

## GEPHE SUMMARY

<p>PRR37 pseudoresponse regulator protein 37 (<a href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase+PRR37+pseudoresponse+regulator+protein+37">#gephebase-summary-title</a>)</p> <p>Published</p>	<p>Gephebase Gene</p> <p>Entry Status</p>	<p>GP00000930</p> <p>Martin</p>	<p>GepheID</p> <p>Main curator</p>
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## PHENOTYPIC CHANGE

<p>Physiology (<a href="https://www.gephebase.org/search-criteria?/and+Trait+Category+Physiology">#gephebase-summary-title</a>)</p> <p>Flowering time (<a href="https://www.gephebase.org/search-criteria?/and+Trait+Flowering+time">#gephebase-summary-title</a>)</p> <p>Sorghum bicolor</p> <p>Sorghum bicolor- SM100 and BTx406</p> <p>Taxon A</p> <p>Domesticated (<a href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status+Domesticated">#gephebase-summary-title</a>)</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>Sorghum bicolor (<a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Sorghum+bicolor">#gephebase-summary-title</a>)</p> <p>sorghum</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) (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4557">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4557</a>)</p> <p>NCBI Taxonomy ID</p> <p>4558 (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4558">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4558</a>)</p> <p>is Taxon A an Intraspecies?</p> <p>No</p>	<p>Taxon B</p> <p>Latin Name</p> <p>Common Name</p> <p>Synonyms</p> <p>Rank</p> <p>Lineage</p> <p>Parent</p> <p>NCBI Taxonomy ID</p> <p>is Taxon B an Intraspecies?</p> <p>Taxon B Description</p>	<p>Latin Name</p> <p>Sorghum bicolor (<a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Sorghum+bicolor">#gephebase-summary-title</a>)</p> <p>sorghum</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) (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4557">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4557</a>)</p> <p>NCBI Taxonomy ID</p> <p>4558 (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4558">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4558</a>)</p> <p>is Taxon B an Intraspecies?</p> <p>Yes</p> <p>Sorghum bicolor- SM100 and BTx406</p>
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## GENOTYPIC CHANGE

<p>PRR37</p> <p>PRR37; OsPRR37; DTH7; HD2; Os07g0695100; LOC_Os07g49460; P0627E10.21</p> <p>39947.LOC_Os07g49460.1 (<a href="http://string-db.org/newstring.cgi/show_network_section.pl?identifier=39947.LOC_Os07g49460.1">http://string-db.org/newstring.cgi/show_network_section.pl?identifier=39947.LOC_Os07g49460.1</a>)</p> <p>Belongs to the ARR-like family.</p>	<p>Generic Gene Name</p> <p>Synonyms</p> <p>String</p> <p>Sequence Similarities</p> <p>GO - Molecular Function</p>	<p>UniProtKB Oryza sativa subsp. japonica Q0D3B6 (<a href="http://www.uniprot.org/uniprot/Q0D3B6">http://www.uniprot.org/uniprot/Q0D3B6</a>)</p> <p>AGN92469 (<a href="https://www.ncbi.nlm.nih.gov/nuccore/AGN92469">https://www.ncbi.nlm.nih.gov/nuccore/AGN92469</a>)</p> <p>GenebankID or UniProtKB</p>
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GO - Biological Process

GO:0009908 : flower development (<https://www.ebi.ac.uk/QuickGO/term/GO:0009908>)  
 GO:0000160 : phosphorelay signal transduction system  
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0000160>)  
 GO:0009585 : red, far-red light phototransduction  
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0009585>)  
 GO:0048579 : negative regulation of long-day photoperiodism, flowering  
 (<https://www.ebi.ac.uk/QuickGO/term/GO:0048579>)  
 GO:0048511 : rhythmic process (<https://www.ebi.ac.uk/QuickGO/term/GO:0048511>)

GO - Cellular Component

GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)

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)) Presumptive Null

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)) Molecular 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)) Aberration Type

1-9 bp Deletion Size

1bp deletion resulting in frameshift Molecular Details of the Mutation

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)) Experimental Evidence

Coincident light and clock regulation of pseudoresponse regulator protein 37 (PRR37) controls photoperiodic flowering in sorghum. (2011) (<https://pubmed.ncbi.nlm.nih.gov/21930910>) Main Reference

Murphy RL; Klein RR; Morishige DT; Brady JA; Rooney WL; Miller FR; Dugas DV; Klein PE; Mullet JE Authors

Optimal flowering time is critical to the success of modern agriculture. Sorghum is a short-day tropical species that exhibits substantial photoperiod sensitivity and delayed flowering in long days. Genotypes with reduced photoperiod sensitivity enabled sorghum's utilization as a grain crop in temperate zones worldwide. In the present study, Ma(1), the major repressor of sorghum flowering in long days, was identified as the pseudoresponse regulator protein 37 (PRR37) through positional cloning and analysis of SbPRR37 alleles that modulate flowering time in grain and energy sorghum. Several allelic variants of SbPRR37 were identified in early flowering grain sorghum germplasm that contain unique loss-of-function mutations. We show that in long days SbPRR37 activates expression of the floral inhibitor CONSTANS and represses expression of the floral activators Early Heading Date 1, FLOWERING LOCUS T, Zea mays CENTRORADIALIS 8, and floral induction. Expression of SbPRR37 is light dependent and regulated by the circadian clock, with peaks of RNA abundance in the morning and evening in long days. In short days, the evening-phase expression of SbPRR37 does not occur due to darkness, allowing sorghum to flower in this photoperiod. This study provides insight into an external coincidence mechanism of photoperiodic regulation of flowering time mediated by PRR37 in the short-day grass sorghum and identifies important alleles of SbPRR37 that are critical for the utilization of this tropical grass in temperate zone grain and bioenergy production. Abstract

Additional References

RELATED GEPHE

1 (Heading Date 1 (HD1)) ([https://www.gephebase.org/search-criteria?/or+Taxon ID=~4558~/and+Trait=Flowering time/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon+ID=~4558~/and+Trait=Flowering+time/and+groupHaplotypes=true#gephebase-summary-title)) Related Genes

2 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase=~PRR37 pseudoresponse regulator protein 37~/and+Taxon ID=~4558~/or+Gene Gephebase=~PRR37 pseudoresponse regulator protein 37~/and+Taxon ID=~4558~#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=~PRR37+pseudoresponse+regulator+protein+37~/and+Taxon+ID=~4558~/or+Gene+Gephebase=~PRR37+pseudoresponse+regulator+protein+37~/and+Taxon+ID=~4558~#gephebase-summary-title)) Related Haplotypes

EXTERNAL LINKS

COMMENTS