

Dr. Duke's Phytochemical and Ethnobotanical Databases

Chemicals found in Citrus sinensis

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
0	WATER	Fruit	839000.0	898000.0	0.5540526248175224	--
0	CARBOHYDRATES	Fruit	99000.0	887125.0	0.557442615155032	--
0	SUGARS	Fruit	39600.0	119800.0	-0.38969414389870244	--
56	NARINGENIN	Pericarp	35000.0	45800.0		Jim Duke's personal files.
0	EO	Pericarp	15000.0	20000.0	1.2809893558000476	--
0	PROTEIN	Fruit	9260.0	78000.0	-0.4222516255728621	--
60	LIMONENE	Fruit	8300.0	9700.0	0.6409395320453212	--
0	EO	Fruit	7500.0	10000.0	-0.625591783140096	Guenther, E., The Essential Oils, 6 volumes, D. van Nostrand, New York, 1948-1952.
23	CITRIC-ACID	Fruit	5600.0	9800.0	-0.4912433942967182	--
0	ASH	Fruit	4100.0	36920.0	-0.5112715299819987	--
15	FIBER	Fruit	3740.0	47000.0	-0.8934118438004772	--
16	P-CYMENE	Fruit	3590.0	4070.0	-0.04098189676522262	--
14	POTASSIUM	Fruit	1400.0	13772.0	-0.3666795712783593	--
24	PECTIN	Fruit	1300.0	5900.0	-0.5601993872457034	--
0	FAT	Fruit	1100.0	16000.0	-0.5190453767939366	--
15	MALIC-ACID	Fruit	600.0	2000.0	-0.8215787018847368	--
0	NITROGEN	Fruit	500.0	13845.0	-0.054501610611493154	--
112	ASCORBIC-ACID	Fruit	500.0	4071.0	-0.03136646807240172	--
4	LYSINE	Fruit	470.0	3548.0	-0.1467119613903352	USDA's Ag Handbook 8 and sequelae)
14	BETAINE	Fruit	390.0	630.0	-1.0398613033298902	--
7	PHENYLALANINE	Fruit	310.0	2340.0	-0.34187787905261324	USDA's Ag Handbook 8 and sequelae)
3	ISOLEUCINE	Fruit	250.0	1888.0	-0.5255451749979052	USDA's Ag Handbook 8 and sequelae)
14	ARGININE	Fruit	230.0	4908.0	0.15957250579145005	--
2	LEUCINE	Fruit	230.0	1136.0	-0.8429441489050677	USDA's Ag Handbook 8 and sequelae)
28	CALCIUM	Fruit	210.0	5615.0	0.4058414049804431	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
15	METHIONINE	Fruit	200.0	1510.0	0.6791094324753408	USDA's Ag Handbook 8 and sequelae)
2	ASPARAGINE	Fruit	200.0	1800.0	0.3373215168393527	--
27	LINOLEIC-ACID	Fruit	180.0	1359.0	-0.33622644162700344	USDA's Ag Handbook 8 and sequelae)
7	HISTIDINE	Fruit	180.0	1359.0	-0.24792284510655177	USDA's Ag Handbook 8 and sequelae)
8	TYROSINE	Fruit	160.0	1208.0	-0.501692988706999	USDA's Ag Handbook 8 and sequelae)
4	THREONINE	Fruit	150.0	1132.0	-0.7838698402029908	USDA's Ag Handbook 8 and sequelae)
4	PHOSPHORUS	Fruit	136.0	1980.0	-0.3754207541761312	--
22	MYRCENE	Fruit	130.0	140.0	-0.36272097374914564	--
13	PALMITIC-ACID	Fruit	130.0	982.0	-0.35024794688904615	USDA's Ag Handbook 8 and sequelae)
2	CYSTINE	Fruit	100.0	755.0	-0.2882040289158333	USDA's Ag Handbook 8 and sequelae)
3	VALINE	Fruit	100.0	3020.0	-0.29566746601618277	--
65	MAGNESIUM	Fruit	98.0	1075.0	-0.4884044378711737	--
29	TRYPTOPHAN	Fruit	90.0	680.0	-0.23921305471754814	USDA's Ag Handbook 8 and sequelae)
20	CHOLINE	Fruit	70.0	160.0	-0.5734302834278399	--
15	ALPHA-LINOLENIC-ACID	Fruit	70.0	528.0	-0.913356590105175	USDA's Ag Handbook 8 and sequelae)
3	ASPARTIC-ACID	Fruit	70.0	8607.0	-0.2038383572771155	--
24	ETHANOL	Fruit Juice	64.0	900.0	1.0	--
0	PROLINE	Fruit	60.0	3473.0	-0.14668369100889192	--
8	GLUTAMIC-ACID	Fruit	60.0	7097.0	-0.4778760905604569	--
12	GLYCINE	Fruit	50.0	7097.0	1.3509995174874219	--
14	SULFUR	Fruit	46.0	1000.0	-0.28853428975640755	--
9	SINAPIC-ACID	Pericarp	45.0	100.0	1.0	--
1	SERINE	Fruit	40.0	2410.0	-0.43531280247846904	--
22	GAMMA-AMINOBUTYRIC-ACID	Fruit	40.0	730.0	-0.27868808492512787	--
28	ALPHA-PINENE	Fruit	35.0	40.0	-0.7083402631126611	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	LINALOL	Fruit	30.0	530.0	-0.5486782133862986	--
53	LINALOOL	Fruit	30.0	530.0	-0.43753461385311765	--
5	GLUTAMINE	Fruit	30.0	630.0	0.1767951575504613	--
3	ALANINE	Fruit	30.0	3775.0	0.02652939797970876	--
2	PALMITOLEIC-ACID	Fruit	30.0	226.0	-0.30412481168854	USDA's Ag Handbook 8 and sequelae)
18	OLEIC-ACID	Fruit	20.0	1510.0	-0.4691070855395464	USDA's Ag Handbook 8 and sequelae)
61	FERULIC-ACID	Pericarp	20.0	180.0	1.0	--
0	DECANAL	Fruit	18.0	21.0	-0.6027493593021571	--
