

Dr. Duke's Phytochemical and Ethnobotanical Databases

Chemicals found in Citrus sinensis

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
1	MALONIC-ACID	Fruit				--
1	XANTHYLETIN	Root				Jim Duke's personal files.
1	MALONIC-ACID	Plant				--
1	HYDROXYPROLINE	Leaf				Jim Duke's personal files.
1	XANTHOXYLETIN	Root Bark		24000.0		Jim Duke's personal files.
1	ETHYL-BUTYRATE	Fruit Juice	0.08	1.02		--
1	XANTHOXYLETIN	Root				Jim Duke's personal files.
1	N-METHYL-TYRAMINE	Fruit	0.0	2.0	-1.0	--
1	QUINIC-ACID	Fruit				--
1	N-METHYL-TYRAMINE	Pericarp				Jim Duke's personal files.
1	SERINE	Fruit	40.0	2410.0	-0.43531280247846904	--
1	GALACTOSE	Fruit				--
1	CHOLESTEROL	Fruit				--
1	TRANS-2-HEXENOL	Fruit Juice	0.0	0.1		--
1	DELPHINIDIN-3-GLUCOSIDE	Fruit				--
1	NEOHESPERIDIN-DIHYDROCHALCONE	Pericarp				Jim Duke's personal files.
1	ANTHERAXANTHIN	Tissue Culture				Jim Duke's personal files.
1	MERCURY	Fruit	0.0	0.001	-0.7865389313824043	--
1	NORDENTATIN	Root Bark		300.0		Jim Duke's personal files.
1	ANTHERAXANTHIN	Fruit				--
1	NARIRUTIN	Fruit Juice				Jim Duke's personal files.
1	CAPROIC-ACID	Fruit				--
1	SODIUM	Fruit	0.0	29.0	-0.1812007490262155	--
1	NARIRUTIN	Pericarp				Jim Duke's personal files.
1	6,7-DIMETHOXYCOUMARIN	Bark		162.0		Jim Duke's personal files.
1	XANTHYLETIN	Root Bark		45000.0		Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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.)
2	PALMITOLEIC-ACID	Fruit	30.0	226.0	-0.30412481168854	USDA's Ag Handbook 8 and sequelae)
2	UNDECANAL	Fruit	0.7	1.0	-0.5758305509285185	--
2	NOMILIN	Seed				Jim Duke's personal files.
2	BETA-CRYPTOXANTHIN	Pericarp				Jim Duke's personal files.
2	COBALT	Fruit	0.001	0.055	-0.5284569584957359	--
2	VIOLAXANTHIN	Fruit				--
2	VIOLAXANTHIN	Pericarp				Jim Duke's personal files.
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	BETA-MYRCENE	Fruit				Jim Duke's personal files.
2	VIOLAXANTHIN	Tissue Culture				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.
2	DODECANAL	Fruit	5.0	20.0	0.9948320067476139	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
2	MOLYBDENUM	Fruit	0.1	0.385	-0.4080774738511709	--
2	ELEMOL	Root Bark		28200.0		Jim Duke's personal files.
2	ASPARAGINE	Fruit	200.0	1800.0	0.3373215168393527	--
2	METHYL-BUTYRATE	Fruit Juice	0.01	0.1		--
2	NOMILIN	Fruit Juice				Jim Duke's personal files.
2	ALPHA-HUMULENE	Fruit	0.0	0.1	-0.5986253681056065	--
2	ARSENIC	Fruit	0.001	0.154	-0.33956845146287234	--
2	METHANOL	Fruit Juice	0.8	80.0	1.0	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
2	CYSTINE	Fruit	100.0	755.0	-0.2882040289158333	USDA's Ag Handbook 8 and sequelae)
2	SINENSETIN	Pericarp				Jim Duke's personal files.
2	LEUCINE	Fruit	230.0	1136.0	-0.8429441489050677	USDA's Ag Handbook 8 and sequelae)
2	CITRONELLYL-ACETATE	Fruit	0.0	0.1	-0.9999999999999998	--
2	CRYPTOXANTHIN	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.
2	SINENSETIN	Fruit Juice				Jim Duke's personal files.
2	FARNESENE	Fruit	0.0	0.1	-1.0	--
2	SINENSETIN	Fruit				--
2	NOOTKATOL	Fruit				Jim Duke's personal files.
2	BETA-CRYPTOXANTHIN	Fruit				--
2	CONIFERIN	Pericarp				Jim Duke's personal files.
3	SILVER	Fruit	0.027	0.055	-0.5875909007853288	--
3	NICKEL	Fruit	0.01	0.55	-0.6121948588601274	--
3	VALINE	Fruit	100.0	3020.0	-0.29566746601618277	--
3	HEXANOL	Fruit Juice	0.02	0.22		--
3	ASPARTIC-ACID	Fruit	70.0	8607.0	-0.2038383572771155	--
3	SESELIN	Root				Jim Duke's personal files.
3	NOOTKATONE	Pericarp Essent. Oil				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.
3	CADMIUM	Fruit	0.001	0.138	-0.23805307615553817	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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.
3	BRASSINOLIDE	Pollen Or Spore				Jim Duke's personal files.
3	ALANINE	Fruit	30.0	3775.0	0.02652939797970876	--
3	OBACUNONE	Seed				Jim Duke's personal files.
3	MANNOSE	Fruit				--
3	NOOTKATONE	Fruit		1.0		Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
3	ISOLEUCINE	Fruit	250.0	1888.0	-0.5255451749979052	USDA's Ag Handbook 8 and sequelae)
3	XYLOSE	Fruit				--
3	CAPRIC-ACID	Fruit				--
4	SILICON	Fruit		2.0	-0.6019449725946585	ACTA AGRIC SCAND SUPPL 22: 1980
4	LYSINE	Fruit	470.0	3548.0	-0.1467119613903352	USDA's Ag Handbook 8 and sequelae)
4	OSTHOLE	Root				--
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.
4	PHOSPHORUS	Fruit	136.0	1980.0	-0.3754207541761312	--
4	NERAL	Fruit	4.0	5.0	-0.8791176720401793	--
4	4-VINYL-GUAIACOL	Fruit Juice				Jim Duke's personal files.
4	THREONINE	Fruit	150.0	1132.0	-0.7838698402029908	USDA's Ag Handbook 8 and sequelae)
4	BORON	Fruit	1.89	27.5	-0.25022637010687165	--
5	BETA-ELEMENE	Fruit	0.7	1.0	-0.565275335737646	--
5	LIMONIN	Root				Jim Duke's personal files.
5	SYNEPHRINE	Fruit	15.0	43.0		--

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.
5	PHYLLOQUINONE	Fruit		0.001	-0.23285139490462353	--
5	NERYL-ACETATE	Fruit	0.7	1.0	-0.724098948454428	--
5	HEXANAL	Fruit Juice	0.02	0.65		--
5	LIMONIN	Seed				Jim Duke's personal files.
5	SYNEPHRINE	Pericarp				Jim Duke's personal files.
5	LIMONIN	Fruit				--
5	LIMONIN	Fruit Juice				Jim Duke's personal files.
5	GERANYL-ACETATE	Fruit	0.0	0.1	-0.9446827484165164	--
5	GLUTAMINE	Fruit	30.0	630.0	0.1767951575504613	--
5	CAPRYLIC-ACID	Fruit				--
5	ZEAXANTHIN	Fruit		2.0	-1.0	--
5	LIMONIN	Twig				Jim Duke's personal files.
5	SABINENE	Fruit	11.0	13.0	-0.5315196015036519	--
5	BETA-ELEMENE	Pericarp Essent. Oil				Jim Duke's personal files.
5	ZEAXANTHIN	Pericarp				Jim Duke's personal files.
5	LIMONIN	Branches				Jim Duke's personal files.
5	SABINENE	Fruit Juice	0.0	0.15		--
5	ALUMINUM	Fruit	1.0	165.0	-0.17551933701223474	--
5	ZEAXANTHIN	Tissue Culture				Jim Duke's personal files.
5	LIMONIN	Bark				Jim Duke's personal files.
6	ETHYL-ACETATE	Fruit Juice	0.01	0.58		--
6	NEOHESPERIDIN	Fruit Juice				Jim Duke's personal files.
6	PROPIONIC-ACID	Plant				--
6	BUTYRIC-ACID	Fruit				--
6	STACHYDRINE	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
6	NEOHESPERIDIN	Pericarp		28000.0		Jim Duke's personal files.
6	ACETALDEHYDE	Fruit Juice	3.0	15.0	1.0	--
6	IRON	Fruit	1.0	8.0	-0.49575433892938076	--
7	SALICYLATES	Fruit	0.0	200.0	0.236750790358027	--
7	HISTIDINE	Fruit	180.0	1359.0	-0.24792284510655177	USDA's Ag Handbook 8 and sequelae)
7	ALPHA-CAROTENE	Pericarp				Jim Duke's personal files.
7	SUCCINIC-ACID	Fruit				--
7	ALPHA-CAROTENE	Fruit	0.19	1.9	-0.26808750426637384	--
7	SCUTELLAREIN	Fruit				--
7	CHLORINE	Fruit	12.0	32.0	-0.6800304631000254	--
7	PHENYLALANINE	Fruit	310.0	2340.0	-0.34187787905261324	USDA's Ag Handbook 8 and sequelae)
7	GLUCOSE	Fruit		23600.0	-0.644631124988246	--
7	SCUTELLAREIN	Fruit Juice				Jim Duke's personal files.
8	HORDENINE	Fruit		0.0		--
8	QUERCETAGETIN	Fruit Juice				Jim Duke's personal files.
8	AURAPTENE	Fruit				--
8	TYROSINE	Fruit	160.0	1208.0	-0.501692988706999	USDA's Ag Handbook 8 and sequelae)
8	NOBILETIN	Fruit				--
8	FRUCTOSE	Fruit		23800.0	-0.555436040816387	--
8	NOBILETIN	Pericarp				Jim Duke's personal files.
8	NOBILETIN	Fruit Juice				Jim Duke's personal files.
8	GLUTAMIC-ACID	Fruit	60.0	7097.0	-0.4778760905604569	--
8	DELTA-3-CARENE	Fruit	7.0	9.0	-0.5981394247478974	--
9	SINAPIC-ACID	Fruit	7.0	19.0	0.784062560233975	--
9	SINAPIC-ACID	Pericarp	45.0	100.0	1.0	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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.
9	DELTA-CADINENE	Pericarp				--
9	DELTA-CADINENE	Pericarp Essent. Oil				Jim Duke's personal files.
9	SINAPIC-ACID	Fruit Juice				Jim Duke's personal files.
9	TERPINOLENE	Fruit	1.0	2.0	-0.7498060467737104	--
9	CAMPHENE	Fruit		0.1	-0.35176349319281713	--
10	NEROL	Fruit	0.7	1.0	-0.5477997473775594	--
11	GAMMA-TERPINENE	Fruit	1.0	2.0	-0.6509562680883627	--
11	GAMMA-TERPINENE	Fruit Juice	0.04	0.46	-1.0	--
11	ALPHA-PHELLANDRENE	Fruit	12.0	14.0	-0.5695870460921888	--
11	TYRAMINE	Fruit	0.0	1.0	0.7071067811865478	--
11	LITHIUM	Fruit	0.108	1.54	0.890343380696948	--
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.
11	PERILLALDEHYDE	Fruit		2.0	-0.7326583054413682	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)
12	NARINGIN	Pericarp				Jim Duke's personal files.
12	NARINGIN	Fruit Juice				Jim Duke's personal files.
12	GLYCINE	Fruit	50.0	7097.0	1.3509995174874219	--
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.)

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
12	COPPER	Fruit	0.44	5.5	-0.569630082366932	--
12	NARINGIN	Flower				Jim Duke's personal files.
12	NARINGIN	Fruit				--
13	GERANIAL	Fruit	6.0	7.0	-0.9983227361677096	--
13	PALMITIC-ACID	Fruit	130.0	982.0	-0.35024794688904615	USDA's Ag Handbook 8 and sequelae)
13	ALPHA-TERPINENE	Fruit	1.0	2.0	-0.44934612100297294	--
13	BETA-PINENE	Fruit	11.0	13.0	-0.29742687330503664	--
14	SULFUR	Fruit	46.0	1000.0	-0.28853428975640755	--
14	SUCROSE	Fruit		47000.0	-0.41357367622327157	--
14	POTASSIUM	Fruit	1400.0	13772.0	-0.3666795712783593	--
14	ARGININE	Fruit	230.0	4908.0	0.15957250579145005	--
14	BETAINE	Fruit	390.0	630.0	-1.0398613033298902	--
14	MANGANESE	Fruit	0.0	8.0	-0.3507865335531638	--
15	TANGERETIN	Fruit				--
15	MALIC-ACID	Fruit	600.0	2000.0	-0.8215787018847368	--
15	RIBOFLAVIN	Fruit	0.0	3.0	-0.4303249009534089	--
15	OSTHOL	Root				Jim Duke's personal files.
15	LUTEIN	Fruit	0.0	3.0	-0.575590894746515	--
15	ALPHA-LINOLENIC-ACID	Fruit	70.0	528.0	-0.913356590105175	USDA's Ag Handbook 8 and sequelae)
15	TANGERETIN	Pericarp				Jim Duke's personal files.
15	LUTEIN	Pericarp				Jim Duke's personal files.
15	METHIONINE	Fruit	200.0	1510.0	0.6791094324753408	USDA's Ag Handbook 8 and sequelae)
15	TANGERETIN	Fruit Juice				Jim Duke's personal files.
15	FOLACIN	Fruit	0.0	2.0	-0.019192793995839758	USDA's Ag Handbook 8 and sequelae)
15	FIBER	Fruit	3740.0	47000.0	-0.8934118438004772	--
15	CITRONELLOL	Fruit	0.7	1.0	-0.5060981097957616	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
16	P-CYMENE	Fruit	3590.0	4070.0	-0.04098189676522262	--
16	LYCOPENE	Pericarp				Jim Duke's personal files.
16	ACETIC-ACID	Plant				--
18	OLEIC-ACID	Fruit	20.0	1510.0	-0.4691070855395464	USDA's Ag Handbook 8 and sequelae)
19	D-LIMONENE	Fruit Juice				Jim Duke's personal files.
19	CARVONE	Fruit	2.0	10.0	-0.49999993853473	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
20	CITRONELLAL	Fruit	4.0	5.0	-0.9952774234291415	--
20	CHOLINE	Fruit	70.0	160.0	-0.5734302834278399	--
22	MYRCENE	Fruit	130.0	140.0	-0.36272097374914564	--
22	GAMMA-AMINOBUTYRIC-ACID	Fruit	40.0	730.0	-0.27868808492512787	--
22	SCOPARONE	Bark		162.5		Jim Duke's personal files.
23	ALPHA-TERPINEOL	Fruit	2.0	3.0	-0.40604181620664676	--
23	ALPHA-TERPINEOL	Fruit Juice	0.09	1.1	-0.6501250791550391	--
23	CITRIC-ACID	Fruit	5600.0	9800.0	-0.4912433942967182	--
23	TERPINEN-4-OL	Fruit		0.1	-0.358333842321623	--
24	ETHANOL	Fruit Juice	64.0	900.0	1.0	--
24	PECTIN	Pericarp				Jim Duke's personal files.
24	CHROMIUM	Fruit	0.005	0.385	-0.45355683651553846	--
24	PECTIN	Fruit	1300.0	5900.0	-0.5601993872457034	--
25	P-COUMARIC-ACID	Pericarp	5.0	75.0	1.0	--
