

(A)

Nipponbare 100  
Kasalath 100

Nipponbare 200  
Kasalath 200

Nipponbare 300  
Kasalath 300

Nipponbare 400  
Kasalath 400

Nipponbare 500  
Kasalath 500

Nipponbare 600  
Kasalath 600

Nipponbare 700  
Kasalath 700

Nipponbare 800  
Kasalath 800

Nipponbare 900  
Kasalath 900

Nipponbare 1000  
Kasalath 1000

Nipponbare 1100  
Kasalath 1100

Nipponbare 1200  
Kasalath 1200

Nipponbare 1300  
Kasalath 1300

Nipponbare 1400  
Kasalath 1400

Nipponbare 1500  
Kasalath 1497

Nipponbare 1600  
Kasalath 1597

Nipponbare 1700  
Kasalath 1697

Nipponbare 1800  
Kasalath 1797

Nipponbare 1900  
Kasalath 1897

Nipponbare 2000  
Kasalath 1997

Nipponbare 2100  
Kasalath 2097

Nipponbare 2200  
Kasalath 2197

Nipponbare 2226  
Kasalath 2223

(B)

Nipponbare 100  
Kasalath 100

Nipponbare 200  
Kasalath 200

Nipponbare 300  
Kasalath 300

Nipponbare 400  
Kasalath 400

Nipponbare 500  
Kasalath 474

Nipponbare 558  
Kasalath 474

(C)

Nipponbare 100  
Kasalath 100

Nipponbare 157  
Kasalath 157

(D)

Nipponbare ATGGAGGAGAAGAAGCTGTCTTCCATCCCTCCAAAGGCCGGCCAGGCCGGCTCCCGCCCGCCGCCACCGCCGCGCCGCGCCGATCCG 100  
 Kasalath ATGGAGGAGAAGAAGCTGTCTTCCATCCCTCCAAAGGCCGGCCAGGCCGGCTCCCGCCCGCCGCCACCGCCGCGCCGCGCCGATCCG 100

Nipponbare ACGACGGCGAGTACTCCGCGCGCCCCCGCCCGCAGTTCGTCAACGAGTTCGACCCCAACCAACCCCTAGCCACCGGGGCGCGCGCTCCGTCATCCG 200  
 Kasalath ACGACGGCGAGTACTCCGCGCGCCCCCGCCCGCAGTTCGTCAACGAGTTCGACCCCAACCAACCCCTAGCCACCGGGGCGCGCGCTCCGTCATCCG 200

Nipponbare GCGCTCCAGAACTCCGGCCACTTCCTCAACCACCGCTCCCGCAAGCCCTCCTCGTCCCCACC CGGAGGAGGAGGCGCCCTCCCGCTCCGCGCC 300  
 Kasalath GCGCTCCAGAACTCCGGCCACTTCCTCAACCACCGCTCCCGCAAGCCCTCCTCGTCCCCACC CGGAGGAGGAGGCGCCCTCCCGCTCCGCGCC 300

Nipponbare GCGGCCCTCCTTCGTGCTCGACAGTCCACCGCCCGCAACCCCTCCTCCACATCGCCTATGGCTCACCGTTCGCAACCGCGCGGAGTTGG 400  
 Kasalath GCGGCCCTCCTTCGTGCTCGACAGTCCACCGCCCGCAACCCCTCCTCCACATCGCCTATGGCTCACCGTTCGCAACCGCGCGGAGTTGG 400

Nipponbare AGAAGCGCGGAGCCGGAAGACGCCCGCCCTCCTCCTGCAAGTGGTCCCGCCAGCGCGACCTTATGCTCGGAGGTACAAGGAGGACATGCCAG 500  
 Kasalath AGAAGCGCGGAGCCGGAAGACGCCCGCCCTCCTCCTGCAAGTGGTCCCGCCAGCGCGACCTTATGCTCGGAGGTACAAGGAGGACATGCCAG 500

Nipponbare TCTCCCGATCACCGCGGCTAGATGAGTTCGCGATGTCCCGCTCGAGGGATTTGGTGTGCGCTGCTTGTGGATACGGCTGGTGGAGGTAAGGT 600  
 Kasalath TCTCCCGATCACCGCGGCTAGATGAGTTCGCGATGTCCCGCTCGAGGGATTTGGTGTGCGCTGCTTGTGGATACGGCTGGTGGAGGTAAGGT 600

Nipponbare ATTGGCAGGAACAATAAGGGGATACCAAGGTTGTTGAATATGACCGCGCTCCCGGTACACAAGGTTAGGCTACAATCCCTCTGAGGCCACCTAAGA 700  
 Kasalath ATTGGCAGGAACAATAAGGGGATACCAAGGTTGTTGAATATGACCGCGCTCCCGGTACACAAGGTTAGGCTACAATCCCTCTGAGGCCACCTAAGA 700

Nipponbare AGACTCGCGCTGGCGAATGGTTGTTGGTGGGAACAGGAGACCCAGAATGGAAATGCGAAGAAGAGAGACCGTGACAGTAGAGGTAGAACAAGGATAG 800  
 Kasalath AGACTCGCGCTGGCGAATGGTTGTTGGTGGGAACAGGAGACCCAGAATGGAAATGCGAAGAAGAGAGACCGTGACAGTAGAGGTAGAACAAGGATAG 800

Nipponbare AGACTCAAGCTCCCGCCAGAGAGATCGGTGAGCGGAGGCGAGAGAGAGGTTCCAAAGAAAGGATAGAAATTCCTCGACATACTAAACAAGTTAAGATT 900  
 Kasalath AGACTCAAGCTCCCGCCAGAGAGATCGGTGAGCGGAGGCGAGAGAGAGGTTCCAAAGAAAGGATAGAAATTCCTCGACATACTAAACAAGTTAAGATT 900

Nipponbare GGTGGTGGTGGAGTGACAAGATCGGTGGTTACACAGCGATATCAAGTTAGGGTGGTTAGTGAGAGGTTGAGCAAGAGCTGACTTGAAGAAGGGGA 1000  
 Kasalath GGTGGTGGTGGAGTGACAAGATCGGTGGTTACACAGCGATATCAAGTTAGGGTGGTTAGTGAGAGGTTGAGCAAGAGCTGACTTGAAGAAGGGGA 1000

Nipponbare GAGTTCGATGTTGTGGGACCTACAACATGTGACATAAATATGGATGATCAGTCTGAGCTGGTGAAGGGTATAGCAGGATATGCTCGAAACAGTCCCT 1100  
 Kasalath GAGTTCGATGTTGTGGGACCTACAACATGTGACATAAATATGGATGATCAGTCTGAGCTGGTGAAGGGTATAGCAGGATATGCTCGAAACAGTCCCT 1100

Nipponbare GCCACGGATCAATGGGCTGGTCTTTTGTCTTCTGGGGAGCACAAGGATATATGGGCACTTGTGAGAAAGATTTCAGAGGAGGAGACCGGAGTGGT 1200  
 Kasalath GCCACGGATCAATGGGCTGGTCTTTTGTCTTCTGGGGAGCACAAGGATATATGGGCACTTGTGAGAAAGATTTCAGAGGAGGAGACCGGAGTGGT 1200

Nipponbare GAGCTGTCCAATACAAGGACATGATACGAGTGAATAACGACAGATCGCAGAATATATTGGAGACCCAGAGTCTCTTGAAGTACTAG 1287  
 Kasalath GAGCTGTCCAATACAAGGACATGATACGAGTGAATAACGACAGATCGCAGAATATATTGGAGACCCAGAGTCTCTTGAAGTACTAG 1287

(E)

Nipponbare ATGGAGGAGAAGAAGCTGTCTTCCATCCCTCCAAAGGCCGGCCAGGCCGGCTCCCGCCCGCCGCCACCGCCGCGCCGCGCCGATCCG 100  
 Kasalath ATGGAGGAGAAGAAGCTGTCTTCCATCCCTCCAAAGGCCGGCCAGGCCGGCTCCCGCCCGCCGCCACCGCCGCGCCGCGCCGATCCG 100

Nipponbare ACGACGGCGAGTACTCCGCGCGCCCCCGCCCGCAGTTCGTCAACGAGTTCGACCCCAACCAACCCCTAGCCACCGGGGCGCGCGCTCCGTCATCCG 200  
 Kasalath ACGACGGCGAGTACTCCGCGCGCCCCCGCCCGCAGTTCGTCAACGAGTTCGACCCCAACCAACCCCTAGCCACCGGGGCGCGCGCTCCGTCATCCG 200

Nipponbare GCGCTCCAGAACTCCGGCCACTTCCTCAACCACCGCTCCCGCAAGCCCTCCTCGTCCCCACC CGGAGGAGGAGGCGCCCTCCCGCTCCGCGCC 300  
 Kasalath GCGCTCCAGAACTCCGGCCACTTCCTCAACCACCGCTCCCGCAAGCCCTCCTCGTCCCCACC CGGAGGAGGAGGCGCCCTCCCGCTCCGCGCC 300

