

## GEPHE SUMMARY

EPSPS ( <a href="https://www.gephebase.org/search-criteria?/and+Gene">https://www.gephebase.org/search-criteria?/and+Gene</a> Gephebase="EPSPS" #gephebase-summary-title)	Gephebase Gene GP00001886	GepheID Main curator
Published	Entry Status Courtier	

## PHENOTYPIC CHANGE

Physiology ( <a href="https://www.gephebase.org/search-criteria?/and+Trait">https://www.gephebase.org/search-criteria?/and+Trait</a> Category="Physiology" #gephebase-summary-title)	Trait Category		
Xenobiotic resistance (herbicides; glyphosate) ( <a #gephebase-summary-title"="" (herbicides;="" glyphosate)"="" href="https://www.gephebase.org/search-criteria?/and+Trait=" resistance="" xenobiotic="">https://www.gephebase.org/search-criteria?/and+Trait="Xenobiotic resistance (herbicides; glyphosate)" #gephebase-summary-title</a> )	Trait		
Kochia scoparia - sensitive	Trait State in Taxon A		
Kochia scoparia - resistant	Trait State in Taxon B		
Taxon A	Ancestral State		
Intraspecific ( <a href="https://www.gephebase.org/search-criteria?/and+Taxonomic">https://www.gephebase.org/search-criteria?/and+Taxonomic</a> Status="Intraspecific" #gephebase-summary-title)	Taxonomic Status		
	Taxon A	Taxon B	
Bassia scoparia ( <a #gephebase-summary-title"="" bassia="" href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=" scoparia"="">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Bassia scoparia" #gephebase-summary-title</a> )	Latin Name	Bassia scoparia ( <a #gephebase-summary-title"="" bassia="" href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=" scoparia"="">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Bassia scoparia" #gephebase-summary-title</a> )	Latin Name
-	Common Name	-	Common Name
Kochia densiflora; Kochia scoparia; burning bush; summer cypress; Bassia scoparia (L.) A.J.Scott, 1978; Kochia densiflora Turcz. ex Aellen, 1954; Kochia scoparia (L.) Schrad., 1809; Bassia scorpia	Synonyms	Kochia densiflora; Kochia scoparia; burning bush; summer cypress; Bassia scoparia (L.) A.J.Scott, 1978; Kochia densiflora Turcz. ex Aellen, 1954; Kochia scoparia (L.) Schrad., 1809; Bassia scorpia	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; Caryophyllales; Chenopodiaceae; Camphorosmoideae; Camphorosmeae; Bassia	Lineage	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; Caryophyllales; Chenopodiaceae; Camphorosmoideae; Camphorosmeae; Bassia	Lineage
Bassia () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 83153">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 83153</a> )	Parent	Bassia () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 83153">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 83153</a> )	Parent
83154 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 83154">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 83154</a> )	NCBI Taxonomy ID	83154 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 83154">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 83154</a> )	NCBI Taxonomy ID
No	is Taxon A an Intraspecies?	No	is Taxon B an Intraspecies?

## GENOTYPIC CHANGE

At2g45300	Generic Gene Name	P05466 ( <a href="http://www.uniprot.org/uniprot/P05466">http://www.uniprot.org/uniprot/P05466</a> )	UniProtKB Arabidopsis thaliana
F4L23.19; At2g45300	Synonyms	0	GenebankID or UniProtKB
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> )	String		
Belongs to the EPSP synthase family.	Sequence Similarities		
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> )	GO - Molecular Function		
GO:0009073 : aromatic amino acid family biosynthetic process	GO - Biological 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>)

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

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

Aberration Type

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

Insertion Size

10-100 kb

Molecular Details of the Mutation

15-25 copies of the EPSPS gene

Experimental Evidence

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

Main Reference

Glyphosate resistance: state of knowledge. (2014) (<https://pubmed.ncbi.nlm.nih.gov/25180399>)

Authors

Sammons RD; Gaines TA

Abstract

Studies of mechanisms of resistance to glyphosate have increased current understanding of herbicide resistance mechanisms. Thus far, single-codon non-synonymous mutations of EPSPS (5-enolpyruvylshikimate-3-phosphate synthase) have been rare and, relative to other herbicide mode of action target-site mutations, unconventionally weak in magnitude for resistance to glyphosate. However, it is possible that weeds will emerge with non-synonymous mutations of two codons of EPSPS to produce an enzyme endowing greater resistance to glyphosate. Today, target-gene duplication is a common glyphosate resistance mechanism and could become a fundamental process for developing any resistance trait. Based on competition and substrate selectivity studies in several species, rapid vacuole sequestration of glyphosate occurs via a transporter mechanism. Conversely, as the chloroplast requires transporters for uptake of important metabolites, transporters associated with the two plastid membranes may separately, or together, successfully block glyphosate delivery. A model based on finite glyphosate dose and limiting time required for chloroplast loading sets the stage for understanding how uniquely different mechanisms can contribute to overall glyphosate resistance.

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Additional References

## RELATED GEPHE

No matches found.

Related Genes

No matches found.

Related Haplotypes

## EXTERNAL LINKS

## COMMENTS