

Dr. Duke's Phytochemical and Ethnobotanical Databases

Chemicals found in Piper nigrum

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
0	(+)-LIMONENE	Essential Oil				--
0	(+)-LIMONENE	Seed Essent. Oil				--
0	(-)-3,4-DIMETHOXY-3,4-DEMETHYLENEDIOXY-CUBEBIN	Leaf				--
0	(-)-CUBEBIN	Leaf				--
0	(-)-PHELLANDRENE	Seed Essent. Oil				--
0	(Z)-OCIMENOL	Fruit		135.0		--
0	1(7),2-P-MENTHADIEN-4-OL	Fruit				--
0	1(7),2-P-MENTHADIEN-6-OL	Fruit				--
0	1,1,4-TRIMETHYLCYCLOHEPTA-2,4-DIEN-6-ONE	Fruit				--
0	1,8(9)-P-MENTHADIEN-4-OL	Fruit				--
0	1,8(9)-P-MENTHADIEN-5-OL	Fruit				--
67	1,8-CINEOLE	Fruit				--
0	1,8-MENTHADIEN-2-OL	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	1-(2,4-DECADIENOYL)-PYRROLIDINE	Fruit		30.0		--
0	1-(2,4-DODECADIENOYL)-PYRROLIDINE	Fruit		10.0		--
0	1-ALPHA-PHELLANDRENE	Essential Oil				--
0	1-PIPERYL-PYRROLIDINE	Fruit				--
0	1-TERPINEN-4-OL	Fruit				--
0	1-TERPINEN-5-OL	Fruit				--
0	2,8-P-MENTHADIEN-1-OL	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	2-METHYL-PENTANOIC-ACID	Fruit				--
0	2-TRANS-4-TRANS-8-TRANS-PIPERAMIDE-C-9-3	Fruit		69.0		--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	2-TRANS-6-TRANS-PIPERAMIDE-C-7-2	Fruit		80.0		--
0	2-TRANS-8-TRANS-PIPERAMIDE-C-9-2	Fruit		5.0		--
0	2-TRANS-PIPERAMIDE-C-5-1	Fruit		75.0		--
4	2-UNDECANONE	Fruit				--
0	3,4-DIHYDROXY-6-(N-ETHYL-AMINO)-BENZAMIDE	Fruit				--
0	3,8(9)-P-MENTHADIEN-1-OL	Fruit				--
0	3-METHYL-BUTYRIC-ACID	Fruit				--
0	4,10,10-TRIMETHYL-7-METHYLENE-BICYCLO-(6.2.0)DECANE-4-CAR...	Plant				--
0	4-METHYL-TRIACONTANE	Plant				=ICMR(Indian Council of Medical Research).1976.Medicinal Plants of India.Vol.1.Indian Council of Med. Res.Cambridge Printing Works, New Delhi.487 pp;ICMR.1987.Medicinal Plants of India.Vol.2.Indian Council of Med. Res.Cambr. Printing Works,New Delhi.600pp
0	4-METHYL-TRITRIACONTANE	Leaf				--
0	5,10(15)-CADINEN-4-OL	Fruit				--
0	6-TRANS-PIPERAMIDE-C-7-1	Fruit		98.0		--
0	8-TRANS-PIPERAMIDE-C-9-1	Fruit		197.0		--
6	ACETOPHENONE	Fruit Essent. Oil		5000.0		--
19	ACETYL-CHOLINE	Seed		23.0	-1.1887435300844578	--
0	ALPHA-AMORPHENE	Fruit Essent. Oil		15100.0		--
0	ALPHA-BISABOLENE	Fruit Essent. Oil		21200.0		--
0	ALPHA-BULNESENE	Fruit Essent. Oil		8200.0	-1.0	--
0	ALPHA-CIS-BERGAMOTENE	Fruit				--
0	ALPHA-CIS-BERGAMOTENE	Seed Essent. Oil				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	ALPHA-CIS-BERGAMOTENE	Fruit Essent. Oil				--
0	ALPHA-COPAENE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	ALPHA-COPAENE	Fruit Essent. Oil	8200.0	15800.0	1.0	--
0	ALPHA-CUBEBENE	Fruit Essent. Oil		16200.0	-1.0	--
0	ALPHA-CUBEBINE	Fruit				--
0	ALPHA-GUAIENE	Fruit				--
0	ALPHA-GUAIENE	Fruit Essent. Oil		1100.0	-1.0	--
0	ALPHA-GURJUNENE	Fruit Essent. Oil		7800.0		--
2	ALPHA-HUMULENE	Fruit				--
2	ALPHA-HUMULENE	Fruit Essent. Oil	2100.0	19500.0	-1.0	--
2	ALPHA-HUMULENE	Leaf Essent. Oil				--
15	ALPHA-LINOLENIC-ACID	Fruit	2200.0	2458.0	-0.03933424045785113	USDA's Ag Handbook 8 and sequelae)
11	ALPHA-PHELLANDRENE	Fruit Essent. Oil	6800.0	36000.0	-0.5597624933275978	--
11	ALPHA-PHELLANDRENE	Seed Essent. Oil				--
