

Overexpression of Na+/H+ antiporter (NHX1) gene to enhance salt tolerance in peanut (*Arachis hypogaea* L.)

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roundnut (Arachis hypogaea L.) is an important Commercial oil seed crop rich in high quality edible oil (56%), protein (30%) and carbohydrate (20%). India produces 8 million tonnes from 7.6 million hectares. Salinity is the major limiting factor in peanut crop productivity resulting in yield loss and reduced seed quality. Salt stress has adverse influence on water relations, photosynthesis, mineral nutrition, metabolism and growth. Mechanisms that confer salt tolerance vary with the plant species; however the basic strategy works towards the maintenance of Na⁺ homeostasis in the cytosol. One of the possible mechanisms is to increase the solute concentration in the vacuoles of the plant cells i.e. to compartmentalize sodium ions. The accumulation of sodium ions inside the vacuoles provides a 2-fold advantage (i) reducing toxic levels of sodium in cytosol and (ii) increasing the vacuolar osmotic potential with

the concomitant generation of a more negative water potential that favors water uptake by the cell and better tissue water retention under high soil salinity. NHX1 gene was introduced into pCAMBIA1302 vector with hygromycin as the selection marker and GFP as the reporter gene, mobilized into Agrobacterium tumefaciens LBA 4404 and used for peanut transformation. The transformants were confirmed by PCR, Southern blotting and RT-PCR to confirm gene expression at the transcription level. Further evaluation of T₁ and T₂ plants in presence of 150 mM NaCl (including controls) for salt tolerance and ion analysis (Na⁺, K⁺ and Ca²⁺) in different parts of the transgenics. Our data demonstrate the potential of NHX1 for imparting enhanced salt tolerance capability to peanut varieties to grow in saline areas.

Biography

Venkatesh K., pursuing Ph.D under the supervision of Dr. A. Roja Rani from Osmania University has published 2 papers in reputed international journals. He has published his papers entitled "Changes in protein composition and protein phosphorylation during somatic embryogenesis and plant regeneration in peanut (Arachis hypogaea L.)" in African Journal of Biotechnology, 2009 and "Auxins and Auxin Polar Transport Inhibitor (TIBA) on Somatic Embryogenesis in Groundnut (Arachis hypogaea. L)", in African Journal of Plant Science, 2009. His work entitled "Biochemical studies on the effect of medicinal plants Gymnema and Andrographis species on diabetes induced Wistar rats" is published in IEEE Explore ICBPE 2009. Conference proceedings, Singapore, INSPEC Accession Number: 11085790.