

GEPHE SUMMARY

Shattering1 - ZmSh1-1 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase+Shattering1+ZmSh1-1#gephebase-summary-title)		Gephebase Gene	GP00001043	GepheID
Published	Entry Status	Courtier		Main curator

PHENOTYPIC CHANGE

Physiology (https://www.gephebase.org/search-criteria?/and+Trait+Category+Physiology#gephebase-summary-title)		Trait Category		
Seed shattering (https://www.gephebase.org/search-criteria?/and+Trait+Seed+shattering#gephebase-summary-title)		Trait		
Zea mays ssp. parviglumis and mexicana (teosinte)		Trait State in Taxon A		
Zea mays ssp. Mays		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		Taxon B
Zea mays (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Zea+mays#gephebase-summary-title)		Latin Name	Zea mays (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Zea+mays#gephebase-summary-title)	Latin Name
-		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
Yes		is Taxon A an Intraspecies?	Yes	is Taxon B an Intraspecies?
Zea mays ssp. parviglumis and mexicana (teosinte)		Taxon A Description	Zea mays ssp. Mays	Taxon B Description

GENOTYPIC CHANGE

YAB2		Generic Gene Name	UniProtKB Oryza sativa subsp. japonica
FIL2; Os03g0650000; LOC_Os03g44710		Synonyms	Q10FZ7 (http://www.uniprot.org/uniprot/Q10FZ7)
39947.LOC_Os03g44710.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=39947.LOC_Os03g44710.1)		String	0
Belongs to the YABBY family.		Sequence Similarities	
GO:0046872 : metal ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0046872)		GO - Molecular Function	
GO:0007275 : multicellular organism development (https://www.ebi.ac.uk/QuickGO/term/GO:0007275)		GO - Biological Process	
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](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](https://www.gephebase.org/search-criteria?/and+Molecular+Type+Coding+gephebase-summary-title))

Aberration Type

Complex Change ([https://www.gephebase.org/search-criteria?/and+Aberration Type+Complex Change+ #gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration+Type+Complex+Change+gephebase-summary-title))

Molecular Details of the Mutation

complex structural variations

Experimental Evidence

Association Mapping ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence+ Association Mapping+ #gephebase-summary-title](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 - ZmSh1-5.1 + ZmSh1-5.2) ([https://www.gephebase.org/search-criteria?/or+Taxon ID+4577+and+Trait=Seed shattering/and+groupHaplotypes=true#gephebase-summary-title](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