GEPHE SUMMARY

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

GepheID
GP00001894

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; ALS inhibitor) (https://www.gephebase.org/search-criteria?/and+Trait=^Xenobiotic resistance (herbicides; ALS inhibitor)^#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?
No

GENOTYPIC CHANGE

Generic Gene Name
ALS

Synonyms
ACETOHYDROXY ACID SYNTHASE; ACETOLACTATE SYNTHASE; AHAS; ALS; chlorsulfuron/imidazolinone resistant 1; IMIDAZOLE RESISTANT 1; IMR1; TRIAZOLOPYRIMIDINE RESISTANT 5; TZP5; CSR1; At3g48560; T8P19.70

String
3702.AT3G48560.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 3702.AT3G48560.1)

Sequence Similarities
Belongs to the TPP enzyme family.

GO - Molecular Function
GO:0000287 : magnesium ion binding (https://www.ebi.ac.uk/QuickGO/term/GO:0000287)
GO:0050660 : flavin adenine dinucleotide binding (https://www.ebi.ac.uk/QuickGO/term/GO:0050660)
GO:0003984 : acetolactate synthase activity

UniProtKB Arabidopsis thaliana
P17597 (http://www.uniprot.org/uniprot/P17597)

GenebankID or UniProtKB
()

(https://www.ebi.ac.uk/QuickGO/term/GO:0003984)
GO:0030976 : thiamine pyrophosphate binding
(https://www.ebi.ac.uk/QuickGO/term/GO:0030976)

GO - Biological Process

GO:0009635 : response to herbicide (https://www.ebi.ac.uk/QuickGO/term/GO:0009635)
GO:0009097 : isoleucine biosynthetic process
(https://www.ebi.ac.uk/QuickGO/term/GO:0009097)
GO:0009099 : valine biosynthetic process
(https://www.ebi.ac.uk/QuickGO/term/GO:0009099)

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

S653N

Experimental Evidence

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

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	-	-	-

Main Reference

Multiple ALS mutations confer herbicide resistance in waterhemp (Amaranthus tuberculatus) . (2007) (https://pubmed.ncbi.nlm.nih.gov/00000000.000012)

Authors

Patzoldt William L; Tranel Patrick J

Abstract

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Additional References

RELATED GEPHE

Related Genes

2 (EPSPS, 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

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

EXTERNAL LINKS

COMMENTS