

## GEPHE SUMMARY

	Gephebase Gene	GephelD
GW2 ( <a href="https://www.gephebase.org/search-criteria/?and+Gene+Gephebase=%23gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Gene+Gephebase=%23gephebase-summary-title</a> )	GP00000424	
	Entry Status	Main curator
Published		

## PHENOTYPIC CHANGE

	Trait Category		
Morphology ( <a href="https://www.gephebase.org/search-criteria/?and+Trait+Category=%23Morphology%23gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Trait+Category=%23Morphology%23gephebase-summary-title</a> )	Trait		
Grain size ( <a href="https://www.gephebase.org/search-criteria/?and+Trait=%23Grain+size%23gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Trait=%23Grain+size%23gephebase-summary-title</a> )	Trait State in Taxon A		
Oryza sativa - Indica FAZ1	Trait State in Taxon B		
Oryza sativa - Japonica WY3	Ancestral State		
Taxon A	Taxonomic Status		
Domesticated ( <a href="https://www.gephebase.org/search-criteria/?and+Taxonomic+Status=%23Domesticated%23gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxonomic+Status=%23Domesticated%23gephebase-summary-title</a> )			
Taxon A	Latin Name	Taxon B	Latin Name
Oryza sativa ( <a href="https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%23Oryza+sativa%23gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%23Oryza+sativa%23gephebase-summary-title</a> )	Oryza sativa ( <a href="https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%23Oryza+sativa%23gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%23Oryza+sativa%23gephebase-summary-title</a> )	Oryza sativa ( <a href="https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%23Oryza+sativa%23gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%23Oryza+sativa%23gephebase-summary-title</a> )	
rice	Common Name		Common Name
rice; red rice; Oryza sativa L.	Synonyms	rice; red rice; Oryza sativa L.	Synonyms
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) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4527">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4527</a> )	Oryza () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4527">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4527</a> )		
4530 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4530">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4530</a> )	NCBI Taxonomy ID	4530 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4530">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4530</a> )	NCBI Taxonomy ID
Yes	is Taxon A an Infraspecies?	Yes	is Taxon B an Infraspecies?
Oryza sativa - Indica FAZ1	Taxon A Description	Oryza sativa - Japonica WY3	Taxon B Description

## GENOTYPIC CHANGE

GW2	Generic Gene Name	UniProtKB Oryza sativa subsp. indica A4GWX9 ( <a href="http://www.uniprot.org/uniprot/A4GWX9">http://www.uniprot.org/uniprot/A4GWX9</a> )
Osl_06523	Synonyms	GenebankID or UniProtKB AGP76213 ( <a href="https://www.ncbi.nlm.nih.gov/nucore/AGP76213">https://www.ncbi.nlm.nih.gov/nucore/AGP76213</a> )
39946.BGIOSGA007870-PA ( <a href="http://string-db.org/newstring_cgi/show_network_section.pl?identifier=39946.BGIOSGA007870-PA">http://string-db.org/newstring_cgi/show_network_section.pl?identifier=39946.BGIOSGA007870-PA</a> )	String	
	Sequence Similarities	
-	GO - Molecular Function	
GO:0046872 : metal ion binding ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0046872">https://www.ebi.ac.uk/QuickGO/term/GO:0046872</a> )		
GO:0061630 : ubiquitin protein ligase activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0061630">https://www.ebi.ac.uk/QuickGO/term/GO:0061630</a> )		
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>)

Presumptive Null

Yes ([https://www.gephebase.org/search-criteria?/and+Presumptive Null=%27Yes%27#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive%20Null=%27Yes%27#gephebase-summary-title))

Molecular Type

Coding ([https://www.gephebase.org/search-criteria?/and+Molecular Type=%27Coding%27#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular%20Type=%27Coding%27#gephebase-summary-title))

Aberration Type

Deletion ([https://www.gephebase.org/search-criteria?/and+Aberration Type=%27Deletion%27#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration%20Type=%27Deletion%27#gephebase-summary-title))

Deletion Size

1-9 bp

Molecular Details of the Mutation

1bp deletion resulting in a premature stop codon in exon 4; the premature stop codon led to truncation of 310 amino acid residues

Experimental Evidence

Linkage Mapping ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence=%27Linkage Mapping%27#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental%20Evidence=%27Linkage%20Mapping%27#gephebase-summary-title))

Main Reference

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>)

Authors

Song XJ; Huang W; Shi M; Zhu MZ; Lin HX

Abstract

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.

Additional References

## RELATED GEPHE

Related Genes

9 (GL3.1, GS3, GS5, OsPPKL1/qGL3, qSW5, OsSPL13, GL7, Os07g0603400, OsSPL16) ([https://www.gephebase.org/search-criteria?/or+Taxon ID=%274530%27/and+Trait=Grain size/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon%20ID=%274530%27/and+Trait=Grain%20size/and+groupHaplotypes=true#gephebase-summary-title))

Related Haplotypes

No matches found.

## EXTERNAL LINKS

## COMMENTS