

GEPHE SUMMARY

colored plant 1 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=^colored plant 1^#gephebase-summary-title)	Gephebase Gene	GP00000190	GepheID
Published	Entry Status	Martin	Main curator

PHENOTYPIC CHANGE

Morphology (https://www.gephebase.org/search-criteria?/and+Trait+Category=^Morphology^#gephebase-summary-title)	Trait Category		
Coloration (seed) (https://www.gephebase.org/search-criteria?/and+Trait=^Coloration (seed)^#gephebase-summary-title)	Trait		
Zea mays - white seeds	Trait State in Taxon A		
Zea mays - purple seeds - allele B1-Peru	Trait State in Taxon B		
Data not curated	Ancestral State		
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=^Domesticated^#gephebase-summary-title)	Taxonomic Status		

Taxon A	Latin Name	Taxon B	Latin Name
Zea mays (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Zea mays^#gephebase-summary-title)	Zea mays (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Zea mays^#gephebase-summary-title)	Zea mays (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Zea mays^#gephebase-summary-title)	Zea mays (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) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4575)	Parent	Zea () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4575)	Parent
4577 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4577)	NCBI Taxonomy ID	4577 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4577)	NCBI Taxonomy ID
No	is Taxon A an Intraspecies?	No	is Taxon B an Intraspecies?

GENOTYPIC CHANGE

b1	Generic Gene Name	W5S3Q3 (http://www.uniprot.org/uniprot/W5S3Q3)	UniProtKB Zea mays
-	Synonyms	KF835723 (https://www.ncbi.nlm.nih.gov/nucleotide/KF835723)	GenebankID or UniProtKB
-	String		
-	Sequence Similarities		
-	GO - Molecular Function		
-	GO - Biological Process		
-	GO - Cellular Component		
Unknown (https://www.gephebase.org/search-criteria?/and+Presumptive+Null=^Unknown^#gephebase-summary-title)			Presumptive Null
Cis-regulatory (https://www.gephebase.org/search-criteria?/and+Molecular+Type=^Cis-regulatory^#gephebase-summary-title)			Molecular Type

Unknown (<https://www.gephebase.org/search-criteria?/and+Aberration+Type=^Unknown^#gephebase-summary-title>)

Aberration Type

Not identified

Molecular Details of the Mutation

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

Experimental Evidence

Allelic diversity of the maize B regulatory gene: different leader and promoter sequences of two B alleles determine distinct tissue specificities of anthocyanin production. (1992) (<https://pubmed.ncbi.nlm.nih.gov/1427078>)

Main Reference

Radicella JP; Brown D; Tolar LA; Chandler VL

Authors

The B gene encodes a transcription factor of the basic helix-loop-helix class, which controls the synthesis of the anthocyanin pigments in maize. This gene, as well as the highly homologous R gene family, displays extensive allelic variation in that different alleles cause distinct distributions of anthocyanin pigments in different tissues and at different developmental times. The analysis of the expression of two B alleles, with distinct tissue-specific patterns of anthocyanin synthesis in plant and seed tissues, demonstrates that the amount of B transcripts correlates with the accumulation of anthocyanins in the various tissues. The comparison of the genomic clones for the two alleles reveals high sequence identity in the coding and 3'-flanking regions (98% and approximately 90%, respectively). In contrast, the most 5' region of their mRNAs and the 5'-flanking sequences share no significant sequence identity. This result suggests that the alleles diverged from each other by complex genome rearrangements rather than by simple base pair substitutions. We have used the high velocity microprojectile transformation assay to demonstrate that the differential expression of the two alleles in the seed is determined by their 5' variant sequences. Thus, the variation in tissue-specific anthocyanin synthesis in plants with these different B alleles is controlled at the level of B gene expression.

Abstract

Additional References

RELATED GEPHE

3 (c1, pericarp color1 (P1), r1 colored1) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=^4577^/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title>)

Related Genes

No matches found.

Related Haplotypes

EXTERNAL LINKS

COMMENTS