

GEPHE SUMMARY

opaque2 (O2) (https://www.gephebase.org/search-criteria?/and+GeneGephebase=^opaque2 (O2)^#gephebase-summary-title)	Gephebase Gene	GP00000754	GephelD
	Entry Status	Martin	Main curator
Published			

PHENOTYPIC CHANGE

	Trait Category
Physiology (https://www.gephebase.org/search-criteria?/and+TraitCategory=^Physiology^#gephebase-summary-title)	Trait
Lysine content (endosperm) (https://www.gephebase.org/search-criteria?/and+Trait=^Lysine content (endosperm)^#gephebase-summary-title)	Trait State in Taxon A
Zea mays - hard translucent endosperm	Trait State in Taxon B
Zea mays - soft opaque endosperm with lysine contents - allele o2-m	Ancestral State
Taxon A	Taxonomic Status

Taxon A	Latin Name	Taxon B	Latin Name
Zea mays (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Zea mays^#gephebase-summary-title)		Zea mays (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Zea mays^#gephebase-summary-title)	
-	Common Name	-	Common Name
Zea mays var. japonica; maize; Zea mays L.; Zea mays mays species	Synonyms	Zea mays var. japonica; maize; Zea mays L.; Zea mays mays species	Synonyms
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Andropogonodae; Andropogoneae; Tripsacinae; Zea	Rank	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Andropogonodae; Andropogoneae; Tripsacinae; Zea	Rank
Zea () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4575)	Lineage	Zea () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4575)	Lineage
4577 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4577)	Parent	4577 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4577)	Parent
is Taxon A an Infraspecies?	NCBI Taxonomy ID	is Taxon B an Infraspecies?	NCBI Taxonomy ID
No		No	

GENOTYPIC CHANGE

O2	Generic Gene Name	UniProtKB Zea mays
-	Synonyms	GenebankID or UniProtKB
4577.GRMZM2G015534_P01 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=4577.GRMZM2G015534_P01)	String	X16618 (https://www.ncbi.nlm.nih.gov/nuccore/X16618)
Belongs to the bZIP family.	Sequence Similarities	
GO:0003700 : DNA-binding transcription factor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003700)	GO - Molecular Function	
GO:0003677 : DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003677)	GO - Biological Process	
-	GO - Cellular Component	
GO:0005634 : nucleus (https://www.ebi.ac.uk/QuickGO/term/GO:0005634)		

No (https://www.gephebase.org/search-criteria/?and+Presumptive+Null=%No%#gephebase-summary-title)	Presumptive Null
Cis-regulatory (https://www.gephebase.org/search-criteria/?and+Molecular+Type=%Cis-regulatory%#gephebase-summary-title)	Molecular Type
Insertion (https://www.gephebase.org/search-criteria/?and+Aberration+Type=%Insertion%#gephebase-summary-title)	Aberration Type
1-10 kb	Insertion Size
insertion of a non-autonomous rbg transposable element in the untranslated leader sequence of the O2 gene	Molecular Details of the Mutation
Linkage Mapping (https://www.gephebase.org/search-criteria/?and+Experimental+Evidence=%Linkage+Mapping%#gephebase-summary-title)	Experimental Evidence
Transposon tagging and molecular analysis of the maize regulatory locus opaque-2. (1987) (https://pubmed.ncbi.nlm.nih.gov/2823388)	Main Reference
Schmidt RJ; Burr FA; Burr B	Authors
Genetic analyses suggested that the opaque-2 (<i>o2</i>) locus in maize acts as a positive, transacting, transcriptional activator of the zein seed storage-protein genes. Because isolation of the gene is requisite to understanding the molecular details of this regulation, transposon mutagenesis with the transposable element suppressor-mutator (<i>Spm</i>) was carried out, and three mutable <i>o2</i> alleles were obtained. One of these alleles contained an 8.3-kilobase autonomous <i>Spm</i> , another a 6.8-kilobase nonautonomous <i>Spm</i> , and the third an unidentified transposon that is unrelated to <i>Spm</i> . A DNA sequence flanking the autonomous <i>Spm</i> insertion was verified to be <i>o2</i> -specific and provided a probe to clone a wild-type allele. Northern blots indicated that the gene is expressed in wild-type endosperm but not in leaf tissues or in endosperms homozygous for a mutant allele of the O2 gene. A transcript was detected in endosperms homozygous for mutations at opaque-7 and floury-2, an indication that O2 expression is independent of these two other putative regulators of zein synthesis.	
Abstract	
Additional References	

RELATED GEPHE

No matches found.	Related Genes
	Related Haplotypes
1 (https://www.gephebase.org/search-criteria/?or+Gene+Gephebase=%opaque2+(O2)%/and+Taxon+ID=%4577%or+Gene+Gephebase=%opaque2+(O2)%/and+Taxon+ID=%4577%#gephebase-summary-title)	

EXTERNAL LINKS

COMMENTS

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