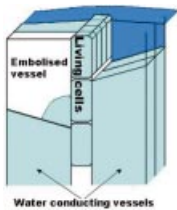




Biomechanics of a sand dune-adapted liana

Many woody lianas show specialized stem biomechanics for climbing growth habits in woodland habitats. **Isnard *et al.*** (pp. 407–417) investigate how a variety of *Clematis flammula* has adapted a basically lianoid mechanical architecture to an open sand dune environment in which specialized aerial trellises are produced from a flexible, mostly underground perennial axis.



Modelling the recovery of embolism

It is known that embolized xylem vessels can be refilled, while adjacent water conducting vessels remain under tension. **Vesala *et al.*** (pp. 419–428) show that refilling is physically possible despite hydraulic isolation of the embolized vessel. The mechanism involves living cells acting as sources and transporters of solutes and water.



Carbon balance of tomato plants in prolonged darkness

Whole-plant respiration decreases in relation to a decline in availability of carbohydrates in vegetative organs. In contrast, fruits maintain fairly stable carbohydrate concentrations and the decrease in their growth rate is moderate whatever their initial carbohydrate

resources. **Gary *et al.*** (pp. 429–438) examine the relevance of a simple model in these source-limited conditions.



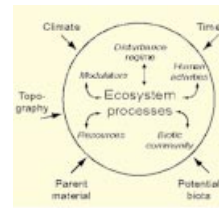
Labellar secretions in *Maxillaria*

Labella of members of the *Maxillaria acuminata* alliance (Orchidaceae) secrete a wax-like or viscid material which is collected by bees. **Davies *et al.*** (pp. 439–446) describe the formation, secretion and chemical composition of this substance and discuss its possible relevance to the pollination biology of these orchids.



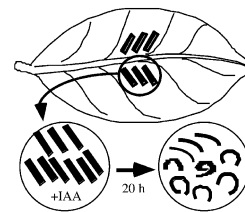
Soybean is injured by elevated root-zone CO₂ concentration

Soybean is very tolerant to excess water and anaerobiosis. However, **Boru *et al.*** (pp. 447–453) show that if anaerobic root-zones also contain elevated CO₂ concentrations, injury to the plant results. In contrast to soybean, rice is impervious to this combination of no oxygen and elevated root-zone CO₂. It is suggested that the relative susceptibility of soybean to soil flooding, compared with that of rice, may be an outcome of its greater sensitivity to CO₂.



Predicting the impact of global climate change

Anthropogenic activities are changing the climate and modifying species composition. **Chapin** (pp. 455–463) reviews likely ecological impacts of these changes. Effects are thought to be greatest when species change affects the productive capacity of the overall vegetative cover, rate of organic matter decomposition and mineralization processes in the soil.



2,4-D antagonizes IAA-induced leaf epinasty

It is known that IAA induces epinastic curvature in tobacco leaf strips via an ethylene-independent mechanism. **Kawano *et al.*** (pp. 465–471) show that the synthetic auxin 2,4-D antagonizes IAA-induced leaf curvature. Kinetic analysis reveals that the mode of this interaction comprises uncompetitive and/or non-competitive inhibition.

Continued overleaf



Stable self-pollination in rice is linked to anther-pore size

Stable pollination may improve the tolerance of rice to low and high temperatures. **Matsui and Kagata (pp. 473–477)** examine relationships between characteristics of floral organs and stability of pollination. They show that the size of basal anther-pore is highly correlated with the stability of pollination in many rice varieties.



Branching pattern in young red oak

In both computational molecular biology and computational plant architecture, the generic problem of analysing successions of homogeneous zones in discrete sequences is currently addressed using a class of statistical models called hidden semi-Markov chains. **Heuret *et al.* (pp. 479–492)** describe growth units that take into account the succession of axillary branch production. This approach reveals different branching pattern types are present in red oak.



Variability of the essential oil of *Viola etrusca*

Viola etrusca Erben is endemic to Italy. The essential oils obtained from different populations have been analysed to verify the phenotypic discontinuity observed in a previous study. Multivariate analysis showed differences, notably between northern and southern populations. **Flamini *et al.* (pp. 493–497)** suggest that this species could be undergoing a slow schizogenetic differentiation process due to its genetic isolation.