Supplementary information for

Characterization and application of the sugar transporter Zmo0293 from *Zymomonas mobilis*

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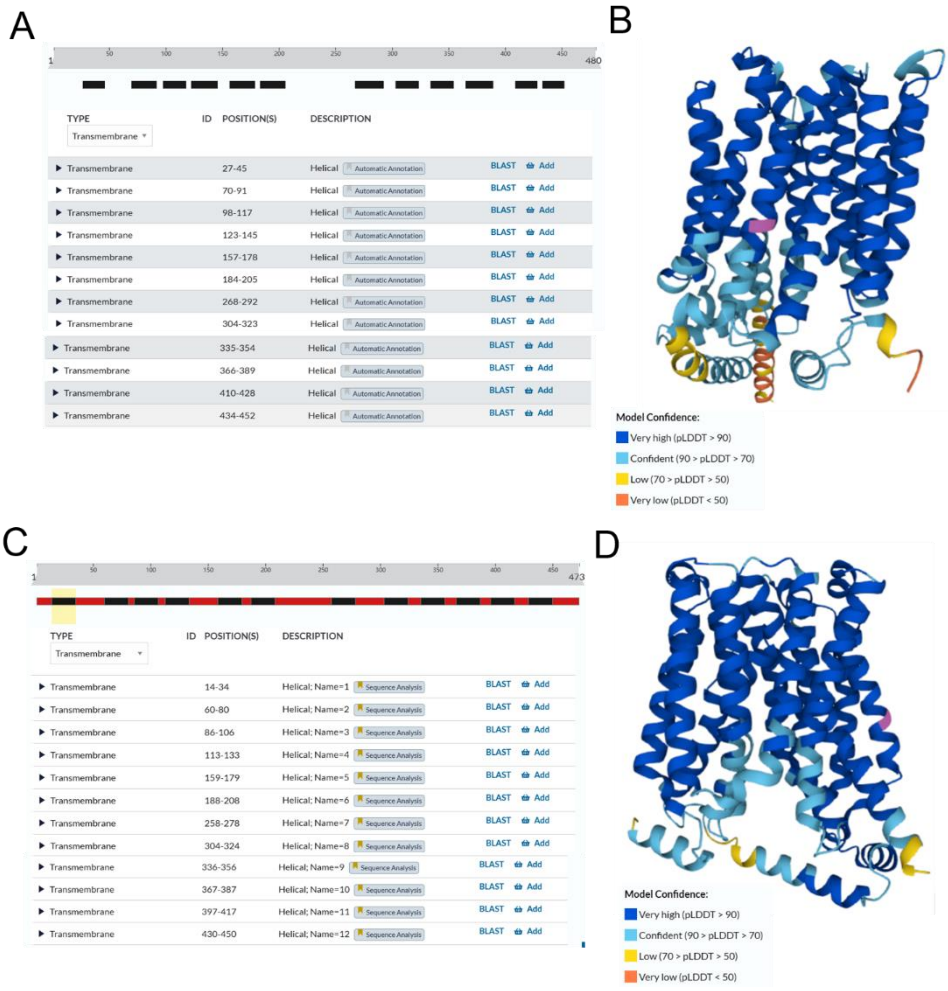
Supplementary Figure S1. Comparison of structure prediction of Zmo0293 and Glf. Structure prediction was performed using AlphaFold. A. The predicted transmembrane region of Zmo0293; B. The predicted 3D structure of Zmo0293; C. The predicted transmembrane region of Glf; D. The predicted 3D structure of Glf.

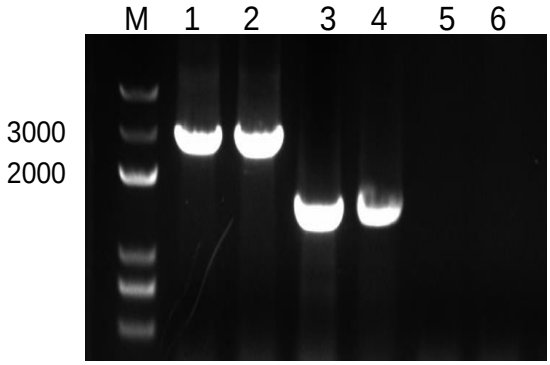


AlphaFold website: https://www.alphafold.ebi.ac.uk/

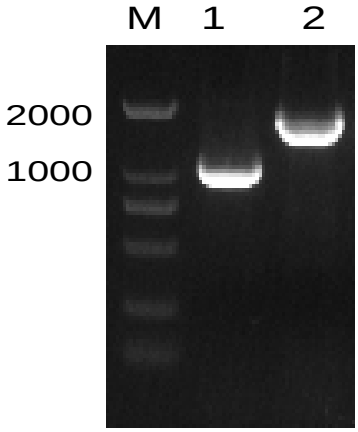
Supplementary Figure S2. PCR verification of deletion of *ZMO0293* gene in ZM4.

Lanes 1 and 2 represent wild -type ZM4; Lanes 3 and 4 represent ZM4-Δ*ZMO0293* mutant;

Lanes 5 and 6 represent *ZMO0293* fragment in ZM4-Δ*ZMO0293* mutant.



Supplementary Figure S3. PCR verification of overexpression of *ZMO0293* gene in ZM4. Lane 1 represents wild -type ZM4; Lane 2 represents ZM4-Δ*ZMO0293*/pZM3*pdc*- *ZMO0293*. Complement strain was constructed in ZM4-Δ*ZMO0293* with plasmid expression of *ZMO0293*.



Supplementary Table S1. Primer used in this study

Primers	**Sequences (5'- 3')**
Genome modification for knockout of *ptsG* gene in *E. coli*:	
ptsGsg-F	CGACATTCCGCGTTATATGGGTTTTAGAGCTAGAAATAGC
ptsGsg-R	CCATATAACGCGGAATGTCGACTAGTATTATACCTAGGAC
ptsGUP-F	GGTAGGCGAACGTGACAACG
ptsGUP-R	AATTGAGAGTGCTCCTGAGTATGG
ptsGDN-F	AAGCACCCATACTCAGGAGCACTCTCAATTTCCGTAAGACGTTGGGGAGAC
ptsGDN-R	CGCAGGACGATACCACACATATG
ptsG-TF	AGTCGACTCACACTGCCATCTC
ptsG-TR	CGGTTGGAACAGTGGCAAACG
Genome modification for integrating the *ZMO0293* gene in the neutral site:	
ycgH-betA-sg-F	CATCATGAATACTGGATATGGTTTTAGAGCTAGAAATAGC
ycgH-betA-sg-R	CATATCCAGTATTCATGATGACTAGTATTATACCTAGGAC
ykgH-UP-F	AATCCCAGAGCCAGGCAAAT
ykgH-UP-R	ACCCGAACATTCCTGATACAG
betA-DN-F	CCTGCGTTAGTTCACATCACG
betA-DN-R	ACGGCCAACAAAGAAGTGCT
gapAP1-F	ATAGTCTGTATCAGGAATGTTCGGGTGAGGCGAGTCAGTCGCGTAATG
gapAP1-R	CCTCCTTTCCACCAGCTATTTGTTAGTGAATAAAAG
ZMOO293-F1	AATAACAATTCAGAAATAGAAAATGATACCC
ZMOO293-R1	GCGAAAAAACCCCGCCGAAGCGGGGTTTTTTGCGTTAGGCGGAGGCTTTTTTACTC
ZMOO293-F2	CACTAACAAATAGCTGGTGGAAAGGAGGAATAACAATTCAGAAATAGAAAATGATACCC
ZMOO293-R2	AAATGAGTCGTGATGTGAACTAACGCAGGGCGAAAAAACCCCGCCGAAG

Genome modification by knockout of *ZMO0293* gene in ZM4:

ZMO0293sg-F	GGCATTGAAATGATGATCTATTATACCCCGACGTTCACTGCCG CACAGGCAGCTTAGAAAGGATCCTCGAACGCGCCGAAT
ZMO0293sg-R	ATTCGGCGCGTTCGAGGATCCTTTCTAAGCTGCCTGTGCGGCA GTGAACGTCGGGGTATAATAGATCATCATTTCAATGCC
mini-F	GGATCCTCGAACGCGCCGAATAAGTAATTCAGGTTTTTTTATA
mini-R	AATAGATCATCATTTCAATGCCTTTCTAAGCTGCCTGTGCGGC AGTGAACGGTACCAGA
ZMO0293UP-F	TACCGGCTATATCAAGCTGCAAGTGTCGACCGAATAGCCCCTG CATAGCG
ZMO0293UP-R	ACCGGATTTTATAAAAAATAGATTATGCTGAACTAGAAATTTAT CCCTTTTTTTAGCG
ZMO0293DN-F	TTCAGCATAATCTATTTTTTATAAAATCCG
ZMO0293DN-R	CAGTGTGACCTGCAGCGGCCGCTACTAGTAATCATCCGTTTGT TCCGGTT
pMini-F	TACTAGTAGCGGCCGCTGCAG
pMini-R	GTCGACACTTGCAGCTTGAT
ZMO0293-DF	TAAAGACCTGTTGCGGGAGG
ZMO0293-DR	TAGCGAGTCAGTGAGCGAGG
ZMO0293-TF	CCGCCCAAGGCATTGTACTG
ZMO0293-TR	AGCTTTCTACACGAGCTCTT
pdcZMO0293-F	ACATAGTGTTTTGAATATATGGAGTAAGCAATGAATAACAATTC AGAAATAGAAAATGATACC
pdcZMO0293-R	ATCGCCATGTAAGCCCACTGCAAGCTACCTTTAGGCGGAGGC TTTTTTACTC
pdcZMO0366-F	ACATAGTGTTTTGAATATATGGAGTAAGCAATGAGTTCTGAAA GTAGTCAGGGTCTAGTC
pdcZMO0366-R	ATCGCCATGTAAGCCCACTGCAAGCTACCTCTACTTCTGGGAG CGCCACATCTCC

pZM3pdc-F	AGGTAGCTTGCAGTGGGCTT
pZM3pdc-R	TGCTTACTCCATATATTCAAAACACTATGTCTG
pZM3pdc-TF	GTTACGCTCATGATCGCGGC
pZM3pdc-TR	ATCAGATCTTGATCCCCTGCG

Supplementary Table S2. The plasmid sequence used in this study.

