

GEPHE SUMMARY

LOC105383139 (<a +loc105383139+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene+Gephebase="+LOC105383139+"#gephebase-summary-title)	Gephebase Gene	GP00002412	GepheID
Published	Entry Status	Courtier	Main curator

PHENOTYPIC CHANGE

Behavior (<a +behavior+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait+Category="+Behavior+"#gephebase-summary-title)	Trait Category		
Courtship behavior (<a +courtship+behavior+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait="+Courtship+behavior+"#gephebase-summary-title)	Trait		
basal courtship behavior	Trait State in Taxon A		
enhanced courtship behavior, increased mating success	Trait State in Taxon B		
Taxon A	Ancestral State		
Intergenic or Higher (<a +intergenic+or+higher+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=">https://www.gephebase.org/search-criteria?/and+Taxonomic+Status="+Intergenic+or+Higher+"#gephebase-summary-title)	Taxonomic Status		
	Taxon A	Taxon B	
Trichoptera (<a +trichoptera+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Trichoptera+"#gephebase-summary-title)	Latin Name	Lepidoptera (<a +lepidoptera+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="+Lepidoptera+"#gephebase-summary-title)	Latin Name
caddisflies	Common Name	butterflies and moths	Common Name
caddisflies	Synonyms	butterflies and moths; moths	Synonyms
order	Rank	order	Rank
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Endopterygota; Amphiesmenoptera	Lineage	cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Amphiesmenoptera	Lineage
Amphiesmenoptera () - (Rank: no rank) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=85604)	Parent	Amphiesmenoptera () - (Rank: no rank) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=85604)	Parent
30263 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=30263)	NCBI Taxonomy ID	7088 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7088)	NCBI Taxonomy ID
No	is Taxon A an Intraspecies?	No	is Taxon B an Intraspecies?

GENOTYPIC CHANGE

-	Generic Gene Name		UniProtKB
-	Synonyms	0	GenebankID or UniProtKB
-	String	0	
-	Sequence Similarities		
-	GO - Molecular Function		
-	GO - Biological Process		
-	GO - Cellular Component		
No (<a +no+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Presumptive+Null=">https://www.gephebase.org/search-criteria?/and+Presumptive+Null="+No+"#gephebase-summary-title)			Presumptive Null
Other (<a +other+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Molecular+Type=">https://www.gephebase.org/search-criteria?/and+Molecular+Type="+Other+"#gephebase-summary-title)			Molecular Type
			Aberration Type

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

Insertion Size

10-100 kb

Molecular Details of the Mutation

Horizontal Gene Transfer from *Listeria* bacteria to Lepidoptera of an entire gene coding region. The gene contains an alcohol dehydrogenase domain and a zinc-binding dehydrogenase domain.

Experimental Evidence

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

Main Reference

HGT is widespread in insects and contributes to male courtship in lepidopterans. (2022) (<https://pubmed.ncbi.nlm.nih.gov/35853453>)

Authors

Li Y; Liu Z; Liu C; Shi Z; Pang L; Chen C; Chen Y; Pan R; Zhou W; Chen XX; Rokas A; Huang J; Shen XX

Abstract

Horizontal gene transfer (HGT) is an important evolutionary force shaping prokaryotic and eukaryotic genomes. HGT-acquired genes have been sporadically reported in insects, a lineage containing >50% of animals. We systematically examined HGT in 218 high-quality genomes of diverse insects and found that they acquired 1,410 genes exhibiting diverse functions, including many not previously reported, via 741 distinct transfers from non-metazoan donors. Lepidopterans had the highest average number of HGT-acquired genes. HGT-acquired genes containing introns exhibited substantially higher expression levels than genes lacking introns, suggesting that intron gains were likely involved in HGT adaptation. Lastly, we used the CRISPR-Cas9 system to edit the prevalent unreported gene LOC105383139, which was transferred into the last common ancestor of moths and butterflies. In diamondback moths, males lacking LOC105383139 courted females significantly less. We conclude that HGT has been a major contributor to insect adaptation.

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Additional References

RELATED GEPHE

No matches found.

Related Genes

No matches found.

Related Haplotypes

EXTERNAL LINKS

COMMENTS

@HGT