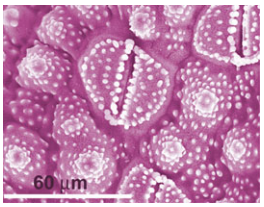
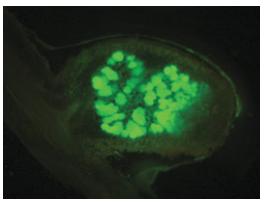
Content*Snapshots*



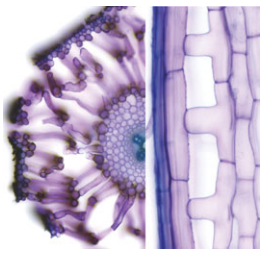
Studies of silica in plants (Botanical Briefing)
Currie and Perry (pp. 1383–1389) review the functions of silica and the mechanisms of its uptake and storage. The roles of simple biomolecules in model systems of silica polymerization are discussed in detail along with probable directions for future research.

Molecular events guiding cotton fibre development (Invited Review)
Lee *et al.* (pp. 1391–1401) describe patterns of gene expression in early fibre formation based on expressed sequence tags, microarrays and genetic transformation. An involvement of hormone signalling is highlighted. Other developmental factors await identification by means of mutant and functional analysis, and by genome mapping.



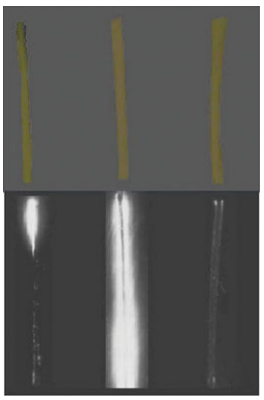
Nodulation of *Cyclopia genistoides* by *Burkholderia tuberum*
Cyclopia is a legume genus endemic to the Cape region of South Africa, where leaves of two species are used for honeybush tea. Plants grow on poor soil and depend on root nodules for nitrogen. **Elliott *et al.* (pp. 1403–1411)** show nodulation by β-rhizobia. This is the first such report for a papilionoid legume.

Diversity and homologies of seedling organs in the Poales
Seedling morphology of 16 families of Poales is analysed by **Tillich (pp. 1413–1429)**. A detailed glossary is provided to enable accurate and comparable descriptions of most monocotyledonous seedlings. The descriptions help to understand the remarkably diverse seedling morphology within the Poales through phylogenetic analysis.

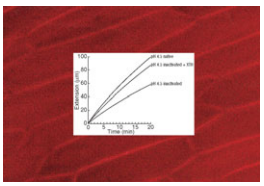


Aerenchyma formation in sponge gourd
Shimamura *et al.* (pp. 1431–1439) describe an unusual pattern of aerenchyma development in hypocotyls and adventitious roots of *Luffa cylindrica*. The aerenchyma is produced by radial elongation of cortical cells in response to flooding. T-shaped cells of adventitious roots occur regularly to form a mesh-like lacunate structure of high porosity.

Cucurbits of Mediterranean antiquity
Cucurbits from first-century descriptions by Dioscorides, Columella, Pliny, rabbinic sages and others are identified by **Janick *et al.* (pp. 1441–1457)** as *Cucumis melo* (melon), *Lagenaria siceraria* (bottle gourd), *Citrullus lanatus* (watermelon), *Citrullus colocynthis* (colocynth), *Ecballium elaterium* (squirting cucumber) and *Bryonia* sp. (bryony). *Cucumis sativus* (cucumber), widely thought to have been grown by Tiberius Caesar, was not found.



^{141}Cerium in horseradish
The distribution and translocation of ^{141}Ce (III) in horseradish are investigated by **Guo *et al.* (pp. 1459–1465).** They report that ^{141}Ce (III) is absorbed and transferred from roots to other organs over time, enters mesophyll cells and can disturb the metabolism of macronutrients.



XTH activity loosens cell walls
Xyloglucan endotransglucosylase/hydrolases (XTHs) are cell-wall enzymes of angiosperms that modify load-bearing components during development. **Van Sandt *et al.* (pp. 1467–1473)** show that a recombinant XTH protein is capable of restoring part of the extension lost after heat inactivation of isolated onion epidermis cells, thus demonstrating that XTHs loosen cell walls.

Juniperus pollination drop is the pollen landing site

The pollination drop is a visible liquid secretion produced by the ovule. **Mugnaini *et al.* (pp. 1475–1481)** reveal that, following pollen deposition on the drop in *Juniperus communis*, subsequent pollination is enabled by physical withdrawal into the ovule, triggered by biochemical changes. Non-specific withdrawal induced by particles of appropriate size may depress pollination efficiency.

The monkey-beetle-pollination syndrome

In the Greater Cape Floral Region of South Africa, monkey beetles pollinate several plant species that have brightly coloured, odourless flowers with conspicuous dark perianth markings (beetle marks). Using artificial flowers with different marking patterns, **Van Kleunen *et al.* (pp. 1483–1489)** demonstrate that these beetle marks are attractive to monkey beetles.

Flowers shed light on Fabales evolution

Floral development in the Quillajaceae and Surianaceae is used by **Bello *et al.* (pp. 1491–1505)** to investigate relationships within the recircumscibed order Fabales. Quillajaceae and Surianaceae have actinomorphic flowers, but a sister relationship is doubtful since their reproductive whorls differ despite similar inflorescence morphology and perianth initiation. *Quillaja* resembles Leguminosae in some floral traits.

Contrasting osmotic responses to water deficit amongst eucalypts

Merchant *et al.* (pp. 1507–1515) find that eucalypt species from wet areas generate lower osmotic potentials in response to drought mainly via osmotic adjustment, while those from drier areas achieve this by also using constitutive solutes and by a lowering of leaf water content.

Adjustment to root biomass allocation helps root aeration and nutrient acquisition

Xie *et al.* (pp. 1517–1523) examine root morphology and physiology in the submerged macrophyte *Myriophyllum spicatum*. They identify a trade-off between internal aeration and nutrient acquisition by means of adjustments to the structure of the root system and biomass allocation to different orders of lateral roots.

Ecophysiological analysis of variability in nitrogen nutrition of pea

Nodule formation is highly energy demanding. **Voisin *et al.* (pp. 1525–1536)** analyse genetic variability associated with N nutrition using an ecophysiological framework, taking into account relationships with C nutrition, the structures involved (roots and nodules) and their productive efficiency. An ideotype for improving N nutrition in pea is developed.

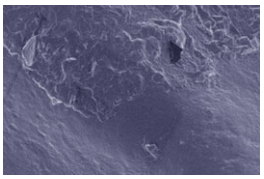
Growth and nitrogen relations in mat-forming lichens

Internal recycling of N occurs in the lichens *Stereocaulon paschale* and *Cladonia stellaris* and may be ecologically important under field conditions. **Kytöviita and Crittenden (pp. 1537–1545)** show that migration of ^{15}N comprises a physiologically dependent translocation based on sink–source relationships.

Geographic variation of plant breeding system

Wide geographic studies of plant–animal interactions can uncover an ecological dimension to the evolution of plant breeding systems. **Alonso *et al.* (pp. 1547–1556)**

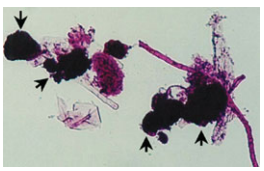
find that hermaphrodite populations of *Daphne laureola* in the Iberian Peninsula are located at warmer sites than gynodioecious ones. Reduced floral display and enhanced pollination characterize the hermaphrodites.



Leaf surface compounds and plant–organism interactions
Buschhaus *et al.* (pp. 1557–1564) analyse surface waxes of *Rosa canina* leaves. They find that while the outermost wax layer is dominated by very-long-chain fatty acid derivatives, the layer beneath contains mainly triterpenoids.

On a phylogeny for coffee
Eighty-six species of *Coffea* (Rubiaceae) and seven species of *Psilanthus* are examined by **Maurin *et al.* (pp. 1565–1583)** using sequence data from four plastid regions and ITS. Several strongly supported lineages are identified with geographical and/or ecological coherence. The origin of *C. arabica* from hybridization between *C. canephora* and *C. eugenioides* is substantiated.

Endocarp variation in *Prunus* section *Prunus*
Identification of *Prunus* groups at subspecies or variety levels is complicated by much variation and by morphologically transitional states. To help clarify the position, **Depypere *et al.* (pp. 1585–1597)** provide a detailed study of endocarp dimension and shape variation for taxa of *Prunus* section *Prunus*.



Rapid isolation of arbuscules from roots of *Lotus* (Technical Article)
A simple, rapid and inexpensive method for the isolation of metabolically active arbuscules from roots of an increased-arbuscule-forming mutant of *Lotus japonicus* is developed by **Senoo *et al.* (pp. 1599–1603)**. The metabolic activity of the isolated arbuscules is not significantly affected by the procedure.