

## GEPHE SUMMARY

GW2 ( <a href="https://www.gephebase.org/search-criteria/?and+Gene">https://www.gephebase.org/search-criteria/?and+Gene</a> Gephebase=^GW2^#gephebase-summary-title)	Gephebase Gene	GP00000425	GephelD
	Entry Status	Martin	Main curator
Published			

## PHENOTYPIC CHANGE

	Trait Category		
Morphology ( <a href="https://www.gephebase.org/search-criteria/?and+Trait">https://www.gephebase.org/search-criteria/?and+Trait</a> Category=^Morphology^#gephebase-summary-title)	Trait		
Grain size ( <a href="https://www.gephebase.org/search-criteria/?and+Trait=^Grain+size^#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Trait=^Grain+size^#gephebase-summary-title</a> )	Trait State in Taxon A		
Triticum aestivum - Chinese spring	Trait State in Taxon B		
Triticum aestivum - Lankaodali	Ancestral State		
Taxon A	Taxonomic Status		
Domesticated ( <a href="https://www.gephebase.org/search-criteria/?and+Taxonomic+Status=^Domesticated^#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxonomic+Status=^Domesticated^#gephebase-summary-title</a> )			
Taxon A	Latin Name	Taxon B	Latin Name
Triticum aestivum ( <a href="https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Triticum+aestivum^#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Triticum+aestivum^#gephebase-summary-title</a> )		Triticum aestivum ( <a href="https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Triticum+aestivum^#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Triticum+aestivum^#gephebase-summary-title</a> )	
bread wheat	Common Name	bread wheat	Common Name
	Synonyms		Synonyms
Triticum aestivum subsp. aestivum; Triticum vulgare; bread wheat; Canadian hard winter wheat; common wheat; wheat; Triticum aestivum L.; Triticum vulgare L.; Triticum vulgare Vill., nom. illeg.; Tricum aestivum; Triticum aestivam; Triticum aestivum8		Triticum aestivum subsp. aestivum; Triticum vulgare; bread wheat; Canadian hard winter wheat; common wheat; wheat; Triticum aestivum L.; Triticum vulgare L.; Triticum vulgare Vill., nom. illeg.; Tricum aestivum; Triticum aestivam; Triticum aestivum8	
species	Rank	species	Rank
	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Triticodae; Triticeae; Triticinae; Triticum		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Triticodae; Triticeae; Triticinae; Triticum	
Triticum () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4564">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4564</a> )	Parent	Triticum () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4564">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4564</a> )	Parent
4565 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4565">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4565</a> )	NCBI Taxonomy ID	4565 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4565">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4565</a> )	NCBI Taxonomy ID
Yes	is Taxon A an Infraspecies?	Yes	is Taxon B an Infraspecies?
Triticum aestivum - Chinese spring	Taxon A Description	Triticum aestivum - Lankaodali	Taxon B Description

## GENOTYPIC CHANGE

GW2	Generic Gene Name	UniProtKB Oryza sativa subsp. indica
Osl_06523	Synonyms	GenebankID or UniProtKB
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	0
-	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 - Biological Process

GO:0007275 : multicellular organism development

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

Molecular Type

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

Aberration Type

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

Insertion Size

1-9 bp

Molecular Details of the Mutation

1bp insertion resulting in premature stop codon

Experimental Evidence

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

Main Reference

SNP identification and allelic-specific PCR markers development for TaGW2, a gene linked to wheat kernel weight. (2012) (<https://pubmed.ncbi.nlm.nih.gov/22643902>)

Authors

Yang Z; Bai Z; Li X; Wang P; Wu Q; Yang L; Li L; Li X

Abstract

TaGW2, an orthologous gene of rice OsGW2, has been associated with kernel width and weight of bread wheat (*Triticum aestivum*). Difference in TaGW2 coding sequence was not found among different wheat varieties in previous researches. In this study, we found eight exons and seven introns in TaGW2 with a full-length cDNA sequence of 1,275 bp, which contains a conserved function domain and seven splice sites that shared homology with rice OsGW2. A single T-base insertion in the eighth exon of TaGW2 on chromosome 6A was detected in a large-kernel wheat variety, Lankaodali. This insertion mutation reduces the coding protein sequence from normal 424 amino acids (~47.2 kDa) to 328 amino acids (~37.1 kDa) by truncating 96 amino acids. The result was validated by identifying histidine-tagged TaGW2 proteins encoded by both alleles of the mutant and the wild types in SDS-PAGE. Allele-specific PCR markers were developed based on the single nucleotide polymorphism (SNP) site. The SNP markers were genotyped for an F(2) segregation population from the cross of Lankaodali × Chinese Spring. Seed traits of F(2:3) families were evaluated in three different environments. The association analysis indicated that F(2:3) families with the mutated TaGW2 allele significantly increased kernel width (KW) and thousand-kernel weight (TKW), and slightly improved kernel length (KL). Using the SNP markers, another two varieties harbored the mutated TaGW2 allele were successfully identified from 22 additional wheat varieties, and they both have large KW and TKW. Cloning and sequencing of the gene further confirmed the functions of the mutated allele of TaGW2 in the two large kernel varieties. The results suggested that TaGW2 may negatively regulate kernel size variation, which shares the same function as OsGW2 in rice. The successful development of SNP markers provides a useful tool for improving kernel yield in wheat.

Additional References

## RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

No matches found.

## EXTERNAL LINKS

## COMMENTS