

Table of Loci for Traits in Grapevine Relevant for Breeding and Genetics:

Associated markers, their chromosomal localisation, and the donor genotype/species are given. Chromosomal position of a trait/allele is given in megabases according to the 12 x genome sequence of PN40024 (<http://www.genoscope.cns.fr/vitis>).

The symbols were discussed and assigned at the International Conference on Grapevine Breeding and Genetics at Geneva, August 1 - 5, 2010. Follow up information on naming of loci will be provided on VIVC to avoid homonyms.

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Symbol	Trait/Allele	Associated marker	Chromosome	Position on chr [Mb]	Parent 1	Parent 2	Population size	Genotype of origin	Original species trait/allele derived from?	Reference	Comment
Be size	berry size (berry weight)	SCC8	18	25.9	MTP2223-27	x MTP2121-30	139		V. vinifera	Doligez et al. (2002)	Only one major QTL for berry size is indicated. There are several other QTLs described in the literature.
		VMC7f2		26.9	Dominga	x Autumn Seedless	118			Cabezas et al. (2006)	
					Ruby Seedless	x Thompson Seedless	144			Mejia et al. (2007)	
					Italia	x Big Perlon	163			Costantini et al. (2008)	
Fib	Fleshless berry	VMC2A3	18	0.9	Chardonnay	x Ugni Blanc Mutant	71	Ugni Blanc	V. vinifera	Fernandez et al. (2006)	Mutant
Lin	Linalool content	cn41	10		Italia	x Big Perlon	163		V. vinifera	Battilana et al. (2009)	
		VrZAG67/VVIH01			Moscato Bianco	x V. riparia	174				
		VrZAG64		13.4	Muscat Ottonel	x Muscat Ottonel	121		V. vinifera	Duchene et al. (2009)	
		VMC3d7		10.8	Gewürztraminer	x Gewürztraminer	115		V. vinifera		
Mtc	monoterpene content	DXS1	5	3.8	Italia	x Big Perlon	163		V. vinifera	Battilana et al. (2009)	
					Moscato Bianco	x V. riparia	174				
					Muscat Ottonel	x Muscat Ottonel	121		V. vinifera	Duchene et al. (2009)	
					Gewürztraminer	x Gewürztraminer	115		V. vinifera		
MybA	berry skin colour		2	14.2					V. vinifera		
Pdr1	Pierce's disease	VMCNg3h8	14	25.3	V. rupestris	x V. arizonica	181		V. arizonica	Riaz et al. (2006)	
		VVIn64		26.6						Riaz et al. (2008)	
		UDV-095		26.1							
Rda1	Diaporthe ampelina (Phomopsis viticola)									Barba et al. (in preparation)	
Rda2	Diaporthe ampelina (Phomopsis viticola)									Barba et al. (in preparation)	
Rdv1	Daktulosphaera vitifoliae	Gf13_9	13	21.9	Gf.V3125	x Börner	188	Börner	V. cinerea	Zhang et al. (2009)	
		VMC8e6		22.5							
		Gf13-1			Gf.V3125	x Börner	188	Börner	V. cinerea	Hausmann et al. (2011)	
		Gf13-7		21.5							
Rpv1	Plasmopara viticola	VV1b32	12	10.3	Syrah	x 28-8-78		28-8-78	M. rotundifolia	Merdinoglu et al. (2003)	
Rpv2	Plasmopara viticola		18		Cabernet Sauvignon	x 8624	129	8624	M. rotundifolia	Wiedemann-Merdinoglu et al. (2006)	
Rpv3	Plasmopara viticola	UDV-112	18		Regent	x Lemberger	153	Regent		Welter et al. (2007)	Regent and Bianca descend from Seibel 4614 (=Rpv3 ²⁹⁹⁻²⁷⁹ = Rpv3-1)
