

GEPHE SUMMARY

Hd6a (https://www.gephebase.org/search-criteria/?and+Gene Gephebase=^Hd6a^#gephebase-summary-title)	Gephebase Gene	GP00000442	GephelD
Published	Entry Status	Martin	Main curator

PHENOTYPIC CHANGE

	Trait Category		
Physiology (https://www.gephebase.org/search-criteria/?and+Trait Category=^Physiology^#gephebase-summary-title)	Trait		
Flowering time (https://www.gephebase.org/search-criteria/?and+Trait=^Flowering time^#gephebase-summary-title)	Trait State in Taxon A		
Oryza sativa - var. indica Kasalath	Trait State in Taxon B		
Oryza sativa - var. japonica Nipponbare	Ancestral State		
Data not curated	Taxonomic Status		
Domesticated (https://www.gephebase.org/search-criteria/?and+Taxonomic Status=^Domesticated^#gephebase-summary-title)			
Taxon A		Taxon B	
Oryza sativa (https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Oryza sativa^#gephebase-summary-title)	Latin Name	Oryza sativa (https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Oryza sativa^#gephebase-summary-title)	Latin Name
rice	Common Name	rice	Common Name
rice; red rice; Oryza sativa L.	Synonyms	rice; red rice; Oryza sativa L.	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzeae; Oryzinae; Oryza	Lineage	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzeae; Oryzinae; Oryza	Lineage
Oryza () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4527)	Parent	Oryza () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4527)	Parent
4530 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4530)	NCBI Taxonomy ID	4530 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4530)	NCBI Taxonomy ID
Yes	is Taxon A an Infraspecies?	Yes	is Taxon B an Infraspecies?
Oryza sativa - var. indica Kasalath	Taxon A Description	Oryza sativa - var. japonica Nipponbare	Taxon B Description

GENOTYPIC CHANGE

HD6	Generic Gene Name	UniProtKB Oryza sativa subsp. indica
CKA2	Synonyms	GenebankID or UniProtKB
-	String	0
	Sequence Similarities	
Belongs to the protein kinase superfamily. Ser/Thr protein kinase family. CK2 subfamily. GO - Molecular Function GO:0005524 : ATP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005524) GO:0004674 : protein serine/threonine kinase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004674)		
	GO - Biological Process GO:0009908 : flower development (https://www.ebi.ac.uk/QuickGO/term/GO:0009908) GO:0010229 : inflorescence development (https://www.ebi.ac.uk/QuickGO/term/GO:0010229)	

GO:0009648 : photoperiodism (<https://www.ebi.ac.uk/QuickGO/term/GO:0009648>)
GO - Cellular Component

GO:0005737 : cytoplasm (<https://www.ebi.ac.uk/QuickGO/term/GO:0005737>)

Presumptive Null

Yes (<https://www.gephebase.org/search-criteria?/and+Presumptive+Null=%Yes%#gephebase-summary-title>)

Molecular Type

Coding (<https://www.gephebase.org/search-criteria?/and+Molecular+Type=%Coding%#gephebase-summary-title>)

Aberration Type

SNP (<https://www.gephebase.org/search-criteria?/and+Aberration+Type=%SNP%#gephebase-summary-title>)

SNP Coding Change

Nonsense

Molecular Details of the Mutation

K91*; AAG>TAG

Experimental Evidence

Linkage Mapping (<https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=%Linkage+Mapping%#gephebase-summary-title>)

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	-	-	-

Hd6, a rice quantitative trait locus involved in photoperiod sensitivity, encodes the alpha subunit of protein kinase CK2. (2001) (<https://pubmed.ncbi.nlm.nih.gov/11416158>)

Main Reference

Takahashi Y; Shomura A; Sasaki T; Yano M

Authors

Hd6 is a quantitative trait locus involved in rice photoperiod sensitivity. It was detected in backcross progeny derived from a cross between the japonica variety Nipponbare and the indica variety Kasalath. To isolate a gene at Hd6, we used a large segregating population for the high-resolution and fine-scale mapping of Hd6 and constructed genomic clone contigs around the Hd6 region. Linkage analysis with P1-derived artificial chromosome clone-derived DNA markers delimited Hd6 to a 26.4-kb genomic region. We identified a gene encoding the alpha subunit of protein kinase CK2 (CK2 alpha) in this region. The Nipponbare allele of CK2 alpha contains a premature stop codon, and the resulting truncated product is undoubtedly nonfunctional. Genetic complementation analysis revealed that the Kasalath allele of CK2 alpha increases days-to-heading. Map-based cloning with advanced backcross progeny enabled us to identify a gene underlying a quantitative trait locus even though it exhibited a relatively small effect on the phenotype.

Abstract

Additional References

RELATED GEPHE

9 (DTH2, EARLY FLOWERING 3/Hd17, Hd1, PRR37 pseudoreceptor protein 37, se5, Early flowering1 (EL1), HEADING DATE 1, Ehd1 (Response regulator), Ghd7) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=%4530%/and+Trait=Flowering+time/and+groupHaplotypes=true#gephebase-summary-title>)

Related Genes

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS