GEPHE SUMMARY

Gephebase Gene
MaMyb2 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^MaMyb2^#gephebase-summary-title)

GepheID
GP00000563

Entry Status
Published

Main curator
Martin

PHENOTYPIC CHANGE

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

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

Trait State in Taxon A
Mimulus aurantiacus - red; hummingbird pollinated

Trait State in Taxon B
Mimulus aurantiacus - yellow; hawkmoth pollinated

Ancestral State
Data not curated

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

Taxon A

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

Common Name
-

Synonyms
Diplacus aurantiacus subsp. aurantiacus; Mimulus aurantiacus; Mimulus aurantiacus subsp. aurantiacus; Diplacus aurantiacus (Curtis) Jeps.; Mimulus aurantiacus Curtis

Rank
species

Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Lamiales; Phrymaceae; Diplacus

Parent
Diplacus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 318117)

NCBI Taxonomy ID
68869 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 68869)

is Taxon A an Infraspecies?
No

Taxon B

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

Common Name
-

Synonyms
Diplacus aurantiacus subsp. aurantiacus; Mimulus aurantiacus; Mimulus aurantiacus subsp. aurantiacus; Diplacus aurantiacus (Curtis) Jeps.; Mimulus aurantiacus Curtis

Rank
species

Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Lamiales; Phrymaceae; Diplacus

Parent
Diplacus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 318117)

NCBI Taxonomy ID
68869 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 68869)

is Taxon B an Infraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
Myb2

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 Diplacus aurantiacus
M9QXG2 (http://www.uniprot.org/uniprot/M9QXG2)

GenebankID or UniProtKB
JX661265 (https://www.ncbi.nlm.nih.gov/nuccore/JX661265)

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

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

Aberration Type

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

Molecular Details of the Mutation

unknown expression-phenotype co-vary

Experimental Evidence

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

Main Reference

Divergent selection drives genetic differentiation in an R2R3-MYB transcription factor that contributes to incipient speciation in Mimulus aurantiacus. (2013) (https://pubmed.ncbi.nlm.nih.gov/23555295)

Authors

Streisfeld MA; Young WN; Sobel JM

Abstract

Identifying the molecular genetic basis of traits contributing to speciation is of crucial importance for understanding the ecological and evolutionary mechanisms that generate biodiversity. Despite several examples describing putative "speciation genes," it is often uncertain to what extent these genetic changes have contributed to gene flow reductions in nature. Therefore, considerable interest lies in characterizing the molecular basis of traits that actively confer reproductive isolation during the early stages of speciation, as these loci can be attributed directly to the process of divergence. In Southern California, two ecotypes of Mimulus aurantiacus are parapatric and differ primarily in flower color, with an anthocyanic, red-flowered morph in the west and an anthocyanin-lacking, yellow-flowered morph in the east. Evidence suggests that the genetic changes responsible for this shift in flower color have been essential for divergence and have become fixed in natural populations of each ecotype due to almost complete differences in pollinator preference. In this study, we demonstrate that a cis-regulatory mutation in an R2R3-MYB transcription factor results in differential regulation of enzymes in the anthocyanin biosynthetic pathway and is the major contributor to differences in floral pigmentation. In addition, molecular population genetic data show that, despite gene flow at neutral loci, divergent selection has driven the fixation of alternate alleles at this gene between ecotypes. Therefore, by identifying the genetic basis underlying ecologically based divergent selection in flower color between these ecotypes, we have revealed the ecological and functional mechanisms involved in the evolution of pre-mating isolation at the early stages of incipient speciation.

Additional References

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS