

Evolution and the primary cell wall

Popper and Fry (pp. 1–12) investigate the composition of the primary cell wall (PCW) of lower land plants and charophytes (their closest living relatives). Charophyte and bryophyte PCWs were found to differ from those of euphyllophytes. However, xyloglucan (a major hemicellulose in all land plants, including bryophytes) was absent from PCWs of charophytes. Variation in PCW composition may be related to ecological pressures experienced during terrestrialization.



Male-biased sex ratios

Different reproductive functions of male and female individuals of dioecious species may lead to sexual differences in life histories. **Espirito-Santo et al. (pp. 13–19)** show that males of a Neotropical shrub, *Baccharis dracunculifolia*, produce inflorescences before females, which then delay fruit maturation until the dry season. This different flowering phenology was associated with higher female mortality, thus helping to explain the male-biased sex ratio of this population.



Intraspecific micro-differentiation

Alpine environments are useful for studying small-scale population differen-

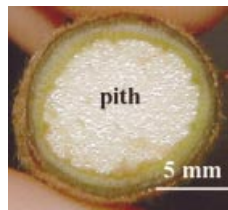
tiation. This is because environmental conditions can change rapidly within a local area. For example, micro-topographical differences can give rise to marked variations in snow melting regime. **Shimono and Kudo (pp. 21–29)** demonstrate that fellfield and snowbed populations of *Potentilla matsumurae* in the Taisetsu Mountains, Hokkaido, northern Japan, differ markedly in their germination behaviour.



First DNA amounts (C-values) for 28 angiosperm genera

Achieving familial representation is a key goal for plant genome size research.

Hanson et al. (pp. 31–38) present first C-value estimates for 28 angiosperm genera, including 25 families, and thus make a significant step towards reaching this target.



Morphological markers in an invasive plant

Baret et al. (pp. 39–48) characterize five development stages in *Rubus alceifolius* and show it to possess a heteroblastic developmental pattern that is midway between a bush and a liana. The authors highlight strong foliar investment at the beginning of development and significant caulinary investment at the adult stage (as estimated from pith dimensions).



Which phylogeny for lentil?

Relationships among taxa of the genus *Lens*, to which the cultivated lentil belongs, are still controversial. **Sonnante et al. (pp. 49–54)** analyse sequence variation of the rDNA internal transcribed spacers from cultivated and wild *Lens* taxa. ITS sequences allow some phylogenetic inferences, even though these data alone cannot clarify all the relationships within the genus.



Crown development in a tropical plagiotropic tree

In tree saplings of the shaded forest understorey, plagiotropic branching is considered more effective at intercepting light than orthotropic branching. **Osada and Takeda (pp. 55–63)** examine leaf demography and light interception of individual leaves, and suggest that carbon allocation from lower branches to upper branches is important for crown development in a plagiotropic species.



Cryopreservation of *Cosmos atrosanguineus*

For long-term storage of rare germplasm, genetic stability is of paramount importance. **Wilkinson et al. (pp. 65–74)** assess possible causes of damage in cryopreserved material using electron microscopy, and check its genetic stability using AFLP fingerprinting. Despite some tissue damage, no genetic change is reported in regenerated plants.



Amphibious survival

Turlough populations of *Ranunculus repens* must endure several months' complete submergence. **Lynn and Waldren (pp. 75–84)** demonstrate greater tolerance of artificial submergence in turlough populations relative to terrestrial populations. Higher levels of non-structural carbohydrates were present in roots of a field-collected turlough population compared with those of a pasture population. This may be an important factor enabling survival of transient submergence in the turlough habitat.



Symbiotic N₂-fixation under elevated CO₂

The regulation of N₂-fixation rates within soybean plants appears to depend on a feedback mechanism from the shoots, but the details are unresolved. **Serraj and Sinclair (pp. 85–89)** explore the accumulation of ureides, the products of N₂-fixation in soybean, following exposure of whole plants to ambient and elevated CO₂ concentrations. Results indicate that ureides do not trigger changes in N₂-fixation rates directly. However, it is suggested that a product of ureide catabolism is involved in a feedback on nodule activity.



Modelling canopy development in apple

A study of canopy development in two cultivars of apple by **Costes *et al.* (pp. 91–104)** shows that over 6 years, changes in growth, number and nature of axillary shoots, as well as spur death can be modelled as a function of within-tree shoot position. Flowering was shown to be easily predictable when regular bearing was observed.