– Short communication

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The Effect of Different Concentrations of NaCl on the Callus Induction and Lipids of Soybean

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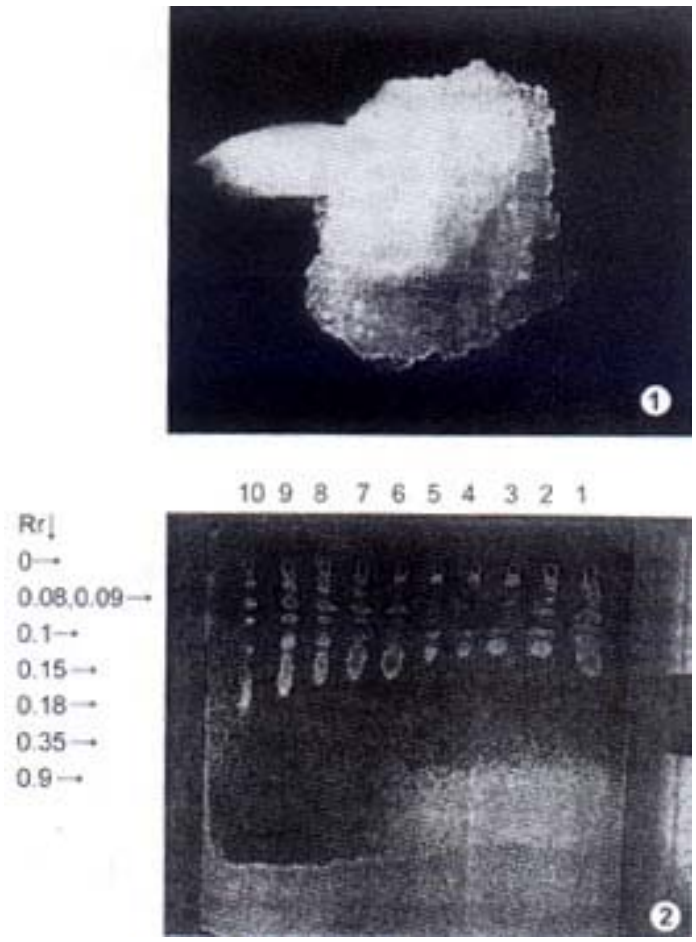
Increased salt tolerance in crop plants provides yield increases in marginal lands and protect plants exposed to transient osmotic stress. The primary characteristics associated with salt tolerance to date are: (i) NaCl transport, (ii) Na^+ distribution and (iii) components at the cellular level. Among these three characteristics, cellular components appear to be the most amenable to study and manipulation at the present time. Plant tissue culture has been used selectively to isolate salt tolerant cultivars of many plants such as alfalfa, barley, sugarbeet, wheat (Flowers et al. 1977). In Iran, soybean *(Glycine max* L. (Merill.) is second in importance to sunflower as a oil crop. Besides being an important source of vegetable oil and protein meal, immature bean and pods of soybean can be eaten as a green vegetable, hence it is called green soybean. Soybean seeds contain: 14 - 24% oil, 37 - 45% protein and 25% carbohydrates. One of the main limitation factors to increase cultivation area of this crop in many parts of Iran is soil salinity. Salinity causes to decrease oil production in soybean. The main objective of this report is to study the effect of different concentrations of NaCl on callus induction and total lipids of soybean calluses.

Callus cultures from cotyledonary explatns of soybean cv. Harkur were intiated as described by Wakhlu and Bornas 1989. Total lipids from sobean calluses were extracted and analysed according to the protocol described by Stahl (1985). Effects of different concentrations of NaCl on callus, inductions, growth of callus and total lipids of soybean calluses were examined on MS containin 2.0 mg/l 2,4-D and 0.5 mg/l Kn. Callus cultures were initiated from cotyledonary explants of soybean cv. Harkur. Results of different treatments with different concentrations of NaCl showed that the growth of calli decreased when salinity was high. This effect was more in calli grown in the

presence of light compared to those grown in the dark. Some parts of calli grown in the light showed necrosis. There was no shoot regeneration in soybean calluses. This may be due to salinity stress on callus. There were exceptions on treatment with 4.38 g/l of NaCl induced somatic embryos (Table 1 and Fig. 1).



Figs. 1 - 2 : Callus induction in soybean. 1. Callus in MS medium with NaCl (1.46 g/l) on light. 2. Rf values of lipids of soybean calluses on silica gel 60 in petroleum ether/diethyl ether/glacial acetic acid (90 : 10 : 1).

The results of lipids extractions of soybean calluses showed that the total lipids were low under high salinity except in callus grown in the medium containing 4.38 g/l NaCl. Salinity had no effect on the kind of lipids and fatty acids compared to controls (Fig. 2). The results reported here corroborate earlier finding that there is direct relationship between salt tolerance of this crop and its callus induction capacity.

Table 1. Effects of different concentrations of NaCl on the growth and lipid contents of soybean callus in light and darkness conditions.

Treatment		NaCl g/l	Callus number	Calli fresh weight	CI (%)	Organo-genesis	Lipids of calli
1.	L	0	16	7.4	3	-	1.81
	D	0	16	10.3	3	-	2.3
2.	L	1.46	16	21.5	4	-	0.14
	D	1.46	16	13.5	4	-	1.39
3.	L	2.92	8	14.8	2.5	-	1.54
	D	2.92	16	12.5	3.5	-	0.77
4.	L	4.38	12	1.7	2	sm	4.29
	D	4.38	16	11.1	3.5	sm	0.83
5.	L	5.84	16	3.8	1	-	1.6
	D	5.84	16	4.2	2		0.76

sm = Somatic embryogenesis.

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