

GEPHE SUMMARY

	Gephebase Gene		GepheID
Cycloidea (Lcyc) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase="Cycloidea (Lcyc)"#gephebase-summary-title)		GP00000197	Main curator
Published	Entry Status	Martin	

PHENOTYPIC CHANGE

	Trait Category		
Morphology (https://www.gephebase.org/search-criteria?/and+Trait Category="Morphology"#gephebase-summary-title)			
	Trait		
Flower morphology (<a flower"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="Flower morphology"#gephebase-summary-title)			
	Trait State in Taxon A		
Linaria vulgaris - bilateral			
	Trait State in Taxon B		
Linaria vulgaris - radial			
	Ancestral State		
Taxon A			
	Taxonomic Status		
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status="Intraspecific"#gephebase-summary-title)			
Taxon A		Taxon B	
	Latin Name		Latin Name
Linaria vulgaris (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="Linaria vulgaris"#gephebase-summary-title)		Linaria vulgaris (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="Linaria vulgaris"#gephebase-summary-title)	
	Common Name		Common Name
common toadflax		common toadflax	
	Synonyms		Synonyms
common toadflax; Linaria vulgaris Mill.		common toadflax; Linaria vulgaris Mill.	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Lamiales; Plantaginaceae; Antirrhineae; Linaria		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Lamiales; Plantaginaceae; Antirrhineae; Linaria	
	Parent		Parent
Linaria (toadflaxes) - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=43170)		Linaria (toadflaxes) - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=43170)	
	NCBI Taxonomy ID		NCBI Taxonomy ID
43171 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=43171)		43171 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=43171)	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		No	

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB Antirrhinum majus
CYC		O49250 (http://www.uniprot.org/uniprot/O49250)	GenebankID or UniProtKB
-	Synonyms		
-		AAP84101 (https://www.ncbi.nlm.nih.gov/nuccore/AAP84101)	
-	String		
-			
-	Sequence Similarities		
-			
	GO - Molecular Function		
GO:0003700 : DNA-binding transcription factor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003700)			
GO:0003677 : DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003677)			
	GO - Biological Process		
GO:0009908 : flower development (https://www.ebi.ac.uk/QuickGO/term/GO:0009908)			
GO:0048262 : determination of dorsal/ventral asymmetry (https://www.ebi.ac.uk/QuickGO/term/GO:0048262)			
GO:0009799 : specification of symmetry (https://www.ebi.ac.uk/QuickGO/term/GO:0009799)			

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

	Presumptive Null
No (<a +no^"="" href="https://www.gephebase.org/search-criteria?/and+Presumptive+Null=">#gephebase-summary-title)	Molecular Type
Cis-regulatory (<a +cis-regulatory^"="" href="https://www.gephebase.org/search-criteria?/and+Molecular+Type=">#gephebase-summary-title)	Aberration Type
Epigenetic Change (<a +epigenetic+change^"="" href="https://www.gephebase.org/search-criteria?/and+Aberration+Type=">#gephebase-summary-title)	Molecular Details of the Mutation
Stable methylation	Experimental Evidence
Linkage Mapping (<a +linkage+mapping^"="" href="https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=">#gephebase-summary-title)	Main Reference
An epigenetic mutation responsible for natural variation in floral symmetry. (1999) (https://pubmed.ncbi.nlm.nih.gov/10490023)	Authors
Cubas P; Vincent C; Coen E	Abstract

Although there have been many molecular studies of morphological mutants generated in the laboratory, it is unclear how these are related to mutants in natural populations, where the constraints of natural selection and breeding structure are quite different. Here we characterize a naturally occurring mutant of *Linaria vulgaris*, originally described more than 250 years ago by Linnaeus, in which the fundamental symmetry of the flower is changed from bilateral to radial. We show that the mutant carries a defect in *Lcyc*, a homologue of the *cycloidea* gene which controls dorsoventral asymmetry in *Antirrhinum*. The *Lcyc* gene is extensively methylated and transcriptionally silent in the mutant. This modification is heritable and co-segregates with the mutant phenotype. Occasionally the mutant reverts phenotypically during somatic development, correlating with demethylation of *Lcyc* and restoration of gene expression. It is surprising that the first natural morphological mutant to be characterized should trace to methylation, given the rarity of this mutational mechanism in the laboratory. This indicates that epigenetic mutations may play a more significant role in evolution than has hitherto been suspected.

Additional References

RELATED GEPHE

No matches found.

Related Genes

No matches found.

Related Haplotypes

EXTERNAL LINKS

COMMENTS