

## Dr. Duke's Phytochemical and Ethnobotanical Databases

### Chemicals found in Citrus sinensis

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
2	NOMILIN	Seed				Jim Duke's personal files.
1	CAPROIC-ACID	Fruit				--
2	NOMILIN	Fruit Juice				Jim Duke's personal files.
0	2-TRANS-O-FERULOYL-GLUCARIC-ACID	Pericarp				Jim Duke's personal files.
31	HESPERIDIN	Fruit				Jim Duke's personal files.
0	FR	Juice				--
0	PECTINESTERASE	Fruit				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	ERIOCITRIN	Flower				Jim Duke's personal files.
7	SCUTELLAREIN	Fruit				--
0	EPOXY-VALENCENE	Pericarp Essent. Oil				Jim Duke's personal files.
0	ZETA-CAROTENE-A	Pericarp				Jim Duke's personal files.
0	NEOXANTHIN-A	Pericarp				Jim Duke's personal files.
0	BRAYLIN	Root				Jim Duke's personal files.
0	3-METHYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
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.
12	NARINGIN	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	PHYTOFLUENE-A	Pericarp				Jim Duke's personal files.
0	LIMONEXIC-ACID	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
5	LIMONIN	Fruit Juice				Jim Duke's personal files.
0	GERANYL-OXY-PYRANOCOUMARIN	Root				Jim Duke's personal files.
9	DELTA-CADINENE	Pericarp				--
8	NOBILETIN	Pericarp				Jim Duke's personal files.
1	HYDROXYPROLINE	Leaf				Jim Duke's personal files.
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.
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.
1	MALONIC-ACID	Fruit				--
0	NOBELITIN	Fruit				--
3	CAPRIC-ACID	Fruit				--
5	BETA-ELEMENE	Pericarp Essent. Oil				Jim Duke's personal files.
0	CITFLAVANONE	Root Bark				--
0	VALENCENE	Pericarp Essent. Oil				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.
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.
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				--
0	BETA-APO-CAROTEN-8-AL	Pericarp				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
24	PECTIN	Pericarp				Jim Duke's personal files.
5	LIMONIN	Twig				Jim Duke's personal files.
1	DELPHINIDIN-3-GLUCOSIDE	Fruit				--
8	NOBILETIN	Fruit Juice				Jim Duke's personal files.
0	2,4-TRANS,TRANS-O-FERULOYL-GLUCARIC-ACID	Pericarp				--
4	4-VINYL-GUAIACOL	Fruit Juice				Jim Duke's personal files.
0	SINENSIAXANTHIN	Fruit				--
2	CONIFERIN	Pericarp				Jim Duke's personal files.
34	DIOSMIN	Flower				Jim Duke's personal files.
1	N-METHYL-TYRAMINE	Pericarp				Jim Duke's personal files.
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.
28	ALPHA-PINENE	Plant				--
2	BETA-MYRCENE	Fruit				Jim Duke's personal files.
0	HESPERIDIN-7-O-ALPHA-L-RHAMNO-GLUCOSIDE	Fruit				--
0	APIGENIN-TRIMETHYL-ETHER	Pericarp				Jim Duke's personal files.
0	BETA-APO-8'-CAROTINAL	Pericarp				Jim Duke's personal files.
15	OSTHOL	Root				Jim Duke's personal files.
0	5,8-EPOXY-5,8-DIHYDRO-8'-APO-BETA-CAROTEN-3,10'-DIOL	Fruit Juice				--
5	LIMONIN	Branches				Jim Duke's personal files.
7	SUCCINIC-ACID	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	PONCITRIN	Root				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.
0	CRYPTOXANTHIN-5,5',6,8'-DIEPOXIDE	Pericarp				Jim Duke's personal files.
0	ARABAN	Fruit				--
0	NICOTINIC-ACID-ETHYL-ESTER	Pericarp Essent. Oil				Jim Duke's personal files.
0	2'-TRANS-O-P-COUMAROYL-GLUCARIC-ACID	Pericarp				Jim Duke's personal files.
