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Supplementary Data

Stress-inducible expression of a *Cleistogenes songorica ALDH* gene enhanced drought tolerance in transgenic *Arabidopsis thaliana*

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Supplementary material

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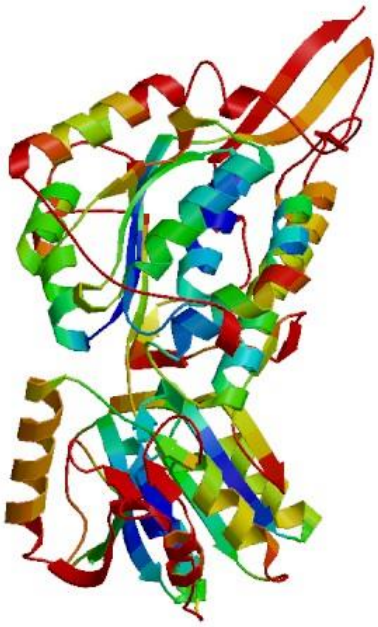
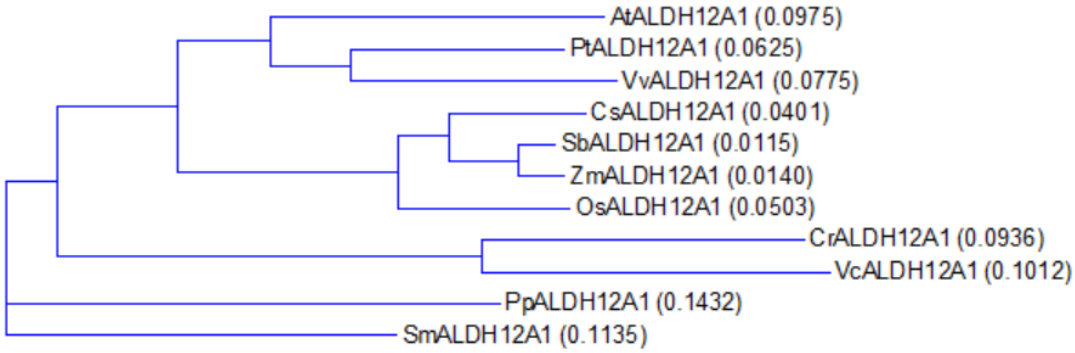
                                                                  M  S  R  L  L
1     GAGCGAGACC GAGTGCGGAG GCTGGAGACT GCAAACCCAA CTAACAGGCA AGTGCATAAT CGCAGCCGCA GCCACTTCCT CTCCGATGAG CCGCCTCCTC
       S  R  R  H  L  A  T  A  A  I  R  R  Y  A  P  L  A  F  G  S  R  W  L  H  T  P  S  F  A  T  V  S  P  Q·
101   TCGCGGCGGC ACCTCGCCAC CGCCGCCATC CGGCGATACG CTCCCCTCGC CTTCGGTTCC AGGTGGCTTC ACACGCCTTC ATTTGCAACG GTGTCTCCGC
      ·  E  I  S  G  S  N  P  A  E  V  Q  N  F  V  Q  G  K  W  T  S  S  T  N  W  S  W  I  V  D  P  L  N  G·
201   AGGAAATTTC AGGCTCCAAC CCCGCGGAAG TTCAGAATTT TGTGCAGGGG AAGTGGACAT CATCTACTAA CTGGAGTTGG ATAGTTGATC CATTAAATGG
      ·E  K  F  I  K  I  A  E  V  Q  G  T  E  I  K  P  F  V  D  S  L  A  S  C  P  K  H  G  L  H  N  P  L
301   TGAAAAATTC ATCAAAATTG CTGAGGTTCA GGGAACAGAA ATAAAGCCAT TTGTGGACAG TTTAGCTAGT TGCCCAAAGC ATGGACTTCA CAACCCACTT
       K  A  P  E  R  Y  L  M  Y  G  D  I  S  A  K  A  A  H  M  L  G  Q  P  A  V  S  D  F  L  A  K  L  I  Q·
401   AAAGCTCCGG AGAGGTATCT CATGTATGGA GATATATCTG CAAAAGCTGC ACATATGCTT GGTCAACCTG CGGTTTCAGA TTTCTTAGCT AAACTTATCC
      ·  R  V  S  P  K  S  Y  Q  Q  A  L  A  E  V  Q  V  S  Q  K  F  L  E  N  F  C  G  D  Q  V  R  F  L  A·
501   AGAGGGTATC CCCAAAGAGT TATCAACAAG CTCTTGCAGA AGTTCAAGTT TCTCAAAAGT TCTTAGAAAA TTTTTGTGGA GATCAGGTAC GCTTTCTGGC
      ·R  S  F  A  V  P  G  N  H  L  G  Q  M  S  N  G  Y  R  W  P  Y  G  P  V  A  I  I  T  P  F  N  F  P
601   TCGGTCATTT GCTGTACCTG GCAACCATCT TGGACAAATG AGTAATGGCT ACCGTTGGCC ATATGGTCCG GTTGCAATAA TCACACCATT CAATTTCCCA
       L  E  I  P  L  L  Q  V  M  G  A  L  Y  M  G  N  K  P  V  L  K  V  D  S  K  V  S  I  V  M  D  Q  M  L·
701   TTAGAGATTC CGTTGCTGCA AGTAATGGGA GCACTATACA TGGGAAATAA ACCAGTTTTG AAAGTTGACA GCAAGGTTAG CATTGTGATG GATCAGATGC
      ·  R  L  L  H  T  C  G  L  P  A  E  D  M  D  F  I  N  S  D  G  V  T  M  N  K  L  L  L  E  A  N  P  K·
801   TAAGATTGCT TCATACTTGT GGATTGCCAG CAGAGGATAT GGATTTCATA AATTCTGATG GTGTCACAAT GAACAAGCTG CTGTTAGAGG CTAATCCAAA
      ·M  T  L  F  T  G  S  S  R  V  A  E  K  L  A  A  D  L  K  G  R  I  K  L  E  D  A  G  F  D  W  K  I
901   AATGACCCTT TTCACTGGGA GCTCACGGGT AGCAGAGAAA TTGGCTGCTG ATTTGAAAGG TCGAATCAAG TTGGAAGATG CTGGTTTTGA TTGGAAAATT
