GEPHE SUMMARY

Gephebase Gene
Ehd1 (Response regulator) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^Ehd1 (Response regulator)^#gephebase-summary-title)

GepheID
GP00000263

Entry Status
Published

Main curator
Martin

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 glaberrima

Trait State in Taxon B
Oryza sativa - Taichung 65

Ancestral State
Data not curated

Taxonomic Status
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Domesticated^#gephebase-summary-title)

Taxon A

Latin Name
Oryza glaberrima (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Oryza glaberrima^#gephebase-summary-title)

Common Name
African rice

Synonyms
African rice; Oryza glaberrima Steud.

Rank
species

Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzeae; Oryzinae; Oryza

Parent
Oryza () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4527)

NCBI Taxonomy ID
4538 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4538)

is Taxon A an Infraspecies?
No

Taxon B

Latin Name
Oryza sativa (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Oryza sativa^#gephebase-summary-title)

Common Name
rice

Synonyms
rice; red rice; Oryza sativa L.

Rank
species

Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzeae; Oryzinae; Oryza

Parent
Oryza () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4527)

NCBI Taxonomy ID
4530 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4530)

is Taxon B an Infraspecies?
Yes

Taxon B Description
Oryza sativa - Taichung 65

GENOTYPIC CHANGE

Generic Gene Name
EHD1

Synonyms
PAST; PAST1; H-PAST; HPAST1; CDABP0131

String
9606.ENSP00000320516 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=9606.ENSP00000320516)

Sequence Similarities
Belongs to the TRAFAC class dynamin-like GTPase superfamily. Dynamin/Fzo/YdjA family. EHD subfamily.

GO - Molecular Function
GO:0005524 : ATP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005524)
GO:0042802 : identical protein binding (https://www.ebi.ac.uk/QuickGO/term/GO:0042802)
GO:0005509 : calcium ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005509)

UniProtKB Homo sapiens
Q9H4M9 (http://www.uniprot.org/uniprot/Q9H4M9)

GenebankID or UniProtKB
AFK31246 (https://www.ncbi.nlm.nih.gov/nuccore/AFK31246)

GO:0045296 : cadherin binding (https://www.ebi.ac.uk/QuickGO/term/GO:0045296)
GO:0005525 : GTP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005525)
GO:0017137 : Rab GTPase binding (https://www.ebi.ac.uk/QuickGO/term/GO:0017137)

GO - Biological Process

GO:0042632 : cholesterol homeostasis
(https://www.ebi.ac.uk/QuickGO/term/GO:0042632)
GO:0006886 : intracellular protein transport
(https://www.ebi.ac.uk/QuickGO/term/GO:0006886)
GO:0007596 : blood coagulation (https://www.ebi.ac.uk/QuickGO/term/GO:0007596)
GO:1990090 : cellular response to nerve growth factor stimulus
(https://www.ebi.ac.uk/QuickGO/term/GO:1990090)
GO:0060271 : cilium assembly (https://www.ebi.ac.uk/QuickGO/term/GO:0060271)
GO:0032456 : endocytic recycling (https://www.ebi.ac.uk/QuickGO/term/GO:0032456)
GO:0006897 : endocytosis (https://www.ebi.ac.uk/QuickGO/term/GO:0006897)
GO:0034383 : low-density lipoprotein particle clearance
(https://www.ebi.ac.uk/QuickGO/term/GO:0034383)
GO:0031175 : neuron projection development
(https://www.ebi.ac.uk/QuickGO/term/GO:0031175)
GO:0010886 : positive regulation of cholesterol storage
(https://www.ebi.ac.uk/QuickGO/term/GO:0010886)
GO:2001137 : positive regulation of endocytic recycling
(https://www.ebi.ac.uk/QuickGO/term/GO:2001137)
GO:1901741 : positive regulation of myoblast fusion
(https://www.ebi.ac.uk/QuickGO/term/GO:1901741)
GO:0051260 : protein homooligomerization
(https://www.ebi.ac.uk/QuickGO/term/GO:0051260)
GO:0061512 : protein localization to cilium
(https://www.ebi.ac.uk/QuickGO/term/GO:0061512)

GO - Cellular Component

GO:0005886 : plasma membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0005886)
GO:0016020 : membrane (https://www.ebi.ac.uk/QuickGO/term/GO:0016020)
GO:0070062 : extracellular exosome (https://www.ebi.ac.uk/QuickGO/term/GO:0070062)
GO:0010008 : endosome membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0010008)
GO:0005811 : lipid droplet (https://www.ebi.ac.uk/QuickGO/term/GO:0005811)
GO:0020018 : ciliary pocket membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0020018)
GO:0031901 : early endosome membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0031901)
GO:0031095 : platelet dense tubular network membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0031095)
GO:0055038 : recycling endosome membrane
(https://www.ebi.ac.uk/QuickGO/term/GO:0055038)

Presumptive Null

No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^No^#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

Nonsynonymous

Molecular Details of the Mutation

G218R in highly conserved region in GARP domain

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	-	-	-

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 (Hd1) (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