Supplementary file 1. Supplementary file with additional data.

a. List of bacterial strains and plasmids used in this study

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| --- | --- | --- |
| **Strains or plasmids** | **Relevant characteristics** | **Resources** |
| **Strains** | | |
| *Xanthomonas citri* subsp.*citri* | | |
| *Xcc*29-1 | Wild-type strain isolated from *Citrus* *sinensis* in Jiangxi Province, China | This lab |
| *Xcc*29-1/avrXa7 | Kmr, *Xcc* 29-1 carrying pUFR034:avrXa7 | Sun *et al*., 2018 |
| Mxac 126-80 | Kmr, a Tn5 insertion mutant of *pthA4* gene derived from *Xcc* 29-1 | Song *et al*., 2015 |
| *Xcc*049 | Wild-type strain isolated from *C.* *sinensis* in Chongqing Province, China | This lab |
| *Xcc*049E | A tale free strain of *Xcc* 049 | Ge *et al*., 2019 |
| *Xcc*049E/pthA4 | Kmr, *Xcc* 049E containing the *pthA* gene | Ge *et al*., 2019 |
| *Escherichia coli* | | |
| DH5α | *F- recA hsdR17 (rk−, mk+) ϕ80lacZ∆M15* | Clontech |
| BL21(DE3) | *F-, ompT, hsdSB (rB-mB-), gal, dcm* | Novagen |
| Saccharomyces cerevisiae | | |
| EGY48 | *MATα, ura3, his3, trp1*, LexAop-LEU2 | Clontech |
| AH109 | *MATα, trp1*, *leu2,* lacZ, HIS3, ADE2, MEL1 | Clontech |
| *Agrobacterium tumefaciens* | | |
| GV3101 | Rifr, with Ti plasmid pMP90 | Koncz and Schell, 1996 |
| **Plasmids** | | |
| pHB | Kmr, a binary vector to express gene under control of a double CaMV 35S promoter | Mao *et al*., 2005 |
| pHB-Cs9g12620 | Kmr, the 1122-bp full-length *Cs9g12620* gene cloned in pHB | This study |
| pHB-CsLOB1 | Kmr, the 714-bp full-length *CsLOB1* gene cloned in pHB | This study |
| pHB-PthA4 | Kmr, the 3492-bp full-length *pthA4* gene cloned in pHB | This lab |
| pGD3FLAG-PthA4 | Kmr, the 3492-bp full-length *pthA4* gene cloned in pGD3FLAG | This lab |
| pGWB435-P*Cs9g12620* | SHr, a 463-bp DNA fragment of *Cs9g12620* gene promoter region cloned in pGWB435-LUC | This study |
| pGWB435-P*Cs9g12620*-M | SHr, a 397-bp DNA fragment of *Cs9g12620* gene promoter region cloned in pGWB435-LUC | This study |
| pGWB435-P*Cs9g12620*-MA | SHr, a 463-bp DNA fragment of *Cs9g12620* gene promoter region cloned in pGWB435-LUC | This study |
| pGWB435-P*Cs9g12620*-MC | SHr, a 463-bp DNA fragment of *Cs9g12620* gene promoter region cloned in pGWB435-LUC | This study |
| pGWB435-P*Cs9g12620*-MG | SHr, a 463-bp DNA fragment of *Cs9g12620* gene promoter region cloned in pGWB435-LUC | This study |
| pGWB435-P*Cs9g12620*-MLB1 | SHr, a 459-bp DNA fragment of *Cs9g12620* gene promoter region cloned in pGWB435-LUC | This study |
| pGWB435-P*Cs9g12620*-MLB2 | SHr, a 459-bp DNA fragment of *Cs9g12620* gene promoter region cloned in pGWB435-LUC | This study |
| pGWB435-P*Cs9g12620*-MLB1/2 | SHr, a 455-bp DNA fragment of *Cs9g12620* gene promoter region cloned in pGWB435-LUC | This study |
| pGWB435-P*Cs9g12650* | SHr, a 460-bp DNA fragment of *Cs9g12650* gene promoter region cloned in pGWB435-LUC | This study |
| pG221 | Apr, Yeast one-hybrid plasmid | Ye *et al*., 2004 |
| pG221-P*Cs9g12620* | Apr, a 463-bp DNA fragment of *Cs9g12620* gene promoter region cloned in pG221 | This study |
| pG221-P*Cs9g12620*-MA | Apr, a 463-bp DNA fragment of *Cs9g12620* gene promoter region cloned in pG221 | This study |
| pG221-P*Cs9g12620*-MC | Apr, a 463-bp DNA fragment of *Cs9g12620*gene promoter region cloned in pG221 | This study |
| pG221-P*Cs9g12620*-MG | Apr, a 463-bp DNA fragment of *Cs9g12620* gene promoter region cloned in pG221 | This study |
| pG221-P*Cs9g12620*-MLB1 | Apr, a 459-bp DNA fragment of *Cs9g12620* gene promoter region cloned in pG221 | This study |
| pG221-P*Cs9g12620*-MLB2 | Apr, a 459-bp DNA fragment of *Cs9g12620* gene promoter region cloned in pG221 | This study |
| pG221-P*Cs9g12620-*MLB1/2 | Apr, a 455-bp DNA fragment of *Cs9g12620* gene promoter region cloned in pG221 | This study |
| pGADT7 | Apr, GAL4(768–881) PADH1, TADH1, HA tag | Clontech |
| pGBKT7 | Kmr, GAL4(1–147) DNA-BD, TRP1, c-Myc epitope tag | Clontech |
| pGADT7-pthA4 | Apr, the 3492-bp full-length *pthA4* gene cloned in pGADT7 | This lab |
| pGBKT7-pthA4 | Kmr, the 3492-bp full-length *pthA4* gene cloned in pGBKT7 | This study |
| pGBKT7-CsLOB1 | Kmr, the 714-bp full-length *CsLOB1* gene cloned in pGBKT7 | This study |
| pCAMBIA1381 | Kmr, plant binary expression vector carrying a promoterless *gusA* gene with start codon | CAMBIA |
| P*Cs9g12620*-GUS | Kmr, a 463-bp DNA fragment of *Cs9g12620* gene promoter region cloned in pCAMBIA1381 | This study |
| P*CsLOB1*-GUS | Kmr, a 584-bp DNA fragment of *CsLOB1* gene promoter region cloned in pCAMBIA1381 | This lab |
| pET41a (+) | Kmr, IPTG-inducible expression vector | Novagen |
| pET41-CsLOB1 | Kmr, the 714-bp full-length *CsLOB1* gene cloned in pET41a (+) | This study |
| pET41-pthA4 | Kmr, the 3492-bp full-length *pthA4* gene cloned in pET41a (+) | This study |
| pMAL-c4x-pthA4 | Apr, the 3492-bp full-length *pthA4* gene cloned in pMAL-c4x | This lab |
| pCAMBIA1300-GFP-nLUC | Kmr, the 720-bp full-length *gfp* gene cloned in pCAMBIA1300-nLUC | This lab |
| pCAMBIA1300-cLUC-GFP | Kmr, the 720-bp full-length *gfp* gene cloned in pCAMBIA1300-cLUC | This lab |
| pCAMBIA1300-pthA4-nLUC | Kmr, the 3492-bp full-length *pthA4* gene cloned in pCAMBIA1300-nLUC | This study |
| pCAMBIA1300-cLUC-CsLOB1 | Kmr, the 714-bp full-length *CsLOB1* gene cloned in pCAMBIA1300-cLUC | This study |
| CTV33 | Kmr, Citrus tristeza virus (CTV)-based expression vector constructed in pCAMBIA1380 | El-Mohtar and Dawson, 2014 |
| CTV-2620i | Kmr, the 488-bp *Cs9g12620* gene fragment cloned in CTV33 for gene silencing | This study |
