

GEPHE SUMMARY

EPSPS (<https://www.gephebase.org/search-criteria?/and+Gene+Gephebase+EPSPS+gephebase-summary-title>)  
 Gephebase Gene: GP00001897  
 Entry Status: Courtier  
 Published  
 GepheID: Main curator

PHENOTYPIC CHANGE

Physiology (<https://www.gephebase.org/search-criteria?/and+Trait+Category+Physiology+gephebase-summary-title>)  
 Trait Category: Trait  
 Xenobiotic resistance (herbicides; glyphosate) (<https://www.gephebase.org/search-criteria?/and+Trait+Xenobiotic+resistance+herbicides+glyphosate+gephebase-summary-title>)  
 Trait: Trait State in Taxon A: Lolium multiflorum - sensitive  
 Trait State in Taxon B: Lolium multiflorum - 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   |
|--|--|--|--|
| Lolium multiflorum<br>( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Lolium+multiflorum+gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Lolium+multiflorum+gephebase-summary-title</a> )  | Lolium multiflorum<br>( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Lolium+multiflorum+gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Lolium+multiflorum+gephebase-summary-title</a> )  | Lolium multiflorum<br>( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Lolium+multiflorum+gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Lolium+multiflorum+gephebase-summary-title</a> )  | Lolium multiflorum<br>( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Lolium+multiflorum+gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Lolium+multiflorum+gephebase-summary-title</a> )  |
| Italian ryegrass   | Italian ryegrass   | Italian ryegrass   | Italian ryegrass   |
| Lolium italicum; Lolium perenne subsp. multiflorum; Lolium perenne var. multiflorum; Italian ryegrass; Lolium italicum A.Braun, 1834, nom. illeg.; Lolium multiflorum Lam., 1779; Lolium perenne subsp. multiflorum (Lam.) Husn., 1899; Lolium perenne var. multiflorum (Lam.) Parn., 1845   | Lolium italicum; Lolium perenne subsp. multiflorum; Lolium perenne var. multiflorum; Italian ryegrass; Lolium italicum A.Braun, 1834, nom. illeg.; Lolium multiflorum Lam., 1779; Lolium perenne subsp. multiflorum (Lam.) Husn., 1899; Lolium perenne var. multiflorum (Lam.) Parn., 1845   | Lolium italicum; Lolium perenne subsp. multiflorum; Lolium perenne var. multiflorum; Italian ryegrass; Lolium italicum A.Braun, 1834, nom. illeg.; Lolium multiflorum Lam., 1779; Lolium perenne subsp. multiflorum (Lam.) Husn., 1899; Lolium perenne var. multiflorum (Lam.) Parn., 1845   | Lolium italicum; Lolium perenne subsp. multiflorum; Lolium perenne var. multiflorum; Italian ryegrass; Lolium italicum A.Braun, 1834, nom. illeg.; Lolium multiflorum Lam., 1779; Lolium perenne subsp. multiflorum (Lam.) Husn., 1899; Lolium perenne var. multiflorum (Lam.) Parn., 1845   |
| species  | species  | species  | species  |
| cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Pooideae; Poaceae; Poaceae Chloroplast Group 2 (Poaceae type); Loliinae; Lolium | cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Pooideae; Poaceae; Poaceae Chloroplast Group 2 (Poaceae type); Loliinae; Lolium | cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Pooideae; Poaceae; Poaceae Chloroplast Group 2 (Poaceae type); Loliinae; Lolium | cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Pooideae; Poaceae; Poaceae Chloroplast Group 2 (Poaceae type); Loliinae; Lolium |
| Lolium () - (Rank: genus)<br>( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4520">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4520</a> )   | Lolium () - (Rank: genus)<br>( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4520">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4520</a> )   | Lolium () - (Rank: genus)<br>( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4521">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4521</a> )   | Lolium () - (Rank: genus)<br>( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4521">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4521</a> )   |
| 4521<br>( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4521">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4521</a> )  | 4521<br>( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4521">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4521</a> )  | 4521<br>( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4521">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4521</a> )  | 4521<br>( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4521">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4521</a> )  |
| No   | is Taxon A an Intraspecies?  | Yes  | is Taxon B an Intraspecies?  |
|  |  | one population of California   | Taxon B Description  |

GENOTYPIC CHANGE

At2g45300  
 F4L23.19; At2g45300  
 3702.AT2G45300.1  
 ([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))  
 Generic Gene Name: P05466 (<http://www.uniprot.org/uniprot/P05466>)  
 Synonyms: ()  
 String: ()  
 Sequence Similarities: Belongs to the EPSP synthase family.  
 GO - Molecular Function: GO:0003866 : 3-phosphoshikimate 1-carboxyvinyltransferase activity  
 UniProtKB Arabidopsis thaliana  
 GenebankID or UniProtKB

(<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>)

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

Pro106Ala conferring 5-15-fold resistance

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 | -       | -       | -        |

Main Reference

Glyphosate-resistant Italian ryegrass (*Lolium multiflorum*) in California: distribution, response to glyphosate, and molecular evidence for an altered target enzyme . (2008 )

(<https://pubmed.ncbi.nlm.nih.gov/00000000.000013>)

Authors

Jasieniuk Marie; Ahmad Riaz; Sherwood Anna M; Firestone Jeffrey L; Perez-Jones Alejandro; Lanini W Thomas; Mallory-Smith Carol; Stednick Zachary

Abstract

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Additional References

## RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

2 (<https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^EPSPS^/and+Taxon ID=^4521^/or+Gene Gephebase=^EPSPS^/and+Taxon ID=^4521^#gephebase-summary-title>)

## EXTERNAL LINKS

## COMMENTS