

GEPHE SUMMARY

	Gephebase Gene	GepheID
Y (<a +y+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase="+Y+"#gephebase-summary-title)	GP00002068	Main curator
Published	Entry Status	-

PHENOTYPIC CHANGE

	Trait Category		
Morphology (<a +morphology+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait+Category="+Morphology+"#gephebase-summary-title)			
	Trait		
Coloration (fruit) (<a +coloration+(fruit)+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="+Coloration+(fruit)+"#gephebase-summary-title)			
	Trait State in Taxon A		
red seed			
	Trait State in Taxon B		
candystripe seed (variegated coloration)			
	Ancestral State		
Taxon A			
	Taxonomic Status		
Domesticated (<a +domesticated+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status="+Domesticated+"#gephebase-summary-title)			
Taxon A		Taxon B	
	Latin Name		Latin Name
Sorghum bicolor (<a +sorghum+bicolor+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Sorghum+bicolor+"#gephebase-summary-title)		Sorghum bicolor (<a +sorghum+bicolor+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Sorghum+bicolor+"#gephebase-summary-title)	
	Common Name		Common Name
sorghum		sorghum	
	Synonyms		Synonyms
Andropogon sorghum; Sorghum bicolor subsp. bicolor; Sorghum nervosum; Sorghum saccharatum; Sorghum vulgare; sorghum; broomcorn; milo; Andropogon sorghum (L.) Brot.; Sorghum bicolor (L.) Moench; Sorghum nervosum Besser ex Schult.; Sorghum saccharatum (L.) Moench; Sorghum vulgare Pers.; Sorghum bicolor milo; Sorghum_bicolor		Andropogon sorghum; Sorghum bicolor subsp. bicolor; Sorghum nervosum; Sorghum saccharatum; Sorghum vulgare; sorghum; broomcorn; milo; Andropogon sorghum (L.) Brot.; Sorghum bicolor (L.) Moench; Sorghum nervosum Besser ex Schult.; Sorghum saccharatum (L.) Moench; Sorghum vulgare Pers.; Sorghum bicolor milo; Sorghum_bicolor	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Andropogonodae; Andropogoneae; Sorghinae; Sorghum		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Andropogonodae; Andropogoneae; Sorghinae; Sorghum	
	Parent		Parent
Sorghum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4557)		Sorghum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4557)	
	NCBI Taxonomy ID		NCBI Taxonomy ID
4558 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4558)		4558 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4558)	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		No	

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Zea mays
P1		O24579 (http://www.uniprot.org/uniprot/O24579)
	Synonyms	GenebankID or UniProtKB
P; GRMZM2G084799		Sorghum bicolor
	String	
-		C5XMT5 (https://www.ncbi.nlm.nih.gov/nuccore/C5XMT5)
	Sequence Similarities	
-		
	GO - Molecular Function	
GO:0003677 : DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003677)		
	GO - Biological Process	
-		
	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=~Unknown~#gephebase-summary-title>)

Molecular Type

Coding (<https://www.gephebase.org/search-criteria?/and+Molecular Type=~Coding~#gephebase-summary-title>)

Aberration Type

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

Insertion Size

10-100 kb

Molecular Details of the Mutation

insertion of a transposable element named Candystripe1 (Cs1) in the second intron of the Y gene - Cs1 is 23,018 bp in size and is bordered by 20-bp terminal inverted repeat sequences. It generated a 3-bp target site duplication upon insertion within the Y gene. Cs1 shares features of the CACTA superfamily of transposons.

Experimental Evidence

Candidate Gene (<https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Candidate Gene~#gephebase-summary-title>)

Main Reference

Molecular characterization of a mutable pigmentation phenotype and isolation of the first active transposable element from Sorghum bicolor. (1999) (<https://pubmed.ncbi.nlm.nih.gov/10611384>)

Authors

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Abstract

Accumulation of red phlobaphene pigments in sorghum grain pericarp is under the control of the Y gene. A mutable allele of Y, designated as y-cs (y-candystripe), produces a variegated pericarp phenotype. Using probes from the maize p1 gene that cross-hybridize with the sorghum Y gene, we isolated the y-cs allele containing a large insertion element. Our results show that the Y gene is a member of the MYB-transcription factor family. The insertion element, named Candystripe1 (Cs1), is present in the second intron of the Y gene and shares features of the CACTA superfamily of transposons. Cs1 is 23,018 bp in size and is bordered by 20-bp terminal inverted repeat sequences. It generated a 3-bp target site duplication upon insertion within the Y gene and excised from y-cs, leaving a 2-bp footprint in two cases analyzed. Reinsertion of the excised copy of Cs1 was identified by Southern hybridization in the genome of each of seven red pericarp revertant lines tested. Cs1 is the first active transposable element isolated from sorghum. Our analysis suggests that Cs1-homologous sequences are present in low copy number in sorghum and other grasses, including sudangrass, maize, rice, teosinte, and sugarcane. The low copy number and high transposition frequency of Cs1 imply that this transposon could prove to be an efficient gene isolation tool in sorghum.

Additional References

RELATED GEPHE

No matches found.

Related Genes

No matches found.

Related Haplotypes

EXTERNAL LINKS

COMMENTS

@TE - maize p1 and sorghum Y genes are probably orthologous. They encode for MYB transcription factors.