		UDV-305		24.9	Chardonnay	x Bianca	116	Bianca		Bellin et al. (2009)	
		VMC7f2		26.9	Regent	x RedGlobe	206	Regent		van Heerden et al. (2014)	
Rpv3-1 (=Rpv3 ²⁹⁹⁻²⁷⁹)		UDV305		24.9				'Seibel 4614'	V. rupestris	Di Gaspero et al. (2012)	Pedigree analysis
		UDV737		26.1							
Rpv3-2 (=Rpv3 ^{null-297})		GF18-06		25.9	GF.GA-47-42	x Villard blanc	151	'Villard blanc'	V. rupestris	Zyprian et al. (2016)	
		GF18-08		26.9					'Munson' (Jaeger 70)	V. rupestris or V. linccumii	Di Gaspero et al. (2012)
Rpv3-3 (=Rpv3 ^{null-271})		UDV305		24.9					V. rupestris or V. linccumii	Di Gaspero et al. (2012)	
		UDV737		26.1	GF.GA-47-42	x Villard blanc	151	GF.GA-47-42	V. rupestris or V. linccumii	Zyprian et al. (2016)	
Rpv3 ³²¹⁻³¹²		UDV305		24.9					V. labrusca or V. riparia	Di Gaspero et al. (2012)	Pedigree analysis
		UDV737		26.1							
Rpv3 ³⁶¹⁻²⁹⁹		UDV305		24.9				V. rupestris Ganzin	V. rupestris		
		UDV737		26.1							
Rpv3 ²⁹⁹⁻³¹⁴		UDV305		24.9				V. rupestris Ganzin	V. rupestris	Di Gaspero et al. (2012)	Pedigree analysis
		UDV737		26.1							

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Rpv3 ^{mull-287}	<i>Plasmopara viticola</i>	UDV305 UDV737	18	24.9 26.1				'Bayard' (Couderc 28112)	<i>V. rupestris</i> or <i>V. labrusca</i>			
Rpv4	<i>Plasmopara viticola</i>	VMC7h3 VMCNg2e1	4	4.7 5.2	Regent	x Lemberger	153	Regent		Welter et al. (2007)		
Rpv5	<i>Plasmopara viticola</i>	VV1o52b	9	4.0	Cabernet Sauvignon	x Gloire de Montpellier	138	Gloire de Montpellier	<i>V. riparia</i>	Marguerit et al. (2009)		
Rpv6	<i>Plasmopara viticola</i>	VMC8G9	12	20.4	Cabernet Sauvignon	x Gloire de Montpellier	138		<i>V. riparia</i>	Marguerit et al. (2009)		
Rpv7	<i>Plasmopara viticola</i>	UDV-097	7	11.4	Chardonnay	x Bianca	116	Bianca		Bellin et al. (2009)		
Rpv8	<i>Plasmopara viticola</i>	Chr14V015	14	6.6	<i>V. amurensis</i> 'Ruprecht'	x <i>V. amurensis</i> 'Ruprecht'	232	<i>V. amurensis</i> 'Ruprecht'	<i>V. amurensis</i>	Blasi et al. (2011)		
Rpv9	<i>Plasmopara viticola</i>	CCoAOMT	7	16.6	Moscato Bianco	x <i>V. riparia</i>	174	Wr63	<i>V. riparia</i>	Moreira et al. (2011)	CCoAOMT is the candidate gene from which the marker IN0006 was derived	
Rpv10	<i>Plasmopara viticola</i>	GF09-46	9	3.7	Gf.Ga-52-42	x Solaris	256	Solaris	<i>V. amurensis</i>	Schwander et al. (2012)		
Rpv11	<i>Plasmopara viticola</i>	VVMD27	5	4.5	Regent	x Lemberger	153	Regent		Fischer et al. (2004)		
		CS1E104J11F			Chardonnay	x Bianca	116	Chardonnay		Bellin et al. (2009)		
		VCHR05C		4.1	Gf.Ga-52-42	x Solaris	256	Solaris		Schwander et al. (2012)		
Rpv12	<i>Plasmopara viticola</i>	UDV-014	14	8.0	99-1-48	x Pinot noir	180	99-1-48	<i>V. amurensis</i>	Venuti et al. (2013)		
		UDV-304		9.3	Cabernet Sauvignon	x 20/3		20/3	<i>V. amurensis</i>			
		rgvvin180										
		UDV-370		10.1								
