

## GEPHE SUMMARY

HAC1 (=ATQ1) ( <a href="https://www.gephebase.org/search-criteria?/and+Gene">https://www.gephebase.org/search-criteria?/and+Gene</a> )	Gephebase Gene	GP00000434	GepheID
Gephebase="HAC1 (=ATQ1)"#gephebase-summary-title)			Main curator
Published	Entry Status	Martin	

## PHENOTYPIC CHANGE

Physiology ( <a href="https://www.gephebase.org/search-criteria?/and+Trait">https://www.gephebase.org/search-criteria?/and+Trait</a> )	Trait Category		
Category="Physiology"#gephebase-summary-title)			
Xenobiotic resistance (soil contamination; arsenate) ( <a (soil="" arsenate)"#gephebase-summary-title"="" contamination;="" href="https://www.gephebase.org/search-criteria?/and+Trait=" resistance="" xenobiotic="">https://www.gephebase.org/search-criteria?/and+Trait="Xenobiotic resistance (soil contamination; arsenate)"#gephebase-summary-title</a> )	Trait		
Arabidopsis thaliana - Col0	Trait State in Taxon A		
Arabidopsis thaliana - Kashmir	Trait State in Taxon B		
Data not curated	Ancestral State		
Intraspecific ( <a href="https://www.gephebase.org/search-criteria?/and+Taxonomic">https://www.gephebase.org/search-criteria?/and+Taxonomic</a> )	Taxonomic Status		
Status="Intraspecific"#gephebase-summary-title)			
	Taxon A	Taxon B	
Arabidopsis thaliana	Latin Name	Arabidopsis thaliana	Latin Name
( <a arabidopsis="" href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=" thaliana"#gephebase-summary-title"="">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Arabidopsis thaliana"#gephebase-summary-title</a> )		( <a arabidopsis="" href="https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=" thaliana"#gephebase-summary-title"="">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Arabidopsis thaliana"#gephebase-summary-title</a> )	
thale cress	Common Name	thale cress	Common Name
thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	Synonyms	thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetales; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis	Lineage	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetales; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis	Lineage
Arabidopsis () - (Rank: genus)	Parent	Arabidopsis () - (Rank: genus)	Parent
( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701</a> )	NCBI Taxonomy ID	( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701</a> )	NCBI Taxonomy ID
3702		3702	
( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702</a> )	is Taxon A an Intraspecies?	( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702</a> )	is Taxon B an Intraspecies?
Yes		Yes	
Arabidopsis thaliana - Col0	Taxon A Description	Arabidopsis thaliana - Kashmir	Taxon B Description

## GENOTYPIC CHANGE

HAC1	Generic Gene Name	Q9C5X9 ( <a href="http://www.uniprot.org/uniprot/Q9C5X9">http://www.uniprot.org/uniprot/Q9C5X9</a> )	UniProtKB Arabidopsis thaliana
ARABIDOPSIS HISTONE ACETYLTRANSFERASE OF THE CBP FAMILY 1; ARABIDOPSIS THALIANA P300/CBP ACETYLTRANSFERASE-RELATED PROTEIN 2; ATHAC1; ATHPCAT2; histone acetyltransferase of the CBP family 1; P300/CBP ACETYLTRANSFERASE-RELATED PROTEIN 2; PCAT2; YUP8H12R.38; YUP8H12R_38; At1g79000; YUP8H12R_22	Synonyms	()	GenebankID or UniProtKB
3702.AT1G79000.2	String		
( <a href="http://string-db.org/newstring.cgi/show_network_section.pl?identifier=3702.AT1G79000.2">http://string-db.org/newstring.cgi/show_network_section.pl?identifier=3702.AT1G79000.2</a> )			
-	Sequence Similarities		

GO - Molecular Function

GO:0008270 : zinc ion binding (<https://www.ebi.ac.uk/QuickGO/term/GO:0008270>)

GO:0003712 : transcription coregulator activity  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0003712>)

GO:0004402 : histone acetyltransferase activity  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0004402>)

GO - Biological Process

GO:0006355 : regulation of transcription, DNA-templated  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0006355>)

GO - Cellular Component

GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)

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=))

Molecular Type

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

Aberration Type

Complex Change ([https://www.gephebase.org/search-criteria?/and+Aberration Type="+Complex Change+"#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration+Type=))

Molecular Details of the Mutation

Coding variation and differential gene expression in roots

Experimental Evidence

Linkage Mapping ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence="+Linkage Mapping+"#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=))

Main Reference

Natural variation in arsenate tolerance identifies an arsenate reductase in *Arabidopsis thaliana*. (2014) (<https://pubmed.ncbi.nlm.nih.gov/25099865>)

Authors

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Abstract

The enormous amount of environmental arsenic was a major factor in determining the biochemistry of incipient life forms early in the Earth's history. The most abundant chemical form in the reducing atmosphere was arsenite, which forced organisms to evolve strategies to manage this chemical species. Following the great oxygenation event, arsenite oxidized to arsenate and the action of arsenate reductases became a central survival requirement. The identity of a biologically relevant arsenate reductase in plants nonetheless continues to be debated. Here we identify a quantitative trait locus that encodes a novel arsenate reductase critical for arsenic tolerance in plants. Functional analyses indicate that several non-additive polymorphisms affect protein structure and account for the natural variation in arsenate reductase activity in *Arabidopsis thaliana* accessions. This study shows that arsenate reductases are an essential component for natural plant variation in As(V) tolerance.

Additional References

Genome-wide association mapping identifies a new arsenate reductase enzyme critical for limiting arsenic accumulation in plants. (2014) (<https://pubmed.ncbi.nlm.nih.gov/25464340>)

RELATED GEPHE

Related Genes

1 (CLH1) ([https://www.gephebase.org/search-criteria?/or+Taxon ID="+3702+"/and+Trait=Xenobiotic resistance/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon+ID=))

Related Haplotypes

1 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase="+HAC1\(=ATQ1\)^/and+Taxon ID="+3702^/or+Gene Gephebase="+HAC1\(=ATQ1\)^/and+Taxon ID="+3702^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=))

EXTERNAL LINKS

COMMENTS

Mapped independently in two studies