

GEPHE SUMMARY

	Gephebase Gene	GepheID
AZI1 (https://www.gephebase.org/search-criteria/?and+Gene Gephebase=^AZI1^#gephebase-summary-title)	GP00001769	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
Root growth (root growth responses to low zinc conditions) (https://www.gephebase.org/search-criteria/?and+Trait=^Root+growth+(root+growth+responses+to+low+zinc+conditions)^#gephebase-summary-title)	Trait State in Taxon A
Arabidopsis thaliana-	Trait State in Taxon B
Arabidopsis thaliana-	Ancestral State
Data not curated	Taxonomic Status
Intraspecific (https://www.gephebase.org/search-criteria/?and+Taxonomic Status=^Intraspecific^#gephebase-summary-title)	

Taxon A		Taxon B	
	Latin Name		Latin Name
Arabidopsis thaliana (https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Arabidopsis+thaliana^#gephebase-summary-title)		Arabidopsis thaliana (https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Arabidopsis+thaliana^#gephebase-summary-title)	
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; Euphylophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelinae; Arabidopsis	Lineage	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphylophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelinae; Arabidopsis	Lineage
Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)	Parent	Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)	Parent
3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)	NCBI Taxonomy ID	3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)	NCBI Taxonomy ID
Yes	is Taxon A an Infraspecies?	Yes	is Taxon B an Infraspecies?
Arabidopsis thaliana- Col-0	Taxon A Description	Arabidopsis thaliana- Sq-1	Taxon B Description

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Arabidopsis thaliana
AZI1		
azelaic acid induced 1; T1P17_60; T1P17_60; At4g12470	Synonyms	GenebankID or UniProtKB
3702.AT4G12470.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier=3702.AT4G12470.1)	String	0
Belongs to the plant LTP family. PEARLI1 subfamily.	Sequence Similarities	
	GO - Molecular Function	
GO:0043621 : protein self-association (https://www.ebi.ac.uk/QuickGO/term/GO:0043621)	GO - Biological Process	
GO:0050832 : defense response to fungus		

[\(<https://www.ebi.ac.uk/QuickGO/term/GO:0050832>\)](https://www.ebi.ac.uk/QuickGO/term/GO:0050832)
 GO:0009682 : induced systemic resistance
[\(<https://www.ebi.ac.uk/QuickGO/term/GO:0009682>\)](https://www.ebi.ac.uk/QuickGO/term/GO:0009682)
 GO:0009631 : cold acclimation (<https://www.ebi.ac.uk/QuickGO/term/GO:0009631>)
 GO:0070417 : cellular response to cold
[\(<https://www.ebi.ac.uk/QuickGO/term/GO:0070417>\)](https://www.ebi.ac.uk/QuickGO/term/GO:0070417)
 GO:0009627 : systemic acquired resistance
[\(<https://www.ebi.ac.uk/QuickGO/term/GO:0009627>\)](https://www.ebi.ac.uk/QuickGO/term/GO:0009627)
 GO:0009626 : plant-type hypersensitive response
[\(<https://www.ebi.ac.uk/QuickGO/term/GO:0009626>\)](https://www.ebi.ac.uk/QuickGO/term/GO:0009626)

GO - Cellular Component

GO:0009506 : plasmodesma (<https://www.ebi.ac.uk/QuickGO/term/GO:0009506>)
 GO:0005783 : endoplasmic reticulum
[\(<https://www.ebi.ac.uk/QuickGO/term/GO:0005783>\)](https://www.ebi.ac.uk/QuickGO/term/GO:0005783)
 GO:0048046 : apoplast (<https://www.ebi.ac.uk/QuickGO/term/GO:0048046>)
 GO:0005618 : cell wall (<https://www.ebi.ac.uk/QuickGO/term/GO:0005618>)
 GO:0009707 : chloroplast outer membrane
[\(<https://www.ebi.ac.uk/QuickGO/term/GO:0009707>\)](https://www.ebi.ac.uk/QuickGO/term/GO:0009707)

Presumptive Null

No ([https://www.gephebase.org/search-criteria?/and+Presumptive Null=%22No%22#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive%20Null=%22No%22#gephebase-summary-title))

Molecular Type

Cis-regulatory ([https://www.gephebase.org/search-criteria?/and+Molecular Type=%22Cis-regulatory%22#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular%20Type=%22Cis-regulatory%22#gephebase-summary-title))

Aberration Type

Unknown ([https://www.gephebase.org/search-criteria?/and+Aberration Type=%22Unknown%22#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration%20Type=%22Unknown%22#gephebase-summary-title))

Molecular Details of the Mutation

exact causing mutation(s) unknown

Experimental Evidence

Association Mapping ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence=%22Association Mapping%22#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental%20Evidence=%22Association%20Mapping%22#gephebase-summary-title))

Main Reference

Natural allelic variation of the AZI1 gene controls root growth under zinc-limiting condition. (2018) (<https://pubmed.ncbi.nlm.nih.gov/29608565>)

Authors

Bouain N; Satbhai SB; Korte A; Saenchai C; Desbrosses G; Berthomieu P; Busch W; Rouached H

Abstract

Zinc is an essential micronutrient for all living organisms and is involved in a plethora of processes including growth and development, and immunity. However, it is unknown if there is a common genetic and molecular basis underlying multiple facets of zinc function. Here we used natural variation in *Arabidopsis thaliana* to study the role of zinc in regulating growth. We identify allelic variation of the systemic immunity gene AZI1 as a key for determining root growth responses to low zinc conditions. We further demonstrate that this gene is important for modulating primary root length depending on the zinc and defence status. Finally, we show that the interaction of the immunity signal azelaic acid and zinc level to regulate root growth is conserved in rice. This work demonstrates that there is a common genetic and molecular basis for multiple zinc dependent processes and that nutrient cues can determine the balance of growth and immune responses in plants.

Additional References

RELATED GEPHE

Related Genes

4 (Brevis radix (BRX), ORGANIC CATION TRANSPORTER 1, Phosphate transporter PHO1, Root System Architecture 1) ([https://www.gephebase.org/search-criteria?/or+Taxon ID=%223702%22/and+Trait=Root growth/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+TaxonID=%223702%22/and+Trait=Root%20growth/and+groupHaplotypes=true#gephebase-summary-title))

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

@GxE