

Ruby (https://www.gephebase.org/search-criteria?/and+GeneGephebase=^Ruby^#gephebase-summary-title)	Gephebase Gene	GP00001018	GepheID
Published	Entry Status	Martin	Main curator

Morphology (https://www.gephebase.org/search-criteria?/and+Trait+Category=^Morphology^#gephebase-summary-title)		Trait Category	
Coloration (fruit; cold-dependent) (https://www.gephebase.org/search-criteria?/and+Trait=^Coloration (fruit; cold-dependent)^#gephebase-summary-title)		Trait	
Citrus spp. - blond		Trait State in Taxon A	
Citrus sinensis - Sicilian blood oranges		Trait State in Taxon B	
Taxon A		Ancestral State	
Domesticated (https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=^Domesticated^#gephebase-summary-title)		Taxonomic Status	
Taxon A		Taxon B	
Citrus (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Citrus^#gephebase-summary-title)		Citrus sinensis (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Citrus sinensis^#gephebase-summary-title)	
-		sweet orange	
Citrus L., 1753; Eremocitrus Swingle; Fortunella Swingle; Microcitrus Swingle		Citrus x sinensis; sweet orange; Valencia orange; apfelsine; naranja; navel orange; Citrus sinensis (L.) Osbeck; Citrtus sinensis	
genus		Rank	
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetales; rosids; malvids; Sapindales; Rutaceae; Aurantioideae		species	
Aurantioideae () - (Rank: subfamily) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=1728959)		Citrus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=2706)	
2706 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=2706)		2711 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=2711)	
Yes		is Taxon A an Intraspecies?	
Citrus spp. - blond		Yes	
Taxon A Description		Taxon B Description	
		Citrus sinensis - Sicilian blood oranges - varieties Moro (Reeds); Tarocco; Maltaise Sanguine; Doppio Sanguigno and Sanguinelli	

	Generic Gene Name	UniProtKB Citrus sinensis
Ruby	H6U1F1 (http://www.uniprot.org/uniprot/H6U1F1)	
-	Synonyms	GenebankID or UniProtKB
-	String	JN402330 (https://www.ncbi.nlm.nih.gov/nuccore/JN402330)
-	Sequence Similarities	
-	GO - Molecular Function	
	GO:0003677 : DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003677)	
-	GO - Biological Process	
-	GO - Cellular Component	
	GO:0005634 : nucleus (https://www.ebi.ac.uk/QuickGO/term/GO:0005634)	

No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=~No~#gephebase-summary-title)	Presumptive Null
Cis-regulatory (https://www.gephebase.org/search-criteria?/and+Molecular Type=~Cis-regulatory~#gephebase-summary-title)	Molecular Type
Insertion (https://www.gephebase.org/search-criteria?/and+Aberration Type=~Insertion~#gephebase-summary-title)	Aberration Type
1-10 kb	Insertion Size
TE (Tcs1) insertion triggering cold-dependent expression	Molecular Details of the Mutation
Candidate Gene (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=~Candidate Gene~#gephebase-summary-title)	Experimental Evidence
Retrotransposons control fruit-specific, cold-dependent accumulation of anthocyanins in blood oranges. (2012) (https://pubmed.ncbi.nlm.nih.gov/22427337)	Main Reference
Butelli E; Licciardello C; Zhang Y; Liu J; Mackay S; Bailey P; Reforgiato-Recupero G; Martin C	Authors
Traditionally, Sicilian blood oranges (<i>Citrus sinensis</i>) have been associated with cardiovascular health, and consumption has been shown to prevent obesity in mice fed a high-fat diet. Despite increasing consumer interest in these health-promoting attributes, production of blood oranges remains unreliable due largely to a dependency on cold for full color formation. We show that Sicilian blood orange arose by insertion of a Copia-like retrotransposon adjacent to a gene encoding Ruby, a MYB transcriptional activator of anthocyanin production. The retrotransposon controls Ruby expression, and cold dependency reflects the induction of the retroelement by stress. A blood orange of Chinese origin results from an independent insertion of a similar retrotransposon, and color formation in its fruit is also cold dependent. Our results suggest that transposition and recombination of retroelements are likely important sources of variation in <i>Citrus</i> .	Abstract
	Additional References

RELATED GEPHE

No matches found.	Related Genes
2 (https://www.gephebase.org/search-criteria?/or+Gene Gephebase=~Ruby~/and+Taxon ID=~2706~/or+Gene Gephebase=~Ruby~/and+Taxon ID=~2711~#gephebase-summary-title)	Related Haplotypes

EXTERNAL LINKS

COMMENTS

@TE