**Supplementary Table 1 The primers used for yeast two-hybrid assays (AD and BD).**

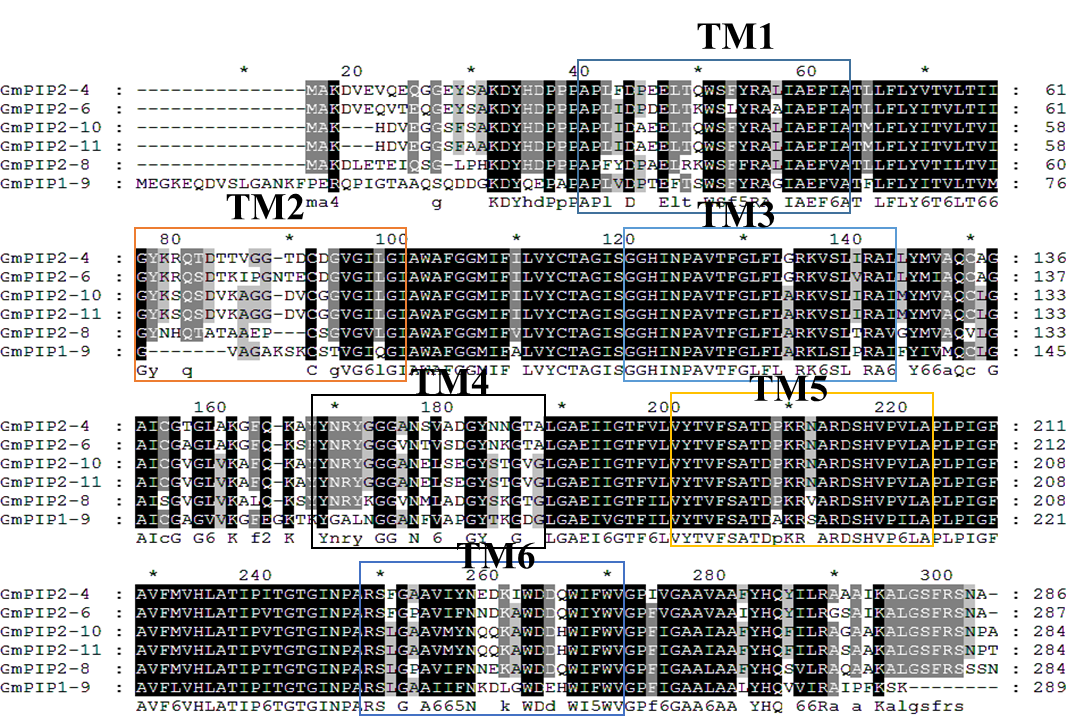
|  |  |  |
| --- | --- | --- |
| **Gene** | **Forward primers** | **Reverse primers** |
| *GmPIP1;2* | cgCCATGGcaATGGAGGGAAGAGATGAGGATG | cGGAATTTCATTTTGACTTGAAAGGAATGGCCCT |
| *GmPIP1;3* | cgCCATGGcaATGGAGAGGGAGGAAGATGT | cGGAATTCTCAACCCCTTGTCTTGAAAGGAA |
| *GmPIP1;4* | cgCCATGGcaATGGAGAGGGAGGAAGATGT | cGGAATTCTCAACCCCTTGTCTTGAATGGAATT |
| *GmPIP1;5* | cgCCATGGcaATGGAGAGCAAAGAGGAAGATGT | cGGAATTCTCAAGCCCTTGTCTTGAAAGGGA |
| *GmPIP1;6* | cgCCATGGcaATGGAGAGTAAAGAGGAAGAT | cGGAATTCTCAAGCCCTTGTCTTGAAAGGA |
| *GmPIP1;7* | cgCCATGGcaATGGAGGGGAAGGAGCAGGAT | cGGAATTCTCACTTGGACTTGAAGGGAAT |
| *GmPIP1;8* | cgCCATGGcaATGGAGGGAAAAGAGGAAGAT | cGGAATTCTCAACTGGATTTGAAGGGAAT |
| *GmPIP2;2* | cgCCATGGcaATGTCGAAGGAAGTGAGCCAAGA | cGGAATTCTCAGTTGGTAGGGTTGCTCCTGA |
| *GmPIP2;4* | cgCCATGGcaATGGCTAAAGATGTTGAGGT | cGGAATTCTCAAGCGTTGCTCCTGAAGGATCCA |
| *GmPIP2;6* | cgCCATGGcaATGGCGAAAGACGTTGAGCAG | cGGAATTCTCAAGCGTTGCTCCTGAAGGATCCA |
| *GmPIP2;8* | cgCCATGGcaATGGCCAAAGACCTCGAAACG | cGGAATTCTCACAGGTTTGAGGAGCTCCTGA |
| *GmPIP2;9* | cgCCATGGcaATGGCTAAGCATGATGTTGA | cGGAATTCTCAAATAGTGGGGTTGCTCCTGA |
| *GmPIP2;11* | cgCCATGGcaATGGCTAAGCATGATGTTGAG | cGGAATTCTCAAATAGCGGGGTTGCTCCTGAAT |
| *GmPIP2;13* | cgCCATGGcaATGAGCGTGTTTTGGCAGGA | cGGAATTCTCAATTATGGGGGTTACTCCTGAATGA |

