GEPHE SUMMARY

Gephebase Gene

DEP1 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^DEP1^#gephebase-summary-title)

Entry Status

Published

GepheID

GP00000218

Main curator

Martin

PHENOTYPIC CHANGE

Trait Category

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

Trait

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

Trait State in Taxon A

Oryza sativa L. ssp. Indica

Trait State in Taxon B

Oryza sativa L. ssp. Japonica

Ancestral State

Taxon A

Taxonomic Status

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

	Taxon A	Taxon B
Latin Name	Oryza sativa (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Oryza sativa^#gephebase-summary-title)	Oryza sativa (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Oryza sativa^#gephebase-summary-title)
Common Name	rice	rice
Synonyms	rice; red rice; Oryza sativa L.	rice; red rice; Oryza sativa L.
Rank	species	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	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)	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)	4530 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4530)
is Taxon A an Infraspecies? / is Taxon B an Infraspecies?	Yes	Yes
Taxon A Description / Taxon B Description	Oryza sativa L. ssp. Indica	Oryza sativa L. ssp. Japonica

GENOTYPIC CHANGE

Generic Gene Name

P0046G12.12-1

Synonyms

DN1; DEP1; pay1; Os09g0441900; OsJ_29530; OSNPB_090441900

String

39947.LOC_Os09g26999.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 39947.LOC_Os09g26999.1)

Sequence Similarities

-

GO - Molecular Function

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GO - Biological Process

GO:0007186 : G protein-coupled receptor signaling pathway (https://www.ebi.ac.uk/QuickGO/term/GO:0007186)

GO - Cellular Component

UniProtKB Oryza sativa subsp. japonica

Q67UU9 (http://www.uniprot.org/uniprot/Q67UU9)

GenebankID or UniProtKB

()

GO:0005882 : intermediate filament (https://www.ebi.ac.uk/QuickGO/term/GO:0005882)

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

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

Indel Size

100-999 bp

Molecular Details of the Mutation

replacement of a 637bp stretch of the middle of exon5 by a 12-bp sequence creating a premature stop codon and consequently a loss of 230 residues from the C-terminus

Experimental Evidence

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

Main Reference

Natural variation at the DEP1 locus enhances grain yield in rice. (2009) (https://pubmed.ncbi.nlm.nih.gov/19305410)

Authors

Huang X; Qian Q; Liu Z; Sun H; He S; Luo D; Xia G; Chu C; Li J; Fu X

Abstract

Grain yield is controlled by quantitative trait loci (QTLs) derived from natural variations in many crop plants. Here we report the molecular characterization of a major rice grain yield QTL that acts through the determination of panicle architecture. The dominant allele at the DEP1 locus is a gain-of-function mutation causing truncation of a phosphatidylethanolamine-binding protein-like domain protein. The effect of this allele is to enhance meristematic activity, resulting in a reduced length of the inflorescence internode, an increased number of grains per panicle and a consequent increase in grain yield. This allele is common to many Chinese high-yielding rice varieties and likely represents a relatively recent introduction into the cultivated rice gene pool. We also show that a functionally equivalent allele is present in the temperate cereals and seems to have arisen before the divergence of the wheat and barley lineages.

Additional References

RELATED GEPHE

Related Genes

4 (Chalk5, OsCKX2=Gn1a, OsSPL14 / WFP, THOUSAND-GRAIN WEIGHT 6 (TGW6)) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^4530^/and+Trait=Grain yield/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS