

## GEPHE SUMMARY

<p>EPSPS (<a href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=^EPSPS^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=^EPSPS^#gephebase-summary-title</a>)</p> <p>Published</p>	<p>Gephebase Gene</p> <p>Entry Status</p>	<p>GP00001884</p> <p>Courtier</p>	<p>GepheID</p> <p>Main curator</p>
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## PHENOTYPIC CHANGE

<p>Physiology (<a href="https://www.gephebase.org/search-criteria?/and+Trait+Category=^Physiology^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait+Category=^Physiology^#gephebase-summary-title</a>)</p> <p>Xenobiotic resistance (herbicides; glyphosate) (<a href="https://www.gephebase.org/search-criteria?/and+Trait=^Xenobiotic+resistance+(herbicides;+glyphosate)^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait=^Xenobiotic+resistance+(herbicides;+glyphosate)^#gephebase-summary-title</a>)</p> <p>Amaranthus tuberculatus - sensitive</p> <p>Amaranthus tuberculatus - resistant</p> <p>Taxon A</p> <p>Intraspecific (<a href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=^Intraspecific^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=^Intraspecific^#gephebase-summary-title</a>)</p>	<p>Trait Category</p> <p>Trait</p> <p>Trait State in Taxon A</p> <p>Trait State in Taxon B</p> <p>Ancestral State</p> <p>Taxonomic Status</p>	<p>Taxon A</p> <p>Latin Name</p> <p>Amaranthus tuberculatus (<a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Amaranthus+tuberculatus^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Amaranthus+tuberculatus^#gephebase-summary-title</a>)</p> <p>Common Name</p> <p>-</p> <p>Synonyms</p> <p>Amaranthus rudis; Amaranthus rudis J.D.Sauer; Amaranthus tuberculatus (Moq.) J.D.Sauer</p> <p>Rank</p> <p>species</p> <p>Lineage</p> <p>cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetales; Caryophyllales; Amaranthaceae; Amaranthus</p> <p>Parent</p> <p>Amaranthus () - (Rank: genus) (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3564">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3564</a>)</p> <p>NCBI Taxonomy ID</p> <p>277990 (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=277990">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=277990</a>)</p> <p>is Taxon A an Intraspecies?</p> <p>No</p>	<p>Taxon B</p> <p>Latin Name</p> <p>Amaranthus tuberculatus (<a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Amaranthus+tuberculatus^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Amaranthus+tuberculatus^#gephebase-summary-title</a>)</p> <p>Common Name</p> <p>-</p> <p>Synonyms</p> <p>Amaranthus rudis; Amaranthus rudis J.D.Sauer; Amaranthus tuberculatus (Moq.) J.D.Sauer</p> <p>Rank</p> <p>species</p> <p>Lineage</p> <p>cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetales; Caryophyllales; Amaranthaceae; Amaranthus</p> <p>Parent</p> <p>Amaranthus () - (Rank: genus) (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3564">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3564</a>)</p> <p>NCBI Taxonomy ID</p> <p>277990 (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=277990">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=277990</a>)</p> <p>is Taxon B an Intraspecies?</p> <p>No</p>
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## GENOTYPIC CHANGE

<p>At2g45300</p> <p>F4L23.19; At2g45300</p> <p>3702.AT2G45300.1 (<a href="http://string-db.org/newstring_cgi/show_network_section.pl?identifier=3702.AT2G45300.1">http://string-db.org/newstring_cgi/show_network_section.pl?identifier=3702.AT2G45300.1</a>)</p> <p>Belongs to the EPSP synthase family.</p> <p>GO:0003866 : 3-phosphoshikimate 1-carboxyvinyltransferase activity (<a href="https://www.ebi.ac.uk/QuickGO/term/GO:0003866">https://www.ebi.ac.uk/QuickGO/term/GO:0003866</a>)</p> <p>GO:0009073 : aromatic amino acid family biosynthetic process (<a href="https://www.ebi.ac.uk/QuickGO/term/GO:0009073">https://www.ebi.ac.uk/QuickGO/term/GO:0009073</a>)</p> <p>GO:0009423 : chorismate biosynthetic process (<a href="https://www.ebi.ac.uk/QuickGO/term/GO:0009423">https://www.ebi.ac.uk/QuickGO/term/GO:0009423</a>)</p>	<p>Generic Gene Name</p> <p>Synonyms</p> <p>String</p> <p>Sequence Similarities</p> <p>GO - Molecular Function</p> <p>GO - Biological Process</p>	<p>P05466 (<a href="http://www.uniprot.org/uniprot/P05466">http://www.uniprot.org/uniprot/P05466</a>)</p> <p>()</p> <p>UniProtKB Arabidopsis thaliana</p> <p>GenebankID or UniProtKB</p>
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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>)

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

Presumptive Null

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

Molecular Type

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

Aberration Type

10-100 kb

Insertion Size

4 copies of the EPSPS gene

Molecular Details of the Mutation

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

Experimental Evidence

Herbicide resistances in *Amaranthus tuberculatus*: a call for new options. (2011) (<https://pubmed.ncbi.nlm.nih.gov/21073196>)

Main Reference

Tranel PJ; Riggins CW; Bell MS; Hager AG

Authors

*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 *A. tuberculatus* has evolved resistance are photosystem II inhibitors, acetolactate synthase inhibitors, protoporphyrinogen oxidase inhibitors, and glyphosate. Many populations of *A. tuberculatus* contain more than one of these resistances, severely limiting the options for effective herbicide control. A survey of multiple-herbicide resistance in *A. tuberculatus* 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 *A. tuberculatus* illustrate the need for continued herbicide discovery efforts and/or the development of new strategies for weed management.

Abstract

Additional References

## RELATED GEPHE

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 Genes

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>)

Related Haplotypes

## EXTERNAL LINKS

## COMMENTS