

GEPHE SUMMARY

Gephebase Gene		GepheID
phytochrome B (PHYB) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase="phytochrome B (PHYB)"#gephebase-summary-title)		GP00000872
Entry Status		Martin
Published		Main curator

PHENOTYPIC CHANGE

Trait Category			
Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category="Physiology"#gephebase-summary-title)		Trait	
Light sensitivity (https://www.gephebase.org/search-criteria?/and+Trait="Light sensitivity"#gephebase-summary-title)		Trait State in Taxon A	
Sorghum bicolor - Ma3		Trait State in Taxon B	
Sorghum bicolor - ma3R		Ancestral State	
Taxon A		Taxonomic Status	
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic Status="Domesticated"#gephebase-summary-title)			
Taxon A		Taxon B	
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?	
Yes		Yes	
Taxon A Description		Taxon B Description	
Sorghum bicolor - Ma3		Sorghum bicolor - ma3R	

GENOTYPIC CHANGE

Generic Gene Name		UniProtKB Arabidopsis thaliana
PHYB		P14713 (http://www.uniprot.org/uniprot/P14713)
Synonyms		GenebankID or UniProtKB
HY3; MSF3.17; MSF3_17; OOP1; OUT OF PHASE 1; phytochrome B; PHYTOCHROME B; At2g18790		AAR30906 (https://www.ncbi.nlm.nih.gov/nuccore/AAR30906)
String		
3702.AT2G18790.1 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=3702.AT2G18790.1)		
Sequence Similarities		
Belongs to the phytochrome family.		
GO - Molecular Function		
GO:0042802 : identical protein binding		

(<https://www.ebi.ac.uk/QuickGO/term/GO:0042802>)
GO:0042803 : protein homodimerization activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0042803>)
GO:0043565 : sequence-specific DNA binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:0043565>)
GO:0000155 : phosphorelay sensor kinase activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0000155>)
GO:0031516 : far-red light photoreceptor activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0031516>)
GO:0009883 : red or far-red light photoreceptor activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009883>)
GO:1990841 : promoter-specific chromatin binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:1990841>)
GO:0031517 : red light photoreceptor activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0031517>)

GO - Biological Process

GO:0009640 : photomorphogenesis
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009640>)
GO:0045892 : negative regulation of transcription, DNA-templated
(<https://www.ebi.ac.uk/QuickGO/term/GO:0045892>)
GO:0009409 : response to cold (<https://www.ebi.ac.uk/QuickGO/term/GO:0009409>)
GO:0006325 : chromatin organization
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006325>)
GO:0010617 : circadian regulation of calcium ion oscillation
(<https://www.ebi.ac.uk/QuickGO/term/GO:0010617>)
GO:0009638 : phototropism (<https://www.ebi.ac.uk/QuickGO/term/GO:0009638>)
GO:0018298 : protein-chromophore linkage
(<https://www.ebi.ac.uk/QuickGO/term/GO:0018298>)
GO:2000028 : regulation of photoperiodism, flowering
(<https://www.ebi.ac.uk/QuickGO/term/GO:2000028>)
GO:0010244 : response to low fluence blue light stimulus by blue low-fluence system
(<https://www.ebi.ac.uk/QuickGO/term/GO:0010244>)
GO:0009867 : jasmonic acid mediated signaling pathway
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009867>)
GO:0010148 : transpiration (<https://www.ebi.ac.uk/QuickGO/term/GO:0010148>)
GO:0009266 : response to temperature stimulus
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009266>)
GO:0010218 : response to far red light
(<https://www.ebi.ac.uk/QuickGO/term/GO:0010218>)
GO:0009649 : entrainment of circadian clock
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009649>)
GO:0009584 : detection of visible light
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009584>)
GO:0009630 : gravitropism (<https://www.ebi.ac.uk/QuickGO/term/GO:0009630>)
GO:0010161 : red light signaling pathway
(<https://www.ebi.ac.uk/QuickGO/term/GO:0010161>)
GO:0009687 : abscisic acid metabolic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0009687>)
GO:0015979 : photosynthesis (<https://www.ebi.ac.uk/QuickGO/term/GO:0015979>)
GO:0017012 : protein-phytochromobilin linkage
(<https://www.ebi.ac.uk/QuickGO/term/GO:0017012>)
GO:0031347 : regulation of defense response
(<https://www.ebi.ac.uk/QuickGO/term/GO:0031347>)
GO:0010029 : regulation of seed germination
(<https://www.ebi.ac.uk/QuickGO/term/GO:0010029>)
GO:0010202 : response to low fluence red light stimulus
(<https://www.ebi.ac.uk/QuickGO/term/GO:0010202>)
GO:0010374 : stomatal complex development
(<https://www.ebi.ac.uk/QuickGO/term/GO:0010374>)

GO - Cellular Component

GO:0005829 : cytosol (<https://www.ebi.ac.uk/QuickGO/term/GO:0005829>)
GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)
GO:0016604 : nuclear body (<https://www.ebi.ac.uk/QuickGO/term/GO:0016604>)
GO:0016607 : nuclear speck (<https://www.ebi.ac.uk/QuickGO/term/GO:0016607>)

No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=~No~#gephebase-summary-title)	Presumptive Null
Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=~Coding~#gephebase-summary-title)	Molecular Type
Deletion (https://www.gephebase.org/search-criteria?/and+Aberration Type=~Deletion~#gephebase-summary-title)	Aberration Type
1-9 bp	Deletion Size
1bp deletion 30bp upstream of the stop codon	Molecular Details of the Mutation
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Linkage Mapping~#gephebase-summary-title)	Experimental Evidence
The sorghum photoperiod sensitivity gene, Ma3, encodes a phytochrome B. (1997) (https://pubmed.ncbi.nlm.nih.gov/9046599)	Main Reference

Childs KL; Miller FR; Cordonnier-Pratt MM; Pratt LH; Morgan PW; Mullet JE

Abstract

The Ma3 gene is one of six genes that regulate the photoperiodic sensitivity of flowering in sorghum (*Sorghum bicolor* [L.] Moench). The ma3R mutation of this gene causes a phenotype that is similar to plants that are known to lack phytochrome B, and ma3 sorghum lacks a 123-KD phytochrome that predominates in light-grown plants and that is present in non-ma3 plants. A population segregating for Ma3 and ma3 was created and used to identify two randomly amplified polymorphic DNA markers linked to Ma3. These two markers were cloned and mapped in a recombinant inbred population as restriction fragment length polymorphisms. cDNA clones of PHYA and PHYC were cloned and sequenced from a cDNA library prepared from green sorghum leaves. Using a genome-walking technique, a 7941-bp partial sequence of PHYB, was determined from genomic DNA from ma3 sorghum. PHYA, PHYB, and PHYC all mapped to the same linkage group. The Ma3-linked markers mapped with PHYB more than 121 centimorgans from PHYA and PHYC. A frameshift mutation resulting in a premature stop codon was found in the PHYB sequence from ma3 sorghum. Therefore, we conclude that the Ma3 locus in sorghum is a PHYB gene that encodes a 123-kD phytochrome.

Additional References

RELATED GEPHE

No matches found.

Related Genes

No matches found.

Related Haplotypes

EXTERNAL LINKS

COMMENTS