

## GEPHE SUMMARY

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

## PHENOTYPIC CHANGE

	Trait Category	
Physiology ( <a href="https://www.gephebase.org/search-criteria?/and+Trait">https://www.gephebase.org/search-criteria?/and+Trait</a> )		
Category="Physiology"#gephebase-summary-title)	Trait	
Sex determination (sex ratio distortion) ( <a href="https://www.gephebase.org/search-criteria?/and+Trait=" sex+determination+(sex+ratio+distortion)"#gephebase-summary-title"="">https://www.gephebase.org/search-criteria?/and+Trait="Sex+determination+(sex+ratio+distortion)"#gephebase-summary-title</a> )		
	Trait State in Taxon A	
Drosophila simulans		
	Trait State in Taxon B	
Drosophila simulans		
	Ancestral State	
Taxon A		
	Taxonomic Status	
Intraspecific ( <a href="https://www.gephebase.org/search-criteria?/and+Taxonomic">https://www.gephebase.org/search-criteria?/and+Taxonomic</a> )		
Status="Intraspecific"#gephebase-summary-title)		

Taxon A	Latin Name	Taxon B	Latin Name
Drosophila simulans ( <a drosophila+simulans"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="Drosophila+simulans"#gephebase-summary-title</a> )		Drosophila simulans ( <a drosophila+simulans"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms="Drosophila+simulans"#gephebase-summary-title</a> )	
-	Common Name	-	Common Name
-	Synonyms	-	Synonyms
-	Rank	-	Rank
species	Lineage	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; Ephydroidea; 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; Ephydroidea; 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> )		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> )	
	is Taxon A an Intraspecies?		is Taxon B an Intraspecies?
No		No	

## GENOTYPIC CHANGE

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

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

Molecular Type

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

Experimental Evidence

A sex-ratio meiotic drive system in *Drosophila simulans*. 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 *Drosophila simulans* 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=^7240^/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>