Rpv13	<i>Plasmopara viticola</i>	VMC1G3.2	12	10.0	Moscato Bianco	x <i>V. riparia</i>	174	Wr63	<i>V. riparia</i>	Moreira et al. (2011)		
Rpv14	<i>Plasmopara viticola</i>	GF05-13	5	20.2	Gf.V3125	x Börner	202	Börner	<i>V. cinerea</i>	Ochssner et al. (2016)		
Rpv15	<i>Plasmopara viticola</i>		18		<i>V. piasezkii</i> (DVIT2027)	x F2-35	94	<i>V. piasezkii</i> (DVIT2027)	<i>V. piasezkii</i>	Pap et al. (in preparation)		
Rpv16	<i>Plasmopara viticola</i>									Pap et al. (in preparation)		
Rpv17	<i>Plasmopara viticola</i>		8		<i>V. rupestris</i> B38	x Horizon	163	Horizon		Divilov et al. (in preparation)		
Rpv18	<i>Plasmopara viticola</i>		11		<i>V. rupestris</i> B38	x Horizon	163	Horizon		Divilov et al. (in preparation)		
Rpv19	<i>Plasmopara viticola</i>		14		<i>V. rupestris</i> B38	x Horizon	163	<i>V. rupestris</i> B38	<i>V. rupestris</i>	Divilov et al. (in preparation)		
Rpv20	<i>Plasmopara viticola</i>		6		Horizon	x <i>V. cinerea</i> B9	152	Horizon		Divilov et al. (in preparation)		
Rpv21	<i>Plasmopara viticola</i>		7		Horizon	x <i>V. cinerea</i> B9	152	Horizon		Divilov et al. (in preparation)		
Rcg1	<i>Agrobacterium spec.</i>	UDV-015	15	7.1	Kunbarát	x Sárfehér	272	Kunbarát	<i>V. amurensis</i>	Kuczmozg et al. (2012)		
		9M3-3		9.3								
Rgb1	<i>Guignardia bidwellii</i>	GF14-42	14	26.7	V3125	x Börner	202	Börner		Rex et al. (2014)		
Rgb2	<i>Guignardia bidwellii</i>	VChr16c	16	15.3	V3125	x Börner	202	Börner		Rex et al. (2014)		
Ren1	<i>Erysiphe necator</i>	UDV-020	13		Nimrang	x Kishmish vatkana	310	Kishmish vatkana	<i>V. vinifera</i>	Hoffmann et al. (2008)		
		VMC9h4-2		18.4								
		VMCNg4e10.1		18.4								
Ren2	<i>Erysiphe necator</i>	CS25	14	26.9	Horizon	x Illinois 547-1	58	Illinois 547-1		Dalbo et al. (2001)		
Ren3	<i>Erysiphe necator</i>	UDV-015b	15	7.1	Regent	x Lemberger	153	Regent		Welter et al. (2007)		
		VViv67		10.9								
		ScORA7-760			Regent	x Lemberger		152	Regent			Akkurt et al. (2007)
		VChr15CenGen02		4.9	Regent	x RedGlobe		206	Regent			van Heerden et al. (2014)
		GF15-28 / VViv67		10.9	GF.GA-47-42	x Villard blanc		151				Zyprian et al. (2016)
		GF15-42		9.3	Regent	x Lemberger		132	Regent			Zendler et al. (2017)
Ren4	<i>Erysiphe necator</i>	VMC7f2	18	26.9	C166-043	x F8909-08	42	C166-043	<i>V. romanetii</i>	Riaz et al. (2012)		
		SNPs		26.9	C87-41	x B70-57		57	C87-41		<i>V. romanetii</i>	Mahanil et al. (2012)
Ren5	<i>Erysiphe necator</i>		14	4.8					<i>M. rotundifolia</i>	Blanc et al. (2012)		
Ren6	<i>Erysiphe necator</i>	PN9-057	9	8.6	F2-35	x <i>V. piasezkii</i> (DVIT2027)	277	<i>V. piasezkii</i> (DVIT2027)	<i>V. piasezkii</i>	Pap et al. (2016)		
		PN9-068		9.1								

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Ren7	<i>Erysiphe necator</i>	VVIp17.1 VMC9a2.1	19	0.2 0.9	F2-35	x <i>V. piasezkii</i> (DVIT2027)	277	<i>V. piasezkii</i> (DVIT2027)	<i>V. piasezkii</i>	Pap et al. (2016)	
