

## GEPHE SUMMARY

	Gephebase Gene		GepheID
CYC-like HaCYC2c ( <a href="https://www.gephebase.org/search-criteria?/and+Gene">https://www.gephebase.org/search-criteria?/and+Gene</a> Gephebase="CYC-like HaCYC2c" #gephebase-summary-title)		GP00000193	
Published	Entry Status	Martin	Main curator

## PHENOTYPIC CHANGE

	Trait Category		
Morphology ( <a href="https://www.gephebase.org/search-criteria?/and+Trait">https://www.gephebase.org/search-criteria?/and+Trait</a> Category="Morphology" #gephebase-summary-title)			
	Trait		
Flower morphology ( <a href="https://www.gephebase.org/search-criteria?/and+Trait">https://www.gephebase.org/search-criteria?/and+Trait</a> morphology" #gephebase-summary-title)			
	Trait State in Taxon A		
Helianthus annuus			
	Trait State in Taxon B		
Helianthus annuus -double-flowered phenotype			
	Ancestral State		
Taxon A			
	Taxonomic Status		
Intraspecific ( <a href="https://www.gephebase.org/search-criteria?/and+Taxonomic">https://www.gephebase.org/search-criteria?/and+Taxonomic</a> Status="Intraspecific" #gephebase-summary-title)			
Taxon A		Taxon B	
	Latin Name		Latin Name
Helianthus annuus ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon">https://www.gephebase.org/search-criteria?/and+Taxon</a> and Synonyms="Helianthus annuus" #gephebase-summary-title)		Helianthus annuus ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon">https://www.gephebase.org/search-criteria?/and+Taxon</a> and Synonyms="Helianthus annuus" #gephebase-summary-title)	
	Common Name		Common Name
common sunflower		common sunflower	
	Synonyms		Synonyms
common sunflower; Helianthus annuus L.; Helianthus annua; Helianthus annuus; Helianthus annuus8		common sunflower; Helianthus annuus L.; Helianthus annua; Helianthus annuus; Helianthus annuus8	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; campanulids; Asterales; Asteraceae; Asteroideae; Heliantheae alliance; Heliantheae; Helianthus		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; campanulids; Asterales; Asteraceae; Asteroideae; Heliantheae alliance; Heliantheae; Helianthus	
	Parent		Parent
Helianthus () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4231">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4231</a> )		Helianthus () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4231">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4231</a> )	
	NCBI Taxonomy ID		NCBI Taxonomy ID
4232 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4232">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4232</a> )		4232 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4232">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4232</a> )	
	is Taxon A an Infrappecies?		is Taxon B an Infrappecies?
No		No	

## GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Antirrhinum majus
CYC		O49250 ( <a href="http://www.uniprot.org/uniprot/O49250">http://www.uniprot.org/uniprot/O49250</a> )	
	Synonyms		GenebankID or UniProtKB
-		()	
	String		
-			
	Sequence Similarities		
-			
	GO - Molecular Function		
GO:0003700 : DNA-binding transcription factor activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0003700">https://www.ebi.ac.uk/QuickGO/term/GO:0003700</a> )			
GO:0003677 : DNA binding ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0003677">https://www.ebi.ac.uk/QuickGO/term/GO:0003677</a> )			
	GO - Biological Process		
GO:0009908 : flower development ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0009908">https://www.ebi.ac.uk/QuickGO/term/GO:0009908</a> )			
GO:0048262 : determination of dorsal/ventral asymmetry ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0048262">https://www.ebi.ac.uk/QuickGO/term/GO:0048262</a> )			
GO:0009799 : specification of symmetry			

(<https://www.ebi.ac.uk/QuickGO/term/GO:0009799>)

GO - Cellular Component

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

Presumptive Null

No (<https://www.gephebase.org/search-criteria?/and+Presumptive Null=`No`#gephebase-summary-title>)

Molecular Type

Cis-regulatory (<https://www.gephebase.org/search-criteria?/and+Molecular Type=`Cis-regulatory`#gephebase-summary-title>)

Aberration Type

Insertion (<https://www.gephebase.org/search-criteria?/and+Aberration Type=`Insertion`#gephebase-summary-title>)

Insertion Size

100-999 bp

Molecular Details of the Mutation

999bp insertion in promoter

Experimental Evidence

Linkage Mapping (<https://www.gephebase.org/search-criteria?/and+Experimental Evidence=`Linkage Mapping`#gephebase-summary-title>)

Main Reference

Genetic analysis of floral symmetry in Van Gogh's sunflowers reveals independent recruitment of CYCLOIDEA genes in the Asteraceae. (2012) (<https://pubmed.ncbi.nlm.nih.gov/22479210>)

Authors

Chapman MA; Tang S; Draeger D; Nambeesan S; Shaffer H; Barb JG; Knapp SJ; Burke JM

Abstract

The genetic basis of floral symmetry is a topic of great interest because of its effect on pollinator behavior and, consequently, plant diversification. The Asteraceae, which is the largest family of flowering plants, is an ideal system in which to study this trait, as many species within the family exhibit a compound inflorescence containing both bilaterally symmetric (i.e., zygomorphic) and radially symmetric (i.e., actinomorphic) florets. In sunflower and related species, the inflorescence is composed of a single whorl of ray florets surrounding multiple whorls of disc florets. We show that in double-flowered (dbl) sunflower mutants (in which disc florets develop bilateral symmetry), such as those captured by Vincent van Gogh in his famous nineteenth-century sunflower paintings, an insertion into the promoter region of a CYCLOIDEA (CYC)-like gene (HaCYC2c) that is normally expressed specifically in WT rays is instead expressed throughout the inflorescence, presumably resulting in the observed loss of actinomorphy. This same gene is mutated in two independent tubular-rayed (tub) mutants, though these mutations involve apparently recent transposon insertions, resulting in little or no expression and radialization of the normally zygomorphic ray florets. Interestingly, a phylogenetic analysis of CYC-like genes from across the family suggests that different paralogs of this fascinating gene family have been independently recruited to specify zygomorphy in different species within the Asteraceae.

Additional References

## RELATED GEPHE

No matches found.

Related Genes

No matches found.

Related Haplotypes

## EXTERNAL LINKS

## COMMENTS

@TE