

GEPHE SUMMARY

	Gephebase Gene		GepheID
phytoene synthase (<a +phytoene+synthase+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase="+phytoene+synthase+"#gephebase-summary-title)	GP00000875		
	Entry Status	Martin	Main curator
Published			

PHENOTYPIC CHANGE

	Trait Category		
Physiology (<a +physiology+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait+Category="+Physiology+"#gephebase-summary-title)		Trait	
Carotenoid content (seed) (<a +carotenoid+content+(seed)+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="+Carotenoid+content+(seed)+"#gephebase-summary-title)		Trait State in Taxon A	
Zea mays - white		Trait State in Taxon B	
Zea mays - yellow orange		Ancestral State	
Data not curated		Taxonomic Status	
Domesticated (<a +domesticated+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status="+Domesticated+"#gephebase-summary-title)			
	Taxon A		Taxon B
	Latin Name		Latin Name
Zea mays (<a +zea+mays+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Zea+mays+"#gephebase-summary-title)		Zea mays (<a +zea+mays+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Zea+mays+"#gephebase-summary-title)	
-	Common Name	-	Common Name
	Synonyms		Synonyms
Zea mays var. japonica; maize; Zea mays L.; Zea mays mays		Zea mays var. japonica; maize; Zea mays L.; Zea mays mays	
species	Rank	species	Rank
	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Andropogonodae; Andropogoneae; Tripsacinae; Zea		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Andropogonodae; Andropogoneae; Tripsacinae; Zea	
	Parent		Parent
Zea () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4575)		Zea () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4575)	
4577 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4577)	NCBI Taxonomy ID	4577 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4577)	NCBI Taxonomy ID
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		No	

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Zea mays
PSY1		P49085 (http://www.uniprot.org/uniprot/P49085)	
pb1; PSY1; ZmPSY1; GRMZM2G300348; Y1; ZEAMMB73_Zm00001d036345	Synonyms	U32636 (https://www.ncbi.nlm.nih.gov/nuccore/U32636)	GenebankID or UniProtKB
4577.GRMZM2G300348_P02 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=4577.GRMZM2G300348_P02)	String		
	Sequence Similarities		
Belongs to the phytoene/squalene synthase family.			
	GO - Molecular Function		
GO:0004310 : farnesyl-diphosphate farnesyltransferase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004310)			
GO:0016767 : geranylgeranyl-diphosphate geranylgeranyltransferase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0016767)			
GO:0046905 : phytoene synthase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0046905)			
GO:0051996 : squalene synthase activity			

(https://www.ebi.ac.uk/QuickGO/term/GO:0051996)	GO - Biological Process	
GO:0006696 : ergosterol biosynthetic process (https://www.ebi.ac.uk/QuickGO/term/GO:0006696) GO:0016117 : carotenoid biosynthetic process (https://www.ebi.ac.uk/QuickGO/term/GO:0016117)	GO - Cellular Component	
GO:0010287 : plastoglobule (https://www.ebi.ac.uk/QuickGO/term/GO:0010287)		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
Not identified		Experimental Evidence
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Linkage Mapping~#gephebase-summary-title)		Main Reference
Contrasting effects of selection on sequence diversity and linkage disequilibrium at two phytoene synthase loci. (2003) (https://pubmed.ncbi.nlm.nih.gov/12897253)		Authors
Palaisa KA; Morgante M; Williams M; Rafalski A		Abstract
We investigated the effects of human selection for yellow endosperm color, representing increased carotenoid content, on two maize genes, the Y1 phytoene synthase and PSY2, a putative second phytoene synthase. Multiple polymorphic sites were identified at Y1 and PSY2 in 75 white and yellow maize inbred lines. Many polymorphic sites showed strong association with the endosperm color phenotype at Y1, but no detectable association was found at PSY2. Nucleotide diversity was equivalent for whites and yellows at PSY2 but was 19-fold less in yellows than in whites at Y1, consistent with the white ancestral state of the gene. The strong sequence haplotype conservation within yellows at Y1 and a significant, negative Tajima's D both verified positive selection for yellow endosperm. We propose that two independent gain-of-function events associated with insertions into the promoter of the Y1 gene and upregulation of expression in endosperm have been incorporated into yellow maize.		
The y1 gene of maize codes for phytoene synthase. (1996) (https://pubmed.ncbi.nlm.nih.gov/8722797)		Additional References

RELATED GEPHE

	Related Genes
No matches found.	
	Related Haplotypes
No matches found.	

EXTERNAL LINKS

COMMENTS