

**Dr. Duke's Phytochemical and Ethnobotanical Databases**

**Chemicals found in Piper nigrum**

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	CARBOHYDRATE	Fruit		648100.0	-0.7817175730480762	USDA's Ag Handbook 8 and sequelae)
0	CARBOHYDRATES	Fruit		648100.0	-0.7207468961442081	--
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.
0	POLYSACCHARIDES	Fruit		450000.0	1.0	--
0	BETA-CARYOPHYLLENE	Fruit Essent. Oil	160000.0	352000.0	2.205325345517652	--
60	LIMONENE	Fruit Essent. Oil	130500.0	210600.0	-0.6891296619826244	--
5	SABINENE	Fruit Essent. Oil	85000.0	204000.0	0.47619676977008224	--
0	N-PENTADECANE	Fruit Essent. Oil		177800.0		--
0	CAR-3-ENE	Fruit Essent. Oil	28200.0	151000.0		--
61	PIPERINE	Fruit	5000.0	150000.0	1.0	--
15	FIBER	Fruit	130056.0	148449.0	0.06390968642828075	USDA's Ag Handbook 8 and sequelae)
13	BETA-PINENE	Fruit Essent. Oil	85000.0	138000.0	0.9556217102868814	--
0	PROTEIN	Fruit	108386.0	123888.0	0.1928969684345906	USDA's Ag Handbook 8 and sequelae)
6	BETA-BISABOLENE	Fruit Essent. Oil	21200.0	111600.0	1.0	--
0	WATER	Fruit	103109.0	107091.0	-2.8848937391548306	USDA's Ag Handbook 8 and sequelae)
0	FAT	Fruit	30940.0	100000.0	0.12253986651771635	--
28	ALPHA-PINENE	Fruit Essent. Oil	45000.0	94000.0	0.39522346445492856	--
0	N-TRIDECANE	Fruit Essent. Oil		67800.0		--
22	MYRCENE	Fruit Essent. Oil	22300.0	64000.0	1.0393197116265955	--
0	ASH	Fruit	42932.0	60000.0	0.08639308861203618	--
0	N-HEPTADECANE	Fruit Essent. Oil		56600.0		--
1	ALPHA-ZINGIBERENE	Fruit Essent. Oil		50100.0		--
2	GERMACRENE-D	Fruit Essent. Oil	400.0	49300.0		--
3	BETA-PHELLANDRENE	Fruit Essent. Oil		41000.0	-0.47230877878271366	--
11	ALPHA-PHELLANDRENE	Fruit Essent. Oil	6800.0	36000.0	-0.5597624933275978	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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.
0	BETA-CARYOPHYLLENE	Leaf Essent. Oil		30000.0	-0.22730263739281492	--
0	TRANS-TRANS-PIPERINE	Fruit		30000.0		--
0	SPATHULENOL	Fruit Essent. Oil		29600.0		--
0	ALPHA-THUJENE	Fruit Essent. Oil	7300.0	29000.0	-0.22630241280017493	--
0	GLOBULOL	Fruit Essent. Oil		26200.0		--
0	N-HEPTADECENE	Fruit Essent. Oil		25300.0		--
0	ALPHA-BISABOLENE	Fruit Essent. Oil		21200.0		--
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.
2	ALPHA-HUMULENE	Fruit Essent. Oil	2100.0	19500.0	-1.0	--
0	GERMACRENE-B	Fruit Essent. Oil		18300.0		--
0	N-PENTADECENE	Fruit Essent. Oil		17900.0		--
0	DELTA-ELEMENE	Fruit Essent. Oil		16200.0		--
0	ALPHA-CUBEBENE	Fruit Essent. Oil		16200.0	-1.0	--
0	ALPHA-COPAENE	Fruit Essent. Oil	8200.0	15800.0	1.0	--
18	OLEIC-ACID	Fruit	13700.0	15309.0	-0.3627535701002104	USDA's Ag Handbook 8 and sequelae)
0	ALPHA-AMORPHENE	Fruit Essent. Oil		15100.0		--
14	POTASSIUM	Fruit	11718.0	15077.0	-0.251221490492334	USDA's Ag Handbook 8 and sequelae)
0	EO	Fruit		15000.0	-0.5284067258944188	--
27	LINOLEIC-ACID	Fruit	13200.0	14750.0	-0.1472997456034458	USDA's Ag Handbook 8 and sequelae)
1	CUPARENE	Fruit Essent. Oil		13800.0		--
13	PALMITIC-ACID	Fruit	12200.0	13633.0	-0.1532986318862056	USDA's Ag Handbook 8 and sequelae)
11	GAMMA-TERPINENE	Fruit Essent. Oil	100.0	11000.0	-0.34330658093433575	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
5	SABINENE	Fruit	1500.0	10000.0	2.605271050216115	--
8	CARYOPHYLLENE-OXIDE	Fruit Essent. Oil		9000.0	1.0	--
0	ALPHA-TERPINEOL ACETATE	Fruit Essent. Oil		8600.0	-1.0	--
0	PIPERETTINE	Fruit	234.0	8200.0		--
0	ALPHA-BULNESENE	Fruit Essent. Oil		8200.0	-1.0	--
60	LIMONENE	Fruit	1500.0	8000.0	0.397130905101767	--
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	ALPHA-GURJUNENE	Fruit Essent. Oil		7800.0		--
0	GAMMA-MUUROLENE	Fruit Essent. Oil		7300.0		--
3	BETA-SELINENE	Fruit Essent. Oil		6400.0	-1.0	--
31	CARYOPHYLLENE	Fruit	1000.0	6000.0	-0.21726348790373295	--
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	TOCOPHEROLS	Resin, Exudate, Sap		5400.0		--
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.
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.
6	ACETOPHENONE	Fruit Essent. Oil		5000.0		--
28	CALCIUM	Fruit	2700.0	4989.0	0.26138541132704457	--
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.
28	ALPHA-PINENE	Fruit		3810.0	0.2759330241103953	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
13	ALPHA-TERPINENE	Fruit Essent. Oil		3000.0	-0.5711872077128709	--
0	KILOCALORIES	Fruit	2550.0	2856.0	-1.2219755197031514	USDA's Ag Handbook 8 and sequelae)
10	PIPERIDINE	Fruit	606.0	2700.0	0.7468101297426346	--
3	AR-CURCUMENE	Fruit Essent. Oil		2600.0		--
15	ALPHA-LINOLENIC-ACID	Fruit	2200.0	2458.0	-0.03933424045785113	USDA's Ag Handbook 8 and sequelae)
13	BETA-PINENE	Fruit		2355.0	-0.2223943577434541	--
65	MAGNESIUM	Fruit	1809.0	2319.0	0.08763983825273146	USDA's Ag Handbook 8 and sequelae)
53	LINALOOL	Fruit Essent. Oil		2200.0	-0.6866142547714452	--
4	PHOSPHORUS	Fruit	700.0	2040.0	-0.3571963668725839	--
0	CIS-NEROLIDOL	Fruit Essent. Oil		2000.0		--
2	MYRTENOL	Fruit Essent. Oil		2000.0		--
0	BETA-BISABOLOL	Fruit Essent. Oil		2000.0		--
0	NEROL-ACETATE	Fruit Essent. Oil		2000.0		--
8	DELTA-3-CARENE	Fruit	500.0	2000.0	2.7325194789368674	--
