

GEPHE SUMMARY

	Gephebase Gene	GepheID
Kit ligand (<a +kit+ligand+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase="+Kit+ligand+"#gephebase-summary-title)	GP00000523	
	Entry Status	Martin
Published		Main curator

PHENOTYPIC CHANGE

	Trait Category		
Morphology (<a +morphology+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait+Category="+Morphology+"#gephebase-summary-title)		Trait	
Coloration (gills; ventrum) (<a +coloration+(gills;+ventrum)+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="+Coloration+(gills;+ventrum)+"#gephebase-summary-title)		Trait State in Taxon A	
Gasterosteus aculeatus - Japanese marine		Trait State in Taxon B	
Gasterosteus aculeatus - Paxton benthic		Ancestral State	
Data not curated		Taxonomic Status	
Intraspecific (<a +intraspecific+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status="+Intraspecific+"#gephebase-summary-title)			
	Taxon A		Taxon B
	Latin Name		Latin Name
Gasterosteus aculeatus (<a +gasterosteus+aculeatus+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Gasterosteus+aculeatus+"#gephebase-summary-title)		Gasterosteus aculeatus (<a +gasterosteus+aculeatus+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Gasterosteus+aculeatus+"#gephebase-summary-title)	
	Common Name		Common Name
three-spined stickleback		three-spined stickleback	
	Synonyms		Synonyms
three-spined stickleback; three spined stickleback; Gasterosteus aculeatus Linnaeus, 1758		three-spined stickleback; three spined stickleback; Gasterosteus aculeatus Linnaeus, 1758	
	Rank		Rank
species		species	
	Lineage		Lineage
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Actinopterygii; Actinopteri; Neopterygii; Teleostei; Osteoglossocephalai; Clupeocephala; Euteleosteomorpha; Neoteleostei; Eurypterygia; Ctenosquamata; Acanthomorpha; Euacanthomorpha; Percomorphaceae; Eupercaria; Perciformes; Cottioidei; Gasterosteales; Gasterosteidae; Gasterosteus		cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Actinopterygii; Actinopteri; Neopterygii; Teleostei; Osteoglossocephalai; Clupeocephala; Euteleosteomorpha; Neoteleostei; Eurypterygia; Ctenosquamata; Acanthomorpha; Euacanthomorpha; Percomorphaceae; Eupercaria; Perciformes; Cottioidei; Gasterosteales; Gasterosteidae; Gasterosteus	
	Parent		Parent
Gasterosteus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=69292)		Gasterosteus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=69292)	
	NCBI Taxonomy ID		NCBI Taxonomy ID
69293 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=69293)		69293 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=69293)	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
Yes		Yes	
	Taxon A Description		Taxon B Description
Gasterosteus aculeatus - Japanese marine		Gasterosteus aculeatus - Paxton benthic	

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Homo sapiens
KITLG		P21583 (http://www.uniprot.org/uniprot/P21583)
	Synonyms	GenebankID or UniProtKB
SF; MGF; SCF; SLF; DCUA; FPH2; FPHH; KL-1; Kitl; SHEP7; DFNA69		AAC04337 (https://www.ncbi.nlm.nih.gov/nuccore/AAC04337)
	String	
9606.ENSPP00000228280 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=9606.ENSPP00000228280)		
	Sequence Similarities	
Belongs to the SCF family.		
	GO - Molecular Function	
GO:0005125 : cytokine activity (https://www.ebi.ac.uk/QuickGO/term/GO:0005125)		
GO:0008083 : growth factor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0008083)		
GO:0046934 : phosphatidylinositol-4,5-bisphosphate 3-kinase activity		

(<https://www.ebi.ac.uk/QuickGO/term/GO:0046934>)
GO:0005088 : Ras guanyl-nucleotide exchange factor activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0005088>)
GO:0005173 : stem cell factor receptor binding
(<https://www.ebi.ac.uk/QuickGO/term/GO:0005173>)

GO - Biological Process

GO:0007155 : cell adhesion (<https://www.ebi.ac.uk/QuickGO/term/GO:0007155>)
GO:0007165 : signal transduction (<https://www.ebi.ac.uk/QuickGO/term/GO:0007165>)
GO:0001755 : neural crest cell migration
(<https://www.ebi.ac.uk/QuickGO/term/GO:0001755>)
GO:0008283 : cell proliferation (<https://www.ebi.ac.uk/QuickGO/term/GO:0008283>)
GO:0035234 : ectopic germ cell programmed cell death
(<https://www.ebi.ac.uk/QuickGO/term/GO:0035234>)
GO:0035162 : embryonic hemopoiesis
(<https://www.ebi.ac.uk/QuickGO/term/GO:0035162>)
GO:0097192 : extrinsic apoptotic signaling pathway in absence of ligand
(<https://www.ebi.ac.uk/QuickGO/term/GO:0097192>)
GO:0008584 : male gonad development
(<https://www.ebi.ac.uk/QuickGO/term/GO:0008584>)
GO:0000165 : MAPK cascade (<https://www.ebi.ac.uk/QuickGO/term/GO:0000165>)
GO:0033026 : negative regulation of mast cell apoptotic process
(<https://www.ebi.ac.uk/QuickGO/term/GO:0033026>)
GO:0001541 : ovarian follicle development
(<https://www.ebi.ac.uk/QuickGO/term/GO:0001541>)
GO:0008284 : positive regulation of cell proliferation
(<https://www.ebi.ac.uk/QuickGO/term/GO:0008284>)
GO:1902035 : positive regulation of hematopoietic stem cell proliferation
(<https://www.ebi.ac.uk/QuickGO/term/GO:1902035>)
GO:0002687 : positive regulation of leukocyte migration
(<https://www.ebi.ac.uk/QuickGO/term/GO:0002687>)
GO:0043406 : positive regulation of MAP kinase activity
(<https://www.ebi.ac.uk/QuickGO/term/GO:0043406>)
GO:0070668 : positive regulation of mast cell proliferation
(<https://www.ebi.ac.uk/QuickGO/term/GO:0070668>)
GO:0045636 : positive regulation of melanocyte differentiation
(<https://www.ebi.ac.uk/QuickGO/term/GO:0045636>)
GO:0002763 : positive regulation of myeloid leukocyte differentiation
(<https://www.ebi.ac.uk/QuickGO/term/GO:0002763>)
GO:0050731 : positive regulation of peptidyl-tyrosine phosphorylation
(<https://www.ebi.ac.uk/QuickGO/term/GO:0050731>)
GO:0051897 : positive regulation of protein kinase B signaling
(<https://www.ebi.ac.uk/QuickGO/term/GO:0051897>)
GO:0046579 : positive regulation of Ras protein signal transduction
(<https://www.ebi.ac.uk/QuickGO/term/GO:0046579>)

GO - Cellular Component

GO:0016021 : integral component of membrane
(<https://www.ebi.ac.uk/QuickGO/term/GO:0016021>)
GO:0005886 : plasma membrane (<https://www.ebi.ac.uk/QuickGO/term/GO:0005886>)
GO:0005737 : cytoplasm (<https://www.ebi.ac.uk/QuickGO/term/GO:0005737>)
GO:0005576 : extracellular region (<https://www.ebi.ac.uk/QuickGO/term/GO:0005576>)
GO:0005615 : extracellular space (<https://www.ebi.ac.uk/QuickGO/term/GO:0005615>)
GO:0005856 : cytoskeleton (<https://www.ebi.ac.uk/QuickGO/term/GO:0005856>)
GO:0030175 : filopodium (<https://www.ebi.ac.uk/QuickGO/term/GO:0030175>)
GO:0030027 : lamellipodium (<https://www.ebi.ac.uk/QuickGO/term/GO:0030027>)

Unknown (https://www.gephebase.org/search-criteria?/and+Presumptive Null=~Unknown~#gephebase-summary-title)	Presumptive Null
Cis-regulatory (https://www.gephebase.org/search-criteria?/and+Molecular Type=~Cis-regulatory~#gephebase-summary-title)	Molecular Type
Unknown (https://www.gephebase.org/search-criteria?/and+Aberration Type=~Unknown~#gephebase-summary-title)	Aberration Type
Not identified	Molecular Details of the Mutation
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Linkage Mapping~#gephebase-summary-title)	Experimental Evidence
cis-Regulatory changes in Kit ligand expression and parallel evolution of pigmentation in sticklebacks and humans. (2007) (https://pubmed.ncbi.nlm.nih.gov/18083106)	Main Reference
Miller CT; Beleza S; Pollen AA; Schluter D; Kittles RA; Shriver MD; Kingsley DM	Authors

Abstract

Dramatic pigmentation changes have evolved within most vertebrate groups, including fish and humans. Here we use genetic crosses in sticklebacks to investigate the parallel origin of pigmentation changes in natural populations. High-resolution mapping and expression experiments show that light gills and light ventrums map to a divergent regulatory allele of the Kit ligand (Kitlg) gene. The divergent allele reduces expression in gill and skin tissue and is shared by multiple derived freshwater populations with reduced pigmentation. In humans, Europeans and East Asians also share derived alleles at the KITLG locus. Strong signatures of selection map to regulatory regions surrounding the gene, and admixture mapping shows that the KITLG genomic region has a significant effect on human skin color. These experiments suggest that regulatory changes in Kitlg contribute to natural variation in vertebrate pigmentation, and that similar genetic mechanisms may underlie rapid evolutionary change in fish and humans.

Additional References

RELATED GEPHE

No matches found.

No matches found.

Related Genes

Related Haplotypes

EXTERNAL LINKS

COMMENTS