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3 **Supplemental Table 1.** Metabolites identified in different organs of *Vaccinium* spp. at different developmental stages and experimental conditions.  
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5 Species	6 Metabolite class	7 Organ	8 Developmental stage	9 Experimental condition	10 References
11 <i>V. corymbosum</i>	12 Primary metabolites	13 Fruits	14 Fruit set	15	16 (Montecchiarini et al., 2019)
17	18	19	20 Maturity (ripe fruits)	21	22 (Kim et al., 2015; Lee et al., 2014; 23 Montecchiarini et al., 2019; Qi et al., 2021)
24	25	26 Leaves	27 Vegetative	28 Aluminum toxicity	29 (Cárcamo-Fincheira et al., 2021)
30	31 Roots	32 Vegetative	33 Aluminum toxicity	34	35 (Cárcamo-Fincheira et al., 2021)
36	37 Organic acids	38 Fruits	39 Maturity (ripe fruits)	40	41 (Wang et al., 2019)
42	43 Secondary metabolites	44 Fruits	45 Maturity (ripe fruits)	46	47 (Ma et al., 2013; Qi et al., 2021)
48	49 Phenolic compounds	50 Fruits	51 Fruit development	52	53 (Castrejón et al., 2008; Günther et al., 2020; 54 Li et al., 2019)

		Maturity (ripe fruits)	(Kim et al., 2015; Lee et al., 2014; Mengist et al., 2020)
		Leaves      Vegetative      UV-B treatment	(Inostroza-Blancheteau et al., 2014; Luengo Escobar, Alberdi, et al., 2017; Luengo Escobar, Magnum de Oliveira Silva, et al., 2017)
	Flavonoids	Fruits      Fruit development	(Zifkin et al., 2012)
		Maturity (ripe fruits)	(Wang et al., 2019)
	Anthocyanins	Fruits      Fruit development	(Günther et al., 2020; Li et al., 2019)
		UV radiation	(Yang et al., 2019)
		Maturity (ripe fruits)	(Lohachoompol et al., 2008)
		Altitude	(Zoratti et al., 2015a)
		Sunlight radiation	(Zoratti et al., 2015b)
	Flavonols	Fruits      Fruit development	UV radiation      (Yang et al., 2019)

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4		Leaves	Vegetative	UV-B
5				(Luengo Escobar, Alberdi, et al., 2017; Luengo Escobar, Magnum de Oliveira Silva, et al., 2017)
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10		Volatile compounds	Fruits	Maturity (ripe fruits)
11				(Du & Rouseff, 2014; Ferrão et al., 2020; Polashock et al., 2007; Saftner et al., 2008)
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17			Location, harvest date	(Du et al., 2011)
18				
19				
20			UV-B	(Eichholz et al., 2011)
21				
22				
23				
24		Triterpenoids, Non-polar compounds	Leaves	Before flowering
25				(Vrancheva et al., 2021)
26				
27				
28		Iridoids	Floral buds	Flower bud development
29				(Leisner et al., 2017)
30				
31				
32			Fruits	Maturity (ripe fruits)
33				(Heffels et al., 2017; Leisner et al., 2017)
34				
35				
36			Leaves	Maturity (ripe fruits)
37				(Leisner et al., 2017)
38				
39			Stems	Maturity (ripe fruits)
40				(Leisner et al., 2017)
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3	<i>V. virgatum</i>	Secondary metabolites	Fruits	Maturity (ripe fruits) (Ma et al., 2013)
4		Polyphenolic compounds	Fruits	Fruit development (Günther et al., 2020)
5				
6		Anthocyanins	Fruits	Fruit development (Günther et al., 2020)
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17	<i>V. angustifolium</i>	Whole metabolome	Leaves	Reproductive (Markus et al., 2015)
18				
19		Secondary metabolites	Fruits	Maturity (ripe fruits) (Ma et al., 2013)
20				
21		Phenolic compounds	Fruits	Maturity (ripe fruits) (Harris et al., 2007; Mengist et al., 2020)