5	SYNEPHRINE	Fruit	15.0	43.0		--
0	CAROTENOIDS	Pericarp	12.0	35.0		--
11	ALPHA-PHELLANDRENE	Fruit	12.0	14.0	-0.5695870460921888	--
7	CHLORINE	Fruit	12.0	32.0	-0.6800304631000254	--
0	CAROTENOIDS	Fruit	12.0	35.0	-0.5036534891621087	--
0	OCTANAL	Fruit	12.0	14.0	-0.6131393394849658	--
13	BETA-PINENE	Fruit	11.0	13.0	-0.29742687330503664	--
5	SABINENE	Fruit	11.0	13.0	-0.5315196015036519	--
61	FERULIC-ACID	Fruit	10.0	30.0	-0.7627700713964738	--
8	DELTA-3-CARENE	Fruit	7.0	9.0	-0.5981394247478974	--
9	SINAPIC-ACID	Fruit	7.0	19.0	0.784062560233975	--
13	GERANIAL	Fruit	6.0	7.0	-0.9983227361677096	--
25	P-COUMARIC-ACID	Fruit	5.0	17.0	-0.6943231755501756	--
2	DODECANAL	Fruit	5.0	20.0	0.9948320067476139	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
25	P-COUMARIC-ACID	Pericarp	5.0	75.0	1.0	--
0	TETRADECANAL	Fruit	5.0	9.0	1.0	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
4	NERAL	Fruit	4.0	5.0	-0.8791176720401793	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
32	ALPHA-TOCOPHEROL	Fruit	4.0	29.0	-0.6752411923996696	--
20	CITRONELLAL	Fruit	4.0	5.0	-0.9952774234291415	--
0	VALENCENE	Fruit	3.0	4.0	-1.0	--
0	HEPTANAL	Fruit	3.0	5.0		Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
0	NONANAL	Fruit	3.0	4.0	-0.8226919978166914	--
6	ACETALDEHYDE	Fruit Juice	3.0	15.0	1.0	--
19	CARVONE	Fruit	2.0	10.0	-0.49999993853473	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
102	CAFFEIC-ACID	Fruit	2.0	50.0	-0.3296566072538586	--
0	(Z)-BETA-OCIMENE	Fruit	2.0	3.0	-0.6648405774204937	--
23	ALPHA-TERPINEOL	Fruit	2.0	3.0	-0.40604181620664676	--
11	PANTOTHENIC-ACID	Fruit	2.0	19.0	0.05712424299404392	USDA's Ag Handbook 8 and sequelae)
39	NIACIN	Fruit	2.0	31.0	-0.39701223426716226	--
4	BORON	Fruit	1.89	27.5	-0.25022637010687165	--
0	ALPHA-SINENSAL	Fruit	1.0	2.0	-1.0	--
9	TERPINOLENE	Fruit	1.0	2.0	-0.7498060467737104	--
11	GAMMA-TERPINENE	Fruit	1.0	2.0	-0.6509562680883627	--
0	VIT-B-6	Fruit	1.0	5.0	-0.538913394725687	USDA's Ag Handbook 8 and sequelae)
5	ALUMINUM	Fruit	1.0	165.0	-0.17551933701223474	--
0	BETA-CARYOPHYLLENE	Fruit	1.0	2.0	-0.5058677869700708	--
6	IRON	Fruit	1.0	8.0	-0.49575433892938076	--
0	GAMMA-CADINENE	Fruit	1.0	2.0	-0.9084313290424243	--
31	THIAMIN	Fruit	1.0	7.0	0.21342198396383905	--
13	ALPHA-TERPINENE	Fruit	1.0	2.0	-0.44934612100297294	--
60	LIMONENE	Fruit Juice	1.0	278.0		--
53	BETA-CAROTENE	Fruit	1.0	28.0	-0.0966771336129336	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
5	HEXANAL	Fruit	1.0	2.0		Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
77	ZINC	Fruit	0.9	13.0	-0.5205322406758267	--
2	METHANOL	Fruit Juice	0.8	80.0	1.0	--
35	GERANIOL	Fruit	0.7	1.0	-0.6057972802749785	--
0	ALPHA-CUBEBENE	Fruit	0.7	1.0	-0.6220320233548484	--
5	NERYL-ACETATE	Fruit	0.7	1.0	-0.724098948454428	--
0	ALPHA-COPAENE	Fruit	0.7	1.0	-0.6881248888845418	--
15	CITRONELLOL	Fruit	0.7	1.0	-0.5060981097957616	--
5	BETA-ELEMENE	Fruit	0.7	1.0	-0.565275335737646	--
2	UNDECANAL	Fruit	0.7	1.0	-0.5758305509285185	--
0	(E)-BETA-OCIMENE	Fruit	0.7	1.0	-0.795218715224166	--
10	NEROL	Fruit	0.7	1.0	-0.5477997473775594	--
0	ALPHA-THUJENE	Fruit	0.7	1.0	-0.5955809256752451	--
0	BARIUM	Fruit	0.54	16.5	-0.456265269747712	USDA's Ag Handbook 8 and sequelae)
0	ZIRCONIUM	Fruit	0.5	1.1	-0.5018207810885003	--
12	COPPER	Fruit	0.44	5.5	-0.569630082366932	--
7	ALPHA-CAROTENE	Fruit	0.19	1.9	-0.26808750426637384	--
53	LINALOOL	Fruit Juice	0.15	4.69	1.0000000000000004	--
0	LINALOL	Fruit Juice	0.15	4.69	1.0000000000000002	--
0	TITANIUM	Fruit	0.135	3.85	-0.6666260908934968	--
11	LITHIUM	Fruit	0.108	1.54	0.890343380696948	--
0	RUBIDIUM	Fruit	0.1	7.7	-0.8530025130786637	ACTA AGRIC SCAND SUPPL 22: 1980
2	MOLYBDENUM	Fruit	0.1	0.385	-0.4080774738511709	--
23	ALPHA-TERPINEOL	Fruit Juice	0.09	1.1	-0.6501250791550391	--
1	ETHYL-BUTYRATE	Fruit Juice	0.08	1.02		--
0	STRONTIUM	Fruit	0.054	110.0	0.7328812786702326	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	VALENCENE	Fruit Juice	0.04	15.3	0.9999999999999999	--
0	FLUORINE	Fruit	0.04	0.76	-0.5863462540268758	ACTA AGRIC SCAND SUPPL 22: 1980
11	GAMMA-TERPINENE	Fruit Juice	0.04	0.46	-1.0	--
3	SILVER	Fruit	0.027	0.055	-0.5875909007853288	--
5	HEXANAL	Fruit Juice	0.02	0.65		--
0	LEAD	Fruit	0.02	1.1	-0.42525727293888926	--
3	HEXANOL	Fruit Juice	0.02	0.22		--
6	ETHYL-ACETATE	Fruit Juice	0.01	0.58		--
2	METHYL-BUTYRATE	Fruit Juice	0.01	0.1		--
3	NICKEL	Fruit	0.01	0.55	-0.6121948588601274	--
24	CHROMIUM	Fruit	0.005	0.385	-0.45355683651553846	--
2	COBALT	Fruit	0.001	0.055	-0.5284569584957359	--
3	CADMIUM	Fruit	0.001	0.138	-0.23805307615553817	--
2	ARSENIC	Fruit	0.001	0.154	-0.33956845146287234	--
0	PHYTOFLUENE	Fruit	0.0	4.0	-1.0	--
7	SALICYLATES	Fruit	0.0	200.0	0.236750790358027	--
15	FOLACIN	Fruit	0.0	2.0	-0.019192793995839758	USDA's Ag Handbook 8 and sequela)
5	GERANYL-ACETATE	Fruit	0.0	0.1	-0.9446827484165164	--
0	PHYTOENE	Fruit	0.0	2.0		--
14	MANGANESE	Fruit	0.0	8.0	-0.3507865335531638	--
0	TRANS-SABINENE-HYDRATE	Fruit	0.0	0.1	-0.5231287251565837	--
15	RIBOFLAVIN	Fruit	0.0	3.0	-0.4303249009534089	--
0	DECANAL	Fruit Juice	0.0	0.15	-1.0000000000000002	--
2	CITRONELLYL-ACETATE	Fruit	0.0	0.1	-0.9999999999999998	--
11	TYRAMINE	Fruit	0.0	1.0	0.7071067811865478	--
0	FERULOYL-PUTRESCINE	Fruit	0.0	5.0	1.0	--
0	AURAXANTHIN	Fruit	0.0	4.0		--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
1	TRANS-2-HEXENOL	Fruit Juice	0.0	0.1		--
60	SELENIUM	Fruit	0.0	0.002	-0.38569128420884563	--
0	OCTANOL	Fruit	0.0	0.1	-0.7071067811865478	--
1	SODIUM	Fruit	0.0	29.0	-0.1812007490262155	--
0	ZETA-CAROTENE	Fruit	0.0	2.0	-1.0	--
0	LUTEOXANTHINS	Fruit	0.0	6.0		--
0	OCTOPAMINE	Fruit	0.0	1.0	-1.0	--
2	FARNESENE	Fruit	0.0	0.1	-1.0	--
71	THYMOL	Fruit	0.0	0.1	-0.7071067811865474	--
1	MERCURY	Fruit	0.0	0.001	-0.7865389313824043	--
15	LUTEIN	Fruit	0.0	3.0	-0.575590894746515	--
5	SABINENE	Fruit Juice	0.0	0.15		--
0	METHYL-N-METHYL-ANTHRANILATE	Fruit	0.0	0.1		--
0	OCTANAL	Fruit Juice	0.0	0.28	-1.0	--
1	N-METHYL-TYRAMINE	Fruit	0.0	2.0	-1.0	--
2	ALPHA-HUMULENE	Fruit	0.0	0.1	-0.5986253681056065	--
0	2-METHYL-1-PROPANOL	Fruit Juice	0.0	0.07		--
0	ISORHOIFOLIN	Pericarp				--
5	LIMONIN	Root				Jim Duke's personal files.
0	SUBERENOL	Root Bark		700.0		Jim Duke's personal files.
0	ALPHA-SINESAL	Fruit		3.0	-1.0	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
0	GERANYL-OXY-PYRANOCOUMARIN	Root				Jim Duke's personal files.
2	BETA-CRYPTOXANTHIN	Pericarp				Jim Duke's personal files.
9	DELTA-CADINENE	Pericarp				--
0	5-HEXYL-2-METHYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
1	ANTHERAXANTHIN	Tissue Culture				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	OBACUNONE-GLUCOSIDE	Fruit Juice				Jim Duke's personal files.
0	P-HYDROQUINONE	Root Bark		80.0		Jim Duke's personal files.
1	6,7-DIMETHOXYCOUMARIN	Bark		162.0		Jim Duke's personal files.
5	ZEAXANTHIN	Pericarp				Jim Duke's personal files.
0	CASTASTERONE	Pollen Or Spore				Jim Duke's personal files.
0	JASMONIC-ACID	Fruit				Jim Duke's personal files.
0	NEUROSPORIN	Pericarp				Jim Duke's personal files.
3	MANNOSE	Fruit				--
0	NARIRUTIN-GLUCOSIDE	Flower				Jim Duke's personal files.
0	HEPTAMETHOXY-FLAVONE	Fruit Juice				Jim Duke's personal files.
0	BETA-APO-CAROTEN-8-AL	Pericarp				--
1	XANTHYLETIN	Root Bark		45000.0		Jim Duke's personal files.
0	NEOCHROME-A	Pericarp				Jim Duke's personal files.
0	3-(4-METHYL-HEXYL)-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
16	LYCOPENE	Pericarp				Jim Duke's personal files.
2	CAMPESTEROL	Fruit		40.0	-0.31972036696488193	Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)
87	RUTIN	Leaf		9000.0	-0.44580487824979076	Jim Duke's personal files.
3	OBACUNONE	Seed				Jim Duke's personal files.
0	2,4-TRANS,TRANS-O-FERULOYL-GLUCARIC-ACID	Pericarp				--
5	SYNEPHRINE	Pericarp				Jim Duke's personal files.
0	3-METHYL-BUTAN-1-OL	Fruit Juice				Jim Duke's personal files.
0	CITFLAVANONE	Root Bark				--
19	D-LIMONENE	Fruit Juice				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
3	SUBAPHYLLIN	Leaf				Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
28	ALPHA-PINENE	Plant				--
2	PHYTOSTEROLS	Fruit		240.0	-0.9087217260357541	Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)
0	CRYPTOFLAVIN-B	Pericarp				Jim Duke's personal files.
1	DELPHINIDIN-3-GLUCOSIDE	Fruit				--
0	5-ACETYL-2-METHYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
0	ABSCISIC-ACID	Tissue Culture				Jim Duke's personal files.
0	MUTATOXANTHIN	Fruit		2.0	-1.0	--
0	EPOXY-NOOTKATONE	Pericarp Essent. Oil				Jim Duke's personal files.
0	ISOPRENE	Essential Oil				Jim Duke's personal files.
0	5,8-EPOXY-5,8-DIHYDRO-8'-APO-BETA-CAROTEN-3,10-DIOL	Fruit Juice				--
5	ZEAXANTHIN	Tissue Culture				Jim Duke's personal files.
0	5,6-DIHYDRO-BETA-BETA-CAROTENE-3,3',5,6-TETROL	Fruit Juice				Jim Duke's personal files.
2	CONIFERIN	Pericarp				Jim Duke's personal files.
2	ELEMOL	Root Bark		28200.0		Jim Duke's personal files.
2	NERYL-FORMATE	Fruit		10.0	-1.0	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
0	4-PHENYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
1	NARIRUTIN	Fruit Juice				Jim Duke's personal files.
0	3,3',4,5,6,7,8-HEPTAMETHOXY-FLAVONE	Fruit Juice				Jim Duke's personal files.

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4	SILICON	Fruit		2.0	-0.6019449725946585	ACTA AGRIC SCAND SUPPL 22: 1980
0	BETA-APO-8'-CAROTINAL	Pericarp				Jim Duke's personal files.
1	XANTHOXYLETIN	Root Bark		24000.0		Jim Duke's personal files.
0	NEO-BETA-CAROTENE	Pericarp				Jim Duke's personal files.
0	2-PHENYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
15	LUTEIN	Pericarp				Jim Duke's personal files.
23	TERPINEN-4-OL	Fruit		0.1	-0.358333842321623	--
0	ARABAN	Fruit				--
0	HESPERIDIN-7-O-ALPHA-L-RHAMNO-GLUCOSIDE	Fruit				--
1	NORDENTATIN	Root Bark		300.0		Jim Duke's personal files.
0	2'-TRANS-O-P-COUMAROYL-GLUCARIC-ACID	Pericarp				Jim Duke's personal files.
0	ISOSINENSETIN	Pericarp				Jim Duke's personal files.
3	BRASSINOLIDE	Pollen Or Spore				Jim Duke's personal files.
0	ICHANGIN-17-O-BETA-D-GLUCOSIDE	Seed				Jim Duke's personal files.
3	SUBAPHYLLIN	Fruit				Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
0	BETA-ZEACAROTENE	Pericarp				Jim Duke's personal files.
5	PHYLLOQUINONE	Fruit		0.001	-0.23285139490462353	--
0	CRYPTOFLAVIN-A	Pericarp				Jim Duke's personal files.
0	3-HYDROXY-ETHYL-HEXANOATE	Fruit Juice				Jim Duke's personal files.
3	NOOTKATONE	Fruit		1.0		Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
0	URONIC-ACID	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	MUTATOCHROME	Fruit				Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
3	NOOTKATONE	Pericarp Essent. Oil				Jim Duke's personal files.
0	ISOPENTENYL-PSORALENS	Fruit				--
0	5,8-EPOXY-5,5',8'-TETRAHYDRO-BETA,BETA-CAROTEN-3,3',5',6'-TETROL	Plant				--
0	FLAVOXANTHIN	Pericarp				Jim Duke's personal files.
1	XANTHYLETIN	Root				Jim Duke's personal files.
0	5,8-EPOXY-5,5',8'-TETRAHYDRO-BETA-BETA-CAROTENE-3,3',5',6'-TETROL	Fruit Juice				Jim Duke's personal files.
31	CARYOPHYLLENE	Pericarp				--
0	3-PROPYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
1	MALONIC-ACID	Plant				--
0	NARINGIN-7-O-ALPHA-L-RHAMNO-GLUCOSIDE	Fruit Juice				Jim Duke's personal files.
61	FERULIC-ACID	Fruit Juice				Jim Duke's personal files.
0	SESLIN	Root				Jim Duke's personal files.
0	BERGAPTOL	Fruit				--
0	CIS-SABINENE-HYDRATE	Fruit		0.1	-0.7071067811865477	--
1	NARIRUTIN	Pericarp				Jim Duke's personal files.
0	2-PENTYLPYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
0	LINOMIN	Leaf				Jim Duke's personal files.
0	TAU-CAROTENE	Pericarp				--
62	CAFFEINE	Leaf		6.0	-0.9423311788449318	Jim Duke's personal files.
0	APOVIOLAXANTH-10'-AL	Pericarp				--
31	HESPERIDIN	Pericarp		63500.0	0.38878029269733505	Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	2'-TRANS-O-P-COUMAROYL-GALACTARIC-ACID	Pericarp				Jim Duke's personal files.
0	ETA-CAROTENE	Pericarp				--
2	SINENSETIN	Pericarp				Jim Duke's personal files.
0	4,7-DIMETHYL-BICYCLO(3.2.1)-OCT-TRANS-3-EN-6-ONE	Pericarp Essent. Oil				Jim Duke's personal files.
0	HESPERIDIN-7-O-ALPHA-L-RHAMNO-GLUCOSIDE	Fruit Juice				Jim Duke's personal files.
47	BETA-SITOSTEROL	Fruit		170.0	-0.570881270243894	Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)
0	PHLORIN	Plant				Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
0	OCTADECADIENOIC-ACID	Pericarp				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
25	P-COUMARIC-ACID	Fruit Juice				Jim Duke's personal files.
2	SINENSETIN	Plant				Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
2	NOOTKATOL	Fruit				Jim Duke's personal files.
0	NOMILINIC-ACID-17-O-BETA-D-GLUCOSIDE	Seed				Jim Duke's personal files.
0	ISOLUTEIN	Pericarp				Jim Duke's personal files.
1	XANTHOXYLETIN	Root				Jim Duke's personal files.
53	BETA-CAROTENE	Pericarp				Jim Duke's personal files.
0	CITRUSINS	Plant				J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
11	NEROLIDOL	Flower				Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
0	3-PHENYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
0	NARINGIN-GLUCOSIDE	Flower				Jim Duke's personal files.
3	SESELIN	Root				Jim Duke's personal files.
9	OXALIC-ACID	Fruit		87.0	-0.3015516499208378	Watt, J.M. and Breyer-Brandwijk, M.G. 1962. The Medicinal and Poisonous Plants of Southern and Eastern Africa. E. & S. Livingstone, Ltd. Edinburg & London. 1457 pp.