Name	sequence
pMini	CGTTCACTGCCGCACAGGCAGCTTAGAAAGGCATTGAAATGATGATCTATTATACCCCGAC GTTCACTGCCGCACAGGCAGCTTAGAAAGGATCCTCGAACGCGCCGAATAAGTAATTCAG GTTTTTTTATAAAGACCTGTTGCGGGAGGTGGCCATGGGGGTCATCGTCAACCGCTTAACC TGAAAAGGGTGATAAAATGGCAAAAAAAATTACCGGCTATATCAAGCTGCAAGTGTCGAC TACTAGTAGCGGCCGCTGCAGGTCACACTGGCTCACCTTCGGGTGGGCCTTTCTGCGTTTA TATACTAGAGAGAGAATATAAAAAGCCAGATTATTAATCCGGCTTTTTTATTATTTGCGCTA GCGGAGTGTATACTGGCTTACTATGTTGGCACTGATGAGGGTGTCAGTGAAGTGCTTCATG TGGCAGGAGAAAAAAGGCTGCACCGGTGCGTCAGCAGAATATGTGATACAGGATATATTC CGCTTCCTCGCTCACTGACTCGCTACGCTCGGTCGTTCGACTGCGGCGAGCGGAAATGGC TTACGAACGGGGCGGAGATTTCCTGGAAGATGCCAGGAAGATACTTAACAGGGAAGTGA GAGGGCCGCGGCAAAGCCGTTTTTCCATAGGCTCCGCCCCCCTGACAAGCATCACGAAAT CTGACGCTCAAATCAGTGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCC CCCTGGCGGCTCCCTCGTGCGCTCTCCTGTTCCTGCCTTTCGGTTTACCGGTGTCATTCCG CTGTTATGGCCGCGTTTGTCTCATTCCACGCCTGACACTCAGTTCCGGGTAGGCAGTTCGC TCCAAGCTGGACTGTATGCACGAACCCCCCGTTCAGTCCGACCGCTGCGCCTTATCCGGT AACTATCGTCTTGAGTCCAACCCGGAAAGACATGCAAAAGCACCACTGGCAGCAGCCAC TGGTAATTGATTTAGAGGAGTTAGTCTTGAAGTCATGCGCCGGTTAAGGCTAAACTGAAA GGACAAGTTTTGGTGACTGCGCTCCTCCAAGCCAGTTACCTCGGTTCAAAGAGTTGGTAG CTCAGAGAACCTTCGAAAAACCGCCCTGCAAGGCGGTTTTTTCGTTTTCAGAGCAAGAGA TTACGCGCAGACCAAAACGATCTCAAGAAGATCATCTTATTAATCAGATAAAATATTTCTTG ATTTCAGTGCAATTTATCTCTTCAAATGTAGCACCTGAAGTCAGCCCCATACGATATAAGTT GTAAATTCTCATGTTTGACAGCTTATCATCGATGGAGCACAGGATGACGCCTAACAATTCA TTCAAGCCGACACCGCTTCGCGGCGCGGCTTAATTCAGGAGTTAAACATCATGAGGGAAG CGGTGATCGCCGAAGTATCGACTCAACTATCAGAGGTAGTTGGCGTCATCGAGCGCCATCT CGAACCGACGTTGCTGGCCGTACATTTGTACGGCTCCGCAGTGGATGGCGGCCTGAAGCC ACACAGTGATATTGATTTGCTGGTTACGGTGACTGTAAGGCTTGATGAAACAACGCGGCG AGCTTTGATCAACGACCTTTTGGAAACTTCGGCTTCCCCTGGAGAGAGCGAGATTCTCCG CGCTGTAGAAGTCACCATTGTTGTGCACGACGACATCATTCCGTGGCGTTATCCAGCTAAG CGCGAACTGCAATTTGGAGAATGGCAGCGCAATGACATTCTTGCAGGTATCTTCGAGCCA GCCACGATCGACATTGATCTGGCTATCTTGCTGACAAAAGCAAGAGAACATAGCGTTGCC TTGGTAGGTCCAGCGGCGGAGGAACTCTTTGATCCGGTTCCTGAACAGGATCTATTTGAG GCGCTAAATGAAACCTTAACGCTATGGAACTCGCCGCCCGACTGGGCTGGCGATGAGCGA AATGTAGTGCTTACGTTGTCCCGCATTTGGTACAGCGCAGTAACCGGCAAAATCGCGCCG AAGGATGTCGCTGCCGACTGGGCAATGGAGCGCCTGCCGGCCCAGTATCAGCCCGTCATA CTTGAAGCTAGGCAGGCTTATCTTGGACAAGAAGATCGCTTGGCCTCGCGCGCAGATCAG TTGGAAGAATTTGTTCACTACGTGAAAGGCGAGATCACCAAGGTAGTCGGCAAATAATGT CTAACAATTCGTTCAAGCCGACGCCGCTTCGCGGCGCGGCTTAACTCAAGCGTTAGAGAG CTGGGGAAGACTATGCGCGATCTGTTGAAGGTGGTTCTAAGCCTCGTACTTGCGATGGCAT CGGGGCAGGCACTTGCTGACCTGCCAAGCAATTCCGTAGTGAGTACTGAATTTATTCTGAT TCGTCTTGCTTTTGGAGCGTCTTTTTGCGTTCTATAACTGTTGTGAAAGCTACGCGGTCGC

	CATTGAAAACGAAATTAGGATTAATAAAATACCATCCTTGGCGAACATGCTTTGCAATGAT TTTAGCTTTTTCTAATTCGGCTAGACCTCTTGCAAAGGTAGCTTGAGATAGTGCCAGTTTTT TTTCTTGTGCGTTAAGAAAGTCCTCTAAAACGAATTTGTCTAAAGGGACGAGGTCTTTGCT GATGCCTTTGTCTTGAAGTATCCAAACCAGAACGCTGAAAGCTTTTATTCCAGCGGCTCCT AGTTCAAAAGTTAGCGCGATATTGGTGCTAAATAATTTTACAAATTCTTCACTATCAACACG TCTGTAAGTCGTCACATGAGTGCCTTGCATCTCACCAGTGGCTTGATTGACCAGAATGTTA TCATCTCGTCCTAATCGAGATAACTGAACCCTCTGACTTTTAACTGGCACAACCATACCTT CGATGAAAGGATTCTCGTCATATCTGATTGGCTGCTTTCTCAATTTTGTCGCCATATTTGATA AACCTTTAATCAAAAAAACCACATTTTTTGATTATACCTATTCATCGAATGAGGCAAGGTCT ATCAATTTTACCCCTTTTTTTGATAGACGGTTTAATCAATATTGATAGACCCCTTCACAGATT CTGAAAATCGACTTCCCTATTTTAGGGATATTTTCACGATTCCCTTTCTTAGTTCTTCCTAGT GGGGAAATTCGTTGAATCCTGCCTCGGAAAAACCATGAGAAAGCTGTTGGTTATATACAC GGGCAAAGCCACCCTATTTTTAGCTACTGGGGAAAGAGATAAGGCAGGTCACCAGCTCAC CGTCTGAATTCGCGGCCGCTTCTAGAATTTACGATTGCTCGTCCTAAATAAATAAGAGTCTT AAATATTTGTTTTAAAAATGTAATTTCAAAAATTCTCGTGATAAATTTATATGCCATAAATAT AGAAAATGCAGATTTTATTTAGTATTTATAAAATATTTTAAATGTACAACAGTCTACATTCTA ATAATAAAATTAGCCATTGTAGATACAGAAGATTTTCTGGTAC
p Z M 3*p* *dc*	AGGTAGCTTGCAGTGGGCTTACATGGCGATAGCTAGACTGGGCGGTTTTATGGACAGCAA GCGAACCGGAATTGCCAGCTGGGGCGCCCTCTGGTAAGGTTGGGAAGCCCTGCAAAGTA AACTGGATGGCTTTCTTGCCGCCAAGGATCTGATGGCGCAGGGGATCAAGATCTGATCAA GAGACAGGATGAGGATCGTTTCGCATGATTGAACAAGATGGATTGCACGCAGGTTCTCCG GCCGCTTGGGTGGAGAGGCTATTCGGCTATGACTGGGCACAACAGACAATCGGCTGCTCT GATGCCGCCGTGTTCCGGCTGTCAGCGCAGGGGCGCCCGGTTCTTTTTGTCAAGACCGAC CTGTCCGGTGCCCTGAATGAACTGCAGGACGAGGCAGCGCGGCTATCGTGGCTGGCCAC GACGGGCGTTCCTTGCGCAGCTGTGCTCGACGTTGTCACTGAAGCGGGAAGGGACTGGC TGCTATTGGGCGAAGTGCCGGGGCAGGATCTCCTGTCATCTCACCTTGCTCCTGCCGAGA AAGTATCCATCATGGCTGATGCAATGCGGCGGCTGCATACGCTTGATCCGGCTACCTGCCC ATTCGACCACCAAGCGAAACATCGCATCGAGCGAGCACGTACTCGGATGGAAGCCGGTCT TGTCGATCAGGATGATCTGGACGAAGAGCATCAGGGGCTCGCGCCAGCCGAACTGTTCGC CAGGCTCAAGGCGCGCATGCCCGACGGCGAGGATCTCGTCGTGACCCATGGCGATGCCTG CTTGCCGAATATCATGGTGGAAAATGGCCGCTTTTCTGGATTCATCGACTGTGGCCGGCTG GGTGTGGCGGACCGCTATCAGGACATAGCGTTGGCTACCCGTGATATTGCTGAAGAGCTT GGCGGCGAATGGGCTGACCGCTTCCTCGTGCTTTACGGTATCGCCGCTCCCGATTCGCAG CGCATCGCCTTCTATCGCCTTCTTGACGAGTTCTTCTGAGCGGGACTCTGGGGTTCGAAAT GACCGACCAAGCGACGCCCAACCTGCCATCACGAGATTTCGATTCCACCGCCGCCTTCTA TGAAAGGTTGGGCTTCGGAATCGAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGAC CAAAATCCCTTAACGTGAGTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAA AGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCA CCGCTACCAGCGGTGGTTTGTTTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTA ACTGGCTTCAGCAGAGCGCAGATACCAAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCC ACCACTTCAAGAACTCTGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGT GGCTGCTGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACC GGATAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGC GAACGACCTACACCGAACTGAGATACCTACAGCGTGAGCATTGAGAAAGCGCCACGCTT

	CCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGC GCACGAGGGAGCTTCCAGGGGGAAACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCC ACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAA ACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTT CTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATA CCGCTCGCCGCAGCCGAACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGA GCGCCCAATACGCAAACCGCCTCTCCCCGCGCGTTGGCCGATTCATTAATGCAGCTGGCA CGACAGGTTTCCCGGAAAGGTCATCCTGAAAATTCTATTCGTATTCTGATCAACCAGATCG TGAATGATCGGGCGATGAGCCGGAAGCTTGTCCCGTGATCAGAACCGGCGCAGCCTCTTC CCTTTTATCTATTTCAAATTCAGGCCTGCCACAGCGGAGAATCTTCGCTGTGGCTTTTTTGC GTCCAAGACCGGAGCCCGCACAATGACCGCCTCTTCCTCTTCAGCGCCCCTCTCGGATGC CTCTGTCTTTTCTTTAGAGCCTGTCTCTGCGTCTTTTGAACAAACGACGCCCGTAACCAGT CCTTTTATCGACAGGCTAGGCCGTTTCAAGCGTGGCACTTATCGAACCATGTTGGTTGAAA CGGGTATGCCATATGACAGCGCAAAGATTATGGCAGATCAGGCCGCAGAACAACATAAAA GAGAGCGCACATTCTCTAAATTAATGCCCTTGGCCAATGGCGCTCATCCCGAAATTTCGGC CTCAAATACCAATATTGAGGCTACAGCCTCTGCATCAGATTTCGACGAAATCGAATATTTTG ACCAGATGGTATCAAACGGCGTTGATCCTAGAGATGCCGCAGATATTGCTCGCAAAACAG CTATTGCGAGACGTCGAGACCCTCTCGAACGAGCCATTCGCTATAAAACCCGCCGTCAAA CTCCTGATCCTGTGCATCGGGATTCTTATGAGGTGGGCGAACGCGAGAAGTCGGTCTGGA AGCCGGTCAATCCGCAAGAGATTGGTGCCTATCTGGAAGCGGTTGATCAATATTCGATCAA AACCAAGGGCTTAAGCGATAAGGCCGTTCGTCTTCTAAAGATGCTGTTTCGGATGGTCGA CTTTAAAACTGGCCGTCTGGAGCCGACCCTCGACACAATATGCGATCGTGTCGGTTATGCC CGTGCGACGGTCGTCAAATTACTGCGGCAATTACAGGATTTAGGCTTCATCCGCTGGATAC GCCGGTCAATCAAGATCAAGGCGGACGGCAAAGGCCCCCGCCGCAAGCAGACCAGTAAC GCCTACGGCTTCTTGTCTCCCAAGGCTTGGCCAGATTTGGCCAGACAGGTTTTCGAGCGT GTGATGCGCCGGAGGCATGCGCCTATTCCTGACGATATCGACCACGCCCAAGAGGCGGAC AAAGCCGAAACCAAGGCTATCGTTGAAAGCTTGCCGCCCGAAGATTTCGTCAAAGCAATA TCGGGCGATAAAGAGCCAACAGAGTTAACAGATTCGTTAATACAGCTCGCCAAATCTATC GAGCGGGCGGAACAACGGGAACAAGAAGAACAGGCTAAGAAGGCAGCACAGGCCGGT CAGGAAGAGGTTAAAACATCTTCCCAAACACCTAAGGAGGATACCTCAAAAAAGCCCCC AATCTCGGGCAATCAACGCGAGTTCAATTCTTATACTCTATCCTGTTATACTTATTTATCTAA TAGCGACCATACAAAACTAAAAACCAAAGAAGAAGATAAAGACTGCACTGCTCCTGCTA CCGCAGGCAGTGCAGACCCTATTTATGATCGAAAACCTGACAGCAATCCTTTCCTCTCAAC TCTCAAAGCTCGCGGTTATCGTCCTGATCAAATCAACGCTTGCCTCGAAAACAGAGATAA ACGGAAAAAGAAAGGATGGATGCCTCTGTCACCCGATGAAACCGCCCGCCTCCTTATTCA AACAAAACAGATGTGCCCATAACAACGACCACTATCCTTCTCAAAGCATATCGTCCGTTAA TCTCTCGGCGCTGCTCGCTTCGCTCACAGGCTCGGCGAGAAAGAAATTTGCCTTTCGGGG GACTATCTAATTCCTAACAATTCGCATTATCGATAATGTAATAAAAGGCTAATCTTTAAAAA CCAAATTACAGCGATTACATCATTTCTATGAATGTGTATTATACATAATATGAGAAGTCGTGA TTTGATCAAAGAAGTTAAAAAAGCCAATATTACCAGCTTGACAGATATAAAATAGGCCTTG GTTGATTTCGTGAAAGAACTGGAAGATTGCACAATTCTTCTTTCTGGTGATATCTTTGACC CGACGGCCCTCAGTCAATGAGTGTGCGCCGCATTTCTGCCCATTCAATCAGGGCCTGCATT GAAGGGCCGAGAGCGTATCCCATACCGCTGAGCTCGTATTCTACCTTTGGCGGGACCTGC GGATAGACCGTTCGGAGCACGATGCGATCCTTTTCCAGTTGCTTGAGCTGCTGGATCAGCA

