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Enhanced Shoot Regeneration of Radish (*Raphanus sativus* L.) Var. *Beeralu by* Natural Organic Additives in *In Vitro* Condition

I.P. Manawadu, N. Dahanayake* and S.G.J.N. Senanayake
Department of Agricultural Biology, Faculty of Agriculture, University of Ruhuna

Abstract

Plant cell and tissue cultures are characterized by the use of isolated parts of plants kept on, or in a suitable nutrient medium. The nutrient medium functions as replacement for the cells, tissue, or conductive elements originally neighbouring the explant. The exact conditions required to initiate and sustain plant cells in culture, or to regenerate intact plants from cultured cells, are different for each plant species. The empirical approach has shown that three factors, namely explant, medium composition, and control of the physical environment are important in successful cultures. When the completely defined plant culture media do not give the desired results, employing natural substances have beneficial effects on *in vitro* plant cell and tissue cultures. *Raphunus sativus* L. (radish) is a popular vegetable crop used by people all over the world for its culinary and medicinal properties. Enhancement of *in vitro* regeneration of radish variety beeralu is needed to further tissue culture studied. Therefore the present study was carried out to improve *in vitro* shoot regeneration of *R. sativus* Var. *Beeralu* by adding natural organic additives.

Hypocotyl explants of aseptic plantlets were cultured on MS basal medium supplemented with different natural additives; T_1-Coconut water,T_2-Coconut milk, T_3-Spanich Leaves , T_4-Pumpkin fruit, T_5-Banana fruit extract and T_6 –Control (without natural additives) with 2.5mg/l Benzyl Adenine (BAP) and 0.1mg/l 1-Naphthaleneacetic Acid (NAA). Complete Randomized Design (CRD) with five replicates was used. After one month the numbers of regenerated shoots were counted and statistical analysis was carried out using the Student Newman-Kuells Means Separation Test of SAS program (9.1.3).

The highest mean number of shoots (8 shoots/explant) from *R.sativus*Var.*Beeralu* observed in MS basal medium with 2.5 mg/l BAP and 0.1mg/l NAA supplemented with coconut water (20ml/100ml MS). The lowest number of shoots (0.0 shoot/explant) was observed from medium with pumpkin juice but it induced callus formation.

Keywords: *Coconut water, In vitro regeneration, Natural additives, Raphunus sativus* L.

* *nilanthi@agbio.ruh.ac.lk*