23	TERPINEN-4-OL	Fruit Essent. Oil		1900.0	-0.669433558721516	--
20	CHOLINE	Seed		1642.0	-0.028583716787024864	--
9	CAMPHENE	Fruit Essent. Oil	1000.0	1400.0	-1.0221892865520528	--
0	CLOVENE	Fruit Essent. Oil		1400.0		--
0	TRANS-SABINENE-HYDRATE	Fruit Essent. Oil		1400.0		--
0	TRANS-NEROLIDOL	Fruit Essent. Oil		1200.0		--
9	DELTA-CADINENE	Fruit Essent. Oil		1200.0		--
0	GERANIOL-ACETATE	Fruit Essent. Oil		1200.0		--
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	ELEMOL	Fruit Essent. Oil		1100.0		--
61	PIPERINE	Stem		1100.0		--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	ALPHA-GUAIENE	Fruit Essent. Oil		1100.0	-1.0	--
2	PHYTOSTEROLS	Fruit	550.0	1028.0	0.10644427802757993	--
23	ALPHA-TERPINEOL	Fruit Essent. Oil		1000.0	-0.910301229242406	--
9	TERPINOLENE	Fruit Essent. Oil		1000.0	-0.7286391135831505	--
32	ALPHA-TOCOPHEROL	Resin, Exudate, Sap		1000.0		--
2	OCIMENE	Fruit Essent. Oil		1000.0		--
5	BETA-ELEMENE	Fruit Essent. Oil		900.0	-0.8343192281159078	--
6	MYRISTIC-ACID	Fruit	700.0	782.0	-0.23225222845607665	USDA's Ag Handbook 8 and sequelae)
3	CEDROL	Fruit Essent. Oil		700.0		--
1	CARYOPHYLLENE-ALCOHOL	Fruit Essent. Oil		700.0		--
3	ALPHA-SELINENE	Fruit Essent. Oil		700.0		--
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.)
1	SODIUM	Fruit	320.0	627.0	-0.1244930806267503	USDA's Ag Handbook 8 and sequelae)
7	LAURIC-ACID	Fruit	400.0	447.0	-0.44001415319735687	USDA's Ag Handbook 8 and sequelae)
6	IRON	Fruit	24.0	407.0	1.0869711226719216	--
7	PIPERITONE	Fruit Essent. Oil		400.0	-1.0	--
0	PIPERANINE	Seed Oil		320.0		--
0	P-MENTH-8-EN-1-OL	Fruit Essent. Oil		300.0		--
3	ELEMENE	Fruit		225.0		--
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.)
0	P-MENTH-CIS-2-EN-1-OL	Fruit Essent. Oil		200.0		--
15	CITRONELLOL	Fruit Essent. Oil		200.0	-1.0	--
0	8-TRANS-PIPERAMIDE-C-9-1	Fruit		197.0		--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	N-ISOBUTYL-EICOSA-TRANS-2-TRANS-4-DIENAMIDE	Fruit		190.0		--
47	BETA-SITOSTEROL	Stem		160.0	-1.327402794862025	--
0	PIPEROLEIN-B	Fruit		160.0		--
16	P-CYMENE	Fruit		150.0	-0.5599100466638004	--
0	(Z)-OCIMENOL	Fruit		135.0		--
9	CAMPHENE	Fruit		120.0	-0.3020426178192843	--
3	N-HENTRIACONTANE	Stem		110.0		--
0	N-ISOBUTYL-EICOSA-TRANS-2-TRANS-4-CIS-8-TRIENAMIDE	Fruit		105.0		--
2	DIHYDROCARVEOL	Fruit Essent. Oil		100.0	-1.0	--
1	TRANS-CARVEOL	Fruit Essent. Oil		100.0	-1.0	--
0	P-MENTH-TRANS-2-EN-1-OL	Fruit Essent. Oil		100.0		--
0	CARVONE-OXIDE	Fruit Essent. Oil		100.0		--
0	6-TRANS-PIPERAMIDE-C-7-1	Fruit		98.0		--
53	LINALOOL	Fruit		90.0	-0.5606025868093102	--
0	2-TRANS-6-TRANS-PIPERAMIDE-C-7-2	Fruit		80.0		--
0	2-TRANS-PIPERAMIDE-C-5-1	Fruit		75.0		--
0	2-TRANS-4-TRANS-8-TRANS-PIPERAMIDE-C-9-3	Fruit		69.0		--
7	SALICYLATES	Fruit	10.0	65.0	-0.1503568703758442	--
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.)
14	MANGANESE	Fruit	19.0	56.0	-0.03428079513973251	--
0	CIS-CARVEOL	Fruit Essent. Oil		50.0	-1.0	--
19	CARVONE	Fruit Essent. Oil		50.0	-0.7219111602348719	--
0	HENTRIACONTAN-16-ONE	Stem		40.0		--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	HENTRIACONTAN-16-OL	Stem		40.0		--
77	ZINC	Fruit	11.2	35.7	0.16241717653889182	--
0	GUINEENSINE	Fruit		31.0		--
0	1-(2,4-DECADIENOYL)-PYRROLIDINE	Fruit		30.0		--
19	ACETYL-CHOLINE	Seed		23.0	-1.1887435300844578	--
12	COPPER	Fruit	9.0	20.0	0.5588968590110831	--
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).
0	FERUPERINE	Fruit		17.0		--
0	P-CYMENE-8-OL	Fruit		15.0	-1.0	--
39	NIACIN	Fruit	2.0	14.5	-0.6175885994937399	--
0	PIPERCIDE	Fruit		13.0		--
0	N-TRANS-FERULOYL-PIPERIDINE	Fruit		11.0		--
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	1-(2,4-DODECADIENOYL)-PYRROLIDINE	Fruit		10.0		--
0	N-5-(4-HYDROXY-3-METHOXY-PHENYL)-PENT-TRANS-2-DIENOYL-PIPERIDINE	Fruit		9.0		--
0	N-ISOBUTYL-11-(3,4-METHYLENEDIOXY-PHENYL)-UNDECA-TRANS-2-TRANS-4-TRANS-10-TRIENAMIDE	Fruit		7.0		--
102	CAFFEIC-ACID	Fruit		6.0	-0.33780275264769194	--
0	2-TRANS-8-TRANS-PIPERAMIDE-C-9-2	Fruit		5.0		--
0	RETROFRACTAMIDE-A	Fruit		4.0		--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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
24	CHROMIUM	Fruit	3.0	3.5	-0.01602978329031414	--
15	RIBOFLAVIN	Fruit	0.4	2.8	-0.4731582297112136	--
3	NICKEL	Fruit	0.7	2.4	-0.04957166517347313	--
31	THIAMIN	Fruit	0.5	1.6	-0.4778065908058602	--
0	PIPERICINE	Fruit		0.4		--
2	COBALT	Fruit	0.3	0.4	-0.48669151400918487	--
0	TOCOPHEROLS	Fruit		0.3		Charalambous, G. (Ed.). 1994. Spices, Herbs and Edible Fungi. Elsevier Science B. V. Amsterdam. 764 pp.
53	BETA-CAROTENE	Fruit	0.114	0.128	-0.1505532074368425	--
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.
32	ALPHA-TOCOPHEROL	Fruit		0.054	-1.1207877074947452	Charalambous, G. (Ed.). 1994. Spices, Herbs and Edible Fungi. Elsevier Science B. V. Amsterdam. 764 pp.
22	MYRCENE	Fruit				--
4	2-UNDECANONE	Fruit				--
22	GABA	Fruit				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.



Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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.