0	5,6-DIHYDRO-BETA-BETA-CAROTEN-3,3',5,6-TETROL	Fruit Juice				--
0	NARINGIN-7-O-ALPHA-L-RHAMNO-GLUCOSIDE	Fruit				--
0	2-METHYL-5-PHENYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
0	LIMONIN-17-O-BETA-D-GLUCOSIDE	Seed				Jim Duke's personal files.
15	TANGERETIN	Fruit				--
62	CAFFEINE	Flower		62.0	1.0998533626601497	Jim Duke's personal files.
1	QUINIC-ACID	Fruit				--
0	APIGENIN-7-O-ALPHA-L-RHAMNO-GLUCOSIDE	Leaf				--
0	HEPTULOSE	Fruit				--
0	2'-TRANS-O-FERULOYL-GALACTARIC-ACID	Pericarp				Jim Duke's personal files.
0	EPOXY-VALENCENE	Fruit				--
2	SINENSETIN	Fruit Juice				Jim Duke's personal files.
0	4,7-DIMETHYL-BICYCLO(3.2.1)-OCT-CIS-3-EN-6-ONE	Pericarp Essent. Oil				Jim Duke's personal files.
1	CHOLESTEROL	Fruit				--
0	VITEXIN-XYLOSIDE	Fruit				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
6	NEOHESPERIDIN	Fruit Juice				Jim Duke's personal files.
12	STIGMASTEROL	Fruit		20.0	-0.8951703667819086	Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)
0	BETA-SINESAL	Pericarp				Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
0	ALPHA-HYDROXY-CAROTENE	Pericarp				Jim Duke's personal files.
8	NOBILETIN	Fruit				--
0	COUMARIC-ACID	Fruit Juice				Jim Duke's personal files.
0	DEACETYL-NOMILIN	Seed				Jim Duke's personal files.
0	NONANOL	Fruit		10.0		Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
0	MEVALONIC-ACID	Pericarp		6.0		Jim Duke's personal files.
0	NOMILINIC-ACID-GLUCOSIDE	Fruit Juice				Jim Duke's personal files.
2	VIOLAXANTHIN	Pericarp				Jim Duke's personal files.
0	ZETA-CAROTENE-B	Pericarp				Jim Duke's personal files.
0	CITRUSININE-II	Root Bark		40.0		--
0	3-PENTYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
12	NARINGIN	Flower				Jim Duke's personal files.
0	NEOERICITRIN	Flower				Jim Duke's personal files.
4	OSTHOLE	Root				--
0	4-(3-METHYL-2-BUTENOXY)-ISO-NITROSO-ACETOPHENONE	Pericarp		48.0		Jim Duke's personal files.
12	NARINGIN	Fruit				--
0	2-METHYL-5-(1-METHYL-ETHENYL)-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
0	LIMONOATE-A-RING-LACTONE	Fruit				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	LIMONIN-GLUCOSIDE	Fruit Juice				Jim Duke's personal files.
62	CAFFEINE	Bud		0.3		Jim Duke's personal files.
1	ANTHERAXANTHIN	Fruit				--
0	EPOXY-NOOKATONE	Pericarp				--
9	SINAPIC-ACID	Fruit Juice				Jim Duke's personal files.
0	2-(METHYL-AMINO)- BENZYL-ALCOHOL	Pericarp Essent. Oil				Jim Duke's personal files.
