

44. *In vitro* salt tolerance in *Oryza sativa* L. vars. Sona Masuri and Thulasi

Deepa P and Najlath T.

Department of Botany,

Korambayil Ahamed Haji Memorial Unity Women's College,
Manjeri,

Abstract: The present study investigated the effect of different concentrations of NaCl on callus induction, somatic embryogenesis and plant regeneration in caryopsis of two rice varieties, Sona Masuri and Thulasi. In Sona Masuri, the better callus induction showed on MS medium supplemented with 2,4-D1.0mg/l, while MS medium fortified with BAP0.5mg/l+IBA1.0mg/l induced higher rate of somatic embryos. Better callus induction and somatic embryogenesis in Thulasi exhibited on MS+2,4-D0.5mg/l and BAP0.5mg/l+IBA1.0mg/l respectively. *In vitro* callus proliferation and salt tolerance under different concentrations of NaCl (20, 40, 60, 80 and 100mM) observed in both varieties. Within 90 days, salt tolerant plantlets of Sona Masuri were regenerated on MS medium containing BAP0.5mg/l, IBA1.0mg/l and 20, 40 or 60mM NaCl whereas plantlets of Thulasi regenerated on MS+BAP0.5mg/l+IBA1.0mg/l with 80 or 100mM NaCl. The study revealed the highest salt tolerant potential of Thulasi compared to Sona Masuri.

Key words: Salt tolerance, callus induction, somatic embryogenesis, *in vitro*, plant regeneration

Introduction: The genus *Oryza* L., included in one of the advanced family Poaceae and consisted of about 24 species. About 95% of the world's rice is produced and consumed in Asia which contributes 40-80% of the calories of Asian diet. *O. sativa* L. is one of the commonly consumed cereals and food staples for more than half of world's population. The species has two major ecotypes, 'indica' and 'japonica' which act as a good source of thiamine, riboflavin, niacin and dietary fibre. A considerable improvement in rice qualities has been done through different rice breeding programmes. Today, the traditional rice breeding has significant progress towards higher yield and improved qualities like disease resistance, stress resistance etc. (Sun *et al.*, 2001).

Stress in plants means any unfavourable condition that affects vegetative growth, metabolism and reproduction. Both abiotic and biotic stresses negatively influence the plants. However, the biotic stress includes the infection by pathogenic organism. While cold, drought, salt and heavy metals like naturally occurring abiotic factors also induce many cellular, molecular and biochemical changes in plants to adapt or tolerate in the stress conditions. Among the abiotic stresses, salinity is considered to be a major environmental factor limiting the plant growth (Flowers & Flowers, 2005). High salt concentration in the root zone limits the productivity of cultivated plants. Moreover salinity is responsible for degradation of 2 million hectare of agricultural lands every year (Cicek & Cakirlar, 2008). To overcome this agricultural issue, the production and cultivation of salt tolerant varieties through tissue culture techniques