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Micropropagation of *Eucalyptus camaldulensis* Dehn. clones selected for tsunami affected areas

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SUMMARY

The soil conditions are totally changed due to the tsunami waves in coastal areas of South India. It turned saline and accumulates salts. Traditional plants badly affected by theses changed conditions but it was observed that *Eucalyptus camaldulensis* Dehn. plants are surviving after tsunami and growing better than other plant species. It can be utilized for the reclamation of saline soils. An *in vitro* multiplication method was developed to fasten the propagation of salt tolerant *E. camaldulensis* plants, on Murashige and Skoog's (MS) medium. Multiple shoots induced on agar gelled MS medium with 6- benzyl 1 amino purine (2.0 mgl^{-1}) and additives. 4-6 shoots generated on this combination. M S medium supplemented with kinetin (0.5 mgl^{-1}), BAP (0.25 mgl^{-1}), indole-3 acetic acid (0.1 mgl^{-1}) and additives was found best for multiplication of shoots. Addition of calcium pantathenate (0.1 mgl^{-1}) found promotary and produce more (about 67) shoots per culture bottle. Efficient rooting was achieved on half strength M S medium with indole- 3 butyric acid (2.0 mgl^{-1}) and activated charcoal (200 mgl^{-1}). *In vitro* rooted plantlets were hardened in the green house and two months old plantlets transplanted to the field for better survival in saline soil.

Key words : Tsunami waves, *Eucalyptus camaldulensis* Dehn., Saline soil, *In vitro*.

The east coast of South India affected by the Tsunami waves on 26th December, 2004. After tsunami the soil and water bodies of the coastal area have turned saline due to inundation of sea water. The electrical conductivity of the saturation extract of the surface soil also changed because of the accumulation of salt in the soil. The chemical composition of soil saturation extract showed higher concentration of sodium, followed by calcium and magnesium as the major ions followed by bicarbonates, indicating that soils turned saline but not sodic (Chaudhary *et al*., 2006).

The affected agricultural lands need to be quickly rehabilitated to restore the production capacity and ensure food security in the rural area. Reclamation of salt affected soils is possible by the use of Gypsum and by the planting of salinity tolerant trees or grasses. It was observed that only *Eucalyptus* trees are the survivors after tsunami waves, even though the soil conditions are changed (increased salinity). Trees like Casuarinas, Coconut, Cashew, Mango etc. are badly affected by strong tsunami waves and salinity of soils.

Further it was observed that *E. camaldulensis* Denh. growing better than other *Eucalyptus* clones in saline soil. It can also tolerate different soil conditions such as high calcium, high salt and periodic water lodging (Farrell *et al.*, 1996). The plant prefers acidic, neutral and basic (alkaline) soil. Plantation of *E. camaldulensis* in tsunami affected areas can be utilized for the reclamation of soil because it is very difficult to grow other traditional plants in saline soil. It is interesting to note that the water use efficiency of *Eucalyptus* is very high as it produces 2.06 gms. of biomass for one liter of water and water consumed for per gm of biomass is lowest as compared to Jamun, Siris, Kikar, and Shisham (Sapra, 1999). *Eucalyptus* plantation can be of great help in the management of municipal sewage, industrial effluents and the water logged soils.

Eucalyptus is a large genus and comprises nearly 700 species. This genus belongs to the family Myrtaceae. Most of the species of this genus are natives of Australia. Because of their adaptability to a wide variety of soil and climatic conditions, fast growth and high biomass yields, species of *Eucalyptus* are introduced and naturalized in many countries. India stands IInd accounting about 8% of the global coverage.

Clonal forestry in the *Eucalyptus* species is reviewed and discussed time to time. (Bennett and McComb, 1982; Zobel, 1992 and Muralidharan and Mascarenhas, 1995). Harry and Thrope (1994) reviewed the work done on somatic cell genetics of *Eucalyptus* species. Similarly several groups are working on frost resistance in *Eucalyptus* species (Chem *et al.*, 1998).

During the present investigation attempts were made to develop micropropagation protocol for cloning of "Candidate Plus Trees" (CPTs) selected for tsunami affected saline soils.

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