

GEPHE SUMMARY

VvMYBA1 (https://www.gephebase.org/search-criteria?/and+GeneGephebase=~VvMYBA1^#gephebase-summary-title)	Gephebase Gene	GP00002096	GepheID
Published	Entry Status	Courtier	Main curator

PHENOTYPIC CHANGE

Morphology (https://www.gephebase.org/search-criteria?/and+TraitCategory=~Morphology^#gephebase-summary-title)	Trait Category		
Coloration (fruit) (https://www.gephebase.org/search-criteria?/and+Trait=~Coloration(fruit)^#gephebase-summary-title)	Trait		
Vitis vinifera - white-skinned cultivar - VvmybA1a allele	Trait State in Taxon A		
Vitis vinifera - mild red-skinned variant (cv. 'Muscat Ã Petits Grains Rouge' - synonym cv. 'Moscatel Galego Roxo') - accumulation of di-hydroxylated anthocyanins	Trait State in Taxon B		
Taxon A	Ancestral State		
Domesticated (https://www.gephebase.org/search-criteria?/and+TaxonomicStatus=~Domesticated^#gephebase-summary-title)	Taxonomic Status		
	Taxon A	Taxon B	
Vitis vinifera (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Vitis+vinifera^#gephebase-summary-title)	Latin Name	Vitis vinifera (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=~Vitis+vinifera^#gephebase-summary-title)	Latin Name
wine grape	Common Name	wine grape	Common Name
Vitis vinifera subsp. vinifera; wine grape; Vitis vinifera L.	Synonyms	Vitis vinifera subsp. vinifera; wine grape; Vitis vinifera L.	Synonyms
species	Rank	species	Rank
cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; rosids incertae sedis; Vitales; Vitaceae; Viteae; Vitis	Lineage	cellular organisms; Eukaryota; Viridiplantae; Streptophyta; Streptophytina; Embryophyta; Tracheophyta; Euphyllophyta; Spermatophyta; Magnoliophyta; Mesangiospermae; eudicotyledons; Gunneridae; Pentapetalae; rosids; rosids incertae sedis; Vitales; Vitaceae; Viteae; Vitis	Lineage
Vitis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3603)	Parent	Vitis () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=3603)	Parent
29760 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=29760)	NCBI Taxonomy ID	29760 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=29760)	NCBI Taxonomy ID
No	is Taxon A an Intraspecies?	Yes	is Taxon B an Intraspecies?
			Taxon B Description
			cv. 'Muscat Ã Petits Grains Rouge' - synonym cv. 'Moscatel Galego Roxo'

GENOTYPIC CHANGE

VvmybA1	Generic Gene Name	Q6L973 (http://www.uniprot.org/uniprot/Q6L973)	UniProtKB Vitis vinifera
mybA; MybA3; mybA1; VVMYBA1; VvmybA3; MYBA1; VIT_02s0033g00410	Synonyms	FN596505 (https://www.ncbi.nlm.nih.gov/nucore/FN596505)	GenebankID or UniProtKB
29760.VIT_02s0033g00410.t01 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=29760.VIT_02s0033g00410.t01)	String		
-	Sequence Similarities		
GO:0003677 : DNA binding (https://www.ebi.ac.uk/QuickGO/term/GO:0003677)	GO - Molecular Function		
-	GO - Biological Process		
	GO - Cellular Component		

GO:0005634 : nucleus (<https://www.ebi.ac.uk/QuickGO/term/GO:0005634>)

Presumptive Null

No ([https://www.gephebase.org/search-criteria?/and+Presumptive Null="+No^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Presumptive+Null=))

Molecular Type

Cis-regulatory ([https://www.gephebase.org/search-criteria?/and+Molecular Type="+Cis-regulatory^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Molecular+Type=))

Aberration Type

Deletion ([https://www.gephebase.org/search-criteria?/and+Aberration Type="+Deletion^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Aberration+Type=))

Deletion Size

1-10 kb

Molecular Details of the Mutation

partial excision of the Gret1 retrotransposon from the promoter region of the MYBA1 anthocyanin regulator - associated with white-to-red berry skin color reversion

Experimental Evidence

Candidate Gene ([https://www.gephebase.org/search-criteria?/and+Experimental Evidence="+Candidate Gene^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=))

Main Reference

Genetic analysis of a white-to-red berry skin color reversion and its transcriptomic and metabolic consequences in grapevine (*Vitis vinifera* cv. 'Moscatel Galego'). (2019) (<https://pubmed.ncbi.nlm.nih.gov/31815637>)

Authors

Ferreira V; Matus JT; Pinto-Carnide O; Carrasco D; Arroyo-García R; Castro I

Abstract

Somatic mutations occurring within meristems of vegetative propagation material have had a major role in increasing the genetic diversity of the domesticated grapevine (*Vitis vinifera* subsp. *vinifera*). The most well studied somatic variation in this species is the one affecting fruit pigmentation, leading to a plethora of different berry skin colors. Color depletion and reversion are often observed in the field. In this study we analyzed the origin of a novel white-to-red skin color reversion and studied its possible metabolic and transcriptomic consequences on cv. 'Muscat \grave{A} Petits Grains Blancs' (synonym cv. 'Moscatel Galego Branco'), a member of the large family of Muscats.

The mild red-skinned variant (cv. 'Muscat \grave{A} Petits Grains Rouge', synonym cv. 'Moscatel Galego Roxo'), characterized by a preferential accumulation of di-hydroxylated anthocyanins, showed in heterozygosis a partially-excised Gret1 retrotransposon in the promoter region of the MYBA1 anthocyanin regulator, while MYBA2 was still in homozygosis for its non-functional allele. Through metabolic (anthocyanin, resveratrol and piceid quantifications) and transcriptomic (RNA-Seq) analyses, we show that within a near-isogenic background, the transcriptomic consequences of color reversion are largely associated to diminished light/UV-B responses probably as a consequence of the augment of metabolic sunscreens (i.e. anthocyanins).

We propose that the reduced activity of the flavonoid tri-hydroxylated sub-branch and decreased anthocyanin synthesis and modification (e.g. methylation and acylation) are the potential causes for the mild red-skinned coloration in the pigmented revertant. The observed positive relation between anthocyanins and stilbenes could be attributable to an increased influx of phenylpropanoid intermediaries due to the replenished activity of MYBA1, an effect yet to be demonstrated in other somatic variants.

Additional References

RELATED GEPHE

Related Genes

3 (VvMybA1 VvMybA2 VvMybA3 and VvMybA4, VvMYBA2, VvMYBA3) ([https://www.gephebase.org/search-criteria?/or+Taxon ID="+29760^/and+Trait=Coloration/and+groupHaplotypes=true#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Taxon+ID=))

Related Haplotypes

5 ([https://www.gephebase.org/search-criteria?/or+Gene Gephebase="+VvMYBA1^/and+Taxon ID="+29760^/or+Gene Gephebase="+VvMYBA1^/and+Taxon ID="+29760^#gephebase-summary-title](https://www.gephebase.org/search-criteria?/or+Gene+Gephebase=))

EXTERNAL LINKS

COMMENTS

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