GEPHE SUMMARY

Gephebase Gene
Ghd7 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^Ghd7^#gephebase-summary-title)

GepheID
GP00000393

Entry Status
Published

Main curator
Martin

PHENOTYPIC CHANGE

Trait #1

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

Trait #2

Trait Category
Morphology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Morphology^#gephebase-summary-title)

Trait
Inflorescence morphology (https://www.gephebase.org/search-criteria?/and+Trait=^Inflorescence morphology^#gephebase-summary-title)

Trait State in Taxon A
-

Trait State in Taxon B
-

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 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?
No

GENOTYPIC CHANGE

Generic Gene Name

GHD7

UniProtKB Oryza sativa subsp. japonica

E5RQA1 (http://www.uniprot.org/uniprot/E5RQA1)

Synonyms

Ghd7; Os07g0261200; LOC_Os07g15770; P0046D03.119

GenebankID or UniProtKB

AEG78663 (https://www.ncbi.nlm.nih.gov/nuccore/AEG78663)

String

39947.LOC_Os07g15770.1
(http://string-db.org/newstring_cgi/show_network_section.pl?identifier=
39947.LOC_Os07g15770.1)

Sequence Similarities

-

GO - Molecular Function

GO:0003677 : DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003677)

GO - Biological Process

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 - Cellular Component

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

Presumptive Null

Unknown (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^Unknown^#gephebase-summary-title)

Molecular Type

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

Aberration Type

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

Molecular Details of the Mutation

unknown

Experimental Evidence

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

Main Reference

Natural variation in Ghd7 is an important regulator of heading date and yield potential in rice. (2008) (https://pubmed.ncbi.nlm.nih.gov/18454147)

Authors

Xue W; Xing Y; Weng X; Zhao Y; Tang W; Wang L; Zhou H; Yu S; Xu C; Li X; Zhang Q

Abstract

Yield potential, plant height and heading date are three classes of traits that determine the productivity of many crop plants. Here we show that the quantitative trait locus (QTL) Ghd7, isolated from an elite rice hybrid and encoding a CCT domain protein, has major effects on an array of traits in rice, including number of grains per panicle, plant height and heading date. Enhanced expression of Ghd7 under long-day conditions delays heading and increases plant height and panicle size. Natural mutants with reduced function enable rice to be cultivated in temperate and cooler regions. Thus, Ghd7 has played crucial roles for increasing productivity and adaptability of rice globally.

Additional References

RELATED GEPHE

Related Genes

9 (DTH2, EARLY FLOWERING 3/Hd17, Hd1, Hd6a, PRR37 pseudoresponse regulator protein 37, se5, Early flowering1 (EL1), HEADING DATE 1, Ehd1 (Response regulator))
(https://www.gephebase.org/search-criteria?/or+Taxon ID=^4530^/and+Trait=Flowering time/or+Taxon ID=^4530^/and+Trait=Inflorescence morphology/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS