

## GEPHE SUMMARY

MLO1 ( <a href="https://www.gephebase.org/search-criteria?/and+Gene">https://www.gephebase.org/search-criteria?/and+Gene</a> Gephebase="MLO1">#gephebase-summary-title)	Gephebase Gene	GP00000674	GepheID
	Entry Status	Martin	Main curator
Published			

## PHENOTYPIC CHANGE

	Trait Category	Trait	
Physiology ( <a href="https://www.gephebase.org/search-criteria?/and+Trait">https://www.gephebase.org/search-criteria?/and+Trait</a> Category="Physiology">#gephebase-summary-title)			
Pathogen resistance ( <a href="https://www.gephebase.org/search-criteria?/and+Trait=^Pathogen">https://www.gephebase.org/search-criteria?/and+Trait=^Pathogen</a> resistance "#gephebase-summary-title)	Trait State in Taxon A		
Solanum lycopersicum	Trait State in Taxon B		
Solanum lycopersicum	Ancestral State		
Taxon A	Taxonomic Status		
Domesticated ( <a href="https://www.gephebase.org/search-criteria?/and+Taxonomic">https://www.gephebase.org/search-criteria?/and+Taxonomic</a> Status="Domesticated">#gephebase-summary-title)			
Taxon A	Latin Name	Taxon B	Latin Name
Solanum lycopersicum ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Solanum+lycopersicum">#gephebase-summary-title"&gt;https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Solanum+lycopersicum"&gt;#gephebase-summary-title</a> )		Solanum lycopersicum ( <a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Solanum+lycopersicum">#gephebase-summary-title"&gt;https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Solanum+lycopersicum"&gt;#gephebase-summary-title</a> )	
tomato	Common Name	tomato	Common Name
Lycopersicon esculentum var. esculentum; Solanum esculentum; Solanum lycopersicum var. humboldtii; tomato; Lycopersicon esculentum Mill.; Solanum esculentum Dunal; Solanum lycopersicum L.; Lycopersicon lycopersicum; Lycopersicum esculentum; Solanum lycopersicon	Synonyms	Lycopersicon esculentum var. esculentum; Solanum esculentum; Solanum lycopersicum var. humboldtii; tomato; Lycopersicon esculentum Mill.; Solanum esculentum Dunal; Solanum lycopersicum L.; Lycopersicon lycopersicum; Lycopersicum esculentum; Solanum lycopersicon	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Viriplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphylophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; Iamiids; Solanales; Solanaceae; Solanoideae; Solaneae; Solanum; Lycopersicon	Lineage	cellular organisms; Eukaryota; Viriplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphylophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; asterids; Iamiids; Solanales; Solanaceae; Solanoideae; Solaneae; Solanum; Lycopersicon	Lineage
Lycopersicon () - (Rank: subgenus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=49274">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=49274</a> )	Parent	Lycopersicon () - (Rank: subgenus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=49274">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=49274</a> )	Parent
4081 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4081">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4081</a> )	NCBI Taxonomy ID	4081 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4081">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4081</a> )	NCBI Taxonomy ID
	is Taxon A an Infraspecies?		is Taxon B an Infraspecies?
No		No	

## GENOTYPIC CHANGE

MLO	Generic Gene Name	UniProtKB Hordeum vulgare
-	Synonyms	GenebankID or UniProtKB
-	String	
Belongs to the MLO family.	Sequence Similarities	
GO:0005516 : calmodulin binding ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0005516">https://www.ebi.ac.uk/QuickGO/term/GO:0005516</a> ) GO - Molecular Function		
GO:0006952 : defense response ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0006952">https://www.ebi.ac.uk/QuickGO/term/GO:0006952</a> ) GO:0009607 : response to biotic stimulus ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0009607">https://www.ebi.ac.uk/QuickGO/term/GO:0009607</a> )	GO - Biological Process	
	GO - Cellular Component	

GO:0016021 : integral component of membrane  
(<https://www.ebi.ac.uk/QuickGO/term/GO:0016021>)

Presumptive Null

Yes ([https://www.gephebase.org/search-criteria?/and+Presumptive Null=%27Yes%27#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive%20Null=%27Yes%27#gephebase-summary-title))

Molecular Type

Coding ([https://www.gephebase.org/search-criteria?/and+Molecular Type=%27Coding%27#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular%20Type=%27Coding%27#gephebase-summary-title))

Aberration Type

Deletion ([https://www.gephebase.org/search-criteria?/and+Aberration Type=%27Deletion%27#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration%20Type=%27Deletion%27#gephebase-summary-title))

Deletion Size

10-99 bp

Molecular Details of the Mutation

19bp deletion resulting in frameshift

Experimental Evidence

Linkage Mapping ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence=%27Linkage Mapping%27#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental%20Evidence=%27Linkage%20Mapping%27#gephebase-summary-title))

Main Reference

Naturally occurring broad-spectrum powdery mildew resistance in a Central American tomato accession is caused by loss of mlo function. (2008) (<https://pubmed.ncbi.nlm.nih.gov/18052880/>)

Authors

Bai Y; Pavan S; Zheng Z; Zappel NF; Reinstädler A; Lotti C; De Giovanni C; Ricciardi L; Lindhout P; Visser R; Theres K; Panstruga R

Abstract

The resistant cherry tomato (*Solanum lycopersicum* var. *cerasiforme*) line LC-95, derived from an accession collected in Ecuador, harbors a natural allele (*ol-2*) that confers broad-spectrum and recessively inherited resistance to powdery mildew (*Oidium neolyccopersici*). As both the genetic and phytopathological characteristics of *ol-2*-mediated resistance are reminiscent of powdery mildew immunity conferred by loss-of-function *mlo* alleles in barley and *Arabidopsis*, we initiated a candidate-gene approach to clone *Ol-2*. A tomato *Mlo* gene (*SiMlo1*) with high sequence-relatedness to barley *Mlo* and *Arabidopsis AtMLO2* mapped to the chromosomal region harboring the *Ol-2* locus. Complementation experiments using transgenic tomato lines as well as virus-induced gene silencing assays suggested that loss of *SiMlo1* function is responsible for powdery mildew resistance conferred by *ol-2*. In progeny of a cross between a resistant line bearing *ol-2* and the susceptible tomato cultivar Moneymaker, a 19-bp deletion disrupting the *SiMlo1* coding region cosegregated with resistance. This polymorphism results in a frameshift and, thus, a truncated nonfunctional *SiMlo1* protein. Our findings reveal the second example of a natural *mlo* mutant that possibly arose post-domestication, suggesting that natural *mlo* alleles might be evolutionarily short-lived due to fitness costs related to loss of *mlo* function.

Additional References

## RELATED GEPHE

Related Genes

4 (Cf-2.1 and Cf-2.2, Cf-4/9, Mi1.2, Pto) ([https://www.gephebase.org/search-criteria?/or+Taxon ID=%274081%27/and+Trait=Pathogen resistance/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon%20ID=%274081%27/and+Trait=Pathogen%20resistance/and+groupHaplotypes=true#gephebase-summary-title))

Related Haplotypes

No matches found.

## EXTERNAL LINKS

## COMMENTS