Dr. Duke's Phytochemical and Ethnobotanical Databases

Chemicals found in Malus domestica

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
77	ZINC	Fruit	0.0	35.0	0.1413570623516533	--
3	XYLOSE	Plant				--
3	VALINE	Fruit	40.0	560.0	-0.8032333881374735	--
89	URSOLIC-ACID	Pericarp				--
89	URSOLIC-ACID	Wax				--
89	URSOLIC-ACID	Fruit Epidermis				--
8	TYROSINE	Fruit	40.0	249.0	-0.8990776765345502	--
29	TRYPTOPHAN	Fruit	20.0	124.0	-1.0195295627538696	--
3	TRIACONTANOL	Plant				--
4	TIN	Fruit		0.0	-0.3771396188984718	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
4	THREONINE	Fruit	30.0	435.0	-1.0736073129874002	--
31	THIAMIN	Fruit	1.0	2.0	-0.4266044741562528	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
14	SULFUR	Fruit	1.65	23.0	-0.9685087927350676	--
14	SUCROSE	Fruit	24000.0	36200.0	-0.49014841841433165	--
7	SUCCINIC-ACID	Plant				--
8	STEARIC-ACID	Seed				Fathy, M. M., Abd El Megid, R. M. 1995. A Comparative Study of the Lipid Contents and the Antimicrobial Activity of Certain Rosaceous Seeds. Zagazig J Pharm Sci, 4(2): 121-127.
8	STEARIC-ACID	Fruit	70.0	435.0	-0.25037310927026857	--
1	SPERMINE	Bud				Wang, S. Y., Faust, M. 1994. Changes in Polyamine Content During Dormancy in Flower Buds of 'Anna' Apple. J. Amer. Soc. Hort. Sci., 119(1): 70-73.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
1	SPERMIDINE	Bud				Wang, S. Y., Faust, M. 1994. Changes in Polyamine Content During Dormancy in Flower Buds of 'Anna' Apple. J. Amer. Soc. Hort. Sci., 119(1): 70-73.
11	SORBITOL	Leaf				--
1	SODIUM	Fruit	0.0	133.0	-0.1713385458263085	--
9	SINAPIC-ACID	Fruit				--
3	SILVER	Fruit	0.011	0.086	-0.4995614833070808	--
4	SILICON	Fruit	0.0	70.0	-0.3810148443665756	--
14	SHIKIMIC-ACID	Plant				--
1	SERINE	Fruit	80.0	497.0	-1.1107007920496865	USDA's Ag Handbook 8 and sequelae)
60	SELENIUM	Fruit		0.0	-0.38618723699673646	--
7	SALICYLATES	Fruit	0.8	60.0	-0.16469419114376535	--
87	RUTIN	Pericarp				--
87	RUTIN	Fruit Epidermis				--
87	RUTIN	Fruit				--
87	RUTIN	Fruit Juice				--
87	RUTIN	Leaf	0.0	8885.0	-0.45294433702030634	--
15	RIBOFLAVIN	Fruit		1.3	-0.7944081953947483	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
2	REYNOUTRIN	Fruit Juice				--
2	REYNOUTRIN	Fruit				--
2	REYNOUTRIN	Pericarp				--
44	QUERCITRIN	Fruit Juice				--
44	QUERCITRIN	Pericarp				--
44	QUERCITRIN	Fruit				--
44	QUERCITRIN	Leaf	600.0	9015.0	1.7298124819748746	--
4	QUERCETIN-3-RHAMNOGLUCOSIDE	Plant				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
1	QUERCETIN-3-O-RHAMNOSIDE	Plant				J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.
2	QUERCETIN-3-O-BETA-D-GLUCOSIDE	Plant				J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.
176	QUERCETIN	Fruit	2.5	41.0	-0.582618968173555	--
176	QUERCETIN	Heart Wood				--
176	QUERCETIN	Pericarp	58.0	263.0	1.0	Pizzorno, J.E. and Murray, M.T. 1985. A Textbook of Natural Medicine. John Bastyr College Publications, Seattle, Washington (Looseleaf).
