## GEPHE SUMMARY

Gephebase Gene
EPSPS (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^EPSPS^#gephebase-summary-title)

GepheID
GP00001899

Entry Status
Published

Main curator
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
Digitaria insularis - sensitive

Trait State in Taxon B
Digitaria insularis - 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
Digitaria insularis (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Digitaria insularis^#gephebase-summary-title)

Common Name
-

Synonyms
Digitaria insularis (L.) Fedde

Rank
species

Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Panicodae; Paniceae; Anthephorinae; Digitaria

Parent
Digitaria () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 66017 )

NCBI Taxonomy ID
173842 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 173842 )

is Taxon A an Infraspecies?
No

### Taxon B

Latin Name
Digitaria insularis (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Digitaria insularis^#gephebase-summary-title)

Common Name
-

Synonyms
Digitaria insularis (L.) Fedde

Rank
species

Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Panicodae; Paniceae; Anthephorinae; Digitaria

Parent
Digitaria () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 66017 )

NCBI Taxonomy ID
173842 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 173842 )

is Taxon B an Infraspecies?
Yes

Taxon B Description
population from Brazil

## GENOTYPIC CHANGE

Generic Gene Name
At2g45300

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 (https://www.ebi.ac.uk/QuickGO/term/GO:0003866)

GO - Biological Process
GO:0009073 : aromatic amino acid family biosynthetic process

UniProtKB Arabidopsis thaliana
P05466 (http://www.uniprot.org/uniprot/P05466)

GenebankID or UniProtKB
()

(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

Pro106Thr

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 | Pro | Thr | 106 |

Main Reference

Pool of resistance mechanisms to glyphosate in Digitaria insularis. (2012) (https://pubmed.ncbi.nlm.nih.gov/22175446)

Authors

de Carvalho LB; Alves PL; GonzÃilez-Torralva F; Cruz-Hipolito HE; Rojano-Delgado AM; De Prado R; Gil-Humanes J; Barro F; de Castro MD

Abstract

Digitaria insularis biotypes resistant to glyphosate have been detected in Brazil. Studies were carried out in controlled conditions to determine the role of absorption, translocation, metabolism, and gene mutation as mechanisms of glyphosate resistance in D. insularis. The susceptible biotype absorbed at least 12% more (14)C-glyphosate up to 48 h after treatment (HAT) than resistant biotypes. High differential (14)C-glyphosate translocation was observed at 12 HAT, so that >70% of the absorbed herbicide remained in the treated leaf in resistant biotypes, whereas 42% remained in the susceptible biotype at 96 HAT. Glyphosate was degraded to aminomethylphosphonic acid (AMPA), glyoxylate, and sarcosine by >90% in resistant biotypes, whereas a small amount of herbicide (up to 11%) was degraded by the susceptible biotype up to 168 HAT. Two amino acid changes were found at positions 182 and 310 in EPSPS, consisting of a proline to threonine and a tyrosine to cysteine substitution, respectively, in resistant biotypes. Therefore, absorption, translocation, metabolism, and gene mutation play an important role in the D. insularis glyphosate resistance.

Additional References

## RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

No matches found.

## EXTERNAL LINKS

## COMMENTS