GEPHE SUMMARY

Gephebase Gene
MYB-FL (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^MYB-FL^#gephebase-summary-title)

GepheID
GP00001590

Entry Status
Published

Main curator
Prigent

PHENOTYPIC CHANGE

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

Trait
Coloration (flower ; UV absorbance) (https://www.gephebase.org/search-criteria?/and+Trait=^Coloration (flower ; UV absorbance)^#gephebase-summary-title)

Trait State in Taxon A
Petunia axillaris hawkmoth pollinated (white with abundant volatiles at dusk) flower with UV absorbance

Trait State in Taxon B
Petunia exserta hummingbird pollinated (bright red non-scented) flower without UV absorbance but UV reflective

Ancestral State
Taxon A

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

Taxon A

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

Common Name
-

Synonyms
large white petunia; white moon petunia; Petunia axillaris (Lam.) Britton, Stern & Poggenb.; Petunia axilliaris

Rank
species

Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Petunioideae; Petunia

Parent
Petunia () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4101)

NCBI Taxonomy ID
33119 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 33119)

is Taxon A an Infraspecies?
No

Taxon B

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

Common Name
-

Synonyms
Petunia exserta Stehmann, 1987

Rank
species

Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Petunioideae; Petunia

Parent
Petunia () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4101)

NCBI Taxonomy ID
323115 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 323115)

is Taxon B an Infraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
MYB-FL

Synonyms
-

String
-

Sequence Similarities
-

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)

UniProtKB Petunia exserta
A0A0S3CVC7 (http://www.uniprot.org/uniprot/A0A0S3CVC7)

GenebankID or UniProtKB
()

Presumptive Null

Yes (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^Yes^#gephebase-summary-title)

Molecular Type

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

Aberration Type

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

Deletion Size

1-9 bp

Molecular Details of the Mutation

A 1-bp deletion in exon 3 causing a frameshift resulting in a truncated protein

Experimental Evidence

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

Main Reference

MYB-FL controls gain and loss of floral UV absorbance, a key trait affecting pollinator preference and reproductive isolation. (2016) (https://pubmed.ncbi.nlm.nih.gov/26656847)

Authors

Sheehan H; Moser M; Klahre U; Esfeld K; Dell'Olivo A; Mandel T; Metzger S; Vandenbussche M; Freitas L; Kuhlemeier C

Abstract

Adaptations to new pollinators involve multiple floral traits, each requiring coordinated changes in multiple genes. Despite this genetic complexity, shifts in pollination syndromes have happened frequently during angiosperm evolution. Here we study the genetic basis of floral UV absorbance, a key trait for attracting nocturnal pollinators. In Petunia, mutations in a single gene, MYB-FL, explain two transitions in UV absorbance. A gain of UV absorbance in the transition from bee to moth pollination was determined by a cis-regulatory mutation, whereas a frameshift mutation caused subsequent loss of UV absorbance during the transition from moth to hummingbird pollination. The functional differences in MYB-FL provide insight into the process of speciation and clarify phylogenetic relationships between nascent species.

Additional References

RELATED GEPHE

Related Genes

3 (anthocyanin2 (an2), bHLH2, WDR1) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^33119^/and+Trait=Coloration/or+Taxon ID=^323115^/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

1 (https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^MYB-FL^/and+Taxon ID=^33119^/or+Gene Gephebase=^MYB-FL^/and+Taxon ID=^323115^#gephebase-summary-title)

EXTERNAL LINKS

COMMENTS

possibly null mutation?