Nucleotide sequence of a full length cDNA clone of light harvesting chlorophyll a/b binding protein gene from green dark-grown pine (*Pinus tunbergii*) seedling

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Light has been shown to induce the expression of gene encoding light harvesting chlorophylll a/b binding protein(LHCP)(1). Dark-grown seedling of coniferous plant is green. We have constructed cDNA library and cloned full length cDNA (pPDLHC2176) for LHCP from dark-grown pine (Pinus thunbergii) seedlings in pUC8, which was identified by cross-hbridization with duckweed genomic clones(2) and complete sequencing. The cDNA included 801 bp of the open reading frame, and 49 and 128 nucleotides of 5'- and 3'-untranslated sequences, respectively. From the putative cleavage site(arrow head), the transit and mature polypeptides have been estimated to be composed of 37 and 229 amino acids, respectively. This result also shows the expression of the gene in the dark-grown pine seedling.

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        -49 CGCATTACCTGACTTTGGTCTGAGCATTTTTCTCGTCGTCACGTTCACC
  1 ATGGCAACAGCTTCAGCCATCCAAAGCTCAAGCTTGGCAGGCCAGACCCTCCTAAGGCCG
    M  A  T  A  S  A  I  Q  S  S  S  L  A  G  Q  T  L  L  R  P
 61 CAGCAGAATGAGCTCGTCAAGAAAGTGGGCACGGCGCAGGCTCGAATCACC▼ATGCGAAGA
    Q  Q  N  E  L  V  K  K  V  G  T  A  Q  A  R  I  T   M  R  R
121 ACCGTAAGGAGCGCCCCCGAGAGCATTTGGTATGGACCTGACCGCCCCAAGTACCTAGGC
    T  V  R  S  A  P  E  S  I  W  Y  G  P  D  R  P  K  Y  L  G
181 CCCTTCTCGGAAGGGACGCCGTCATATCTCACCGGAGAATTTCCCGGCGACTACGGGTGG
    P  F  S  E  G  T  P  S  Y  L  T  G  E  F  P  G  D  Y  G  W
241 GACACTGCCGCCGTCTCGGCGGATCCAGAGACCTTCGCAAAAAACAGAGAGCTGGAGGTG
    D  T  A  A  V  S  A  D  P  E  T  F  A  K  N  R  E  L  E  V
301 ATCCACTGCAGATGGGCCATGTTGGGAGCGCTCGGCTGCGTTTTCCCGGAGCTGTTGGCC
    I  H  C  R  W  A  M  L  G  A  L  G  C  V  F  P  E  L  L  A
361 AAAAATGGGTTGAAATTTGGGGAAGCTGTGTGGTTCAAGGCCGGGGGCGCAGATATTCTCA
    K  N  G  L  K  F  G  E  A  V  W  F  K  A  G  A  Q  I  F  S
421 GAGGGAGGCCTTGACTACGCTGGGAACCCCAACCTGATCCACGCGCAGAGCATTCTAGCC
    E  G  G  L  D  Y  A  G  N  P  N  L  I  H  A  Q  S  I  L  A
481 ATCTGGGCCTGCCAGGTTGTTCTCATGGGATTGATTGAAGGATACAGAGTGGGAGGAGGG
    I  W  A  C  Q  V  V  L  M  G  L  I  E  G  Y  R  V  G  G  G
541 ACCCTTGGAGAGGGGTTGGACCCTCTGTTACCAGGGGGTGCCTTCGACCCACTGGGGCTG
    T  L  G  E  G  L  D  P  L  L  P  G  G  A  F  D  P  L  G  L
601 GCCGACGACCCCGAGGCCTGCGCGGAGCTGAAGGTGAAAGAGATTAAGAACGGTCGGCTG
    A  D  D  P  E  A  C  A  E  L  K  V  K  E  I  K  N  G  R  L
661 GCCATGTTCTCCATGTTCGGTTTCTTCGTTCAGGCAATCGTGACCGGGAAGGGCCCCATT
    A  M  F  S  M  F  G  F  F  V  Q  A  I  V  T  G  K  G  P  I
721 GAAAATCTCTACGACCACTTGGCGGACCCCGTTGCCAACAATGCCTGGGCCTACGCCACC
    E  N  L  Y  D  H  L  A  D  P  V  A  N  N  A  W  A  Y  A  T
781 AATTTCGTTCCTGGCAAGTGAAGGTGACGGAAAATAAAAGAGGCCTGTGATCTGTGCATC
    N  F  V  P  G  K  -
841 AATCATTTGACAGCCTTAGTGTTAATAAAATATGTTCTTTCAGCTGGATGTATTTGTTGG
901 TGATCTTCGTTAATAAAATATTTTCTTTC
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