

汉麻 *CsGolS2* 基因及其启动子耐旱功能鉴定

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Identification of Drought Tolerance Function of the *CsGolS2* Gene and Its Promoter in Hemp

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附表 1 PCR 引物序列

Attached table 1 Primer sequences for PCR

基因	上游引物	下游引物	用途
Genes	Foeward primers (5'-3')	Reverse primers (5'-3')	Use
<i>CsGolS2</i>	AGGAGTCTAGCCAAGCAAGCC	CTAAACCCACCACGCCTTTCAC	RT-qPCR
<i>CsEF1a</i>	TGTTTTGCACGGATCAGTTTG	AATGCCGACCGCTACAGTTC	RT-qPCR
<i>NtActin</i>	TTGCTGGTCGTGATCTTACTGATTG	CAGTCTCCAACCTCTTGCTCATAGTC	RT-qPCR
<i>GUS</i>	GATCGCGAAAACTGTGGAAT	TAATGAGTGACCGCATCGAA	RT-qPCR
<i>Ata-tubulin</i>	ATGAGAGAGTGCATATCGAT	TTCATGAAGAAGGTGTTGAA	RT-qPCR
<i>CsGolS2</i>	ATGGCTCCTAACATCATCAACG	CTAAGCCGCGGATGGAGCT	PCR
<i>CsGolS2P</i>	ATCATTGATCATAAATGGAGCAA	ATTAGTTAGTGTTGTTTGGTTGATG	PCR

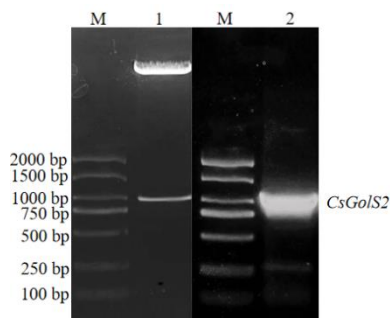
1 ATGGCTCTAATCATCAACGGTCAACAGGCAGGAGGAGTCTAGCCAAGCAAGCC
1 M A P N I L I N G A T T G R G R S L A K Q A
61 AGCGTCCAAGCCGAGCTTATGTGACGTTCTGGCGGTGACGGAGACTACGTGAAAGGC
21 S G P S R A A Y V E G G T A G A A G C T A A G A G T A A C C T T T G C T G C T
121 GTGGTGGTGTAGCCAAGGCTTAGAAAGCTAAGAGTAAGTACCTTTGCTGGTGGCT
41 V V G L A K G L R K A K S K Y P L V V A
181 ATGTTGCCGATGTTCCACATCATAGGAATATCTGGTGGAGCAAGGTGCATCGTA
61 M L P D V P Q H H R N I L V E Q G C I V
241 AGAGATTGTACACTCCATCCACTGAAAACGAGACTAAGTTGCTATGGCTTATTAC
81 R E L V P L H P P E K T W S N S P Q Y
301 GTTATCAATTACTCCAAGCTTCGTATTTGGAGTTTGTGGAGTATAGCAAGATGATATAC
101 V I N Y S K L R I W E F V E Y S K M I Y
361 TTGGATGGAGATTTCAAGTATTTGGGAACATTGACCATCTGTTGACCGCCAGACTCC
121 L D G D I Q V F G N I D H L F D Q P D S
421 TACTTTTACCGGTAATGGACTGTTTTCGGAGAAAAATGGAGTAATGCCACAATAC
141 Y F V A V M D C P C E K T W S N S P Q Y
481 CAGATTGGGTATTGTGAGCAATGCCCGATAGAGTCCAGTGGCCCAAGAGTTGGCCCA
161 Q I G Y C Q Q C P D R V Q W P K E L G P
541 AAACCACTCTTACTTCAACGCTGGAATGTCTGTTTGTAGCCCAAGTTGCCCACTTAC
181 K P P L V F N A G M F V F E P S L P T Y
601 TATGATCTACTCAAAACAGTCAAAGAGACCCCTCAACTCTTTTGCTGAACAGGATTTT
201 Y D L L R K T V K E T P P T L F A E Q D F
661 TTGAATATGTTCTTACGGGCAAAATACAGCCTATTCCACAGTTTATAATCTTGTTTA
221 L N M F F R D K Y K P I P P V V N L V L
721 GCCATGTTGTGGCTCACCTGAGAATATCGATCTTGACCAAGTCAAAGTCGTTCACTAT
241 A M L W R H P E N I D L D Q V K V V H Y
781 TGTGCTGCTGATCTAAACCATGGAGGTATCTGGGAGGAAGAGAACATGGATAGAGAA
261 C A A G S K P W R Y T G E E E N M D R E
841 GATATAAAATGTTAGTGAAGAAATGGTGGGACATATACAACGACGAGTCTTGGACTAC
281 D I K M L V K K W W D I Y N D E S L D Y
901 AAGAAAACGACAAACCTGGAGTAGAATTACCTCCAAATGGAACAATAAGCAGACAGCAA
301 K K T T T P G V E L P P N G T I T T E Q
961 CGGAATCTCCAAGCCTTTTGGAGCACTATCAGGGGCTGGTGTGCCAGGTGTTAAA
321 A N L Q A F L E A L S G A G G V P R V K
1021 GCTCATCCCGGCTTAG
341 A P S A A *

红色代表锰离子结合相关元件；绿色代表羧基末端疏水性五肽；*代表终止密码子

Red represents the element related to manganese ion binding; Green represents the carboxyl-terminal hydrophobic pentapeptide; * represents the termination codon

附图 1 *CsGolS2* 基因核苷酸及其编码蛋白氨基酸序列

Attached Fig. 1 Nucleotide and protein amino acid sequences of *CsGolS2*

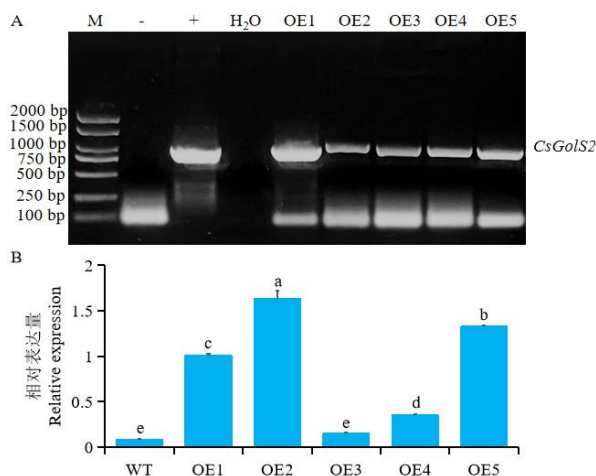


M: DL2000 分子量标记物; 1: pRI101-*CsGolS2* 质粒双酶切产物; 2: pRI101-*CsGolS2* 农杆菌菌液 PCR
M: DL2000 marker; 1: Double enzyme digestion products of pRI101-*CsGolS2*; 2: *Agrobacterium tumefaciens*

PCR of pRI101-*CsGolS2*

附图 2 *CsGolS2* 植物表达载体构建

Attached Fig. 2 Construction of *CsGolS2* plant expression vector

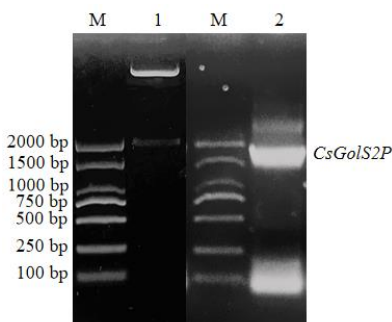


A: *CsGolS2* 转基因烟草基因组 DNA PCR; B: *CsGolS2* 转基因烟草 RT-qPCR; M: DL2000 分子量标记物; -: 野生型烟草; +: pRI101-*CsGolS2* 载体质粒; OE1-OE5: *CsGolS2* 转基因烟草

A: Genomic DNA PCR of *CsGolS2* transgenic tobacco; B: RT-qPCR of *CsGolS2* transgenic tobacco; M: DL2000 DNA marker; -: Wild-type tobacco; +: pRI101-*CsGolS2* vector plasmid; OE1-OE5: *CsGolS2* transgenic tobacco

附图 3 T₂ 代 *CsGolS2* 转基因烟草鉴定

Attached Fig. 3 Identification of T₂ generation *CsGolS2* transgenic tobacco

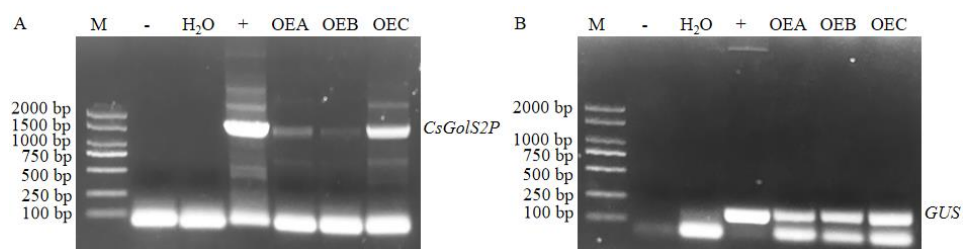


M: DL2000 分子量标记物; 1: pCambia1301-*CsGolS2P* 质粒双酶切产物; 2: pCambia1301-*CsGolS2P* 农杆菌菌液 PCR

M: DL2000 marker; 1: Double enzyme digestion products of pCambia1301-*CsGolS2P*; 2: *Agrobacterium tumefaciens* PCR of pCambia1301-*CsGolS2P*

附图 4 *CsGolS2P* 植物表达载体构建

Attached Fig. 4 Construction of *CsGolS2P* plant expression vector



A: *CsGolS2P* 转基因拟南芥基因组 DNA PCR; B: *CsGolS2P* 转基因拟南芥 RT-PCR; M: DL2000 分子量标记物; -: 野生型拟南芥; +: pCAMBIA1301-*CsGolS2P* 载体质粒; OEA-OEC: *CsGolS2P* 转基因拟南芥

A: Genomic DNA PCR of *CsGolS2P* transgenic *Arabidopsis thaliana*; B: RT-PCR of *CsGolS2P* transgenic *Arabidopsis thaliana*; M: DL2000 DNA marker; -: Wild-type *Arabidopsis thaliana*; +: pCAMBIA1301-*CsGolS2P* vector plasmid; OEA-OEC: *CsGolS2P* transgenic *Arabidopsis thaliana*

附图 5 T₂ 代 *CsGolS2P* 转基因拟南芥鉴定

Attached Fig. 5 Identification of T₂ generation *CsGolS2P* transgenic *Arabidopsis thaliana*