Ren8	<i>Erysiphe necator</i>		18		GF.GA-47-42	x Villard blanc	151			Zyprian et al. (2016)	
Ren9	<i>Erysiphe necator</i>	CenGen6	15	1.4	Regent	x Lemberger	153	Regent		Zendler et al. (2017)	
Ren10	<i>Erysiphe necator</i>	S2_17854965 Haploblock validation	2	79.0	MN1264	x MN1214	147	Seyval blanc		Teh et al. (2017)	
Run1	<i>Erysiphe (Uncinula) necator</i>	VMC4f3.1 VMC8g9	12	13.1 20.4	VRH3082-1-42	x Cabernet Sauvignon	161	VRH3082-1-42	<i>M. rotundifolia</i>	Barker et al. (2005)	powdery mildew resistance originating from <i>Muscaninia</i> should be named as
Run2.1	<i>Erysiphe (Uncinula) necator</i>	VMC7f2 VMCNg1e3 VVIn16 VMC7f2 VMC7f2	18	26.9 20.9 23.4 26.9 26.9	JB81-107-11 JB81-107-11 A90-71	x Chenin Blanc x Tokay x Flame Seedless	97 47 80	Magnolia	<i>M. rotundifolia</i>	Riaz et al. (2011)	resistant tissue: Cane Rachis Rachis Fruit Leaf, Cane, Rachis, Fruit
Run2.2	<i>Erysiphe (Uncinula) necator</i>	VMC7f2	18	26.9	e2-9	x Malaga Rosada	255	Trayshed	<i>M. rotundifolia</i>	Riaz et al. (2011)	
Sd1	seed development inhibitor seedlessness	SCC8 VMC6f1 VMC7f2	18	25.9 23.2 26.9	MTP2223-27 Dominga	x MTP2121-30 x Autumn Seedless	139 118 118			Doligez et al. (2002) Cabezas et al. (2006)	
Sen1	<i>Erysiphe necator</i>	S8_19258484	9	13.6 - 18.0	<i>V. rupestris</i> B38	x Chardonnay	85	Chardonnay	<i>V. vinifera</i>	Barba et al. (2014)	
Sex	sex	VVMD34 VVS3 VVib23 APT3 SNP4C_1 Vvib23	2	3.7 4.2 4.9 5.0 4.7 4.9	Horizon Ramsey <i>V. rupestris</i> V3125 Moscato Bianco Muscat Ottonel	x Illinois 547-1 x Riparia Gloire x <i>V. arizonica</i> x Börner x Vr x <i>Malvasia aromatica di Candia</i>	58 188 181 202 340 91			Dalbó et al. (2000) Lowe and Walker (2006) Riaz et al. (2006) Fechter et al. (2012) Battilana et al. (2013)	
Ufgt		UFGT	16	2.3	Regent	x Lemberger	153			Fischer et al. (2004)	
Ver	véraison	VMC1E11	16	13.7	Regent	x Lemberger	153	Regent		Fischer et al. (2004)	For véraison (begin of ripening) several QTLs are published. This list here is still incomplete.
Ver1	véraison	UDV52 SNP1092P11R	16	15.8	GF.GA-47-42	x Villard blanc	151	GF.GA-47-42		Zyprian et al. (2016)	
Ver2	véraison	SPS_P_SNP632GF	18		GF.GA-47-42	x Villard blanc	151			Zyprian et al. (2016)	
Vvgail	GA insensitive dwarf mutant		1	4.9				Pinot Meunier		Boss & Thomas (2002)	
VvOMT3	Isobutyl-methoxy-pyrazine (IBMP)	VvOMT3	3	2.2	(Cabernet Sauvignon x Pinot Meunier) Cabernet Sauvignon	x self pollinated x Gloire de Montpellier	64 138	Cabernet Sauvignon Cabernet Sauvignon		Dunlevy et al. (2013) Guillaumie et al. (2013)	F2 population 3 significant QTLs for IBMP content
XiR1	<i>Xiphinema index</i>	VMC5a10 IN2R3b M4F3R	19	20.9 20.9	<i>V. rupestris</i>	x <i>V. arizonica</i>	185		<i>V. arizonica</i>	Xu et al. (2008) Hwang et al. (2010)	
5-GT	anthocyanin 3,5-diglucosides		9	6.5	Regent	x Lemberger	153	Regent		Hausmann et al. (2009) Janvary et al. (2009)	