GEPHE SUMMARY

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

GepheID
GP00001459

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

Trait State in Taxon A
Common morning glory with colored flower (YO/FR-34 & KK/FR-35 & KK/FP-36 & YO/FP-39)

Trait State in Taxon B
Common morning glory with white flower with variegated colored flakes and sectors (KK/VR-37 & KK/VR-40a & KK/VP-347 & YY/VP-SU2001 & KK/WR-321)

Ancestral State
Taxon A

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

Taxon A

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

Common Name
common morning-glory

Synonyms
Convolvulus purpureus; Pharbitis purpurea; common morning-glory; Convolvulus purpureus L., 1762; Ipomoea purpurea (L.) Roth, 1787; Pharbitis purpurea (L.) Voigt, 1845; Pharbits purpurea

Rank
species

Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Convolvulaceae; Ipomoeeae; Ipomoea

Parent
Ipomoea () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4119)

NCBI Taxonomy ID
4121 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4121)

is Taxon A an Infraspecies?
Yes

Taxon A Description
Common morning glory with colored flower (YO/FR-34 & KK/FR-35 & KK/FP-36 & YO/FP-39)

Taxon B

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

Common Name
common morning-glory

Synonyms
Convolvulus purpureus; Pharbitis purpurea; common morning-glory; Convolvulus purpureus L., 1762; Ipomoea purpurea (L.) Roth, 1787; Pharbitis purpurea (L.) Voigt, 1845; Pharbits purpurea

Rank
species

Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Convolvulaceae; Ipomoeeae; Ipomoea

Parent
Ipomoea () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4119)

NCBI Taxonomy ID
4121 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4121)

is Taxon B an Infraspecies?
Yes

Taxon B Description
Common morning glory with white flower with variegated colored flakes and sectors (KK/VR-37 & KK/VR-40a & KK/VP-347 & YY/VP-SU2001 & KK/WR-321)

GENOTYPIC CHANGE

Generic Gene Name
CHSD

Synonyms
CHSD; CHS-D

String
-

Sequence Similarities
Belongs to the chalcone/stilbene synthases family.

GO - Molecular Function
GO:0016210 : naringenin-chalcone synthase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0016210)

UniProtKB Ipomoea nil
O22045 (http://www.uniprot.org/uniprot/O22045)

GenebankID or UniProtKB
AB004905 (https://www.ncbi.nlm.nih.gov/nuccore/AB004905)

GO - Biological Process

GO:0009813 : flavonoid biosynthetic process (https://www.ebi.ac.uk/QuickGO/term/GO:0009813)

GO - Cellular Component

-

Presumptive Null

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

Molecular Type

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

Aberration Type

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

Insertion Size

1-10 kb

Molecular Details of the Mutation

insertion of a 3.9kb long transposable element Tip100 in intron

Experimental Evidence

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

Main Reference

Molecular characterization of the mutable flaked allele for flower variegation in the common morning glory. (1998) (https://pubmed.ncbi.nlm.nih.gov/9881157)

Authors

Habu Y; Hisatomi Y; Iida S

Abstract

The mutable flaked (or af) lines of the common morning glory bear white flowers with colored flakes and sectors. The af allele shows incomplete dominance. Plants in the heterozygous state A/af bear lightly colored flowers with intensely colored flakes and occasionally with white sectors. We showed that the mutable af allele is caused by insertion of a new transposable element, Tip100, into the CHS-D gene intron. Tip100 is 3.9 kb long and belongs to the Ac/Ds family. Although the timing and frequency of the flower variegation vary in different lines, they carry an identical mutable allele. We also noticed that a flaked subline, bearing variegated flowers, carries a Tip100 derivative, Tip100-1. The structure of Tip100-1 contains an additional 48 bp terminal sequence as tandem repeats and its integration site is identical to that of Tip100. Another line, with stable white flowers, is a double mutant carrying two copies of Tip100 in the CHS-D gene. These results are discussed with regard to the variegated phenotypes of flowers in various mutable lines.

Additional References

RELATED GEPHE

Related Genes

3 (bHLH2, flavonoid 3′-hydroxylase (F3′H), MYB1) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^4121^/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

1 (https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^Chalcone synthase D (CHS-D)^/and+Taxon ID=^4121^/or+Gene Gephebase=^Chalcone synthase D (CHS-D)^/and+Taxon ID=^4121^#gephebase-summary-title)

EXTERNAL LINKS

COMMENTS

@TE; coding or regulatory mutation