GEPHE SUMMARY

Gephebase Gene
se5 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^se5^#gephebase-summary-title)

GepheID
GP00001034

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 sativa

Trait State in Taxon B
Oryza sativa se5

Ancestral State
Taxon A

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

Taxon A

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 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 se5

GENOTYPIC CHANGE

Generic Gene Name
HO1

Synonyms
HO1; HY1; SE5; OsJ_21897; Os06g0603000; LOC_Os06g40080; P0486H12.31

String
39947.LOC_Os06g40080.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=39947.LOC_Os06g40080.1)

Sequence Similarities
Belongs to the heme oxygenase family.

GO - Molecular Function
GO:0046872 : metal ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0046872)
GO:0004392 : heme oxygenase (decyclizing) activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004392)

GO - Biological Process
GO:0048573 : photoperiodism, flowering

UniProtKB Oryza sativa subsp. japonica
Q69XJ4 (http://www.uniprot.org/uniprot/Q69XJ4)

GenebankID or UniProtKB
()

(https://www.ebi.ac.uk/QuickGO/term/GO:0048573)
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:0015979 : photosynthesis (https://www.ebi.ac.uk/QuickGO/term/GO:0015979)
GO:0006788 : heme oxidation (https://www.ebi.ac.uk/QuickGO/term/GO:0006788)

GO - Cellular Component

GO:0009507 : chloroplast (https://www.ebi.ac.uk/QuickGO/term/GO:0009507)

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

Deletion (https://www.gephebase.org/search-criteria?/and+Aberration Type=^Deletion^#gephebase-summary-title)

Deletion Size

1-9 bp

Molecular Details of the Mutation

1bp deletion in exon 1; causes a frameshift and a premature stop codon

Experimental Evidence

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

Main Reference

Phytochromes confer the photoperiodic control of flowering in rice (a short-day plant). (2000) (https://pubmed.ncbi.nlm.nih.gov/10849355)

Authors

Izawa T; Oikawa T; Tokutomi S; Okuno K; Shimamoto K

Abstract

The photoperiodic sensitivity 5 (se5) mutant of rice, a short-day plant, has a very early flowering phenotype and is completely deficient in photoperiodic response. We have cloned the SE5 gene by candidate cloning and demonstrated that it encodes a putative heme oxygenase. Lack of responses of coleoptile elongation by light pulses and photoreversible phytochromes in crude extracts of se5 indicate that SE5 may function in phytochrome chromophore biosynthesis. Ectopic expression of SE5 cDNA by the CaMV 35S promoter restored the photoperiodic response in the se5 mutant. Our results indicate that phytochromes confer the photoperiodic control of flowering in rice. Comparison of se5 with hy1, a counterpart mutant of Arabidopsis, suggests distinct roles of phytochromes in the photoperiodic control of flowering in these two species.

Additional References

RELATED GEPHE

Related Genes

9 (DTH2, EARLY FLOWERING 3/Hd17, Hd1, Hd6a, PRR37 pseudoresponse regulator protein 37, 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 Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS