropterophily has rarely been documented in neotropical representatives of this family. **Machado and Vogel** (pp. 609–613) are the first to record bat visits to the flowers of *Adenocalymna dichilum*, a species of north-eastern Brazil. The floral features of this liana confirm the chiropterophilous syndrome. This discovery amplifies the spectrum of floral adaptive radiation by which a large genus has diversified.