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SEED GERMINATION STUDIES ON *SOLANUM MELONGENA* L. UNDER SALT STRESS

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ABSTRACT: The present work has been conducted on the effect of different concentrations of sodium chloride ranging from 25mg – 100mg of NaCl. The maximum germination percentage has observed at 25mg. beyond this level, the percentage of germination has reduced gradually, in the same way similarly time diffraction has also reduced gradually and 4h duration has shown maximum germination. The shoot and root lengths, fresh and dry weights also increased up to 25mg / in 4h when it is in NaCl and thereafter its gradually reduced.

Keywords: *Solanum melongena,* NaCl, Seed germination, Salinization.

INTRODUCTION

Salinity is a significant environmental stress for influencing crop growth around the world. Soil salinization may arise from intrinsic soil components. Use of low quality of salinuation is good for irrigation and excessive use of fertilizers. Salinity in the soil is a major determinal factor for crop production in arid and semiarid regions of the world. Epestein (1978), Massound (1974) examined the distribution of the 13.5 million hector of saline soils throughout the world. In India about 12 million hectares of land is affected by salinity or alkalinity (Sharma and Gupta, 1986) and each year more land is becoming saline. Sharma (1983) and Balaji *et al.,* (2002) have examined the mechanism of salt injury during germination and early seedling growth of wheat. Salt causes stress and damage on the plant during the vegetative period from germination, through growth, developing and harvesting time (Larcher, 1995). Salinity in general has inhibitory effects on germination of seeds (Kumar *et al.,* 1988; Mondal 1988; Sharma and Yamadagni, 1989 and Yaseen *et al.,* 1989). Salinity decreases the germination (Bernard *et al.,* 2000).

MATERIAL AND METHODS

The *Solanum melongena* type 1(CVK), type 2(GR) seeds were collected from Regional Agriculture Research institute, Rajendranagar, Hyderabad. The seeds were surface sterilized for two min. in 0.2% mercuric chloride ($HgCl_2$) solution. The surface sterilized seeds were thoroughly washed with tap water and followed by distilled water. Then the seeds were soaked in distilled water up to 24h. The seeds were arranged equispecially on the periphery of sterilized petri dish lined with filter paper. Each Petri plate allotted with 25 seeds and treated with various concentrations & time level of sodium chloride ranging from 25-100mg (4, 8, & 16h). The controlled seeds were treated with distilled water. The seeds could survive up to 100mg NaCl and the favorable growth has been observed at 25mg NaCl. So the germination of this loop species could not survive above 100mg of NaCl. The experimental work is maintained in the laboratory conditions.

RESULTS AND DISCUSSION

The germination percentage of *S. melongena* as affected at different concentrations of NaCl and the results are given below. The germination percentage has found to be maximum at 25mg and this has increased to 95% and 100% during 8-14 days respectively. Minimum percentage of germination has recorded at 100mg of NaCl in table-1.

The results of the study are given in the table. Germination percentages decreased with higher concentrations of NaCl. Reduction in germination percentage of Brinjal at higher concentration may be attributed to the interference of sodium ions. Similar inhibition of germination at higher concentration of metal ions was observed by Jaya Kumar *et al.,* (2006) with cobalt. Root and shoot lengths, dry weight vigorous index and tolerance index increased at lower concentrations at 25mg NaCl ion.

Table-1: Seed germination studies on *Solanum melongena* under salt stress

Concentration		No. of seeds replicated	% germination				Shootlength(cm)		Rootlength(cm)		Toatal length(cm)		Fresh weight(mg)		Dry weight(mg)	
			1st week		2nd week		GR	CVK	GR	CVK	GR	CVK	GR	CVK	GR	CVK
			GR	CVK	GR	CVK										
Control		25	99	98	100	99	4.5	4.6	2.4	3.1	6.9	7.7	38	37	3.1	3
25mg	4h	25	96	90	97	92	4.4	4.3	2.3	2.8	6.7	6.5	30	29	2	2
	8h	25	95	90	95	90	4.3	4.2	2.7	2.6	7	6.8	27	24	3	3
	16h	25	90	85.7	90	88	4.5	4.2	2.8	2.2	7.3	6.4	25	20	3	2
50mg	4h	25	90	85.7	90	85	4.2	4.4	2.4	2.7	6.6	7.1	26	23	3	2
	8h	25	85.61	81.8	86	82	3.7	3.9	2.4	2.1	6.1	6	25	23	3	2
	16h	25	80.8	75	80.8	75.7	4.1	3.6	2.7	2	6.8	5.6	21	23	3	3
75mg	4h	25	85.71	75	86.2	76	3.7	3.6	1.9	2.5	5.8	6.1	22	20	2	2
	8h	25	81.8	72.7	81.8	73	3.1	2.8	1.9	1.6	5	4.4	20	20	2	2
	16h	25	74	71.4	75	72	3.9	3.2	2.6	2.3	6.5	5.5	19	18	2	3
100mg	4h	25	75	71	76	72	2.7	3.2	1.5	1.7	4.2	4.9	21	17	2	2
	8h	25	72.7	70	74	70	2.1	1.9	1.8	1.5	3.9	3.4	16	14	2	2
	16h	25	61.9	60	63.1	60	2.1	2	1.8	1.5	3.9	3.5	14	13	1.9	1.5

In *S.melongena*. on salinity are in agreement with the present results. Similar observations were observed in some species of *Vigna mungo* by Jenci *et al.,* (2006), Chidambaram *et al.,* (2006). As salinity influences crop growth it may be more appropriate to use the term seed survival instead of 'germinability' as a criterion of seed under saline conditions. In terms of evolution the ability of halophyte seeds to survive under hyper saline conditions can be considered as a selective advantage. The experiment shows the reduction in the growth of the seeds above 25mg which coincides with the result of earlier findings of Marschner *et al.,* (1981) who reported that salinity effects reduces the growth in sugar beet. The investigation concludes that seeds can adapt to saline conditions themselves, but there have been suggestions of external maneuvers to counteract the salinity. The increase in fresh weight at 25mg is due to an increase in tissue water content, which is due to faster accuvertation of ions, minerals and water in the tissues. However, the growth has stunted at higher concentration and the results showed a reduction in fresh and dry weight beyond 25mg NaCl in sampling days. Similar results were found in *Cicer arietinum* (Deepak, 2001).

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