AS> Vol.2 No.2, May 2011

OPEN ACCESS

A dual role of selenium in the growth control of seedlings of Stylosanthes humilis

PDF (Size:260KB) PP. 78-85 DOI: 10.4236/as.2011.22012

Author(s)

Dimas Mendes Ribeiro, Ana Maria Mapeli, Werner Camargos Antunes, Raimundo Santos Barros

ABSTRACT

The growth of seedlings of Townsville sytlo (Stylosanthes humilis H.B.K.) is inhibited by aluminium (Al) ions, their elongation being re-covered with sodium selenate at 1.0 µM. Methyl viologen and hydrogen peroxide, reactive oxy-gen species (ROS)-generating compounds, also inhibited seedling elongation and again growth was relieved by selenate. Selenate, thus, seemed to be operating as a ROS quencher, since N-acetylcysteine (NAC), an antioxidant com-pound, also stimulated largely the growth of Al-inhibited seedlings. At a higher concentra-tion (0.1 mM), however, selenate inhibited seed-ling growth and elongation was recovered by NAC. Ethylene production by selenate plus NAC-treated seedlings was very higher and thus the gaseous hormone was not responsible for the seedling growth inhibition caused by sele-nate. Hence, it seems that at high levels sele-nate operates as a ROS-generating compound whose effects were counteracted by NAC. It can be deduced that, at low concentration, sele-nates behave as a ROS quencher and at high level as a ROS-promoting species.

KEYWORDS

Aluminium, Ethylene, Growth Inhibition, Reactive Oxygenspecies, Selenate, Townsville Stylo

Cite this paper

Ribeiro, D. , Mapeli, A. , Antunes, W. and Barros, R. (2011) A dual role of selenium in the growth control of seedlings of Stylosanthes humilis. *Agricultural Sciences*, 2, 78-85. doi: 10.4236/as.2011.22012.

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