

GEPHE SUMMARY

	Gephebase Gene		GepheID
goldentouch (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=^goldentouch^#gephebase-summary-title)		GP00002362	
Published	Entry Status	Santos	Main curator

PHENOTYPIC CHANGE

	Trait Category	
Morphology (https://www.gephebase.org/search-criteria?/and+Trait+Category=^Morphology^#gephebase-summary-title)		
	Trait	
Coloration (https://www.gephebase.org/search-criteria?/and+Trait=^Coloration^#gephebase-summary-title)		
dark morph	Trait State in Taxon A	
golden morph	Trait State in Taxon B	
Unknown	Ancestral State	
	Taxonomic Status	
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=^Intraspecific^#gephebase-summary-title)		

Taxon A	Latin Name	Taxon B	Latin Name
Amphilophus citrinellus (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Amphilophus+citrinellus^#gephebase-summary-title)		Amphilophus citrinellus (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Amphilophus+citrinellus^#gephebase-summary-title)	
Midas cichlid	Common Name	Midas cichlid	Common Name
	Synonyms		Synonyms
Archocentrus citrinellum; Cichlasoma citrinellum; Herichthys citrinellus; Heros citrinellus; Midas cichlid; red devil; red devil cichlid; Amphilophus citrinellus (Guenther, 1864); Heros citrinellus Guenther, 1864; Heros citrinellus Gunther, 1864; Amphilophus citrenellus; Amphilophus citrinellum; Cichlosoma citrinellum		Archocentrus citrinellum; Cichlasoma citrinellum; Herichthys citrinellus; Heros citrinellus; Midas cichlid; red devil; red devil cichlid; Amphilophus citrinellus (Guenther, 1864); Heros citrinellus Guenther, 1864; Heros citrinellus Gunther, 1864; Amphilophus citrenellus; Amphilophus citrinellum; Cichlosoma citrinellum	
species	Rank	species	Rank
	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; Percormorphaceae; Ovalentaria; Cichlomorphae; Cichliformes; Cichlidae; New World cichlids; Cichlasomatinae; Heroini; Amphilophus		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; Percormorphaceae; Ovalentaria; Cichlomorphae; Cichliformes; Cichlidae; New World cichlids; Cichlasomatinae; Heroini; Amphilophus	
	Parent		Parent
Amphilophus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=61818)		Amphilophus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=61818)	
61819 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=61819)	NCBI Taxonomy ID	61819 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=61819)	NCBI Taxonomy ID
No	is Taxon A an Infrasppecies?	No	is Taxon B an Infrasppecies?

GENOTYPIC CHANGE

	Generic Gene Name		UniProtKB
-		0	
	Synonyms		GenebankID or UniProtKB
-		0	
	String		
-			
	Sequence Similarities		
-			
	GO - Molecular Function		
-			
	GO - Biological Process		
-			
	GO - Cellular Component		

No ([https://www.gephebase.org/search-criteria?/and+Presumptive Null=^No^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive+Null+No^#gephebase-summary-title))

Presumptive Null

Cis-regulatory ([https://www.gephebase.org/search-criteria?/and+Molecular Type=^Cis-regulatory^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular+Type+^Cis-regulatory^#gephebase-summary-title))

Molecular Type

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

Aberration Type

1-10 kb

Insertion Size

Molecular Details of the Mutation

“Using a new haplotype-resolved long-read assembly we discover an 8.2â€‰kb, transposon-derived inverted repeat in an intron of an undescribed gene, which we term goldentouch in reference to the Greek myth of King Midas. The gene goldentouch is differentially expressed between morphs, presumably due to structural implications of inverted repeats in both DNA and/or RNA (cruciform and hairpin formation). The near-perfect association of the insertion with the phenotype across independent populations suggests that it likely underlies this trans-specific, stable polymorphism.”

Experimental Evidence

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

Main Reference

An intronic transposon insertion associates with a trans-species color polymorphism in Midas cichlid fishes. (2022) (<https://pubmed.ncbi.nlm.nih.gov/35027541>)

Authors

Kratochwil CF; Kautt AF; Nater A; HÄƒrner A; Liang Y; Henning F; Meyer A

Abstract

Polymorphisms have fascinated biologists for a long time, but their genetic underpinnings often remain elusive. Here, we aim to uncover the genetic basis of the gold/dark polymorphism that is eponymous of Midas cichlid fish (*Amphilophus* spp.) adaptive radiations in Nicaraguan crater lakes. While most Midas cichlids are of the melanic “dark morph”, about 10% of individuals lose their melanic pigmentation during their ontogeny and transition into a conspicuous “gold morph”. Using a new haplotype-resolved long-read assembly we discover an 8.2â€‰kb, transposon-derived inverted repeat in an intron of an undescribed gene, which we term goldentouch in reference to the Greek myth of King Midas. The gene goldentouch is differentially expressed between morphs, presumably due to structural implications of inverted repeats in both DNA and/or RNA (cruciform and hairpin formation). The near-perfect association of the insertion with the phenotype across independent populations suggests that it likely underlies this trans-specific, stable polymorphism.

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Additional References

RELATED GEPHE

No matches found.

Related Genes

No matches found.

Related Haplotypes

EXTERNAL LINKS

COMMENTS