Isolation and cloning of genes induced by sodium carbonate in *Leymus chinensis*

Z.W. Liang, X.J. Kong, M. Liu, H.Y. Ma, Z.C. Wang
Northeast Institute of Geography and Agricultural Ecology, CAS, Changchun, Jilin 130012, China; Da an Sodic Land Experiment Station of China, Da an Jilin 131317, China; E-mail: liangzw@neigae.ac.cn

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Introduction *L. chinensis* is the dormant species of Songnen plain which is high tolerant to saline alkali stress. Soil salinity is one of the most serious abiotic stresses and has become the main limiting factor of the world-wide agricultural production. Many genes tolerant to salt have been cloned but few to alkali. The aim of this study is to isolate and clone the genes in response to sodium carbonate.

Materials and methods Seedlings of *L. chiensis* were treated with 100mM Na_2CO_3 (pH10.5) as Jin *et al.* (2006) described. Total RNA was extracted using the method of Manickavelu (2007). DDRT-PCR was then performed as described by Liang and Pardee (1992). RNA dot blot analysis was performed using DIG labeled probes of high specific activity, Gel-purified cDNA fragments were subcloned into the pMD-18T vector and sequenced by Invitrogen.

Results Twenty-two differentially expressed cDNA fragments were isolated using three different anchor primers (T13A, T13G and T13C) and twenty arbitrary primers (10mer), corresponding to 60 primer combinations. Of which *SIGL*1 was isolated from the root of *L. chinensis* following the stress of sodium carbonate, and by dot blot analysis further confirmed that it expressed in the root of sample but not in control (Figure 2). *SIGL*1 did not show any obvious sequence similarity with known genes in databases.

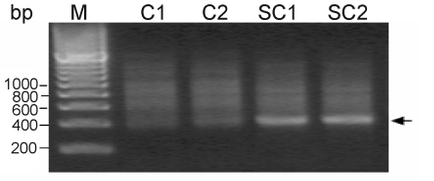

Figure 1 *mRNA differential display in agarose. The arrow indicates SIGL1.*

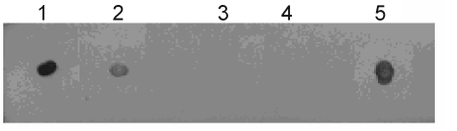

Figure 2 *Northern blot analysis of SIGL1.*

Conclusions *SIGL*1 was a novel cDNA fragment in response to sodium carbonate stress and our studies would contribute towards the further understanding of gene regulation in *L. chinensis* under alkali-stress. The full length of this gene is being performed by RACE.

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