       L  G  P  D  V  Q  E  V  D  Y  I  A  W  V  C  D  Q  D  A  Y  A  C  S  G  Q  K  C  S  A  Q  S  V  L  F·
1001  CTTGGTCCAG ATGTTCAAGA GGTTGATTAT ATAGCATGGG TTTGCGATCA GGATGCTTAT GCTTGCAGTG GTCAGAAGTG CTCTGCCCAG TCTGTTCTGT
      ·  I  H  K  N  W  S  S  S  G  L  L  E  K  M  K  K  L  S  E  R  R  K  L  E  D  L  T  I  G  P  V  L  T·
1101  TCATCCACAA GAATTGGTCA TCTAGCGGGC TTCTTGAGAA AATGAAGAAA CTTTCTGAAA GAAGGAAGCT CGAAGATTTG ACAATTGGCC CGGTCCTTAC
      ·V  T  T  E  A  M  M  E  H  M  N  N  L  L  K  I  P  G  S  K  V  L  F  G  G  E  P  L  G  N  H  S  I
1201  TGTTACTACA GAAGCTATGA TGGAGCACAT GAACAACCTC CTCAAAATAC CAGGATCCAA GGTTCTGTTT GGTGGTGAAC CTTTGGGGAA TCACTCTATT
       P  K  V  Y  G  A  M  K  P  T  A  V  F  V  P  L  E  E  I  L  K  S  G  N  F  E  L  V  M  K  E  I  F  G·
1301  CCAAAAGTAT ATGGTGCTAT GAAGCCAACT GCTGTATTTG TTCCTCTAGA GGAAATCCTT AAAAGCGGGA ACTTTGAGCT TGTGATGAAG GAGATATTTG
      ·  P  F  R  V  V  T  E  Y  S  E  D  Q  L  E  L  V  L  E  A  C  E  R  M  N  A  H  L  T  A  A  V  V  S·
1401  GTCCATTCCG GGTGGTGACT GAATACTCTG AAGATCAGCT TGAATTGGTA TTGGAAGCCT GTGAAAGGAT GAATGCCCAT CTGACAGCTG CCGTAGTTTC
      ·N  N  P  L  F  L  Q  E  V  L  G  R  S  V  N  G  T  T  Y  A  G  I  R  A  R  T  T  G  A  P  Q  N  H
1501  AAACAACCCG CTATTCCTGC AGGAAGTACT TGGGAGATCG GTCAACGGTA CAACGTATGC TGGGATTCGA GCAAGGACCA CCGGCGCTCC GCAGAACCAC
       W  F  G  P  A  G  D  P  R  G  A  G  I  G  T  P  E  A  I  K  L  V  W  S  C  H  R  E  I  I  Y  D  I  G·
1601  TGGTTTGGGC CAGCCGGTGA CCCGAGAGGT GCAGGCATCG GAACTCCAGA AGCCATCAAA CTTGTCTGGT CTTGCCACAG AGAGATCATA TATGACATCG
      ·  P  V  P  K  N  W  A  L  P  S  A  T
1701  GTCCCGTGCC CAAGAACTGG GCGCTTCCTT CCGCGACTTA ATTTGTGGTG GCGCCAAGAA TAAAAGGGGA AGAGAGGGCT GACAGGGCCG GAGTAGTCAG
1801  GAACTGAGAG CGTGCAGGAA TAATTTGCCC GTGTATGCAT TTTTTGTACC CTCCAGAAAC ATTGATAAAC GCCAGATATG GTTATTGTAG CCTGTAAAAT
1901  GTAGTGTTGT TTTTGCACAC TCGATATTGG AAATTCGAGG TTGGTTCAAT AAAGGTAGAA GCTCATGTTT GAGTGGTTTG CCGTTAAAAA AAAAAAAAAA
2001  AAAAAAAAAA AAAAAA
```

Supplementary Fig 1. The full nucleotide and deduced amino acid sequences of *CsALDH12A1* cDNA (GenBank accession No. FJ972824).



Supplementary Fig 2. The 3D structure prediction of CsALDH12A1 using SWISS-MODEL soft. It include alpha-helix (red), beta-strand (yellow arrow), random-coils (blue curve).



Supplementary Fig 3. Phylogenetic analyses of ALDH12A1 family members. Phylogram created using ALDH12A1 protein sequences and Vector NIT suite alignment software. Tree edited using Treeview software. The numbers in the parenthesis is root length, indicating root growth and the degree of ramification.