Nipponbare GCGGCCCTCCTTCGTGCTCGACAGTCCACCGCCCGCAACCCCTCCTCCACATCGCCTATGGCTCACCGTTCGCAACCGCGCGGAGTTGG 400  
 Kasalath GCGGCCCTCCTTCGTGCTCGACAGTCCACCGCCCGCAACCCCTCCTCCACATCGCCTATGGCTCACCGTTCGCAACCGCGCGGAGTTGG 400

Nipponbare AGAAGCGCGGAGCCGGAAGACGCCCGCCCTCCTCCTGCAAGTGGTCCCGCCAGCGCGACCTTATGCTCGGAGGTACAAGGAGGACATGCCAG 500  
 Kasalath AGAAGCGCGGAGCCGGAAGACGCCCGCCCTCCTCCTGCAAGTGGTCCCGCCAGCGCGACCTTATGCTCGGAGGTACAAGGAGGACATGCCAG 500

Nipponbare TCTCCCGATCACCGCGGCTAGATGAGTTCGCGATGTCCCGCTCGAGGGATTTGGTGTGCGCTGCTTGTGGATACGGCTGGTGGAGGTAAGGT 600  
 Kasalath TCTCCCGATCACCGCGGCTAGATGAGTTCGCGATGTCCCGCTCGAGGGATTTGGTGTGCGCTGCTTGTGGATACGGCTGGTGGAGGTAAGGT 600

Nipponbare ATTGGCAGGAACAATAAGGGGATACCAAGGTTGTTGAATATGACCGCGCTCCCGGTACACAAGGTTAGGCTACAATCCCTCTGAGGCCACCTAAGA 700  
 Kasalath ATTGGCAGGAACAATAAGGGGATACCAAGGTTGTTGAATATGACCGCGCTCCCGGTACACAAGGTTAGGCTACAATCCCTCTGAGGCCACCTAAGA 700

Nipponbare AGACTCGCGCTGGCGAATGGTTGTTGGTGGGAACAGGAGACCCAGAATGGAAATGCGAAGAAGAGAGACCGTGACAGTAGAGGTAGAACAAGGATAG 800  
 Kasalath AGACTCGCGCTGGCGAATGGTTGTTGGTGGGAACAGGAGACCCAGAATGGAAATGCGAAGAAGAGAGACCGTGACAGTAGAGGTAGAACAAGGATAG 800

Nipponbare AGACTCAAGCTCCCGCCAGAGAGATCGGTGAGCGGAGGCGAGAGAGAGGTTCCAAAGAAAGGATAGAAATTCCTCGACATACTAAACAAGTTAAGATT 900  
 Kasalath AGACTCAAGCTCCCGCCAGAGAGATCGGTGAGCGGAGGCGAGAGAGAGGTTCCAAAGAAAGGATAGAAATTCCTCGACATACTAAACAAGTTAAGATT 900

Nipponbare GGTGGTGGTGGAGTGACAAGATCGGTGGTTACACAGCGATATCAAGTTAGGGTGGTTAGTGAGAGGTTGAGCAAGAGCTGACTTGAAGAAGGGGA 1000  
 Kasalath GGTGGTGGTGGAGTGACAAGATCGGTGGTTACACAGCGATATCAAGTTAGGGTGGTTAGTGAGAGGTTGAGCAAGAGCTGACTTGAAGAAGGGGA 1000

Nipponbare GAGTTCGATGTTGTGGGACCTACAACATGTGACATAAATATGGATGATCAGTCTGAGCTGGTGAAGGGTATAGCAGGATATGCTCGAAACAGTCCCT 1100  
 Kasalath GAGTTCGATGTTGTGGGACCTACAACATGTGACATAAATATGGATGATCAGTCTGAGCTGGTGAAGGGTATAGCAGGATATGCTCGAAACAGTCCCT 1100

Nipponbare GCCACGGATCAATGGGCTGGTCTTTTGTCTTCTGGGGAGCACAAGGATATATGGGCACTTGTGAGAAAGATTTCAGAGGAGGAGACCGGAGTGGT 1200  
 Kasalath GCCACGGATCAATGGGCTGGTCTTTTGTCTTCTGGGGAGCACAAGGATATATGGGCACTTGTGAGAAAGATTTCAGAGGAGGAGACCGGAGTGGT 1200

Nipponbare GAGCTGTCCAATACAAGGACATGATACGAGTGAATAACGACAGATCGCAGAATATATTGGAGACCCAGAGTCTCTTGAAGTACTAG 1287  
 Kasalath GAGCTGTCCAATACAAGGACATGATACGAGTGAATAACGACAGATCGCAGAATATATTGGAGACCCAGAGTCTCTTGAAGTACTAG 1287