6	STACHYDRINE	Fruit				--
0	BETA-SINESAL	Fruit		6.0		Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
31	CARYOPHILLENE	Pericarp Essent. Oil				Jim Duke's personal files.
11	PERILLALDEHYDE	Fruit		2.0	-0.7326583054413682	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
0	ALPHA-COPAENE	Pericarp				--
0	BETA-SINENSAL	Pericarp				Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
0	ALPHA-COPAENE	Pericarp Essent. Oil				Jim Duke's personal files.
0	VALENCIACHROME	Fruit		0.0		--
0	MEVALONIC-ACID	Fruit		0.5	-0.6071834425016228	Jim Duke's personal files.
0	NOMILIN-17-O-BETA-D- GLUCOSIDE	Seed				Jim Duke's personal files.
0	ISOCAPROIC-ACID	Fruit				--
31	HESPERIDIN	Flower				Jim Duke's personal files.
7	ALPHA-CAROTENE	Pericarp				Jim Duke's personal files.
0	CITRUSININE-I	Root Bark		80.0		--
0	NEOXANTHIN-B	Pericarp				Jim Duke's personal files.
0	3-OCTYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
12	NARINGIN	Pericarp				Jim Duke's personal files.
0	ERIOCITRIN	Pericarp				Jim Duke's personal files.
8	AURAPTENE	Fruit				--
0	3-METHYL-BUTAN-1-OL	Fruit				--
2	VIOLAXANTHIN	Tissue Culture				Jim Duke's personal files.
0	NARINGENIN-RUTINOSIDE-4-BETA-D-GLUCOSIDE	Fruit				--
0	PHYTOFLUENE-B	Pericarp				Jim Duke's personal files.
5	LIMONIN	Fruit				--
5	LIMONIN	Seed				Jim Duke's personal files.
6	PROPIONIC-ACID	Plant				--
0	TETRA-O-METHYL-SCUTELLAREIN	Fruit Juice				Jim Duke's personal files.
0	N-N-DIMETHYL-ANILINE	Pericarp Essent. Oil				Jim Duke's personal files.
2	VIOLAXANTHIN	Fruit				--
9	CAMPHENE	Fruit		0.1	-0.35176349319281713	--
0	PECTINESTERASE	Fruit				Jim Duke's personal files.
0	GALACTURONIC-ACID	Fruit				--
0	ALPHA-SINENSAL	Pericarp				Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
0	CITRUSIN-IV	Fruit		6.0		Jim Duke's personal files.
0	CYANIDIN-3-GLUCOSIDE	Fruit				--
28	ALPHA-PINENE	Fruit Juice		0.22	-0.9999999999999999	--
2	NOMILIN	Seed				Jim Duke's personal files.
2	NOMILIN	Fruit Juice				Jim Duke's personal files.
31	HESPERIDIN	Fruit				Jim Duke's personal files.
0	ZETA-CAROTENE-A	Pericarp				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	CITRUNOBIN	Root Bark				--
0	NEOXANTHIN-A	Pericarp				Jim Duke's personal files.
0	3-METHYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
12	NARINGIN	Fruit Juice				Jim Duke's personal files.
0	ERIOCITRIN	Flower				Jim Duke's personal files.
7	SCUTELLAREIN	Fruit				--
0	OCTYL-ACETATE	Fruit		10.0	-0.7063104401414774	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
0	3-METHYL-BUT-1-ENE	Essential Oil				Jim Duke's personal files.
0	EPOXY-VALENCENE	Pericarp Essent. Oil				Jim Duke's personal files.
0	PHYTOFLUENE-A	Pericarp				Jim Duke's personal files.
0	LIMONEXIC-ACID	Fruit				--
5	LIMONIN	Fruit Juice				Jim Duke's personal files.
7	SCUTELLAREIN	Fruit Juice				Jim Duke's personal files.
0	N-N-DIMETHYL-3-METHYL-ANILINE	Pericarp Essent. Oil				Jim Duke's personal files.
0	NARINGENIN-RUTINOSIDE	Fruit				--
0	SINESETIN	Plant				Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
0	BETA-CUBEBENE	Fruit		10.0	-0.7068656261481132	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
0	ALPHA-BERGAMOTENE	Fruit		6.0	-1.0	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
1	GALACTOSE	Fruit				--
4	TRANS-2-HEXENAL	Pericarp				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	CITRUSIN-III	Fruit		13.0		Jim Duke's personal files.
0	CRYPTOXANTHIN-5,5',6,6'-DIEPOXIDE	Pericarp				Jim Duke's personal files.
1	MALONIC-ACID	Fruit				--
0	NOBELITIN	Fruit				--
8	NOBILETIN	Pericarp				Jim Duke's personal files.
1	HYDROXYPROLINE	Leaf				Jim Duke's personal files.
31	HESPERIDIN	Fruit Juice		110.0		Jim Duke's personal files.
0	3-HYDROXY-5,8-EPOXY-5,8-DIHYDRO-8'-APO-BETA-CAROTEN-8'-AL	Fruit Juice				Jim Duke's personal files.
5	ZEAXANTHIN	Fruit		2.0	-1.0	--
0	NEOPONCIRIN	Pericarp				Jim Duke's personal files.
0	3-HEPTYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
0	LUTEOLIN-7-O-BETA-D-RUTINOSIDE	Leaf				Jim Duke's personal files.
34	MYRICETIN	Fruit		0.5	-0.7536633445071549	Jim Duke's personal files.
5	BETA-ELEMENE	Pericarp Essent. Oil				Jim Duke's personal files.
22	SCOPARONE	Bark		162.5		Jim Duke's personal files.
0	3-HYDROXY-ETHYL-HEXANOATE	Fruit				Jim Duke's personal files.
0	VALENCENE	Pericarp Essent. Oil				Jim Duke's personal files.
24	PECTIN	Pericarp				Jim Duke's personal files.
5	LIMONIN	Twig				Jim Duke's personal files.
14	SUCROSE	Fruit		47000.0	-0.41357367622327157	--
6	BUTYRIC-ACID	Fruit				--
34	DIOSMIN	Pericarp				--
0	ISORHOIFOLIN	Flower				Jim Duke's personal files.
0	N-METHYL-ANILINE	Pericarp Essent. Oil				Jim Duke's personal files.
0	VALENCIC-ACID	Root				Jim Duke's personal files.
0	NARINGENIN-4-BETA-D-GLUCOSIDE	Plant				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	BETA-CRYTOXANTHIN	Fruit				Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
0	GALACTAN	Fruit				--
0	CITRUSIN-II	Fruit		40.0		Jim Duke's personal files.
2	CRYPTOXANTHIN	Fruit				--
8	NOBILETIN	Fruit Juice				Jim Duke's personal files.
8	HORDENINE	Fruit		0.0		--
4	4-VINYL-GUAIACOL	Fruit Juice				Jim Duke's personal files.
0	SINENSIXANTHIN	Fruit				--
0	5,8-EPOXY-5,8-DIHYDRO-10'-APO-BETA-CAROTEN-3,10'-DIOL	Fruit Juice				Jim Duke's personal files.
0	XYLOSYL-VITEXIN	Leaf				Jim Duke's personal files.
1	NEOHESPERIDIN-DIHYDROCHALCONE	Pericarp				Jim Duke's personal files.
0	3-BUTYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
0	LUTEOLIN-7-O-ALPHA-L-RHAMNO-GLUCOSIDE	Fruit				Jim Duke's personal files.
2	BETA-MYRCENE	Fruit				Jim Duke's personal files.
5	CAPRYLIC-ACID	Fruit				--
34	DIOSMIN	Flower				Jim Duke's personal files.
0	3,3',4,5,6,7,8-HEPTAMETHOXY-FLAVONE	Fruit				Jim Duke's personal files.
