GEPHE SUMMARY

Gephebase Gene
S locus supergene (GLO/CFB Cluster) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^S locus supergene (GLO/CFB Cluster)^#gephebase-summary-title)

GepheID
GP00001392

Entry Status
Published

Main curator
Courtier

PHENOTYPIC CHANGE

Trait Category
Morphology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Morphology^#gephebase-summary-title)

Trait
Flower morphology (heterostyly) (https://www.gephebase.org/search-criteria?/and+Trait=^Flower morphology (heterostyly)^#gephebase-summary-title)

Trait State in Taxon A
Primula vulgaris

Trait State in Taxon B
Primula vulgaris

Ancestral State
Unknown

Taxonomic Status
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Intraspecific^#gephebase-summary-title)

Taxon A

Latin Name
Primula vulgaris (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Primula vulgaris^#gephebase-summary-title)

Common Name
-

Synonyms
Primula acaulis; Primula acaulis (L.) Hill; Primula vulgaris Huds.

Rank
species

Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; Ericales; Primulaceae; Primula

Parent
Primula (primroses) - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 49647)

NCBI Taxonomy ID
175104 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 175104)

is Taxon A an Infraspecies?
No

Taxon B

Latin Name
Primula vulgaris (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Primula vulgaris^#gephebase-summary-title)

Common Name
-

Synonyms
Primula acaulis; Primula acaulis (L.) Hill; Primula vulgaris Huds.

Rank
species

Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; Ericales; Primulaceae; Primula

Parent
Primula (primroses) - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 49647)

NCBI Taxonomy ID
175104 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 175104)

is Taxon B an Infraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
-

Synonyms
-

String
-

Sequence Similarities
-

GO - Molecular Function
-

GO - Biological Process
-

GO - Cellular Component
-

UniProtKB
()

GenebankID or UniProtKB
()

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

Molecular Type
Other (https://www.gephebase.org/search-criteria?/and+Molecular Type=^Other^#gephebase-summary-title)

Aberration Type

Complex Change (https://www.gephebase.org/search-criteria?/and+Aberration Type=^Complex Change^#gephebase-summary-title)

Molecular Details of the Mutation

Absence/presence of a supergene constituted by a cluster of 6 genes

Experimental Evidence

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

Main Reference

Genetic architecture and evolution of the S locus supergene in Primula vulgaris. (2016) (https://pubmed.ncbi.nlm.nih.gov/27909301)

Authors

Li J; Cocker JM; Wright J; Webster MA; McMullan M; Dyer S; Swarbreck D; Caccamo M; Oosterhout CV; Gilmartin PM

Abstract

Darwin's studies on heterostyly in Primula described two floral morphs, pin and thrum, with reciprocal anther and stigma heights that promote insect-mediated cross-pollination. This key innovation evolved independently in several angiosperm families. Subsequent studies on heterostyly in Primula contributed to the foundation of modern genetic theory and the neo-Darwinian synthesis. The established genetic model for Primula heterostyly involves a diallelic S locus comprising several genes, with rare recombination events that result in self-fertile homostyle flowers with anthers and stigma at the same height. Here we reveal the S locus supergene as a tightly linked cluster of thrum-specific genes that are absent in pins. We show that thrums are hemizygous not heterozygous for the S locus, which suggests that homostyles do not arise by recombination between S locus haplotypes as previously proposed. Duplication of a floral homeotic gene 51.7 million years (Myr) ago, followed by its neofunctionalization, created the current S locus assemblage which led to floral heteromorphy in Primula. Our findings provide new insights into the structure, function and evolution of this archetypal supergene.

Additional References

RELATED GEPHE

Related Genes

2 (CYP(T), GLO(T)) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^175104^/and+Trait=Flower morphology/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

@SuperGene ; thrum flowers are hemizygous for the supergene S