

GEPHE SUMMARY

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

<p>Morphology (<a href="https://www.gephebase.org/search-criteria?/and+Trait+Category+Morphology+#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait+Category+Morphology+#gephebase-summary-title</a>)</p> <p>Plant size (dwarfism) (<a href="https://www.gephebase.org/search-criteria?/and+Trait+Plant+size+(dwarfism)+#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait+Plant+size+(dwarfism)+#gephebase-summary-title</a>)</p> <p>Triticum aestivum</p> <p>Triticum aestivum -dwarf</p> <p>Data not curated</p> <p>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>)</p>	<p>Trait Category</p> <p>Trait</p> <p>Trait State in Taxon A</p> <p>Trait State in Taxon B</p> <p>Ancestral State</p> <p>Taxonomic Status</p>
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Taxon A		Taxon B	
<p>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>)</p> <p>bread wheat</p> <p>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 aestivum; Triticum aestivum8</p> <p>species</p> <p>cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Triticoeae; Triticeae; Triticinae; Triticum</p> <p>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>)</p> <p>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>)</p> <p>No</p>	<p>Latin Name</p> <p>Common Name</p> <p>Synonyms</p> <p>Rank</p> <p>Lineage</p> <p>Parent</p> <p>NCBI Taxonomy ID</p> <p>is Taxon A an Intraspecies?</p>	<p>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>)</p> <p>bread wheat</p> <p>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 aestivum; Triticum aestivum8</p> <p>species</p> <p>cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Triticoeae; Triticeae; Triticinae; Triticum</p> <p>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>)</p> <p>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>)</p> <p>Yes</p> <p>Triticum aestivum -dwarf</p>	<p>Latin Name</p> <p>Common Name</p> <p>Synonyms</p> <p>Rank</p> <p>Lineage</p> <p>Parent</p> <p>NCBI Taxonomy ID</p> <p>is Taxon B an Intraspecies?</p> <p>Taxon B Description</p>

GENOTYPIC CHANGE

<p>D8</p> <p>-</p> <p>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>)</p> <p>Belongs to the GRAS family, DELLA subfamily.</p> <p>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>)</p> <p>GO:0043565 : sequence-specific DNA binding</p>	<p>Generic Gene Name</p> <p>Synonyms</p> <p>String</p> <p>Sequence Similarities</p> <p>GO - Molecular Function</p>	<p>Q9ST48 (<a href="http://www.uniprot.org/uniprot/Q9ST48">http://www.uniprot.org/uniprot/Q9ST48</a>)</p> <p>UniProtKB Zea mays</p> <p>GenebankID or UniProtKB</p> <p>0</p>
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(<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.gephebase.org/search-criteria?/and+Presumptive Null=~Yes^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive+Null=~Yes^#gephebase-summary-title))

Molecular Type

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

Aberration Type

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

SNP Coding Change

Nonsense

Molecular Details of the Mutation

Q64\*: TGA>CGA

Experimental Evidence

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

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

Main Reference

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

Authors

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

Abstract

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.

Additional References

RELATED GEPHE

Related Genes

1 (Reduced height-D1 (RhtD1)) ([https://www.gephebase.org/search-criteria?/or+Taxon ID=~4565^/and+Trait=Plant size/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon+ID=~4565^/and+Trait=Plant+size/and+groupHaplotypes=true#gephebase-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.