

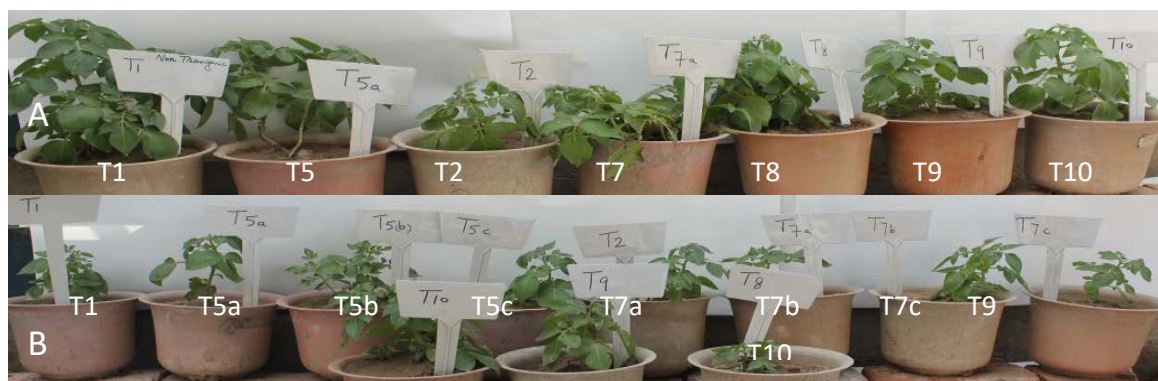


Fig. 1 Suppl. The phenotypes of non-transgenic lines T1, T2, T5, T7, T8, T9, and T10 (A) and betaine aldehyde dehydrogenase transgenic lines T1, T5a, 5b, 5c, T7a, T7b, T7c, T9, and T10 (B) before salt stress. The plants were watered for 35 d in 7-d intervals.



Fig. 2 Suppl. The phenotype of non-transgenic and betaine aldehyde dehydrogenase transgenic plants (BADH) under salt stress. Non-transgenic lines T1, T2, T5, T7, T8, T9, and T10 (A) and BADH transgenic lines T1, T5a, 5b, 5c, T7a, T7b, T7c, T9, and T10 (B). Both transgenic and non-transgenic lines were irrigated with 200 mM NaCl solution for 35 d at 7-d intervals.

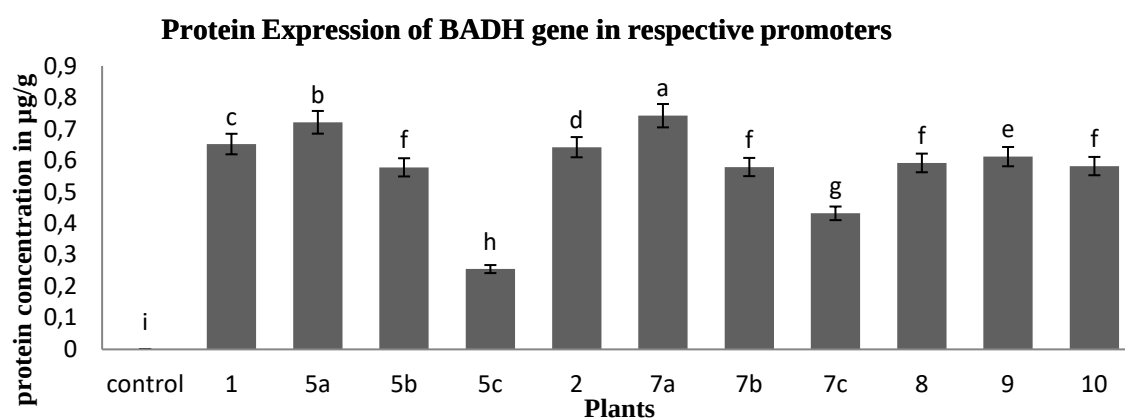


Fig. 3 Suppl. Betaine aldehyde dehydrogenase (BADH) content in control (wild type) plants and transgenic plants with the *BADH* gene driven by triple (5a and 7a), double (1, 5b, 7b, 2, 8, 9, and 10), and single (5c and 7c) *CAMV* 35S promoters. Means $\pm$ SEs, $n = 3$, different letters indicate significant differences between different transgenic and control plants (the Tukey's test, $P < 0.05$).

REc assay at different salt solution

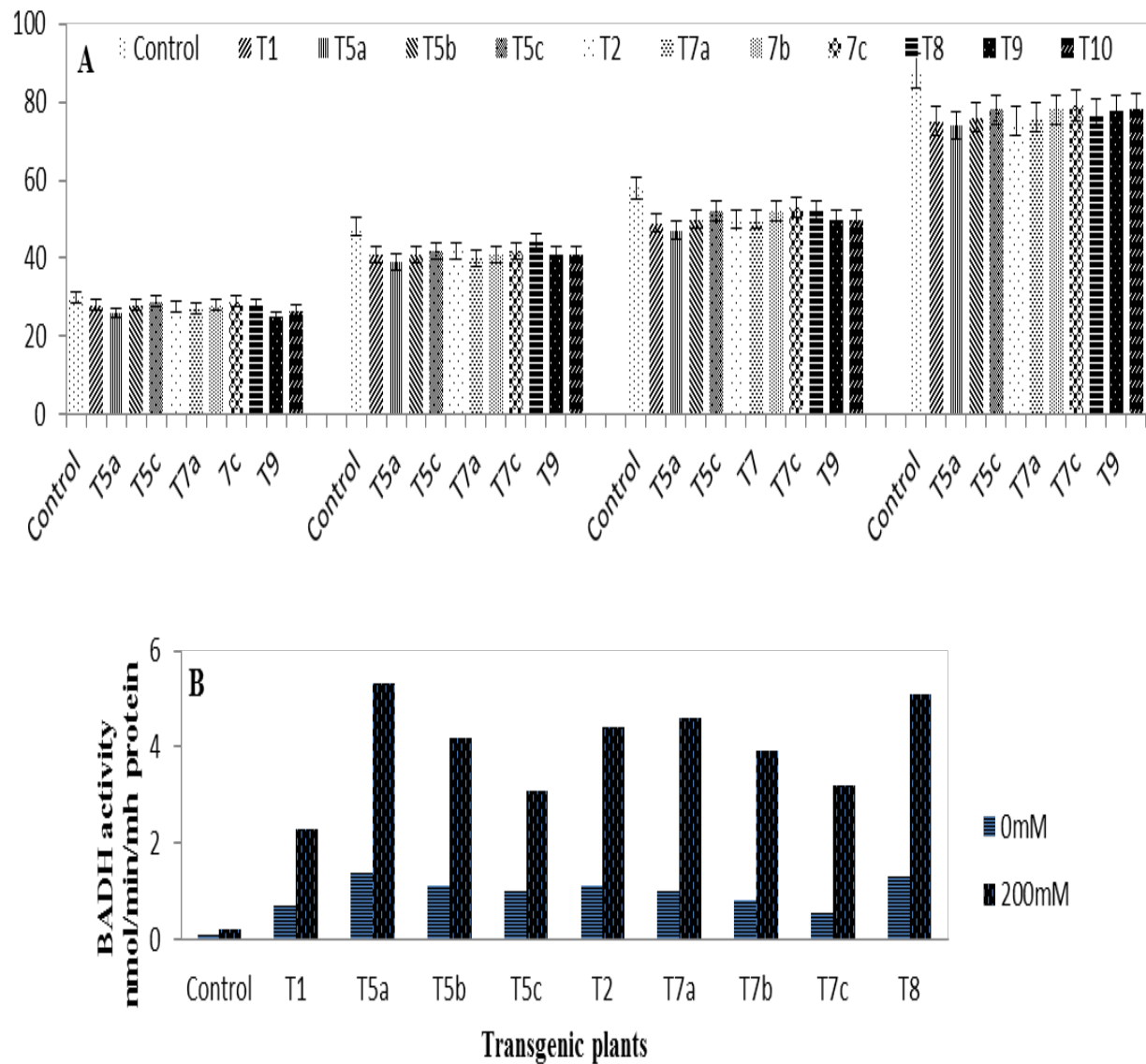


Fig. 4 Suppl. A - Effect of NaCl on plasmalemma permeability of wild-type plants (control) and transgenic potato lines (T1, T5a, T5b, T5c, T2, T7a, T7b, T7c, T8, T9, and T10); means $\pm$ SEs, n = 3. B - Betaine aldehyde dehydrogenase (BADH) activity in the *Solanum tuberosum* L. cv. AgriBuyer-Red variety and transgenic potato lines under standard watering conditions or 200 mM NaCl stress.