(F)

Nipponbare MEEKLSFSPKARPPASRPAATAAAAAASDDGEYSARAPAPQVTFDPDQTLATGAAPSVIAPLNSGHFLNHRSRKPSLPT EEEPAALASAA 100  
 Kasalath MEEKLSFSPKARPPASRPAATAAAAAASDDGEYSARAPAPQVTFDPDQTLATGAAPSVIAPLNSGHFLNHRSRKPSLPT EEEPAALASAA 100

Nipponbare GSPFVLDNSTAPDNPSHHIAYGLTVRNAAAELEKAAEPEKTPPPPPAAGAPSGDMLLRYYKEDMASLPDRHGLDFRDPVVEFGAALLAGYGSSEK 200  
 Kasalath GSPFVLDNSTAPDNPSHHIAYGLTVRNAAAELEKAAEPEKTPPPPPAAGAPSGDMLLRYYKEDMASLPDRHGLDFRDPVVEFGAALLAGYGSSEK 200

Nipponbare IGRNNGDKVVEYDRRAGTQGLGYNPSEADPKKTRAGEWVVGNGKETQNGNAKRRDRSRGRTEDRDRSSSRQKRSERRAREVQEKDRNSRHTKQVKI 300  
 Kasalath IGRNNGDKVVEYDRRAGTQGLGYNPSEADPKKTRAGEWVVGNGKETQNGNAKRRDRSRGRTEDRDRSSSRQKRSERRAREVQEKDRNSRHTKQVKI 300

Nipponbare GGGGDKMRWLHSDIKVRVVSERLSKLLYLKGRVLDVVGPTTCDIIMDDQSELVQGVQDMLETVLPRLMGLVLLLAGHKLGLCHLVEKNSEETGVV 400  
 Kasalath GGGGDKMRWLHSDIKVRVVSERLSKLLYLKGRVLDVVGPTTCDIIMDDQSELVQGVQDMLETVLPRLMGLVLLLAGHKLGLCHLVEKNSEETGVV 400

Nipponbare ELSNTKDMIRVRYDQIAEYIGDPESLEY 428  
 Kasalath ELSNTKDMIRVRYDQIAEYIGDPESLEY 428



(I)

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Nipponbare MSSYDQMLAPLLGAGRSAWTAHDGGGGGGEAVVRQILKCTRWQLEETDFVTCPHYHYCDSSYPGDYHAAVGVLVAAFAAYCFLSTLAFTVLDLARSGGG 100
Kasalath MSSYDQMLAPLLGAGRSAWTAHDGGGGGGEAVVRQILKCTRWQLEETDFVTCPHYHYCDSSYPGDYHAAVGVLVAAFAAYCFLSTLAFTVLDLARSGGG 100

Nipponbare GGGAGGVIRGIRRKYLLPSGPFLLPLVLLVLAQRINAVFPLAQLGPALLLLLQASALAFRNEADGDIRYAVLEASTVSGVLHASLYLDAVVLPPYTGLE 200
Kasalath GGGAGGVIRGIRRKYLLPSGPFLLPLVLLVLAQRINAVFPLAQLGPALLLLLQASALAFRNEADGDIRYAVLEASTVSGVLHASLYLDAVVLPPYTGLE 200

Nipponbare ALRWSQFSGECATCLCRMEPLVVGGA VRYRGLSKTALAIIFALCSRMCRIYGEERLSAWTRSALEAAGWVFVAADAVYLVGWVAIEGGAVAVLAYSIV 300
Kasalath ALRWSQFSGECATCLCRMEPLVVGGA VRYRGLSKTALAIIFALCSRMCRIYGEERLSAWTRSALEAAGWVFVAADAVYLVGWVAIEGGAVAVLAYSIV 300

Nipponbare AGLVFLSVFGKVYRFLAWLETROSQWKSSLCHSAV 335
Kasalath AGLVFLSVFGKVYRFLAWLETROSQWKSSLCHSAV 335
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**S4 Fig. Alignment of the sequences of three candidate gene in Nipponbare and Kasalath (A)-(C) Gene sequence, coding sequence and deduced amino acid sequence of *LOC\_Os03g14850*, respectively. (D)-(F) Gene sequence, coding sequence and deduced amino acid sequence of *LOC\_Os03g14860*, respectively. (G)-(I) Gene sequence, coding sequence and deduced amino acid sequence of *LOC\_Os03g14880*, respectively.**