GEPHE SUMMARY

Gephebase Gene

AZI1 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^AZI1^#gephebase-summary-title)

GepheID

GP00001769

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

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

Latin Name

Arabidopsis thaliana (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Arabidopsis thaliana^#gephebase-summary-title)

Common Name

thale cress

Synonyms

thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress

Rank

species

Lineage

cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis

Parent

Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3701)

NCBI Taxonomy ID

3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3702)

is Taxon A an Infraspecies?

Yes

Taxon A Description

Arabidopsis thaliana- Col-0

Taxon B

Latin Name

Arabidopsis thaliana (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Arabidopsis thaliana^#gephebase-summary-title)

Common Name

thale cress

Synonyms

thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress

Rank

species

Lineage

cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis

Parent

Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3701)

NCBI Taxonomy ID

3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 3702)

is Taxon B an Infraspecies?

Yes

Taxon B Description

Arabidopsis thaliana- Sq-1

GENOTYPIC CHANGE

Generic Gene Name

AZI1

Synonyms

azelaic acid induced 1; T1P17.60; T1P17_60; At4g12470

String

3702.AT4G12470.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 3702.AT4G12470.1)

Sequence Similarities

Belongs to the plant LTP family. PEARLI1 subfamily.

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

UniProtKB Arabidopsis thaliana

Q9SU35 (http://www.uniprot.org/uniprot/Q9SU35)

GenebankID or UniProtKB

()

(https://www.ebi.ac.uk/QuickGO/term/GO:0050832)
GO:0009682 : induced systemic resistance
(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)
GO:0009627 : systemic acquired resistance
(https://www.ebi.ac.uk/QuickGO/term/GO:0009627)
GO:0009626 : plant-type hypersensitive response
(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)
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)

Presumptive Null

No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^No^#gephebase-summary-title)

Molecular Type

Cis-regulatory (https://www.gephebase.org/search-criteria?/and+Molecular Type=^Cis-regulatory^#gephebase-summary-title)

Aberration Type

Unknown (https://www.gephebase.org/search-criteria?/and+Aberration Type=^Unknown^#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=^Association Mapping^#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=^3702^/and+Trait=Root growth/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

@GxE