GEPHE SUMMARY

Gephebase Gene
Brix9-2-5/LIN5 invertase (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^Brix9-2-5/LIN5 invertase^#gephebase-summary-title)

GepheID
GP00000159

Entry Status
Published

Main curator
Martin

PHENOTYPIC CHANGE

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

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

Trait State in Taxon A
Lycopersicum pennellii wild

Trait State in Taxon B
Solanum lycopersicum domesticated

Ancestral State
Taxon A

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

Taxon A

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

Common Name
-

Synonyms
Lycopersicon pennellii; Lycopersicon pennelllii; Lycopesion pennellii; Solanum pennelli; Lycopersicon pennellii (Correll) D'Arcy; Solanum pennellii Correll

Rank
species

Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Solanoideae; Solaneae; Solanum; Lycopersicon

Parent
Lycopersicon () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 49274)

NCBI Taxonomy ID
28526 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 28526)

is Taxon A an Infraspecies?
Yes

Taxon A Description
Lycopersicum pennellii wild

Taxon B

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

Common Name
tomato

Synonyms
Lycopersicon esculentum var. esculentum; Solanum esculentum; Solanum lycopersicum var. humboldtii; tomato; Lycopersicon esculentum Mill.; Solanum esculentum Dunal; Solanum lycopersicum L.; Lycopersicon lycopersicum; Lycopersicum esculentum; Solanum lycopersicon

Rank
species

Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; lamiids; Solanales; Solanaceae; Solanoideae; Solaneae; Solanum; Lycopersicon

Parent
Lycopersicon () - (Rank: subgenus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 49274)

NCBI Taxonomy ID
4081 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 4081)

is Taxon B an Infraspecies?
Yes

Taxon B Description
Solanum lycopersicum domesticated

GENOTYPIC CHANGE

Generic Gene Name
LIN5

Synonyms
-

String
-

Sequence Similarities
-

GO - Molecular Function
GO:0004564 : beta-fructofuranosidase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004564)

GO - Biological Process
GO:0005975 : carbohydrate metabolic process

UniProtKB Solanum lycopersicum
P93199 (http://www.uniprot.org/uniprot/P93199)

GenebankID or UniProtKB
X91389 (https://www.ncbi.nlm.nih.gov/nuccore/X91389)

(https://www.ebi.ac.uk/QuickGO/term/GO:0005975)

GO - Cellular Component

-

Presumptive Null

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

Molecular Type

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

Aberration Type

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

Molecular Details of the Mutation

Not identified

Experimental Evidence

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

Main Reference

Zooming in on a quantitative trait for tomato yield using interspecific introgressions. (2004) (https://pubmed.ncbi.nlm.nih.gov/15375271)

Authors

Fridman E; Carrari F; Liu YS; Fernie AR; Zamir D

Abstract

To explore natural biodiversity we developed and examined introgression lines (ILs) containing chromosome segments of wild species (Solanum pennellii) in the background of the cultivated tomato (S. lycopersicum). We identified Brix9-2-5, which is a S. pennellii quantitative trait locus (QTL) that increases sugar yield of tomatoes and was mapped within a flower- and fruit-specific invertase (LIN5). QTL analysis representing five different tomato species delimited the functional polymorphism of Brix9-2-5 to an amino acid near the catalytic site of the invertase crystal, affecting enzyme kinetics and fruit sink strength. These results underline the power of diverse ILs for high-resolution perspectives on complex phenotypes.

Additional References

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS