

	Gephebase Gene	GepheID
Molybdenum transporter1 (MOT1) (<a +molybdenum+transporter1+(mot1)^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase="+Molybdenum+transporter1+(MOT1)^#gephebase-summary-title)	GP00001270	Main curator
	Entry Status	Arnoult
Published		

Physiology (#gephebase-summary-title)		Trait Category	
Metal tolerance (#gephebase-summary-title)		Trait	
Arabidopsis thaliana- Bay0		Trait State in Taxon A	
Arabidopsis thaliana- Shahdara		Trait State in Taxon B	
Taxon A		Ancestral State	
Intraspecific (#gephebase-summary-title)		Taxonomic Status	
Taxon A		Taxon B	
Latin Name		Latin Name	
Arabidopsis thaliana (#gephebase-summary-title)		Arabidopsis thaliana (#gephebase-summary-title)	
Common Name		Common Name	
thale cress		thale cress	
Synonyms		Synonyms	
thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress		thale cress; mouse-ear cress; thale-cress; Arabidopsis thaliana (L.) Heynh.; Arabidopsis thaliana (thale cress); Arabidopsis_thaliana; Arbisopsis thaliana; thale kress	
Rank		Rank	
species		species	
Lineage		Lineage	
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis		cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelineae; Arabidopsis	
Parent		Parent	
Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)		Arabidopsis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3701)	
NCBI Taxonomy ID		NCBI Taxonomy ID	
3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)		3702 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3702)	
is Taxon A an Intraspecies?		is Taxon B an Intraspecies?	
Yes		Yes	
Taxon A Description		Taxon B Description	
Arabidopsis thaliana- Bay0		Arabidopsis thaliana- Shahdara	

Generic Gene Name	UniProtKB Arabidopsis thaliana
MOT1	Q9SL95 (http://www.uniprot.org/uniprot/Q9SL95)
F3N11.13; F3N11_13; molybdate transporter 1; ST5.2; SULTR5.2; At2g25680	GenebankID or UniProtKB
817109 (https://www.ncbi.nlm.nih.gov/nuccore/817109)	
String	
3702.AT2G25680.1 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=3702.AT2G25680.1)	
Sequence Similarities	
Belongs to the SLC26A/SulP transporter (TC 2.A.53) family.	
GO - Molecular Function	
GO:0015098 : molybdate ion transmembrane transporter activity (https://www.ebi.ac.uk/QuickGO/term/GO:0015098)	
GO - Biological Process	
GO:0015689 : molybdate ion transport	

(<https://www.ebi.ac.uk/QuickGO/term/GO:0015689>)

GO - Cellular Component

GO:0016021 : integral component of membrane
(<https://www.ebi.ac.uk/QuickGO/term/GO:0016021>)
GO:0031966 : mitochondrial membrane
(<https://www.ebi.ac.uk/QuickGO/term/GO:0031966>)
GO:0005739 : mitochondrion (<https://www.ebi.ac.uk/QuickGO/term/GO:0005739>)
GO:0005773 : vacuole (<https://www.ebi.ac.uk/QuickGO/term/GO:0005773>)

Presumptive Null

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

Molecular Type

Coding (<https://www.gephebase.org/search-criteria?/and+Molecular Type=~Coding^#gephebase-summary-title>)

Aberration Type

SNP (<https://www.gephebase.org/search-criteria?/and+Aberration Type=~SNP^#gephebase-summary-title>)

SNP Coding Change

Nonsynonymous

Molecular Details of the Mutation

D104Y

Experimental Evidence

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

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	-	-	-

Main Reference

Allelic heterogeneity and trade-off shape natural variation for response to soil micronutrient. (2012) (<https://pubmed.ncbi.nlm.nih.gov/22807689>)

Authors

Poormohammad Kiani S; Trontin C; Andreatta M; Simon M; Robert T; Salt DE; Loudet O

Abstract

As sessile organisms, plants have to cope with diverse environmental constraints that may vary through time and space, eventually leading to changes in the phenotype of populations through fixation of adaptive genetic variation. To fully comprehend the mechanisms of evolution and make sense of the extensive genotypic diversity currently revealed by new sequencing technologies, we are challenged with identifying the molecular basis of such adaptive variation. Here, we have identified a new variant of a molybdenum (Mo) transporter, MOT1, which is causal for fitness changes under artificial conditions of both Mo-deficiency and Mo-toxicity and in which allelic variation among West-Asian populations is strictly correlated with the concentration of available Mo in native soils. In addition, this association is accompanied at different scales with patterns of polymorphisms that are not consistent with neutral evolution and show signs of diversifying selection. Resolving such a case of allelic heterogeneity helps explain species-wide phenotypic variation for Mo homeostasis and potentially reveals trade-off effects, a finding still rarely linked to fitness.

Additional References

RELATED GEPHE

Related Genes

5 (FPN2, FRD3 (FERRIC REDUCTASE DEFECTIVE3), heavy metal atpase3 (HMA3), heavy metal atpase5 (HMA5), heavy metal atpase4 (HMA4))
(<https://www.gephebase.org/search-criteria?/or+Taxon ID=~3702^/and+Trait=Metal tolerance/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

2 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase=~Molybdenum transporter1 \(MOT1\)^/and+Taxon ID=~3702^/or+Gene Gephebase=~Molybdenum transporter1 \(MOT1\)^/and+Taxon ID=~3702^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene Gephebase=~Molybdenum transporter1 (MOT1)^/and+Taxon ID=~3702^/or+Gene Gephebase=~Molybdenum transporter1 (MOT1)^/and+Taxon ID=~3702^#gephebase-summary-title))

EXTERNAL LINKS

COMMENTS

@GxE - Another haplotype than described by 18454190.