

GEPHE SUMMARY

<p>PpeGID1c (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~PpeGID1c^#gephebase-summary-title)</p> <p>Published</p>	<p>Gephebase Gene</p> <p>Entry Status</p>	<p>GP00000920</p> <p>Martin</p>	<p>GepheID</p> <p>Main curator</p>
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PHENOTYPIC CHANGE

<p>Morphology (https://www.gephebase.org/search-criteria?/and+Trait+Category=~Morphology^#gephebase-summary-title)</p> <p>Plant size (dwarfism) (https://www.gephebase.org/search-criteria?/and+Trait=~Plant+size+(dwarfism)^#gephebase-summary-title)</p> <p>Prunus persica</p> <p>Prunus persica - Brachytic Dwarf (BD)</p> <p>Taxon A</p> <p>Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Domesticated^#gephebase-summary-title)</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>	<p>Taxon A</p> <p>Prunus persica (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Prunus+persica^#gephebase-summary-title)</p> <p>peach</p> <p>Amygdalus persica; Persica vulgaris; peach; Persica vulgaris Mill.; Prunus persica (L.) Batsch; Prunus persica var. densa Makino; Prunus persica var densa</p> <p>species</p> <p>cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; fabids; Rosales; Rosaceae; Amygdaloideae; Amygdaleae; Prunus</p> <p>Prunus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3754)</p> <p>3760 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3760)</p> <p>is Taxon A an Intraspecies?</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 B an Intraspecies?</p>	<p>Taxon B</p> <p>Prunus persica (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Prunus+persica^#gephebase-summary-title)</p> <p>peach</p> <p>Amygdalus persica; Persica vulgaris; peach; Persica vulgaris Mill.; Prunus persica (L.) Batsch; Prunus persica var. densa Makino; Prunus persica var densa</p> <p>species</p> <p>cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; fabids; Rosales; Rosaceae; Amygdaloideae; Amygdaleae; Prunus</p> <p>Prunus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3754)</p> <p>3760 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3760)</p> <p>is Taxon B an Intraspecies?</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 B an Intraspecies?</p>
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GENOTYPIC CHANGE

<p>GID1C</p> <p>ATGID1C; F21A20.30; F21A20_30; GA INSENSITIVE DWARF1C; CXE19; GID1L3; At5g27320</p> <p>3702.AT5G27320.1 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=3702.AT5G27320.1)</p> <p>Belongs to the 'GDXG' lipolytic enzyme family.</p> <p>GO:0016787 : hydrolase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0016787) GO:0010331 : gibberellin binding (https://www.ebi.ac.uk/QuickGO/term/GO:0010331)</p> <p>GO:0010629 : negative regulation of gene expression (https://www.ebi.ac.uk/QuickGO/term/GO:0010629)</p>	<p>Generic Gene Name</p> <p>Synonyms</p> <p>String</p> <p>Sequence Similarities</p> <p>GO - Molecular Function</p> <p>GO - Biological Process</p>	<p>Q940G6 (http://www.uniprot.org/uniprot/Q940G6)</p> <p>()</p>	<p>UniProtKB Arabidopsis thaliana</p> <p>GenebankID or UniProtKB</p>
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GO:0009739 : response to gibberellin
 (https://www.ebi.ac.uk/QuickGO/term/GO:0009739)
 GO:0048444 : floral organ morphogenesis
 (https://www.ebi.ac.uk/QuickGO/term/GO:0048444)
 GO:0048530 : fruit morphogenesis (https://www.ebi.ac.uk/QuickGO/term/GO:0048530)
 GO:0010476 : gibberellin mediated signaling pathway
 (https://www.ebi.ac.uk/QuickGO/term/GO:0010476)
 GO:0009939 : positive regulation of gibberellic acid mediated signaling pathway
 (https://www.ebi.ac.uk/QuickGO/term/GO:0009939)
 GO:0010325 : raffinose family oligosaccharide biosynthetic process
 (https://www.ebi.ac.uk/QuickGO/term/GO:0010325)

GO - Cellular Component

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

Molecular Type

Coding (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)

SNP Coding Change

Nonsense

Molecular Details of the Mutation

Trp162* (TGG>TAG)

Experimental Evidence

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

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

Main Reference

A brachytic dwarfism trait (dw) in peach trees is caused by a nonsense mutation within the gibberellic acid receptor PpeGID1c. (2016) (https://pubmed.ncbi.nlm.nih.gov/26639453)

Authors

Hollender CA; Hadiarto T; Srinivasan C; Scorza R; Dardick C

Abstract

Little is known about the genetic factors controlling tree size and shape. Here, we studied the genetic basis for a recessive brachytic dwarfism trait (dw) in peach (*Prunus persica*) that has little or no effect on fruit development. A sequencing-based mapping strategy positioned dw on the distal end of chromosome 6. Further sequence analysis and fine mapping identified a candidate gene for dw as a non-functional allele of the gibberellic acid receptor GID1c. Expression of the two GID1-like genes found in peach, PpeGID1c and PpeGID1b, was analyzed. GID1c was predominantly expressed in actively growing vegetative tissues, whereas GID1b was more highly expressed in reproductive tissues. Silencing of GID1c in plum via transgenic expression of a hairpin construct led to a dwarf phenotype similar to that of dw/dw peaches. In general, the degree of GID1c silencing corresponded to the degree of dwarfing. The results suggest that PpeGID1c serves a primary role in vegetative growth and elongation, whereas GID1b probably functions to regulate gibberellic acid perception in reproductive organs. Modification of GID1c expression could provide a rational approach to control tree size without impairing fruit development.

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Additional References

RELATED GEPHE

No matches found.

Related Genes

No matches found.

Related Haplotypes

EXTERNAL LINKS

COMMENTS

