



University of Kentucky
UKnowledge

International Grassland Congress Proceedings

21st International Grassland Congress / 8th
International Rangeland Congress

Effect of NaCl Concentration on Embryogenic Callus Growth and Plant Regeneration of *Pennisetum Purpureum* Schumach (Napier Grass) *in Vitro*

Xiaoxian Zhong
Jiangsu Academy of Agricultural Sciences, China

Jianming She
Jiangsu Academy of Agricultural Sciences, China

Hongru Gu
Jiangsu Academy of Agricultural Sciences, China

Follow this and additional works at: <https://uknowledge.uky.edu/igc>



Part of the [Plant Sciences Commons](#), and the [Soil Science Commons](#)

This document is available at <https://uknowledge.uky.edu/igc/21/1-4/11>

The 21st International Grassland Congress / 8th International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

This Event is brought to you for free and open access by the Plant and Soil Sciences at UKnowledge. It has been accepted for inclusion in International Grassland Congress Proceedings by an authorized administrator of UKnowledge. For more information, please contact UKnowledge@lsv.uky.edu.

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

Zhong Xiaoxian, She Jianming, Gu Hongru

Institute of animal Science, Jiangsu Academy of Agricultural Sciences, Nanjing 210014, China. E-mail: xiaoxian@jaas.ac.cn

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.