0	2,4-TRANS-TRANS-O-DIFERULOYL-GLUCARIC-ACID	Pericarp				Jim Duke's personal files.
0	FLAVOXANTHIN	Pericarp				Jim Duke's personal files.
2	SINENSETIN	Fruit				--
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	ETA-CAROTENE	Pericarp				--
15	TANGERETIN	Pericarp				Jim Duke's personal files.
102	CAFFEIC-ACID	Fruit Juice				Jim Duke's personal files.
3	XYLOSE	Fruit				--
0	BETA-ZEACAROTENE	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.
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	BERGAPTOL	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	OBACUNONE-17-O-BETA-D-GLUCOSIDE	Seed				Jim Duke's personal files.
0	ISOSAKURANETIN	Fruit				--
0	5,8-EPOXY-5,5',8-TETRAHYDRO-BETA,BETA-CAROTEN-3,3',5',6'-TETROL	Plant				--
5	LIMONIN	Bark				Jim Duke's personal files.
0	SUBEROSIN	Root				Jim Duke's personal files.
0	POLYGALACTURONIC-ACID	Fruit				--
2	BETA-CRYPTOXANTHIN	Fruit				--
0	MERANZINE	Fruit				--
0	APOVIOLAXANTH-10'-AL	Pericarp				--
0	NARIRUTIN-GLUCOSIDE	Pericarp				Jim Duke's personal files.
0	2'-TRANS-O-P-COUMAROYL-GALACTARIC-ACID	Pericarp				Jim Duke's personal files.
0	GIBBERELLIC-ACID	Fruit				Jim Duke's personal files.
0	CITRUSINS	Plant				J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.
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	EPOXY-VALENCENE	Fruit				--
1	CHOLESTEROL	Fruit				--
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	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.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
0	LOCHNOCARPOL-A	Root				Jim Duke's personal files.
0	MUTATOXANTHIN	Fruit Juice				Jim Duke's personal files.
0	HEPTULOSE	Fruit				--
0	TETRA-O-METHYL-SCUTELLAREIN	Fruit				--
1	ANTHERAXANTHIN	Tissue Culture				Jim Duke's personal files.
0	OBACUNONE-GLUCOSIDE	Fruit Juice				Jim Duke's personal files.
0	ISORHOIFOLIN	Pericarp				--
0	5,6-DIHYDRO-BETA-BETA-CAROTEN-3,3',5,6-TETROL	Fruit Juice				--
5	LIMONIN	Root				Jim Duke's personal files.
0	DEACETYL-NOMILIN	Seed				Jim Duke's personal files.
2	BETA-CRYPTOXANTHIN	Pericarp				Jim Duke's personal files.
0	5-HEXYL-2-METHYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
3	MANNOSE	Fruit				--
0	APIGENIN-7-O-ALPHA-L-RHAMNO-GLUCOSIDE	Leaf				--
0	NARIRUTIN-GLUCOSIDE	Flower				Jim Duke's personal files.
0	2'-TRANS-O-FERULOYL-GALACTARIC-ACID	Pericarp				Jim Duke's personal files.
0	HEPTAMETHOXY-FLAVONE	Fruit Juice				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.
0	EPOXY-NOOKATONE	Pericarp				--
3	OBACUNONE	Seed				Jim Duke's personal files.
5	SYNEPHRINE	Pericarp				Jim Duke's personal files.
0	3-METHYL-BUTAN-1-OL	Fruit Juice				Jim Duke's personal files.
0	NEOCHROME-A	Pericarp				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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	3-(4-METHYL-HEXYL)-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
0	ALPHA-HYDROXY-CAROTENE	Pericarp				Jim Duke's personal files.
16	LYCOPENE	Pericarp				Jim Duke's personal files.
0	ABSCISIC-ACID	Tissue Culture				Jim Duke's personal files.
0	EPOXY-NOOTKATONE	Pericarp Essent. Oil				Jim Duke's personal files.
0	ISOPRENE	Essential Oil				Jim Duke's personal files.
19	D-LIMONENE	Fruit Juice				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	CRYPTOFLAVIN-B	Pericarp				Jim Duke's personal files.
0	5-ACETYL-2-METHYL-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.
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.
0	4-PHENYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
1	ANTHERAXANTHIN	Fruit				--
0	ISOSINENSETIN	Pericarp				Jim Duke's personal files.
3	BRASSINOLIDE	Pollen Or Spore				Jim Duke's personal files.
0	NEO-BETA-CAROTENE	Pericarp				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	2-PHENYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
0	ALPHA-COPAENE	Pericarp				--
15	LUTEIN	Pericarp				Jim Duke's personal files.
0	3-HYDROXY-ETHYL- HEXANOATE	Fruit Juice				Jim Duke's personal files.
0	URONIC-ACID	Fruit				--
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.
8	AURAPTENE	Fruit				--
3	NOOTKATONE	Pericarp Essent. Oil				Jim Duke's personal files.
0	ISOPENTENYL- PSORALENS	Fruit				--
0	3-METHYL-BUTAN-1-OL	Fruit				--
0	ICHANGIN-17-O-BETA-D- GLUCOSIDE	Seed				Jim Duke's personal files.
0	GALACTURONIC-ACID	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	CYANIDIN-3-GLUCOSIDE	Fruit				--
0	CRYPTOFLAVIN-A	Pericarp				Jim Duke's personal files.
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	CITRUNOBIN	Root Bark				--
1	XANTHYLETIN	Root				Jim Duke's personal files.



Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	5,8-EPOXY-5,5',8'-TETRAHYDRO-BETA-BETA-CAROTENE-3,3',5',6'-TETROL	Fruit Juice				Jim Duke's personal files.
31	CARYOPHYLENE	Pericarp				--
0	3-PROPYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
1	MALONIC-ACID	Plant				--
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.
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				--
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.
0	3-METHYL-BUT-1-ENE	Essential Oil				Jim Duke's personal files.
0	HESPERIDIN-7-O-ALPHA-L-RHAMNO-GLUCOSIDE	Fruit Juice				Jim Duke's personal files.
1	GALACTOSE	Fruit				--
0	CRYPTOXANTHIN-5,5',6,6'-DIEPOXIDE	Pericarp				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	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.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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-GLUCOSIDE	Flower				Jim Duke's personal files.
3	SESELIN	Root				Jim Duke's personal files.
1	XANTHOXYLETIN	Root				Jim Duke's personal files.
53	BETA-CAROTENE	Pericarp				Jim Duke's personal files.
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.
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.
0	VITEXIN-XYLOSIDE	Fruit				Jim Duke's personal files.
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				--
34	DIOSMIN	Pericarp				--
1	QUINIC-ACID	Fruit				--
0	NOMILINIC-ACID-GLUCOSIDE	Fruit Juice				Jim Duke's personal files.
0	3-HYDROXY-ETHYL-HEXANOATE	Fruit				Jim Duke's personal files.
6	NEOHESPERIDIN	Fruit Juice				Jim Duke's personal files.
0	GALACTAN	Fruit				--
2	CRYPTOXANTHIN	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
8	NOBILETIN	Fruit				--
0	COUMARIC-ACID	Fruit Juice				Jim Duke's personal files.
0	NEOERIOCITRIN	Flower				Jim Duke's personal files.
0	ETROGOL	Root				Jim Duke's personal files.
4	OSTHOLE	Root				--
2	VIOLAXANTHIN	Pericarp				Jim Duke's personal files.
0	ZETA-CAROTENE-B	Pericarp				Jim Duke's personal files.
6	BUTYRIC-ACID	Fruit				--
0	3-PENTYL-PYRIDINE	Pericarp Essent. Oil				Jim Duke's personal files.
12	NARINGIN	Flower				Jim Duke's personal files.
9	SINAPIC-ACID	Fruit Juice				Jim Duke's personal files.
0	2-(METHYL-AMINO)- BENZYL-ALCOHOL	Pericarp Essent. Oil				Jim Duke's personal files.
12	NARINGIN	Fruit				--
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	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.
0	LIMONIN-GLUCOSIDE	Fruit Juice				Jim Duke's personal files.
0	DIOSMETIN-7-O-ALPHA-L- RHAMNO-GLUCOSIDE	Leaf				Jim Duke's personal files.
5	CAPRYLIC-ACID	Fruit				--
0	NOMILIN-17-O-BETA-D- GLUCOSIDE	Seed				Jim Duke's personal files.
0	ISOCAPROIC-ACID	Fruit				--
0	3,3',4,5,6,7,8- HEPTAMETHOXY- FLAVONE	Fruit				Jim Duke's personal files.
31	HESPERIDIN	Flower				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
6	STACHYDRINE	Fruit				--
31	CARYOPHYLLENE	Pericarp Essent. Oil				Jim Duke's personal files.
0	CRYPTOFLAVIN	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	ERIOCITRIN	Pericarp				Jim Duke's personal files.
2	VIOLAXANTHIN	Tissue Culture				Jim Duke's personal files.
7	ALPHA-CAROTENE	Pericarp				Jim Duke's personal files.
0	NEOXANTHIN-B	Pericarp				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	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				--
0	NARINGENIN-RUTINOSIDE-4-BETA-D-GLUCOSIDE	Fruit				--
0	BETA-CITRAURIN	Pericarp				Jim Duke's personal files.
0	PHYTOFLUENE-B	Pericarp				Jim Duke's personal files.
5	LIMONIN	Fruit				--
16	ACETIC-ACID	Plant				--
5	LIMONIN	Seed				Jim Duke's personal files.
0	GLUCOSAN	Fruit				--
0	DIHYDROKAEMPFEROL-4'-METHYL-ETHER-7-O-RHAMNOSIDE	Fruit				Jim Duke's personal files.
6	PROPIONIC-ACID	Plant				--
8	HORDENINE	Fruit		0.0		--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
0	VALENCIACHROME	Fruit		0.0		--
1	MERCURY	Fruit	0.0	0.001	-0.7865389313824043	--
5	PHYLLOQUINONE	Fruit		0.001	-0.23285139490462353	--
60	SELENIUM	Fruit	0.0	0.002	-0.38569128420884563	--
2	COBALT	Fruit	0.001	0.055	-0.5284569584957359	--
3	SILVER	Fruit	0.027	0.055	-0.5875909007853288	--
0	2-METHYL-1-PROPANOL	Fruit Juice	0.0	0.07		--
2	METHYL-BUTYRATE	Fruit Juice	0.01	0.1		--
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		--
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	--
23	TERPINEN-4-OL	Fruit		0.1	-0.358333842321623	--
0	CIS-SABINENE-HYDRATE	Fruit		0.1	-0.7071067811865477	--
2	FARNESENE	Fruit	0.0	0.1	-1.0	--
2	CITRONELLYL-ACETATE	Fruit	0.0	0.1	-0.9999999999999998	--
1	TRANS-2-HEXENOL	Fruit Juice	0.0	0.1		--
0	OCTANOL	Fruit	0.0	0.1	-0.7071067811865478	--
3	CADMIUM	Fruit	0.001	0.138	-0.23805307615553817	--
5	SABINENE	Fruit Juice	0.0	0.15		--
0	DECANAL	Fruit Juice	0.0	0.15	-1.0000000000000002	--
2	ARSENIC	Fruit	0.001	0.154	-0.33956845146287234	--
28	ALPHA-PINENE	Fruit Juice		0.22	-0.9999999999999999	--
3	HEXANOL	Fruit Juice	0.02	0.22		--
0	OCTANAL	Fruit Juice	0.0	0.28	-1.0	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
62	CAFFEINE	Bud		0.3		Jim Duke's personal files.
24	CHROMIUM	Fruit	0.005	0.385	-0.45355683651553846	--
2	MOLYBDENUM	Fruit	0.1	0.385	-0.4080774738511709	--
11	GAMMA-TERPINENE	Fruit Juice	0.04	0.46	-1.0	--
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.
3	NICKEL	Fruit	0.01	0.55	-0.6121948588601274	--
6	ETHYL-ACETATE	Fruit Juice	0.01	0.58		--
5	HEXANAL	Fruit Juice	0.02	0.65		--
0	FLUORINE	Fruit	0.04	0.76	-0.5863462540268758	ACTA AGRIC SCAND SUPPL 22: 1980
2	UNDECANAL	Fruit	0.7	1.0	-0.5758305509285185	--
0	(E)-BETA-OCIMENE	Fruit	0.7	1.0	-0.795218715224166	--
0	OCTOPAMINE	Fruit	0.0	1.0	-1.0	--
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	--
0	ALPHA-CUBEBENE	Fruit	0.7	1.0	-0.6220320233548484	--
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	--
0	ALPHA-COPAENE	Fruit	0.7	1.0	-0.6881248888845418	--
5	BETA-ELEMENE	Fruit	0.7	1.0	-0.565275335737646	--
11	TYRAMINE	Fruit	0.0	1.0	0.7071067811865478	--
15	CITRONELLOL	Fruit	0.7	1.0	-0.5060981097957616	--
0	BROMINE	Fruit		1.0	-0.42563543443835	ACTA AGRIC SCAND SUPPL 22: 1980
1	ETHYL-BUTYRATE	Fruit Juice	0.08	1.02		--
0	LEAD	Fruit	0.02	1.1	-0.42525727293888926	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	ZIRCONIUM	Fruit	0.5	1.1	-0.5018207810885003	--
