World Academy of Science, Engineering and Technology
International Journal of Biotechnology and Bioengineering
Vol:9, No:01, 2015

In Vitro Morphogenic Response of the Alginate Encapsulated Nodal Segment and Antioxidative Enzymes Analysis during Acclimatization of Cassia Angustifolia Vahl

Authors : Iram Siddique

Abstract : Synthetic seed technology is an alternative to traditional micropropagation for production and delivery of cloned plantlets. Synthetic seeds were produced by encapsulating nodal segments of C. angustifolia in calcium alginate gel. 3% (w/v) sodium alginate and 100 mM CaCl2. 2H2O were found most suitable for encapsulation of nodal segments. Synthetic seeds cultured on half strength Murashige and Skoog (MS) medium supplemented with thidiazuron (5.0 µM) + indole -3- acetic acid (1.0 µM) produced maximum number of shoots (10.9 ± 0.78) after 8 weeks of culture exhibiting (78%) in vitro conversion response. Encapsulated nodal segments demonstrated successful regeneration after different period (1-6 weeks) of cold storage at 4 °C. The synthetic seeds stored at 4 °C for a period of 4 weeks resulted in maximum conversion frequency (93%) after 8 weeks when placed back to regeneration medium. The isolated shoots when cultured on half strength MS medium supplemented with 1.0 µM indole -3- butyric acid (IBA), produced healthy roots and plantlets with well developed shoot and roots were successfully hardened off in plastic pots containing sterile soilrite inside the growth chamber and gradually transferred to greenhouse where they grew well with 85% survival rate. Changes in the content of photosynthetic pigments, net photosynthetic rate (PN), superoxide dismutase (SOD) and catalase (CAT) activity in C. angustifolia indicated the adaptation of micropropagated plants to ex vitro conditions.

Keywords : biochemical studies, nodal segments, rooting, synthetic seeds, thidiazuron
Conference Title : ICBBB 2015 : International Conference on Bioscience, Biotechnology, and Biochemistry
Conference Location : Paris, France
Conference Dates : January 23-24, 2015