

## GEPHE SUMMARY

	Gephebase Gene	GephelD
Reduced height-B1 (RhtB1) ( <a href="https://www.gephebase.org/search-criteria?/and+Gene">https://www.gephebase.org/search-criteria?/and+Gene</a> Gephebase=^Reduced height-B1 (RhtB1)^#gephebase-summary-title)	GP00000965	Main curator
Published	Entry Status	Martin

## 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	
Plant size (dwarfism) ( <a href="https://www.gephebase.org/search-criteria?/and+Trait=^Plant+size">https://www.gephebase.org/search-criteria?/and+Trait=^Plant size</a> (dwarfism)^#gephebase-summary-title)	Trait State in Taxon A	
Triticum aestivum	Trait State in Taxon B	
Triticum aestivum -dwarf	Ancestral State	
Data not curated	Taxonomic Status	
Domesticated ( <a href="https://www.gephebase.org/search-criteria?/and+Taxonomic">https://www.gephebase.org/search-criteria?/and+Taxonomic</a> Status=^Domesticated^#gephebase-summary-title)		
Taxon A	Latin Name	Taxon B
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> )		Latin Name
bread wheat	Common Name	
	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		
species	Rank	
	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		
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	NCBI Taxonomy ID
No	is Taxon A an Infraspecies?	is Taxon B an Infraspecies?
	Yes	
	Triticum aestivum -dwarf	Taxon B Description

## GENOTYPIC CHANGE

D8	Generic Gene Name	UniProtKB Zea mays
-	Synonyms	GenebankID or UniProtKB
4577.GRMZM2G144744_P01 ( <a href="http://string-db.org/newstring_cgi/show_network_section.pl?identifier=4577.GRMZM2G144744_P01">http://string-db.org/newstring_cgi/show_network_section.pl?identifier=4577.GRMZM2G144744_P01</a> )	String	
Belongs to the GRAS family. DELLA subfamily.	Sequence Similarities	
GO:0003700 : DNA-binding transcription factor activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0003700">https://www.ebi.ac.uk/QuickGO/term/GO:0003700</a> ) GO:0043565 : sequence-specific DNA binding	GO - Molecular Function	

(<https://www.ebi.ac.uk/QuickGO/term/GO:0043565>)

GO:0003712 : transcription coregulator activity

(<https://www.ebi.ac.uk/QuickGO/term/GO:0003712>)

#### GO - Biological Process

GO:0009740 : gibberellic acid mediated signaling pathway

(<https://www.ebi.ac.uk/QuickGO/term/GO:0009740>)

GO:2000377 : regulation of reactive oxygen species metabolic process

(<https://www.ebi.ac.uk/QuickGO/term/GO:2000377>)

GO:0009737 : response to abscisic acid

(<https://www.ebi.ac.uk/QuickGO/term/GO:0009737>)

GO:2000033 : regulation of seed dormancy process

(<https://www.ebi.ac.uk/QuickGO/term/GO:2000033>)

GO:0042538 : hyperosmotic salinity response

(<https://www.ebi.ac.uk/QuickGO/term/GO:0042538>)

GO:0009867 : jasmonic acid mediated signaling pathway

(<https://www.ebi.ac.uk/QuickGO/term/GO:0009867>)

GO:0009938 : negative regulation of gibberellic acid mediated signaling pathway

(<https://www.ebi.ac.uk/QuickGO/term/GO:0009938>)

GO:0010187 : negative regulation of seed germination

(<https://www.ebi.ac.uk/QuickGO/term/GO:0010187>)

GO:0009723 : response to ethylene (<https://www.ebi.ac.uk/QuickGO/term/GO:0009723>)

GO:0009863 : salicylic acid mediated signaling pathway

(<https://www.ebi.ac.uk/QuickGO/term/GO:0009863>)

#### GO - Cellular Component

GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)

Presumptive Null

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

Molecular Type

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

Aberration Type

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

SNP Coding Change

Nonsense

Molecular Details of the Mutation

Q64\*; TGA>CGA

Experimental Evidence

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

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	-	-	-

'Green revolution' genes encode mutant gibberellin response modulators. (1999) (<https://pubmed.ncbi.nlm.nih.gov/10421366>)

Main Reference

Peng J; Richards DE; Hartley NM; Murphy GP; Devos KM; Flintham JE; Beales J; Fish LJ; Worland AJ; Pelica F; Sudhakar D; Christou P; Snape JW; Gale MD; Harberd NP

Authors

World wheat grain yields increased substantially in the 1960s and 1970s because farmers rapidly adopted the new varieties and cultivation methods of the so-called 'green revolution'. The new varieties are shorter, increase grain yield at the expense of straw biomass, and are more resistant to damage by wind and rain. These wheats are short because they respond abnormally to the plant growth hormone gibberellin. This reduced response to gibberellin is conferred by mutant dwarfing alleles at one of two Reduced height-1 (Rht-B1 and Rht-D1) loci. Here we show that Rht-B1/Rht-D1 and maize dwarf-8 (d8) are orthologues of the *Arabidopsis Gibberellin Insensitive (GAI)* gene. These genes encode proteins that resemble nuclear transcription factors and contain an SH2-like domain, indicating that phosphotyrosine may participate in gibberellin signalling. Six different orthologous dwarfing mutant alleles encode proteins that are altered in a conserved amino-terminal gibberellin signalling domain. Transgenic rice plants containing a mutant GAI allele give reduced responses to gibberellin and are dwarfed, indicating that mutant GAI orthologues could be used to increase yield in a wide range of crop species.

Abstract

Additional References

## RELATED GEPHE

Related Genes

1 (Reduced height-D1 (RhtD1)) ([https://www.gephbase.org/search-criteria?/or+Taxon ID=%274565%27/and+Trait=Plant size/and+groupHaplotypes=true#gephbase-summary-title](https://www.gephbase.org/search-criteria?/or+Taxon%20ID=%274565%27/and+Trait=Plant%20size/and+groupHaplotypes=true#gephbase-summary-title))

Related Haplotypes

No matches found.

## EXTERNAL LINKS

## COMMENTS

Various mutant alleles (gai in Arabidopsis; D8 in maize, and Rht1 in sunflowers) resembles the phenotypic effect of Rht1 described here: they act in a genetically dominant fashion and encode active (altered function) mutant products that decrease GA response and thus confer reduced height.