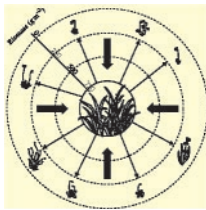


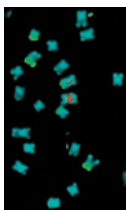
Phytochromes and shade avoidance (Botanical Briefing)

Sensing red:far-red ratios (R:FR) is an important component of competitive responses to the presence of near-neighbours. **Franklin and Whitelam (pp. 169–175)** assess these responses and the molecular processes that bring them about following R:FR perception by phytochromes. Roles for blue light sensing and the circadian clock are also considered.



Pragmatic models for conserving plant diversity (Invited Review)

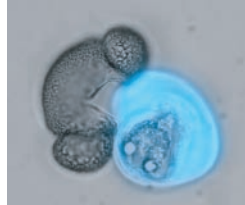
There is a compelling need to protect natural plant communities and restore them in degraded landscapes. **Keddy (pp. 177–189)** introduces six pragmatic models to guide managers in maintaining biodiversity. Although theoretical models receive far more headline attention, pragmatic models hold more promise for yielding results with immediate application to plant communities.



Characterization of I genome in *Paspalum* group *Quadrifaria*

Species of the *Quadrifaria* group of *Paspalum* share the I genome. **Vaio et al. (pp. 191–200)** analyse five species for chromatin condensation patterns, physical location of 5S and 45S rDNA sites by FISH, and sequences of five chloroplast non-coding regions. Results

with FISH and chloroplast DNA sequences are consistent with two clades. This suggests *Quadrifaria* is not monophyletic.



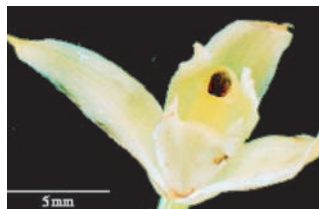
Exine layer of pine pollen is hydrophillic

Using pollen-derived sporopollenin capsules, **Bohne et al. (pp. 201–208)** show that although the exine of *Pinus sylvestris* and *P. nigra* presents an insignificant barrier to water movement, its restricted permeability to low-molecular-weight solutes exerts a strong osmotic influence on water uptake.



Carpels of *Brasenia* are one-sided yet completely ascidiate

Histological differentiation of carpels at anthesis does not necessarily reflect final morphological organization. **Endress (pp. 209–215)** shows that carpels of the basal extant angiosperm *Brasenia* (Nymphaeales) have a pronounced one-sided, ventral stigma but are completely ascidiate and not conduplicate. This finding affects the interpretation of fossil flowers.



Nectar secretion and pollination in orchid

Current understanding of nectar secretion in *Maxillaria* is based on studies of atypical *M. coccinea*. **Davies et al. (pp. 217–227)** describe nectary structure

and nectar secretion via stomata in more typical *M. anceps*. On the basis of floral morphology and nectar analysis, they propose that bees, possibly Meliponini, pollinate this orchid.



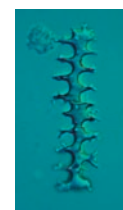
Genome sizes (C-values) for more than 300 angiosperms

Genome size provides a strong unifying element in plant biology and the need to make hitherto unpublished data available to the scientific community was recognised at the Second Plant Genome Size Meeting, Kew, UK, 2003. **Zonneveld et al. (pp. 229–244)** contribute to this goal by publishing C-values for 411 angiosperms, including 308 species not previously listed in the Plant DNA C-values database.



Genetic structure of *Haloxylon ammodendron* in China

Sheng et al. (pp. 245–252) show that populations of *Haloxylon ammodendron* from two regions of China (Xinjiang and Inner Mongolia) possess high genetic variability within populations and high genetic homogeneity amongst populations. They suggest that the present genetic structure arose because of high rates of pollen flow.



