

GEPHE SUMMARY

	Gephebase Gene		GepheID
ARNT-L2a ( <a +arnt-l2a^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase="+ARNT-L2a^#gephebase-summary-title</a> )		GP00002671	Main curator
Published	Entry Status	Courtier	

PHENOTYPIC CHANGE

	Trait Category		
Physiology ( <a +physiology^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait+Category="+Physiology^#gephebase-summary-title</a> )			
	Trait		
Xenobiotic resistance (pollution) ( <a +xenobiotic+resistance+(pollution)^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="+Xenobiotic+resistance+(pollution)^#gephebase-summary-title</a> )			
	Trait State in Taxon A		
Fundulus grandis - sensitive - lives in non-polluted sites			
	Trait State in Taxon B		
Fundulus grandis - tolerant - adapted to polluted sites			
	Ancestral State		
Taxon A			
	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</a> )			
Taxon A		Taxon B	
	Latin Name		Latin Name
Fundulus grandis ( <a +fundulus+grandis^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Fundulus+grandis^#gephebase-summary-title</a> )		Fundulus grandis ( <a +fundulus+grandis^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Fundulus+grandis^#gephebase-summary-title</a> )	
	Common Name		Common Name
Gulf killifish		Gulf killifish	
	Synonyms		Synonyms
Gulf killifish; Fundulus grandis Baird & Girard, 1853		Gulf killifish; Fundulus grandis Baird & Girard, 1853	
	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; Euteleostomorpha; Neoteleostei; Eurypterygia; Ctenosquamata; Acanthomorpha; Euacanthomorpha; Percomorpha; Ovalentaria; Atherinomorpha; Cyprinodontiformes; Cyprinodontidae; Fundulidae; Fundulus		cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Actinopterygii; Actinopteri; Neopterygii; Teleostei; Osteoglossocephalai; Clupeocephala; Euteleostomorpha; Neoteleostei; Eurypterygia; Ctenosquamata; Acanthomorpha; Euacanthomorpha; Percomorpha; Ovalentaria; Atherinomorpha; Cyprinodontiformes; Cyprinodontidae; Fundulidae; Fundulus	
	Parent		Parent
Fundulus () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=8077">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=8077</a> )		Fundulus () - (Rank: genus) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=8077">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=8077</a> )	
	NCBI Taxonomy ID		NCBI Taxonomy ID
34779 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=34779">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=34779</a> )		34779 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=34779">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=34779</a> )	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		No	

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB
-		P27540NULL ( <a href="http://www.uniprot.org/uniprot/P27540NULL">http://www.uniprot.org/uniprot/P27540NULL</a> )	
	Synonyms		GenebankID or UniProtKB
-		0	
	String		
-			
	Sequence Similarities		
-			
	GO - Molecular Function		
-			
	GO - Biological Process		
-			
	GO - Cellular Component		
-			
			Presumptive Null
Yes ( <a +yes^#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Presumptive+Null=">https://www.gephebase.org/search-criteria?/and+Presumptive+Null="+Yes^#gephebase-summary-title</a> )			

Unknown (<https://www.gephebase.org/search-criteria?/and+Molecular+Type=~Unknown^#gephebase-summary-title>)

Molecular Type

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

Aberration Type

exact mutation(s) unknown - very good candidate gene according to high differentiation region on chromosome 10 and knowledge about the physiology. ARNT-L2a is a nuclear dimerization partner of aryl hydrocarbon receptor (AHR) required for activation of the xenobiotic response pathway.

Molecular Details of the Mutation

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

Experimental Evidence

Adaptive introgression enables evolutionary rescue from extreme environmental pollution. (2019) (<https://pubmed.ncbi.nlm.nih.gov/31048485>)

Main Reference

Oziolor EM; Reid NM; Yair S; Lee KM; Guberman VerPloeg S; Bruns PC; Shaw JR; Whitehead A; Matson CW

Authors

Radical environmental change that provokes population decline can impose constraints on the sources of genetic variation that may enable evolutionary rescue. Adaptive toxicant resistance has rapidly evolved in Gulf killifish (*Fundulus grandis*) that occupy polluted habitats. We show that resistance scales with pollution level and negatively correlates with inducibility of aryl hydrocarbon receptor (AHR) signaling. Loci with the strongest signatures of recent selection harbor genes regulating AHR signaling. Two of these loci introgressed recently (18 to 34 generations ago) from Atlantic killifish (*F. heteroclitus*). One introgressed locus contains a deletion in AHR that confers a large adaptive advantage [selection coefficient ( $s$ ) = 0.8]. Given the limited migration of killifish, recent adaptive introgression was likely mediated by human-assisted transport. We suggest that interspecies connectivity may be an important source of adaptive variation during extreme environmental change.

Abstract

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Additional References

## RELATED GEPHE

3 (AHR2, AIP, ARNT-1c) (<https://www.gephebase.org/search-criteria?/or+Taxon+ID=~34779^/and+Trait=Xenobiotic+resistance/and+groupHaplotypes=true#gephebase-summary-title>)

Related Genes

No matches found.

Related Haplotypes

## EXTERNAL LINKS

## COMMENTS

@Introgression from *Fundulus heteroclitus* @Fitness @@pb with UniProt P27540