Mechanisms of Resistance and Alteration of Chemical Compositions of the Potential Cash Crop Halophyte *Leptochloa fusca* L. Kunth under Salinity Stress

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1.Objectives

Rehabilitation dry-saline soil by using high potential halophyte. Saving the precious fresh water resources. Allow farmers to make productive use of dry-saline soil.

2. Introduction

Cash halophyte crops can grow using land and water unsuitable for other conventional crops and provide food, fodder, fuel, medicines, landscaping. One of these plants is Kallar Grass (*Leptochloa fusca* L. Kunth). It is a fast growing, perennial herbaceous, and can be utilized as forage, bio-reclamation of saline soil and carbon sequestration.

3. Materials and methods

•Potential yield of *Lepotochloa fusca* under salt stress was evaluated using pot experiment.

• Leaf osmotic potential (-MPa), Potassium and sodium concentration, Transpiration rate (mmol $m^{-2}S^{-1}$) and Stomatal resistance (m^2S mol^{-1}) of *Lepotochloa fusca* grown under 0.0%, 100, 200, 300 mM NaCl were determined.

•Evalute the chemical composition of *Lepotochloa fusca* as fodder crop under non saline soil and 100 mM NaCl .

4. Results

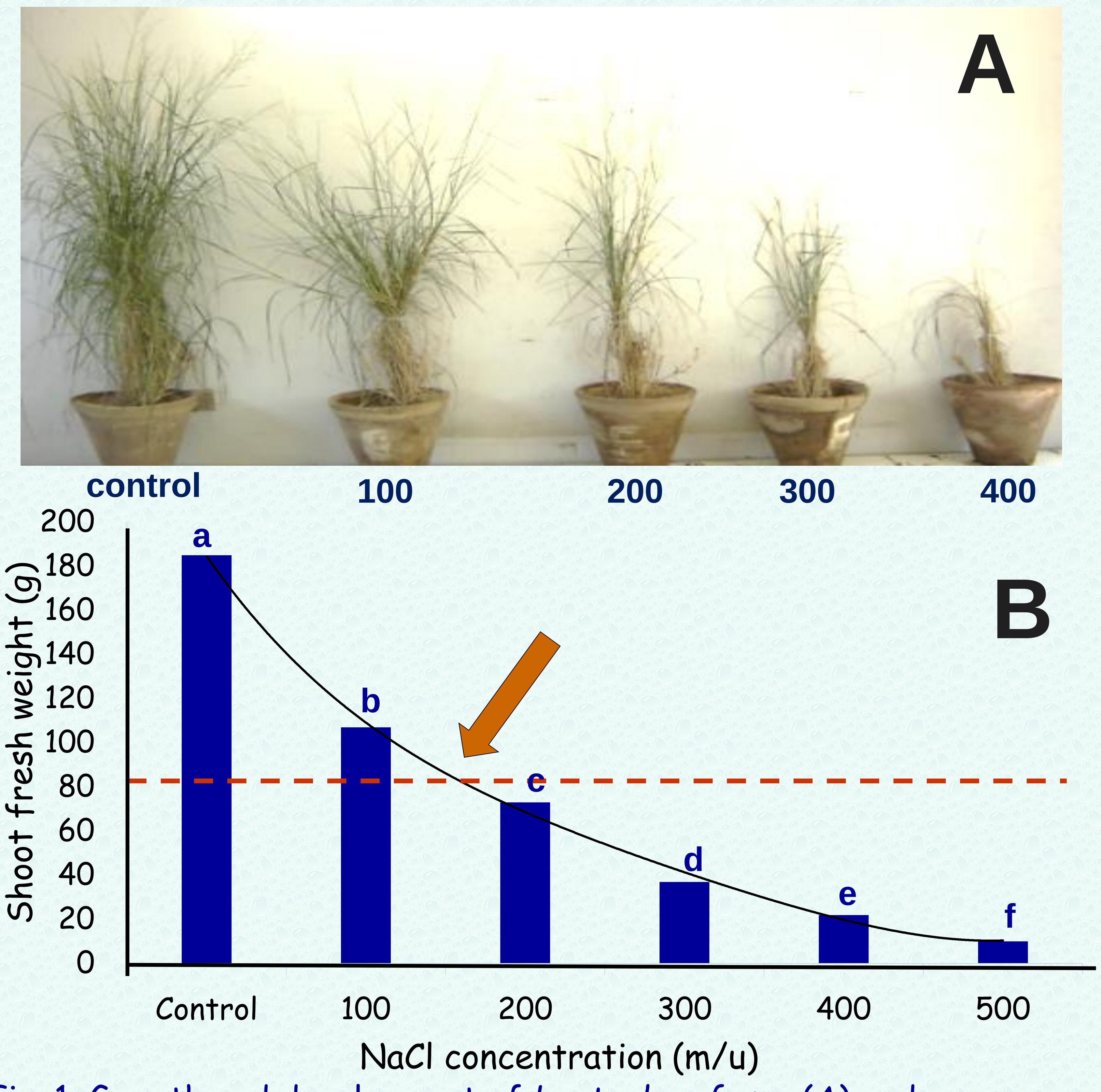

Fig. 1. Growth and development of *Leptochoa fusca* (A) and responses of shoot fresh weight to different NaCl salinity levels (b). The crossover of the dotted and solid lines reflects the limits of salinity resistance

