

## GEPHE SUMMARY

|  |   |                                 |                                    |
|--|---|---------------------------------|------------------------------------|
| <p>WntA (<a href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~WntA^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=~WntA^#gephebase-summary-title</a>)</p> <p>Published</p> | <p>Gephebase Gene</p> <p>Entry Status</p> | <p>GP00001206</p> <p>Martin</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 (wing, Mullerian mimicry) (<a href="https://www.gephebase.org/search-criteria?/and+Trait=~Coloration+(wing,+Mullerian+mimicry)^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Trait=~Coloration+(wing,+Mullerian+mimicry)^#gephebase-summary-title</a>)</p> <p>Heliconius hecale melicerta</p> <p>Heliconius hecale zuleika -differs from melicerta by amount of melanic (WntA-positive) spots</p> <p>Unknown</p> <p>Intraspecific (<a href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Intraspecific^#gephebase-summary-title">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=~Intraspecific^#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>Heliconius hecale</p> <p>Heliconius hecale (Fabricius, 1775)</p> <p>species</p> <p>cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Amphimesenoptera; Lepidoptera; Glossata; Neolepidoptera; Heteroneura; Dityrsia; Obtectomera; Papilionoidea; Nymphalidae; Heliconiinae; Heliconiini; Heliconius</p> <p>Heliconius () - (Rank: genus) (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=33416">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=33416</a>)</p> <p>33425 (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=33425">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=33425</a>)</p> <p>Yes</p> <p>Heliconius hecale melicerta</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 hecale</p> <p>Heliconius hecale (Fabricius, 1775)</p> <p>species</p> <p>cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Amphimesenoptera; Lepidoptera; Glossata; Neolepidoptera; Heteroneura; Dityrsia; Obtectomera; Papilionoidea; Nymphalidae; Heliconiinae; Heliconiini; Heliconius</p> <p>Heliconius () - (Rank: genus) (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=33416">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=33416</a>)</p> <p>33425 (<a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=33425">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=33425</a>)</p> <p>Yes</p> <p>Heliconius hecale zuleika -differs from melicerta by amount of melanic (WntA-positive) spots</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 (<a href="https://www.ebi.ac.uk/QuickGO/term/GO:0005102">https://www.ebi.ac.uk/QuickGO/term/GO:0005102</a>)</p> <p>GO:0007275 : multicellular organism development</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 (<a href="http://www.uniprot.org/uniprot/A0A077DF90">http://www.uniprot.org/uniprot/A0A077DF90</a>)</p> <p>()</p> | <p>UniProtKB Vanessa cardui</p> <p>GenebankID or UniProtKB</p> |
|---|---|---|--|

(<https://www.ebi.ac.uk/QuickGO/term/GO:0007275>)

GO:0016055 : Wnt signaling pathway

(<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=))

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=))

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=))

Molecular Details of the Mutation

unknown

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=))

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

No matches found.

Related Genes

No matches found.

Related Haplotypes

## EXTERNAL LINKS

## COMMENTS