0	ETROGOL	Root				Jim Duke's personal files.
1	N-METHYL-TYRAMINE	Pericarp				Jim Duke's personal files.
15	OSTHOL	Root				Jim Duke's personal files.
5	LIMONIN	Branches				Jim Duke's personal files.
7	SUCCINIC-ACID	Fruit				--
0	BROMINE	Fruit		1.0	-0.42563543443835	ACTA AGRIC SCAND SUPPL 22: 1980

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	PONCITRIN	Root				Jim Duke's personal files.
7	GLUCOSE	Fruit		23600.0	-0.644631124988246	--
0	ALPHA-YLANGENE	Pericarp				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	CRYPTOXANTHIN-5,5',6,8'-DIEPOXIDE	Pericarp				Jim Duke's personal files.
0	DIOSMETIN-7-O-ALPHA-L-RHAMNO-GLUCOSIDE	Leaf				Jim Duke's personal files.
176	QUERCETIN	Fruit		3.4	-0.7856446697799095	Jim Duke's personal files.
0	APIGENIN-TRIMETHYL-ETHER	Pericarp				Jim Duke's personal files.
0	VALENCIAXANTHIN	Fruit		3.0		--
16	ACETIC-ACID	Plant				--
8	FRUCTOSE	Fruit		23800.0	-0.555436040816387	--
26	BERGAPTEN	Pericarp				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	BETA-CITRAURIN	Fruit Juice				Jim Duke's personal files.
0	CRYPTOFLAVIN	Pericarp				--
0	NICOTINIC-ACID-ETHYL-ESTER	Pericarp Essent. Oil				Jim Duke's personal files.
0	2,4-TRANS-TRANS-O-DIFERULOYL-GLUCARIC-ACID	Pericarp				Jim Duke's personal files.
2	SINENSETIN	Fruit				--
0	BETA-CITRAURIN	Pericarp				Jim Duke's personal files.
0	CITRACRIDONE-I	Root Bark		400.0		--
3	XYLOSE	Fruit				--
6	NEOHESPERIDIN	Pericarp		28000.0		Jim Duke's personal files.
0	3-(BUT-TRANS-1-ENYL)-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
0	MUTATOXANTHIN	Pericarp				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
1	CAPROIC-ACID	Fruit				--
0	2-TRANS-O-FERULOYL-GLUCARIC-ACID	Pericarp				Jim Duke's personal files.
0	ETHYL-SUBERENOL	Root Bark		700.0		Jim Duke's personal files.
15	TANGERETIN	Pericarp				Jim Duke's personal files.
102	CAFFEIC-ACID	Fruit Juice				Jim Duke's personal files.
0	ISOSAKURANETIN	Fruit				--
5	LIMONIN	Bark				Jim Duke's personal files.
0	SUBEROSIN	Root				Jim Duke's personal files.
0	BRAYLIN	Root				Jim Duke's personal files.
0	POLYGALACTURONIC-ACID	Fruit				--
0	ALPHA-SINESAL	Pericarp				Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
0	GLUCOSAN	Fruit				--
2	BETA-CRYPTOXANTHIN	Fruit				--
0	DIHYDROKAEMPFEROL-4'-METHYL-ETHER-7-O-RHAMNOSIDE	Fruit				Jim Duke's personal files.
8	QUERCETAGETIN	Fruit Juice				Jim Duke's personal files.
0	ANTHRANILIC-ACID-METHYL-ESTER	Pericarp Essent. Oil				Jim Duke's personal files.
0	VALENCIACHROME	Plant				--
0	OBACUNONE-17-O-BETA-D-GLUCOSIDE	Seed				Jim Duke's personal files.
0	FR	Juice				--
0	AURAPTENOL	Pericarp				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	CITFLAVANONE	Root				Jim Duke's personal files.
0	CRENULATIN	Root Bark		60.0		Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
0	MERANZINE	Fruit				--
0	NARIRUTIN-GLUCOSIDE	Pericarp				Jim Duke's personal files.
0	GIBBERELIC-ACID	Fruit				Jim Duke's personal files.
0	XYLAN	Fruit				--
0	NEOCHROME-B	Pericarp				Jim Duke's personal files.
0	3-(4-METHYL-PHENYL)-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
0	LOCHNOCARPOL-A	Root				Jim Duke's personal files.
0	MUTATOXANTHIN	Fruit Juice				Jim Duke's personal files.
0	TETRA-O-METHYL-SCUTELLAREIN	Fruit				--
3	CAPRIC-ACID	Fruit				--
87	RUTIN	Pericarp		6100.0		Jim Duke's personal files.
0	OCTAN-1-AL	Fruit				Jim Duke's personal files.
15	TANGERETIN	Fruit Juice				Jim Duke's personal files.
9	DELTA-CADINENE	Pericarp Essent. Oil				Jim Duke's personal files.
0	CITRABASINE	Root Bark		14.0		--