Internationally agreed protocol for describing phytoliths

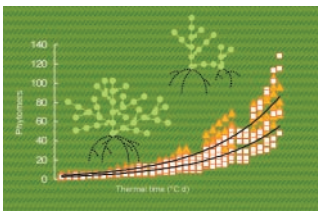
Phytoliths (microscopic silica particles produced in and between cells) are one

of the most widespread and often-preserved plant microfossils and thus used widely in palaeoenvironmental studies, botany, geology and archaeology. **The International Code for Phytolith Nomenclature (ICPN) Working Group (pp. 253–260)** presents the first internationally accepted protocol to describe and name phytoliths easily.



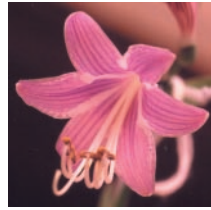
Germination in salt mixtures

Most salinity studies have used monosaline solutions. However, based on studies of Cl^- and SO_4^{2-} effects on germination in monosaline solutions and their interaction in salt mixtures, **Sosa *et al.* (pp. 261–267)** advise considerable caution before results with monosaline solutions are extrapolated to field conditions.



Tillering in different growth forms of grasses

Greater knowledge of growth patterns in the Graminae could improve the management of plurispecific grass communities and provide a basis for plant modelling. To these ends, **Fustec *et al.* (pp. 269–278)** compare tillering and leaf emergence rate on tillers in a cespitose, a cespitose–stoloniferous and a rhizomatous species.



Fine-scale genetic structure and sampling strategy in an endangered clonal species

The effects of clonal spread on fine-scale spatial genetic structure within plant populations of *Hosta jonesii* are quantified by **Chung *et al.* (pp. 279–288)**. Their work suggests that collecting or preserving individuals that are spaced at least 5 m apart could maximize genetic diversity.



Molecular evidence for separating *Petunia* and *Calibrachoa*

Although superficially similar, it is possible that *Petunia* and *Calibrachoa* belong to different lines of evolution. In the first comprehensive molecular analysis of these genera, **Ando *et al.* (pp. 289–297)** construct phylogenetic trees based on RFLP analyses of chloroplast DNA and show that separation of *Petunia* and *Calibrachoa* is well justified.



Latitudinal differences of growth characteristics of *Typha*

Asaeda *et al.* (pp. 299–312) employ a dynamic model to determine how latitudinal changes in temperature and

radiation affect assimilate production and subsequent translocation patterns. They validate the model and use it to investigate the dynamics of above- and below-ground biomass accumulation at three latitudes.



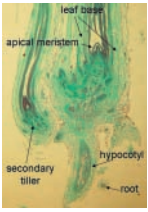
Sapling structure and function in relation to shade tolerance

The relationship between sapling structure and shade tolerance in 18 congeneric non-pioneer species of *Shorea* is examined by **Aiba and Nakashizuka (pp. 313–321)**. They uncover allocation-based and architecture-based trade-offs in these species and their co-variation. The contribution of these features to shade tolerance is discussed.



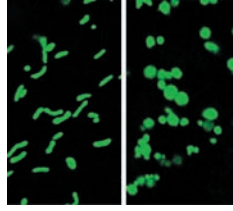
Structural and allocation traits depend on relative age

Plant species are generally considered discrete entities with specific invariable trait combinations. However, in this study of the perennial herb *Pimpinella saxifrage*, **Niinemets (pp. 323–330)** reveals a several-fold variation in main plant structure and biomass allocation due to plant age. Such age-dependent modifications affect light interception and blur differences between community-forming species.



Distribution of carbohydrates in oat crowns before and after freezing

During freezing, dramatic shifts in carbohydrate concentrations occur in crowns of winter cereals. These shifts are probably related to hardening that occurs at sub-zero temperatures. **Livingston *et al.* (pp. 331–335)** report that after 3 d exposure to -3°C , resultant changes in oat crown carbohydrates and protein are tissue specific.



Mitochondrial behaviour in Arabidopsis under ROS stress

Reactive oxygen species (ROS) play a central role in plant cell death.

Yoshinaga *et al.* (pp. 337–342) visualize mitochondria under ROS stress using Arabidopsis transformed with mitochondrial-targeted green fluorescent protein. They show that morphology of mitochondria is dramatically changed and cytoplasmic streaming is paused during ROS-induced plant cell death.