

## GEPHE SUMMARY

srg-36/37 ( <a href="https://www.gephebase.org/search-criteria/?and+Gene Gephebase=srg-36/37">#gephebase-summary-title)</a>	Gephebase Gene	GP00001076	GephelD
	Entry Status	Martin	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
Diapause (resistance to dauer-inducing pheromone) ( <a href="https://www.gephebase.org/search-criteria/?and+Trait=Diapause (resistance to dauer-inducing pheromone)">#gephebase-summary-title)</a>	Trait
C. elegans - N2	Trait State in Taxon A
C. elegans LSJ2	Trait State in Taxon B
Data not curated	Ancestral State
Domesticated ( <a href="https://www.gephebase.org/search-criteria/?and+Taxonomic Status=Domesticated">#gephebase-summary-title)</a>	Taxonomic Status

	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	Latin Name
-	Common Name	Common Name
roundworm; Rhabditis elegans; Caenorhabditis elegans (Maupas, 1900); Rhabditis elegans Maupas, 1900	Synonyms	Synonyms
species	Rank	Rank
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Nematoda; Chromadorea; Rhabditida; Rhabditina; Rhabditomorpha; Rhabditoidea; Rhabditidae; Peloderinae; Caenorhabditis	Lineage	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	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	NCBI Taxonomy ID
Yes	is Taxon A an Infraspecies?	is Taxon B an Infraspecies?
C. elegans - N2	Taxon A Description	Taxon B Description

	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	Latin Name
-	Common Name	Common Name
roundworm; Rhabditis elegans; Caenorhabditis elegans (Maupas, 1900); Rhabditis elegans Maupas, 1900	Synonyms	Synonyms
species	Rank	Rank
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Nematoda; Chromadorea; Rhabditida; Rhabditina; Rhabditomorpha; Rhabditoidea; Rhabditidae; Peloderinae; Caenorhabditis	Lineage	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	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	NCBI Taxonomy ID
Yes	is Taxon A an Infraspecies?	is Taxon B an Infraspecies?
C. elegans LSJ2	Taxon A Description	Taxon B Description

## GENOTYPIC CHANGE

srg-34	Generic Gene Name	UniProtKB Caenorhabditis elegans
CELE_Y51A2D.12; Y51A2D.12	Synonyms	GenebankID or UniProtKB
6239_Y51A2D.12 ( <a href="http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 6239_Y51A2D.12">http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 6239_Y51A2D.12</a> )	String	BX284605 ( <a href="https://www.ncbi.nlm.nih.gov/nuccore/BX284605">https://www.ncbi.nlm.nih.gov/nuccore/BX284605</a> )
Belongs to the nematode receptor-like protein srg family.	Sequence Similarities	
GO:0004888 : transmembrane signaling receptor activity ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0004888">https://www.ebi.ac.uk/QuickGO/term/GO:0004888</a> )	GO - Molecular Function	
GO:0007606 : sensory perception of chemical stimulus ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0007606">https://www.ebi.ac.uk/QuickGO/term/GO:0007606</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.gepheebase.org/search-criteria?/and+Presumptive+Null=%Yes%#gepheebase-summary-title>)

Molecular Type

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

Aberration Type

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

Deletion Size

100-999 bp

Molecular Details of the Mutation

4906bp deletion

Experimental Evidence

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

Main Reference

Parallel evolution of domesticated *Caenorhabditis* species targets pheromone receptor genes. (2011) (<https://pubmed.ncbi.nlm.nih.gov/21849976>)

Authors

McGrath PT; Xu Y; Ailion M; Garrison JL; Butcher RA; Bargmann CI

Abstract

Evolution can follow predictable genetic trajectories, indicating that discrete environmental shifts can select for reproducible genetic changes. Conspecific individuals are an important feature of an animal's environment, and a potential source of selective pressures. Here we show that adaptation of two *Caenorhabditis* species to growth at high density, a feature common to domestic environments, occurs by reproducible genetic changes to pheromone receptor genes. Chemical communication through pheromones that accumulate during high-density growth causes young nematode larvae to enter the long-lived but non-reproductive dauer stage. Two strains of *Caenorhabditis elegans* grown at high density have independently acquired multigenic resistance to pheromone-induced dauer formation. In each strain, resistance to the pheromone ascaroside C<sub>3</sub> results from a deletion that disrupts the adjacent chemoreceptor genes serpentine receptor class g (srg)-36 and -37. Through misexpression experiments, we show that these genes encode redundant G-protein-coupled receptors for ascaroside C<sub>3</sub>. Multigenic resistance to dauer formation has also arisen in high-density cultures of a different nematode species, *Caenorhabditis briggsae*, resulting in part from deletion of an srg gene paralogous to srg-36 and srg-37. These results demonstrate rapid remodelling of the chemoreceptor repertoire as an adaptation to specific environments, and indicate that parallel changes to a common genetic substrate can affect life-history traits across species.

Additional References

## RELATED GEPHE

Related Genes

2 (nurf-1, scd-2) (<https://www.gepheebase.org/search-criteria?/or+Taxon+ID=%6239%/and+Trait=Diapause/and+groupHaplotypes=true#gepheebase-summary-title>)

Related Haplotypes

1 (<https://www.gepheebase.org/search-criteria?/or+Gene+Gepheebase=%srg-36/37%/and+Taxon+ID=%6239%/or+Gene+Gepheebase=%srg-36/37%/and+Taxon+ID=%6239%#gepheebase-summary-title>)

## EXTERNAL LINKS

## COMMENTS

Cluster of paralogous genes