

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>GP00001205</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>Coloration (wing, Mullerian mimicry) (https://www.gephebase.org/search-criteria?/and+Trait=~Coloration+(wing,+Mullerian+mimicry)^#gephebase-summary-title)</p> <p>Heliconius erato emma - Peruvian amazon</p> <p>Heliconius erato emma - Peruvian low-lands</p> <p>Unknown</p> <p>Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Intraspecific^#gephebase-summary-title)</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>Heliconius erato emma - Peruvian amazon</p> <p>Heliconius erato emma - Peruvian low-lands</p> <p>Unknown</p> <p>Intraspecific</p>	<p>Heliconius erato emma - Peruvian amazon</p> <p>Heliconius erato emma - Peruvian low-lands</p> <p>Unknown</p> <p>Intraspecific</p>
Taxon A		Taxon B	
<p>Heliconius erato (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Heliconius+erato^#gephebase-summary-title)</p> <p>crimson-patched longwing</p> <p>crimson-patched longwing; Heliconius erato (Linnaeus, 1764)</p> <p>species</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>Heliconius () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=33416)</p> <p>33431 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=33431)</p> <p>Yes</p> <p>Heliconius erato emma - Peruvian amazon</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>Taxon A Description</p>	<p>Heliconius erato (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Heliconius+erato^#gephebase-summary-title)</p> <p>crimson-patched longwing</p> <p>crimson-patched longwing; Heliconius erato (Linnaeus, 1764)</p> <p>species</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>Heliconius () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=33416)</p> <p>33431 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=33431)</p> <p>Yes</p> <p>Heliconius erato emma - Peruvian low-lands</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>Taxon B Description</p>

GENOTYPIC CHANGE

<p>WntA</p> <p>-</p> <p>-</p> <p>Belongs to the Wnt family.</p> <p>GO:0005102 : signaling receptor binding (https://www.ebi.ac.uk/QuickGO/term/GO:0005102)</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>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>A0A077DF90 (http://www.uniprot.org/uniprot/A0A077DF90)</p> <p>0</p> <p>0</p>	<p>UniProtKB Vanessa cardui</p> <p>GenebankID or UniProtKB</p>
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(<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

unknown

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

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

Authors

Martin A; Papa R; Nadeau NJ; Hill RI; Counterman BA; Halder G; Jiggins CD; Kronforst MR; Long AD; McMillan WO; Reed RD

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

Related Haplotypes

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

EXTERNAL LINKS

COMMENTS

UPDATE: add Van Belleghem et al. reference