Influence of Stress on Physiological-Biochemical Characteristics of Three *Atriplex* L. Plants

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Key words : *Atriplex* L ., physiological , biochemical , stress , NaCl

Introduction The *Atriplex* L . plants are the typical plant in arid and semi-arid regions of the world . It is reported that many *Atriplex* L plants have more strengthen of drought stress and salt-resistance (ASLAM *et al* . ,1986 ;Jos e Ramos *et al* . ,2004) . We introduced 3 kinds of *Atriplex* L plants to improving atrocious environments , especially in salina and less rainfall areas . Therefore , to understand the physiological-biochemical characteristics of 3 plants is very important .

Materials and methods The experimental materials are yearold seedlings of *Atriplex canescens* ssp . *Aptera* , *Atriplex canescens* ssp . *canescens* var . *laciniata* Parish and *Atriplex canescens* (Pursh) Nutt which were placed in greenhouse and tested the inorganic ion content beforehand . Three plants above signed as A ,B ,C . Drought stress contains 4 levels which signed as D1 , D2 ,D3 ,D4 , corresponding is 60% ,45% ,30% ,20% of saturated soil water content , using TSC-V moisture teller to supply losing water everyday . Salt stress (NaCl : Na_2SO_4 = 1 :1) contains 5 levels as S1 ,S2 ,S3 ,S4 ,S5 , which corresponding is 0 .1% , 0 .3% ,0 .5% ,0 .7% ,1 .0% of soil weight . Set no stress as contrast (CK) and 30d for test , 5 repeats . Indexes included SOD , POD , MDA , and Water holding capacity of leaves .

Results Along with the increasing of drought stress , SOD of plant A was increasing from CK (268 .58u/g) to D1(483 .63u/g) , and then gradually decreased from D2 to D4(from 306 .13 to 233 .26u/g) . However , plant B and C was decreased . Under salt stress , SOD of 3 plants was all decreased . POD of three testing plants were all decreased under drought and salt stress , in which plant C were significantly different to other 2 plants ($p<0.01$) . MDA was the product of plasmalemma that under stress , it is all increased under drought and salt stress , in which D4 of A ,B and C owned the highest value as 36 .49 , 32 .65 and 28 .33(μmol/g) . Water holding capacity of 3 plants is B>A>C (Figure 1) .

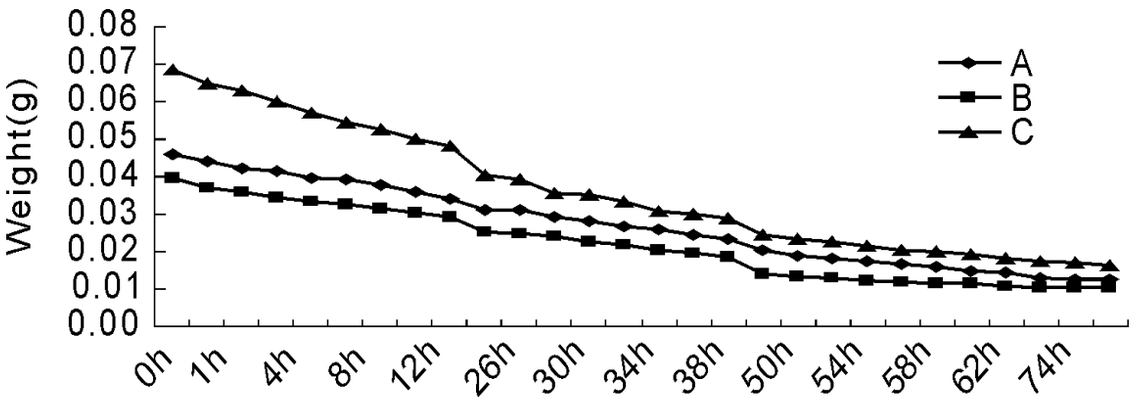

Figure 1 *Leaves waber holding capacity of* 3 *test plants* .

Conclusions Under drought /salt stress , three *Atriplex* L plants exhibited a good resistance in a smaller change between CK and low-grade stress . At high-grade stress , the growth of three plants was all repressed seriously . Meanwhile , 3 plants showed more repressed along with the increasing of stress grade . SOD and POD were protector of plasmalemma . Under adversity , 3 plants can rapidly increase the content of these substances to resisting stress .

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