

## GEPHE SUMMARY

peel-1/zeel-1 ( <a href="https://www.gephebase.org/search-criteria/?and+Gene+Gephebase=%peel-1/zeel-1">#gephebase-summary-title)</a>	Gephebase Gene	GP00001320	GephelD
	Entry Status	Courtier	Main curator
Published			

## PHENOTYPIC CHANGE

Trait Category			
Physiology ( <a href="https://www.gephebase.org/search-criteria/?and+Trait+Category=%Physiology">#gephebase-summary-title)</a>	Trait		
Hybrid incompatibility ( <a href="https://www.gephebase.org/search-criteria/?and+Trait=%Hybrid+incompatibility">#gephebase-summary-title)</a>	Trait State in Taxon A		
C. elegans	Trait State in Taxon B		
C. elegans - Hawaii strain CB4856 and 16 other strains	Ancestral State		
Taxon A	Taxonomic Status		
Intraspecific ( <a href="https://www.gephebase.org/search-criteria/?and+Taxonomic+Status=%Intraspecific">#gephebase-summary-title)</a>			
Taxon A		Taxon B	
Caenorhabditis elegans ( <a href="https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%Caenorhabditis+elegans">#gephebase-summary-title)</a> )	Latin Name	Caenorhabditis elegans ( <a href="https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=%Caenorhabditis+elegans">#gephebase-summary-title)</a> )	Latin Name
-	Common Name	-	Common Name
roundworm; Rhabditis elegans; Caenorhabditis elegans (Maupas, 1900); Rhabditis elegans Maupas, 1900	Synonyms	roundworm; Rhabditis elegans; Caenorhabditis elegans (Maupas, 1900); Rhabditis elegans Maupas, 1900	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Nematoda; Chromadorea; Rhabditida; Rhabditina; Rhabditomorpha; Rhabditoidea; Rhabditidae; Peloderinae; Caenorhabditis	Lineage	cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Nematoda; Chromadorea; Rhabditida; Rhabditina; Rhabditomorpha; Rhabditoidea; Rhabditidae; Peloderinae; Caenorhabditis	Lineage
Caenorhabditis () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=6237">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=6237</a> )	Parent	Caenorhabditis () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=6237">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=6237</a> )	Parent
6239 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=6239">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=6239</a> )	NCBI Taxonomy ID	6239 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=6239">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=6239</a> )	NCBI Taxonomy ID
No	is Taxon A an Infraspecies?	Yes	is Taxon B an Infraspecies?
			Taxon B Description
			C. elegans - Hawaii strain CB4856 and 16 other strains

## GENOTYPIC CHANGE

peel-1	Generic Gene Name	UniProtKB Caenorhabditis elegans
CELE_Y39G10AR.25; Y39G10AR.25	Synonyms	GenebankID or UniProtKB
6239.Y39G10AR.25 ( <a href="http://string-db.org/newstring_cgi/show_network_section.pl?identifier=6239.Y39G10AR.25">http://string-db.org/newstring_cgi/show_network_section.pl?identifier=6239.Y39G10AR.25</a> )	String	HQ291556.1 ( <a href="https://www.ncbi.nlm.nih.gov/nuccore/HQ291556.1">https://www.ncbi.nlm.nih.gov/nuccore/HQ291556.1</a> )
	Sequence Similarities	
	GO - Molecular Function	
	GO - Biological Process	
	GO - Cellular Component	
GO:0016021 : integral component of membrane		

Yes (<https://www.gephebase.org/search-criteria?/and+Presumptive+Null=%Yes%#gephebase-summary-title>)

Molecular Type

Gene Loss (<https://www.gephebase.org/search-criteria?/and+Molecular+Type=%Gene+Loss%#gephebase-summary-title>)

Aberration Type

Deletion (<https://www.gephebase.org/search-criteria?/and+Aberration+Type=%Deletion%#gephebase-summary-title>)

Deletion Size

10-100 kb

Molecular Details of the Mutation

19kb deletion

Experimental Evidence

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

Main Reference

Widespread genetic incompatibility in *C. elegans* maintained by balancing selection. (2008) (<https://pubmed.ncbi.nlm.nih.gov/18187622>)

Authors

Seidel HS; Rockman MV; Kruglyak L

Abstract

Natural selection is expected to eliminate genetic incompatibilities from interbreeding populations. We have discovered a globally distributed incompatibility in the primarily selfing species *Caenorhabditis elegans* that has been maintained despite its negative consequences for fitness. Embryos homozygous for a naturally occurring deletion of the zygotically acting gene *zeel-1* arrest if their sperm parent carries an incompatible allele of a second, paternal-effect locus, *peel-1*. The two interacting loci are tightly linked, with incompatible alleles occurring in linkage disequilibrium in two common haplotypes. These haplotypes exhibit elevated sequence divergence, and population genetic analyses of this region indicate that natural selection is preserving both haplotypes in the population. Our data suggest that long-term maintenance of a balanced polymorphism has permitted the incompatibility to persist despite gene flow across the rest of the genome.

Additional References

A novel sperm-delivered toxin causes late-stage embryo lethality and transmission ratio distortion in *C. elegans*. (2011) (<https://pubmed.ncbi.nlm.nih.gov/21814493>)

## RELATED GEPHE

Related Genes

1 (*peel-1*) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=%6239%/and+Trait=Hybrid+incompatibility/and+groupHaplotypes=true#gephebase-summary-title>)

Related Haplotypes

No matches found.

## EXTERNAL LINKS

## COMMENTS

@BalancingSelection - The 19-kb deletion removes 2 genes; *zeel-1* and *peel-1*. Signature of balancing selection. The large haplotype region spans 33 kb of Bristol sequence and includes four full genes and part of a fifth. Sequencing of multiple strains suggests a single deletion event ; Null mutation