

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	--
0	PROTEIN	Fruit	9260.0	78000.0	-0.4222516255728621	--
31	HESPERIDIN	Pericarp		63500.0	0.38878029269733505	Jim Duke's personal files.
14	SUCROSE	Fruit		47000.0	-0.41357367622327157	--
15	FIBER	Fruit	3740.0	47000.0	-0.8934118438004772	--
56	NARINGENIN	Pericarp	35000.0	45800.0		Jim Duke's personal files.
1	XANTHYLETIN	Root Bark		45000.0		Jim Duke's personal files.
0	ASH	Fruit	4100.0	36920.0	-0.5112715299819987	--
2	ELEMOL	Root Bark		28200.0		Jim Duke's personal files.
6	NEOHESPERIDIN	Pericarp		28000.0		Jim Duke's personal files.
1	XANTHOXYLETIN	Root Bark		24000.0		Jim Duke's personal files.
8	FRUCTOSE	Fruit		23800.0	-0.555436040816387	--
7	GLUCOSE	Fruit		23600.0	-0.644631124988246	--
0	EO	Pericarp	15000.0	20000.0	1.2809893558000476	--
0	FAT	Fruit	1100.0	16000.0	-0.5190453767939366	--
0	NITROGEN	Fruit	500.0	13845.0	-0.054501610611493154	--
14	POTASSIUM	Fruit	1400.0	13772.0	-0.3666795712783593	--
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	--
60	LIMONENE	Fruit	8300.0	9700.0	0.6409395320453212	--
87	RUTIN	Leaf		9000.0	-0.44580487824979076	Jim Duke's personal files.
3	ASPARTIC-ACID	Fruit	70.0	8607.0	-0.2038383572771155	--
8	GLUTAMIC-ACID	Fruit	60.0	7097.0	-0.4778760905604569	--
12	GLYCINE	Fruit	50.0	7097.0	1.3509995174874219	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
87	RUTIN	Pericarp		6100.0		Jim Duke's personal files.
24	PECTIN	Fruit	1300.0	5900.0	-0.5601993872457034	--
28	CALCIUM	Fruit	210.0	5615.0	0.4058414049804431	--
14	ARGININE	Fruit	230.0	4908.0	0.15957250579145005	--
112	ASCORBIC-ACID	Fruit	500.0	4071.0	-0.03136646807240172	--
16	P-CYMENE	Fruit	3590.0	4070.0	-0.04098189676522262	--
3	ALANINE	Fruit	30.0	3775.0	0.02652939797970876	--
4	LYSINE	Fruit	470.0	3548.0	-0.1467119613903352	USDA's Ag Handbook 8 and sequelae)
0	PROLINE	Fruit	60.0	3473.0	-0.14668369100889192	--
3	VALINE	Fruit	100.0	3020.0	-0.29566746601618277	--
1	SERINE	Fruit	40.0	2410.0	-0.43531280247846904	--
7	PHENYLALANINE	Fruit	310.0	2340.0	-0.34187787905261324	USDA's Ag Handbook 8 and sequelae)
15	MALIC-ACID	Fruit	600.0	2000.0	-0.8215787018847368	--
4	PHOSPHORUS	Fruit	136.0	1980.0	-0.3754207541761312	--
3	ISOLEUCINE	Fruit	250.0	1888.0	-0.5255451749979052	USDA's Ag Handbook 8 and sequelae)
2	ASPARAGINE	Fruit	200.0	1800.0	0.3373215168393527	--
15	METHIONINE	Fruit	200.0	1510.0	0.6791094324753408	USDA's Ag Handbook 8 and sequelae)
18	OLEIC-ACID	Fruit	20.0	1510.0	-0.4691070855395464	USDA's Ag Handbook 8 and sequelae)
7	HISTIDINE	Fruit	180.0	1359.0	-0.24792284510655177	USDA's Ag Handbook 8 and sequelae)
27	LINOLEIC-ACID	Fruit	180.0	1359.0	-0.33622644162700344	USDA's Ag Handbook 8 and sequelae)
8	TYROSINE	Fruit	160.0	1208.0	-0.501692988706999	USDA's Ag Handbook 8 and sequelae)
2	LEUCINE	Fruit	230.0	1136.0	-0.8429441489050677	USDA's Ag Handbook 8 and sequelae)
4	THREONINE	Fruit	150.0	1132.0	-0.7838698402029908	USDA's Ag Handbook 8 and sequelae)
65	MAGNESIUM	Fruit	98.0	1075.0	-0.4884044378711737	--
14	SULFUR	Fruit	46.0	1000.0	-0.28853428975640755	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
13	PALMITIC-ACID	Fruit	130.0	982.0	-0.35024794688904615	USDA's Ag Handbook 8 and sequelae)
24	ETHANOL	Fruit Juice	64.0	900.0	1.0	--
2	CYSTINE	Fruit	100.0	755.0	-0.2882040289158333	USDA's Ag Handbook 8 and sequelae)
22	GAMMA-AMINOBUTYRIC-ACID	Fruit	40.0	730.0	-0.27868808492512787	--
0	ETHYL-SUBERENOL	Root Bark		700.0		Jim Duke's personal files.
0	SUBERENOL	Root Bark		700.0		Jim Duke's personal files.
29	TRYPTOPHAN	Fruit	90.0	680.0	-0.23921305471754814	USDA's Ag Handbook 8 and sequelae)
14	BETAINE	Fruit	390.0	630.0	-1.0398613033298902	--
5	GLUTAMINE	Fruit	30.0	630.0	0.1767951575504613	--
53	LINALOOL	Fruit	30.0	530.0	-0.43753461385311765	--
0	LINALOL	Fruit	30.0	530.0	-0.5486782133862986	--
15	ALPHA-LINOLENIC-ACID	Fruit	70.0	528.0	-0.913356590105175	USDA's Ag Handbook 8 and sequelae)
0	CITRACRIDONE-I	Root Bark		400.0		--
1	NORDENTATIN	Root Bark		300.0		Jim Duke's personal files.
60	LIMONENE	Fruit Juice	1.0	278.0		--
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.)
2	PALMITOLEIC-ACID	Fruit	30.0	226.0	-0.30412481168854	USDA's Ag Handbook 8 and sequelae)
7	SALICYLATES	Fruit	0.0	200.0	0.236750790358027	--
61	FERULIC-ACID	Pericarp	20.0	180.0	1.0	--
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.)
5	ALUMINUM	Fruit	1.0	165.0	-0.17551933701223474	--
22	SCOPARONE	Bark		162.5		Jim Duke's personal files.
1	6,7-DIMETHOXYCOUMARIN	Bark		162.0		Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
20	CHOLINE	Fruit	70.0	160.0	-0.5734302834278399	--
22	MYRCENE	Fruit	130.0	140.0	-0.36272097374914564	--
31	HESPERIDIN	Fruit Juice		110.0		Jim Duke's personal files.
0	STRONTIUM	Fruit	0.054	110.0	0.7328812786702326	--
9	SINAPIC-ACID	Pericarp	45.0	100.0	1.0	--
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.
2	METHANOL	Fruit Juice	0.8	80.0	1.0	--
0	P-HYDROQUINONE	Root Bark		80.0		Jim Duke's personal files.
0	CITRUSININE-I	Root Bark		80.0		--
25	P-COUMARIC-ACID	Pericarp	5.0	75.0	1.0	--
62	CAFFEINE	Flower		62.0	1.0998533626601497	Jim Duke's personal files.
0	CRENULATIN	Root Bark		60.0		Jim Duke's personal files.
102	CAFFEIC-ACID	Fruit	2.0	50.0	-0.3296566072538586	--
0	4-(3-METHYL-2-BUTENOXY)-ISO-NITROSO-ACETOPHENONE	Pericarp		48.0		Jim Duke's personal files.
5	SYNEPHRINE	Fruit	15.0	43.0		--
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.)
0	CITRUSIN-II	Fruit		40.0		Jim Duke's personal files.
28	ALPHA-PINENE	Fruit	35.0	40.0	-0.7083402631126611	--
0	CITRUSININE-II	Root Bark		40.0		--
0	CAROTENOIDS	Fruit	12.0	35.0	-0.5036534891621087	--
0	CAROTENOIDS	Pericarp	12.0	35.0		--
7	CHLORINE	Fruit	12.0	32.0	-0.6800304631000254	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
39	NIACIN	Fruit	2.0	31.0	-0.39701223426716226	--
61	FERULIC-ACID	Fruit	10.0	30.0	-0.7627700713964738	--
1	SODIUM	Fruit	0.0	29.0	-0.1812007490262155	--
32	ALPHA-TOCOPHEROL	Fruit	4.0	29.0	-0.6752411923996696	--
53	BETA-CAROTENE	Fruit	1.0	28.0	-0.0966771336129336	--
4	BORON	Fruit	1.89	27.5	-0.25022637010687165	--
0	DECANAL	Fruit	18.0	21.0	-0.6027493593021571	--
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.)
2	DODECANAL	Fruit	5.0	20.0	0.9948320067476139	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
11	PANTOTHENIC-ACID	Fruit	2.0	19.0	0.05712424299404392	USDA's Ag Handbook 8 and sequelae)
9	SINAPIC-ACID	Fruit	7.0	19.0	0.784062560233975	--
25	P-COUMARIC-ACID	Fruit	5.0	17.0	-0.6943231755501756	--
0	BARIUM	Fruit	0.54	16.5	-0.456265269747712	USDA's Ag Handbook 8 and sequelae)
0	VALENCENE	Fruit Juice	0.04	15.3	0.9999999999999999	--
6	ACETALDEHYDE	Fruit Juice	3.0	15.0	1.0	--
11	ALPHA-PHELLANDRENE	Fruit	12.0	14.0	-0.5695870460921888	--
0	OCTANAL	Fruit	12.0	14.0	-0.6131393394849658	--
0	CITRABASINE	Root Bark		14.0		--
77	ZINC	Fruit	0.9	13.0	-0.5205322406758267	--
0	CITRUSIN-III	Fruit		13.0		Jim Duke's personal files.
5	SABINENE	Fruit	11.0	13.0	-0.5315196015036519	--
13	BETA-PINENE	Fruit	11.0	13.0	-0.29742687330503664	--
0	OCTYL-ACETATE	Fruit		10.0	-0.7063104401414774	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
2	NERYL-FORMATE	Fruit		10.0	-1.0	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
0	NONANOL	Fruit		10.0		Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
0	BETA-CUBEBENE	Fruit		10.0	-0.7068656261481132	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
19	CARVONE	Fruit	2.0	10.0	-0.49999993853473	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
8	DELTA-3-CARENE	Fruit	7.0	9.0	-0.5981394247478974	--
0	TETRADECANAL	Fruit	5.0	9.0	1.0	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
14	MANGANESE	Fruit	0.0	8.0	-0.3507865335531638	--
6	IRON	Fruit	1.0	8.0	-0.49575433892938076	--
0	RUBIDIUM	Fruit	0.1	7.7	-0.8530025130786637	ACTA AGRIC SCAND SUPPL 22: 1980
31	THIAMIN	Fruit	1.0	7.0	0.21342198396383905	--
13	GERANIAL	Fruit	6.0	7.0	-0.9983227361677096	--
0	CITRUSIN-IV	Fruit		6.0		Jim Duke's personal files.
62	CAFFEINE	Leaf		6.0	-0.9423311788449318	Jim Duke's personal files.
0	BETA-SINESAL	Fruit		6.0		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	ALPHA-BERGAMOTENE	Fruit		6.0	-1.0	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
0	LUTEOXANTHINS	Fruit	0.0	6.0		--
12	COPPER	Fruit	0.44	5.5	-0.569630082366932	--
20	CITRONELLAL	Fruit	4.0	5.0	-0.9952774234291415	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	FERULOYL-PUTRESCINE	Fruit	0.0	5.0	1.0	--
0	HEPTANAL	Fruit	3.0	5.0		Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
4	NERAL	Fruit	4.0	5.0	-0.8791176720401793	--
0	VIT-B-6	Fruit	1.0	5.0	-0.538913394725687	USDA's Ag Handbook 8 and sequelae)
0	LINALOL	Fruit Juice	0.15	4.69	1.0000000000000002	--
53	LINALOOL	Fruit Juice	0.15	4.69	1.0000000000000004	--
0	PHYTOFLUENE	Fruit	0.0	4.0	-1.0	--
0	VALENCENE	Fruit	3.0	4.0	-1.0	--
0	AURAXANTHIN	Fruit	0.0	4.0		--
0	NONANAL	Fruit	3.0	4.0	-0.8226919978166914	--
0	TITANIUM	Fruit	0.135	3.85	-0.6666260908934968	--
176	QUERCETIN	Fruit		3.4	-0.7856446697799095	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	(Z)-BETA-OCIMENE	Fruit	2.0	3.0	-0.6648405774204937	--
15	LUTEIN	Fruit	0.0	3.0	-0.575590894746515	--
0	VALENCIAXANTHIN	Fruit		3.0		--
15	RIBOFLAVIN	Fruit	0.0	3.0	-0.4303249009534089	--
23	ALPHA-TERPINEOL	Fruit	2.0	3.0	-0.40604181620664676	--
0	ZETA-CAROTENE	Fruit	0.0	2.0	-1.0	--
0	BETA-CARYOPHYLLENE	Fruit	1.0	2.0	-0.5058677869700708	--
5	ZEAXANTHIN	Fruit		2.0	-1.0	--
5	HEXANAL	Fruit	1.0	2.0		Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
1	N-METHYL-TYRAMINE	Fruit	0.0	2.0	-1.0	--
0	GAMMA-CADINENE	Fruit	1.0	2.0	-0.9084313290424243	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
15	FOLACIN	Fruit	0.0	2.0	-0.019192793995839758	USDA's Ag Handbook 8 and sequelae)
0	MUTATOXANTHIN	Fruit		2.0	-1.0	--
9	TERPINOLENE	Fruit	1.0	2.0	-0.7498060467737104	--
0	PHYTOENE	Fruit	0.0	2.0		--
4	SILICON	Fruit		2.0	-0.6019449725946585	ACTA AGRIC SCAND SUPPL 22: 1980
13	ALPHA-TERPINENE	Fruit	1.0	2.0	-0.44934612100297294	--
11	GAMMA-TERPINENE	Fruit	1.0	2.0	-0.6509562680883627	--
0	ALPHA-SINENSAL	Fruit	1.0	2.0	-1.0	--
11	PERILLALDEHYDE	Fruit		2.0	-0.7326583054413682	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
7	ALPHA-CAROTENE	Fruit	0.19	1.9	-0.26808750426637384	--
11	LITHIUM	Fruit	0.108	1.54	0.890343380696948	--
0	LEAD	Fruit	0.02	1.1	-0.42525727293888926	--
0	ZIRCONIUM	Fruit	0.5	1.1	-0.5018207810885003	--
23	ALPHA-TERPINEOL	Fruit Juice	0.09	1.1	-0.6501250791550391	--
1	ETHYL-BUTYRATE	Fruit Juice	0.08	1.02		--
15	CITRONELLOL	Fruit	0.7	1.0	-0.5060981097957616	--
0	OCTOPAMINE	Fruit	0.0	1.0	-1.0	--
2	UNDECANAL	Fruit	0.7	1.0	-0.5758305509285185	--
0	(E)-BETA-OCIMENE	Fruit	0.7	1.0	-0.795218715224166	--
35	GERANIOL	Fruit	0.7	1.0	-0.6057972802749785	--
10	NEROL	Fruit	0.7	1.0	-0.5477997473775594	--
0	ALPHA-THUJENE	Fruit	0.7	1.0	-0.5955809256752451	--
3	NOOTKATONE	Fruit		1.0		Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
5	NERYL-ACETATE	Fruit	0.7	1.0	-0.724098948454428	--
5	BETA-ELEMENE	Fruit	0.7	1.0	-0.565275335737646	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	ALPHA-CUBEBENE	Fruit	0.7	1.0	-0.6220320233548484	--
0	ALPHA-COPAENE	Fruit	0.7	1.0	-0.6881248888845418	--
11	TYRAMINE	Fruit	0.0	1.0	0.7071067811865478	--
0	BROMINE	Fruit		1.0	-0.42563543443835	ACTA AGRIC SCAND SUPPL 22: 1980
0	FLUORINE	Fruit	0.04	0.76	-0.5863462540268758	ACTA AGRIC SCAND SUPPL 22: 1980
5	HEXANAL	Fruit Juice	0.02	0.65		--
6	ETHYL-ACETATE	Fruit Juice	0.01	0.58		--
3	NICKEL	Fruit	0.01	0.55	-0.6121948588601274	--
34	MYRICETIN	Fruit		0.5	-0.7536633445071549	Jim Duke's personal files.
0	MEVALONIC-ACID	Fruit		0.5	-0.6071834425016228	Jim Duke's personal files.
11	GAMMA-TERPINENE	Fruit Juice	0.04	0.46	-1.0	--
24	CHROMIUM	Fruit	0.005	0.385	-0.45355683651553846	--
2	MOLYBDENUM	Fruit	0.1	0.385	-0.4080774738511709	--
62	CAFFEINE	Bud		0.3		Jim Duke's personal files.
0	OCTANAL	Fruit Juice	0.0	0.28	-1.0	--
28	ALPHA-PINENE	Fruit Juice		0.22	-0.9999999999999999	--
3	HEXANOL	Fruit Juice	0.02	0.22		--
2	ARSENIC	Fruit	0.001	0.154	-0.33956845146287234	--
5	SABINENE	Fruit Juice	0.0	0.15		--
0	DECANAL	Fruit Juice	0.0	0.15	-1.0000000000000002	--
3	CADMIUM	Fruit	0.001	0.138	-0.23805307615553817	--
2	FARNESENE	Fruit	0.0	0.1	-1.0	--
0	OCTANOL	Fruit	0.0	0.1	-0.7071067811865478	--
9	CAMPHENE	Fruit		0.1	-0.35176349319281713	--
71	THYMOL	Fruit	0.0	0.1	-0.7071067811865474	--
0	METHYL-N-METHYL-ANTHRANILATE	Fruit	0.0	0.1		--
23	TERPINEN-4-OL	Fruit		0.1	-0.358333842321623	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
2	ALPHA-HUMULENE	Fruit	0.0	0.1	-0.5986253681056065	--
5	GERANYL-ACETATE	Fruit	0.0	0.1	-0.9446827484165164	--
0	TRANS-SABINENE-HYDRATE	Fruit	0.0	0.1	-0.5231287251565837	--
0	CIS-SABINENE-HYDRATE	Fruit		0.1	-0.7071067811865477	--
1	TRANS-2-HEXENOL	Fruit Juice	0.0	0.1		--
2	METHYL-BUTYRATE	Fruit Juice	0.01	0.1		--
2	CITRONELLYL-ACETATE	Fruit	0.0	0.1	-0.9999999999999998	--
0	2-METHYL-1-PROPANOL	Fruit Juice	0.0	0.07		--
3	SILVER	Fruit	0.027	0.055	-0.5875909007853288	--
2	COBALT	Fruit	0.001	0.055	-0.5284569584957359	--
60	SELENIUM	Fruit	0.0	0.002	-0.38569128420884563	--
1	MERCURY	Fruit	0.0	0.001	-0.7865389313824043	--
5	PHYLLOQUINONE	Fruit		0.001	-0.23285139490462353	--
8	HORDENINE	Fruit		0.0		--
0	VALENCIACHROME	Fruit		0.0		--
8	NOBILETIN	Fruit				--
1	CAPROIC-ACID	Fruit				--
0	NARINGENIN-RUTINOSIDE	Fruit				--
0	2-TRANS-O-FERULOYL-GLUCARIC-ACID	Pericarp				Jim Duke's personal files.
