

## GEPHE SUMMARY

**Gephebase Gene**  
Ehd1 (Response regulator)

**Entry Status**  
Published

**GepheID**  
GP00000263

**Main curator**  
Martin

## PHENOTYPIC CHANGE

**Trait Category**  
Physiology

**Trait**  
Flowering time

**Trait State in Taxon A**  
Oryza glaberrima

**Trait State in Taxon B**  
Oryza sativa - Taichung 65

**Ancestral State**  
Data not curated

**Taxonomic Status**  
Domesticated

### Taxon A

**Latin Name**  
*Oryza glaberrima*

**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; Oryzaceae; Oryzinae; Oryza

**Parent**  
Oryza () - (Rank: genus)

**NCBI Taxonomy ID**  
4538

**is Taxon A an Intraspecies?**  
No

### Taxon B

**Latin Name**  
*Oryza sativa*

**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; Oryzaceae; Oryzinae; Oryza

**Parent**  
Oryza () - (Rank: genus)

**NCBI Taxonomy ID**  
4530

**is Taxon B an Intraspecies?**  
Yes

**Taxon B Description**  
Oryza sativa - Taichung 65

## GENOTYPIC CHANGE

**Generic Gene Name**  
EHD1

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

**String**  
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  
GO:0042802 : identical protein binding  
GO:0005509 : calcium ion binding  
GO:0045296 : cadherin binding  
GO:0005525 : GTP binding  
GO:0017137 : Rab GTPase binding

**GO - Biological Process**

**UniProtKB Homo sapiens**  
Q9H4M9

**GenebankID or UniProtKB**  
AFK31246

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

#### GO - Cellular Component

GO:0005886 : plasma membrane  
GO:0016020 : membrane  
GO:0070062 : extracellular exosome  
GO:0010008 : endosome membrane  
GO:0005811 : lipid droplet  
GO:0020018 : ciliary pocket membrane  
GO:0031901 : early endosome membrane  
GO:0031095 : platelet dense tubular network membrane  
GO:0055038 : recycling endosome membrane

#### Presumptive Null

No

#### Molecular Type

Coding

#### Aberration Type

SNP

#### SNP Coding Change

Nonsynonymous

#### Molecular Details of the Mutation

G218R in highly conserved region in GARP domain

#### Experimental Evidence

Linkage Mapping

	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)

#### 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)

#### Related Haplotypes

No matches found.

## EXTERNAL LINKS

## COMMENTS