



## Nitrogen and phosphorus stoichiometry (Invited Review)

Well-defined allometric (scaling) relationships hold across many orders of magnitude in body size, and across ecologically and genetically diverse species of plants, animals and bacteria. **Niklas (pp. 155–163)** reviews how allometric theory and nitrogen–phosphorus stoichiometry can be juxtaposed to provide a proximate explanation for broad interspecific allometric relationships.



## Renaissance images of cucurbits

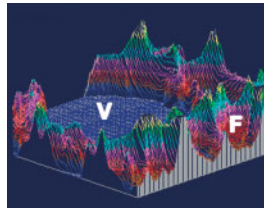
New and Old World cucurbits depicted in festoons painted between 1515 and 1518 on the ceiling of Villa Farnesina, Rome, are identified by **Janick and Paris (pp. 165–176)** as belonging to eight species. They also evaluate intraspecific diversity, compare them with contemporary images and consider the implications for cucurbit dispersal. The images of *Cucurbita maxima* appear to be the first in Europe.



## Nectar production dynamics

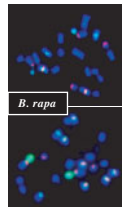
Nectar production throughout floret phenology is investigated by **Wist and Davis (pp. 177–193)** in relation to nectary ultrastructure of *Echinacea purpurea* (Asteraceae). They highlight the presence of sieve elements

immediately below the epidermis, companion cells modified as transfer cells, and modified stomata on the nectary surface as contributing to the pathway of pre-nectar movement and escape.



## Wounding modifies lignin distribution in xylem of poplar

In trees, wounding modifies cells differentiating at that time. **Frankenstein et al. (pp. 194–204)** describe wound-induced cell wall modifications such as thickening, altered lignin composition and heterogeneous lignin distribution in the differentiating xylem of poplar trees.



## rDNA loci distribution and polymorphism in Brassicaceae

The number of rDNA loci in Brassicaceae species is large and variously reported in the literature. To regularize the situation, 52 accessions in five genera are analysed by **Hasterok et al. (pp. 205–216)** using FISH. They show that polymorphism in number, appearance and chromosomal distribution of rDNA loci is genome dependent.



## Parameter optimization of GREENLAB crop model for maize

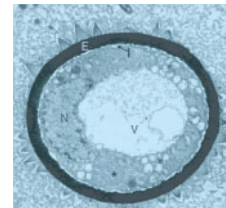
Crop models based on architecture and organogenesis are highly desirable. **Guo et al. (pp. 217–230)** describe new

methodologies for crop parameter optimization that validate this model using field data obtained with 3D visualization.



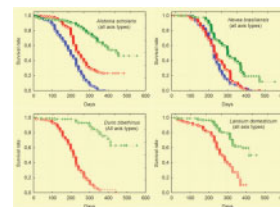
## Mossy rose mutation identified

*Rosa × damascena* ‘Quatre Saisons Blanc Mousseux’ displays mossy growth on the pedicel and calyx. **Caissard et al. (pp. 231–238)** show it to be a heterochronic mutation involving secretory trichomes. Such a mutation of trichomes growing on other trichomes has also appeared, probably independently, in *R. × centifolia*, giving the famous moss roses, *R. × centifolia* ‘muscosa’.



## Explanation of unusual pollen wall in an arum

The pollen wall of *Arum alpinum* contains no sporopolleninous exine. An ontogenetical investigation of this unusual feature by **Anger and Weber (pp. 239–244)** indicates that an absence of callose throughout pollen development, including the tetrad, may be the explanation.



## Leaf longevity and shade

Plasticity in leaf life span of four tropical tree species is shown by **Vincent (pp. 245–255)** to be commensurate with plasticity in specific leaf area and photosynthetic rate. This is expected to

impact strongly on carbon gain efficiency when plants acclimate to different light regimes.



#### Sulfur tolerance in mosses

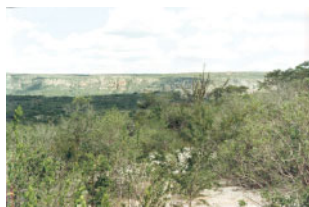
Detoxification of dissolved sulfur dioxide (bisulfite) is shown by **Bharali and Bates (pp. 257–263)** to involve oxidation to sulfate extracellularly using energy from photosynthesis. In calcicolous *Rhytidiadelphus triquetrus*, intracellular oxidation may also take place using  $\text{Ca}^{2+}$ . A passive oxidation of bisulfite by  $\text{Fe}^{3+}$  adsorbed in the cell walls is seen in the calcifuge *Pleurozium schreberi*.



#### Flowering periodicity in tropical trees

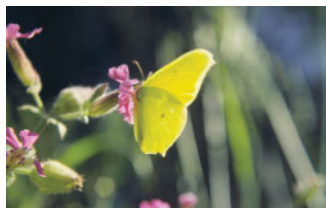
Amongst tropical deciduous forest trees, **Singh and Kushwaha (pp. 265–276)** identify five distinct flowering types with differing time lags between onset of leaf flushing and flowering. They suggest

that flowering periodicity has evolved as an adaptation to length of the leafless period and the time required for fruit development.



#### Reproductive biology in the dry tropics

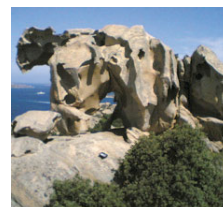
**Machado et al. (pp. 277–287)** identify plant sexual and breeding systems for the Caatinga, a Brazilian tropical dry forest. They make comparisons with worldwide studies of the reproductive biology of different tropical communities with a view to understanding the organization of pollination mechanisms and the forces driving breeding system evolution.



#### Pollination ecology of *Silene acutifolia*

Variability in pollination mechanisms within *Silene* is exploited by **Buide (pp. 289–297)** to analyse the role of

specialized or generalized systems of pollination. She describes the pollinator assemblage of the hermaphrodite *S. acutifolia*, including pollen limitations, and relationships between size and number of open flowers, pollinator species and total seed production per plant.



#### Genetic variation in *Juniperus phoenicea* (Short Communication)

The Mediterranean Basin is rich in biodiversity, but few of its plant species have been analysed for population size and genetic variation. **Meloni et al. (pp. 299–304)** use molecular markers to analyse *Juniperus phoenicea* and report significant differences among populations.