

***In vitro* selection and characterization of salt tolerant cell lines in cassava plant (*Manihot esculenta* Crantz)**

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Abstract: To identify and characterized a tolerant cassava cell lines for salt stress. Cassava suspension culture grow on MS media containing 50, 100, 150, 200 and 250 mM NaCl were established from cassava callus cultures and some traits, including viability percentage, average and concentration of total viability cells and biochemical indicators including sodium, potassium, calcium and chloride (Na^+ , K^+ , Ca^{2+} , Cl^-), proline content, peroxidase, glutathione reductase and glutathione peroxidase enzymes were all dramatically induced in response to salt treatment. The results indicated that the high concentration of NaCl 200 and 250 mM decrease the viable cell number one fold comparing to lower concentrations of NaCl and control sample. Surprisingly at 50, 100 mM and 150 mM NaCl we found that the number of viable cells was higher than the control sample. However, the cell viability in 12 days under NaCl stress shows high tolerance against salt stress and the cell numbers also higher comparing to other NaCl concentrations. Ionic status suggested that 200 mM NaCl accumulated less Na^+ , Cl^- and Ca^{2+} and maintained better K^+ in comparison to other NaCl stress cell samples. The ion homeostasis data of cassava cell culture under NaCl stress showed that the Na^+ and K^+ accumulation increased very much under lower concentrations of NaCl and gradually decrease in higher concentration. There is a positive relationship between salt tolerance and proline content in in cassava cultures up to 200 mM NaCl stress and the highest proline content compared to other treatments. Gel activity assay of superoxide dismutase (SOD), peroxidase (GPX) and Total peroxidase (POX) activity increased in tolerant cell lines as compared to control. Analysis of the above enzymes suggests that selected cassava cell lines possessed more efficient scavenging system of reactive oxygen species under 200 mL NaCl. we can concluded that in cassava suspension culture we can realize that viability of cell under 200 mM NaCl stress after 15 day will be the perfect time to isolate and identify the intercellular and extracellular protein or/and peptides which could be produced abundantly.

Key words: cassava, salt stress, cell viability, ion concentrations, detoxification enzyme, proline.