

GEPHE SUMMARY

| | | | |
|--|----------------|------------|--------------|
| | Gephebase Gene | | GepheID |
| Lysine histidine transporter 1 (https://www.gephebase.org/search-criteria?/and+Gene) | | GP00000555 | |
| Gephebase="Lysine histidine transporter 1" #gephebase-summary-title) | | | Main curator |
| Published | Entry Status | Martin | |

PHENOTYPIC CHANGE

| | | | |
|---|-----------------------------|---|-----------------------------|
| | Trait Category | | |
| Physiology (https://www.gephebase.org/search-criteria?/and+Trait) | | | |
| Category="Physiology" #gephebase-summary-title) | Trait | | |
| Pathogen resistance (<a "="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait=") | | | |
| resistance" #gephebase-summary-title) | Trait State in Taxon A | | |
| Zea mays | | | |
| | Trait State in Taxon B | | |
| Zea mays - Southern corn leaf blight resistant | | | |
| | Ancestral State | | |
| Taxon A | | | |
| | Taxonomic Status | | |
| Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic) | | | |
| Status="Domesticated" #gephebase-summary-title) | | | |
| | Taxon A | Taxon B | |
| | Latin Name | | Latin Name |
| Zea mays | | Zea mays | |
| (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Zea | | (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms="Zea | |
| mays" #gephebase-summary-title) | | mays" #gephebase-summary-title) | |
| | Common Name | | Common Name |
| - | | - | |
| | Synonyms | | Synonyms |
| Zea mays var. japonica; maize; Zea mays L.; Zea mays mays | | Zea mays var. japonica; maize; Zea mays L.; Zea mays mays | |
| | Rank | | Rank |
| species | | species | |
| | Lineage | | Lineage |
| cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; | | cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; | |
| Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; | | Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; | |
| Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; | | Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; PACMAD clade; Panicoideae; | |
| Andropogonodae; Andropogoneae; Tripsacinae; Zea | | Andropogonodae; Andropogoneae; Tripsacinae; Zea | |
| | Parent | | Parent |
| Zea () - (Rank: genus) | | Zea () - (Rank: genus) | |
| (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4575) | | (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4575) | |
| | NCBI Taxonomy ID | | NCBI Taxonomy ID |
| 4577 | | 4577 | |
| (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4577) | | (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4577) | |
| | is Taxon A an Intraspecies? | | is Taxon B an Intraspecies? |
| No | | No | |

GENOTYPIC CHANGE

| | | | |
|---|-------------------------|--|--------------------------------|
| | Generic Gene Name | | UniProtKB Arabidopsis thaliana |
| LHT1 | | Q9FKS8 (http://www.uniprot.org/uniprot/Q9FKS8) | |
| | Synonyms | | GenebankID or UniProtKB |
| K1B16.3; K1B16_3; LYSINE AND HISTIDINE SPECIFIC TRANSPORTER; lysine histidine | | ACG41301 (https://www.ncbi.nlm.nih.gov/nuccore/ACG41301) | |
| transporter 1; At5g40780 | | | |
| | String | | |
| 3702.AT5G40780.1 | | | |
| (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=3702.AT5G40780.1) | | | |
| | Sequence Similarities | | |
| Belongs to the amino acid/polyamine transporter 2 family. Amino acid/auxin permease | | | |
| (AAP) (TC 2.A.18.2) subfamily. | | | |
| | GO - Molecular Function | | |
| GO:0015171 : amino acid transmembrane transporter activity | | | |
| (https://www.ebi.ac.uk/QuickGO/term/GO:0015171) | | | |
| GO:0015293 : symporter activity (https://www.ebi.ac.uk/QuickGO/term/GO:0015293) | | | |
| | GO - Biological Process | | |
| GO:0080167 : response to karrikin (https://www.ebi.ac.uk/QuickGO/term/GO:0080167) | | | |

GO:0043090 : amino acid import (<https://www.ebi.ac.uk/QuickGO/term/GO:0043090>)

GO:0003333 : amino acid transmembrane transport
(<https://www.ebi.ac.uk/QuickGO/term/GO:0003333>)

GO - Cellular Component

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

GO:0005886 : plasma membrane (<https://www.ebi.ac.uk/QuickGO/term/GO:0005886>)

Presumptive Null

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

Molecular Type

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

Aberration Type

Insertion ([https://www.gephebase.org/search-criteria?/and+Aberration Type=~Insertion^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration+Type=~Insertion^#gephebase-summary-title))

Insertion Size

100-999 bp

Molecular Details of the Mutation

354bp insertioin resulting in premature stop codon

Experimental Evidence

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

Main Reference

Identification and fine mapping of rhm1 locus for resistance to Southern corn leaf blight in maize. (2012) (<https://pubmed.ncbi.nlm.nih.gov/22348228>)

Authors

Zhao Y; Lu X; Liu C; Guan H; Zhang M; Li Z; Cai H; Lai J

Abstract

rhm1 is a major recessive disease resistance locus for Southern corn leaf blight (SCLB). To further narrow down its genetic position, F(2) population and BC(1) F(1) population derived from the cross between resistant (H95(rhm)) and susceptible parents (H95) of maize (*Zea mays*) were constructed. Using newly developed markers, rhm1 was initially delimited within an interval of 2.5 Mb, and then finally mapped to a 8.56 kb interval between InDel marker IDP961-503 and simple sequence repeat (SSR) marker A194149-1. Three polymorphic markers IDP961-504, IDP B2-3 and A194149-2 were shown to be co-segregated with the rhm1 locus. Sequence analysis of the 8.56 kb DNA fragment revealed that it contained only one putative gene with a predicted amino acid sequence identical to lysine histidine transporter 1 (LHT1). Comparative sequence analysis indicated that the LHT1 in H95(rhm) harbors a 354 bp insertion in its third exon as compared with that of susceptible alleles in B73, H95 and Mo17. The 354 bp insertion resulted in a truncation of the predicted protein of candidate resistance allele (LHT1-H95(rhm)). Our results strongly suggest LHT1 as the candidate gene for rhm1 against SCLB. The tightly linked molecular markers developed in this study can be directly used for molecular breeding of resistance to Southern corn leaf blight in maize.

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Additional References

RELATED GEPHE

Related Genes

5 (HM1 = HC toxin reductase (HCTR), HM1 = HC toxin reductase (HCTR) [possible pseudo-replicate from other Maize entry], HM2 = HC toxin reductase (HCTR), Rp1-D, Rp3 cluster) ([https://www.gephebase.org/search-criteria?/or+Taxon ID=~4577^/and+Trait=Pathogen resistance/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon+ID=~4577^/and+Trait=Pathogen+resistance/and+groupHaplotypes=true#gephebase-summary-title))

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS