

GEPHE SUMMARY

	Gephebase Gene	GephelD
EPSPS (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^EPSPS^#gephebase-summary-title)	GP00001899	Main curator
Published	Entry Status	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		Taxon B	
	Latin Name		Latin Name
Digitaria insularis (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Digitaria+insularis^#gephebase-summary-title)	Digitaria insularis (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Digitaria+insularis^#gephebase-summary-title)		
-	Common Name		Common Name
Digitaria insularis (L.) Fedde	Synonyms	Digitaria insularis (L.) Fedde	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Viriplantae; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophytina; Magnoliopsida; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Panicodae; Paniceae; Anthephorinae; Digitaria	Lineage	cellular organisms; Eukaryota; Viriplantae; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophytina; Magnoliopsida; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Panicodae; Paniceae; Anthephorinae; Digitaria	Lineage
Digitaria () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 66017)	Parent	Digitaria () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 66017)	Parent
173842 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 173842)	NCBI Taxonomy ID	173842 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 173842)	NCBI Taxonomy ID
No	is Taxon A an Infraspecies?	Yes	is Taxon B an Infraspecies?
		population from Brazil	Taxon B Description

GENOTYPIC CHANGE

	Generic Gene Name		
	Synonyms		UniProtKB Arabidopsis thaliana
At2g45300	P05466 (http://www.uniprot.org/uniprot/P05466)		GenebankID or UniProtKB
F4L23.19; At2g45300	0		
3702.AT2G45300.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 3702.AT2G45300.1)	String		
Belongs to the EPSP synthase family.	Sequence Similarities		
GO:0003866 : 3-phosphoshikimate 1-carboxyvinyltransferase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003866)	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=%22No%22#gephebase-summary-title>)

Molecular Type

Coding (<https://www.gephebase.org/search-criteria?/and+Molecular+Type=%22Coding%22#gephebase-summary-title>)

Aberration Type

SNP (<https://www.gephebase.org/search-criteria?/and+Aberration+Type=%22SNP%22#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=%22Candidate+Gene%22#gephebase-summary-title>)

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Pro	Thr	106

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

Main Reference

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

Authors

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.

Abstract

Additional References

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS