



Plant architecture: a review (Invited Review)

Barthélémy and Caraglio (pp. 375–407) use novel architectural concepts and analytical methods in a multi-level, comprehensive and dynamic approach to study plant form and ontogeny that extends from germination to death. Current knowledge on plant architecture and morphology are summarized, and their implications and potential roles in modern plant biology are discussed.



Regeneration *in vitro* of different root types of cassava

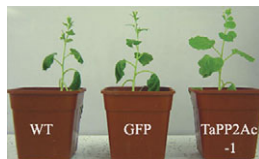
Medina *et al.* (pp. 409–423) describe the root system of cassava, focusing on storage roots, and propose tuberization criteria. The authors assess the effect of intrinsic and extrinsic factors on *in vitro* storage root formation with the aim of achieving cassava *in vitro* tuberization.



Architectural traits in two grapevine cultivars

Topological analysis based on Markovian models, kinematics and

geometric analysis by **Louarn *et al.* (pp. 425–437)** reveal that differences between two cultivars in primary shoot structure and in branch development can be accounted for by differences in leaf area distribution. Shoot shape is seemingly controlled by differences in axis length arising from different internode lengths.



Wheat *TaPP2Ac-1* gene enhances drought tolerance in tobacco

Xu *et al.* (pp. 439–450) clone a catalytic subunit of a wheat protein phosphatase gene (PP2A). Droughted transgenic tobacco plants over-expressing *TaPP2Ac-1* have improved capacity to maintain leaf relative water content, leaf cell membrane stability index, water retention ability and water use efficiency, suggesting that *TaPP2Ac-1* is a drought-responsive gene.



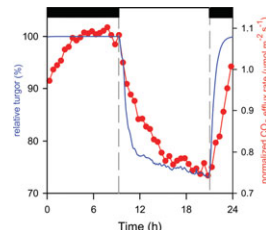
Pollination of *Schisandra henryi* by female pollen-eating gall midge

Dioecious *S. henryi* is shown to be pollinated only by female pollen-eating *Megommata* sp. (**Yuan *et al.*, pp. 451–460**). Pollen is the sole reward. Female flowers also attract the same insect pollinators while offering no food reward. This is the first report of predacious gall midges utilizing pollen as food.



Hydrophobicity shift in chloroplast small heat shock protein in *Rhododendron* (eudicot) and *Machilus* (basal angiosperm)

Large, coriaceous leaves of certain *Rhododendron* species may be an adaptation to high altitudes. **Wu *et al.* (pp. 461–475)** suggest this links to genetic divergence of the chloroplast small heat shock protein (CPsHSP) gene and an associated hydrophobicity shift also found in *Machilus*.



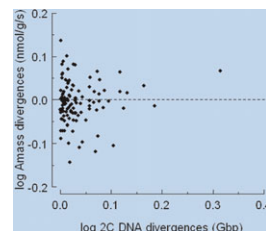
Stem CO₂ efflux in relation to stem turgor

Daytime stem CO₂ efflux rates are often lower than expected from temperature effects. **Saveyn *et al.* (pp. 477–485)** show that these daytime depressions correlate with the daily dynamics of stem turgor. They suggest that stem water status is a potentially important determinant of stem CO₂ efflux rates.



Inclination-induced corrective growth in *Cryptomeria japonica*

In response to inclination stimuli, gymnosperm trees undergo corrective growth during which compression wood develops on the lower side of the inclined stem. In an inclination experiment with *C. japonica* saplings, **Yamashita *et al.* (pp. 487–493)** show how stress in the compression wood region is involved in this righting response.



Genome size evolution, leaf strategy and metabolic rates

Genome size variation may be associated with predictable effects on leaf strategy and metabolic efficiency. **Beaulieu et al.** (pp. 495–505) test these hypotheses across a dataset that includes angiosperms and gymnosperms. Although the proposed effects are manifest using conventional statistics, an entirely different picture emerges when effects of phylogeny are corrected for.



New floral morph of invasive Mediterranean weed

Oxalis pes-caprae is a tristylous invasive weed of Mediterranean climates. **Castro et al.** (pp. 507–517) study the distribution of flower morphs, ploidy level and sexual reproduction, and report a new floral morph. This finding opens new perspectives on sexual reproduction, despite the apparent absence of seed set.



Environmental scales on the reproduction of a gypsophyte

Environmental variability can determine reproductive success. **Aragón et al.**

(pp. 519–527) evaluate the effect of two different scales of variability on the reproductive output of a semi-arid specialist. They evaluate the environmental factors that may stress a stress-tolerant specialist while taking into account its ability to maintain reproduction across contrasting conditions.



Adaptation to climate in Arabidopsis thaliana

Twenty-one accessions of *A. thaliana* collected from its historic range were grown in a common garden. **Rutter and Fenster** (pp. 529–536) find superior performance among accessions whose historical climates were most similar to conditions during the experiment.



Relative growth rate and seedling survival in the shade

The ability to sustain fast relative growth rates in well-lit conditions is thought to prejudice seedling survival in shady situations. **Seiwa** (pp. 537–544) explores the validity of this hypothesis

for five broadleaved species under different levels of canopy cover in forest conditions.



Seasonal water use in Mediterranean woody species with different post-fire regenerative strategies

Post-fire regeneration is a key process in mediterranean shrubland dynamics.

Saura-Mas and Lloret (pp. 545–554) analyse 30 woody species and find that those that establish by seedlings tend to have more leaf and shoot moisture and rehydrate more easily in winter than species re-sprouting after fire.



Values for phyllotactic parameters in Begonia shoot apex

Barabé et al. (pp. 555–560) show that plastochrone and platochronic ratio involved in the initiation of two successive primordia in *Begonia* indicate that the time between the appearance of successive primordia is related to primordial enlargement and not to distance to the centre of the apex.