

GEPHE SUMMARY

ZmCCT (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^ZmCCT^#gephebase-summary-title)	Gephebase Gene	GP00001227	GepheID
Published	Entry Status	Martin	Main curator

PHENOTYPIC CHANGE

	Trait Category		
Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title)	Trait		
Flowering time (https://www.gephebase.org/search-criteria?/and+Trait=^Flowering time^#gephebase-summary-title)	Trait State in Taxon A		
Zea mays	Trait State in Taxon B		
Zea mays	Ancestral State		
Taxon A	Taxonomic Status		
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Domesticated^#gephebase-summary-title)			
Taxon A		Taxon B	
Zea mays	Latin Name	Zea mays	Latin Name
(https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Zea+mays^#gephebase-summary-title)		(https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Zea+mays^#gephebase-summary-title)	
-	Common Name	-	Common Name
Zea mays var. japonica; maize; Zea mays L.; Zea mays mays	Synonyms	Zea mays var. japonica; maize; Zea mays L.; Zea mays mays	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Andropogonodae; Andropogoneae; Tripsacinae; Zea	Lineage	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Andropogonodae; Andropogoneae; Tripsacinae; Zea	Lineage
Zea () - (Rank: genus)	Parent	Zea () - (Rank: genus)	Parent
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4575)	NCBI Taxonomy ID	(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4575)	NCBI Taxonomy ID
4577		4577	
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4577)	is Taxon A an Infraspecies?	(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4577)	is Taxon B an Infraspecies?
No		No	

GENOTYPIC CHANGE

GHD7	Generic Gene Name	UniProtKB Oryza sativa subsp. japonica
Ghd7; Os07g0261200; LOC_Os07g15770; P0046D03.119	Synonyms	E5RQA1 (http://www.uniprot.org/uniprot/E5RQA1)
39947.LOC_Os07g15770.1	String	GenebankID or UniProtKB
(http://string-db.org/newstring_cgi/show_network_section.pl?identifier=39947.LOC_Os07g15770.1)	Sequence Similarities	AGW42769 (https://www.ncbi.nlm.nih.gov/nuccore/AGW42769)
-	GO - Molecular Function	
GO:0003677 : DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003677)		
GO:0009908 : flower development (https://www.ebi.ac.uk/QuickGO/term/GO:0009908)	GO - Biological Process	
GO:0009909 : regulation of flower development (https://www.ebi.ac.uk/QuickGO/term/GO:0009909)		
GO:0048579 : negative regulation of long-day photoperiodism, flowering (https://www.ebi.ac.uk/QuickGO/term/GO:0048579)		

GO - Cellular Component

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

Presumptive Null

Unknown ([https://www.gephebase.org/search-criteria?/and+Presumptive Null=%20Unknown%23gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive%20Null=%20Unknown%23gephebase-summary-title))

Molecular Type

Cis-regulatory ([https://www.gephebase.org/search-criteria?/and+Molecular Type=%20Cis-regulatory%23gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular%20Type=%20Cis-regulatory%23gephebase-summary-title))

Aberration Type

Insertion ([https://www.gephebase.org/search-criteria?/and+Aberration Type=%20Insertion%23gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration%20Type=%20Insertion%23gephebase-summary-title))

Insertion Size

1-10 kb

Molecular Details of the Mutation

insertion of a CACTA-like transposon into the promoter of ZmCCT. This insertion suppresses ZmCCT expression through methylation and reduces maize sensitivity to photoperiod.

Experimental Evidence

Linkage Mapping ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence=%20Linkage Mapping%23gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental%20Evidence=%20Linkage%20Mapping%23gephebase-summary-title))

Main Reference

Fine mapping and haplotype structure analysis of a major flowering time quantitative trait locus on maize chromosome 10. (2009) (<https://pubmed.ncbi.nlm.nih.gov/19822732>)

Authors

Ducrocq S; Giauffret C; Madur D; Combes V; Dumas F; Jouanne S; Coubranche D; Jamin P; Moreau L; Charcosset A

Abstract

Flowering time is a major adaptive trait in plants and an important selection criterion for crop species. In maize, however, little is known about its molecular basis. In this study, we report the fine mapping and characterization of a major quantitative trait locus located on maize chromosome 10, which regulates flowering time through photoperiod sensitivity. This study was performed in near-isogenic material derived from a cross between the day-neutral European flint inbred line FV286 and the tropical short-day inbred line FV331. Recombinant individuals were identified among a large segregating population and their progenies were scored for flowering time. Combined genotypic characterization led to delimit the QTL to an interval of 170 kb and highlighted an unbalanced recombination pattern. Two bacterial artificial chromosomes (BACs) covering the region were analyzed to identify putative candidate genes, and synteny with rice, sorghum, and brachypodium was investigated. A gene encoding a CCT domain protein homologous to the rice Gh67 heading date regulator was identified, but its causative role was not demonstrated and deserves further analyses. Finally, an association study showed a strong level of linkage disequilibrium over the region and highlighted haplotypes that could provide useful information for the exploitation of genetic resources and marker-assisted selection in maize.

Additional References

ZmCCT and the genetic basis of day-length adaptation underlying the postdomestication spread of maize. (2012) (<https://pubmed.ncbi.nlm.nih.gov/22711828>)CACTA-like transposable element in ZmCCT attenuated photoperiod sensitivity and accelerated the postdomestication spread of maize. (2013) (<https://pubmed.ncbi.nlm.nih.gov/24089449>)

RELATED GEPHE

Related Genes

2 (Rap2.7 (vgt1), zfl2) ([https://www.gephebase.org/search-criteria?/or+Taxon ID=%204577%20and+Trait=Flowering time%20and+groupHaplotypes=true%23gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon%20ID=%204577%20and+Trait=Flowering%20time%20and+groupHaplotypes=true%23gephebase-summary-title))

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

@TE @Epigenetics