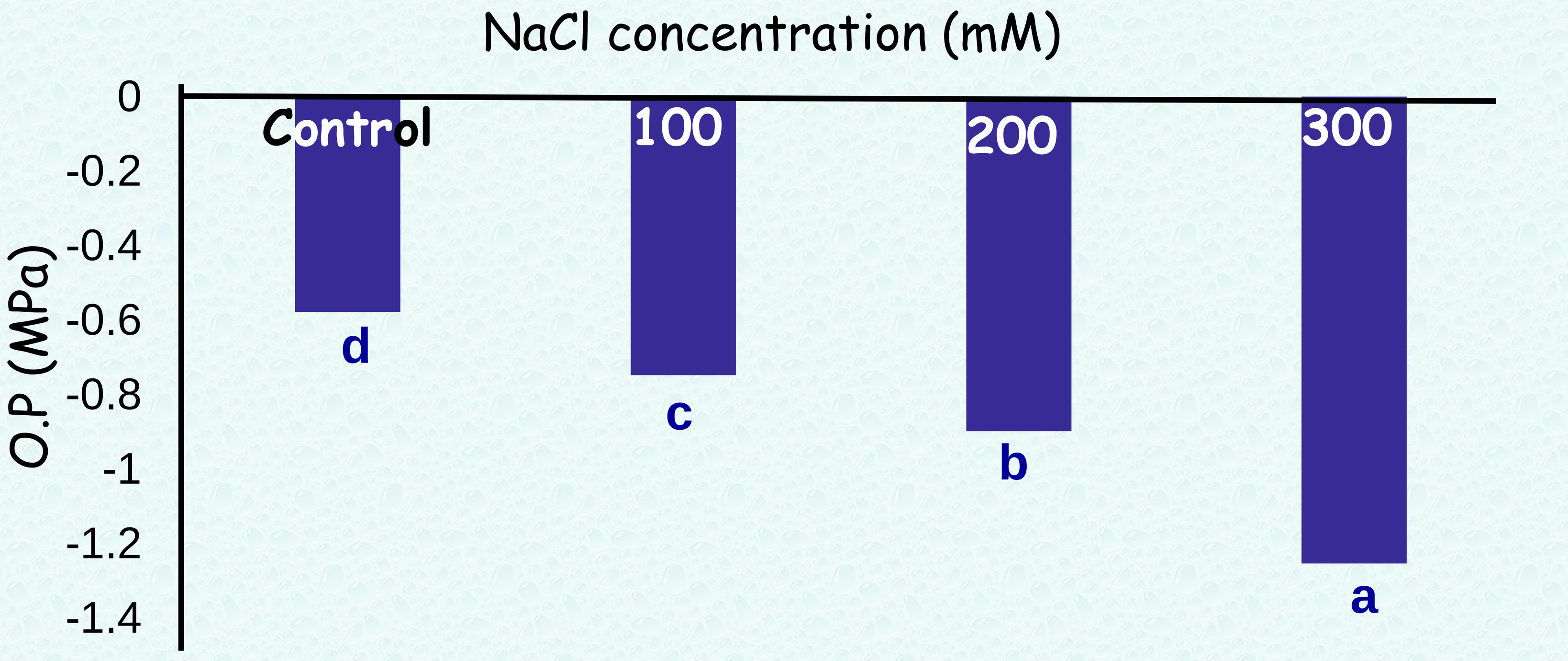

Fig. 2. Leaf osmotic potential (-Mpa) of *Lepotochloa fusca* grown under 0.0%, 100, 200, 300 mM NaCl

5. Conclusion

•The limits of salinity resistance for *Lepotochloa fusca* was at 150 mM NaCl.

•*Lepotochloa fusca* has the ability to regulate its osmotic potential under salinity stress.

