

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: Physiology
 Trait: Xenobiotic resistance (herbicides; glyphosate) ([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))
 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 (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Lolium+multiflorum+gephebase-summary-title) | Lolium multiflorum (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Lolium+multiflorum+gephebase-summary-title) | Lolium multiflorum (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Lolium+multiflorum+gephebase-summary-title) | Lolium multiflorum (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+Lolium+multiflorum+gephebase-summary-title) |
| 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; Pooadae; Poaeae; Poaeae Chloroplast Group 2 (Poaeae type); Loliinae; Lolium | cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Pooadae; Poaeae; Poaeae Chloroplast Group 2 (Poaeae type); Loliinae; Lolium | cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Pooadae; Poaeae; Poaeae Chloroplast Group 2 (Poaeae type); Loliinae; Lolium | cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Pooideae; Pooadae; Poaeae; Poaeae Chloroplast Group 2 (Poaeae type); Loliinae; Lolium |
| Lolium () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4520) | Lolium () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4520) | Lolium () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4521) | Lolium () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4521) |
| 4521 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4521) | 4521 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4521) | 4521 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4521) | 4521 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4521) |
| No | is Taxon A an Intraspecies? | Yes | is Taxon B an Intraspecies? |
| | | one population of California | Taxon B Description |

GENOTYPIC CHANGE

At2g45300
 Generic Gene Name: P05466 (<http://www.uniprot.org/uniprot/P05466>)
 Synonyms: 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
 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](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](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](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](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](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