23	ALPHA-TERPINEOL	Fruit Juice	0.09	1.1	-0.6501250791550391	--
11	LITHIUM	Fruit	0.108	1.54	0.890343380696948	--
7	ALPHA-CAROTENE	Fruit	0.19	1.9	-0.26808750426637384	--
5	HEXANAL	Fruit	1.0	2.0		Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
0	ZETA-CAROTENE	Fruit	0.0	2.0	-1.0	--
15	FOLACIN	Fruit	0.0	2.0	-0.019192793995839758	USDA's Ag Handbook 8 and sequelae)
5	ZEAXANTHIN	Fruit		2.0	-1.0	--
0	GAMMA-CADINENE	Fruit	1.0	2.0	-0.9084313290424243	--
1	N-METHYL-TYRAMINE	Fruit	0.0	2.0	-1.0	--
11	GAMMA-TERPINENE	Fruit	1.0	2.0	-0.6509562680883627	--
13	ALPHA-TERPINENE	Fruit	1.0	2.0	-0.44934612100297294	--
0	ALPHA-SINENSAL	Fruit	1.0	2.0	-1.0	--
9	TERPINOLENE	Fruit	1.0	2.0	-0.7498060467737104	--
0	MUTATOXANTHIN	Fruit		2.0	-1.0	--
0	PHYTOENE	Fruit	0.0	2.0		--
4	SILICON	Fruit		2.0	-0.6019449725946585	ACTA AGRIC SCAND SUPPL 22: 1980
11	PERILLALDEHYDE	Fruit		2.0	-0.7326583054413682	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
0	BETA-CARYOPHYLLENE	Fruit	1.0	2.0	-0.5058677869700708	--
0	(Z)-BETA-OCIMENE	Fruit	2.0	3.0	-0.6648405774204937	--
0	ALPHA-SINESAL	Fruit		3.0	-1.0	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
0	VALENCIAXANTHIN	Fruit		3.0		--
15	LUTEIN	Fruit	0.0	3.0	-0.575590894746515	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
15	RIBOFLAVIN	Fruit	0.0	3.0	-0.4303249009534089	--
23	ALPHA-TERPINEOL	Fruit	2.0	3.0	-0.40604181620664676	--
176	QUERCETIN	Fruit		3.4	-0.7856446697799095	Jim Duke's personal files.
0	TITANIUM	Fruit	0.135	3.85	-0.6666260908934968	--
0	VALENCENE	Fruit	3.0	4.0	-1.0	--
0	PHYTOFLUENE	Fruit	0.0	4.0	-1.0	--
0	AURAXANTHIN	Fruit	0.0	4.0		--
0	NONANAL	Fruit	3.0	4.0	-0.8226919978166914	--
53	LINALOOL	Fruit Juice	0.15	4.69	1.0000000000000004	--
0	LINALOL	Fruit Juice	0.15	4.69	1.0000000000000002	--
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.
20	CITRONELLAL	Fruit	4.0	5.0	-0.9952774234291415	--
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)
12	COPPER	Fruit	0.44	5.5	-0.569630082366932	--
0	CITRUSIN-IV	Fruit		6.0		Jim Duke's personal files.
0	LUTEOXANTHINS	Fruit	0.0	6.0		--
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	ALPHA-BERGAMOTENE	Fruit		6.0	-1.0	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.
31	THIAMIN	Fruit	1.0	7.0	0.21342198396383905	--
13	GERANIAL	Fruit	6.0	7.0	-0.9983227361677096	--



Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	RUBIDIUM	Fruit	0.1	7.7	-0.8530025130786637	ACTA AGRIC SCAND SUPPL 22: 1980
6	IRON	Fruit	1.0	8.0	-0.49575433892938076	--
14	MANGANESE	Fruit	0.0	8.0	-0.3507865335531638	--
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.
0	OCTYL-ACETATE	Fruit		10.0	-0.7063104401414774	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
2	NERYL-FORMATE	Fruit		10.0	-1.0	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.
0	BETA-CUBEBENE	Fruit		10.0	-0.7068656261481132	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	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	--
77	ZINC	Fruit	0.9	13.0	-0.5205322406758267	--
0	CITRABASINE	Root Bark		14.0		--
0	OCTANAL	Fruit	12.0	14.0	-0.6131393394849658	--
11	ALPHA-PHELLANDRENE	Fruit	12.0	14.0	-0.5695870460921888	--
6	ACETALDEHYDE	Fruit Juice	3.0	15.0	1.0	--
0	VALENCENE	Fruit Juice	0.04	15.3	0.9999999999999999	--
0	BARIUM	Fruit	0.54	16.5	-0.456265269747712	USDA's Ag Handbook 8 and sequela)

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
25	P-COUMARIC-ACID	Fruit	5.0	17.0	-0.6943231755501756	--
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	--
2	DODECANAL	Fruit	5.0	20.0	0.9948320067476139	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
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	DECANAL	Fruit	18.0	21.0	-0.6027493593021571	--
4	BORON	Fruit	1.89	27.5	-0.25022637010687165	--
53	BETA-CAROTENE	Fruit	1.0	28.0	-0.0966771336129336	--
1	SODIUM	Fruit	0.0	29.0	-0.1812007490262155	--
32	ALPHA-TOCOPHEROL	Fruit	4.0	29.0	-0.6752411923996696	--
61	FERULIC-ACID	Fruit	10.0	30.0	-0.7627700713964738	--
39	NIACIN	Fruit	2.0	31.0	-0.39701223426716226	--
7	CHLORINE	Fruit	12.0	32.0	-0.6800304631000254	--
0	CAROTENOIDS	Fruit	12.0	35.0	-0.5036534891621087	--
0	CAROTENOIDS	Pericarp	12.0	35.0		--
0	CITRUSIN-II	Fruit		40.0		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.)
28	ALPHA-PINENE	Fruit	35.0	40.0	-0.7083402631126611	--
0	CITRUSININE-II	Root Bark		40.0		--
5	SYNEPHRINE	Fruit	15.0	43.0		--
0	4-(3-METHYL-2-BUTENOXY)-ISO-NITROSO-ACETOPHENONE	Pericarp		48.0		Jim Duke's personal files.
102	CAFFEIC-ACID	Fruit	2.0	50.0	-0.3296566072538586	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	CRENULATIN	Root Bark		60.0		Jim Duke's personal files.
62	CAFFEINE	Flower		62.0	1.0998533626601497	Jim Duke's personal files.
25	P-COUMARIC-ACID	Pericarp	5.0	75.0	1.0	--
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		--
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	SINAPIC-ACID	Pericarp	45.0	100.0	1.0	--
31	HESPERIDIN	Fruit Juice		110.0		Jim Duke's personal files.
0	STRONTIUM	Fruit	0.054	110.0	0.7328812786702326	--
22	MYRCENE	Fruit	130.0	140.0	-0.36272097374914564	--
20	CHOLINE	Fruit	70.0	160.0	-0.5734302834278399	--
1	6,7-DIMETHOXYCOUMARIN	Bark		162.0		Jim Duke's personal files.
22	SCOPARONE	Bark		162.5		Jim Duke's personal files.
5	ALUMINUM	Fruit	1.0	165.0	-0.17551933701223474	--
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.)
61	FERULIC-ACID	Pericarp	20.0	180.0	1.0	--
7	SALICYLATES	Fruit	0.0	200.0	0.236750790358027	--
2	PALMITOLEIC-ACID	Fruit	30.0	226.0	-0.30412481168854	USDA's Ag Handbook 8 and sequelae)
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.)
