

Dr. Duke's Phytochemical and Ethnobotanical Databases

Chemicals found in Citrus sinensis

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
77	ZINC	Fruit	0.9	13.0	-0.5205322406758267	--
5	ZEAXANTHIN	Pericarp				Jim Duke's personal files.
5	ZEAXANTHIN	Tissue Culture				Jim Duke's personal files.
5	ZEAXANTHIN	Fruit		2.0	-1.0	--
3	XYLOSE	Fruit				--
1	XANTHYLETIN	Root Bark		45000.0		Jim Duke's personal files.
1	XANTHYLETIN	Root				Jim Duke's personal files.
1	XANTHOXYLETIN	Root Bark		24000.0		Jim Duke's personal files.
1	XANTHOXYLETIN	Root				Jim Duke's personal files.
2	VIOLAXANTHIN	Fruit				--
2	VIOLAXANTHIN	Pericarp				Jim Duke's personal files.
2	VIOLAXANTHIN	Tissue Culture				Jim Duke's personal files.
3	VALINE	Fruit	100.0	3020.0	-0.29566746601618277	--
2	UNDECANAL	Fruit	0.7	1.0	-0.5758305509285185	--
8	TYROSINE	Fruit	160.0	1208.0	-0.501692988706999	USDA's Ag Handbook 8 and sequelae)
11	TYRAMINE	Fruit	0.0	1.0	0.7071067811865478	--
29	TRYPTOPHAN	Fruit	90.0	680.0	-0.23921305471754814	USDA's Ag Handbook 8 and sequelae)
1	TRANS-2-HEXENOL	Fruit Juice	0.0	0.1		--
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.
71	THYMOL	Fruit	0.0	0.1	-0.7071067811865474	--
4	THREONINE	Fruit	150.0	1132.0	-0.7838698402029908	USDA's Ag Handbook 8 and sequelae)
31	THIAMIN	Fruit	1.0	7.0	0.21342198396383905	--
9	TERPINOLENE	Fruit	1.0	2.0	-0.7498060467737104	--
23	TERPINEN-4-OL	Fruit		0.1	-0.358333842321623	--
15	TANGERETIN	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
15	TANGERETIN	Pericarp				Jim Duke's personal files.
15	TANGERETIN	Fruit Juice				Jim Duke's personal files.
5	SYNEPHRINE	Fruit	15.0	43.0		--
5	SYNEPHRINE	Pericarp				Jim Duke's personal files.
14	SULFUR	Fruit	46.0	1000.0	-0.28853428975640755	--
14	SUCROSE	Fruit		47000.0	-0.41357367622327157	--
7	SUCCINIC-ACID	Fruit				--
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	SUBAPHYLLIN	Fruit				Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
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.)
6	STACHYDRINE	Fruit				--
1	SODIUM	Fruit	0.0	29.0	-0.1812007490262155	--
2	SINENSETIN	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	SINENSETIN	Fruit				--
2	SINENSETIN	Pericarp				Jim Duke's personal files.
9	SINAPIC-ACID	Fruit	7.0	19.0	0.784062560233975	--
9	SINAPIC-ACID	Fruit Juice				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
9	SINAPIC-ACID	Pericarp	45.0	100.0	1.0	--
3	SILVER	Fruit	0.027	0.055	-0.5875909007853288	--
4	SILICON	Fruit		2.0	-0.6019449725946585	ACTA AGRIC SCAND SUPPL 22: 1980
3	SESELIN	Root				Jim Duke's personal files.
1	SERINE	Fruit	40.0	2410.0	-0.43531280247846904	--
60	SELENIUM	Fruit	0.0	0.002	-0.38569128420884563	--
7	SCUTELLAREIN	Fruit Juice				Jim Duke's personal files.
7	SCUTELLAREIN	Fruit				--
22	SCOPARONE	Bark		162.5		Jim Duke's personal files.
7	SALICYLATES	Fruit	0.0	200.0	0.236750790358027	--
5	SABINENE	Fruit	11.0	13.0	-0.5315196015036519	--
5	SABINENE	Fruit Juice	0.0	0.15		--
87	RUTIN	Leaf		9000.0	-0.44580487824979076	Jim Duke's personal files.
87	RUTIN	Pericarp		6100.0		Jim Duke's personal files.
15	RIBOFLAVIN	Fruit	0.0	3.0	-0.4303249009534089	--
1	QUINIC-ACID	Fruit				--
176	QUERCETIN	Fruit		3.4	-0.7856446697799095	Jim Duke's personal files.
8	QUERCETAGETIN	Fruit Juice				Jim Duke's personal files.
6	PROPIONIC-ACID	Plant				--
14	POTASSIUM	Fruit	1400.0	13772.0	-0.3666795712783593	--
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.)
5	PHYLLOQUINONE	Fruit		0.001	-0.23285139490462353	--
4	PHOSPHORUS	Fruit	136.0	1980.0	-0.3754207541761312	--
7	PHENYLALANINE	Fruit	310.0	2340.0	-0.34187787905261324	USDA's Ag Handbook 8 and sequelae)

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
11	PERILLALDEHYDE	Fruit		2.0	-0.7326583054413682	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
24	PECTIN	Pericarp				Jim Duke's personal files.
24	PECTIN	Fruit	1300.0	5900.0	-0.5601993872457034	--
11	PANTOTHENIC-ACID	Fruit	2.0	19.0	0.05712424299404392	USDA's Ag Handbook 8 and sequelae)
2	PALMITOLEIC-ACID	Fruit	30.0	226.0	-0.30412481168854	USDA's Ag Handbook 8 and sequelae)
13	PALMITIC-ACID	Fruit	130.0	982.0	-0.35024794688904615	USDA's Ag Handbook 8 and sequelae)
16	P-CYMENE	Fruit	3590.0	4070.0	-0.04098189676522262	--
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	--
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.
4	OSTHOLE	Root				--
15	OSTHOL	Root				Jim Duke's personal files.
18	OLEIC-ACID	Fruit	20.0	1510.0	-0.4691070855395464	USDA's Ag Handbook 8 and sequelae)
3	OBACUNONE	Seed				Jim Duke's personal files.
1	NORDENTATIN	Root Bark		300.0		Jim Duke's personal files.
3	NOOTKATONE	Pericarp Essent. Oil				Jim Duke's personal files.
3	NOOTKATONE	Fruit		1.0		Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
2	NOOTKATOL	Fruit				Jim Duke's personal files.
2	NOMILIN	Seed				Jim Duke's personal files.
2	NOMILIN	Fruit Juice				Jim Duke's personal files.
8	NOBILETIN	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
8	NOBILETIN	Pericarp				Jim Duke's personal files.
8	NOBILETIN	Fruit Juice				Jim Duke's personal files.
3	NICKEL	Fruit	0.01	0.55	-0.6121948588601274	--
39	NIACIN	Fruit	2.0	31.0	-0.39701223426716226	--
2	NERYL-FORMATE	Fruit		10.0	-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	--
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.
10	NEROL	Fruit	0.7	1.0	-0.5477997473775594	--
4	NERAL	Fruit	4.0	5.0	-0.8791176720401793	--
1	NEOHESPERIDIN-DIHYDROCHALCONE	Pericarp				Jim Duke's personal files.
6	NEOHESPERIDIN	Fruit Juice				Jim Duke's personal files.
6	NEOHESPERIDIN	Pericarp		28000.0		Jim Duke's personal files.
1	NARIRUTIN	Fruit Juice				Jim Duke's personal files.
1	NARIRUTIN	Pericarp				Jim Duke's personal files.
12	NARINGIN	Pericarp				Jim Duke's personal files.
12	NARINGIN	Flower				Jim Duke's personal files.
12	NARINGIN	Fruit Juice				Jim Duke's personal files.
12	NARINGIN	Fruit				--
56	NARINGENIN	Pericarp	35000.0	45800.0		Jim Duke's personal files.
1	N-METHYL-TYRAMINE	Fruit	0.0	2.0	-1.0	--
1	N-METHYL-TYRAMINE	Pericarp				Jim Duke's personal files.
34	MYRICETIN	Fruit		0.5	-0.7536633445071549	Jim Duke's personal files.
22	MYRCENE	Fruit	130.0	140.0	-0.36272097374914564	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
2	MOLYBDENUM	Fruit	0.1	0.385	-0.4080774738511709	--
2	METHYL-BUTYRATE	Fruit Juice	0.01	0.1		--
15	METHIONINE	Fruit	200.0	1510.0	0.6791094324753408	USDA's Ag Handbook 8 and sequelae)
2	METHANOL	Fruit Juice	0.8	80.0	1.0	--
1	MERCURY	Fruit	0.0	0.001	-0.7865389313824043	--
3	MANNOSE	Fruit				--
14	MANGANESE	Fruit	0.0	8.0	-0.3507865335531638	--
1	MALONIC-ACID	Fruit				--
1	MALONIC-ACID	Plant				--
15	MALIC-ACID	Fruit	600.0	2000.0	-0.8215787018847368	--
65	MAGNESIUM	Fruit	98.0	1075.0	-0.4884044378711737	--
4	LYSINE	Fruit	470.0	3548.0	-0.1467119613903352	USDA's Ag Handbook 8 and sequelae)
16	LYCOPENE	Pericarp				Jim Duke's personal files.
15	LUTEIN	Fruit	0.0	3.0	-0.575590894746515	--
15	LUTEIN	Pericarp				Jim Duke's personal files.
11	LITHIUM	Fruit	0.108	1.54	0.890343380696948	--
27	LINOLEIC-ACID	Fruit	180.0	1359.0	-0.33622644162700344	USDA's Ag Handbook 8 and sequelae)
53	LINALOOL	Fruit Juice	0.15	4.69	1.0000000000000004	--
53	LINALOOL	Fruit	30.0	530.0	-0.43753461385311765	--
5	LIMONIN	Bark				Jim Duke's personal files.
5	LIMONIN	Root				Jim Duke's personal files.
5	LIMONIN	Fruit				--
5	LIMONIN	Seed				Jim Duke's personal files.
5	LIMONIN	Fruit Juice				Jim Duke's personal files.
5	LIMONIN	Twig				Jim Duke's personal files.
5	LIMONIN	Branches				Jim Duke's personal files.
60	LIMONENE	Fruit	8300.0	9700.0	0.6409395320453212	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
60	LIMONENE	Fruit Juice	1.0	278.0		--
2	LEUCINE	Fruit	230.0	1136.0	-0.8429441489050677	USDA's Ag Handbook 8 and sequelae)
3	ISOLEUCINE	Fruit	250.0	1888.0	-0.5255451749979052	USDA's Ag Handbook 8 and sequelae)
6	IRON	Fruit	1.0	8.0	-0.49575433892938076	--
1	HYDROXYPROLINE	Leaf				Jim Duke's personal files.
8	HORDENINE	Fruit		0.0		--
7	HISTIDINE	Fruit	180.0	1359.0	-0.24792284510655177	USDA's Ag Handbook 8 and sequelae)
3	HEXANOL	Fruit Juice	0.02	0.22		--
5	HEXANAL	Fruit	1.0	2.0		Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
