

GEPHE SUMMARY

	Gephebase Gene	GephelD
Distorter on the X (Dox) (https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^Distorter on the X (Dox)^#gephebase-summary-title)	GP00001969	
	Entry Status	Main curator
Published	Courtier	

PHENOTYPIC CHANGE

	Trait Category	
Physiology (https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title)	Trait	
Sex determination (sex ratio distortion) (https://www.gephebase.org/search-criteria?/and+Trait=^Sex determination (sex ratio distortion)^#gephebase-summary-title)	Trait State in Taxon A	
Drosophila simulans	Trait State in Taxon B	
Drosophila simulans	Ancestral State	
Taxon A	Taxonomic Status	
Intraspecific (https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Intraspecific^#gephebase-summary-title)		
Taxon A	Latin Name	Taxon B
Drosophila simulans (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Drosophila simulans^#gephebase-summary-title)		Drosophila simulans (https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Drosophila simulans^#gephebase-summary-title)
-	Common Name	
-	Synonyms	
-	Rank	
species	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; Ephydriidae; 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; Ephydriidae; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Sophophora; melanogaster group; melanogaster subgroup
melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32351)	Parent	
7240 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7240)	NCBI Taxonomy ID	
	is Taxon A an Infraspecies?	
No		
Taxon B	Latin Name	
Drosophila simulans		
-	Common Name	
-	Synonyms	
-	Rank	
species	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; Ephydriidae; 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; Ephydriidae; Drosophilidae; Drosophilinae; Drosophilini; Drosophila; Sophophora; melanogaster group; melanogaster subgroup
melanogaster subgroup () - (Rank: species subgroup) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 32351)	Parent	
7240 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id= 7240)	NCBI Taxonomy ID	
	is Taxon B an Infraspecies?	
No		

GENOTYPIC CHANGE

	Generic Gene Name	UniProtKB
-	0	
	Synonyms	GenebankID or UniProtKB
-	EF596895 (https://www.ncbi.nlm.nih.gov/nuccore/EF596895)	
	String	
-	Sequence Similarities	
-	GO - Molecular Function	
-	GO - Biological Process	
-	GO - Cellular Component	
-		Presumptive Null
Unknown (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^Unknown^#gephebase-summary-title)		

Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=%5BCoding%5D#gephebase-summary-title)	Molecular Type
Deletion (https://www.gephebase.org/search-criteria?/and+Aberration Type=%5BDeletion%5D#gephebase-summary-title)	Aberration Type
100-999 bp	Deletion Size
Deletion of 105bp, resulting in the loss of exon III, which deletes one of the 42bp elements that is tandemly repeated in wild-type Dsim\ Dox.	Molecular Details of the Mutation
Linkage Mapping (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=%5BLinkage%20Mapping%5D#gephebase-summary-title)	Experimental Evidence
A sex-ratio meiotic drive system in <i>Drosophila simulans</i> . II: an X-linked distorter. (2007) (https://pubmed.ncbi.nlm.nih.gov/17988173)	Main Reference
Tao Y; Araripe L; Kingan SB; Ke Y; Xiao H; Hartl DL	Authors
The evolution of heteromorphic sex chromosomes creates a genetic condition favoring the invasion of sex-ratio meiotic drive elements, resulting in the biased transmission of one sex chromosome over the other, in violation of Mendel's first law. The molecular mechanisms of sex-ratio meiotic drive may therefore help us to understand the evolutionary forces shaping the meiotic behavior of the sex chromosomes. Here we characterize a sex-ratio distorter on the X chromosome (Dox) in <i>Drosophila simulans</i> by genetic and molecular means. Intriguingly, Dox has very limited coding capacity. It evolved from another X-linked gene, which also evolved de novo. Through retrotransposition, Dox also gave rise to an autosomal suppressor, not much yang (Nmy). An RNA interference mechanism seems to be involved in the suppression of the Dox distorter by the Nmy suppressor. Double mutant males of the genotype dox; nmy are normal for both sex-ratio and spermatogenesis. We postulate that recurrent bouts of sex-ratio meiotic drive and its subsequent suppression might underlie several common features observed in the heterogametic sex, including meiotic sex chromosome inactivation and achiasmy.	Abstract
	Additional References

RELATED GEPHE

2 (HP1D2, Not much yang (Nmy)) (https://www.gephebase.org/search-criteria?/or+Taxon ID=%5B7240%5D/and+Trait=Sex determination/and+groupHaplotypes=true#gephebase-summary-title)	Related Genes
No matches found.	Related Haplotypes

EXTERNAL LINKS

COMMENTS

Dox evolved from another X-linked gene which also evolved de novo. Dox also gave rise to an autosomal suppressor (not much yang (Nmy)) through retrotransposition. @Epistasis - No UniProtKD_ID - <http://flybase.org/reports/FBal0240568.html>