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35		Iridoids	Fruits	Maturity (ripe fruits) (Heffels et al., 2017)
36				
37	<i>V. macrocarpon</i>	Whole metabolome	Leaves	Reproductive (Markus et al., 2015)
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3	Polar compounds	Fruits	Maturity (ripe fruits)	(Hurkova et al., 2019)
4				
5	Organic acids	Fruits	Maturity (ripe fruits)	(Fong et al., 2020, 2021)
6				
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8				
9	Phenolic compounds	Fruits	Maturity (ripe fruits)	(Wang et al., 2018)
10				
11	Anthocyanins	Fruits	Maturity (ripe fruits)	(Vorsa & Polashock, 2005)
12				
13				
14	Non-volatile compounds	Fruits	Maturity (ripe fruits)	(Brown, Murch, et al., 2012; Brown, Turi, et al., 2012)
15				
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17				
18	<i>V. oxyacccos</i>	Anthocyanins	Fruits	Maturity (ripe fruits)
19				(Vorsa & Polashock, 2005)
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26				
27	Non-volatile compounds	Fruits	Maturity (ripe fruits)	(Brown, Turi, et al., 2012)
28				
29				
30	<i>V. vitis-idaea</i>	Polar compounds	Fruits	Maturity (ripe fruits)
31				(Hurkova et al., 2019)
32				
33				
34	Fatty acids	Leaves	Whole growing season	(Liu et al., 2014)
35				
36				
37	Phenolic compounds	Leaves	Whole growing season	(Liu et al., 2014)
38				
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40	Triterpenoids, Non-polar compounds	Leaves	Before flowering	(Vrancheva et al., 2021)
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4	Non-volatile compounds	Fruits	Maturity (ripe fruits)	(Brown, Turi, et al., 2012)
5				
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7	<i>V. myrtillus</i>	Primary metabolites	Fruits	Fruit development (Ayaz et al., 2001)
8				
9				
10			Maturity (ripe fruits)	Location (Elisabetta et al., 2013; Rohloff et al., 2015)
11				
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14				Climate, temperature, photoperiod (Rohloff et al., 2015; Uleberg et al., 2012)
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19				Fertilizer, soil (Rohloff et al., 2015)
20				
21				
22	Fatty acids	Leaves	Whole growing season	(Liu et al., 2014)
23				
24				
25	Secondary metabolites	Fruits	Maturity (ripe fruits)	Location (Elisabetta et al., 2013)
26				
27				
28	Phenolic compounds	Flowers	Flowering	(Riihinens et al., 2008)
29				
30				
31			Fruits	Maturity (ripe fruits) (Ancillotti et al., 2016; Riihinens et al., 2008)
32				
33				
34				Location (Mikulic-Petkovsek et al., 2015)
35				
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39				Temperature, photoperiod (Uleberg et al., 2012)
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3		Leaves	Whole growing season	(Liu et al., 2014)
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5			Maturity (ripe fruits)	(Riihinens et al., 2008)
6				
7		Rhizome	Maturity (ripe fruits)	(Riihinens et al., 2008)
8				
9		Flavonoids	Leaves	Maturity (ripe fruits) Solar radiation (Jaakola et al., 2004)
10				
11			Fruits	Fruit development (Jaakola et al., 2002)
12				
13			Fruits	Maturity (ripe fruits) Solar radiation (Jaakola et al., 2004)
14				
15		Proanthocyanidins	Fruits	Fruit development (Suvanto et al., 2020)
16				
17				Maturity (ripe fruits) Location (Åkerström et al., 2010)
18				
19		Anthocyanins	Fruits	Maturity (ripe fruits) (Benvenuti et al., 2018; Lätti et al., 2008)
20				
21				Location/altitude (Åkerström et al., 2010; Primetta et al., 2013; Zoratti et al., 2015a)