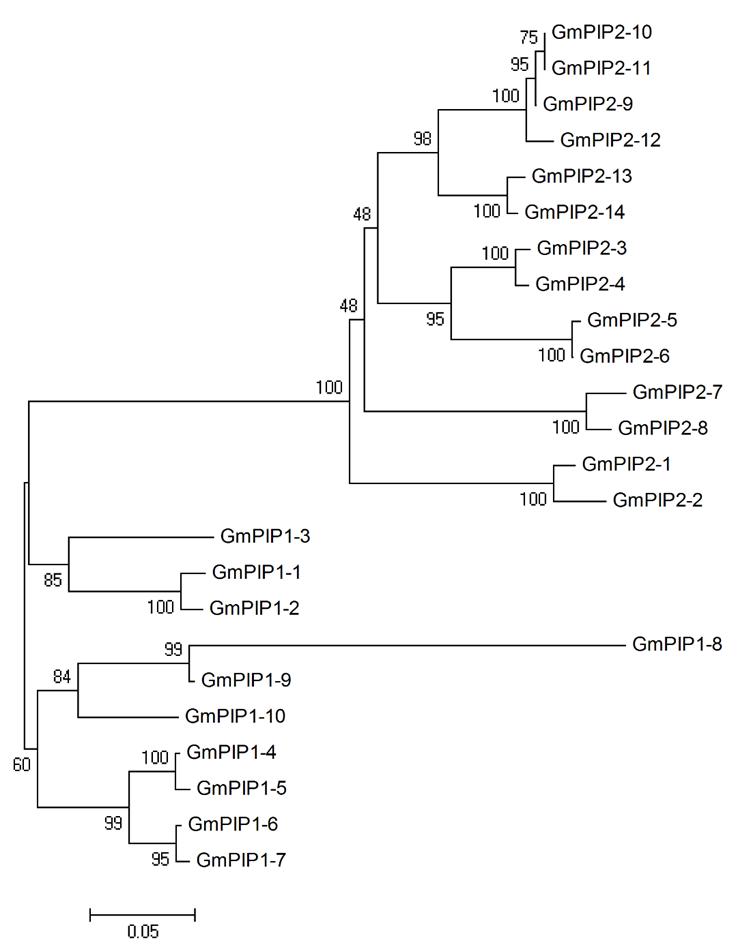
**Supplementary Table 2 The primers used for qRT-PCR.**

|  |  |  |
| --- | --- | --- |
| **Gene** | **Forward primers** | **Reverse primers** |
| *GmPIP1;1* | GAGGGAAAAGAAGAGGAC | CTTCGACGAGAAGGGGATG |
| *GmPIP1;2* | GAGGGAAGAGATGAGGATG | ACTTGAAAGGAATGGCCCT |
| *GmPIP1;3* | GAGAGGGAGGAAGATGT | CCTTGTCTTGAAAGGAAT |
| *GmPIP1;4* | GAGAGGGAGGAAGATGT | CCTTGTCTTGAATGGAATTG |
| *GmPIP1;5* | GAGAGCAAAGAGGAAGATGT | CACAAAATTGGCTCCACCT |
| *GmPIP1;6* | GAGTAAAGAGGAAGAT | CCTTGTCTTGAAAGGAA |
| *GmPIP1;7* | GAGGGGAAGGAGCAGGAT | GGACTTGAAGGGAATGG |
| *GmPIP1;8* | GAGGGAAAAGAGGAAGAT | GGATTTGAAGGGAATGG |
| *GmPIP2;1* | TCGAAGGAAGTGAGCCAGCA | TGGTAGGGTTGCTCCTGA |
| *GmPIP2;2* | TCGAAGGAAGTGAGCCAAGA | GGTAGGGTTGCTCCTGA |
| *GmPIP2;3* | GCTAAAGATGTTGAGGT | CGTTGCTTCTGAAGGATCCA |
| *GmPIP2;4* | GCTAAAGATGTTGAGGT | GCGTTGCTCCTGAAGGATCCA |
| *GmPIP2;5* | GCCAAAGACGTTGAGCA | AGTGTTGCTCCTGAATGATC |
| *GmPIP2;6* | GCGAAAGACGTTGAGCAG | AGCGTTGCTCCTGAAGGATCCA |
| *GmPIP2;7* | GCGAAAGACATCGAAACT | CAGGTTTGAGGAGCTCCTGA |
| *GmPIP2;8* | GCCAAAGACCTCGAAACG | CAGGTTTGAGGAGCTCCTGA |
| *GmPIP2;9* | GCTAAGCATGATGTTGA | AATAGTGGGGTTGCTCCTGA |
| *GmPIP2;10* | GCTAAGCATGATGTTGAG | AATAGCGGGGTTGCTCCTGAAT |
| *GmPIP2;11* | TAAGCATGATGTTGAG | CGGGGTTGCTCCTGAAT |
| *GmPIP2;13* | AGCGTGTTTTGGCAGGA | TTATGGGGGTTACTCCTGAATGA |
| *GmPIP2;14*  *GmTUBB3*  *GmActin* | GCGAAGGACGTTGAGGTT  GGAGGGTGAGTGAGCAGTTC  CGGTGGTTCTATCTTGGCATC | ATTATGGGGGTTACTCCTGAA  GCCGCATAACATTGTTCCCA  GTCTTTCGCTTCAATAACCCTA |

**Supplementary Figure 1:** Multiple alignment of soybean GmPIP1 type and GmPIP2 type aquaporins using Clustal X. GmPIP1s had longer N-terminal ends and GmPIP2s had longer C-terminal ends. All the GmPIPs contained six transmembrane domains (rectangles) and two conserved NPA motifs (red circles).

**Supplementary Figure 2:** The phylogenetic tree of GmPIPs.



**Supplementary Figure 3:** The phylogenetic tree of GmPIPs, AtPIPs and OsPIPs.

