

GW2 (https://www.gephebase.org/search-criteria?/and+GeneGephebase=~GW2^#gephebase-summary-title)	Gephebase Gene	GP00000424	GepheID
Published	Entry Status	Martin	Main curator

Morphology (https://www.gephebase.org/search-criteria?/and+Trait+Category=~Morphology^#gephebase-summary-title)		Trait Category	
Grain size (https://www.gephebase.org/search-criteria?/and+Trait=~Grain+size^#gephebase-summary-title)		Trait	
Oryza sativa - Indica FAZ1		Trait State in Taxon A	
Oryza sativa - Japonica WY3		Trait State in Taxon B	
Taxon A		Ancestral State	
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Domesticated^#gephebase-summary-title)		Taxonomic Status	
Taxon A		Taxon B	
Oryza sativa (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Oryza+sativa^#gephebase-summary-title)	Latin Name	Oryza sativa (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Oryza+sativa^#gephebase-summary-title)	Latin Name
rice	Common Name	rice	Common Name
rice; red rice; Oryza sativa L.	Synonyms	rice; red rice; Oryza sativa L.	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzeae; Oryzinae; Oryza	Lineage	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzeae; Oryzinae; Oryza	Lineage
Oryza () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4527)	Parent	Oryza () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4527)	Parent
4530 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4530)	NCBI Taxonomy ID	4530 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4530)	NCBI Taxonomy ID
Yes	is Taxon A an Intraspecies?	Yes	is Taxon B an Intraspecies?
Oryza sativa - Indica FAZ1	Taxon A Description	Oryza sativa - Japonica WY3	Taxon B Description

GW2	Generic Gene Name	A4GWX9 (http://www.uniprot.org/uniprot/A4GWX9)	UniProtKB Oryza sativa subsp. indica
OsL_06523	Synonyms	AGP76213 (https://www.ncbi.nlm.nih.gov/nuccore/AGP76213)	GenebankID or UniProtKB
39946.BGIOSGA007870-PA (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=39946.BGIOSGA007870-PA)	String		
-	Sequence Similarities		
GO:0046872 : metal ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0046872)	GO - Molecular Function		
GO:0061630 : ubiquitin protein ligase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0061630)			
GO:0007275 : multicellular organism development	GO - Biological Process		

(<https://www.ebi.ac.uk/QuickGO/term/GO:0007275>)
GO:0016567 : protein ubiquitination (<https://www.ebi.ac.uk/QuickGO/term/GO:0016567>)
GO:0080113 : regulation of seed growth
(<https://www.ebi.ac.uk/QuickGO/term/GO:0080113>)

GO - Cellular Component

GO:0005737 : cytoplasm (<https://www.ebi.ac.uk/QuickGO/term/GO:0005737>)

Yes (#gephebase-summary-title)	Presumptive Null
Coding (#gephebase-summary-title)	Molecular Type
Deletion (#gephebase-summary-title)	Aberration Type
1-9 bp	Deletion Size
1bp deletion resulting in a premature stop codon in exon 4; the premature stop codon led to truncation of 310 amino acid residues	Molecular Details of the Mutation
Linkage Mapping (#gephebase-summary-title)	Experimental Evidence
A QTL for rice grain width and weight encodes a previously unknown RING-type E3 ubiquitin ligase. (2007) (https://pubmed.ncbi.nlm.nih.gov/17417637)	Main Reference
Song XJ; Huang W; Shi M; Zhu MZ; Lin HX	Authors
Grain weight is one of the most important components of grain yield and is controlled by quantitative trait loci (QTLs) derived from natural variations in crops. However, the molecular roles of QTLs in the regulation of grain weight have not been fully elucidated. Here, we report the cloning and characterization of GW2, a new QTL that controls rice grain width and weight. Our data show that GW2 encodes a previously unknown RING-type protein with E3 ubiquitin ligase activity, which is known to function in the degradation by the ubiquitin-proteasome pathway. Loss of GW2 function increased cell numbers, resulting in a larger (wider) spikelet hull, and it accelerated the grain milk filling rate, resulting in enhanced grain width, weight and yield. Our results suggest that GW2 negatively regulates cell division by targeting its substrate(s) to proteasomes for regulated proteolysis. The functional characterization of GW2 provides insight into the mechanism of seed development and is a potential tool for improving grain yield in crops.	Abstract
	Additional References

RELATED GEPHE

9 (GL3.1, GS3, GS5, OsPPKL1/qGL3, qSW5, OsSPL13, GL7, Os07g0603400, OsSPL16) (https://www.gephebase.org/search-criteria?/or+Taxon ID=~4530#/and+Trait=Grain size/and+groupHaplotypes=true#gephebase-summary-title)	Related Genes
No matches found.	Related Haplotypes

EXTERNAL LINKS

COMMENTS