inhibition of symbiotic nitrogen fixation (SNF), is induced. Plants of a chilling sensitive and chilling tolerant genotype (PAN809 and Highveld Top respectively) were exposed to temperatures of 6 °C for twelve nights, comparing the effects of whole plant chilling (WPC) with shoot chilling (SC). In PAN809 chilling inhibited growth, with WPC causing chlorosis, while Highveld Top experienced no visible effects. CO_2 assimilation was severely inhibited in PAN809, especially as a result of WPC, while Highveld Top showed only minor inhibition. Investigation of key Calvin cycle enzymes, which exert significant control over the flux through the cycle, revealed considerable chilling-induced inhibition of fructose-1,6-bisphosphatase (FBPase) activity. This was especially true for PAN809, where much larger and earlier reductions in FBPase activity were observed than in Highveld Top. The decrease in FBPase activity preceded the much smaller, and often non-significant, decreases in the activities of ribulose-1,5-bisphosphate carboxylase/oxygenase (Rubisco) and sedoheptulose-1,7-bisphosphatase (SBPase). The only other enzyme that experienced large chilling-induced reductions in activity was aldolase, but only in the final stages of the WPC treatment of PAN809. Chilling effects in PAN809 were also manifested as reductions in the steady-state protein levels of FBPase and Rubisco. The severe effects on FBPase in the WPC treatment of PAN809 led to lower RuBP regeneration capacity. The reductions in Rubisco protein content on the other hand is a typical symptom of N-limitation and associated acceleration of leaf senescence due to inhibition of SNF. However, the effects on FBPase started earlier indicating that it is a key site of inhibition in chilling sensitive genotypes, especially when roots are also chilled.

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Effect of heavy metals on germination and seedling development of widely used medicinal plants belonging to the Hyacinthaceae

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Many small-scale farming approaches have been adopted for the cultivation of medicinal plants, but little is known about the effect of heavy metals on germination and seedling establishment. The aim of this work was to test the tolerance levels of three important medicinal plants to various metal treatments. Plant species belonging to the Hyacinthaceae, namely *Bowiea volubilis*, *Eucomis autumnalis* and *Merwilla natalensis*, were subjected to heavy metal treatments Cd, Pb and Hg (0.5, 1 and 2 mg l^{-1}) and Cu and Zn (1, 2, 5 10, 20 and 50 mg l^{-1}). High levels of Cu and Zn, which were well within the limits for maximum permissible concentrations in agricultural soils, proved to be detrimental to all three species.

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Fingerprinting *Pennisetum purpureum* Schumach varieties and cultivars using AFLP analysis

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Pennisetum Rich. is one of the most important genera in the family Poaceae because it includes forage and crop species such as *Pennisetum purpureum* Schumach and *Pennisetum glaucum* (L.) R. Br. Both *P. purpureum* and *P. glaucum* have a number of cultivars and varieties arising due to natural crossing which are very difficult to distinguish morphologically. *P. purpureum* and *P glaucum* also hybridize naturally because they are protogynous and cross pollinated and the resulting hybrids are highly sterile and resemble *P. purpureum*. Stem borers in maize cause great yield loss to resource-poor farmers in Africa and are managed by habitat management or push–pull strategies, in which purported *P. purpureum* cultivars (or possible hybrids) are used as a trap crop. The utility of AFLP is investigated to accurately identify grasses currently employed as trap crops. Preliminary results show potential for the technique in that four major groupings have been obtained in the grasses analysed to date, namely a hybrid, a *P. purpureum*, a *P. glaucum* and a *P purpureum*-Ghana grouping.

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Genetic and morphological comparisons of a potentially invasive weed (*Argemone ochroleuca*) from its natural (Mexico) and invaded (South Africa) habitat

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Morphological and genetic comparisons of a potentially invasive weed (*Argemone ochroleuca*) from its natural (Mexico)