GEPHE SUMMARY

Gephebase Gene
beta-tubulin (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^beta-tubulin^#gephebase-summary-title)

GepheID
GP00001815

Entry Status
Published

Main curator
Courtier

PHENOTYPIC CHANGE

Trait Category
Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title)

Trait
Xenobiotic resistance (benzimidazole) (https://www.gephebase.org/search-criteria?/and+Trait=^Xenobiotic resistance (benzimidazole)^#gephebase-summary-title)

Trait State in Taxon A
sensitive

Trait State in Taxon B
resistant

Ancestral State
Taxon A

Taxonomic Status
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Intraspecific^#gephebase-summary-title)

Taxon A

Latin Name
Teladorsagia circumcincta (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Teladorsagia circumcincta^#gephebase-summary-title)

Common Name
-

Synonyms
Ostertagia circumcincta; Teladoragia circumcincta

Rank
species

Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Nematoda; Chromadorea; Strongylida; Trichostrongyloidea; Haemonchidae; Teladorsagia

Parent
Teladorsagia () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 94964)

NCBI Taxonomy ID
45464 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 45464)

is Taxon A an Infraspecies?
No

Taxon B

Latin Name
Teladorsagia circumcincta (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Teladorsagia circumcincta^#gephebase-summary-title)

Common Name
-

Synonyms
Ostertagia circumcincta; Teladoragia circumcincta

Rank
species

Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Nematoda; Chromadorea; Strongylida; Trichostrongyloidea; Haemonchidae; Teladorsagia

Parent
Teladorsagia () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 94964)

NCBI Taxonomy ID
45464 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 45464)

is Taxon B an Infraspecies?
No

GENOTYPIC CHANGE

Generic Gene Name
TUB2

Synonyms
ARM10; SHE8; YFL037W

String
4932.YFL037W (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 4932.YFL037W)

UniProtKB Saccharomyces cerevisiae (strain ATCC 204508 / S288c) P02557 (http://www.uniprot.org/uniprot/P02557)

Sequence Similarities
Belongs to the tubulin family.

GenebankID or UniProtKB
()

GO - Molecular Function
GO:0005525 : GTP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005525)
GO:0003924 : GTPase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0003924)
GO:0005200 : structural constituent of cytoskeleton (https://www.ebi.ac.uk/QuickGO/term/GO:0005200)

GO - Biological Process
GO:0007010 : cytoskeleton organization (https://www.ebi.ac.uk/QuickGO/term/GO:0007010)
GO:0000278 : mitotic cell cycle (https://www.ebi.ac.uk/QuickGO/term/GO:0000278)
GO:0000070 : mitotic sister chromatid segregation

(https://www.ebi.ac.uk/QuickGO/term/GO:0000070)
GO:0007017 : microtubule-based process
(https://www.ebi.ac.uk/QuickGO/term/GO:0007017)
GO:0046677 : response to antibiotic (https://www.ebi.ac.uk/QuickGO/term/GO:0046677)
GO:0000226 : microtubule cytoskeleton organization
(https://www.ebi.ac.uk/QuickGO/term/GO:0000226)
GO:0045143 : homologous chromosome segregation
(https://www.ebi.ac.uk/QuickGO/term/GO:0045143)
GO:0030473 : nuclear migration along microtubule
(https://www.ebi.ac.uk/QuickGO/term/GO:0030473)
GO:0090316 : positive regulation of intracellular protein transport
(https://www.ebi.ac.uk/QuickGO/term/GO:0090316)

GO - Cellular Component

GO:0005737 : cytoplasm (https://www.ebi.ac.uk/QuickGO/term/GO:0005737)
GO:0005874 : microtubule (https://www.ebi.ac.uk/QuickGO/term/GO:0005874)
GO:0005816 : spindle pole body (https://www.ebi.ac.uk/QuickGO/term/GO:0005816)
GO:0005881 : cytoplasmic microtubule
(https://www.ebi.ac.uk/QuickGO/term/GO:0005881)
GO:0005828 : kinetochore microtubule
(https://www.ebi.ac.uk/QuickGO/term/GO:0005828)
GO:0005880 : nuclear microtubule (https://www.ebi.ac.uk/QuickGO/term/GO:0005880)
GO:0045298 : tubulin complex (https://www.ebi.ac.uk/QuickGO/term/GO:0045298)

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

Phe200Tyr

Experimental Evidence

Candidate Gene (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=^Candidate Gene^#gephebase-summary-title)

	Taxon A	Taxon B	Position
Codon	-	-	-
Amino-acid	Phe	Tyr	200

Main Reference

Importance of the mutation of amino acid 200 of the isotype 1 beta-tubulin gene in the benzimidazole resistance of the small-ruminant parasite Teladorsagia circumcincta. (1999)
(https://pubmed.ncbi.nlm.nih.gov/10344538)

Authors

Elard L; Humbert JF

Abstract

In this work we demonstrated that the acquisition of benzimidazole (BZ) resistance in the small-ruminant parasite Teladorsagia circumcincta is linked to the selection of individuals that are characterized by a tyrosine (Tyr) at amino acid 200 of their isotype 1 beta-tubulin gene. This mutation appears to be recessive, since only homozygous mutant (Tyr/Tyr) individuals survived after BZ treatment of two resistant populations in which the three genotypes (rr, rs, ss) were initially present. In comparison with natural BZ-susceptible populations, a decrease in the restriction polymorphism (RFLP) of the isotype 1 beta-tubulin gene was observed in natural resistant populations. It seems that this decrease in beta-tubulin polymorphism results from the selection of homozygous mutant individuals.

Additional References

RELATED GEPHE

Related Genes

No matches found.

Related Haplotypes

1 (https://www.gephebase.org/search-criteria?/or+Gene Gephebase=^beta-tubulin^/and+Taxon ID=^45464^/or+Gene Gephebase=^beta-tubulin^/and+Taxon ID=^45464^#gephebase-summary-title)

EXTERNAL LINKS

COMMENTS

Effect of the amino acid change tested in C. elegans