

## Effect of NaCl concentration on embryogenic callus growth and plant regeneration of *Pennisetum Purpureum* Schumach (Napier grass) *in vitro*

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**Key words:** *Pennisetum Purpureum*, napier grass, salt-tolerant, sodium chloride, tissue culture

**Introduction** *Pennisetum americanum* (Napier or elephant grass) and *P. americanum* × *P. purpureum* (Hybrid *Pennisetum*) are important forage and energy crops. In order to guarantee food safety, breeding salt-tolerant napier grass and hybrid *Pennisetum* are of great significance for utilizing plentiful arid and saline land to satisfy need of livestock and production of biomass energy in China. Only one paper reported selection of NaCl tolerant cells from leaf-derived embryogenic cultures of napier grass till now (Stephen and INDRA, 1984). This report describes effect of NaCl concentration in medium on from immature inflorescences embryogenic callus growth and plant regeneration of *Pennisetum Purpureum* N51, which is R line of registered variety Hybrid *pennisetum*" (Tift 23A CMS pearl millet × N51 Napier grass).

**Materials and methods** Embryogenic callus was initiated from young inflorescences (1-3 cm in length) of *Pennisetum purpureum* Schum (N51). Using sterilization and dissection techniques previously described (Zhong et al., 2007). A white and compact embryogenic callus pieces obtained from immature inflorescences were transferred to subculture medium supplemented with 1.0, 1.2, 1.4, 1.6, 1.8 and 2.0 g/L NaCl. After 45 days healthy embryogenic callus was grown on differentiation medium with same NaCl concentration. All cultures were incubated at 26-28°C in a growth chamber under 16h of diffused light.

**Table 1** Effect of NaCl concentration in medium on rate of compact callus and rate of regeneration plant.

NaCl (g/L)	NO. of total callus	Subculture	Differentiation culture
		Rate of compact callus (%)	Percentage of plantlet (%)
0	676	55.3	8.4
10	226	49.3	4.0
12	337	36.2	1.8
14	365	32.8	1.6
16	157	32.2	0.6
18	304	34.1	0.3
20	135	15.4	0.0

**Results** There was a decrease in ration of compact callus and percentage of plantlet with salt concentration increase (Table 1). The pellet callus became less well organized and more watery appearance and light brown color above 1.2 g/L NaCl. Rate of compact callus and percentage of plantlet was 15.4% and 0.0% at 2.0 g/L NaCl. All compact callus was necrotic after 2 weeks above 2.0 g/L NaCl. This result showed critical NaCl concentration limit was 20 g/L during subculture of small pellet callus and lethal NaCl concentration was respectively 20 g/L in differential culture.

**Conclusions** NaCl concentrations in medium have obvious effect on embryogenic callus growth and plant regeneration of Napier grass *in vitro* in this study. Callus cultures tolerant to normally inhibitory concentrations of sodium chloride were 20 g/L in subculture and 18 g/L in differential culture. Salt tolerance of plant regenerated from callus selected at high salt levels need further assessed.

### Reference

STEPHEN FC and INDRA KV. (1984). Selection and characterization of NaCl tolerant cells from embryogenic cultures of *Pennisetum Purpureum* Schum. (Napier or elephant grass). *Plant Science letters*, 37, 157-164.