

GEPHE SUMMARY

	Gephebase Gene	GephelD
GRAIN INCOMPLETE FILLING 1 (https://www.gephebase.org/search-criteria/?and+GeneGephebase=%GRAIN INCOMPLETE FILLING 1%#gephebase-summary-title)	GP00000413	Main curator
Published	Entry Status	Martin

PHENOTYPIC CHANGE

	Trait Category	
Morphology (https://www.gephebase.org/search-criteria/?and+TraitCategory=%Morphology%#gephebase-summary-title)	Trait	
Grain weight (https://www.gephebase.org/search-criteria/?and+Trait=%Grain weight%#gephebase-summary-title)	Trait State in Taxon A	
Oryza rufipogon - wild rice	Trait State in Taxon B	
Oryza sativa - Teqing	Ancestral State	
Data not curated	Taxonomic Status	
Domesticated (https://www.gephebase.org/search-criteria/?and+TaxonomicStatus=%Domesticated%#gephebase-summary-title)		
Taxon A		Taxon B
	Latin Name	Latin Name
Oryza rufipogon (https://www.gephebase.org/search-criteria/?and+Taxon and Synonyms=%Oryza rufipogon%#gephebase-summary-title)		Oryza sativa (https://www.gephebase.org/search-criteria/?and+Taxon and Synonyms=%Oryza sativa%#gephebase-summary-title)
-	Common Name	Common Name
	Synonyms	Synonyms
red rice; common wild rice; Oryza rufipogon Griff.		rice; red rice; Oryza sativa L.
species	Rank	Rank
	Lineage	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	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)
4529 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4529)	NCBI Taxonomy ID	NCBI Taxonomy ID
	is Taxon A an Infraspecies?	is Taxon B an Infraspecies?
No	Yes	Yes
		Taxon B Description
		Oryza sativa - Teqing

GENOTYPIC CHANGE

CIN2	Generic Gene Name	UniProtKB Oryza sativa subsp. japonica
WB1; CIN2; GIF1; OsCIN2; OsJ_014165; OJ000126_13.8; Os04g0413500; LOC_Os04g33740	Synonyms	Q0JDC5 (http://www.uniprot.org/uniprot/Q0JDC5)
39947.LOC_Os04g33740.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=39947.LOC_Os04g33740.1)	String	GenebankID or UniProtKB ABW80997 (https://www.ncbi.nlm.nih.gov/nuccore/ABW80997)
Belongs to the glycosyl hydrolase 32 family.	Sequence Similarities	
GO:0004564 : beta-fructofuranosidase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004564)	GO - Molecular Function	
GO:0005975 : carbohydrate metabolic process	GO - Biological Process	

(https://www.ebi.ac.uk/QuickGO/term/GO:0005975)	
GO:0042742 : defense response to bacterium	
(https://www.ebi.ac.uk/QuickGO/term/GO:0042742)	
GO:0050832 : defense response to fungus	
(https://www.ebi.ac.uk/QuickGO/term/GO:0050832)	
GO:0052576 : carbohydrate storage (https://www.ebi.ac.uk/QuickGO/term/GO:0052576)	GO - Cellular Component
GO:0005576 : extracellular region (https://www.ebi.ac.uk/QuickGO/term/GO:0005576)	Presumptive Null
GO:0005618 : cell wall (https://www.ebi.ac.uk/QuickGO/term/GO:0005618)	Molecular Type
Unknown (https://www.gephebase.org/search-criteria?/and+Presumptive Null=%27Unknown%27#gephebase-summary-title)	Aberration Type
Cis-regulatory (https://www.gephebase.org/search-criteria?/and+Molecular Type=%27Cis-regulatory%27#gephebase-summary-title)	Molecular Details of the Mutation
Unknown (https://www.gephebase.org/search-criteria?/and+Aberration Type=%27Unknown%27#gephebase-summary-title)	Experimental Evidence
unknown	Main Reference
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=%27Linkage Mapping%27#gephebase-summary-title)	Authors
Control of rice grain-filling and yield by a gene with a potential signature of domestication. (2008) (https://pubmed.ncbi.nlm.nih.gov/18820698)	Abstract
Wang E; Wang J; Zhu X; Hao W; Wang L; Li Q; Zhang L; He W; Lu B; Lin H; Ma H; Zhang G; He Z	Additional References
Grain-filling, an important trait that contributes greatly to grain weight, is regulated by quantitative trait loci and is associated with crop domestication syndrome. However, the genes and underlying molecular mechanisms controlling crop grain-filling remain elusive. Here we report the isolation and functional analysis of the rice GIF1 (GRAIN INCOMPLETE FILLING 1) gene that encodes a cell-wall invertase required for carbon partitioning during early grain-filling. The cultivated GIF1 gene shows a restricted expression pattern during grain-filling compared to the wild rice allele, probably a result of accumulated mutations in the gene's regulatory sequence through domestication. Fine mapping with introgression lines revealed that the wild rice GIF1 is responsible for grain weight reduction. Ectopic expression of the cultivated GIF1 gene with the 35S or rice Waxy promoter resulted in smaller grains, whereas overexpression of GIF1 driven by its native promoter increased grain production. These findings, together with the domestication signature that we identified by comparing nucleotide diversity of the GIF1 loci between cultivated and wild rice, strongly suggest that GIF1 is a potential domestication gene and that such a domestication-selected gene can be used for further crop improvement.	

RELATED GEPHE

No matches found.	Related Genes
No matches found.	Related Haplotypes

EXTERNAL LINKS

COMMENTS