| CTV-LOB1i | Kmr, the 264-bp *CsLOB1* gene fragment cloned in CTV33 for gene silencing | This study |

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b. List of Primers used in this study

|  |  |  |
| --- | --- | --- |
| **Primer pair** | **Sequence (5’-3’)** | **Description or purpose** |
| **Primers used for plasmid construction** | | |
| Cs9g12620.F  Cs9g12620.R | TGCTGCAGATGGCTTGGTTTCTCTCTCTT  TCGAGCTCCTATCGGAGAGGAAGAACACTAA | The 1122-bp coding sequence of *Cs9g12620* cloned in pHB vector at *Pst*I and *Sac*I sites |
| CsLOB1.F  CsLOB1.R | TGCTGCAGATGGAATGCAAACACAAAATT  TCGAGCTCTCATGTCCACAGAGGCTCC | The 714-bp coding sequence of *CsLOB1* cloned in pHB vector at *Pst*I and *Sac*I sites |
| 435-P*Cs9g12620*.F  435-P*Cs9g12620*.R | GGGGACAAGTTTGTACAAAAAAGCAGGCTTCAAGTCAACATTAGCACGAAC  GGGGACCACTTTGTACAAGAAAGCTGGGTCAAGAGAGAGAAACCAAGGCAT | A 463-bp DNA fragment of *Cs9g12620* gene promoter cloned in pGWB435-LUC with gateway |
| P*Cs9g12620*-1.R  P*Cs9g12620*-2.F | TGATTTGCTCCTATAGTCTT  AAGACTATAGGAGCAAATCAAACCAATGAAGCTTCATTTG | To obtained fragment P*Cs9g12620*-MLB1 and P*Cs9g12620*-MLB1/2  To obtained fragment P*Cs9g12620*-MLB1 and P*Cs9g12620*-MLB1/2 |
| P*Cs9g12620*-3.R | TGAGATGTGCCACTTGGTCT | To obtained fragment P*Cs9g12620*-MLB2 and P*Cs9g12620*-MLB1/2 |
| P*Cs9g12620*-4.F | AGACCAAGTGGCACATCTCATAATTTGGTGGCCCTATAAC | To obtained fragment P*Cs9g12620*-MLB2 and P*Cs9g12620*-MLB1/2 |
| 435-P*Cs9g12620*-5.R | GGGGACCACTTTGTACAAGAAAGCTGGGTCGAATGAAAACGCTCAACGGG | To construct pGWB435-P*Cs9g12620*-M |
| 435-P*Cs9g12650*.F | GGGGACAAGTTTGTACAAAAAAGCAGGCTTCGTACTTCTTGGATTT | A 450-bp DNA fragment of *Cs9g12650* gene promoter cloned in |
| 435-P*Cs9g12650*.R | GGGGACCACTTTGTACAAGAAAGCTGGGTCTTTTCTATGATGAAG | pGWB435-LUC with gateway |
| Xho-P*Cs9g12620*.F  Bam-P*Cs9g12620*.R | TGCTCGAGAAGTCAACATTAGCACGAAC  TCGGATCCAAGAGAGAGAAACCAAGCCAT | A 463-bp DNA fragment of *Cs9g12620* gene promoter cloned in pG221 at *Xho*I and *Bam*HI sites |
| Eco-P*Cs9g12620*.F  Bam-P*Cs9g12620*.R | TCGAATTCAAGTCAACATTAGCACGAAC  TCGGATCCAAGAGAGAGAAACCAAGCCAT | A 463-bp DNA fragment of *Cs9g12620* gene promoter cloned in pCAMBIA1381 at *Eco*RI and *Bam*HI sites |
| P*Cs9g12620*-A*.*F | TTCCTTTCTTTTTGTCACCCACTTTAATATATAA | To obtained fragment P*Cs9g12620*-MA |
| P*Cs9g12620*-A*.*R | GTGACAAAAAGAAAGGAA |  |
| P*Cs9g12620*-C*.*F | TTCCTTTCTTTTTGTCCCCCACTTTAATATATAA | To obtained fragment P*Cs9g12620*-MC |
| P*Cs9g12620*-C*.*R | GGGACAAAAAGAAAGGAA |  |
| P*Cs9g12620*-G*.*F | TTCCTTTCTTTTTGTCGCCCACTTTAATATATAA | To obtained fragment P*Cs9g12620*-MG |
| P*Cs9g12620*-G*.*R | GCGACAAAAAGAAAGGAA |  |
| FL | TCCCACTTTAATATATAA | EMSA |
| FL:A | ACCCACTTTAATATATAA | EMSA |
| FL:C | CCCCACTTTAATATATAA | EMSA |