	TCTTCTGGTTGATGCCGTCGATCTGCTTTTCCAGTGAGGAGAAGCGGATTGGGCCTTTTGC GGCAAACAACTGGCAGATGATAACAATCTTCCATTTTCCTTCGAGTACCCTGAGCGCTTCT GTCGTCGCCTCAGTTACGCTCATGATCGCGGCATGTTCTGATATTTTTCCTCTAAAAAAGAT AAAAAGTCTTTTCGCTTCGGCAGAAGAGGTTCATCATGAACAAAAATTCGGCATTTTTAA AAATGCCTATAGCTAAATCCGGAACGACACTTTAGAGGTTTCTGGGTCATCCTGATTCAGA CATAGTGTTTTGAATATATGGAGTAAGCAATGAGCAAAGGAGAAGAACTTTTCACTGGAG TTGTCCCAATTCTTGTTGAATTAGATGGTGATGTTAATGGGCACAAATTTTCTGTCAGTGG AGAGGGTGAAGGTGATGCTACATACGGAAAACTCACCCTTAAATTTATTTGCACTACTGGA AAACTACCTGTTCCATGGCCAACACTTGTCACTACTCTGACCTATGGTGTTCAATGCTTTT CCCGTTATCCGGATCACATGAAACGGCATGACTTTTTCAAGAGTGCCATGCCCGAAGGTTA TGTACAGGAACGCACTATATCTTTCAAAGATGACGGGAACTACAAGACGCGTGCTGAAGT CAAGTTTGAAGGTGATACCCTTGTTAATCGTATCGAGTTAAAGGGTATTGATTTTAAAGAA GATGGAAACATTCTCGGACACAAACTAGAGTACAACTATAACTCACACAATGTATACATCA CGGCAGACAAACAAAAGAATGGAATCAAAGCTAACTTCAAAATTCGCCACAACATTGAA GATGGTTCCGTTCAACTAGCAGACCATTATCAACAAAATACTCCAATTGGCGATGGCCCTG TCCTTTTACCAGACAACCATTACCTGTCGACACAATCTGCCCTTTCGAAAGATCCCAACGA AAAGCGTGACCACATGGTCCTTCTTGAGTTTGTAACTGCTGCTGGGATTACACATGGCATG GATGAGCTCTACAAA

