

GEPHE SUMMARY

EPSPS (https://www.gephebase.org/search-criteria?/and+Gene Gephebase="EPSPS" #gephebase-summary-title)	Gephebase Gene	GP00001899	GepheID
Published	Entry Status	Courtier	Main curator

PHENOTYPIC CHANGE

Physiology (https://www.gephebase.org/search-criteria?/and+Trait 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)	Trait		
Digitaria insularis - sensitive	Trait State in Taxon A		
Digitaria insularis - resistant	Trait State in Taxon B		
Taxon A	Ancestral State		
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status="Intraspecific" #gephebase-summary-title)	Taxonomic Status		
		Taxon A	Taxon B
	Latin Name		Latin Name
Digitaria insularis (<a #gephebase-summary-title"="" digitaria="" href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=" insularis"="">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Digitaria insularis" #gephebase-summary-title)		Digitaria insularis (<a #gephebase-summary-title"="" digitaria="" href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=" insularis"="">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Digitaria insularis" #gephebase-summary-title)	
	Common Name		Common Name
-		-	
	Synonyms		Synonyms
Digitaria insularis (L.) Fedde		Digitaria insularis (L.) Fedde	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Panicodae; Paniceae; Antheophorinae; Digitaria		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliopsida; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; Panicodae; Paniceae; Antheophorinae; Digitaria	
	Parent		Parent
Digitaria () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 66017)		Digitaria () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 66017)	
	NCBI Taxonomy ID		NCBI Taxonomy ID
173842 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 173842)		173842 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 173842)	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		Yes	
			Taxon B Description
		population from Brazil	

GENOTYPIC CHANGE

At2g45300	Generic Gene Name	P05466 (http://www.uniprot.org/uniprot/P05466)	UniProtKB Arabidopsis thaliana
F4L23.19; At2g45300	Synonyms		GenebankID or UniProtKB
	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			

(<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 ([#gpepbase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive+Null+No))

Molecular Type

Coding ([#gpepbase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular+Type+Coding))

Aberration Type

SNP ([#gpepbase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration+Type+SNP))

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

Pro106Thr

Experimental Evidence

Candidate Gene ([#gpepbase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental+Evidence+Candidate+Gene))

	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; Gonz  lez-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

No matches found.

Related Genes

No matches found.

Related Haplotypes

EXTERNAL LINKS

COMMENTS