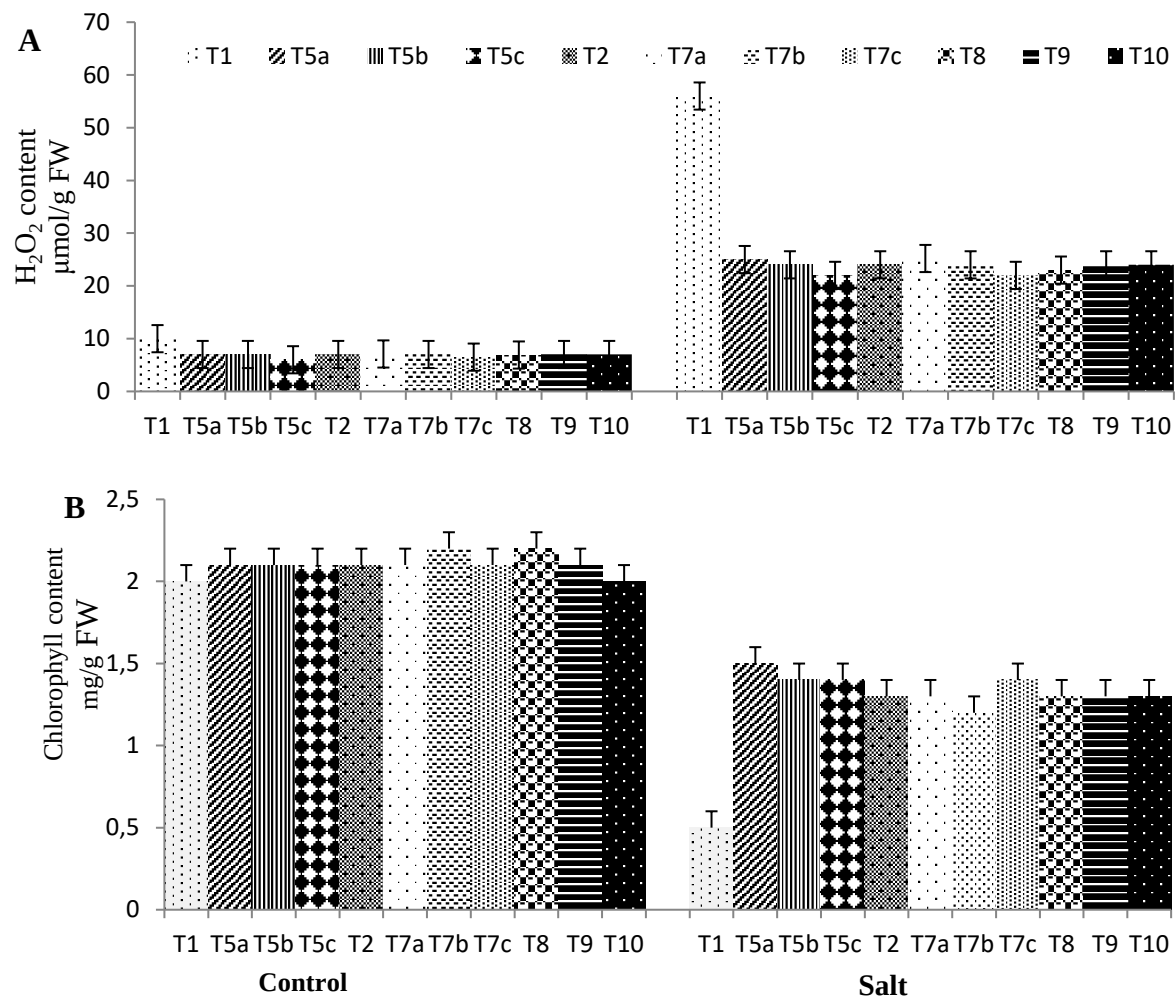


Fig. 5 Suppl. A - Hydrogen peroxide content in betaine aldehyde dehydrogenase transgenic plants before and after 200 mM NaCl treatment. B - Chlorophyll content of transgenic lines before and after 200 mM NaCl treatment. Means $\pm$ SEs, $n = 3$.

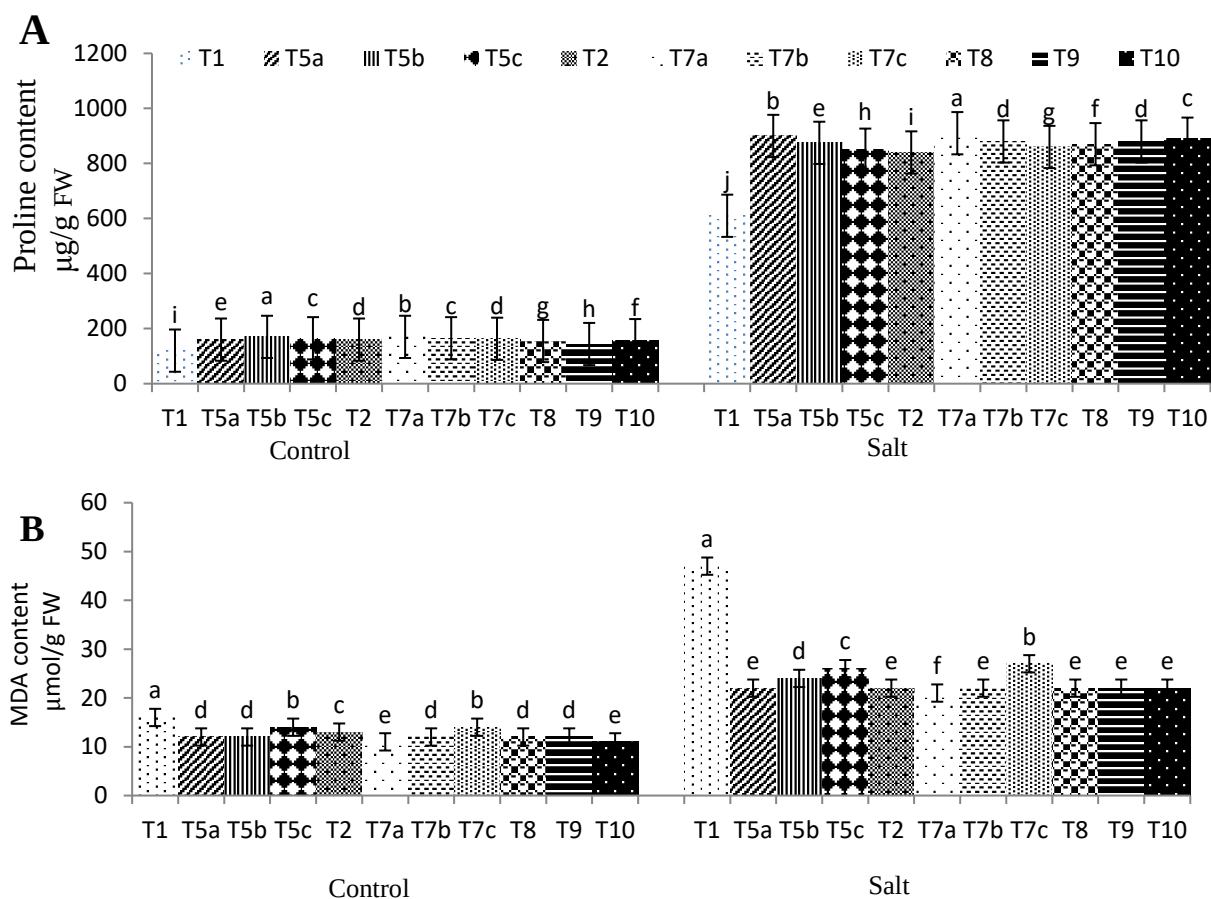


Fig. 6 Suppl. Proline (A) and malondialdehyde (MDA, B) content in betaine aldehyde dehydrogenase transgenic potato plants (T1, T5a, T5b, T5c, T2, T7a, T7b, T7c, T8, T9, and T10) before and after 200 mM NaCl treatment. Means $\pm$ SEs, $n = 3$, different letters indicate significant differences among plants.

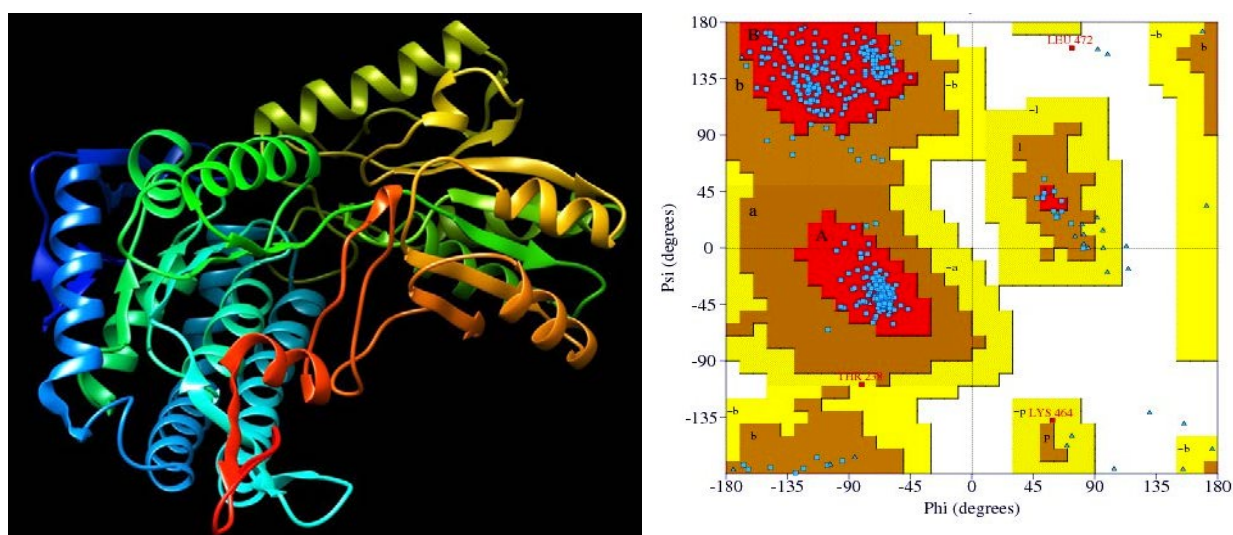


Fig. 7 Suppl. A 3-D protein structure model of betaine aldehyde dehydrogenase predicted by *Modeler v 9.14* showing structure details of sheets, helices, turns, and loops (*on the left*) and a Ramachandran plot showing torsion angles (phi-psi) between amino acid residues (*on the right*).

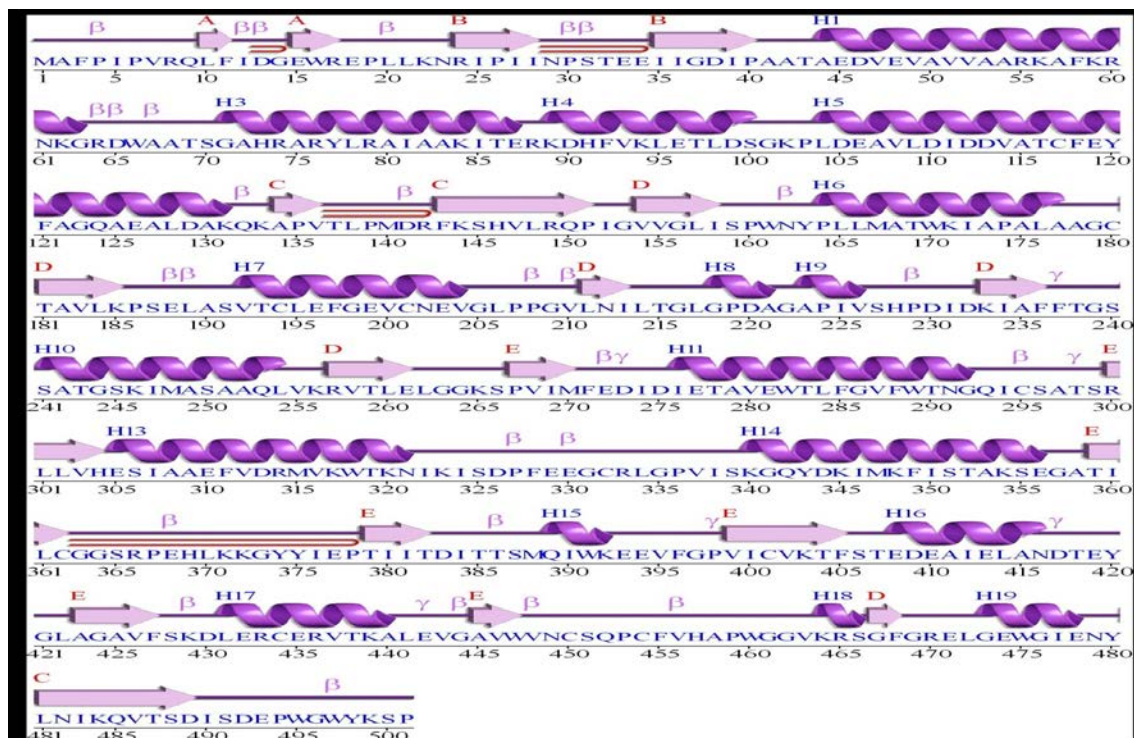


Fig. 8 Suppl. A 2-D structure profile of the betaine aldehyde dehydrogenase protein showing more details of its structure.

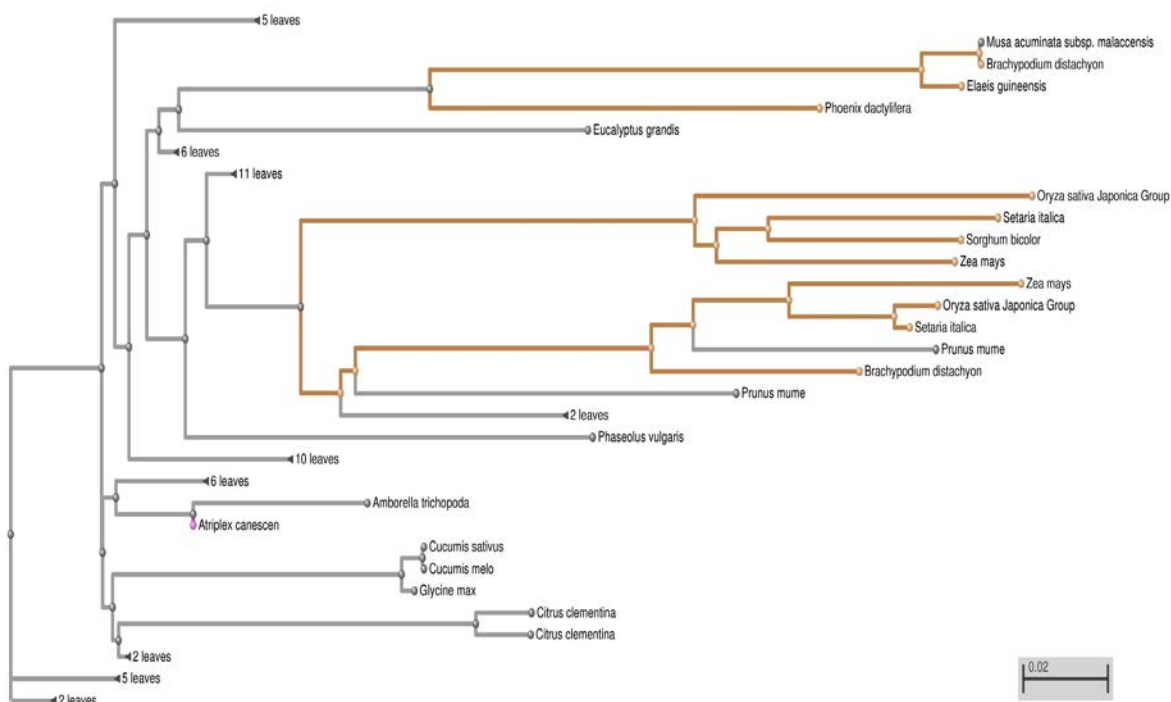


Fig. 9 Suppl. Phylogenetic analysis of the betaine aldehyde dehydrogenase protein. Monocot betaine aldehyde dehydrogenase protein sequences are shown as *brown branches*. Sequences related to eucots are shown as *silver branches*.

Table 1 Suppl. Analysis of variance, relative electrical conductivity.

Source	DF	SS	MS	F	P
Replication	1	19.0104	19.0104		
Transgene	11	478.675	43.5159	1.7E+31*	0.0000
Treatment	3	31923.0	10641.0	4.1E+33*	0.0000
Transgene*Treatment	33	125.424	3.80072	1.4E+30*	0.0000
Error	47	1.232E-28	2.622E-30		
Total	95	32546.1			

Grand mean 50.010 CV 6.34, * - significant at 5 % probability

Table 2 Suppl. Analysis of variance, H₂O₂ content.

Source	DF	SS	MS	F	P
Replication	1	6.52	6.52		
Transgene	10	1158.47	115.85	22116.2*	0.0000
Treatment	1	4233.60	4233.60	808233*	0.0000
Tg*Treatment	10	777.52	77.75	14843.5*	0.0000
Error	21	0.11	0.01		
Total	43	6176.22			

Grand mean 17.280 CV 0.42, * - significant at 5 % probability

Table 3 Suppl. Analysis of variance, chlorophyll content.

Source	DF	SS	MS	F	P
Replication	1	2.0339	2.03390		
Transgene	10	0.8855	0.08855	13.97*	0.0000
Treatments	1	9.8516	9.85165	1554.35*	0.0000
Tg*Treatment	10	0.6055	0.06055	9.55*	0.0000
Error	21	0.1331	0.00634		
Total	43	13.5096			

Grand mean 1.8968 CV 4.20, * - significant at 5 % probability

Table 4 Suppl. Analysis of variance, tproline content.

Source	DF	SS	MS	F	P
Replication	1	25	24.7500		
Transgene	10	90389	9038.85	69024.0*	0.0000
Treatments	1	5307022	5307022	4.1E+07*	0.0000
Tg*Treatment	10	50345	5034.49	38445.2*	0.0000
Error	21	3	0.13095		
Total	43	5447783			

Grand mean 505.07 CV 0.07, * - significant at 5 % probability

Table 5 Suppl. Analysis of variance, malondialdehyde content.

Source	DF	SS	MS	F	P
Replication	1	24.75	24.75		
Transgene	10	775.64	77.56	592.30*	0.0000
Treatments	1	1872.02	1872.02	14295.4*	0.0000
Tg*Treatment	10	388.73	38.87	296.85*	0.0000
Error	21	2.75	0.13		
Total	43	3063.89			

Grand mean 19.659 CV 1.84, * - significant at 5 % probability

Table 6 Suppl. Analysis of variance, betaine aldehyde dehydrogenase activity.

Source	DF	SS	MS	F	P
Replication	1	0.311	0.3111		
Trangenes	10	15.592	1.5592	0.97*	0.0260
Treatments	1	45.289	45.2893	28.18*	0.0000
Tg*treatment	10	37.903	3.7903	2.36*	0.0469
Error	21	33.751	1.6072		
Total	43	132.846			

Grand mean 2.2964 CV 8.21, * - significant at 5 % probability

Table 7 Suppl. The mean performance of transgenic plants under different salt stress conditions.

Transgenic	REc	MDA	H ₂ O ₂	Chlorophyll Contents	Proline	BADH activity
T1	48.25D	19.25C	33.385A	2.015A	365.75I	1.375E
T5a	46.5D	17.75DE	16.385V	1.465C	530.75B	1.61D
T5b	48.75D	18.75C	15.885D	1.965AB	523.25D	1.325E
T5c	50.25B	20.75B	14.385G	1.965AB	508.25G	1.925C
T2	48.625D	18.25CD	15.885D	1.915AB	500.75H	2.325B
T7a	48.25D	16.75F	16.535B	1.915AB	540.75A	2.7975A
T7b	49.75C	17.75DE	15.885D	1.915AB	523.25D	2.835A
T7c	50.75A	21.25A	14.635F	1.965AB	512.25F	2.7475A
T8	50.25B	17.75DE	15.335E	1.965AB	513.25E	2.885A
T9	48.425D	17.75DE	15.885D	1.915AB	512.75EF	2.875A
T10	48.975D	17.25EF	15.885D	1.865B	524.75C	2.56B

Table 8 Suppl. Correlation among different traits of transgenic plants under different stress conditions; BADH - betaine aldehyde dehydrogenase.

Traits	REc	MDA	H ₂ O ₂	Chlorophyll contents	Proline
MDA	-0.0046ns				
H ₂ O ₂	-0.2962*	0.90692*			
Chlorophyll content	0.6925*	0.34065*	-0.20471*		
Proline	-0.0801ns	0.96257*	0.94608*	0.34833*	
BADH activity	0.45023*	0.58327*	-0.30856*	0.27524*	0.69473*

* - significant at 5 % probability, ns = non-significant

Table 9 Suppl. Stepwise regression analysis of betaine aldehyde dehydrogenase activity in transgenic plants.

Traits	Coefficients	Standard Error	t Stat	Partial R ²
MDA	0.240195	0.179309	1.339563	22.893
REc	-0.2979	0.134628	-2.21273	6.894
Chlorophyll contents	5.096125	1.681673	3.03039	2.309
H ₂ O ₂	-0.00289	0.022933	-0.12615	90.374
Proline	0.46527	0.056354	0.86592	12.864

Intercept = 41.999, multiple R² = 90.16%, R² = 81.29 %, adjust R² = 68.81, standard error = 0.6761