1	PYRUVIC-ACID	Plant				--
1	PYRROLIDINE	Pericarp		1.5		--
1	PYRROLIDINE	Fruit Epidermis		1.5		--
4	PUFA	Fruit	1050.0	6535.0	-0.3716987814442892	USDA's Ag Handbook 8 and sequelae)
43	PROTOCATECHUIC-ACID	Fruit				--
2	PROPIONALDEHYDE	Fruit				--
27	PROCYANIDINS	Leaf				--
4	PROCYANIDIN-B-4	Leaf				--
1	PROCYANIDIN-B-2	Fruit	2.0	10.0		--
1	PROCYANIDIN-B-2	Pericarp	15.0	100.0		--
1	PROCYANIDIN-B-2	Leaf	150.0	900.0	0.9999999999999998	--
1	PROCYANIDIN-B-2	Fruit Juice				--
1	PROCYANIDIN-B-1	Leaf				--
1	PROCYANIDIN-B-1	Pericarp				--
1	PROCYANIDIN-B-1	Fruit Juice				--
1	PROCYANIDIN-B-1	Fruit				--
17	PROCYANIDIN-A-2	Leaf				--
14	POTASSIUM	Fruit	1110.0	12140.0	-0.5110685274797335	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
2	POMOLIC-ACID	Plant				J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.
2	PHYTOSTEROLS	Fruit	120.0	745.0	-0.2581394518581099	USDA's Ag Handbook 8 and sequelae)
5	PHYLLOQUINONE	Fruit		0.06	-0.22359887323159108	--
4	PHOSPHORUS	Fruit	68.0	925.0	-0.6958662309301713	--
2	PHOSPHATIDYL-CHOLINE	Fruit	189.0	214.0		--
8	PHLORIZIN	Leaf				--
8	PHLORIZIN	Plant				--
8	PHLORIZIN	Pericarp				--
8	PHLORIDZIN	Leaf	54000.0	140000.0	1.0	--
8	PHLORIDZIN	Fruit Juice				--
1	PHLORETIN-GLUCOSIDE	Pericarp	10.0	15.0		--
1	PHLORETIN-GLUCOSIDE	Fruit		1.0		--
9	PHLORETIN	Leaf	300.0	11000.0		--
7	PHENYLALANINE	Fruit	50.0	311.0	-1.0455516744717288	--
24	PECTIN	Fruit	1400.0	66585.0	0.16029071562128944	--
11	PANTOTHENIC-ACID	Fruit	1.0	4.0	-0.8996713902808875	USDA's Ag Handbook 8 and sequelae)
2	PALMITOLEIC-ACID	Fruit	10.0	62.0	-0.3340992517515945	--
13	PALMITIC-ACID	Seed				Fathy, M. M., Abd El Megid, R. M. 1995. A Comparative Study of the Lipid Contents and the Antimicrobial Activity of Certain Rosaceous Seeds. Zagazig J Pharm Sci, 4(2): 121-127.
