

GEPHE SUMMARY

<p>Shattering1 - Sh1 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase+Shattering1+Sh1#gephebase-summary-title)</p> <p>Published</p>	<p>Gephebase Gene</p> <p>Entry Status</p>	<p>GP00001040</p> <p>Martin</p>	<p>GepheID</p> <p>Main curator</p>
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PHENOTYPIC CHANGE

<p>Physiology (https://www.gephebase.org/search-criteria?/and+Trait+Category+Physiology#gephebase-summary-title)</p> <p>Seed shattering (https://www.gephebase.org/search-criteria?/and+Trait+Seed+shattering#gephebase-summary-title)</p> <p>Sorghum virgatum - shattering</p> <p>Sorghum bicolor; Tx623-like non-shattering</p> <p>Taxon A</p> <p>Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status+Domesticated#gephebase-summary-title)</p>	<p>Trait Category</p> <p>Trait</p> <p>Trait State in Taxon A</p> <p>Trait State in Taxon B</p> <p>Ancestral State</p> <p>Taxonomic Status</p>	<p>Taxon A</p> <p>Latin Name</p> <p>Sorghum virgatum (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Sorghum+virgatum#gephebase-summary-title)</p> <p>Common Name</p> <p>-</p> <p>Synonyms</p> <p>Sorghum bicolor var. virgatum; Sorghum bicolor var. virgatum (Hack.) de Wet & Huckabay, nom. inval.; Sorghum virgatum (Hack.) Stapf</p> <p>Rank</p> <p>species</p> <p>Lineage</p> <p>cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Andropogonodae; Andropogoneae; Sorghinae; Sorghum</p> <p>Parent</p> <p>Sorghum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4557)</p> <p>NCBI Taxonomy ID</p> <p>1428165 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=1428165)</p> <p>is Taxon A an Intraspecies?</p> <p>No</p>	<p>Taxon B</p> <p>Latin Name</p> <p>Sorghum bicolor (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Sorghum+bicolor#gephebase-summary-title)</p> <p>Common Name</p> <p>sorghum</p> <p>Synonyms</p> <p>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</p> <p>Rank</p> <p>species</p> <p>Lineage</p> <p>cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Andropogonodae; Andropogoneae; Sorghinae; Sorghum</p> <p>Parent</p> <p>Sorghum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4557)</p> <p>NCBI Taxonomy ID</p> <p>4558 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4558)</p> <p>is Taxon B an Intraspecies?</p> <p>Yes</p> <p>Taxon B Description</p> <p>Sorghum bicolor; Tx623-like non-shattering</p>
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GENOTYPIC CHANGE

<p>YAB2</p> <p>FIL2; Os03g0650000; LOC_Os03g44710</p> <p>39947.LOC_Os03g44710.1 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=39947.LOC_Os03g44710.1)</p> <p>Sequence Similarities</p> <p>Belongs to the YABBY family.</p> <p>GO - Molecular Function</p> <p>GO:0046872 : metal ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0046872)</p> <p>GO - Biological Process</p>	<p>Generic Gene Name</p> <p>Synonyms</p> <p>String</p>	<p>UniProtKB Oryza sativa subsp. japonica</p> <p>Q10FZ7 (http://www.uniprot.org/uniprot/Q10FZ7)</p> <p>GenebankID or UniProtKB</p> <p>()</p>
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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

Yes ([https://www.gephebase.org/search-criteria?/and+Presumptive Null=~Yes^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive+Null=~Yes^#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

Deletion ([https://www.gephebase.org/search-criteria?/and+Aberration Type=~Deletion^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration+Type=~Deletion^#gephebase-summary-title))

Deletion Size

1-10 kb

Molecular Details of the Mutation

2.2kb deletion at the location of exons 2 and 3

Experimental Evidence

Linkage Mapping ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Linkage Mapping^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=~Linkage+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

No matches found.

Related Haplotypes

2 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase=~Shattering1 - Sh1^/and+Taxon ID=~1428165^/or+Gene Gephebase=~Shattering1 - Sh1^/and+Taxon ID=~4558^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=~Shattering1+Sh1^/and+Taxon+ID=~1428165^/or+Gene+Gephebase=~Shattering1+Sh1^/and+Taxon+ID=~4558^#gephebase-summary-title))

EXTERNAL LINKS

COMMENTS

Verify Orthology