•Has salt tolerance mechanism to avoid ion toxicity by replacement of potassium by sodium

• *Lepotochloa fusca* could be utilized to rehabilitate dry-saline soil and provides high potential fodder crop

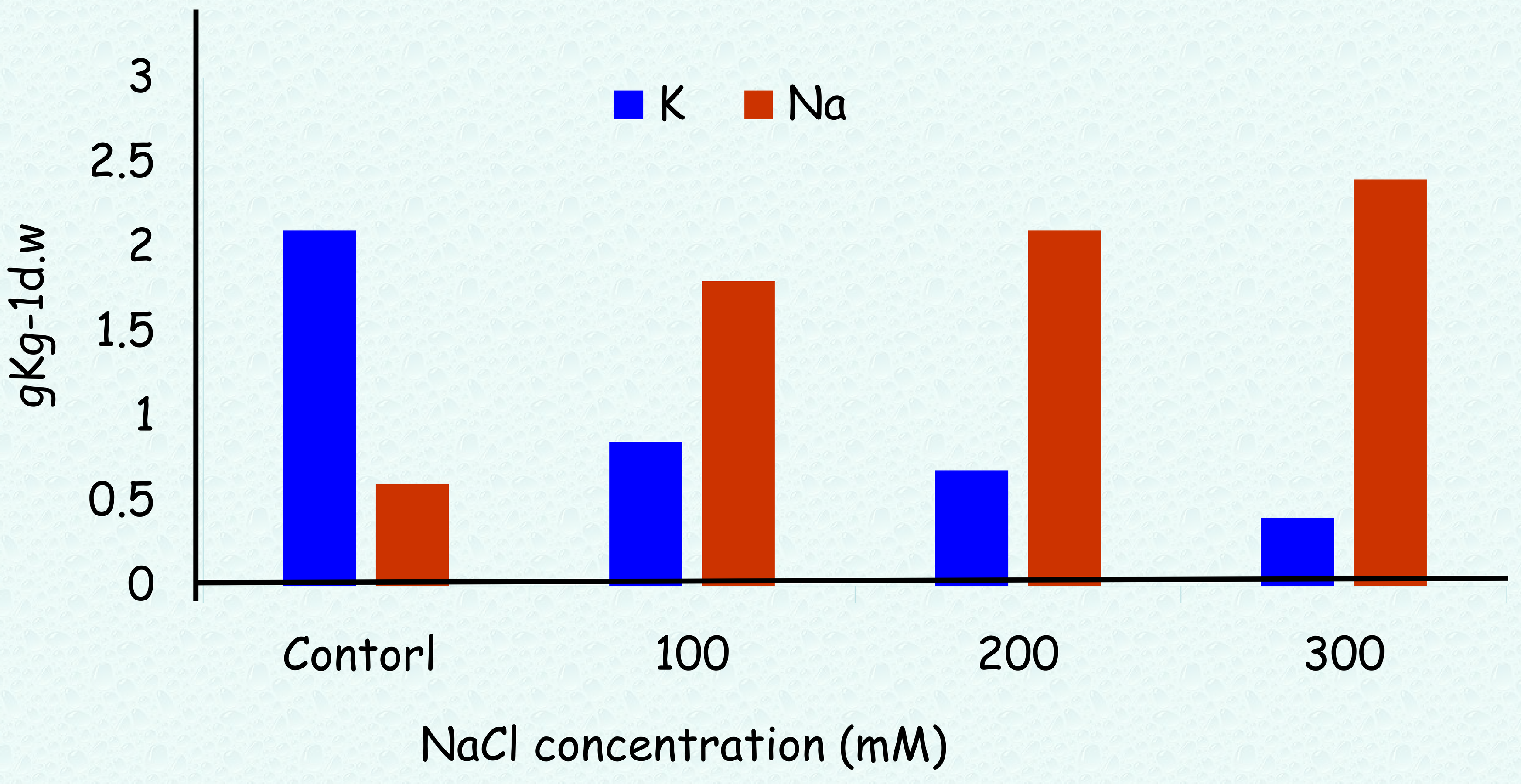

Fig. 3. Potassium and sodium concentration in Lepotochloa fusca shoot at different NaCl salinity levels

Table 1. Effect of different NaCl levels on transpiration rate and Stomatal resistance of Lepotochloa fusca

NaCl concentration (mM)	Transpiration rate (mmol $m^{-2}S^{-1}$)	Stomatal resistance (m^2S mol^{-1})
Control	0.646[a]	54[d]
100	0.304[b]	90[c]
200	0.265[c]	103[b]
300	0.220[d]	115[a]

Table 2: Chemical composition of the Lepotochloa fusca shoot at non salin soil and 100 mM NaCl.

	Pot experiment	
NaCl level (mM)	Control	100
Dry matter	90.55	90.79
Constituents,(% on DM basis)		
Organic matter	90.58	88.75
Ash	9.42	11.25
Crude protein	5.16	6.48
Crude Fiber	38.94	32.58
Ether extract	3.36	4.68
Nitrogen free extract	43.12	45.02
Cell wall constituents, % on DM basis		
Neutral-detergent fiber	76.21	72.49
Acid- detergent fiber	62.49	60.91