

# GEPHE SUMMARY

	Gephebase Gene	GephelD
tartan ( <a href="https://www.gephebase.org/search-criteria/?and+Gene">https://www.gephebase.org/search-criteria/?and+Gene</a> Gephebase="tartan">#gephebase-summary-title)	GP00002047	
	Entry Status	Main curator
Published	Courtier	

## PHENOTYPIC CHANGE

Trait #1	Trait Category	Trait	Trait State in Taxon A	Trait State in Taxon B
Morphology ( <a href="https://www.gephebase.org/search-criteria/?and+Trait">https://www.gephebase.org/search-criteria/?and+Trait</a> Category="Morphology">#gephebase-summary-title)				
Organ size (genitalia; clasper) ( <a href="https://www.gephebase.org/search-criteria/?and+Trait=^Organ+size+(genitalia;+clasper)^#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Trait=^Organ+size+(genitalia;+clasper)^#gephebase-summary-title</a> )				
Drosophila mauritiana				
Drosophila simulans				

Trait #2	Trait Category	Trait	Trait State in Taxon A	Trait State in Taxon B
Morphology ( <a href="https://www.gephebase.org/search-criteria/?and+Trait">https://www.gephebase.org/search-criteria/?and+Trait</a> Category="Morphology">#gephebase-summary-title)				
Bristle number (genitalia; clasper) ( <a href="https://www.gephebase.org/search-criteria/?and+Trait=^Bristle+number+(genitalia;+clasper)^#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Trait=^Bristle+number+(genitalia;+clasper)^#gephebase-summary-title</a> )				
Drosophila simulans - small claspers				
Drosophila mauritiana - larger claspers; increased spatial domain and temporal expression of tartan during clasper development				

Taxon A	Ancestral State	Taxon B	Ancestral State
	Taxonomic Status		Taxonomic Status
Interspecific ( <a href="https://www.gephebase.org/search-criteria/?and+Taxonomic">https://www.gephebase.org/search-criteria/?and+Taxonomic</a> Status="Interspecific">#gephebase-summary-title)			
Taxon A	Latin Name	Taxon B	Latin Name
Drosophila simulans ( <a href="https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Drosophila+simulans^#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Drosophila+simulans^#gephebase-summary-title</a> )		Drosophila mauritiana ( <a href="https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Drosophila+mauritiana^#gephebase-summary-title">https://www.gephebase.org/search-criteria/?and+Taxon+and+Synonyms=^Drosophila+mauritiana^#gephebase-summary-title</a> )	
Common Name		Common Name	
-		-	
Synonyms		Synonyms	
-		-	
Rank		Rank	
species		species	
Lineage		Lineage	
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Diptera; Brachycera; Muscomorpha; Eremoneura; Cyclorrhapha; Schizophora; Acalyptratae; Ephydriidea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Sophophora; melanogaster group; melanogaster subgroup		cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Protostomia; Ecdysozoa; Panarthropoda; Arthropoda; Mandibulata; Pancrustacea; Hexapoda; Insecta; Dicondylia; Pterygota; Neoptera; Holometabola; Diptera; Brachycera; Muscomorpha; Eremoneura; Cyclorrhapha; Schizophora; Acalyptratae; Ephydriidea; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Sophophora; melanogaster group; melanogaster subgroup	
Parent		Parent	
melanogaster subgroup () - (Rank: species subgroup) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32351">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32351</a> )		melanogaster subgroup () - (Rank: species subgroup) ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32351">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32351</a> )	
NCBI Taxonomy ID		NCBI Taxonomy ID	
7240 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7240">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7240</a> )		7226 ( <a href="https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7226">https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7226</a> )	
is Taxon A an Infraspecies?		is Taxon B an Infraspecies?	
No		No	

## GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB Drosophila melanogaster
trn	Q9VU51 ( <a href="http://www.uniprot.org/uniprot/Q9VU51">http://www.uniprot.org/uniprot/Q9VU51</a> )	
	Synonyms	GenebankID or UniProtKB
0024/05; 0641/17; anon-EST:fe2B1; CG11280; CT31487; Dmel\CG11280; Trn; 0024; 05; 0641; 17; Dmel\_CG11280	0	
	String	
-	Sequence Similarities	
-	GO - Molecular Function	
-	GO - Biological Process	
GO:0007155 : cell adhesion ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0007155">https://www.ebi.ac.uk/QuickGO/term/GO:0007155</a> )		
GO:0008045 : motor neuron axon guidance ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0008045">https://www.ebi.ac.uk/QuickGO/term/GO:0008045</a> )		
GO:0016477 : cell migration ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0016477">https://www.ebi.ac.uk/QuickGO/term/GO:0016477</a> )		
GO:0035147 : branch fusion, open tracheal system ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0035147">https://www.ebi.ac.uk/QuickGO/term/GO:0035147</a> )		
GO:0007436 : larval salivary gland morphogenesis ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0007436">https://www.ebi.ac.uk/QuickGO/term/GO:0007436</a> )		
	GO - Cellular Component	
GO:0016021 : integral component of membrane ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0016021">https://www.ebi.ac.uk/QuickGO/term/GO:0016021</a> )		
GO:0031012 : extracellular matrix ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0031012">https://www.ebi.ac.uk/QuickGO/term/GO:0031012</a> )		
GO:0005615 : extracellular space ( <a href="https://www.ebi.ac.uk/QuickGO/term/GO:0005615">https://www.ebi.ac.uk/QuickGO/term/GO:0005615</a> )		
No ( <a href="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</a> )		Presumptive Null
Cis-regulatory ( <a href="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</a> )		Molecular Type
Unknown ( <a href="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</a> )		Aberration Type
no coding changes		Molecular Details of the Mutation
Linkage Mapping ( <a href="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</a> )		Experimental Evidence
tartan underlies the evolution of Drosophila male genital morphology. (2019) ( <a href="https://pubmed.ncbi.nlm.nih.gov/31484761">https://pubmed.ncbi.nlm.nih.gov/31484761</a> )		Main Reference
Hagen JFD; Mendes CC; Blogg A; Payne A; Tanaka KM; Gaspar P; Figueras Jimenez J; Kittelmann M; McGregor AP; Nunes MDS		Authors
Male genital structures are among the most rapidly evolving morphological traits and are often the only features that can distinguish closely related species. This process is thought to be driven by sexual selection and may reinforce species separation. However, while the genetic bases of many phenotypic differences have been identified, we still lack knowledge about the genes underlying evolutionary differences in male genital organs and organ size more generally. The claspers (surstyli) are periphalllic structures that play an important role in copulation in insects. Here, we show that divergence in clasper size and bristle number between <i>Drosophila mauritiana</i> and <i>Drosophila simulans</i> is caused by evolutionary changes in tartan (trn), which encodes a transmembrane leucine-rich repeat domain protein that mediates cell-cell interactions and affinity. There are no fixed amino acid differences in trn between <i>D. mauritiana</i> and <i>D. simulans</i> , but differences in the expression of this gene in developing genitalia suggest that cis-regulatory changes in trn underlie the evolution of clasper morphology in these species. Finally, analyses of reciprocal hemizygotes that are genetically identical, except for the species from which the functional allele of trn originates, determined that the trn allele of <i>D. mauritiana</i> specifies larger claspers with more bristles than the allele of <i>D. simulans</i> . Therefore, we have identified a gene underlying evolutionary change in the size of a male genital organ, which will help to better understand not only the rapid diversification of these structures, but also the regulation and evolution of organ size more broadly.		Abstract
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## RELATED GEPHE

	Related Genes
No matches found.	
No matches found.	Related Haplotypes

## EXTERNAL LINKS

## COMMENTS