| FL:G | GCCCACTTTAATATATAA | EMSA |
| Nde-A4.1.F  Eco-A4.1.R | TTCATATGGATCCCATTCGTTCGCG  TTGAATTCGTGTGTAAACCCATGGCC | A 571-bp DNA fragment of *pthA4* gene N terminus cloned in pGBKT7 at *Nde*I and *Eco*RI |
| Eco-A4.2.F  Sal-A4.2.R | TTGAATTCGGGATGAGCAGGCACG  TTGTCGACTCACTGAGGCAATAGCTCCAT | A 561-bp DNA fragment of *pthA4* gene C terminus cloned in pGBKT7 and pET41:avrXa7 at *Eco*RI and *Sal*I sites |
| P23.F  P23.R | CACTGCAGTATTTGGTTTTACAACAACGG  GCATGCGAATTCAATTCAAACCTAGTAAATG | A 1930-bp DNA fragment amplified from CTV33 in pMD19-T Simple vector |
| End.F  End.R | TCGAATTCGCATGCTTGAAGTGGACGGAATAAG  CGATTTAAATCCCGTTTCGTCCTTTAGG | A 365-bp DNA fragment amplified from CTV33 in pMD19-T Simple vector |
| GFP.F  GFP.R | CGGAATTCTCTAGAGCGGCCGCATGGCTAGCAAAGG  CATGCATGCGGTACCCGATCGCTATTTGTAGAGCTC | A 720-bp DNA fragment amplified from CTV33 in pMD19-T Simple vector |
| Cs9g12620i.F  Cs9g12620i.R | TCGAATTCCAGCAACTCGTCCATCTC  TCGGTACCAAGAGAGGTCCACAAGTG | A 488-bp *Cs9g12620* gene fragment cloned in CTV33 vector for RNA silencing |
| LOB1i.F | TGGAATTCATGGAATGCAAACACAAAATT | A 264-bp *CsLOB1* gene fragment cloned in CTV33 vector for RNA silencing |
| LOB1i.R | TCGGTACCGCGGAGGATTTTGCAAGC |
| Eco-CsLOB1.F  Sal-CsLOB1.R | TGGAATTCATGGAATGCAAACACAAAATT  TCGTCGACTCATGTCCACAGAGGCTCC | A full length of *CsLOB1* gene fused in pGBKT7 and pET41a (+) Vector at *Eco*RI and *Sal*I sites |
| CsLOB1-cLUC.F | cggggcggtacccgggatccaATGGAATGCAAACACAAAATT | A full length of *CsLOB1* gene fused in pCAMBIA1300-cLUC with overlapping |
| CsLOB1-cLUC.F | cgaaagctctgcaggtcgacTCATGTCCACAGAGGCTCC |
| SacI-pthA4.1.F | TCGAGCTCATGGATCCCATTCGTTCGCG | A 571-bp DNA fragment of *pthA4* gene N terminus cloned in pCAMBIA1300-nLUC at *Sac*I and *Kpn*I sites |
| KpnI-pthA4.1.R | TTGGTACCGTGTGTAAACCCATGGCC |
| KpnI-pthA4.2.F | TTGGTACCGGGATGAGCAGGCACG | A 561-bp DNA fragment of *pthA4* gene C terminus cloned in pCAMBIA1300-nLUC at *Kpn*I and *Sal*I sites |
| SalI-pthA4.2.R | TTGTCGACCTGAGGCAATAGCTCCAT |
| **Primers for real time PCR analysis** | | |
| *CsActin* | CCAAGCAGCATGAAGATCAA  ATCTGCTGGAAGGTGCTGAG | 101-bp |
| *Cs9g12620* | GGTCAGTCGGGTAACCTCTCAGT  CAGAAGTTGCCTTAAAAGCCCAT | 85-bp |
| *Cs9g12650* | CTCGAGTTATTCATCCTC | 132-bp |
|  | TGATTTCCCATTTGGGAA |  |
| *CsLOB1* | AGGAACTGCCAGAATCTCAACGA  GGATTCTGGCACTTGCTTCATA | 70-bp |
| *NbEF1α* | TGGTGTCCTCAAGCCTGGTATGGTTG  ACGCTTGAGATCCTTAACCGCAACATTCTT | 155-bp |
| *gusA* | TAGAAACCCCAACCCGTGAA  TTGCCCGGCTTTCTTGTAAC | 120-bp |
| *pthA4* | TGCCCCCTCACCTGCGTTCT  CTGTGGCAGCCTCTGTATGGTGA | 131-bp |
| *pectin esterase* | TGGGTGAGTAGGGAGACGAG | 114-bp |
|  | AATCGCTTCCGCAATCGTTG |  |
| *expansin* | TCCAGCATGTTCAGGCAGAG | 115-bp |
|  | CATGGCACCGAAAGCTGTTC |  |

The 5′ end of each primer for molecular cloning contains restriction enzyme sites