28	ALPHA-PINENE	Seed Essent. Oil				--
28	ALPHA-PINENE	Fruit Essent. Oil	45000.0	94000.0	0.39522346445492856	--
28	ALPHA-PINENE	Essential Oil				--
28	ALPHA-PINENE	Fruit		3810.0	0.2759330241103953	--
0	ALPHA-SANTALENE	Fruit Essent. Oil				--
0	ALPHA-SANTALENE	Fruit				--
3	ALPHA-SELINENE	Fruit Essent. Oil		700.0		--
3	ALPHA-SELINENE	Fruit				--
13	ALPHA-TERPINENE	Seed Essent. Oil				--
13	ALPHA-TERPINENE	Fruit Essent. Oil		3000.0	-0.5711872077128709	--
13	ALPHA-TERPINENE	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
23	ALPHA-TERPINEOL	Fruit				--
23	ALPHA-TERPINEOL	Fruit Essent. Oil		1000.0	-0.910301229242406	--
0	ALPHA-TERPINEOL ACETATE	Fruit Essent. Oil		8600.0	-1.0	--
0	ALPHA-THUJENE	Fruit				--
0	ALPHA-THUJENE	Fruit Essent. Oil	7300.0	29000.0	-0.22630241280017493	--
32	ALPHA-TOCOPHEROL	Resin, Exudate, Sap		1000.0		--
32	ALPHA-TOCOPHEROL	Fruit		0.054	-1.1207877074947452	Charalambous, G. (Ed.). 1994. Spices, Herbs and Edible Fungi. Elsevier Science B. V. Amsterdam. 764 pp.
0	ALPHA-TRANS-BERGAMOTENE	Fruit				--
1	ALPHA-ZINGIBERENE	Fruit Essent. Oil		50100.0		--
3	AR-CURCUMENE	Fruit				--
3	AR-CURCUMENE	Fruit Essent. Oil		2600.0		--
0	ARACHIDIC-ACID	Fruit				=ICMR(Indian Council of Medical Research).1976.Medicinal Plants of India.Vol.1.Indian Council of Med. Res.Cambridge Printing Works, New Delhi.487 pp;ICMR.1987.Medicinal Plants of India.Vol.2.Indian Council of Med. Res.Cambr. Printing Works,New Delhi.600pp
112	ASCORBIC-ACID	Fruit		10.0	-0.2838672355464054	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	ASH	Fruit	42932.0	60000.0	0.08639308861203618	--
7	ASTRAGALIN	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
1	BEHENIC-ACID	Fruit				=ICMR(Indian Council of Medical Research).1976.Medicinal Plants of India.Vol.1.Indian Council of Med. Res.Cambridge Printing Works, New Delhi.487 pp;ICMR.1987.Medicinal Plants of India.Vol.2.Indian Council of Med. Res.Cambr. Printing Works,New Delhi.600pp
20	BENZOIC-ACID	Fruit				--
6	BETA-BISABOLENE	Fruit Essent. Oil	21200.0	111600.0	1.0	--
6	BETA-BISABOLENE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	BETA-BISABOLOL	Fruit Essent. Oil		2000.0		--
53	BETA-CAROTENE	Fruit	0.114	0.128	-0.1505532074368425	--
0	BETA-CARYOPHYLLENE	Essential Oil				--
0	BETA-CARYOPHYLLENE	Fruit Essent. Oil	160000.0	352000.0	2.205325345517652	--
0	BETA-CARYOPHYLLENE	Leaf Essent. Oil		30000.0	-0.22730263739281492	--
0	BETA-CARYOPHYLLENE	Seed				--
0	BETA-CARYOPHYLLENE	Fruit				Chemical Constituents of Oriental Herbs (3 diff. books)
0	BETA-CARYOPHYLLENE-ALCOHOL	Fruit				--
0	BETA-CUBEBENE	Fruit Essent. Oil				--
0	BETA-CUBEBINE	Fruit				--
5	BETA-ELEMENE	Fruit Essent. Oil		900.0	-0.8343192281159078	--
5	BETA-ELEMENE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	BETA-FARNESENE	Fruit Essent. Oil				--
0	BETA-FARNESENE	Fruit				--
3	BETA-PHELLANDRENE	Fruit Essent. Oil		41000.0	-0.47230877878271366	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
3	BETA-PHELLANDRENE	Seed Essent. Oil				--
13	BETA-PINENE	Seed Essent. Oil				--
13	BETA-PINENE	Fruit Essent. Oil	85000.0	138000.0	0.9556217102868814	--
13	BETA-PINENE	Fruit		2355.0	-0.2223943577434541	--
13	BETA-PINENE	Essential Oil				--
0	BETA-PINONE	Plant				J.S. Glasby Dict.Plis Containing 2ndary Metabolite. 1991.
3	BETA-SELINENE	Fruit Essent. Oil		6400.0	-1.0	--
3	BETA-SELINENE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
47	BETA-SITOSTEROL	Leaf				--
47	BETA-SITOSTEROL	Fruit	380.0	650.0	0.059781582959947475	Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)
47	BETA-SITOSTEROL	Stem		160.0	-1.327402794862025	--
35	BORNEOL	Fruit Essent. Oil				--
35	BORNEOL	Fruit				--
4	BORON	Fruit	0.5	18.0	-0.44149735010956404	Betting on Boron, Unpublished draft by J. A. Duke on file at USDA, draft and papers relating to boron percentages. Includes Internat. Z. Vit. Ern. Forschung 43:1973 (boron).
6	BUTYRIC-ACID	Fruit				--
102	CAFFEIC-ACID	Fruit		6.0	-0.33780275264769194	--
0	CALAMENE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	CALAMENENE	Fruit Essent. Oil				--
0	CALAMENENE	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
28	CALCIUM	Fruit	2700.0	4989.0	0.26138541132704457	--
2	CAMPESTEROL	Fruit	30.0	60.0	-0.14986892201478846	Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)
9	CAMPHENE	Fruit Essent. Oil	1000.0	1400.0	-1.0221892865520528	--
9	CAMPHENE	Fruit		120.0	-0.3020426178192843	--
9	CAMPHENE	Seed Essent. Oil				--
41	CAMPHOR	Fruit				--
0	CAR-3-ENE	Fruit Essent. Oil	28200.0	151000.0		--
0	CAR-3-ENE	Seed Essent. Oil				--
0	CARBOHYDRATE	Fruit		648100.0	-0.7817175730480762	USDA's Ag Handbook 8 and sequelae)
0	CARBOHYDRATES	Fruit		648100.0	-0.7207468961442081	--
37	CARVACROL	Fruit				--
0	CARVETONACETONE	Fruit				--
19	CARVONE	Fruit				--
19	CARVONE	Fruit Essent. Oil		50.0	-0.7219111602348719	--
0	CARVONE-OXIDE	Fruit Essent. Oil		100.0		--
0	CARYOPHYLLA-2,7(15)-DIEN-4-BETA-OL	Fruit				--
0	CARYOPHYLLA-2,7(15)-DIEN-4-OL	Fruit				--
0	CARYOPHYLLA-3(12),7(15)DIEN-4-BETA-OL	Fruit				--
31	CARYOPHYLLENE	Fruit	1000.0	6000.0	-0.21726348790373295	--
31	CARYOPHYLLENE	Seed Essent. Oil				--
1	CARYOPHYLLENE-ALCOHOL	Fruit Essent. Oil		700.0		--
0	CARYOPHYLLENE-KETONE	Fruit				--
8	CARYOPHYLLENE-OXIDE	Fruit Essent. Oil		9000.0	1.0	--
8	CARYOPHYLLENE-OXIDE	Fruit				Chemical Constituents of Oriental Herbs (3 diff. books)
3	CEDROL	Fruit Essent. Oil		700.0		--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
1	CHAVICINE	Fruit				--
7	CHLORINE	Fruit	2700.0	5100.0	2.9820406376676973	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
20	CHOLINE	Seed		1642.0	-0.028583716787024864	--
24	CHROMIUM	Fruit	3.0	3.5	-0.01602978329031414	--
18	CINNAMIC-ACID	Fruit				--
0	CIS-2,8-MENTHADIEN-2-OL	Fruit				--
0	CIS-CARVEOL	Fruit				--
0	CIS-CARVEOL	Fruit Essent. Oil		50.0	-1.0	--
0	CIS-NEROLIDOL	Fruit Essent. Oil		2000.0		--
3	CIS-OCIMENE	Fruit				--
0	CIS-P-2-MENTHEN-1-OL	Fruit				--
0	CIS-SABINENE-HYDRATE	Fruit				--
0	CIS-TRANS-PIPERINE	Fruit				--
53	CITRAL	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
20	CITRONELLAL	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
15	CITRONELLOL	Fruit Essent. Oil		200.0	-1.0	--
15	CITRONELLOL	Essential Oil				--
2	CITRONELLYL-ACETATE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	CLOVENE	Fruit Essent. Oil		1400.0		--
2	COBALT	Fruit	0.3	0.4	-0.48669151400918487	--
12	COPPER	Fruit	9.0	20.0	0.5588968590110831	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	CRYPTONE	Fruit				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	CRYPTONE	Essential Oil				--
0	CRYPTONE	Fruit Essent. Oil				--
0	CUBEBINE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	CUMAPERINE	Fruit				--
1	CUPARENE	Fruit Essent. Oil		13800.0		--
19	D-LIMONENE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
8	DELTA-3-CARENE	Fruit	500.0	2000.0	2.7325194789368674	--
9	DELTA-CADINENE	Fruit Essent. Oil		1200.0		--
9	DELTA-CADINENE	Leaf Essent. Oil				--
9	DELTA-CADINENE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	DELTA-ELEMENE	Fruit				--
0	DELTA-ELEMENE	Fruit Essent. Oil		16200.0		--
2	DIHYDROCARVEOL	Essential Oil				--
2	DIHYDROCARVEOL	Fruit Essent. Oil		100.0	-1.0	--
2	DIHYDROCARVEOL	Fruit				--
0	DIHYDROCARVONE	Fruit				--
0	DIHYDROPIPERCIDE	Fruit				--
0	DL-LIMONENE	Essential Oil				--
3	ELEMENE	Fruit		225.0		--
2	ELEMOL	Fruit Essent. Oil		1100.0		--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	EO	Fruit		15000.0	-0.5284067258944188	--
0	EPOXYDIHYDROCARYOPHYLLENE	Fruit				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	EPOXYDIHYDROCARYOPHYLLENE	Essential Oil				--
76	EUGENOL	Fruit				--
76	EUGENOL	Leaf Essent. Oil				--
5	EUGENOL-METHYL-ETHER	Fruit Essent. Oil				--
5	EUGENOL-METHYL-ETHER	Leaf Essent. Oil				--
0	FAT	Fruit	30940.0	100000.0	0.12253986651771635	--
0	FERUPERINE	Fruit		17.0		--
15	FIBER	Fruit	130056.0	148449.0	0.06390968642828075	USDA's Ag Handbook 8 and sequelae)
3	FLUORIDE	Fruit		3.6	1.4608696696245176	=ICMR(Indian Council of Medical Research).1976.Medicinal Plants of India.Vol.1.Indian Council of Med. Res.Cambridge Printing Works, New Delhi.487 pp;ICMR.1987.Medicinal Plants of India.Vol.2.Indian Council of Med. Res.Cambr. Printing Works,New Delhi.600pp
22	GABA	Fruit				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	GAMMA-CADINENE	Fruit Essent. Oil				--
0	GAMMA-CADINENE	Fruit				--
0	GAMMA-MUUROLENE	Fruit Essent. Oil		7300.0		--
0	GAMMA-MUUROLENE	Fruit				--
11	GAMMA-TERPINENE	Fruit Essent. Oil	100.0	11000.0	-0.34330658093433575	--
11	GAMMA-TERPINENE	Seed Essent. Oil				--
11	GAMMA-TERPINENE	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	GERANIOL-ACETATE	Fruit Essent. Oil		1200.0		--
5	GERANYL-ACETATE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	GERMACRENE-B	Fruit Essent. Oil		18300.0		--
2	GERMACRENE-D	Fruit Essent. Oil	400.0	49300.0		--
0	GLOBULOL	Fruit Essent. Oil		26200.0		--
0	GUINEENSINE	Fruit		31.0		--
0	HELIOTROPIN	Fruit				Guenther, E., The Essential Oils, 6 volumes, D. van Nostrand, New York, 1948-1952.
0	HENTRIACONTAN-16-OL	Stem		40.0		--
0	HENTRIACONTAN-16-ONE	Plant				Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
0	HENTRIACONTAN-16-ONE	Stem		40.0		--
0	HENTRIACONTAN-16-ONE	Leaf				--
0	HENTRIACONTANE	Stem				=ICMR(Indian Council of Medical Research).1976.Medicinal Plants of India.Vol.1.Indian Council of Med. Res.Cambridge Printing Works, New Delhi.487 pp;ICMR.1987.Medicinal Plants of India.Vol.2.Indian Council of Med. Res.Cambr. Printing Works,New Delhi.600pp

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0	HENTRIACONTANOL	Stem				=ICMR(Indian Council of Medical Research).1976.Medicinal Plants of India.Vol.1.Indian Council of Med. Res.Cambridge Printing Works, New Delhi.487 pp;ICMR.1987.Medicinal Plants of India.Vol.2.Indian Council of Med. Res.Cambr. Printing Works,New Delhi.600pp
0	HENTRIACONTANONE	Stem				=ICMR(Indian Council of Medical Research).1976.Medicinal Plants of India.Vol.1.Indian Council of Med. Res.Cambridge Printing Works, New Delhi.487 pp;ICMR.1987.Medicinal Plants of India.Vol.2.Indian Council of Med. Res.Cambr. Printing Works,New Delhi.600pp
2	HEXANOIC-ACID	Fruit				--
30	HYPEROSIDE	Fruit				--
12	IODINE	Fruit		0.09	-0.2902538943414157	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
6	IRON	Fruit	24.0	407.0	1.0869711226719216	--
0	ISOBUTYL-CAPROATE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	ISOBUTYL-ISOVALERATE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
1	ISOCARYOPHYLLENE	Fruit				--
1	ISOCARYOPHYLLENE	Fruit Essent. Oil				--
0	ISOCHAVICINE	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	ISOCHAVINIC-ACID	Fruit				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	ISOPIPERINE	Fruit				--
3	ISOPULEGOL	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
22	ISOQUERCITRIN	Fruit				--
75	KAEMPFEROL	Fruit				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	KAEMPFEROL-3-O-ARABINOSYL-7-O-RHAMNOSIDE	Fruit				--
0	KILOCALORIES	Fruit	2550.0	2856.0	-1.2219755197031514	USDA's Ag Handbook 8 and sequelae)
0	L-ALPHA-PHELLANDRENE	Fruit				--
2	L-LIMONENE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
7	LAURIC-ACID	Fruit	400.0	447.0	-0.44001415319735687	USDA's Ag Handbook 8 and sequelae)
0	LIMONEN-4-OL	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
60	LIMONENE	Fruit Essent. Oil	130500.0	210600.0	-0.6891296619826244	--
60	LIMONENE	Seed Essent. Oil				--
60	LIMONENE	Fruit	1500.0	8000.0	0.397130905101767	--
0	LINALOL	Fruit				--
53	LINALOOL	Fruit Essent. Oil		2200.0	-0.6866142547714452	--
53	LINALOOL	Fruit		90.0	-0.5606025868093102	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
7	LINALYL-ACETATE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
27	LINOLEIC-ACID	Fruit	13200.0	14750.0	-0.1472997456034458	USDA's Ag Handbook 8 and sequelae)
0	LIPASE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	M-MENTHA-3(8),6-DIENE	Seed Essent. Oil				--
0	M-METHYL-ACETOPHENONE	Fruit				--
65	MAGNESIUM	Fruit	1809.0	2319.0	0.08763983825273146	USDA's Ag Handbook 8 and sequelae)
14	MANGANESE	Fruit	19.0	56.0	-0.03428079513973251	--
0	METHYL-CAFFEIC-ACID-PIPERIDIDE	Fruit				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	METHYL-CARVACROL	Fruit				--
5	METHYL-CINNAMATE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	METHYL-CYCLOHEPTA-2,4-DIEN-6-ONE	Plant				J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.
20	METHYL-EUGENOL	Fruit				--
0	METHYL-HEPTANOATE	Fruit				--
0	METHYL-OCTANOATE	Fruit				--
0	MONOTERPENES	Fruit	7000.0	20800.0		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
22	MYRCENE	Seed Essent. Oil				--
22	MYRCENE	Fruit Essent. Oil	22300.0	64000.0	1.0393197116265955	--
22	MYRCENE	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
6	MYRISTIC-ACID	Fruit	700.0	782.0	-0.23225222845607665	USDA's Ag Handbook 8 and sequelae)
31	MYRISTICIN	Fruit				--
31	MYRISTICIN	Fruit Essent. Oil				--
5	MYRTENAL	Fruit				--
2	MYRTENOL	Fruit				--
2	MYRTENOL	Fruit Essent. Oil		2000.0		--
0	N-(2-METHYLPROPYL)-DECA-TRANS-2-TRANS-4-DIENAMIDE	Fruit				--
0	N-5-(4-HYDROXY-3-METHOXY-PHENYL)-PENT-TRANS-2-DIENOYL-PIPERIDINE	Fruit		9.0		--
0	N-BUTYOPHENONE	Fruit				--
0	N-FORMYLPIPERIDINE	Fruit				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
3	N-HENTRIACONTANE	Leaf				--
3	N-HENTRIACONTANE	Stem		110.0		--
0	N-HEPTADECANE	Fruit Essent. Oil		56600.0		--
0	N-HEPTADECENE	Fruit Essent. Oil		25300.0		--
0	N-ISOBUTYL-11-(3,4-METHYLENEDIOXY-PHENYL)-UNDECA-TRANS-2-TRANS-4-TRANS-10-TRIENAMIDE	Seed				--
0	N-ISOBUTYL-11-(3,4-METHYLENEDIOXY-PHENYL)-UNDECA-TRANS-2-TRANS-4-TRANS-10-TRIENAMIDE	Fruit		7.0		--
0	N-ISOBUTYL-13-(3,4-METHYLENEDIOXY-PHENYL)-TRIDECA-TRANS-2-TRANS-4-TRANS-12-TRIENAMIDE	Fruit				--
0	N-ISOBUTYL-EICOSA-TRANS-2-TRANS-4-CIS-8-TRIENAMIDE	Fruit		105.0		--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	N-ISOBUTYL-EICOSA-TRANS-2-TRANS-4-DIENAMIDE	Fruit		190.0		--
2	N-ISOBUTYL-OCTADECAN-2-TRANS-4-DIENAMIDE	Fruit				--
0	N-METHYL-PYRROLINE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	N-NONADECANE	Fruit				--
0	N-NONANE	Fruit				--
0	N-PENTADECANE	Fruit Essent. Oil		177800.0		--
0	N-PENTADECENE	Fruit Essent. Oil		17900.0		--
0	N-TRANS-FERULOYL-PIPERIDINE	Fruit		11.0		--
0	N-TRIDECANE	Fruit Essent. Oil		67800.0		--
0	N-TRIDECANE	Fruit				--
0	NEROL-ACETATE	Fruit Essent. Oil		2000.0		--
11	NEROLIDOL	Fruit Essent. Oil				--
11	NEROLIDOL	Fruit				--
39	NIACIN	Fruit	2.0	14.5	-0.6175885994937399	--
3	NICKEL	Fruit	0.7	2.4	-0.04957166517347313	--
2	OCIMENE	Fruit Essent. Oil		1000.0		--
2	OCIMENE	Seed Essent. Oil				--
18	OLEIC-ACID	Fruit	13700.0	15309.0	-0.3627535701002104	USDA's Ag Handbook 8 and sequelae)
9	OXALIC-ACID	Fruit	4000.0	34000.0	1.5684920731098055	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
25	P-COUMARIC-ACID	Fruit				--
0	P-CYMEN-8-OL	Fruit Essent. Oil				--
16	P-CYMENE	Fruit Essent. Oil				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
16	P-CYMENE	Fruit		150.0	-0.5599100466638004	--
16	P-CYMENE	Seed Essent. Oil				--
0	P-CYMENE-8-METHYL-ETHER	Fruit				--
0	P-CYMENE-8-OL	Fruit		15.0	-1.0	--
0	P-MENTH-8-EN-1-OL	Fruit Essent. Oil		300.0		--
0	P-MENTH-8-EN-2-OL	Fruit Essent. Oil				--
0	P-MENTH-CIS-2-EN-1-OL	Seed Essent. Oil				--
0	P-MENTH-CIS-2-EN-1-OL	Fruit Essent. Oil		200.0		--
0	P-MENTH-TRANS-2-EN-1-OL	Fruit Essent. Oil		100.0		--
2	P-METHYL-ACETOPHENONE	Fruit				--
13	PALMITIC-ACID	Fruit	12200.0	13633.0	-0.1532986318862056	USDA's Ag Handbook 8 and sequelae)
2	PELLITORINE	Fruit				--
11	PERILLALDEHYDE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
2	PHENYLACETIC-ACID	Essential Oil				--
2	PHENYLACETIC-ACID	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
4	PHOSPHORUS	Fruit	700.0	2040.0	-0.3571963668725839	--
0	PHYTIN-PHOSPHORUS	Fruit		1150.0	-0.13177293449153588	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
2	PHYTOSTEROLS	Fruit	550.0	1028.0	0.10644427802757993	--
0	PIPERANINE	Seed Oil		320.0		--
0	PIPERANINE	Fruit				--
0	PIPERCIDE	Fruit		13.0		--
0	PIPERETTINE	Fruit	234.0	8200.0		--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	PIPERICINE	Fruit		0.4		--
10	PIPERIDINE	Essential Oil				--
10	PIPERIDINE	Seed				--
10	PIPERIDINE	Fruit	606.0	2700.0	0.7468101297426346	--
61	PIPERINE	Shoot				--
61	PIPERINE	Fruit	5000.0	150000.0	1.0	--
61	PIPERINE	Seed Oil				--
61	PIPERINE	Leaf				--
61	PIPERINE	Leaf Essent. Oil				--
61	PIPERINE	Root				--
61	PIPERINE	Seed Essent. Oil				--
61	PIPERINE	Seed				--
61	PIPERINE	Stem		1100.0		--
7	PIPERITONE	Fruit Essent. Oil		400.0	-1.0	--
0	PIPEROLEIN-A	Fruit				--
0	PIPEROLEIN-B	Fruit		160.0		--
0	PIPEROLEIN-C	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	PIPEROLEINE-B	Fruit				--
2	PIPERONAL	Essential Oil				--
2	PIPERONAL	Fruit				--
0	PIPERONIC-ACID	Fruit				--
0	PIPERYLIN	Fruit				--
0	PIPERYLINE	Fruit				--
0	POLYSACCHARIDES	Fruit		450000.0	1.0	--
14	POTASSIUM	Fruit	11718.0	15077.0	-0.251221490492334	USDA's Ag Handbook 8 and sequelae)

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	PROTEIN	Fruit	108386.0	123888.0	0.1928969684345906	USDA's Ag Handbook 8 and sequelae)
1	PYRROLIDINE	Seed				--
0	PYRROPERINE	Seed				--
176	QUERCETIN	Fruit				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	QUERCETIN-3-O-ALPHA-D-GALACTOSIDE	Fruit				--
44	QUERCITRIN	Fruit				--
0	RESIN	Fruit		5000.0	-0.7191073491736661	List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	RETROFRACTAMIDE-A	Fruit		4.0		--
18	RHAMNETIN	Fruit				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	RHAMNETIN-O-TRIGLUCOSIDE	Fruit				--
15	RIBOFLAVIN	Fruit	0.4	2.8	-0.4731582297112136	--
87	RUTIN	Fruit				--
5	SABINENE	Seed Essent. Oil				--
5	SABINENE	Fruit Essent. Oil	85000.0	204000.0	0.47619676977008224	--
5	SABINENE	Fruit	1500.0	10000.0	2.605271050216115	--
29	SAFROLE	Fruit Essent. Oil				--
29	SAFROLE	Fruit				--
7	SALICYLATES	Fruit	10.0	65.0	-0.1503568703758442	--
0	SESQUISABINENE	Seed Essent. Oil				--
0	SESQUISABINENE	Fruit				--
0	SESQUISABINENE	Plant				J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	SESQUITERPENES	Fruit	2000.0	7800.0		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	SILICA	Fruit	750.0	3900.0	1.371867681308522	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
1	SODIUM	Fruit	320.0	627.0	-0.1244930806267503	USDA's Ag Handbook 8 and sequelae)
0	SPATHULENOL	Fruit Essent. Oil		29600.0		--
5	STARCH	Fruit	280000.0	565000.0	0.4063516312545475	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
8	STEARIC-ACID	Fruit				=ICMR(Indian Council of Medical Research).1976.Medicinal Plants of India.Vol.1.Indian Council of Med. Res.Cambridge Printing Works, New Delhi.487 pp;ICMR.1987.Medicinal Plants of India.Vol.2.Indian Council of Med. Res.Cambr. Printing Works,New Delhi.600pp
12	STIGMASTEROL	Fruit	140.0	210.0	1.7404035436813556	Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)
14	SULFUR	Fruit	1750.0	5760.0	3.0243404637527247	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	TERPIN-1-EN-4-OL	Fruit Essent. Oil				--
23	TERPINEN-4-OL	Fruit Essent. Oil		1900.0	-0.669433558721516	--
23	TERPINEN-4-OL	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
9	TERPINOLENE	Fruit Essent. Oil		1000.0	-0.7286391135831505	--
9	TERPINOLENE	Seed Essent. Oil				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
9	TERPINOLENE	Fruit				--
5	TERPINYL-ACETATE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
31	THIAMIN	Fruit	0.5	1.6	-0.4778065908058602	--
0	THUJENE	Seed Essent. Oil				--
0	TOCOPHEROLS	Resin, Exudate, Sap		5400.0		--
0	TOCOPHEROLS	Fruit		0.3		Charalambous, G. (Ed.). 1994. Spices, Herbs and Edible Fungi. Elsevier Science B. V. Amsterdam. 764 pp.
1	TRANS-CARVEOL	Fruit Essent. Oil		100.0	-1.0	--
1	TRANS-CARVEOL	Fruit				--
0	TRANS-CIS-PIPERINE	Fruit				--
0	TRANS-NEROLIDOL	Fruit Essent. Oil		1200.0		--
2	TRANS-PINOCARVEOL	Fruit				--
2	TRANS-PINOCARVEOL	Seed Essent. Oil				--
0	TRANS-SABINENE-HYDRATE	Fruit Essent. Oil		1400.0		--
0	TRANS-SABINENE-HYDRATE	Fruit				--
0	TRANS-TRANS-PIPERINE	Fruit		30000.0		--
0	TRICHOSTACHINE	Fruit				--
8	UBIQUINONE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	WATER	Fruit	103109.0	107091.0	-2.8848937391548306	USDA's Ag Handbook 8 and sequelae)
77	ZINC	Fruit	11.2	35.7	0.16241717653889182	--