7	ALPHA-CAROTENE	Pericarp				Jim Duke's personal files.
0	LIMONEXIC-ACID	Fruit				--
0	2-METHYL-5-(1-METHYL-ETHENYL)-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
0	PECTINESTERASE	Fruit				Jim Duke's personal files.
0	LIMONIN-GLUCOSIDE	Fruit Juice				Jim Duke's personal files.
0	BRAYLIN	Root				Jim Duke's personal files.
0	NOBELITIN	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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.
34	DIOSMIN	Pericarp				--
7	SCUTELLAREIN	Fruit				--
0	N-N-DIMETHYL-ANILINE	Pericarp Essent. Oil				Jim Duke's personal files.
1	HYDROXYPROLINE	Leaf				Jim Duke's personal files.
0	NOMILIN-17-O-BETA-D-GLUCOSIDE	Seed				Jim Duke's personal files.
2	VIOLAXANTHIN	Fruit				--
31	HESPERIDIN	Flower				Jim Duke's personal files.
2	VIOLAXANTHIN	Pericarp				Jim Duke's personal files.
2	CRYPTOXANTHIN	Fruit				--
0	LUTEOLIN-7-O-BETA-D-RUTINOSIDE	Leaf				Jim Duke's personal files.
0	3-OCTYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
12	NARINGIN	Pericarp				Jim Duke's personal files.
0	ERIOCITRIN	Pericarp				Jim Duke's personal files.
9	SINAPIC-ACID	Fruit Juice				Jim Duke's personal files.
0	GALACTAN	Fruit				--
0	NEOPONCIRIN	Pericarp				Jim Duke's personal files.
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.
3	CAPRIC-ACID	Fruit				--
0	ETROGOL	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	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	ZETA-CAROTENE-A	Pericarp				Jim Duke's personal files.
0	PHYTOFLUENE-B	Pericarp				Jim Duke's personal files.
31	CARYOPHYLLENE	Pericarp Essent. Oil				Jim Duke's personal files.
5	LIMONIN	Seed				Jim Duke's personal files.
0	DIOSMETIN-7-O-ALPHA-L-RHAMNO-GLUCOSIDE	Leaf				Jim Duke's personal files.
0	N-N-DIMETHYL-3-METHYL-ANILINE	Pericarp Essent. Oil				Jim Duke's personal files.
2	NOMILIN	Fruit Juice				Jim Duke's personal files.
31	HESPERIDIN	Fruit				Jim Duke's personal files.
2	VIOLAXANTHIN	Tissue Culture				Jim Duke's personal files.
0	CRYPTOFLAVIN	Pericarp				--
0	LUTEOLIN-7-O-ALPHA-L-RHAMNO-GLUCOSIDE	Fruit				Jim Duke's personal files.
0	3-METHYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
1	MALONIC-ACID	Fruit				--
12	NARINGIN	Fruit Juice				Jim Duke's personal files.
0	ERIOCITRIN	Flower				Jim Duke's personal files.
0	TETRA-O-METHYL-SCUTELLAREIN	Fruit Juice				Jim Duke's personal files.
0	BETA-APO-CAROTEN-8-AL	Pericarp				--
1	NEOHESPERIDIN-DIHYDROCHALCONE	Pericarp				Jim Duke's personal files.
0	2,4-TRANS,TRANS-O-FERULOYL-GLUCARIC-ACID	Pericarp				--
0	SINENSIAXANTHIN	Fruit				--
0	3-HYDROXY-5,8-EPOXY-5,8-DIHYDRO-8'-APO-BETA-CAROTEN-8'-AL	Fruit Juice				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	PHYTOFLUENE-A	Pericarp				Jim Duke's personal files.
5	LIMONIN	Fruit Juice				Jim Duke's personal files.
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	GLUCOSAN	Fruit				--
28	ALPHA-PINENE	Plant				--
0	DIHYDROKAEMPFEROL-4'-METHYL-ETHER-7-O-RHAMNOSIDE	Fruit				Jim Duke's personal files.
0	N-METHYL-ANILINE	Pericarp Essent. Oil				Jim Duke's personal files.
8	NOBILETIN	Pericarp				Jim Duke's personal files.
0	VALENCIC-ACID	Root				Jim Duke's personal files.
0	EPOXY-VALENCENE	Pericarp Essent. Oil				Jim Duke's personal files.
0	3-HEPTYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
0	PONCITRIN	Root				Jim Duke's personal files.
5	BETA-ELEMENE	Pericarp Essent. Oil				Jim Duke's personal files.
7	SCUTELLAREIN	Fruit Juice				Jim Duke's personal files.
0	BETA-APO-8'-CAROTINAL	Pericarp				Jim Duke's personal files.
0	FR	Juice				--
0	5,8-EPOXY-5,8-DIHYDRO-8'-APO-BETA-CAROTEN-3,10-DIOL	Fruit Juice				--
7	SUCCINIC-ACID	Fruit				--
0	ARABAN	Fruit				--
0	2'-TRANS-O-P-COUMAROYL-GLUCARIC-ACID	Pericarp				Jim Duke's personal files.
2	SINENSETIN	Fruit				--
0	5,8-EPOXY-5,8-DIHYDRO-10'-APO-BETA-CAROTEN-3,10'-DIOL	Fruit Juice				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	ISOSAKURANETIN	Fruit				--
24	PECTIN	Pericarp				Jim Duke's personal files.
0	XYLOSYL-VITEXIN	Leaf				Jim Duke's personal files.
5	LIMONIN	Twig				Jim Duke's personal files.
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.
0	BETA-ZEACAROTENE	Pericarp				Jim Duke's personal files.
0	GERANYL-OXY-PYRANOCOUMARIN	Root				Jim Duke's personal files.
9	DELTA-CADINENE	Pericarp				--
0	CRYPTOXANTHIN-5,5',6,8'-DIEPOXIDE	Pericarp				Jim Duke's personal files.
0	MERANZINE	Fruit				--
0	APIGENIN-TRIMETHYL-ETHER	Pericarp				Jim Duke's personal files.
8	NOBILETIN	Fruit Juice				Jim Duke's personal files.
4	4-VINYL-GUAIACOL	Fruit Juice				Jim Duke's personal files.
0	VALENCENE	Pericarp Essent. Oil				Jim Duke's personal files.
0	LOCHNOCARPOL-A	Root				Jim Duke's personal files.
0	3-BUTYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
0	POLYGALACTURONIC-ACID	Fruit				--
2	BETA-MYRCENE	Fruit				Jim Duke's personal files.
34	DIOSMIN	Flower				Jim Duke's personal files.
0	ISORHOIFOLIN	Flower				Jim Duke's personal files.
0	BERGAPTOL	Fruit				--
0	NEOCHROME-B	Pericarp				Jim Duke's personal files.
0	5,8-EPOXY-5,5',8-TETRAHYDRO-BETA,BETA-CAROTEN-3,3',5',6'-TETROL	Plant				--
0	SUBEROSIN	Root				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	BETA-CITRAURIN	Fruit Juice				Jim Duke's personal files.
0	APOVIOLAXANTH-10'-AL	Pericarp				--
0	2'-TRANS-O-P-COUMAROYL-GALACTARIC-ACID	Pericarp				Jim Duke's personal files.
0	CITFLAVANONE	Root Bark				--
102	CAFFEIC-ACID	Fruit Juice				Jim Duke's personal files.
0	ISORHOIFOLIN	Pericarp				--
15	OSTHOL	Root				Jim Duke's personal files.
3	XYLOSE	Fruit				--
5	LIMONIN	Branches				Jim Duke's personal files.
0	NEUROSPORIN	Pericarp				Jim Duke's personal files.
0	TETRA-O-METHYL-SCUTELLAREIN	Fruit				--
1	DELPHINIDIN-3-GLUCOSIDE	Fruit				--
2	BETA-CRYPTOXANTHIN	Fruit				--
3	MANNOSE	Fruit				--
0	ANTHRANILIC-ACID-METHYL-ESTER	Pericarp Essent. Oil				Jim Duke's personal files.
0	NICOTINIC-ACID-ETHYL-ESTER	Pericarp Essent. Oil				Jim Duke's personal files.
0	OCTAN-1-AL	Fruit				Jim Duke's personal files.
0	VALENCIACHROME	Plant				--
0	2,4-TRANS-TRANS-O-DIFERULOYL-GLUCARIC-ACID	Pericarp				Jim Duke's personal files.
1	N-METHYL-TYRAMINE	Pericarp				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.
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.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	NEOCHROME-A	Pericarp				Jim Duke's personal files.
0	5,6-DIHYDRO-BETA-BETA-CAROTEN-3,3',5,6-TETROL	Fruit Juice				--
2	CONIFERIN	Pericarp				Jim Duke's personal files.
0	CITFLAVANONE	Root				Jim Duke's personal files.
0	HESPERIDIN-7-O-ALPHA-L-RHAMNO-GLUCOSIDE	Fruit				--
0	APIGENIN-7-O-ALPHA-L-RHAMNO-GLUCOSIDE	Leaf				--
0	2'-TRANS-O-FERULOYL-GALACTARIC-ACID	Pericarp				Jim Duke's personal files.
9	DELTA-CADINENE	Pericarp Essent. Oil				Jim Duke's personal files.
0	ISOPRENE	Essential Oil				Jim Duke's personal files.
0	OBACUNONE-17-O-BETA-D-GLUCOSIDE	Seed				Jim Duke's personal files.
0	XYLAN	Fruit				--
5	LIMONIN	Bark				Jim Duke's personal files.
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-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.
2	BETA-CRYPTOXANTHIN	Pericarp				Jim Duke's personal files.
1	ANTHERAXANTHIN	Tissue Culture				Jim Duke's personal files.
0	NARIRUTIN-GLUCOSIDE	Pericarp				Jim Duke's personal files.
3	OBACUNONE	Seed				Jim Duke's personal files.
0	GIBBERELLIC-ACID	Fruit				Jim Duke's personal files.
15	TANGERETIN	Pericarp				Jim Duke's personal files.
0	JASMONIC-ACID	Fruit				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	MUTATOXANTHIN	Fruit Juice				Jim Duke's personal files.
8	QUERCETAGETIN	Fruit Juice				Jim Duke's personal files.
0	FLAVOXANTHIN	Pericarp				Jim Duke's personal files.
0	NEO-BETA-CAROTENE	Pericarp				Jim Duke's personal files.
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.
0	CASTASTERONE	Pollen Or Spore				Jim Duke's personal files.
0	3-(4-METHYL-PHENYL)-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
1	ANTHERAXANTHIN	Fruit				--
0	ETA-CAROTENE	Pericarp				--
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.
0	3-METHYL-BUTAN-1-OL	Fruit Juice				Jim Duke's personal files.
0	ISOPENTENYL-PSORALENS	Fruit				--
0	OBACUNONE-GLUCOSIDE	Fruit Juice				Jim Duke's personal files.
5	LIMONIN	Root				Jim Duke's personal files.
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	ALPHA-COPAENE	Pericarp				--
0	CRYPTOFLAVIN-B	Pericarp				Jim Duke's personal files.
1	MALONIC-ACID	Plant				--
0	ABSCISIC-ACID	Tissue Culture				Jim Duke's personal files.
0	NARIRUTIN-GLUCOSIDE	Flower				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
0	HEPTAMETHOXY-FLAVONE	Fruit Juice				Jim Duke's personal files.
15	TANGERETIN	Fruit Juice				Jim Duke's personal files.
16	LYCOPENE	Pericarp				Jim Duke's personal files.
0	5-HEXYL-2-METHYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
8	AURAPTENE	Fruit				--
1	NARIRUTIN	Pericarp				Jim Duke's personal files.
0	3-METHYL-BUTAN-1-OL	Fruit				--
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	CITRUSINS	Plant				J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.
0	5,6-DIHYDRO-BETA-BETA-CAROTENE-3,3',5,6-TETROL	Fruit Juice				Jim Duke's personal files.
0	3-(4-METHYL-HEXYL)-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
0	HEPTULOSE	Fruit				--
2	NOOTKATOL	Fruit				Jim Duke's personal files.
0	EPOXY-VALENCENE	Fruit				--
0	SESLIN	Root				Jim Duke's personal files.
1	CHOLESTEROL	Fruit				--
3	BRASSINOLIDE	Pollen Or Spore				Jim Duke's personal files.
0	ISOLUTEIN	Pericarp				Jim Duke's personal files.
0	EPOXY-NOOTKATONE	Pericarp Essent. Oil				Jim Duke's personal files.
19	D-LIMONENE	Fruit Juice				Jim Duke's personal files.
5	ZEAXANTHIN	Pericarp				Jim Duke's personal files.

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	TAU-CAROTENE	Pericarp				--
0	DEACETYL-NOMILIN	Seed				Jim Duke's personal files.
0	CRYPTOFLAVIN-A	Pericarp				Jim Duke's personal files.
0	4-PHENYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
0	3-HYDROXY-ETHYL-HEXANOATE	Fruit Juice				Jim Duke's personal files.
1	NARIRUTIN	Fruit Juice				Jim Duke's personal files.
0	URONIC-ACID	Fruit				--
0	3,3',4,5,6,7,8-HEPTAMETHOXY-FLAVONE	Fruit Juice				Jim Duke's personal files.
5	SYNEPHRINE	Pericarp				Jim Duke's personal files.
31	CARYOPHYLLENE	Pericarp				--
15	LUTEIN	Pericarp				Jim Duke's personal files.
0	5-ACETYL-2-METHYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
0	NARINGIN-7-O-ALPHA-L-RHAMNO-GLUCOSIDE	Fruit				--
0	3-METHYL-BUT-1-ENE	Essential Oil				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.
0	2-PHENYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
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	EPOXY-NOOTKATONE	Pericarp				--
3	SESELIN	Root				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	4,7-DIMETHYL-BICYCLO(3.2.1)-OCT-TRANS-3-EN-6-ONE	Pericarp Essent. Oil				Jim Duke's personal files.
3	NOOTKATONE	Pericarp Essent. Oil				Jim Duke's personal files.
0	ICHANGIN-17-O-BETA-D-GLUCOSIDE	Seed				Jim Duke's personal files.
5	ZEAXANTHIN	Tissue Culture				Jim Duke's personal files.
15	TANGERETIN	Fruit				--
25	P-COUMARIC-ACID	Fruit Juice				Jim Duke's personal files.
0	3-PROPYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
1	QUINIC-ACID	Fruit				--
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.
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	ISOSINENSETIN	Pericarp				Jim Duke's personal files.
0	LINOMIN	Leaf				Jim Duke's personal files.
12	NARINGIN	Fruit				--
0	3-HYDROXY-ETHYL-HEXANOATE	Fruit				Jim Duke's personal files.
53	BETA-CAROTENE	Pericarp				Jim Duke's personal files.
0	LIMONOATE-A-RING-LACTONE	Fruit				Jim Duke's personal files.
0	2-PENTYLPYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
6	BUTYRIC-ACID	Fruit				--
0	4,7-DIMETHYL-BICYCLO(3.2.1)-OCT-CIS-3-EN-6-ONE	Pericarp Essent. Oil				Jim Duke's personal files.
0	ISOCAPROIC-ACID	Fruit				--
0	NOMILINIC-ACID-17-O-BETA-D-GLUCOSIDE	Seed				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
4	OSTHOLE	Root				--
0	VITEXIN-XYLOSIDE	Fruit				Jim Duke's personal files.
0	HESPERIDIN-7-O-ALPHA-L-RHAMNO-GLUCOSIDE	Fruit Juice				Jim Duke's personal files.
1	XANTHYLETIN	Root				Jim Duke's personal files.
0	NEOXANTHIN-B	Pericarp				Jim Duke's personal files.
0	CYANIDIN-3-GLUCOSIDE	Fruit				--
0	COUMARIC-ACID	Fruit Juice				Jim Duke's personal files.
0	3-PHENYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
0	NARINGIN-GLUCOSIDE	Flower				Jim Duke's personal files.
2	SINENSETIN	Pericarp				Jim Duke's personal files.
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	GALACTURONIC-ACID	Fruit				--
0	LIMONIN-17-O-BETA-D-GLUCOSIDE	Seed				Jim Duke's personal files.
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.
5	CAPRYLIC-ACID	Fruit				--
0	NARINGENIN-RUTINOSIDE-4-BETA-D-GLUCOSIDE	Fruit				--
0	3,3',4,5,6,7,8-HEPTAMETHOXY-FLAVONE	Fruit				Jim Duke's personal files.
6	STACHYDRINE	Fruit				--
0	CITRUNOBIN	Root Bark				--
0	ZETA-CAROTENE-B	Pericarp				Jim Duke's personal files.
5	LIMONIN	Fruit				--
0	2-METHYL-5-PHENYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
2	NOMILIN	Seed				Jim Duke's personal files.
0	2-(METHYL-AMINO)- BENZYL-ALCOHOL	Pericarp Essent. Oil				Jim Duke's personal files.
0	NOMILINIC-ACID- GLUCOSIDE	Fruit Juice				Jim Duke's personal files.
6	NEOHESPERIDIN	Fruit Juice				Jim Duke's personal files.
1	XANTHOXYLETIN	Root				Jim Duke's personal files.
16	ACETIC-ACID	Plant				--
0	CRYPTOXANTHIN-5,5',6,6'- DIEPOXIDE	Pericarp				Jim Duke's personal files.
0	ALPHA-COPAENE	Pericarp Essent. Oil				Jim Duke's personal files.
0	3-PENTYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
6	PROPIONIC-ACID	Plant				--
12	NARINGIN	Flower				Jim Duke's personal files.
0	NEOERIOCITRIN	Flower				Jim Duke's personal files.
2	SINENSETIN	Fruit Juice				Jim Duke's personal files.
0	BETA-CITRAURIN	Pericarp				Jim Duke's personal files.
1	GALACTOSE	Fruit				--
0	NEOXANTHIN-A	Pericarp				Jim Duke's personal files.