



University of Kentucky  
UKnowledge

---

International Grassland Congress Proceedings

XXI International Grassland Congress / VIII  
International Rangeland Congress

---

## Isolation and Cloning of Genes Induced by Sodium Carbonate in *Leymus chinensis*

Z. W. Liang  
*Chinese Academy of Sciences, China*

X. J. Kong  
*Chinese Academy of Sciences, China*

M. Liu  
*Chinese Academy of Sciences, China*

H. Y. Ma  
*Chinese Academy of Sciences, China*

Z. C. Wang  
*Chinese Academy of Sciences, China*

Follow this and additional works at: <https://uknowledge.uky.edu/igc>

 Part of the [Plant Sciences Commons](#), and the [Soil Science Commons](#)

This document is available at <https://uknowledge.uky.edu/igc/21/12-1/3>

The XXI International Grassland Congress / VIII International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

---

This Event is brought to you for free and open access by the Plant and Soil Sciences at UKnowledge. It has been accepted for inclusion in International Grassland Congress Proceedings by an authorized administrator of UKnowledge. For more information, please contact [UKnowledge@lsv.uky.edu](mailto:UKnowledge@lsv.uky.edu).

## 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

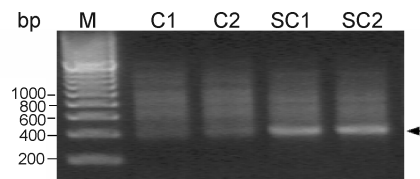
Northeast Institute of Geography and Agricultural Ecology, CAS, Changchun, Jilin 130012, China; Da an Sodic Land Experiment Station of China, Da an Jilin 131317, China; E-mail: liangzw@neigae.ac.cn

**Key words** : cloning ,mRNA differential display ,alkali stress ,SIGL ,*Leymus chinensis*

**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. chinensis* were treated with 100mM  $\text{Na}_2\text{CO}_3$  (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 *SIGL1* 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) . *SIGL1* 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** *SIGL1* 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 .

**Acknowledgement** This project is supported by the 973 program (2007CB106803) , National Key Project for the Eleventh Five Year Plan (2006BAC01A08) , and the Foundation of the Knowledge Innovation Project of Chinese Academy of Sciences (No . KZCX3-SW-NA3-05) .

### References

- Jin , H . , Plaha , P . , Park , J . Y . , *et al.* (2006) . Comparative EST profiles of leaf and root of *L. chinensis* , a xerophilous grass adapted to high pH sodic soil . *Plant Science* , 170 , 1081-1086 .
- Liang , P . , Pardee , A . B . (1992) . Differential display of eukaryotic messenger RNA by means of the polymerase chain reaction , *Science* , 257 , 967-997 .
- Manickavelu , A . , Kumiko Kambara , Kohei Mishina , *et al.* (2007) . An efficient method for purifying high quality RNA from wheat pistils . *Colloids and Surfaces B : Biointerfaces* , 54 , 254-258 .