

Effect of salinity on regeneration of callus in sugarcane

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Received : November, 2010; Accepted : December, 2010

SUMMARY

The present work has been carried out to study the regeneration efficiency of callus on different salinity levels in three varieties of sugarcane viz., Co. 86032, Co. 7714 and Co. 671. For callus induction apical meristems were subjected to *in vitro* culture on MS medium supplemented with 2mg/l 2,4-D. The calli were transferred on the media having different levels of salinity viz., 2,4,5,6 and 8 Ece mmhos/cm, obtained by combination of salts viz., NaHCO₃, Na₂SO₄, CaCl₂ and MgCl₂ in proportion of 2:1:1 of chlorides, carbonates and sulphates, respectively. The callus treated with different concentrations of salinity were transferred for regeneration on MS medium with 2mg/l BAP. The variety Co.86032 showed early regeneration than other varieties. The regeneration ability was maximum in Co. 86032 followed by Co.7714 and it was lowest in Co.671. In salinity levels there was progressive drop of regeneration with the increase of salinity. The 5,6 and 8 Ece salinity levels showed drastic reduction in regeneration in Co.7714 and Co. 671. However, in a variety Co. 86032, the regeneration was better even in the highest salinity levels. The variety Co 86032 was found most tolerant to salinity compared to Co.7714 and Co. 671.

Kadam, A.S. (2011). Effect of salinity on regeneration of callus in sugarcane. *Internat. J. Plant Sci.*, 6 (1): 183-184.

Key words : Callus induction, *In vitro* salt tolerance, Regeneration ability, Sugarcane

Sugarcane (*Saccharum officinarum* L.) is one of the most important sugar crop of India. Because of semi-arid climate and salinity of its cultivation area in country increasing, salt tolerance of sugarcane is signifying. *In vitro* selection of plants in salt stressed culture medium is a potential tool to raise plants tolerance to saline environment (Tal 1984, Rains, 1989, Collins and Pix, 1990, Chopra and Narasimhulu, 1991). In most cases regeneration of plants from resistant cell lines is difficult to achieve (Naik and Babu, 1988). Therefore, in the present investigation regeneration efficiency of callus on different salinity levels was carried out.

MATERIALS AND METHODS

To study the regeneration efficiency of callus on different salinity levels, three varieties of sugarcane viz., Co. 86032, Co. 7714 and Co. 671 were taken. For callus induction apical meristem (explant) were subjected to *in vitro* culture on MS (Marashige and Skoog, 1962) medium supplemented with 2mg/l 2,4-D. The well developed calli were transferred on the media having different salinity levels viz., 2,4,5,6 and 8 Ece Mmhos/cm, obtained by

combination of salts viz., NaHCO₃, Na₂SO₄, CaCl₂ and MgCl₂ in proportion of 2:1:1 of chlorides, carbonates and sulphates, respectively. After 6 weeks of salt treatment on different salinity levels, the calli showing well growth were removed and transferred to MS medium supplemented with 2mg/l BAP for regeneration. The calli were incubated in a culture room illuminated for 16 hours of photoperiod with 8 hours dark cycle. The 15 tubes of each salinity levels and varieties in three replications were kept for regeneration of calli. The days required for regeneration and percentage of regeneration were recorded.

RESULTS AND DISCUSSION

The data presented in Table 1 and 2, shows regeneration efficiency of calli of different varieties in different salinity levels. The results revealed that as the concentration of salts increases there was increase in number of days for ignition of regeneration. The variety Co.86032 showed early regeneration(11.44) compared to Co.7714(16.33) and Co.671(16.50). Maximum regeneration ability in the salt induced callus was observed in the variety Co. 86032 followed by Co. 7714 and Co. 671. The varietal difference were significant. In the salinity levels maximum per cent regeneration was observed in 2 Ece and there was gradual decrease in regeneration, which was non-significant in the progressive

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