

GEPHE SUMMARY

| | | |
|---|------------------------------|-------------------------|
| Pi37 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^Pi37^#gephebase-summary-title) | Gephebase Gene GP00000879 | GephelD Main curator |
| Published | Entry Status Courtier | |
| | | |

PHENOTYPIC CHANGE

| | Trait Category |
|---|------------------------|
| Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title) | Trait |
| Pathogen resistance (https://www.gephebase.org/search-criteria?/and+Trait=^Pathogen resistance^#gephebase-summary-title) | Trait State in Taxon A |
| Oryza sativa - blast susceptible CO39 | Trait State in Taxon B |
| Oryza sativa - blast resistant japonica | Ancestral State |
| Data not curated | Taxonomic Status |
| Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Domesticated^#gephebase-summary-title) | |

| Taxon A | Latin Name | Taxon B | Latin Name |
|---|-----------------------------|---|-----------------------------|
| Oryza sativa (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Oryza+sativa^#gephebase-summary-title) | | Oryza sativa (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Oryza+sativa^#gephebase-summary-title) | |
| rice | Common Name | rice | Common Name |
| rice; red rice; Oryza sativa L. | Synonyms | rice; red rice; Oryza sativa L. | Synonyms |
| species | Rank | species | Rank |
| | Lineage | | Lineage |
| cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzeae; Oryzinae; Oryza | | cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; Liliopsida; Petrosaviidae; commelinids; Poales; Poaceae; BOP clade; Oryzoideae; Oryzeae; Oryzinae; Oryza | |
| | Parent | | Parent |
| Oryza () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4527) | NCBI Taxonomy ID 4527 | Oryza () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4527) | NCBI Taxonomy ID 4527 |
| 4530 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4530) | | 4530 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=4530) | |
| Yes | is Taxon A an Infraspecies? | Yes | is Taxon B an Infraspecies? |
| Oryza sativa - blast susceptible CO39 | Taxon A Description | Oryza sativa - blast resistant japonica | Taxon B Description |

GENOTYPIC CHANGE

| | | |
|--|---|--|
| Pi37 | Generic Gene Name Q06AJ9 (http://www.uniprot.org/uniprot/Q06AJ9) | UniProtKB Oryza sativa subsp. japonica |
| - | Synonyms ABI94578 (https://www.ncbi.nlm.nih.gov/nuccore/ABI94578) | GenebankID or UniProtKB |
| - | String | |
| - | Sequence Similarities | |
| Belongs to the disease resistance NB-LRR family. | | |
| | GO - Molecular Function GO:0043531 : ADP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0043531) | |
| | GO - Biological Process GO - Cellular Component | |
| - | | |
| - | | Presumptive Null |
| No (https://www.gephebase.org/search-criteria?/and+Presumptive+Null=^No^#gephebase-summary-title) | | |

| | |
|---|-----------------------------------|
| Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=%5BCoding%5D#gephebase-summary-title) | Molecular Type |
| SNP (https://www.gephebase.org/search-criteria?/and+Aberration Type=%5BSNP%5D#gephebase-summary-title) | Aberration Type |
| Nonsynonymous | SNP Coding Change |
| V239A and I247M are the only amino acid substitutions found in all tested resistant strains- the effect of each individual amino acid change has not been tested | Molecular Details of the Mutation |
| Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=%5BLinkage Mapping%5D#gephebase-summary-title) | Experimental Evidence |

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

The blast resistance gene Pi37 encodes a nucleotide binding site leucine-rich repeat protein and is a member of a resistance gene cluster on rice chromosome 1. (2007) (<https://pubmed.ncbi.nlm.nih.gov/17947408>)

Lin F; Chen S; Que Z; Wang L; Liu X; Pan Q

The resistance (R) gene Pi37, present in the rice cultivar St. No. 1, was isolated by an in silico map-based cloning procedure. The equivalent genetic region in Nipponbare contains four nucleotide binding site-leucine-rich repeat (NBS-LRR) type loci. These four candidates for Pi37 (Pi37-1, -2, -3, and -4) were amplified separately from St. No. 1 via long-range PCR, and cloned into a binary vector. Each construct was individually transformed into the highly blast susceptible cultivar Q1063. The subsequent complementation analysis revealed Pi37-3 to be the functional gene, while -1, -2, and -4 are probably pseudogenes. Pi37 encodes a 1290 peptide NBS-LRR product, and the presence of substitutions at two sites in the NBS region (V239A and I247M) is associated with the resistance phenotype. Semiquantitative expression analysis showed that in St. No. 1, Pi37 was constitutively expressed and only slightly induced by blast infection. Transient expression experiments indicated that the Pi37 product is restricted to the cytoplasm. Pi37-3 is thought to have evolved recently from -2, which in turn was derived from an ancestral -1 sequence. Pi37-4 is likely the most recently evolved member of the cluster and probably represents a duplication of -3. The four Pi37 paralogs are more closely related to maize rp1 than to any of the currently isolated rice blast R genes Pita, Pib, Pi9, Pi2, Piz-t, and Pi36.

Additional References

RELATED GEPHE

15 (Pi-ta, Pi2 (Nb54-Pi2), Pi36, Pi5-1 + Pi5-2 cluster, Pi9 (= Nb52-Pi9), Pib, Pid3, PigmR, Pikm1-TS + Pikm2-TS cluster, Pit, Piz-t, SLB1/2, Xa1, Xa21, Xa26) ([https://www.gephebase.org/search-criteria?/or+Taxon ID=%5B4530%5D/+and+Trait=Pathogen resistance/+and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon%20ID=%5B4530%5D/+and+Trait=Pathogen%20resistance/+and+groupHaplotypes=true#gephebase-summary-title))

Related Genes

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS