

## GEPHE SUMMARY

<p>pax3b (<a href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~pax3b~#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~pax3b~#gephebase-summary-title</a>)</p> <p>Published</p>	<p>Gephebase Gene</p> <p>Entry Status</p>	<p>GP00001419</p> <p>Prigent</p>	<p>GepheID</p> <p>Main curator</p>
---	---	----------------------------------	------------------------------------

## PHENOTYPIC CHANGE

<p>Morphology (<a href="https://www.gephebase.org/search-criteria?/and+Trait+Category=~Morphology~#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait+Category=~Morphology~#gephebase-summary-title</a>)</p> <p>Coloration (scales) (<a href="https://www.gephebase.org/search-criteria?/and+Trait=~Coloration(scales)~#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait=~Coloration(scales)~#gephebase-summary-title</a>)</p> <p>Labeotropheus fuelleborni with more xanthophore on caudal region of the flank</p> <p>Tropheops red cheek with less xanthophores on caudal region of the flank</p> <p>Unknown</p> <p>Interspecific (<a href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Interspecific~#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Interspecific~#gephebase-summary-title</a>)</p>	<p>Trait Category</p> <p>Trait</p> <p>Trait State in Taxon A</p> <p>Trait State in Taxon B</p> <p>Ancestral State</p> <p>Taxonomic Status</p>	<p>Tropheops sp. 'red cheek' (<a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Tropheops+sp.+&amp;#039;red+cheek&amp;#039;~#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Tropheops+sp.+&amp;#039;red+cheek&amp;#039;~#gephebase-summary-title</a>)</p> <p>-</p> <p>Tropheops redcheek</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; Euteleostomorpha; Neoteleostei; Eurypterygia; Ctenosquamata; Acanthomorpha; Euacanthomorpha; Percomorphaceae; Ovalentaria; Cichlomorphae; Cichliformes; Cichlidae; African cichlids; Pseudocrenilabrinae; Haplochromini; Labeotropheus</p> <p>Tropheops () - (Rank: genus) (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=702376">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=702376</a>)</p> <p>702379 (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=702379">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=702379</a>)</p> <p>is Taxon B an Intraspecies?</p> <p>No</p>	<p>Latin Name</p> <p>Common Name</p> <p>Synonyms</p> <p>Rank</p> <p>Lineage</p> <p>Parent</p> <p>NCBI Taxonomy ID</p> <p>is Taxon B an Intraspecies?</p>
<p>blue mbuna</p> <p>blue mbuna; Labeotropheus fuelleborni Ahl, 1926</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; Euteleostomorpha; Neoteleostei; Eurypterygia; Ctenosquamata; Acanthomorpha; Euacanthomorpha; Percomorphaceae; Ovalentaria; Cichlomorphae; Cichliformes; Cichlidae; African cichlids; Pseudocrenilabrinae; Haplochromini; Labeotropheus</p> <p>Labeotropheus () - (Rank: genus) (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=57306">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=57306</a>)</p> <p>57307 (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=57307">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=57307</a>)</p> <p>is Taxon A an Intraspecies?</p> <p>No</p>	<p>Taxon A</p> <p>Latin Name</p> <p>Common Name</p> <p>Synonyms</p> <p>Rank</p> <p>Lineage</p> <p>Parent</p> <p>NCBI Taxonomy ID</p> <p>is Taxon A an Intraspecies?</p>	<p>Tropheops sp. 'red cheek' (<a href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Tropheops+sp.+&amp;#039;red+cheek&amp;#039;~#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Tropheops+sp.+&amp;#039;red+cheek&amp;#039;~#gephebase-summary-title</a>)</p> <p>-</p> <p>Tropheops redcheek</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; Euteleostomorpha; Neoteleostei; Eurypterygia; Ctenosquamata; Acanthomorpha; Euacanthomorpha; Percomorphaceae; Ovalentaria; Cichlomorphae; Cichliformes; Cichlidae; African cichlids; Pseudocrenilabrinae; Haplochromini; Tropheops</p> <p>Tropheops () - (Rank: genus) (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=702376">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=702376</a>)</p> <p>702379 (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=702379">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=702379</a>)</p> <p>is Taxon B an Intraspecies?</p> <p>No</p>	<p>Latin Name</p> <p>Common Name</p> <p>Synonyms</p> <p>Rank</p> <p>Lineage</p> <p>Parent</p> <p>NCBI Taxonomy ID</p> <p>is Taxon B an Intraspecies?</p>

## GENOTYPIC CHANGE

<p>pax3-b</p> <p>pax3; ws1; Pax3; cdhs; hup2; pax-3; pax3b; xpax3; pax3-a; pax3-b; pax3.S; xPax3-B; pax3B</p> <p>-</p> <p>Belongs to the paired homeobox family.</p> <p>GO:0043565 : sequence-specific DNA binding (<a href="https://www.ebi.ac.uk/QuickGO/term/GO:0043565">https://www.ebi.ac.uk/QuickGO/term/GO:0043565</a>)</p> <p>GO:0007399 : nervous system development (<a href="https://www.ebi.ac.uk/QuickGO/term/GO:0007399">https://www.ebi.ac.uk/QuickGO/term/GO:0007399</a>)</p> <p>GO:0045893 : positive regulation of transcription, DNA-templated (<a href="https://www.ebi.ac.uk/QuickGO/term/GO:0045893">https://www.ebi.ac.uk/QuickGO/term/GO:0045893</a>)</p>	<p>Generic Gene Name</p> <p>Synonyms</p> <p>String</p> <p>Sequence Similarities</p> <p>GO - Molecular Function</p> <p>GO - Biological Process</p>	<p>Q0IH87 (<a href="http://www.uniprot.org/uniprot/Q0IH87">http://www.uniprot.org/uniprot/Q0IH87</a>)</p> <p>()</p> <p>UniProtKB Xenopus laevis</p> <p>GenebankID or UniProtKB</p>
---	---	--

GO:0008543 : fibroblast growth factor receptor signaling pathway  
 (https://www.ebi.ac.uk/QuickGO/term/GO:0008543)  
 GO:0016055 : Wnt signaling pathway  
 (https://www.ebi.ac.uk/QuickGO/term/GO:0016055)  
 GO:0048785 : hatching gland development  
 (https://www.ebi.ac.uk/QuickGO/term/GO:0048785)  
 GO:0014034 : neural crest cell fate commitment  
 (https://www.ebi.ac.uk/QuickGO/term/GO:0014034)  
 GO:0014029 : neural crest formation (https://www.ebi.ac.uk/QuickGO/term/GO:0014029)  
 GO - Cellular Component  
 GO:0005634 : nucleus (https://www.ebi.ac.uk/QuickGO/term/GO:0005634)

Presumptive Null

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

Molecular Type

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

Aberration Type

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

Molecular Details of the Mutation

unknown

Experimental Evidence

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

Main Reference

Genetic basis of continuous variation in the levels and modular inheritance of pigmentation in cichlid fishes. (2014) (https://pubmed.ncbi.nlm.nih.gov/25156298)

Authors

Albertson RC; Powder KE; Hu Y; Coyle KP; Roberts RB; Parsons KJ

Abstract

Variation in pigmentation type and levels is a hallmark of myriad evolutionary radiations, and biologists have long been fascinated by the factors that promote and maintain variation in coloration across populations. Here, we provide insights into the genetic basis of complex and continuous patterns of colour variation in cichlid fishes, which offer a vast diversity of pigmentation patterns that have evolved in response to both natural and sexual selection. Specifically, we crossed two divergent cichlid species to generate an F2 mapping population that exhibited extensive variation in pigmentation levels and patterns. Our experimental design is robust in that it combines traditional quantitative trait locus (QTL) analysis with population genomics, which has allowed us to move efficiently from QTL interval to candidate gene. In total, we detected 41 QTL and 13 epistatic interactions that underlie melanocyte- and xanthophore-based coloration across the fins and flanks of these fishes. We also identified 2 QTL and 1 interaction for variation in the magnitude of integration among these colour traits. This finding in particular is notable as there are marked differences both within and between species with respect to the complexity of pigmentation patterns. While certain individuals are characterized by more uniform 'integrated' colour patterns, others exhibit many more degrees of freedom with respect to the distribution of colour 'modules' across the fins and flank. Our data reveal, for the first time, a genetic basis for this difference. Finally, we implicate pax3a as a mediator of continuous variation in the levels of xanthophore-based colour along the cichlid flank.

© 2014 John Wiley & Sons Ltd.

Additional References

## RELATED GEPHE

Related Genes

4 (ephrin-a4, pax3a, zeb1a, Pax7) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^57307^/and+Trait=Coloration/or+Taxon ID=^702379^/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

## EXTERNAL LINKS

## COMMENTS

SNP adjacent to pax3b