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Uptake of cadmium and aluminium and their effects on plant growth and biochemical composition of micropropagated *Hypoxis hemerocallidea*

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Hypoxis hemerocallidea is one of the most highly utilized medicinal plants in South Africa and has received considerable attention with regards to its cultivation in order to meet the high demand. To date there is no information about the physiological responses of *H. hemerocallidea* exposed to heavy metal stress. Our study used an *in vitro* propagation model to study the effect of cadmium (Cd) and aluminium (Al) on *H. hemerocallidea* plant growth and biochemical composition. Overall, growth of plantlets exposed to Cd and high concentrations of Al was significantly reduced. Furthermore, Cd, Al and Cd:Al combinations significantly reduced the level of photosynthetic pigments. *Hypoxis hemerocallidea* exhibited some tolerance mechanisms to Cd and Al stress by accumulating high concentrations of free-proline and malondialdehyde after 6 weeks of in vitro culture. Analysis of cell wall and cytoplasmic fractions showed that *H. hemerocallidea* significantly accumulated higher amounts of Cd and Al in the cytoplasmic fractions from the roots and corms, respectively. These results explain some of the underlining mechanisms involved in the uptake and translocation of heavy metals in *H. hemerocallidea.* Cd and Al interfered with the uptake and accumulation of essential mineral elements in micropropagated *H. hemerocallidea*. Thus there is an urgent need to monitor the accumulation of heavy metals in this highly valued medicinal plant to ensure safety and quality of medicinal products.

Biography

Ambrose Okem his PhD at the age of 34 years from University of Kwazulu-Natal, South Africa and recently took up a postdoctoral fellowship at University of KwaZulu-Natal, South Africa. He has published 9 scientific papers in reputed journals and has been serving as review editor of reputed journals. He has great interest in plant physiology and medicinal plant research especially in the aspect of safety, quality and efficacy

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