

assay showed high activity of proteases from matured soybean nodules while active inhibitors were observed from younger nodules. Only activity of cysteine proteases increased at later stages of nodule development.

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Involvement of nitric oxide during the Russian wheat aphid resistance

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The resistance response of wheat to the Russian wheat aphid (RWA) (*Diuraphis noxia*) is a typical hypersensitive reaction (HR) and it involves early induction of the reactive oxygen and nitrogen species. The current study was conducted to extensively investigate the involvement of nitric oxide (NO) during the RWA resistance response of wheat (*Triticum aestivum* L.). The resistant (cv. *Tugela DN*) and near-isogenic susceptible (cv. *Tugela*) wheat plants were used. Our previous results have suggested that nitrate reductase (NR) could be a key enzyme involved in NO production during the RWA resistance response. We report here that the enzyme nitrite reductase (NiR) mediates this NO production from NR. Treatment of plants with a nitric oxide synthase (NOS) inhibitor, further suggested that NR is the key enzyme for this NO production. The insinuated role of NO as an important signaling molecule was verified by treating plants with sodium nitroprusside (SNP) (a NO donor). In this study, we also found that NO seems to act upstream of salicylic acid (another important signaling molecule during the RWA resistance responses). We also report here that there is an inter-relation between NO and the reactive oxygen species. Peroxynitrite is found to be induced to higher levels in the infested resistant plants selectively. This induction implies its involvement in the RWA resistance response. The inhibitory studies using urate further confirmed this discovery.

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The megafaunal 'browse trap' and savanna vegetation structure

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Despite elephant browsing and plant utilization being acknowledged as highly influential in savanna vegetation dynamics the cumulative impact of browser fauna on ecosystem structure is not well understood. A browser of particular interest is the giraffe (*Giraffa camelopardalis*). Their large body size and the fact that they are almost exclusively browsers ranging over large areas, suggests that they ought to have a strong and ubiquitous effect on the growth and demography of woody plants. At a height of around 2-3 m, plants escape the 'fire trap'. At this same height, plants grow beyond the reach of many browsers (kudu, steenbok, impala) and into the range preferably browsed by giraffe. If depression of plant growth within foraging height is strong enough it may result in a demographic bottleneck concentrating woody plants that have escaped fire into these height classes. Using height-diameter allometries measured in the presence and absence of giraffe and elephant to translate modelled stem diameter growth of individual trees into vertical structure we hope to gain and understanding of, and quantify, browser impacts on savanna structure and investigate the possibility of a mega-faunal 'browse trap'.

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Understanding drought (and desiccation) tolerance in woody perennials: Lessons from a resurrection plant

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Drought tolerance has been most intensively studied in annual crop plants such as maize. The goal being to improve crop survival during the season while minimizing the effect of water stress on yield. In contrast comparatively little work has focused on the molecular physiological and biochemical responses of woody perennials to mild, moderate and severe water deficit. Southern Africa harbours a rich diversity of resurrection plant species, plants which display the ability to survive the almost complete loss of protoplasmic water from vegetative organs (i.e. leaves). Of these species, only the resurrection bush *Myrothamnus flabellifolia*, is a true woody perennial, displaying the remarkable capacity to be able survive extensive periods (i.e. years) in the desiccated (quiescent) state. Recent research has highlighted a number of anatomical (xylem modification), physiological (photosynthetic adjustment), chemical (antioxidant load), biochemical (cell wall flexibility and membrane stabilizers) and molecular (sugar transport) properties which facilitate survival of this plant under adverse environmental conditions. This presentation will review the current hypotheses concerning desiccation survival in this species. The application of this knowledge in