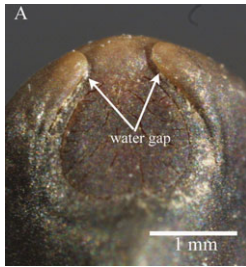




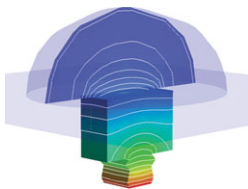
Homeotic genes at work in palm flower induction (Invited Review)

Homeotic MADS-box genes encode transcription factors regulating development and are an integral part of the ABC model of flower-part initiation and spatial arrangement established in dictyotyledons. [Adam et al. \(pp. 1–12\)](#) demonstrate that the general ABC model applies to palms and that modifications found necessary for some other monocot groups such as the Liliales are not required.



Identification of 'water gap' in Convolvulaceae seeds

Seed dormancy in Convolvulaceae species is imposed by a water-impermeable palisade layer of cells in the seed coat (physical dormancy). [Jayasuriya et al. \(pp. 13–22\)](#) identify a specialized structure (the 'water gap') in seeds of *Ipomoea lacunosa* that opens in response to dormancy-breaking cues and characterize it morphologically and anatomically.



Computer-based studies of diffusion through stomata

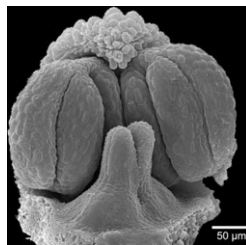
Gas diffusion through stomata with varied structures (stomata sunken, presence of internal cuticle, substomatal chamber size) is examined by [Roth-Nebelsick \(pp. 23–32\)](#) using computer simulations. The results highlight the significance of detailed stomatal architecture and indicate likely

overestimates of stomatal conductance in calculations based solely on stomatal density, pore depth and size.



Impact of clover leaf longevity on N-dynamics

[Sturite et al. \(pp. 33–40\)](#) find leaves to be the most short-lived parts of white clover (*Trifolium repens*). The leaves' short life span and poor over-wintering made them important as a nitrogen source in a soil–plant ecosystem, but they also heighten the risk of off-season N-loss.



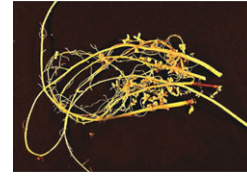
Floral ontogeny of the Afro-Madagascan genus *Mitrasacmopsis*

Mitrasacmopsis follows a pattern of floral development common for most Rubiaceae. However, [Groeninckx et al. \(pp. 41–49\)](#) demonstrate that continued expansion of the upper part of the inferior ovary in the fruiting stage results in a change in the ovary position from basically inferior to secondarily semi-inferior.



Large clones on cliff faces

Clonal growth capacity on cliff faces is poorly understood. [Liu et al. \(pp. 51–54\)](#) find that a few large clones of *Oxyria sinensis*, formed by rhizomes growing along crevices, can dominate a population. The multi-clone structure suggests that sexual reproduction is also important for the long-term persistence of these cliff populations.



Rhizobitoxine-induced chlorosis explained

The bacterium *Bradyrhizobium elkanii* nodulates soybeans in association with the production of rhizobitoxine, an inhibitor of methionine biosynthesis. A side-effect is enhanced leaf chlorosis. [Okazaki et al. \(pp. 55–59\)](#) compare the effects of a rhizobitoxine-deficient mutant with the wild type and conclude that the chlorosis is caused by foliar methionine deficiency.



Germination during post-harvest treatment of coffee beans

Expression patterns of germination-specific isocitrate lyase (quantified by competitive RT-PCR) and the resumption of cell-cycle activity (determined by the abundance of β -tubulin and flow cytometry) reveal that coffee seeds germinate during commercial post-harvest processing ([Bytof et al., pp. 61–66](#)). Time-courses of germination processes are different for wet- and dry-processed coffees.



Responses of dark respiration and translocation to temperature

[Bunce \(pp. 67–73\)](#) reports that, in *Glycine max*, leaf dark respiration and translocation both acclimate to temperature, but in *Amaranthus hypochondriacus* no acclimation occurs and translocation is unaffected. Lack of substrates limits

respiration on warm nights in both species, producing the false appearance of rapid acclimation to high temperature.



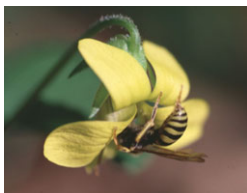
Genetic diversity maintained in a Chilean forest tree

Estimates by **Torres-Díaz et al.** (pp. 75–82) of genetic diversity within and among populations of the endangered endemic *Nothofagus alessandrii* show that, despite its restricted geographical range and recent human fragmentation, it maintains high levels of genetic diversity and genetic differentiation. This is reminiscent of the variation reported for widespread congeners.



Role of leaf lobation in elongation response to shade

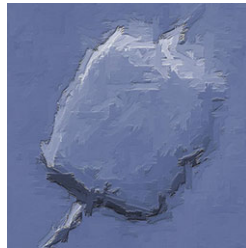
Shading *Serratula tinctoria* with artificial plants in a field experiment resulted in extensive leaf lobation that increased leaf length. **Semchenko and Zobel** (pp. 83–90) propose that leaf lobation is a low-cost way of elevating the height of photosynthetic surfaces in response to herbaceous shade.



Genetic effects of urban habitat fragmentation

Plants are susceptible to detrimental effects of habitat fragmentation. However, **Culley et al.** (pp. 91–100)

report urban populations of the herb *Viola pubescens* with substantial genetic variation, showing no apparent impedence to gene flow among populations. This is consistent with a chasmogamous/cleistogamous breeding system and substantial pollinator abundance in urban habitats.



A fresh look at forisome structure

Forisomes are unique ATP-independent contractile protein bodies that act as reversible plugs in legume sieve tubes. **Peters et al.** (pp. 101–109) introduce *Canavalia gladiata* as a new model species with extraordinarily large forisomes. These bear tail-like protrusions that greatly facilitate the handling of specimens isolated for experimentation.



Selenium accumulation quantified in a wide range of species

White et al. (pp. 111–118) survey leaf selenium (Se) and sulfur (S) concentrations in 39 angiosperms grown hydroponically under identical conditions and representing the range of Se accumulation phenotypes. They find Se-accumulator plants possess distinct mineral composition as defined by extraordinarily high Se concentrations and Se/S quotients.



Population structure and genetic differentiation in *Silene latifolia*

Using phenotypic traits and six microsatellite loci, **Jolivet and**

Bernasconi (pp. 119–127) identify a significant molecular genetic structure among F_1 populations of European white campion. These are consistent with known seed and pollen flow distances. Quantitative genetic divergence among populations and clinal variation for age at first flowering suggest local adaptation.



EST libraries for disease resistance in cacao

EST libraries of resistant and susceptible interactions between *Theobroma cacao* and *Moniliophthora perniciosa* are documented by **Gesteira et al.** (pp. 129–140). Two unigenes of 1719 and 1907 sequences were analysed using bioinformatics and compared with the other cacao libraries. Roles of *in silico* differentially expressed genes in resistance processes are discussed.



Non-adaptivity of genome size in a highly variable population

Analysis of a relict tetraploid population of *Festuca pallens* by **Šmarda et al.** (pp. 141–150) suggests an absence of natural selection in the initial stage of genome size diversification.

This supports the genome size evolution model of Bennetzen et al. (2005; *Annals of Botany* 95: 127–132).