

**Additional file 4. Multiple alignment of full-length *TvQR1* cDNA clones**

The start codon is depicted with **green bold** letters and the stop codon in **red bold** letters. Dots represent identical nucleotides. Dashes represent missing nucleotides.

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cTvQR1_1      1 CTGGAATTCATTTTCAAGCTTCTCAAGCCTTTTACATAATAAAAAAAAAATTAATTTAATT
cTvQR1_9      1 .....
cTvQR1_8      1 .....
cTvQR1_3      1 .....
cTvQR1_4      1 .....
cTvQR1_5      1 .....
cTvQR1_7      1 .....
cTvQR1_2      1 .....T.....TA.AT.AT.....G.A.
cTvQR1_6      1 .....T.....TACA..AT.....-.....G.A.
Consensus     1 .....

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cTvQR1_1      61 ATGGCCGGAAAGCTTATGCGTGCGGTTTCAGTACGACGGTTAGCTGCTGGTTTGAAGCATG
cTvQR1_9      61 .....
cTvQR1_8      61 .....
cTvQR1_3      61 .....
cTvQR1_4      61 .....
cTvQR1_5      61 .....
cTvQR1_7      61 .....
cTvQR1_2      61 .....C.
cTvQR1_6      60 .....C.
Consensus     61 .....

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cTvQR1_1      121 TTGAAGTTCCAATACCTAGTCCTGGCAAGGTATAAAGCTTGAAGCCATAAGCTTAAATCA
cTvQR1_9      121 .....C.....
cTvQR1_8      121 .....
cTvQR1_3      121 .....
cTvQR1_4      121 .....
cTvQR1_5      121 .....
cTvQR1_7      121 .....
cTvQR1_2      121 .....G.T.....A.....A.....
cTvQR1_6      120 .....G.T.....A.....
Consensus     121 .....

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cTvQR1_1      181 ACTTGATTGGAAGCTTTCAGATCGTCCTTTTCTTCTCGGAAATTCCTTTTATACCTGCT
cTvQR1_9      181 .....
cTvQR1_8      181 .....
cTvQR1_3      181 .....
cTvQR1_4      181 .....
cTvQR1_5      181 .....
cTvQR1_7      181 .....T.....
cTvQR1_2      181 .....AA.....A.....T.....
cTvQR1_6      180 .....AA.....C..A.....C.....T.....
Consensus     181 .....

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cTvQR1_1      241 ACCGACGTGGGGTCCGGATCGGACCGGATGTCAAAAACCTTTAAACCCGGTGATAAAGTTG
cTvQR1_9      241 .....
cTvQR1_8      241 .....

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cTvQR1\_3 241 .....C.....  
cTvQR1\_4 241 .....C.....  
cTvQR1\_5 241 .....C.....  
cTvQR1\_7 241 .....C.....  
cTvQR1\_2 241 .....T.....T..A.....G...G.....C.....C.....  
cTvQR1\_6 240 .....T.....T..A.....G...G.....C.....C.....  
Consensus 241 .....C.....

cTvQR1\_1 301 TGGCAGTTTTGGAGGAGGTGGCTTAGCCGAATACGGCGTAGCAAGTGCAATCACCGGCCA  
cTvQR1\_9 301 .....  
cTvQR1\_8 301 .....A.....A.....G  
cTvQR1\_3 301 .....A..C..TA...G  
cTvQR1\_4 301 .....A..C..TA...G  
cTvQR1\_5 301 .....A..C..TA...G  
cTvQR1\_7 301 .....A..C..TA...G  
cTvQR1\_2 301 ....CA...A.....A.....A.....G  
cTvQR1\_6 300 ....CA...A.....A..C..A...G  
Consensus 301 .....A.....A.....G

cTvQR1\_1 361 CCCGAGGTCTCAGCTGCCGAGAGTTCGGCCTTCCCATTGGGCCACATGGCCCTCACCC  
cTvQR1\_9 361 .....  
cTvQR1\_8 361 .....A.....  
cTvQR1\_3 361 .....A.....C..A.....A.....  
cTvQR1\_4 361 .....A.....C..A.....A.....  
cTvQR1\_5 361 .....A.....C..A.....A.....  
cTvQR1\_7 361 .....A.....C..A.....A.....  
cTvQR1\_2 361 .....A.....C..G.....T.....A.....  
cTvQR1\_6 360 .....A.....A.....  
Consensus 361 .....A.....

cTvQR1\_1 421 AACACATCGGCCTAACCTCGACAAAAGTGAAACATCCTCATCACAGCCGCCTCCGGTGG  
cTvQR1\_9 421 .....  
cTvQR1\_8 421 .....  
cTvQR1\_3 421 .....T.....  
cTvQR1\_4 421 .....T.....  
cTvQR1\_5 421 .....T.....  
cTvQR1\_7 421 .....C.....T.....  
cTvQR1\_2 421 .....  
cTvQR1\_6 420 .....  
Consensus 421 .....

