



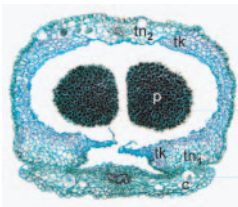
How and why do flowers die? (Botanical Briefing)

Factors regulating flower life span are reviewed by **Rogers (pp. 309–315)**. Triggers and co-ordinators of cell death in whole flowers and in tissues are considered, and potential mechanisms for programmed cell death are assessed at a cellular level. Leaf and petal senescence are compared to find useful parallels and points of divergence.



Pollination systems and species diversity in the Iridaceae (Invited Review)

Sub-Saharan species of the Iridaceae show repeated shifts from the inferred ancestral strategy of long-tongued anthophorine bees foraging for nectar. **Goldblatt and Manning (pp. 317–344)** reveal that pollination by a single pollinator class is the rule and that <3 % of species are generalists. Pollination diversity explains, in part, the huge species diversity of the Iridaceae in Africa.



Anther cap retention prevents orchid self-pollination

Orchids risk self-pollination because their pollen is packaged as pollinia. **Peter and Johnson (pp. 345–355)** examine *Eulophia foliosa* where the anther cap covers pollinia for longer than the time that beetle pollinators spend on a plant. This precludes self-pollination by this rare example of an orchid pollinated by beetles.



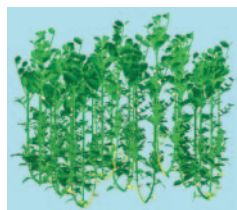
Function of trichomatic glands in the Bignoniaceae

Nectar production in many Bignoniaceae species is from trichomatic glands around the ovary base. **Machado et al. (pp. 357–369)** propose that continuous presence and activity of peltate trichomes on the ovary of *Zeyheria montana* from early budding to fruit set, and their marked alkaloid and terpene content, suggest that they serve a protective function rather than as a source of nectar.



Mirror-image flowers and pollination in a gesneria

Little is known about enantiostyly in the Gesneriaceae. **Gao et al. (pp. 371–376)** show that *Paraboea rufescens* from China is self-compatible, monomorphic and enantiostylous, and exhibits significant inbreeding depression. Floral morphology and pollinator foraging behaviour discourage both self-pollination and pollinations between flowers of similar styler deflection.



ALAMEDA, a functional–structural faba bean model

Ruiz-Ramos and Mínguez (pp. 377–388) present a functional–structural 3D model of the canopy of a faba bean crop. To simulate ca. 3500 vegetative organs (including compound leaves) they use an L-system linked to growth functions as the supporting structure. ALAMEDA's

performance suggests an improvement for functional modelling on leaf area simulation.



Genetic and morphological variability of Melocactus

Populations of two *Melocactus* (Cactaceae) species are found by **Lambert et al. (pp. 389–403)** to display very low levels of genetic variability and show evidence of introgression at two sites. Such conspecific populations present high genetic and morphological differentiation that cannot be explained by geographical substructuring but is consistent with the occurrence of hybridization.



Architectural traits in coffee trees

Observation protocols for describing tree architecture are applied by **Cilas et al. (pp. 405–411)** to six clones of *Coffea canephora*. They find that many architectural traits are highly heritable and some display strong genetic correlations with cumulated yield. The fruiting node proportion at plagiotropic level 15 is seen as an especially good predictor of yield capacity.



Nectar in temperate-forest species of South America

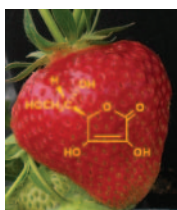
The nectar concentration and composition of 26 species of the temperate forest of southern South America and its

relationship with flower type are evaluated. **Chalcoff *et al.* (pp. 413–421)** show that pollinators are not the only force involved in determining the sugar composition of the highly endemic flora from this region.



Diurnal and nocturnal pollination in a cactus of Central Mexico

Marginatocereus marginatus is open pollinated by up to 25 diurnal and nocturnal species. According to **Dar *et al.* (pp. 423–427)**, this represents a fail-safe system in the event of low abundance of one of the pollinator groups (humming-birds) and where competition for nocturnal pollinators is high from other columnar cacti that bloom synchronously with *M. marginatus*.



Bioactive compounds in strawberry fruit

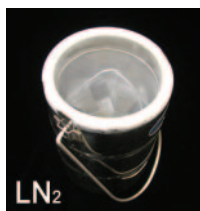
The potential to enhance beneficial health compounds in the human diet is considerable. **Atkinson *et al.* (pp. 429–441)** show that PAR-reflective soil mulches enhance both fruit yields

and concentrations of vitamin C and ellagic acid. Cultivar variation in these compounds is large and offers considerable breeding potential.



Shade adaptation in Arabidopsis Cookson and Granier (pp. 443–452)

assess shade-induced plasticity of cell, leaf and rosette area development in *Arabidopsis thaliana*. Dynamic growth variables are shown to be affected at all levels of development except for duration of rosette area expansion. Results are discussed in terms of shade-adaptive responses and related to theories of leaf size control.



Revisiting cryopreservation and plant cell culture growth phases

Cryopreservation is generally thought to work best with cultured cells at late lag or early exponential growth phase.

Ishikawa *et al.* (pp. 453–459) overturn this view by determining the optimum growth phase for cryopreserving a bromegrass (*Bromus inermis*) suspension

culture using recently developed protocols and regrowth assays for survival.



Systematic implications of genome size variation

Interspecific variation and its implications for infrageneric classification in the genus *Carthamus* and the process of allopolyploid formation have been studied by **Garnatje *et al.* (pp. 461–467)**. They show that the genome size represents a useful tool for delimiting systematic relationships between closely related species.



Drought tolerance and inter-tissue water movement

In *Hylocereus undatus*, a hemiepiphytic cactus, the fleshy stem is crucial for surviving drought. Using novel techniques, **Nobel (pp. 469–474)** shows that cell walls are more flexible (thinner) in water storage parenchyma than in the chlorenchyma. During drought, water therefore moves into the chlorenchyma, thereby preserving the net CO₂ uptake ability of the stems.