Supplementary Table S3. Primer sequence for qPCR of the main genes involved in ED pathway

Primers	**Sequences (5'- 3')**
16sRNA-F	TCACCGCCATTGTAGCAC
16sRNA-R	AGTTGGGCACTTTAGAGGAAC
ZMO0293-F	AAGCATTCAGACCGCCATA
ZMO0293-R	TGCGGGTGGTATTCAGGTTA
ZMO0366-F	GGTTGGTGATGAAGGGACGT
ZMO0366-R	TTTGTAAAGCCGAACCACCG
ZMOO152-F	CAGACCAAACCAAGACGACG
ZMO0152-R	CTGAAAACGCCAGCAAAACC
ZMO0177-F	ATGACCTGGGTAGCGTTGAA
ZMO0177-R	TCACGATATCAACGCCAAGC
ZMO0178-F	ATTTTGGCTCACTTCGGTCG
ZMO0178-R	TGATGAAGTGAACCGGACGA
ZMO0367-F	TGGTTTCCGTGATTTTGCAGA
ZMO0367-R	AGGTCAGCTAATTTTCCGAATTG
ZMO0368-F	CCGTCCAAACCTGTCCTGTA
ZMO0368-R	GCGAGCAAATACTTTCATCTGC
ZMO0369-F	CGACTTTTAAAACGGCAGAACA
ZMO0369-R	CGTATCGATGTCCAGCTTTTCA
ZMO0487-F	AGACAAAGAGCAAGCCAGAG
ZMO0487-R	AAGAAGTCAAAGCAGCACCG
ZMOO569-F	GACCCCTATAATGCGGCTGA
ZMO0569-R	CCAGTCCAGAAAATTATGCGC
ZMO0997-F	TGGTGGTCTGAACGTTCTTG
ZMO0997-R	GTCAGACCCGGGCTAACGAA
ZMO01236-F	CGATACCGTCAAGCACCAAG
ZMO1236-R	CGGTGGTGACAGCTGTTGCC

ZMO1237-F	GCAAAGACGCTCCCGATATG
ZMO1237-R	GAATCGGCAAATTTCACGCG
ZMO1240-F	CTTGCCAGCCTTCAGTTCAG
ZMO1240-R	CAAGTTCGATCTGTCTGGCG
ZMO1360-F	TCTTGATGTTGTTGTACGGACC
ZM01360-R	TCAGGAAGTCGCTCAGATGG
ZMO1478-F	GACAAGCTAAGGGTTACGCG
ZMO1478-R	TTCCCAGGTCCCAATTTCGA
ZMO1496-F	CGGGGTATTGTTGACAGCAC
ZMO1496-R	TCAGGATCAAGGGCATCTCC
ZMO1570-R	CGATTTGAAAGGCCCCGTTG
ZMO1570-F	GCCCCTGCCCCGAAATAACC
ZMO1596-F	AATCCGGTGTTGTGAAGCAG
ZMO1596-R	CACCGAGGGAGATGACGAAG
ZMO1608-F	GGCTACCGGTCTTGATCTGA
ZMO1608-R	GCTGCTCGTGAAGTTTAACCA
ZMO1719-F	CCACAACCCCTGAAGAAACG
ZMO1719-R	GTTTCGGGGTGTTGGTGATA
ZMO1722-F	AAGCAGAGCCTTTCCAAACG
ZMO1722-R	CTTGGAAGCCTGTCATCGTG
ZMO1754-F	ACCGCATAAATCTGGGCAAT
ZMO1754-R	CGGTTCAAAATGGCGCAAAG
ZMO1955-F	CCTTTATTCTGTGCTGCTGGT
ZMO1955-R	ACGCCTATATTTTCCCGGGT
ZMO1963-F	GCGGTAAACATAGAAGTCGGG
ZM01963-R	CTCGCGCCTTGGAAGAAATC