cTvQR1\_1 481 TGTTGGCCAATACGCCGTTTCGCTAGGAAACACACATGTAACCGCCACATGTGGGTCCCGA  
cTvQR1\_9 481 .....  
cTvQR1\_8 481 C..C.....A.....C.....C.....  
cTvQR1\_3 481 C.....A.....C.....A.....  
cTvQR1\_4 481 C.....A.....C.....A.....  
cTvQR1\_5 481 C.....A.....C.....A.....  
cTvQR1\_7 481 C.....A.....C.....A.....  
cTvQR1\_2 481 C.....C.....  
cTvQR1\_6 480 C.....T.....C.....A.....  
Consensus 481 C.....C.....

cTvQR1\_1 541 AACTTTGACTCCTCGGAGCCGACGAGGTTATTGACTATAAAACTCCCGAAGGGGCAGCCC  
cTvQR1\_9 541 .....  
cTvQR1\_8 541 .....T.....C.....  
cTvQR1\_3 541 .....C.....  
cTvQR1\_4 541 .....A.....C.....  
cTvQR1\_5 541 .....C.....  
cTvQR1\_7 541 .....C.....  
cTvQR1\_2 541 .....A.....C.....T.....  
cTvQR1\_6 540 .....C.....  
Consensus 541 .....C.....

cTvQR1\_1 601 GTCGGGCAAGAAGTATGATGCGGTTATTCATTGTGCGTCGCCTTTGCCATTAAACCGAAC  
cTvQR1\_9 601 .....  
cTvQR1\_8 601 .....C.....A.....  
cTvQR1\_3 601 .....A.....A.....  
cTvQR1\_4 601 .....A.....A.....  
cTvQR1\_5 601 .....A.....A.....  
cTvQR1\_7 601 .....A.....A..A.....  
cTvQR1\_2 601 .....A.....  
cTvQR1\_6 600 T.....A.....C.....  
Consensus 601 .....A.....

cTvQR1\_1 661 TTGAGCAAACATGGGAAAGTGATTGATATAACTCCCGGTCGTTGACTTCGGCTATGACAA  
cTvQR1\_9 661 .....  
cTvQR1\_8 661 .....C.....A.....T.....  
cTvQR1\_3 661 .....C.....  
cTvQR1\_4 661 .....C.....T.....  
cTvQR1\_5 661 .....C.....T.....  
cTvQR1\_7 661 .....C.....T.....  
cTvQR1\_2 661 .....C.....  
cTvQR1\_6 660 .....  
Consensus 661 .....C.....

cTvQR1\_1 721 AACTTACGTGCTCGAAGAAACGATTGGTGATGTGATCAAGGGCGAGCATTGAGTTATCT  
cTvQR1\_9 721 .....  
cTvQR1\_8 721 ...C.....T.....  
cTvQR1\_3 721 .....  
cTvQR1\_4 721 ...C.....T.....T.....  
cTvQR1\_5 721 ...G.....A.....T.....  
cTvQR1\_7 721 ...G.....A.....T.....  
cTvQR1\_2 721 .....  
cTvQR1\_6 720 ...C.....  
Consensus 721 .....

cTvQR1\_1 781 TGTTGAGTTAATGAGAGAAGGACCGTTATCGACTCTAAGTTTTTCGTTGAGCAAGGCTGAG  
cTvQR1\_9 781 .....  
cTvQR1\_8 781 ...C.G.....A.....T.....  
cTvQR1\_3 781 .....G.....C...A..T.....  
cTvQR1\_4 781 .....C.....T.....  
cTvQR1\_5 781 .....G.....CC.T...T.....  
cTvQR1\_7 781 .....G.....CC.T...T.....  
cTvQR1\_2 781 .....G.....C...A..T.....  
cTvQR1\_6 780 ...C.....C...A..T.....

Consensus 780 .....C.....T.....

cTvQR1\_1 841 GAGGCTTGGGCGACGGCCATGCTACCGGAAAATCGTTGTCGAGCCA**TAA**GTTAGTAAGA  
cTvQR1\_9 841 .....A.  
cTvQR1\_8 841 .....G.....  
cTvQR1\_3 841 .....  
cTvQR1\_4 841 .....G.....  
cTvQR1\_5 841 .....G.....  
cTvQR1\_7 841 .....G.....  
cTvQR1\_2 841 .....G.....  
cTvQR1\_6 840 .....G.....  
Consensus 839 .....G.....

cTvQR1\_1 901 TTTTATGATATTGTAATGTGGAATTTGGCTTATGACTTGTTTTGGTAATCGATATGAGAT  
cTvQR1\_9 901 .....G.....  
cTvQR1\_8 901 .....G.....  
cTvQR1\_3 901 .....G.....  
cTvQR1\_4 901 .....G.....  
cTvQR1\_5 901 .....G.A.....G.....  
cTvQR1\_7 901 .....G.A.....G.....  
cTvQR1\_2 901 .....G.....  
cTvQR1\_6 900 .....G.A.....G.....  
Consensus 899 .....G.....

cTvQR1\_1 961 CTTTTGTTAACCTA  
cTvQR1\_9 961 .....  
cTvQR1\_8 961 .....  
cTvQR1\_3 961 .....  
cTvQR1\_4 961 .....  
cTvQR1\_5 961 .....  
cTvQR1\_7 961 .....  
cTvQR1\_2 961 .....  
cTvQR1\_6 960 .....  
Consensus 959 .....