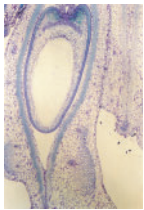


Auxin: regulation, action, and interaction (Invited Review)

Auxin biology has long been a fundamental field of plant science. **Woodward and Bartel (pp. 707–735)** review recent discoveries that reveal how auxin controls diverse aspects of plant development, the tight homeostatic control of auxin abundance, and the use of auxin as a tool to examine the inner workings of eukaryotic cell biology.



Structure and development of *Medicago truncatula* pod wall and seed coat

Medicago truncatula is a genomic model species for legume biology. **Wang and Grusak (pp. 737–747)** present the first detailed characterization of structural and developmental features of the pod wall and seed coat during early and mid-stages of pod development.



Orchid nectaries and presumed pollination by hummingbirds

Floral morphology of certain neotropical orchids suggests that they are ornithophilous, even though evidence for the transfer of pollinia by hummingbirds is scarce. Surprisingly, the structure of the nectary of such orchids has largely been neglected. In a comparative study,

Stpiczyńska et al. (pp. 749–756) describe nectar secretion and nectary histology and ultrastructure in a presumed ornithophilous orchid *Hexisea imbricata*.



Foliar absorption of a carnivorous plant

Roridula plants capture insects but have no appropriate digestive enzymes. Instead, their leaves absorb nitrogen from faeces of mutualist hemipterans that consume captured insects. **Anderson (pp. 757–761)** shows that a discontinuous leaf cuticle facilitates rapid absorption from the faeces. This feature extends the known adaptations to insectivory in *Roridula*.



New case of pseudocopulatory pollination

Pollination by sexually deceived male insects (pseudocopulation) occurs in several orchid groups. **Blanco and Barboza (pp. 763–772)** document a new case of pseudocopulation by fungus gnats in a species of *Lepanthes*, one of the largest genera of angiosperms. In a remarkable mode of pseudocopulation, the insects temporarily connect to the flowers with their genitalia during pollination.



Genetic structure of *Monimopetalum chinense*

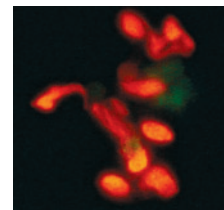
The genetic structure of populations of *Monimopetalum chinense* (Celastraceae),

an endangered endemic species of eastern China, is assessed by **Xie et al. (pp. 773–777)**. High clonal diversity was found together with low levels of genetic variation and strong genetic differentiation among populations. Appropriate conservation strategies are suggested.



Dichogamy and sexual dimorphism in an andromonoecious species

Andromonoecious *Euphorbia boetica* produces male and hermaphrodite cyathia differing in size, pollen and nectar production, and in position along the inflorescence. **Narbona et al. (pp. 779–787)** show that, at lower levels in the inflorescence, a true sexual dimorphism affects primary sexual characters that are related to gender function. In contrast, an apparent size dimorphism due to positional effects occurs at upper positions.



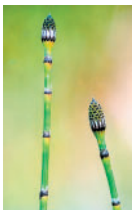
Nuclear DNA content of *Gossypium*

Estimates of the DNA content of 37 of the 50 known *Gossypium* species are reported by **Hendrix and Stewart (pp. 789–797)** using propidium iodide fluorescence flow cytometry and internal standardization with barley, maize and rice. Barley standardization overestimated DNA content for *Gossypium*. The results indicate marked genome constancy during speciation and suggest some post allopolyploidization.



Unravelling evolutionary relationships through molecules

Lorenz-Lemke et al. (pp. 799–806) describe a natural fertile hybrid at the distribution borders of two closely related species of *Passiflora*, one widespread, the other endemic. They suggest extensive hybridization was probably prevented by environmental factors and report a north–south geographic gradient in intra- and interspecific relationships.



Triploidy in *Equisetum*

Hitherto, the genus *Equisetum* has been considered cytologically uniform with a chromosome number of $2n = 216$. Flow cytometry and chromosome counting by **Bennert et al. (pp. 807–815)** reveal that, within the subgenus *Hippochaete*, triploidy ($2n \approx 324$) occurs in nature. They conclude that through reticulate evolution, morphologically distinct triploid hybrids have evolved which may represent three different cytotypes.



Iron and copper for the next generation

The micronutrient content of cereal grains is important for human and plant nutrition and depends greatly on remobilization from vegetative tissue during grain filling. **Garnett and Graham (pp. 817–826)** find that, in wheat, there

can be surprisingly large amounts of remobilized iron and copper present in wheat grains.



Genetic subdivision in *Atriplex halimus*

Atriplex halimus L. is a chenopodiaceous species widely distributed in the Mediterranean Basin. **Ortíz-Dorda et al. (pp. 827–834)** analyse its genetic variation and show the existence of two genetically distinct groups. One is distributed in the north, and the other is present in the southern and eastern borders of the Mediterranean Basin.



Molecular characterization of bamboo species

A long sexual cycle and lack of distinguishing morphological features make molecular markers an attractive alternative for the correct identification of bamboo species. **Das et al. (pp. 835–841)** describe two species-specific SCAR markers for the identification of *Bambusa balcooa* and *B. tulda*. This approach minimizes unintentional mistakes that can reduce the quality and quantity of merchandise produced from bamboo.



Genetic diversity and geographic differentiation in *Ammopiptanthus*

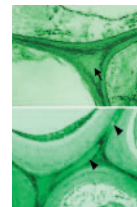
The desert legume genus *Ammopiptanthus* comprises two endangered

species: *A. mongolicus* and *A. nanus*. Against a background of low-level genetic variation and moderate genetic differentiation, **Ge et al. (pp. 843–851)** show significant genetic differences between the two species and propose appropriate conservation strategies.



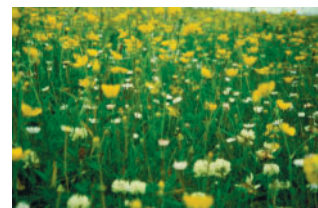
N dynamics in field-grown winter oilseed rape

Using ^{15}N labelling, **Malagoli et al. (pp. 853–861)** follow the translocation, to various organs, of N derived from root uptake or from mobilization out of vegetative parts of oilseed rape. The results reveal that, between stem extension and final harvest, two groups of leaves exist with contrasting N dynamics that are related to the pattern of leaf drop and to crop ontogeny.



Irregular distribution of pectin and lignin in middle lamella

Micro-distribution of lignin, pectin, peroxidase and hydrogen peroxide in the middle lamella of alfalfa (*Medicago sativa*) is assessed by **Wi et al. (pp. 863–868)** using transmission electron microscopy. They observe an irregular distribution of pectin that corresponds to the pattern of lignin deposition.



Photosynthetic responses to sand burial

Effects of short (2 week) and long-term (6 week) burial on turves from four

sub-communities from Scottish machair are described by **Kent *et al.* (pp. 869–877)**. Their findings demonstrate marked differences in the ability of dune species to reinstate photosynthetic mechanisms following sand burial and re-exposure in this dynamic environment.



Preferences of pollinators and herbivores in gynodioecious species

To co-exist with hermaphrodites, females need to compensate for the lack of pollen

production. One such compensation is through higher seed production, a strategy that is susceptible to modification by biological interactions with pollinators and herbivores. **Asikainen and Mutikainen (pp. 879–886)** show that pollinator preference does not benefit females, whereas the greater floral herbivory of hermaphrodites may enhance the maintenance of females in *Geranium sylvaticum*.