GEPHE SUMMARY

Gephebase Gene
Q = wheat AP2-like (WAP2) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^Q = wheat AP2-like (WAP2)^#gephebase-summary-title)

GepheID
GP00000940

Entry Status
Published

Main curator
Martin

PHENOTYPIC CHANGE

Trait #1

Trait Category
Morphology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Morphology^#gephebase-summary-title)

Trait
Inflorescence morphology (https://www.gephebase.org/search-criteria?/and+Trait=^Inflorescence morphology^#gephebase-summary-title)

Trait State in Taxon A
Triticum turgidum/aestivum - qq allele

Trait State in Taxon B
Triticum turgidum/aestivum - QQ allele

Trait #2

Trait Category
Morphology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Morphology^#gephebase-summary-title)

Trait
Spike morphology (https://www.gephebase.org/search-criteria?/and+Trait=^Spike morphology^#gephebase-summary-title)

Trait State in Taxon A
-

Trait State in Taxon B
-

Ancestral State
Data not curated

Taxonomic Status
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Domesticated^#gephebase-summary-title)

Taxon A

Latin Name
Triticum turgidum (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Triticum turgidum^#gephebase-summary-title)

Common Name
-

Synonyms
Triticum aethiopicum; English wheat; cone wheat; poulard wheat; rivet wheat; Triticum aethiopicum Jakubz.; Triticum turgidum L.; Triticum turgidum8

Rank
species

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

Parent
Triticum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4564)

NCBI Taxonomy ID
4571 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4571)

is Taxon A an Infraspecies?
Yes

Taxon A Description
Triticum turgidum/aestivum - qq allele

Taxon B

Latin Name
Triticum turgidum (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Triticum turgidum^#gephebase-summary-title)

Common Name
-

Synonyms
Triticum aethiopicum; English wheat; cone wheat; poulard wheat; rivet wheat; Triticum aethiopicum Jakubz.; Triticum turgidum L.; Triticum turgidum8

Rank
species

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

Parent
Triticum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4564)

NCBI Taxonomy ID
4571 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4571)

is Taxon B an Infraspecies?
Yes

Taxon B Description
Triticum turgidum/aestivum - QQ allele

GENOTYPIC CHANGE

Generic Gene Name

WANT1

Synonyms

-

String

-

Sequence Similarities

-

GO - Molecular Function

GO:0003700 : DNA-binding transcription factor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003700)
GO:0003677 : DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003677)

GO - Biological Process

GO:0006351 : transcription, DNA-templated (https://www.ebi.ac.uk/QuickGO/term/GO:0006351)

GO - Cellular Component

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

UniProtKB Triticum aestivum

C1PH82 (http://www.uniprot.org/uniprot/C1PH82)

GenebankID or UniProtKB

BAE20414 (https://www.ncbi.nlm.nih.gov/nuccore/BAE20414)

Presumptive Null

No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^No^#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

Nonsynonymous

Molecular Details of the Mutation

V329I

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

Molecular characterization of the major wheat domestication gene Q. (2006) (https://pubmed.ncbi.nlm.nih.gov/16172507)

Authors

Simons KJ; Fellers JP; Trick HN; Zhang Z; Tai YS; Gill BS; Faris JD

Abstract

The Q gene is largely responsible for the widespread cultivation of wheat because it confers the free-threshing character. It also pleiotropically influences many other domestication-related traits such as glume shape and tenacity, rachis fragility, spike length, plant height, and spike emergence time. We isolated the Q gene and verified its identity by analysis of knockout mutants and transformation. The Q gene has a high degree of similarity to members of the AP2 family of transcription factors. The Q allele is more abundantly transcribed than q, and the two alleles differ for a single amino acid. An isoleucine at position 329 in the Q protein leads to an abundance of homodimer formation in yeast cells, whereas a valine in the q protein appears to limit homodimer formation. Ectopic expression analysis allowed us to observe both silencing and overexpression effects of Q. Rachis fragility, glume shape, and glume tenacity mimicked the q phenotype in transgenic plants exhibiting post-transcriptional silencing of the transgene and the endogenous Q gene. Variation in spike compactness and plant height were associated with the level of transgene transcription due to the dosage effects of Q. The q allele is the more primitive, and the mutation that gave rise to Q occurred only once leading to the world's cultivated wheats.

Additional References

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

@Pleiotropy