

GEPHE SUMMARY

ds1 (https://www.gephebase.org/search-criteria/?and+Gene Gephebase=^ds1^#gephebase-summary-title)	Gephebase Gene	GP00000238	GepheID
	Entry Status	Martin	Main curator
Published			

PHENOTYPIC CHANGE

	Trait Category		
Physiology (https://www.gephebase.org/search-criteria/?and+Trait Category=^Physiology^#gephebase-summary-title)	Trait		
Pathogen resistance (https://www.gephebase.org/search-criteria/?and+Trait=^Pathogen resistance^#gephebase-summary-title)	Trait State in Taxon A		
Sorghum bicolor	Trait State in Taxon B		
Sorghum bicolor - resistant	Ancestral State		
Data not curated	Taxonomic Status		
Domesticated (https://www.gephebase.org/search-criteria/?and+Taxonomic Status=^Domesticated^#gephebase-summary-title)			
Taxon A	Latin Name	Taxon B	Latin Name
Sorghum bicolor (https://www.gephebase.org/search-criteria/?and+Taxon and Synonyms=^Sorghum bicolor^#gephebase-summary-title)		Sorghum bicolor (https://www.gephebase.org/search-criteria/?and+Taxon and Synonyms=^Sorghum bicolor^#gephebase-summary-title)	
sorghum	Common Name	sorghum	Common Name
	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	Lineage	species	Lineage
cellular organisms; Eukaryota; Viriplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphylophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; Liliopsida; Petrosavidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Andropogonodae; Andropogoneae; Sorghinae; Sorghum		cellular organisms; Eukaryota; Viriplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphylophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; Liliopsida; Petrosavidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Andropogonodae; Andropogoneae; Sorghinae; Sorghum	
Sorghum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4557)	Parent	Sorghum () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4557)	Parent
4558 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4558)	NCBI Taxonomy ID	4558 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4558)	NCBI Taxonomy ID
	is Taxon A an Infraspecies?		is Taxon B an Infraspecies?
No		No	

GENOTYPIC CHANGE

ds1	Generic Gene Name	UniProtKB Sorghum bicolor
-	Synonyms	GenebankID or UniProtKB
-	String	BAM45642 (https://www.ncbi.nlm.nih.gov/nuccore/BAM45642)
	Sequence Similarities	
Belongs to the protein kinase superfamily. Ser/Thr protein kinase family.		
GO - Molecular Function		
GO:0005524 : ATP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005524)		
GO:0004674 : protein serine/threonine kinase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004674)		
GO - Biological Process		
-		
	GO - Cellular Component	

GO:0016021 : integral component of membrane
(<https://www.ebi.ac.uk/QuickGO/term/GO:0016021>)

Presumptive Null

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

Molecular Type

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

Aberration Type

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

Molecular Details of the Mutation

unknown

Experimental Evidence

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

Main Reference

Positional cloning of ds1, the target leaf spot resistance gene against Bipolaris sorghicola in sorghum. (2011) (<https://pubmed.ncbi.nlm.nih.gov/21442410>)

Authors

Kawahigashi H; Kasuga S; Ando T; Kanamori H; Wu J; Yonemaru J; Sazuka T; Matsumoto T

Abstract

Target leaf spot is one of the major sorghum diseases in southern Japan and caused by a necrotrophic fungus, *Bipolaris sorghicola*. Sorghum resistance to target leaf spot is controlled by a single recessive gene (ds1). A high-density genetic map of the ds1 locus was constructed with simple sequence repeat markers using progeny from crosses between a sensitive variety, bmr-6, and a resistant one, SIL-05, which allowed the ds1 gene to be genetically located within a 26-kb region on the short arm of sorghum chromosome 5. The sorghum genome annotation database for BTx623, for which the whole genome sequence was recently published, indicated a candidate gene from the Leucine-Rich Repeat Receptor Kinase family in this region. The candidate protein kinase gene was expressed in susceptible plants but was not expressed or was severely reduced in resistant plants. The expression patterns of ds1 gene and the phenotype of target leaf spot resistance were clearly correlated. Genomic sequences of this region in parental varieties showed a deletion in the promoter region of SIL-05 that could cause reduction of gene expression. We also found two ds1 alleles for resistant phenotypes with a stop codon in the coding region. The results shown here strongly suggest that the loss of function or suppression of the ds1 protein kinase gene leads to resistance to target leaf spot in sorghum.

Additional References

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS