

## GEPHE SUMMARY

BOLTING TIME CONTROL 1 (BvBTC1) ( <a href="https://www.gephebase.org/search-criteria?/and+Gene Gephebase=BOLTING TIME CONTROL 1 (BvBTC1)^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Gene Gephebase=BOLTING TIME CONTROL 1 (BvBTC1)^#gephebase-summary-title</a> )	Gephebase Gene GP00000155	GepheID Main curator
Published	Entry Status	

## PHENOTYPIC CHANGE

Physiology ( <a href="https://www.gephebase.org/search-criteria?/and+Trait Category=Physiology^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait Category=Physiology^#gephebase-summary-title</a> )	Trait Category	
Flowering time ( <a href="https://www.gephebase.org/search-criteria?/and+Trait=^Flowering time^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait=^Flowering time^#gephebase-summary-title</a> )	Trait	
Beta vulgaris - annual	Trait State in Taxon A	
Beta vulgaris - biennial	Trait State in Taxon B	
Data not curated	Ancestral State	
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> )	Taxonomic Status	
Beta vulgaris ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=Beta vulgaris^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=Beta vulgaris^#gephebase-summary-title</a> )	Taxon A	Taxon B
-	Latin Name	Latin Name
Beta altissima; beet; Beta altissima Steud.; Beta vulgaris L.	Common Name	Common Name
species	Synonyms	Synonyms
cellular organisms; Eukaryota; Viriplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphylophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; Caryophyllales; Chenopodiaceae; Betoideae; Beta	Rank	Rank
Beta () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3554">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3554</a> )	Lineage	Lineage
161934 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 161934">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 161934</a> )	Parent	Parent
No	NCBI Taxonomy ID	NCBI Taxonomy ID
is Taxon A an Infraspecies?		is Taxon B an Infraspecies?

## GENOTYPIC CHANGE

BTC1	Generic Gene Name	UniProtKB Beta vulgaris subsp. vulgaris
-	Synonyms	GenebankID or UniProtKB
-	String	
-	Sequence Similarities	
-	GO - Molecular Function	
-	GO - Biological Process	
GO:0000160 : phosphorelay signal transduction system ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0000160">https://www.ebi.ac.uk/QuickGO/term/GO:0000160</a> )	GO - Cellular Component	
GO:0005634 : nucleus ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0005634">https://www.ebi.ac.uk/QuickGO/term/GO:0005634</a> )		Presumptive Null
Unknown ( <a href="https://www.gephebase.org/search-criteria?/and+Presumptive Null=^Unknown^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Presumptive Null=^Unknown^#gephebase-summary-title</a> )		

Molecular Type

Cis-regulatory ([https://www.gephebase.org/search-criteria?/and+Molecular Type=%22Cis-regulatory%22#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular%20Type=%22Cis-regulatory%22#gephebase-summary-title))

Aberration Type

Unknown ([https://www.gephebase.org/search-criteria?/and+Aberration Type=%22Unknown%22#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration%20Type=%22Unknown%22#gephebase-summary-title))

Molecular Details of the Mutation

unknown

Experimental Evidence

Linkage Mapping ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence=%22Linkage Mapping%22#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental%20Evidence=%22Linkage%20Mapping%22#gephebase-summary-title))

Main Reference

The role of a pseudo-response regulator gene in life cycle adaptation and domestication of beet. (2012) (<https://pubmed.ncbi.nlm.nih.gov/22608508/>)

Authors

Pin PA; Zhang W; Vogt SH; Dally N; BÄttner B; Schulze-Buxloh G; Jelly NS; Chia TY; Mutasa-GÅ¶ttgens ES; Dohm JC; Himmelbauer H; Weisshaar B; Kraus J; Gielen JJ; Lommel M; Weyens G; Wahl B; Schechert A; Nilsson O; Jung C; Kraft T; MÄller AE

Abstract

Life cycle adaptation to latitudinal and seasonal variation in photoperiod and temperature is a major determinant of evolutionary success in flowering plants. Whereas the life cycle of the dicotyledonous model species *Arabidopsis thaliana* is controlled by two epistatic genes, FLOWERING LOCUS C and FRIGIDA, three unrelated loci (VERNALIZATION) determine the spring and winter habits of monocotyledonous plants such as temperate cereals. In the core eudicot species *Beta vulgaris*, whose lineage diverged from that leading to *Arabidopsis* shortly after the monocot-dicot split 140 million years ago, the bolting locus B is a master switch distinguishing annuals from biennials. Here, we isolated B and show that the pseudo-response regulator gene BOLTING TIME CONTROL 1 (BvBTC1), through regulation of the FLOWERING LOCUS T genes, is absolutely necessary for flowering and mediates the response to both long days and vernalization. Our results suggest that domestication of beets involved the selection of a rare partial loss-of-function BvBTC1 allele that imparts reduced sensitivity to photoperiod that is restored by vernalization, thus conferring bienniality, and illustrate how evolutionary plasticity at a key regulatory point can enable new life cycle strategies.

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Additional References

## RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

No matches found.

## EXTERNAL LINKS

## COMMENTS

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