stations; n=3349) in a 5-km radius around plots from topographical maps. Environmental processes as predictors of problem plants differed across spatial scales. At the regional scale, Canonical Correspondence Analysis showed that annual precipitation, elevation, bare soil and indigenous plant cover were the strongest predictors of problem species composition. At the locality scale, environmental variables predicting problem species composition differed strongly between localities. At the road scale, correlation analysis of problem species richness with housing showed that richness was significantly positively correlated with housing density, particularly within 1500 m from plots. Environmental variables as predictors of problem species composition differed across spatial levels, confirming the need for a spatial hierarchical approach in such studies. Distance of plots from urban areas was never a significant predictor for problem species richness or cover at any of the spatial levels. Density and proximity of structures predicted problem species richness but never cover, suggesting that propagule pressure affects successful colonisation while local variables affect population growth.

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How is carbon allocation of African Savanna trees affected by atmospheric CO_2 change?

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The allocation of carbon strongly differentiates between woody and herbaceous plants, with trees especially vulnerable to the impacts of low CO_2 typical of Pleistocene glacial conditions, due to their required investment in costly trunks and branches. This suggests that trees might allocate carbon away from certain key functions, such as defence structures and compounds, in low CO_2. The anticipated doubling of atmospheric CO_2 concentration due to anthropogenic activity has prompted thousands of studies on its impacts on plants, but very few on macro-allocation. Comparison of studies on elevated CO_2 impacts has revealed responses that include enhanced photosynthesis and growth of different functional types especially in woody shrubs and trees. Carbon allocation was allocated proportionally to growth in height, stem diameter, number of leaves and leaf area index. A large proportion of carbon was allocated to branches (in the form of increased number of branches) and dry matter production. This paper presents evidence that African savanna tree photosynthetic physiology was suppressed by the low levels of atmospheric CO_2 during the last glacial maximum. This reduction in photosynthesis translated to reduced growth in above ground plant height, stem diameter and below ground growth. Equally importantly, there less carbon was invested towards defence against herbivory in the form of condensed tannins and thorns. These responses were reversed under elevated CO_2 conditions with trees exhibiting enhanced photosynthesis, growth and carbon investment towards defence was also increased. The adjustment of carbon allocation may be a critical factor in projecting the direct impacts of varying atmospheric CO_2 levels on woody plants, and their ecological implications.

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Effects of competition and resource availability on *Terminalia sericea* seedlings establishment and growth

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Competition for resources between established grass species and transplanted seedlings is high. We studied the establishment and growth of *Terminalia sericea* seedlings in a mesic savanna in Pretoriuskop under different levels of resource availability. To examine the effects of water and nutrients on *T. sericea* growth, competition for resources between *T. sericea* and grass species and effects of grass on *T. sericea* seedling growth we conducted an experiment under field conditions with manipulation of water and addition of nitrogen and phosphorous. We tested hypothesis (i) *T. sericea* growth will be highly influenced by the addition of water and nutrients in the absence of grasses, (ii) grass will compete for resources with *T. sericea* seedlings, and (iii) high belowground biomass of grasses will reduce seedling growth rate by limiting available resources. The grass biomass was higher after the addition of water and nutrients. *T. sericea* seedlings did not show effect to the addition of water and nutrients in the presence and absence of grass layer. Results suggest that the initial height (May) was more important to determine the September seedling height, followed by the addition of nutrients; and the initial stem diameter was also important to determine the September stem diameter followed by grass layer. Although there was not treatment effect on seedling growth, we therefore conclude that seedlings do not grow during the dry season but use the little resources available to maintain their daily photosynthetic activities.

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