

GEPHE SUMMARY

VvMYBA1 (https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=^VvMYBA1^#gephebase-summary-title)	Gephebase Gene	GP00002097	GepheID
Published	Entry Status	Courtier	Main curator

PHENOTYPIC CHANGE

Morphology (https://www.gephebase.org/search-criteria?/and+Trait+Category=^Morphology^#gephebase-summary-title)	Trait Category		
Coloration (fruit) (https://www.gephebase.org/search-criteria?/and+Trait=^Coloration+(fruit)^#gephebase-summary-title)	Trait		
Vitis vinifera - red-skinned cultivar	Trait State in Taxon A		
Vitis vinifera - pink-skinned cultivar	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	Latin Name	Taxon B	Latin Name
Vitis vinifera (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Vitis+vinifera^#gephebase-summary-title)	Vitis vinifera (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Vitis+vinifera^#gephebase-summary-title)	Vitis vinifera (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Vitis+vinifera^#gephebase-summary-title)	Vitis vinifera (https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=^Vitis+vinifera^#gephebase-summary-title)
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?	No	is Taxon B an Intraspecies?

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/nucleotide/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:0005634 : nucleus (https://www.ebi.ac.uk/QuickGO/term/GO:0005634)	GO - Cellular Component		
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

10-99 bp

Insertion Size

33bp insertion in the second intron of the MYBA1 red allele which affects messenger RNA (mRNA) stability - 16 bp of the 3' end in the insertion is a key structure for a defect in splicing of MybA1 transcripts

Molecular Details of the Mutation

Candidate Gene (<https://www.gephebase.org/search-criteria?/and+Experimental+Evidence=Candidate+Gene#gephebase-summary-title>)

Experimental Evidence

Pink-colored grape berry is the result of short insertion in intron of color regulatory gene. (2011) (<https://pubmed.ncbi.nlm.nih.gov/21695059>)

Main Reference

Shimazaki M; Fujita K; Kobayashi H; Suzuki S

Authors

We report here that pink grape berries were obtained by a short insertion in the intron of the MybA1 gene, a gene that regulates grape berry color. Genetic variation was detected among the MybA1 genes from grapes cultivated worldwide. PCR analysis of the MybA1 gene demonstrated that the size of the MybA1 gene in the red allele differs among grapes. Oriental *V. vinifera* bearing pink berries has the longest MybA1 gene among grapes, whereas the shortest MybA1 gene was detected in occidental *V. vinifera* grapes. The nucleotide sequences of the MybA1 genes demonstrated that oriental *V. vinifera* has two additional gene fragments (44 bp and 111 bp) in the promoter region of the MybA1 gene in the red allele and another 33 bp fragment in the second intron of the MybA1 gene in the red allele. The short insertion in the intron decreased the transcription activity in the model system and retained MybA1 transcripts with unspliced intron in the total RNA. From the experiments using deletion mutants of the 33 bp short insertion, 16 bp of the 3' end in the insertion is a key structure for a defect in splicing of MybA1 transcripts. Thus, a weakly colored grape berry might be a result of the short insertion in the intron of a color regulatory gene. This is new evidence concerning the molecular mechanism of the fate of grape berry color. These findings are expected to contribute to the further understanding of the color variation in grape berries, which is correlated with the evolutionary events occurring in the MybA1 gene of grapes.

Abstract

Additional References

RELATED GEPHE

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>)

Related Genes

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>)

Related Haplotypes

EXTERNAL LINKS

COMMENTS