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Functional Plant Biology

Contents

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Cover illustration: *Nothofagus menziesii* in Waitutu Forest, New Zealand. Stable oxygen isotopes can help determine sources of plant water and plant regulation of water loss (see Barbour, pp. 83–94). Photo by Neil Fitzgerald (http://www.neilfitzgeraldphoto.co.nz/).

Black coloration in leaves of *Ophiopogon planiscapus* 'Nigrescens'. Leaf optics, chromaticity, and internal light gradients
Jean-Hugues B. Hatier and Kevin S. Gould 130–138

Black-pigmented leaves rarely occur in nature. This paper compares the optical properties of black and green foliage. The authors quantify leaf pigments, enumerate leaf colour, and examine light-transmission profiles of near-isogenic black and green leaves of *Ophiopogon planiscapus*. The exceptionally dark colour is attributable to luxuriant concentrations of anthocyanins and chlorophylls. While the black pigmentation restricts transmission of green light to the upper mesophyll, it has little effect on the distribution of red and blue wavelengths within the leaf.

ASP53, a thermostable protein from *Acacia erioloba* seeds that protects target proteins against thermal denaturation
Linda Mtwisha, Jill M. Farrant, Wolf Brandt, Caswell Hlongwane and George G. Lindsey 139–149

Mtwisha *et al.* describe the purification and characterisation of a late embryogenesis abundant-like, cupin-domain-containing protein from seeds of the Camel Thorn tree (*Acacia erioloba*). This protein has some unique and interesting properties, including a high level of thermal stability and the capacity to protect other proteins against thermal denaturation. The abundance of this protein in seeds may account for their ability to survive the extreme high soil temperatures of the African summer.

Potassium and sodium relations in salinised barley tissues as a basis of differential salt tolerance
Zhonghua Chen, Meixue Zhou, Ian A. Newman, Neville J. Mendham, Guoping Zhang and Sergey Shabala 150–162

A large-scale glasshouse experiment was conducted to evaluate physiological responses of barley to salinity. Plant salt tolerance was also evaluated by non-invasive microelectrode measurements of net K^+ flux from roots of 3-day-old seedlings after treatment with 80 mM NaCl. K^+ efflux from epidermal root cells was highly correlated with whole-plant measures of salt tolerance, suggesting that the ability to maintain a high K^+/Na^+ ratio is a key feature of salt tolerance in barley.
