

GEPHE SUMMARY

VRN1 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~VRN1~#gephebase-summary-title)	Gephebase Gene	GP00002105	GepheID
Published	Entry Status	Courtier	Main curator

PHENOTYPIC CHANGE

Physiology (https://www.gephebase.org/search-criteria?/and+Trait+Category=~Physiology~#gephebase-summary-title)	Trait Category		
Flowering time (https://www.gephebase.org/search-criteria?/and+Trait=~Flowering+time~#gephebase-summary-title)	Trait		
Triticum turgidum - recessive allele vrn-B1 - winter growth habit	Trait State in Taxon A		
Triticum turgidum - dominant allele Vrn-B1 - spring growth habit	Trait State in Taxon B		
Taxon A	Ancestral State		
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Domesticated~#gephebase-summary-title)	Taxonomic Status		
	Taxon A		Taxon B
Triticum turgidum (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Triticum+turgidum~#gephebase-summary-title)	Latin Name	Triticum turgidum (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Triticum+turgidum~#gephebase-summary-title)	Latin Name
-	Common Name	-	Common Name
Triticum aethiopicum; English wheat; cone wheat; poulard wheat; rivet wheat; Triticum aethiopicum Jakubz.; Triticum turgidum L.; Triticum turgidum8	Synonyms	Triticum aethiopicum; English wheat; cone wheat; poulard wheat; rivet wheat; Triticum aethiopicum Jakubz.; Triticum turgidum L.; Triticum turgidum8	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Triticodae; Triticeae; Triticinae; Triticum	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	Lineage
Triticum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4564)	Parent	Triticum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4564)	Parent
4571 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4571)	NCBI Taxonomy ID	4571 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4571)	NCBI Taxonomy ID
No	is Taxon A an Intraspecies?	No	is Taxon B an Intraspecies?

GENOTYPIC CHANGE

VRN1	Generic Gene Name	Q8L3W1 (http://www.uniprot.org/uniprot/Q8L3W1)	UniProtKB Arabidopsis thaliana
REDUCED VERNALIZATION RESPONSE 1; REM39; REPRODUCTIVE MERISTEM 39; AT3g18990; K13E13.10	Synonyms	()	GenebankID or UniProtKB
3702.AT3G18990.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=3702.AT3G18990.1)	String		
-	Sequence Similarities		
GO:0043565 : sequence-specific DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0043565)	GO - Molecular Function		
GO:0003677 : DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003677)	GO - Biological Process		
GO:0009909 : regulation of flower development			

(<https://www.ebi.ac.uk/QuickGO/term/GO:0009909>)

GO:0010048 : vernalization response

(<https://www.ebi.ac.uk/QuickGO/term/GO:0010048>)

GO - Cellular Component

GO:0005654 : nucleoplasm (<https://www.ebi.ac.uk/QuickGO/term/GO:0005654>)

Presumptive Null

No ([https://www.gephebase.org/search-criteria?/and+Presumptive Null="+No^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive+Null=))

Molecular Type

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

Aberration Type

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

Insertion Size

1-10 kb

Molecular Details of the Mutation

5463-bp insertion in the 5'-UTR region of the Vrn-B1 allele. This insertion is a novel retrotransposon (designated as retrotrans_VRN), which is flanked by a 5-bp target site duplication and contains primer binding site and polypurine tract motifs; a 325-bp long terminal repeat and an open reading frame encoding 1231 amino acids. The insertion of retrotrans_VRN results in expression of Vrn-B1 without vernalization.

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=))

Main Reference

A Novel Retrotransposon Inserted in the Dominant Vrn-B1 Allele Confers Spring Growth Habit in Tetraploid Wheat (*Triticum turgidum* L.). (2011)

(<https://pubmed.ncbi.nlm.nih.gov/22384375>)

Authors

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Abstract

Vernalization genes determine winter/spring growth habit in temperate cereals and play important roles in plant development and environmental adaptation. In wheat (*Triticum* L. sp.), it was previously shown that allelic variation in the vernalization gene VRN1 was due to deletions or insertions either in the promoter or in the first intron. Here, we report a novel Vrn-B1 allele that has a retrotransposon in its promoter conferring spring growth habit. The VRN-B1 gene was mapped in a doubled haploid population that segregated for winter-spring growth habit but was derived from two spring tetraploid wheat genotypes, the durum wheat (*T. turgidum* subsp. durum) variety 'Lebsock' and *T. turgidum* subsp. carthlicum accession PI 94749. Genetic analysis revealed that Lebsock carried the dominant Vrn-A1 and recessive vrn-B1 alleles, whereas PI 94749 had the recessive vrn-A1 and dominant Vrn-B1 alleles. The Vrn-A1 allele in Lebsock was the same as the Vrn-A1c allele previously reported in hexaploid wheat. No differences existed between the vrn-B1 and Vrn-B1 alleles, except that a 5463-bp insertion was detected in the 5'-UTR region of the Vrn-B1 allele. This insertion was a novel retrotransposon (designated as retrotrans_VRN), which was flanked by a 5-bp target site duplication and contained primer binding site and polypurine tract motifs, a 325-bp long terminal repeat, and an open reading frame encoding 1231 amino acids. The insertion of retrotrans_VRN resulted in expression of Vrn-B1 without vernalization. Retrotrans_VRN is prevalent among *T. turgidum* subsp. carthlicum accessions, less prevalent among *T. turgidum* subsp. dicoccum accessions, and rarely found in other tetraploid wheat subspecies.

Additional References

RELATED GEPHE

No matches found.

Related Genes

No matches found.

Related Haplotypes

EXTERNAL LINKS

COMMENTS

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