

GEPHE SUMMARY

<p>Xmrk (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=Xmrk^#gephebase-summary-title)</p> <p>Published</p>	<p>Gephebase Gene</p> <p>Entry Status</p>	<p>GP00002137</p> <p>Martin</p>	<p>GepheID</p> <p>Main curator</p>
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PHENOTYPIC CHANGE

<p>Physiology (https://www.gephebase.org/search-criteria?/and+Trait+Category=Physiology^#gephebase-summary-title)</p>		<p>Trait Category</p>		
<p>Hybrid incompatibility (melanoma) (https://www.gephebase.org/search-criteria?/and+Trait=Hybrid+incompatibility+(melanoma)^#gephebase-summary-title)</p>		<p>Trait</p>		
<p>X. malinche = no "spotted caudal" trait but hybrids develop melanoma</p>		<p>Trait State in Taxon A</p>		
<p>X. birchmanni with "spotted caudal" trait = a dark blotch on the caudal fin generated by clusters of macromelanocyte cells</p>		<p>Trait State in Taxon B</p>		
<p>Taxon A</p>		<p>Ancestral State</p>		
<p>Interspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=Interspecific^#gephebase-summary-title)</p>		<p>Taxonomic Status</p>		
<p>Taxon A</p>	<p>Latin Name</p>	<p>Taxon B</p>	<p>Latin Name</p>	
<p>Xiphophorus birchmanni (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=Xiphophorus+birchmanni^#gephebase-summary-title)</p>	<p>Xiphophorus malinche (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=Xiphophorus+malinche^#gephebase-summary-title)</p>			
<p>sheepshead swordtail</p>	<p>highland swordtail</p>			
<p>sheepshead swordtail; Xiphophorus birchmanni Lechner & Radda, 1987</p>	<p>highland swordtail; Xiphophorus malinche Rauchenberger, Kallman & Morizot, 1990</p>			
<p>species</p>	<p>species</p>			
<p>cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Actinopterygii; Actinopteri; Neopterygii; Teleostei; Osteoglossocephalai; Clupecocephala; Euteleostei; Neoteleostei; Eurypterygia; Ctenosquamata; Acanthomorpha; Euacanthomorpha; Percormorphaceae; Ovalentaria; Atherinomorphae; Cyprinodontiformes; Cyprinodontoidae; Poeciliidae; Poeciliinae; Xiphophorus</p>	<p>cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Actinopterygii; Actinopteri; Neopterygii; Teleostei; Osteoglossocephalai; Clupecocephala; Euteleostei; Neoteleostei; Eurypterygia; Ctenosquamata; Acanthomorpha; Euacanthomorpha; Percormorphaceae; Ovalentaria; Atherinomorphae; Cyprinodontiformes; Cyprinodontoidae; Poeciliidae; Poeciliinae; Xiphophorus</p>			
<p>Xiphophorus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=8082)</p>	<p>Xiphophorus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=8082)</p>			
<p>32469 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32469)</p>	<p>32476 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=32476)</p>			
<p>No</p>	<p>No</p>			
	<p>is Taxon A an Intraspecies?</p>		<p>is Taxon B an Intraspecies?</p>	

GENOTYPIC CHANGE

<p>xmrk</p>	<p>Generic Gene Name</p>	<p>P13388 (http://www.uniprot.org/uniprot/P13388)</p>	<p>UniProtKB Xiphophorus maculatus</p>
<p>tu</p>	<p>Synonyms</p>	<p>0</p>	<p>GenebankID or UniProtKB</p>
<p>-</p>	<p>String</p>		
<p>Belongs to the protein kinase superfamily. Tyr protein kinase family. EGF receptor subfamily.</p>			
<p>GO - Molecular Function</p>			
<p>GO:0005524 : ATP binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005524)</p>			
<p>GO:0004714 : transmembrane receptor protein tyrosine kinase activity (https://www.ebi.ac.uk/QuickGO/term/GO:0004714)</p>			
<p>GO - Biological Process</p>			
<p>GO:0007169 : transmembrane receptor protein tyrosine kinase signaling pathway (https://www.ebi.ac.uk/QuickGO/term/GO:0007169)</p>			

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

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

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

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

unknown

Loss of Xmrk in several Xiphophorus species

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

Natural hybridization reveals incompatible alleles that cause melanoma in swordtail fish. (2020) (https://pubmed.ncbi.nlm.nih.gov/32409469)

Powell DL; Garc a-Olaz ıbal M; Keegan M; Reilly P; Du K; D az-Loyo AP; Banerjee S; Blakkan D; Reich D; Andolfatto P; Rosenthal GG; Schartl M; Schumer M

The establishment of reproductive barriers between populations can fuel the evolution of new species. A genetic framework for this process posits that “incompatible” interactions between genes can evolve that result in reduced survival or reproduction in hybrids. However, progress has been slow in identifying individual genes that underlie hybrid incompatibilities. We used a combination of approaches to map the genes that drive the development of an incompatibility that causes melanoma in swordtail fish hybrids. One of the genes involved in this incompatibility also causes melanoma in hybrids between distantly related species. Moreover, this melanoma reduces survival in the wild, likely because of progressive degradation of the fin. This work identifies genes underlying a vertebrate hybrid incompatibility and provides a glimpse into the action of these genes in natural hybrid populations.

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Presumptive Null

Molecular Type

Aberration Type

Deletion Size

Molecular Details of the Mutation

Experimental Evidence

Main Reference

Authors

Abstract

Additional References

RELATED GEPHE

No matches found.

No matches found.

Related Genes

Related Haplotypes

EXTERNAL LINKS

COMMENTS

@Epistasis interaction with a second loci thought to be in cd97 gene (unknown if regulatory or coding change)