5	HEXANAL	Fruit Juice	0.02	0.65		--
31	HESPERIDIN	Flower				Jim Duke's personal files.
31	HESPERIDIN	Pericarp		63500.0	0.38878029269733505	Jim Duke's personal files.
31	HESPERIDIN	Fruit				Jim Duke's personal files.
31	HESPERIDIN	Fruit Juice		110.0		Jim Duke's personal files.
12	GLYCINE	Fruit	50.0	7097.0	1.3509995174874219	--
5	GLUTAMINE	Fruit	30.0	630.0	0.1767951575504613	--
8	GLUTAMIC-ACID	Fruit	60.0	7097.0	-0.4778760905604569	--
7	GLUCOSE	Fruit		23600.0	-0.644631124988246	--
5	GERANYL-ACETATE	Fruit	0.0	0.1	-0.9446827484165164	--
35	GERANIOL	Fruit	0.7	1.0	-0.6057972802749785	--
13	GERANIAL	Fruit	6.0	7.0	-0.9983227361677096	--
11	GAMMA-TERPINENE	Fruit	1.0	2.0	-0.6509562680883627	--
11	GAMMA-TERPINENE	Fruit Juice	0.04	0.46	-1.0	--
22	GAMMA-AMINOBUTYRIC-ACID	Fruit	40.0	730.0	-0.27868808492512787	--
1	GALACTOSE	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
8	FRUCTOSE	Fruit		23800.0	-0.555436040816387	--
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	--
61	FERULIC-ACID	Fruit	10.0	30.0	-0.7627700713964738	--
61	FERULIC-ACID	Fruit Juice				Jim Duke's personal files.
61	FERULIC-ACID	Pericarp	20.0	180.0	1.0	--
2	FARNESENE	Fruit	0.0	0.1	-1.0	--
1	ETHYL-BUTYRATE	Fruit Juice	0.08	1.02		--
6	ETHYL-ACETATE	Fruit Juice	0.01	0.58		--
24	ETHANOL	Fruit Juice	64.0	900.0	1.0	--
2	ELEMOL	Root Bark		28200.0		Jim Duke's personal files.
2	DODECANAL	Fruit	5.0	20.0	0.9948320067476139	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
34	DIOSMIN	Pericarp				--
34	DIOSMIN	Flower				Jim Duke's personal files.
9	DELTA-CADINENE	Pericarp				--
9	DELTA-CADINENE	Pericarp Essent. Oil				Jim Duke's personal files.
8	DELTA-3-CARENE	Fruit	7.0	9.0	-0.5981394247478974	--
1	DELPHINIDIN-3-GLUCOSIDE	Fruit				--
19	D-LIMONENE	Fruit Juice				Jim Duke's personal files.
2	CYSTINE	Fruit	100.0	755.0	-0.2882040289158333	USDA's Ag Handbook 8 and sequelae)
2	CRYPTOXANTHIN	Fruit				--
12	COPPER	Fruit	0.44	5.5	-0.569630082366932	--
2	CONIFERIN	Pericarp				Jim Duke's personal files.
2	COBALT	Fruit	0.001	0.055	-0.5284569584957359	--
2	CITRONELLYL-ACETATE	Fruit	0.0	0.1	-0.9999999999999998	--
15	CITRONELLOL	Fruit	0.7	1.0	-0.5060981097957616	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
20	CITRONELLAL	Fruit	4.0	5.0	-0.9952774234291415	--
23	CITRIC-ACID	Fruit	5600.0	9800.0	-0.4912433942967182	--
24	CHROMIUM	Fruit	0.005	0.385	-0.45355683651553846	--
20	CHOLINE	Fruit	70.0	160.0	-0.5734302834278399	--
1	CHOLESTEROL	Fruit				--
7	CHLORINE	Fruit	12.0	32.0	-0.6800304631000254	--
31	CARYOPHYLLENE	Pericarp Essent. Oil				Jim Duke's personal files.
31	CARYOPHYLLENE	Pericarp				--
19	CARVONE	Fruit	2.0	10.0	-0.49999993853473	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
5	CAPRYLIC-ACID	Fruit				--
1	CAPROIC-ACID	Fruit				--
3	CAPRIC-ACID	Fruit				--
9	CAMPHENE	Fruit		0.1	-0.35176349319281713	--
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.)
28	CALCIUM	Fruit	210.0	5615.0	0.4058414049804431	--
62	CAFFEINE	Flower		62.0	1.0998533626601497	Jim Duke's personal files.
62	CAFFEINE	Bud		0.3		Jim Duke's personal files.
62	CAFFEINE	Leaf		6.0	-0.9423311788449318	Jim Duke's personal files.
102	CAFFEIC-ACID	Fruit	2.0	50.0	-0.3296566072538586	--
102	CAFFEIC-ACID	Fruit Juice				Jim Duke's personal files.
3	CADMIUM	Fruit	0.001	0.138	-0.23805307615553817	--
6	BUTYRIC-ACID	Fruit				--
3	BRASSINOLIDE	Pollen Or Spore				Jim Duke's personal files.
4	BORON	Fruit	1.89	27.5	-0.25022637010687165	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
14	BETAINE	Fruit	390.0	630.0	-1.0398613033298902	--
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.)
13	BETA-PINENE	Fruit	11.0	13.0	-0.29742687330503664	--
2	BETA-MYRCENE	Fruit				Jim Duke's personal files.
5	BETA-ELEMENE	Fruit	0.7	1.0	-0.565275335737646	--
5	BETA-ELEMENE	Pericarp Essent. Oil				Jim Duke's personal files.
2	BETA-CRYPTOXANTHIN	Fruit				--
2	BETA-CRYPTOXANTHIN	Pericarp				Jim Duke's personal files.
53	BETA-CAROTENE	Pericarp				Jim Duke's personal files.
53	BETA-CAROTENE	Fruit	1.0	28.0	-0.0966771336129336	--
26	BERGAPTEN	Pericarp				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
8	AURAPTENE	Fruit				--
3	ASPARTIC-ACID	Fruit	70.0	8607.0	-0.2038383572771155	--
2	ASPARAGINE	Fruit	200.0	1800.0	0.3373215168393527	--
112	ASCORBIC-ACID	Fruit	500.0	4071.0	-0.03136646807240172	--
2	ARSENIC	Fruit	0.001	0.154	-0.33956845146287234	--
14	ARGININE	Fruit	230.0	4908.0	0.15957250579145005	--
1	ANTHERAXANTHIN	Fruit				--
1	ANTHERAXANTHIN	Tissue Culture				Jim Duke's personal files.
5	ALUMINUM	Fruit	1.0	165.0	-0.17551933701223474	--
32	ALPHA-TOCOPHEROL	Fruit	4.0	29.0	-0.6752411923996696	--
23	ALPHA-TERPINEOL	Fruit	2.0	3.0	-0.40604181620664676	--
23	ALPHA-TERPINEOL	Fruit Juice	0.09	1.1	-0.6501250791550391	--
13	ALPHA-TERPINENE	Fruit	1.0	2.0	-0.44934612100297294	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
28	ALPHA-PINENE	Fruit Juice		0.22	-0.9999999999999999	--
28	ALPHA-PINENE	Plant				--
28	ALPHA-PINENE	Fruit	35.0	40.0	-0.7083402631126611	--
11	ALPHA-PHELLANDRENE	Fruit	12.0	14.0	-0.5695870460921888	--
15	ALPHA-LINOLENIC-ACID	Fruit	70.0	528.0	-0.913356590105175	USDA's Ag Handbook 8 and sequelae)
2	ALPHA-HUMULENE	Fruit	0.0	0.1	-0.5986253681056065	--
7	ALPHA-CAROTENE	Fruit	0.19	1.9	-0.26808750426637384	--
7	ALPHA-CAROTENE	Pericarp				Jim Duke's personal files.
3	ALANINE	Fruit	30.0	3775.0	0.02652939797970876	--
16	ACETIC-ACID	Plant				--
6	ACETALDEHYDE	Fruit Juice	3.0	15.0	1.0	--
1	6,7-DIMETHOXYCOUMARIN	Bark		162.0		Jim Duke's personal files.
4	4-VINYL-GUAIACOL	Fruit Juice				Jim Duke's personal files.