

GEPHE SUMMARY

	Gephebase Gene		GepheID
Hd1 (https://www.gephebase.org/search-criteria?/and+GeneGephebase=~Hd1~#gephebase-summary-title)		GP00000439	
	Entry Status	Martin	Main curator
Published			

PHENOTYPIC CHANGE

	Trait Category		
Physiology (https://www.gephebase.org/search-criteria?/and+TraitCategory=~Physiology~#gephebase-summary-title)		Trait	
Flowering time (https://www.gephebase.org/search-criteria?/and+Trait=~Floweringtime~#gephebase-summary-title)			
	Trait State in Taxon A		
Oryza glaberrima; Oryza sativa Nipponbare and Kasalath		Trait State in Taxon B	
Oryza sativa - Taichung 65			
	Ancestral State		
Taxon A		Taxonomic Status	
Domesticated (https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=~Domesticated~#gephebase-summary-title)			
Taxon A		Taxon B	
	Latin Name		Latin Name
Oryza glaberrima (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Oryzaglaberrima~#gephebase-summary-title)		Oryza sativa (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Oryzasativa~#gephebase-summary-title)	
	Common Name		Common Name
African rice		rice	
	Synonyms		Synonyms
African rice; Oryza glaberrima Steud.		rice; red rice; Oryza sativa L.	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzeae; Oryzinae; Oryza		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzeae; Oryzinae; Oryza	
	Parent		Parent
Oryza () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4527)		Oryza () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4527)	
	NCBI Taxonomy ID		NCBI Taxonomy ID
4538 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4538)		4530 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4530)	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
Yes		Yes	
	Taxon A Description		Taxon B Description
Oryza glaberrima; Oryza sativa Nipponbare and Kasalath		Oryza sativa - Taichung 65	

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Oryza sativa subsp. japonica
HD1		Q9FDX8 (http://www.uniprot.org/uniprot/Q9FDX8)	
	Synonyms		GenebankID or UniProtKB
HD1; SE1; OsHd1; Os06g0275000; LOC_Os06g16370; P0038C05.23; P0676F10.34		BAB17628 (https://www.ncbi.nlm.nih.gov/nuccore/BAB17628)	
	String		
39947.LOC_Os06g16370.1 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=39947.LOC_Os06g16370.1)			
	Sequence Similarities		
Belongs to the CONSTANS family.			
	GO - Molecular Function		
GO:0003700 : DNA-binding transcription factor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003700)			
GO:0008270 : zinc ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0008270)			
GO:0003677 : DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003677)			
	GO - Biological Process		

GO:0030154 : cell differentiation (<https://www.ebi.ac.uk/QuickGO/term/GO:0030154>)
GO:0045892 : negative regulation of transcription, DNA-templated (<https://www.ebi.ac.uk/QuickGO/term/GO:0045892>)
GO:0009908 : flower development (<https://www.ebi.ac.uk/QuickGO/term/GO:0009908>)
GO:0009909 : regulation of flower development (<https://www.ebi.ac.uk/QuickGO/term/GO:0009909>)
GO:0048579 : negative regulation of long-day photoperiodism, flowering (<https://www.ebi.ac.uk/QuickGO/term/GO:0048579>)
GO:0048571 : long-day photoperiodism (<https://www.ebi.ac.uk/QuickGO/term/GO:0048571>)
GO:0048576 : positive regulation of short-day photoperiodism, flowering (<https://www.ebi.ac.uk/QuickGO/term/GO:0048576>)
GO:0048572 : short-day photoperiodism (<https://www.ebi.ac.uk/QuickGO/term/GO:0048572>)

GO - Cellular Component

GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)

Presumptive Null

Yes ([https://www.gephebase.org/search-criteria?/and+Presumptive Null=~Yes~#gephebase-summary-title](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](https://www.gephebase.org/search-criteria?/and+Molecular+Type=~Coding~#gephebase-summary-title))

Aberration Type

Insertion ([https://www.gephebase.org/search-criteria?/and+Aberration Type=~Insertion~#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration+Type=~Insertion~#gephebase-summary-title))

Insertion Size

1-10 kb

Molecular Details of the Mutation

Retro-element-like inserted in exon 2

Experimental Evidence

Candidate Gene ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Candidate Gene~#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=~Candidate+Gene~#gephebase-summary-title))

Main Reference

Ehd1, a B-type response regulator in rice, confers short-day promotion of flowering and controls FT-like gene expression independently of Hd1. (2004) (<https://pubmed.ncbi.nlm.nih.gov/15078816>)

Authors

Doi K; Izawa T; Fuse T; Yamanouchi U; Kubo T; Shimatani Z; Yano M; Yoshimura A

Abstract

Two evolutionarily distant plant species, rice (*Oryza sativa* L.), a short-day (SD) plant, and *Arabidopsis thaliana*, a long-day plant, share a conserved genetic network controlling photoperiodic flowering. The orthologous floral regulators-rice Heading date 1 (Hd1) and *Arabidopsis* CONSTANS (CO)-integrate circadian clock and external light signals into mRNA expression of the FLOWERING LOCUS T (FT) group floral inducer. Here, we report that the rice Early heading date 1 (Ehd1) gene, which confers SD promotion of flowering in the absence of a functional allele of Hd1, encodes a B-type response regulator that might not have an ortholog in the *Arabidopsis* genome. Ehd1 mRNA was induced by 1-wk SD treatment, and Ehd1 may promote flowering by inducing FT-like gene expression only under SD conditions. Microarray analysis further revealed a few MADS box genes downstream of Ehd1. Our results indicate that a novel two-component signaling cascade is integrated into the conserved pathway in the photoperiodic control of flowering in rice.

Additional References

RELATED GEPHE

Related Genes

1 (Ehd1 (Response regulator)) ([https://www.gephebase.org/search-criteria?/or+Taxon ID=~4538~/and+Trait=Flowering time/or+Taxon ID=~4530~/and+Trait=Flowering time/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon+ID=~4538~/and+Trait=Flowering+time/or+Taxon+ID=~4530~/and+Trait=Flowering+time/and+groupHaplotypes=true#gephebase-summary-title))

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS