

GEPHE SUMMARY

<p>WntA (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~WntA^#gephebase-summary-title)</p> <p>Published</p>	<p>Gephebase Gene</p> <p>Entry Status</p>	<p>GP00001211</p> <p>Martin</p>	<p>GepheID</p> <p>Main curator</p>
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PHENOTYPIC CHANGE

<p>Morphology (https://www.gephebase.org/search-criteria?/and+Trait+Category=~Morphology^#gephebase-summary-title)</p>		<p>Trait Category</p>		
<p>Coloration (wing, Mullerian mimicry) (https://www.gephebase.org/search-criteria?/and+Trait=~Coloration+(wing,+Mullerian+mimicry)^#gephebase-summary-title)</p>		<p>Trait</p>		
<p>Heliconius himera - central color patch</p>		<p>Trait State in Taxon A</p>		
<p>Heliconius erato erato - "broken" color patch</p>		<p>Trait State in Taxon B</p>		
<p>Data not curated</p>		<p>Ancestral State</p>		
<p>Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Intraspecific^#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>Heliconius himera (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Heliconius+himera^#gephebase-summary-title)</p>	<p>Heliconius erato (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Heliconius+erato^#gephebase-summary-title)</p>	<p>Heliconius erato (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Heliconius+erato^#gephebase-summary-title)</p>	<p>Heliconius erato (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Heliconius+erato^#gephebase-summary-title)</p>	
<p>-</p>	<p>Common Name</p>	<p>crimson-patched longwing</p>	<p>Common Name</p>	
<p>-</p>	<p>Synonyms</p>	<p>crimson-patched longwing; Heliconius erato (Linnaeus, 1764)</p>	<p>Synonyms</p>	
<p>species</p>	<p>Rank</p>	<p>species</p>	<p>Rank</p>	
<p>cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Amphimesnoptera; Lepidoptera; Glossata; Neolepidoptera; Heteroneura; Ditrysia; Obtectomera; Papilionoidea; Nymphalidae; Heliconiinae; Heliconiini; Heliconius</p>	<p>Lineage</p>	<p>cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Amphimesnoptera; Lepidoptera; Glossata; Neolepidoptera; Heteroneura; Ditrysia; Obtectomera; Papilionoidea; Nymphalidae; Heliconiinae; Heliconiini; Heliconius</p>	<p>Lineage</p>	
<p>Heliconius () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=33416)</p>	<p>Parent</p>	<p>Heliconius () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=33416)</p>	<p>Parent</p>	
<p>33442 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=33442)</p>	<p>NCBI Taxonomy ID</p>	<p>33431 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=33431)</p>	<p>NCBI Taxonomy ID</p>	
<p>No</p>	<p>is Taxon A an Intraspecies?</p>	<p>Yes</p>	<p>is Taxon B an Intraspecies?</p>	
			<p>Taxon B Description</p>	
			<p>Heliconius erato erato - "broken" color patch</p>	

GENOTYPIC CHANGE

<p>WntA</p>	<p>Generic Gene Name</p>	<p>A0A077DF90 (http://www.uniprot.org/uniprot/A0A077DF90)</p>	<p>UniProtKB Vanessa cardui</p>
<p>-</p>	<p>Synonyms</p>	<p>JN944589 (https://www.ncbi.nlm.nih.gov/nucleotide/JN944589)</p>	<p>GenebankID or UniProtKB</p>
<p>-</p>	<p>String</p>		
<p>Belongs to the Wnt family.</p>	<p>Sequence Similarities</p>		
<p>GO:0005102 : signaling receptor binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005102)</p>	<p>GO - Molecular Function</p>		
<p>GO:0007275 : multicellular organism development (https://www.ebi.ac.uk/QuickGO/term/GO:0007275)</p> <p>GO:0016055 : Wnt signaling pathway</p>	<p>GO - Biological Process</p>		

(<https://www.ebi.ac.uk/QuickGO/term/GO:0016055>)

GO - Cellular Component

GO:0005576 : extracellular region (<https://www.ebi.ac.uk/QuickGO/term/GO:0005576>)

Presumptive Null

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))

Molecular Type

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))

Aberration Type

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

Molecular Details of the Mutation

Not identified

Experimental Evidence

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

Main Reference

Diversification of complex butterfly wing patterns by repeated regulatory evolution of a Wnt ligand. (2012) (<https://pubmed.ncbi.nlm.nih.gov/22802635>)

Authors

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Abstract

Although animals display a rich variety of shapes and patterns, the genetic changes that explain how complex forms arise are still unclear. Here we take advantage of the extensive diversity of Heliconius butterflies to identify a gene that causes adaptive variation of black wing patterns within and between species. Linkage mapping in two species groups, gene-expression analysis in seven species, and pharmacological treatments all indicate that cis-regulatory evolution of the WntA ligand underpins discrete changes in color pattern features across the Heliconius genus. These results illustrate how the direct modulation of morphogen sources can generate a wide array of unique morphologies, thus providing a link between natural genetic variation, pattern formation, and adaptation.

Additional References

RELATED GEPHE

Related Genes

1 (Optix) ([https://www.gephebase.org/search-criteria?/or+Taxon ID=~33442^/and+Trait=Coloration/or+Taxon ID=~33431^/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon+ID=~33442^/and+Trait=Coloration/or+Taxon+ID=~33431^/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title))

Related Haplotypes

2 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase=~WntA^/and+Taxon ID=~33442^/or+Gene Gephebase=~WntA^/and+Taxon ID=~33431^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=~WntA^/and+Taxon+ID=~33442^/or+Gene+Gephebase=~WntA^/and+Taxon+ID=~33431^#gephebase-summary-title))

EXTERNAL LINKS

COMMENTS

See follow-up paper : Van Belleghem et al. for high-resolution Association Mapping of the H. erato erato allele