

GEPHE SUMMARY

cortex (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase+^cortex+^#gephebase-summary-title)	Gephebase Gene	GP00002420	GepheID
Published	Entry Status	Courtier	Main curator

PHENOTYPIC CHANGE

Morphology (https://www.gephebase.org/search-criteria?/and+Trait+Category+^Morphology+^#gephebase-summary-title)	Trait Category		
Coloration (wing; seasonal) (https://www.gephebase.org/search-criteria?/and+Trait+^Coloration+(wing;+seasonal)+^#gephebase-summary-title)	Trait		
Plastic line - the dark red wing phenotype is induced by environmental cues	Trait State in Taxon A		
Red line - the dark red wing phenotype is formed irrespective of the external conditions	Trait State in Taxon B		
	Ancestral State		
Experimental Evolution (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status+^Experimental+Evolution+^#gephebase-summary-title)	Taxonomic Status		
	Taxon A	Taxon B	
Junonia coenia (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+^Junonia+coenia+^#gephebase-summary-title)	Latin Name	Junonia coenia (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms+^Junonia+coenia+^#gephebase-summary-title)	Latin Name
buckeye	Common Name	buckeye	Common Name
Precis coenia; buckeye; peacock butterfly; Junonia coenia Hubner, 1822	Synonyms	Precis coenia; buckeye; peacock butterfly; Junonia coenia Hubner, 1822	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Endopterygota; Amphiesmenoptera; Lepidoptera; Glossata; Neolepidoptera; Heteroneura; Ditrysia; Obtectomera; Papilionoidea; Nymphalidae; Nymphalinae; Junoniini; Junonia	Lineage	cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Endopterygota; Amphiesmenoptera; Lepidoptera; Glossata; Neolepidoptera; Heteroneura; Ditrysia; Obtectomera; Papilionoidea; Nymphalidae; Nymphalinae; Junoniini; Junonia	Lineage
Junonia (buckeyes) - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=39707)	Parent	Junonia (buckeyes) - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=39707)	Parent
39708 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=39708)	NCBI Taxonomy ID	39708 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=39708)	NCBI Taxonomy ID
No	is Taxon A an Intraspecies?	No	is Taxon B an Intraspecies?

GENOTYPIC CHANGE

cort	Generic Gene Name	Q960N3 (http://www.uniprot.org/uniprot/Q960N3)	UniProtKB Drosophila melanogaster
CG11330; cor; Cort; Dmel\CG11330	Synonyms	()	GenebankID or UniProtKB
7227.FBpp0078949 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=7227.FBpp0078949)	String		
Belongs to the WD repeat CORT family.	Sequence Similarities		
GO:0010997 : anaphase-promoting complex binding (https://www.ebi.ac.uk/QuickGO/term/GO:0010997)	GO - Molecular Function		
GO:0097027 : ubiquitin-protein transferase activator activity (https://www.ebi.ac.uk/QuickGO/term/GO:0097027)			
GO:0048477 : oogenesis (https://www.ebi.ac.uk/QuickGO/term/GO:0048477)	GO - Biological Process		

GO:0045143 : homologous chromosome segregation
 (https://www.ebi.ac.uk/QuickGO/term/GO:0045143)
 GO:0031145 : anaphase-promoting complex-dependent catabolic process
 (https://www.ebi.ac.uk/QuickGO/term/GO:0031145)
 GO:0007349 : cellularization (https://www.ebi.ac.uk/QuickGO/term/GO:0007349)
 GO:0007343 : egg activation (https://www.ebi.ac.uk/QuickGO/term/GO:0007343)
 GO:0007144 : female meiosis I (https://www.ebi.ac.uk/QuickGO/term/GO:0007144)
 GO:0007147 : female meiosis II (https://www.ebi.ac.uk/QuickGO/term/GO:0007147)
 GO:0007143 : female meiotic nuclear division
 (https://www.ebi.ac.uk/QuickGO/term/GO:0007143)
 GO:0007279 : pole cell formation (https://www.ebi.ac.uk/QuickGO/term/GO:0007279)
 GO:1905786 : positive regulation of anaphase-promoting complex-dependent catabolic
 process (https://www.ebi.ac.uk/QuickGO/term/GO:1905786)
 GO:1904668 : positive regulation of ubiquitin protein ligase activity
 (https://www.ebi.ac.uk/QuickGO/term/GO:1904668)

GO - Cellular Component

GO:0005737 : cytoplasm (https://www.ebi.ac.uk/QuickGO/term/GO:0005737)

Presumptive Null

No (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)

Aberration Type

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

Molecular Details of the Mutation

No variation in coding region. Strong association with cis-regulatory SNP.

Experimental Evidence

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

Main Reference

Genomic architecture of a genetically assimilated seasonal color pattern. (2020) (https://pubmed.ncbi.nlm.nih.gov/33154142)

Authors

van der Burg KRL; Lewis JJ; Brack BJ; Fandino RA; Mazo-Vargas A; Reed RD

Abstract

Developmental plasticity allows genomes to encode multiple distinct phenotypes that can be differentially manifested in response to environmental cues. Alternative plastic phenotypes can be selected through a process called genetic assimilation, although the mechanisms are still poorly understood. We assimilated a seasonal wing color phenotype in a naturally plastic population of butterflies (*Junonia coenia*) and characterized three responsible genes. Endocrine assays and chromatin accessibility and conformation analyses showed that the transition of wing coloration from an environmentally determined trait to a predominantly genetic trait occurred through selection for regulatory alleles of downstream wing-patterning genes. This mode of genetic evolution is likely favored by selection because it allows tissue- and trait-specific tuning of reaction norms without affecting core cue detection or transduction mechanisms.

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Additional References

RELATED GEPHE

Related Genes

2 (herfst, trehalase) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^39708^/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title)

Related Haplotypes

No matches found.

EXTERNAL LINKS

COMMENTS

@Parallelism @GxE The two color morphs of *Junonia coenia*, light tan and dark red, depend on day length and temperature.