## GEPHE SUMMARY

Gephebase Gene

DOG1 (DELAY OF GERMINATION 1) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^DOG1 (DELAY OF GERMINATION 1)^#gephebase-summary-title)

Entry Status

Published

GepheID

GP00000231

Main curator

Martin

## PHENOTYPIC CHANGE

Trait Category

Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title)

Trait

Seed dormancy (https://www.gephebase.org/search-criteria?/and+Trait=^Seed dormancy^#gephebase-summary-title)

Trait State in Taxon A

Arabidopsis thaliana- Ler0

Trait State in Taxon B

Arabidopsis thaliana- Cvi and other lines

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- Ler0

### 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- Cvi and other lines

## GENOTYPIC CHANGE

Generic Gene Name

DOG1

Synonyms

ATDOG1; DELAY OF GERMINATION 1; GAAS5; germination ability after storage 5; GLUCOSE SENSING QTL 5; GSQ5; K15I22.3; K15I22_3; At5g45830

String

3702.AT5G45830.1 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 3702.AT5G45830.1 )

Sequence Similarities

-

GO - Molecular Function

GO:0043565 : sequence-specific DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0043565)

UniProtKB Arabidopsis thaliana

A0SVK0 (http://www.uniprot.org/uniprot/A0SVK0)

GenebankID or UniProtKB

EF028469 (https://www.ncbi.nlm.nih.gov/nuccore/EF028469)

GO - Biological Process

GO:0006351 : transcription, DNA-templated (https://www.ebi.ac.uk/QuickGO/term/GO:0006351)
GO:0009738 : abscisic acid-activated signaling pathway (https://www.ebi.ac.uk/QuickGO/term/GO:0009738)
GO:2000033 : regulation of seed dormancy process (https://www.ebi.ac.uk/QuickGO/term/GO:2000033)
GO:0010162 : seed dormancy process (https://www.ebi.ac.uk/QuickGO/term/GO:0010162)
GO:0010182 : sugar mediated signaling pathway (https://www.ebi.ac.uk/QuickGO/term/GO:0010182)

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)

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

Not identified (possibly polyallelic as each cross to the Ler accession showed different DOG1 effects)

Experimental Evidence

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

Main Reference

Cloning of DOG1, a quantitative trait locus controlling seed dormancy in Arabidopsis. (2006) (https://pubmed.ncbi.nlm.nih.gov/17065317)

Authors

Bentsink L; Jowett J; Hanhart CJ; Koornneef M

Abstract

Genetic variation for seed dormancy in nature is a typical quantitative trait controlled by multiple loci on which environmental factors have a strong effect. Finding the genes underlying dormancy quantitative trait loci is a major scientific challenge, which also has relevance for agriculture and ecology. In this study we describe the identification of the DELAY OF GERMINATION 1 (DOG1) gene previously identified as a quantitative trait locus involved in the control of seed dormancy. This gene was isolated by a combination of positional cloning and mutant analysis and is absolutely required for the induction of seed dormancy. DOG1 is a member of a small gene family of unknown molecular function, with five members in Arabidopsis. The functional natural allelic variation present in Arabidopsis is caused by polymorphisms in the cis-regulatory region of the DOG1 gene and results in considerable expression differences between the DOG1 alleles of the accessions analyzed.

Additional References

Genome-wide association study of 107 phenotypes in Arabidopsis thaliana inbred lines. (2010) (https://pubmed.ncbi.nlm.nih.gov/20336072)
Genome-wide patterns of genetic variation in worldwide Arabidopsis thaliana accessions from the RegMap panel. (2012) (https://pubmed.ncbi.nlm.nih.gov/22231484)
Seed Dormancy in Arabidopsis Requires Self-Binding Ability of DOG1 Protein and the Presence of Multiple Isoforms Generated by Alternative Splicing. (2015) (https://pubmed.ncbi.nlm.nih.gov/26684465)

## RELATED GEPHE

Related Genes

2 (D14 (KAI2 paralog), RDO5 REDUCED DORMANCY5) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^3702^/and+Trait=Seed dormancy/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

1 (https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^DOG1 (DELAY OF GERMINATION 1)^/and+Taxon ID=^3702^/or+Gene Gephebase=^DOG1 (DELAY OF GERMINATION 1)^/and+Taxon ID=^3702^#gephebase-summary-title)

## EXTERNAL LINKS

## COMMENTS

@GxE