GEPHE SUMMARY

Gephebase Gene

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

GepheID

GP00001892

Entry Status

Published

Main curator

Courtier

PHENOTYPIC CHANGE

Trait Category

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

Trait

Xenobiotic resistance (herbicides; glyphosate) (https://www.gephebase.org/search-criteria?/and+Trait=^Xenobiotic resistance (herbicides; glyphosate)^#gephebase-summary-title)

Trait State in Taxon A

Amaranthus tuberculatus - sensitive

Trait State in Taxon B

Amaranthus tuberculatus - resistant

Ancestral State

Taxon A

Taxonomic Status

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

Taxon A

Latin Name

Amaranthus tuberculatus (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Amaranthus tuberculatus^#gephebase-summary-title)

Common Name

-

Synonyms

Amaranthus rudis; Amaranthus rudis J.D.Sauer; Amaranthus tuberculatus (Moq.) J.D.Sauer

Rank

species

Lineage

cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; Caryophyllales; Amaranthaceae; Amaranthus

Parent

Amaranthus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3564)

NCBI Taxonomy ID

277990 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 277990)

is Taxon A an Infraspecies?

No

Taxon B

Latin Name

Amaranthus tuberculatus (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Amaranthus tuberculatus^#gephebase-summary-title)

Common Name

-

Synonyms

Amaranthus rudis; Amaranthus rudis J.D.Sauer; Amaranthus tuberculatus (Moq.) J.D.Sauer

Rank

species

Lineage

cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; Caryophyllales; Amaranthaceae; Amaranthus

Parent

Amaranthus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3564)

NCBI Taxonomy ID

277990 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 277990)

is Taxon B an Infraspecies?

Yes

Taxon B Description

Brown County glyphosate-resistant

GENOTYPIC CHANGE

Generic Gene Name

At2g45300

Synonyms

F4L23.19; At2g45300

String

3702.AT2G45300.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 3702.AT2G45300.1)

Sequence Similarities

Belongs to the EPSP synthase family.

GO - Molecular Function

GO:0003866 : 3-phosphoshikimate 1-carboxyvinyltransferase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003866)

GO - Biological Process

GO:0009073 : aromatic amino acid family biosynthetic process (https://www.ebi.ac.uk/QuickGO/term/GO:0009073)

UniProtKB Arabidopsis thaliana

P05466 (http://www.uniprot.org/uniprot/P05466)

GenebankID or UniProtKB

()

GO:0009423 : chorismate biosynthetic process (https://www.ebi.ac.uk/QuickGO/term/GO:0009423)

GO - Cellular Component

GO:0009507 : chloroplast (https://www.ebi.ac.uk/QuickGO/term/GO:0009507)
GO:0009570 : chloroplast stroma (https://www.ebi.ac.uk/QuickGO/term/GO:0009570)

Presumptive Null

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

Molecular Type

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

Aberration Type

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

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

resistance not due to EPSPS amplification; partly due to P106S mutation

Experimental Evidence

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

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Pro	Ser	106

Main Reference

Multiple resistance to herbicides from four site-of-action groups in waterhemp (Amaranthus tuberculatus) . (2013) (https://pubmed.ncbi.nlm.nih.gov/00000000.000011)

Authors

Bell Michael S; Hager Aaron G; Tranel Patrick J

Abstract

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Additional References

RELATED GEPHE

Related Genes

2 (ALS, protoporphyrinogen oxidase (PPO2 = PPX2L)) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^277990^/and+Trait=Xenobiotic resistance/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

1 (https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^EPSPS^/and+Taxon ID=^277990^/or+Gene Gephebase=^EPSPS^/and+Taxon ID=^277990^#gephebase-summary-title)

EXTERNAL LINKS

COMMENTS