60	LIMONENE	Fruit Juice	1.0	278.0		--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
1	NORDENTATIN	Root Bark		300.0		Jim Duke's personal files.
0	CITRACRIDONE-I	Root Bark		400.0		--
15	ALPHA-LINOLENIC-ACID	Fruit	70.0	528.0	-0.913356590105175	USDA's Ag Handbook 8 and sequelae)
0	LINALOL	Fruit	30.0	530.0	-0.5486782133862986	--
53	LINALOOL	Fruit	30.0	530.0	-0.43753461385311765	--
14	BETAINE	Fruit	390.0	630.0	-1.0398613033298902	--
5	GLUTAMINE	Fruit	30.0	630.0	0.1767951575504613	--
29	TRYPTOPHAN	Fruit	90.0	680.0	-0.23921305471754814	USDA's Ag Handbook 8 and sequelae)
0	SUBERENOL	Root Bark		700.0		Jim Duke's personal files.
0	ETHYL-SUBERENOL	Root Bark		700.0		Jim Duke's personal files.
22	GAMMA-AMINOBUTYRIC-ACID	Fruit	40.0	730.0	-0.27868808492512787	--
2	CYSTINE	Fruit	100.0	755.0	-0.2882040289158333	USDA's Ag Handbook 8 and sequelae)
24	ETHANOL	Fruit Juice	64.0	900.0	1.0	--
13	PALMITIC-ACID	Fruit	130.0	982.0	-0.35024794688904615	USDA's Ag Handbook 8 and sequelae)
14	SULFUR	Fruit	46.0	1000.0	-0.28853428975640755	--
65	MAGNESIUM	Fruit	98.0	1075.0	-0.4884044378711737	--
4	THREONINE	Fruit	150.0	1132.0	-0.7838698402029908	USDA's Ag Handbook 8 and sequelae)
2	LEUCINE	Fruit	230.0	1136.0	-0.8429441489050677	USDA's Ag Handbook 8 and sequelae)
8	TYROSINE	Fruit	160.0	1208.0	-0.501692988706999	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)
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)
2	ASPARAGINE	Fruit	200.0	1800.0	0.3373215168393527	--
3	ISOLEUCINE	Fruit	250.0	1888.0	-0.5255451749979052	USDA's Ag Handbook 8 and sequelae)

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
4	PHOSPHORUS	Fruit	136.0	1980.0	-0.3754207541761312	--
15	MALIC-ACID	Fruit	600.0	2000.0	-0.8215787018847368	--
7	PHENYLALANINE	Fruit	310.0	2340.0	-0.34187787905261324	USDA's Ag Handbook 8 and sequelae)
1	SERINE	Fruit	40.0	2410.0	-0.43531280247846904	--
3	VALINE	Fruit	100.0	3020.0	-0.29566746601618277	--
0	PROLINE	Fruit	60.0	3473.0	-0.14668369100889192	--
4	LYSINE	Fruit	470.0	3548.0	-0.1467119613903352	USDA's Ag Handbook 8 and sequelae)
3	ALANINE	Fruit	30.0	3775.0	0.02652939797970876	--
16	P-CYMENE	Fruit	3590.0	4070.0	-0.04098189676522262	--
112	ASCORBIC-ACID	Fruit	500.0	4071.0	-0.03136646807240172	--
14	ARGININE	Fruit	230.0	4908.0	0.15957250579145005	--
28	CALCIUM	Fruit	210.0	5615.0	0.4058414049804431	--
24	PECTIN	Fruit	1300.0	5900.0	-0.5601993872457034	--
87	RUTIN	Pericarp		6100.0		Jim Duke's personal files.
12	GLYCINE	Fruit	50.0	7097.0	1.3509995174874219	--
8	GLUTAMIC-ACID	Fruit	60.0	7097.0	-0.4778760905604569	--
3	ASPARTIC-ACID	Fruit	70.0	8607.0	-0.2038383572771155	--
87	RUTIN	Leaf		9000.0	-0.44580487824979076	Jim Duke's personal files.
60	LIMONENE	Fruit	8300.0	9700.0	0.6409395320453212	--
23	CITRIC-ACID	Fruit	5600.0	9800.0	-0.4912433942967182	--
0	EO	Fruit	7500.0	10000.0	-0.625591783140096	Guenther, E., The Essential Oils, 6 volumes, D. van Nostrand, New York, 1948-1952.
14	POTASSIUM	Fruit	1400.0	13772.0	-0.3666795712783593	--
0	NITROGEN	Fruit	500.0	13845.0	-0.054501610611493154	--
0	FAT	Fruit	1100.0	16000.0	-0.5190453767939366	--
0	EO	Pericarp	15000.0	20000.0	1.2809893558000476	--
7	GLUCOSE	Fruit		23600.0	-0.644631124988246	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
8	FRUCTOSE	Fruit		23800.0	-0.555436040816387	--
1	XANTHOXYLETIN	Root Bark		24000.0		Jim Duke's personal files.
6	NEOHESPERIDIN	Pericarp		28000.0		Jim Duke's personal files.
2	ELEMOL	Root Bark		28200.0		Jim Duke's personal files.
0	ASH	Fruit	4100.0	36920.0	-0.5112715299819987	--
1	XANTHYLETIN	Root Bark		45000.0		Jim Duke's personal files.
56	NARINGENIN	Pericarp	35000.0	45800.0		Jim Duke's personal files.
14	SUCROSE	Fruit		47000.0	-0.41357367622327157	--
15	FIBER	Fruit	3740.0	47000.0	-0.8934118438004772	--
31	HESPERIDIN	Pericarp		63500.0	0.38878029269733505	Jim Duke's personal files.
0	PROTEIN	Fruit	9260.0	78000.0	-0.4222516255728621	--
0	SUGARS	Fruit	39600.0	119800.0	-0.38969414389870244	--
0	CARBOHYDRATES	Fruit	99000.0	887125.0	0.557442615155032	--
0	WATER	Fruit	839000.0	898000.0	0.5540526248175224	--