13	PALMITIC-ACID	Fruit	480.0	2986.0	-0.31904990505316816	--
13	P-HYDROXY-BENZOIC-ACID	Fruit				--
25	P-COUMARIC-ACID	Fruit	15.0	460.0	1.836295249622603	--
25	P-COUMARIC-ACID	Leaf				--
9	OXALIC-ACID	Plant				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
18	OLEIC-ACID	Fruit	140.0	871.0	-0.4740320725940964	--
6	OCTACOSANOL	Plant				--
2	NONACOSANE	Plant				--
3	NICKEL	Fruit	0.004	0.645	-0.5833033975627046	--
39	NIACIN	Fruit	1.0	7.0	-0.7178505836876389	--
2	NEOXANTHIN	Fruit Epidermis				--
2	NEO-CHLOROGENIC-ACID	Plant				--
1	N-HEXYL-PROPIONATE	Fruit				--
1	N-HEXYL-PROPIONATE	Plant				--
1	N-BUTYL-PROPIONATE	Fruit				--
1	N-BUTYL-PROPIONATE	Plant				--
1	N-BUTYL-FORMATE	Plant				--
6	MYRISTIC-ACID	Fruit	20.0	124.0	-0.26329389964394695	--
34	MYRICETIN	Fruit		0.5	-0.7536633445071549	--
13	MUFA	Fruit	150.0	935.0	-0.24039423421132997	USDA's Ag Handbook 8 and sequelae)
2	MOLYBDENUM	Fruit	0.077	0.43	-0.3990584824882058	--
2	METHYL-CAPROATE	Plant				--
2	METHYL-BUTYRATE	Fruit				--
2	METHYL-BUTYRATE	Plant				--
4	METHYL-BENZOATE	Fruit				--
1	METHYL-AMINE	Pericarp		4.5		--
1	METHYL-AMINE	Fruit		5.6		--
1	METHYL-AMINE	Fruit Epidermis		4.5		--
3	METHYL-ACETATE	Plant				--
2	METHYL-2-METHYL-BUTYRATE	Plant				--
15	METHIONINE	Plant	20.0	124.0	-0.9578509469925256	--
2	METHANOL	Plant				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
1	MERCURY	Fruit	0.0	0.02	0.10095423065636192	--
23	MELATONIN	Fruit				Hattori, A., et. al. 1995. Identification of Melatonin in Plants and its Effects on Plasma Melatonin Levels and Binding to Melatonin Receptors in Vertebrates. Biochem. Mol. Biol. Int., 35(3): 627-634.
3	MANNOSE	Plant				--
14	MANGANESE	Fruit	0.0	29.0	-0.2123152729972876	--
65	MAGNESIUM	Fruit	48.0	478.0	-0.7648501234386748	--
4	LYSINE	Fruit	20.0	746.0	-0.8724121045963826	--
78	LUTEOLIN	Heart Wood				--
15	LUTEIN	Fruit	0.4	5.0	-0.4027761600563295	--
11	LITHIUM	Fruit	0.044	0.172	-0.8448748858580687	--
2	LEUCINE	Fruit	120.0	746.0	-0.9258535515942413	--
20	LECITHIN	Plant				--
7	LAURIC-ACID	Fruit	10.0	63.0	-0.44474745342800637	--
8	LACTIC-ACID	Plant				--
1	L-ARGININE	Shoot				--
1	L-ARGININE	Stem				--
75	KAEMPFEROL	Fruit		2.0	-0.5794291374991353	--
1	ISOVALERALDEHYDE	Fruit				--
22	ISOQUERCITRIN	Pericarp				--
22	ISOQUERCITRIN	Fruit				--
22	ISOQUERCITRIN	Fruit Juice				--
3	ISOQUERCETIN	Fruit Juice				--
4	ISOPROPYL-ACETATE	Fruit				--
3	ISOLEUCINE	Fruit	50.0	497.0	-0.9433250929721118	--
4	ISOCHLOROGENIC-ACID	Plant				Stitt, Paul. Why George should eat broccoli.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
