

GEPHE SUMMARY

	Gephebase Gene	GephelD
EPSPS (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^EPSPS^#gephebase-summary-title)	GP00001884	Main curator
Published	Entry Status	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	Taxon B	Latin Name
Amaranthus tuberculatus (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Amaranthus+tuberculatus^#gephebase-summary-title)		Amaranthus tuberculatus (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Amaranthus+tuberculatus^#gephebase-summary-title)	
-	Common Name	-	Common Name
Amaranthus rudis; Amaranthus rudis J.D.Sauer; Amaranthus tuberculatus (Moq.) J.D.Sauer	Synonyms	Amaranthus rudis; Amaranthus rudis J.D.Sauer; Amaranthus tuberculatus (Moq.) J.D.Sauer	Synonyms
species	Rank	species	Rank
	Lineage		Lineage
cellular organisms; Eukaryota; Viriplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; Caryophyllales; Amaranthaceae; Amaranthus		cellular organisms; Eukaryota; Viriplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; Caryophyllales; Amaranthaceae; Amaranthus	
Amaranthus () - (Rank: genus)	Parent	Amaranthus () - (Rank: genus)	Parent
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3564)		(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3564)	
277990	NCBI Taxonomy ID	277990	NCBI Taxonomy ID
(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=277990)	is Taxon A an Infraspecies?	(https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=277990)	is Taxon B an Infraspecies?
No		No	

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Arabidopsis thaliana
At2g45300	Synonyms	GenebankID or UniProtKB
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)		
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)	Presumptive Null
GO:0009570 : chloroplast stroma (https://www.ebi.ac.uk/QuickGO/term/GO:0009570)	Molecular Type
No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=%22No%22#gephebase-summary-title)	Aberration Type
Gene Amplification (https://www.gephebase.org/search-criteria?/and+Molecular Type=%22Gene Amplification%22#gephebase-summary-title)	Insertion Size
Insertion (https://www.gephebase.org/search-criteria?/and+Aberration Type=%22Insertion%22#gephebase-summary-title)	
10-100 kb	Molecular Details of the Mutation
4 copies of the EPSPS gene	Experimental Evidence
Candidate Gene (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=%22Candidate Gene%22#gephebase-summary-title)	Main Reference
Herbicide resistances in Amaranthus tuberculatus: a call for new options. (2011) (https://pubmed.ncbi.nlm.nih.gov/21073196)	Authors
Tranel PJ; Riggins CW; Bell MS; Hager AG	Abstract
Amaranthus tuberculatus is a major weed of crop fields in the midwestern United States. Making this weed particularly problematic to manage is its demonstrated ability to evolve resistance to herbicides. Herbicides to which <i>A. tuberculatus</i> has evolved resistance are photosystem II inhibitors, acetolactate synthase inhibitors, protoporphyrinogen oxidase inhibitors, and glyphosate. Many populations of <i>A. tuberculatus</i> contain more than one of these resistances, severely limiting the options for effective herbicide control. A survey of multiple-herbicide resistance in <i>A. tuberculatus</i> revealed that all populations resistant to glyphosate contained resistance to acetolactate synthase inhibitors, and 40% contained resistance to protoporphyrinogen oxidase inhibitors. The occurrences of multiple-herbicide resistances in <i>A. tuberculatus</i> illustrate the need for continued herbicide discovery efforts and/or the development of new strategies for weed management.	Additional References

RELATED GEPHE

2 (ALS, protoporphyrinogen oxidase (PPO2 = PPX2L)) (https://www.gephebase.org/search-criteria?/or+Taxon ID=%22277990%22/and+Trait=Xenobiotic resistance/and+groupHaplotypes=true#gephebase-summary-title)	Related Genes
1 (https://www.gephebase.org/search-criteria?/or+Gene Gephebase=%22EPSPS%22/and+Taxon ID=%22277990%22/or+Gene Gephebase=%22EPSPS%22/and+Taxon ID=%22277990%22#gephebase-summary-title)	Related Haplotypes

EXTERNAL LINKS

COMMENTS