GEPHE SUMMARY

Gephebase Gene
srg-34 (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^srg-34^#gephebase-summary-title)

GepheID
GP00001074

Entry Status
Published

Main curator
Martin

PHENOTYPIC CHANGE

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

Trait
Diapause (resistance to dauer-inducing pheromone) (https://www.gephebase.org/search-criteria?/and+Trait=^Diapause (resistance to dauer-inducing pheromone)^#gephebase-summary-title)

Trait State in Taxon A
C._briggsae - AF16

Trait State in Taxon B
C._briggsae DR1690

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
Caenorhabditis briggsae (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Caenorhabditis briggsae^#gephebase-summary-title)

Common Name
-

Synonyms
Caenorhabditis briggsae Dougherty & Nigon, 1949

Rank
species

Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Nematoda; Chromadorea; Rhabditida; Rhabditina; Rhabditomorpha; Rhabditoidea; Rhabditidae; Peloderinae; Caenorhabditis

Parent
Caenorhabditis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6237)

NCBI Taxonomy ID
6238 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6238)

is Taxon A an Infraspecies?
Yes

Taxon A Description
C._briggsae - AF16

Taxon B

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

Common Name
-

Synonyms
Caenorhabditis briggsae Dougherty & Nigon, 1949

Rank
species

Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Nematoda; Chromadorea; Rhabditida; Rhabditina; Rhabditomorpha; Rhabditoidea; Rhabditidae; Peloderinae; Caenorhabditis

Parent
Caenorhabditis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6237)

NCBI Taxonomy ID
6238 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 6238)

is Taxon B an Infraspecies?
Yes

Taxon B Description
C._briggsae DR1690

GENOTYPIC CHANGE

Generic Gene Name
srg-34

Synonyms
CELE_Y51A2D.12; Y51A2D.12

String
6239.Y51A2D.12 (http://string-db.org/newstring_cgi/show_network_section.pl?identifier= 6239.Y51A2D.12)

Sequence Similarities
Belongs to the nematode receptor-like protein srg family.

GO - Molecular Function
GO:0004888 : transmembrane signaling receptor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004888)

GO - Biological Process
GO:0007606 : sensory perception of chemical stimulus (https://www.ebi.ac.uk/QuickGO/term/GO:0007606)

GO - Cellular Component

UniProtKB Caenorhabditis elegans
Q9XXQ5 (http://www.uniprot.org/uniprot/Q9XXQ5)

GenebankID or UniProtKB
CAA16409 (https://www.ncbi.nlm.nih.gov/nuccore/CAA16409)

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

Presumptive Null

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

1-10 kb

Molecular Details of the Mutation

33kb deletion

Experimental Evidence

Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=^Linkage Mapping^#gephebase-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 C3 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 C3. 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

No matches found.

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

Cluster of paralogous genes