3	ISOBUTYL-ACETATE	Plant				--
2	ISOAMYL-ACETATE	Fruit				--
6	IRON	Fruit	1.1	123.0	-0.039580333705947705	--
12	IODINE	Plant				--
8	INOSITOL	Plant				--
7	INDOLE-3-ACETIC-ACID	Plant				Stitt, Paul. Why George should eat broccoli.
7	INDOLE-3-ACETIC-ACID	Stem Bark				--
7	INDOLE-3-ACETIC-ACID	Leaf				--
30	HYPEROSIDE	Heart Wood				--
30	HYPEROSIDE	Fruit Juice				--
30	HYPEROSIDE	Pericarp				--
30	HYPEROSIDE	Fruit				--
14	HYPERIN	Plant				--
7	HISTIDINE	Fruit	30.0	187.0	-1.0696353953245137	--
1	HEXYL-FORMATE	Plant				--
1	HEXYL-BUTYRATE	Plant				--
1	HEXYL-BUTYRATE	Fruit				--
1	HEXYL-ACETATE	Plant				--
1	HEXYL-ACETATE	Fruit				--
3	HEXANOL	Plant				--
5	HEXANAL	Fruit				--
6	GUANIDINE	Shoot				--
6	GUANIDINE	Stem				--
1	GLYOXYLIC-ACID	Plant				--
4	GLYCOLIC-ACID	Plant				--
12	GLYCINE	Plant	80.0	497.0	-0.8208359653564842	--
3	GLYCERIC-ACID	Plant				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
5	GLUTAMINE	Plant		20.0		--
8	GLUTAMIC-ACID	Fruit	156.0	1244.0	-0.9333642189445454	--
7	GLUCOSE	Fruit	17200.0	18200.0	-0.7019443383136035	--
35	GERANIOL	Plant				--
62	GALLIC-ACID	Pericarp				--
62	GALLIC-ACID	Fruit				--
7	FUMARIC-ACID	Plant				--
8	FRUCTOSE	Fruit	50100.0	60800.0	0.04916971831634761	--
2	FRIEDELIN	Heart Wood				--
13	FORMIC-ACID	Plant				--
15	FOLACIN	Fruit	0.02	0.2	-0.7547576455042277	USDA's Ag Handbook 8 and sequelae)
15	FIBER	Fruit	5200.0	49636.0	-0.8685372806832163	USDA's Ag Handbook 8 and sequelae)
61	FERULIC-ACID	Fruit	4.0	95.0	1.7162326606420661	--
2	FARNESENE	Fruit Epidermis				--
2	FARNESENE	Pericarp				--
1	ETHYL-VALERATE	Fruit				--
1	ETHYL-PROPIONATE	Fruit				--
1	ETHYL-PROPIONATE	Plant				--
1	ETHYL-NONANOATE	Plant				--
2	ETHYL-ISOBUTYRATE	Fruit				--
2	ETHYL-ISOBUTYRATE	Plant				--
1	ETHYL-FORMATE	Fruit				--
1	ETHYL-BUTYRATE	Plant				--
6	ETHYL-ACETATE	Plant				--
6	ETHYL-ACETATE	Fruit				--
24	ETHANOL	Plant				--
8	ESTRONE	Seed	0.1	0.13	-1.0000000000000002	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
12	ESTRAGOLE	Essential Oil				--
1	EPSILON-CAROTENE	Plant				Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
40	EPICATECHIN	Pericarp	20.0	80.0		--
40	EPICATECHIN	Fruit	4.0	11.0		--
2	DIETHYL-AMINE	Fruit		3.0		--
4	D-CATECHIN	Fruit				--
2	CYSTINE	Plant	30.0	187.0	-1.078139109591067	--
7	CYANIDIN	Leaf				--
4	COSMOSIIN	Heart Wood				--
12	COPPER	Fruit	0.24	4.0	-0.6863742487163819	--
2	COBALT	Fruit	0.005	0.043	-0.5299096696083117	--
23	CITRIC-ACID	Plant				--
60	CINNAMALDEHYDE	Fruit				--
24	CHROMIUM	Fruit	0.005	0.3	-0.4654957769727276	--
21	CHLOROPHYLL	Fruit	0.0	1.0	-0.9710352631864654	--
77	CHLOROGENIC-ACID	Pt				--
77	CHLOROGENIC-ACID	Fruit	5.0	15.0	-1.0935971883111022	--
77	CHLOROGENIC-ACID	Seed				--
77	CHLOROGENIC-ACID	Leaf	100.0	1200.0	-1.3240006985895736	--
77	CHLOROGENIC-ACID	Fruit Juice				--
77	CHLOROGENIC-ACID	Pericarp	8.0	18.0		--
1	CATALASE	Plant				--
2	CAMPESTEROL	Fruit	10.0	60.0	-0.14986892201478846	Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
4	CALCIUM-OXALATE	Plant				--
28	CALCIUM	Fruit	43.0	570.0	-0.75834467805693	--
102	CAFFEIC-ACID	Fruit Juice				--
102	CAFFEIC-ACID	Fruit	85.0	1270.0	-0.10378621224302456	--
3	CADMIUM	Fruit	0.002	0.026	-0.5672128851607269	--
4	BORON	Fruit	1.0	110.0	1.410811087811246	--
4	BIOTIN	Plant				--
47	BETA-SITOSTEROL	Heart Wood				--
47	BETA-SITOSTEROL	Seed				Fathy, M. M., Abd El Megid, R. M. 1995. A Comparative Study of the Lipid Contents and the Antimicrobial Activity of Certain Rosaceous Seeds. Zagazig J Pharm Sci, 4(2): 121-127.
