

GEPHE SUMMARY

	Gephebase Gene	GephelD
Shattering1 - ZmSh1-5.1 + ZmSh1-5.2 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^Shattering1 - ZmSh1-5.1 + ZmSh1-5.2^#gephebase-summary-title)	GP00001044	
	Entry Status	Main curator
Published	Courtier	

PHENOTYPIC CHANGE

	Trait Category		
Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title)	Trait		
Seed shattering (https://www.gephebase.org/search-criteria?/and+Trait=^Seed shattering^#gephebase-summary-title)	Trait State in Taxon A		
Zea mays ssp. parviflora and mexicana (teosinte)	Trait State in Taxon B		
Zea mays ssp. Mays	Ancestral State		
Data not curated	Taxonomic Status		
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Domesticated^#gephebase-summary-title)			
	Taxon A	Taxon B	
	Latin Name	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)	
	Common Name	Common Name	
-	-	-	
	Synonyms	Synonyms	
Zea mays var. japonica; maize; Zea mays L.; Zea mays mays	Zea mays var. japonica; maize; Zea mays L.; Zea mays mays	Zea mays var. japonica; maize; Zea mays L.; Zea mays mays	
	Rank	Rank	
species	species	species	
	Lineage	Lineage	
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Andropogonidae; Andropogoneae; Tripsacinae; Zea	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Andropogonidae; Andropogoneae; Tripsacinae; Zea	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Andropogonidae; Andropogoneae; Tripsacinae; Zea	
	Parent	Parent	
Zea () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4575)	Zea () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4575)	Zea () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4575)	
	NCBI Taxonomy ID	NCBI Taxonomy ID	
4577 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4577)	4577 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4577)	4577 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4577)	
	is Taxon A an Infraspecies?	is Taxon B an Infraspecies?	
Yes	Yes	Yes	
	Taxon A Description	Taxon B Description	
Zea mays ssp. parviflora and mexicana (teosinte)	Zea mays ssp. Mays		

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Oryza sativa subsp. japonica
YAB2		
FIL2; Os03g065000; LOC_Os03g44710	Synonyms	GenebankID or UniProtKB
39947.LOC_Os03g44710.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=39947.LOC_Os03g44710.1)	String	0
	Sequence Similarities	
Belongs to the YABBY family.		
	GO - Molecular Function	
GO:0046872 : metal ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0046872)	GO - Biological Process	
GO:0007275 : multicellular organism development (https://www.ebi.ac.uk/QuickGO/term/GO:0007275)		

GO:0045165 : cell fate commitment (<https://www.ebi.ac.uk/QuickGO/term/GO:0045165>)

GO:0010158 : abaxial cell fate specification

(<https://www.ebi.ac.uk/QuickGO/term/GO:0010158>)

GO - Cellular Component

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

Presumptive Null

No (<https://www.gephebase.org/search-criteria?/and+Presumptive+Null=%No%#gephebase-summary-title>)

Molecular Type

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

Aberration Type

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

Molecular Details of the Mutation

various structural variations

Experimental Evidence

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

Main Reference

Parallel domestication of the Shattering1 genes in cereals. (2012) (<https://pubmed.ncbi.nlm.nih.gov/22581231>)

Authors

Lin Z; Li X; Shannon LM; Yeh CT; Wang ML; Bai G; Peng Z; Li J; Trick HN; Clemente TE; Doebley J; Schnable PS; Tuinstra MR; Tesso TT; White F; Yu J

Abstract

A key step during crop domestication is the loss of seed shattering. Here, we show that seed shattering in sorghum is controlled by a single gene, Shattering1 (Sh1), which encodes a YABBY transcription factor. Domesticated sorghums harbor three different mutations at the Sh1 locus. Variants at regulatory sites in the promoter and intronic regions lead to a low level of expression, a 2.2-kb deletion causes a truncated transcript that lacks exons 2 and 3, and a GT-to-GG splice-site variant in the intron 4 results in removal of the exon 4. The distributions of these non-shattering haplotypes among sorghum landraces suggest three independent origins. The function of the rice ortholog (OsSh1) was subsequently validated with a shattering-resistant mutant, and two maize orthologs (ZmSh1-1 and ZmSh1-5.1+ZmSh1-5.2) were verified with a large mapping population. Our results indicate that Sh1 genes for seed shattering were under parallel selection during sorghum, rice and maize domestication.

Additional References

RELATED GEPHE

Related Genes

1 (Shattering1 - ZmSh1-1) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=%4577%/and+Trait=Seed+shattering/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

Verify Orthology