22				
23				Sunlight radiation (Zoratti et al., 2015b)
24				
25		Triterpenoids, Non-polar compounds	Leaves	Before flowering (Vrancheva et al., 2021)
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	Iridoids	Fruits	Maturity (ripe fruits)	(Heffels et al., 2017)
	<i>V. bracteatum</i>	Primary metabolites	Fruits	Maturity (ripe fruits) (Lee et al., 2014)
		Secondary metabolites	Fruits	Maturity (ripe fruits) (Lee et al., 2014)
			Leaves	Post-budding stages (Fan et al., 2018, 2019, 2020)
	<i>V. uliginosum</i>	Phenolic compounds	Fruits	Maturity (ripe fruits) (Ancillotti et al., 2016)
		Proanthocyanidins, Anthocyanins	Fruits	Maturity (ripe fruits) (Kellogg et al., 2010)
		Triterpenoids, Non-polar compounds	Leaves	Before flowering (Vrancheva et al., 2021)
		Iridoids	Fruits	Maturity (ripe fruits) (Heffels et al., 2017)
	<i>V. elliottii</i>	Organic acids	Fruits	Maturity (ripe fruits) (Yifei Wang et al., 2019)
		Phenolic compounds	Fruits	Maturity (ripe fruits) (Mengist et al., 2020; Yifei Wang et al., 2019)
		Iridoids	Fruits	Maturity (ripe fruits) (Leisner et al., 2017)

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3	<i>V. oldhamii</i>	Primary metabolites	Fruits	Maturity (ripe fruits)
4		Secondary metabolites	Fruits	Maturity (ripe fruits)
5				(Lee et al., 2014)
6				(Lee et al., 2014)
7	<i>V. ovalifolium</i>	Whole metabolome	Leaves	Reproductive
8				(Markus et al., 2015)
9		Proanthocyanidins, Anthocyanins	Fruits	Maturity (ripe fruits)
10				(Kellogg et al., 2010)
11				
12	<i>V. arboreum</i>	Iridoids	Fruits	Maturity (ripe fruits)
13				(Leisner et al., 2017)
14				
15	<i>V. arctostaphylos</i>	Primary metabolites	Fruits	Fruit development
16				(Ayaz et al., 2001)
17				
18	<i>V. boreale</i>	Organic acids, Flavonoids	Fruits	Maturity (ripe fruits)
19				(Yifei Wang et al., 2019)
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21	<i>V. calycinum</i>	Iridoids	Fruits	Maturity (ripe fruits)
22				(Leisner et al., 2017)
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24	<i>V. consanguineum</i>	Iridoids	Fruits	Maturity (ripe fruits)
25				(Leisner et al., 2017)
26				
27	<i>V. corymbodendron</i>	Iridoids	Fruits	Maturity (ripe fruits)
28				(Leisner et al., 2017)
29				
30	<i>V. cylindraceum</i>	Iridoids	Fruits	Maturity (ripe fruits)
31				(Leisner et al., 2017)
32				
33	<i>V. darrowii</i>	Organic acids, Flavonoids	Fruits	Maturity (ripe fruits)
34				(Yifei Wang et al., 2019)
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3	<i>V. floribundum</i>	Iridoids	Fruits	Maturity (ripe fruits)
4				(Leisner et al., 2017)
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6	<i>V. fuscatum</i>	Iridoids	Fruits	Maturity (ripe fruits)
7				(Leisner et al., 2017)
8				
9	<i>V. ovatum</i>	Iridoids	Fruits	Maturity (ripe fruits)
10				(Leisner et al., 2017)
11				
12	<i>V. padifolium</i>	Iridoids	Fruits	Maturity (ripe fruits)
13				(Leisner et al., 2017)
14				
15	<i>V. pallidum</i>	Organic acids, Flavonoids	Fruits	Maturity (ripe fruits)
16				(Yifei Wang et al., 2019)
17				
18	<i>V. reticulatum</i>	Iridoids	Fruits	Maturity (ripe fruits)
19				(Leisner et al., 2017)
20				
21	<i>V. stamineum</i>	Iridoids	Fruits	Maturity (ripe fruits)
22				(Leisner et al., 2017)
23				
24	<i>V. tenellum</i>	Organic acids, Flavonoids	Fruits	Maturity (ripe fruits)
25				(Yifei Wang et al., 2019)
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