47	BETA-SITOSTEROL	Fruit	110.0	660.0	0.07292039240169416	Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)
53	BETA-CAROTENE	Fruit	0.0	76.0	-0.0038939984397263717	--
2	BETA-ALANINE	Fruit				--
9	BENZYL-ACETATE	Plant				--
20	BENZOIC-ACID	Plant				--
20	BENZOIC-ACID	Leaf	98.0	710.0	1.3479809099758226	--
7	AVICULARIN	Fruit Juice				--
7	AVICULARIN	Fruit				--
7	AVICULARIN	Pericarp				--
7	AVICULARIN	Leaf	0.0	1425.0		--
3	ASPARTIC-ACID	Fruit	210.0	2115.0	-1.056731649443471	USDA's Ag Handbook 8 and sequelae)
2	ASPARAGINE	Fruit		171.0	-0.825458790451801	--
112	ASCORBIC-ACID	Fruit	20.0	402.0	-0.2594938543964892	--
2	ARSENIC	Fruit	0.001	0.43	0.014133429185321438	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
14	ARGININE	Fruit	60.0	373.0	-1.0500818434124615	USDA's Ag Handbook 8 and sequelae)
101	APIGENIN	Heart Wood				--
1	AMYL-FORMATE	Fruit				--
3	AMYL-BUTYRATE	Fruit				--
3	AMYL-BUTYRATE	Plant				--
8	AMYGDALIN	Seed	6000.0	13800.0	-0.8422024808761887	--
5	ALUMINUM	Fruit	0.4	129.0	-0.18599251654737567	--
32	ALPHA-TOCOPHEROL	Fruit	2.0	37.0	-0.5521025162177928	--
15	ALPHA-LINOLENIC-ACID	Fruit	180.0	1120.0	-0.6452626880371877	--
3	ALANINE	Fruit	70.0	435.0	-1.2861845168681025	USDA's Ag Handbook 8 and sequelae)
11	ADENINE	Root				--
3	ACETONE	Plant				--
16	ACETIC-ACID	Plant				--
6	ACETALDEHYDE	Fruit				--
6	ACETALDEHYDE	Fruit Juice				Miyake, T., Shibamoto, T. 1993. Quantitative Analysis of Acetaldehyde in Foods and Beverages. J. Agr. Food Chem, 41(11): 1968-1970.
6	ACETALDEHYDE	Plant				--
38	(-)-EPICATECHIN	Pericarp				--
38	(-)-EPICATECHIN	Fruit				--
38	(-)-EPICATECHIN	Leaf	150.0	900.0	-0.6820874109972213	--
38	(-)-EPICATECHIN	Fruit Juice				--
30	(+)-CATECHIN	Pt				--
30	(+)-CATECHIN	Pericarp				--
30	(+)-CATECHIN	Fruit				--
30	(+)-CATECHIN	Leaf				--
30	(+)-CATECHIN	Bark				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
30	(+)-CATECHIN	Seed				--