

GEPHE SUMMARY

	Gephebase Gene		GepheID
ds1 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase+^ds1+^#gephebase-summary-title)		GP00000238	
	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		Taxon B	
	Latin Name		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)	
	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 Sorghum bicolor
ds1		K0IXC4 (http://www.uniprot.org/uniprot/K0IXC4)	
	Synonyms		GenebankID or UniProtKB
-		BAM45642 (https://www.ncbi.nlm.nih.gov/nuccore/BAM45642)	
	String		
-			
	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](https://www.gephebase.org/search-criteria?/and+Presumptive+Null=))

Molecular Type

Unknown ([https://www.gephebase.org/search-criteria?/and+Molecular Type="+Unknown`#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular+Type=))

Aberration Type

Unknown ([https://www.gephebase.org/search-criteria?/and+Aberration Type="+Unknown`#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration+Type=))

Molecular Details of the Mutation

unknown

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=))

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

No matches found.

Related Genes

No matches found.

Related Haplotypes

EXTERNAL LINKS

COMMENTS