25	P-COUMARIC-ACID	Fruit Juice				Jim Duke's personal files.
25	P-COUMARIC-ACID	Fruit	5.0	17.0	-0.6943231755501756	--
26	BERGAPTEN	Pericarp				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
27	LINOLEIC-ACID	Fruit	180.0	1359.0	-0.33622644162700344	USDA's Ag Handbook 8 and sequelae)

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
28	CALCIUM	Fruit	210.0	5615.0	0.4058414049804431	--
28	ALPHA-PINENE	Plant				--
28	ALPHA-PINENE	Fruit	35.0	40.0	-0.7083402631126611	--
28	ALPHA-PINENE	Fruit Juice		0.22	-0.9999999999999999	--
29	TRYPTOPHAN	Fruit	90.0	680.0	-0.23921305471754814	USDA's Ag Handbook 8 and sequelae)
31	HESPERIDIN	Flower				Jim Duke's personal files.
31	HESPERIDIN	Fruit				Jim Duke's personal files.
31	CARYOPHYLLENE	Pericarp				--
31	HESPERIDIN	Fruit Juice		110.0		Jim Duke's personal files.
31	HESPERIDIN	Pericarp		63500.0	0.38878029269733505	Jim Duke's personal files.
31	THIAMIN	Fruit	1.0	7.0	0.21342198396383905	--
31	CARYOPHYLLENE	Pericarp Essent. Oil				Jim Duke's personal files.
32	ALPHA-TOCOPHEROL	Fruit	4.0	29.0	-0.6752411923996696	--
34	MYRICETIN	Fruit		0.5	-0.7536633445071549	Jim Duke's personal files.
34	DIOSMIN	Pericarp				--
34	DIOSMIN	Flower				Jim Duke's personal files.
35	GERANIOL	Fruit	0.7	1.0	-0.6057972802749785	--
39	NIACIN	Fruit	2.0	31.0	-0.39701223426716226	--
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.)
53	BETA-CAROTENE	Fruit	1.0	28.0	-0.0966771336129336	--
53	BETA-CAROTENE	Pericarp				Jim Duke's personal files.
53	LINALOOL	Fruit Juice	0.15	4.69	1.0000000000000004	--
53	LINALOOL	Fruit	30.0	530.0	-0.43753461385311765	--
56	NARINGENIN	Pericarp	35000.0	45800.0		Jim Duke's personal files.
60	LIMONENE	Fruit	8300.0	9700.0	0.6409395320453212	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
60	LIMONENE	Fruit Juice	1.0	278.0		--
60	SELENIUM	Fruit	0.0	0.002	-0.38569128420884563	--
61	FERULIC-ACID	Pericarp	20.0	180.0	1.0	--
61	FERULIC-ACID	Fruit Juice				Jim Duke's personal files.
61	FERULIC-ACID	Fruit	10.0	30.0	-0.7627700713964738	--
62	CAFFEINE	Leaf		6.0	-0.9423311788449318	Jim Duke's personal files.
62	CAFFEINE	Flower		62.0	1.0998533626601497	Jim Duke's personal files.
62	CAFFEINE	Bud		0.3		Jim Duke's personal files.
65	MAGNESIUM	Fruit	98.0	1075.0	-0.4884044378711737	--
71	THYMOL	Fruit	0.0	0.1	-0.7071067811865474	--
77	ZINC	Fruit	0.9	13.0	-0.5205322406758267	--
87	RUTIN	Leaf		9000.0	-0.44580487824979076	Jim Duke's personal files.
87	RUTIN	Pericarp		6100.0		Jim Duke's personal files.
102	CAFFEIC-ACID	Fruit Juice				Jim Duke's personal files.
102	CAFFEIC-ACID	Fruit	2.0	50.0	-0.3296566072538586	--
112	ASCORBIC-ACID	Fruit	500.0	4071.0	-0.03136646807240172	--
176	QUERCETIN	Fruit		3.4	-0.7856446697799095	Jim Duke's personal files.