

## GEPHE SUMMARY

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

## PHENOTYPIC CHANGE

Trait Category		Trait	Taxon A	Taxon B
Physiology ( <a href="https://www.gephebase.org/search-criteria/?and+Trait+Category=%Physiology%#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Trait+Category=%Physiology%#gephebase-summary-title</a> )				
Metal tolerance ( <a href="https://www.gephebase.org/search-criteria/?and+Trait=%Metal+tolerance%#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Trait=%Metal+tolerance%#gephebase-summary-title</a> )	Trait			
Arabidopsis thaliana- Bay0	Trait State in Taxon A			
Arabidopsis thaliana- Shahdara	Trait State in Taxon B			
Taxon A	Ancestral State			
Intraspecific ( <a href="https://www.gephebase.org/search-criteria/?and+Taxonomic+Status=%Intraspecific%#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxonomic+Status=%Intraspecific%#gephebase-summary-title</a> )	Taxonomic Status			
Taxon A	Latin Name			Latin Name
Arabidopsis thaliana ( <a href="https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%Arabidopsis+thaliana%#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%Arabidopsis+thaliana%#gephebase-summary-title</a> )		Arabidopsis thaliana ( <a href="https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%Arabidopsis+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; Viriplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphylophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelinae; Arabidopsis	Lineage	cellular organisms; Eukaryota; Viriplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphylophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; malvids; Brassicales; Brassicaceae; Camelinae; Arabidopsis		Lineage
Arabidopsis () - (Rank: genus) ( <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> )	Parent	Arabidopsis () - (Rank: genus) ( <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> )		Parent
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> )	NCBI Taxonomy ID	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> )		NCBI Taxonomy ID
is Taxon A an Infraspecies?		is Taxon B an Infraspecies?		
Yes	Taxon A Description	Yes	Taxon B Description	
Arabidopsis thaliana- Bay0		Arabidopsis thaliana- Shahdara		

## GENOTYPIC CHANGE

MOT1	Generic Gene Name	UniProtKB Arabidopsis thaliana
F3N11.13; F3N11_13; molybdate transporter 1; ST5.2; SULTR5.2; At2g25680	Synonyms	GenebankID or UniProtKB
3702.AT2G25680.1 ( <a href="http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 3702.AT2G25680.1">http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 3702.AT2G25680.1</a> )	String	
Belongs to the SLC26A/SulP transporter (TC 2.A.53) family.	Sequence Similarities	
GO:0015098 : molybdate ion transmembrane transporter activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0015098">https://www.ebi.ac.uk/QuickGO/term/GO:0015098</a> )	GO - Molecular Function	
GO:0015689 : molybdate ion transport	GO - Biological Process	

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.