5	EUGENOL-METHYL-ETHER	Leaf Essent. Oil				--
29	SAFROLE	Fruit				--
15	CITRONELLOL	Essential Oil				--
11	ALPHA-PHELLANDRENE	Seed Essent. Oil				--
29	SAFROLE	Fruit Essent. Oil				--
0	CIS-SABINENE-HYDRATE	Fruit				--
2	PHENYLACETIC-ACID	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
20	BENZOIC-ACID	Fruit				--
0	1(7),2-P-MENTHADIEN-4-OL	Fruit				--
19	D-LIMONENE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
61	PIPERINE	Seed Essent. Oil				--
0	CIS-TRANS-PIPERINE	Fruit				--
0	PIPEROLEIN-A	Fruit				--
9	CAMPHENE	Seed Essent. Oil				--
0	(-)-PHELLANDRENE	Seed Essent. Oil				--
2	PIPERONAL	Essential Oil				--
2	OCIMENE	Seed Essent. Oil				--
1	TRANS-CARVEOL	Fruit				--
0	EPOXYDIHYDROCARYOPHYLLENE	Essential Oil				--
0	CARYOPHYLLA-3(12),7(15)DIEN-4-BETA-OL	Fruit				--
11	NEROLIDOL	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	ISOBUTYL-ISOVALERATE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
3	BETA-SELINENE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	METHYL-OCTANOATE	Fruit				--
0	2-METHYL-PENTANOIC-ACID	Fruit				--
76	EUGENOL	Leaf Essent. Oil				--
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
5	SABINENE	Seed Essent. Oil				--
0	CIS-P-2-MENTHEN-1-OL	Fruit				--
11	PERILLALDEHYDE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
7	LINALYL-ACETATE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	BETA-CARYOPHYLLENE	Seed				--
61	PIPERINE	Seed				--
0	N-(2-METHYLPROPYL)-DECA-TRANS-2-TRANS-4-DIENAMIDE	Fruit				--
0	LIPASE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	HENTRIACONTAN-16-ONE	Leaf				--
11	NEROLIDOL	Fruit Essent. Oil				--
2	DIHYDROCARVEOL	Essential Oil				--
0	TRANS-CIS-PIPERINE	Fruit				--
0	CARYOPHYLLA-2,7(15)-DIEN-4-OL	Fruit				--
0	N-TRIDECANE	Fruit				--
2	ALPHA-HUMULENE	Fruit				--
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	BETA-PINONE	Plant				J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.
0	METHYL-HEPTANOATE	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.
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	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
3	CIS-OCIMENE	Fruit				--
0	LINALOL	Fruit				--
2	TRANS-PINOCARVEOL	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	(-)-3,4-DIMETHOXY-3,4-DEMETHYLENEDIOXY-CUBEBIN	Leaf				--
0	CUMAPERINE	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.
0	THUJENE	Seed Essent. Oil				--
0	CARYOPHYLLA-2,7(15)-DIEN-4-BETA-OL	Fruit				--
0	N-NONANE	Fruit				--
0	ALPHA-GUAIENE	Fruit				--
20	METHYL-EUGENOL	Fruit				--
0	1-TERPINEN-5-OL	Fruit				--
76	EUGENOL	Fruit				--
0	ISOPIPERINE	Fruit				--
31	MYRISTICIN	Fruit Essent. Oil				--
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
87	RUTIN	Fruit				--
0	CIS-CARVEOL	Fruit				--
2	P-METHYL-ACETOPHENONE	Fruit				--
3	AR-CURCUMENE	Fruit				--
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.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
10	PIPERIDINE	Essential Oil				--
19	CARVONE	Fruit				--
0	(-)-CUBEBIN	Leaf				--
47	BETA-SITOSTEROL	Leaf				--
9	TERPINOLENE	Fruit				--
13	ALPHA-TERPINENE	Seed Essent. Oil				--
0	CARVETONACETONE	Fruit				--
0	N-NONADECANE	Fruit				--
0	ALPHA-CUBEBINE	Fruit				--
0	CUBEBINE	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				--
0	METHYL-CYCLOHEPTA-2,4-DIEN-6-ONE	Plant				J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.
0	1-TERPINEN-4-OL	Fruit				--
0	EPOXYDIHYDROCARYOPHYLLENE	Fruit				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	DL-LIMONENE	Essential Oil				--
0	PIPEROLEINE-B	Fruit				--
0	ISOCHAVICINE	Fruit				--
0	BETA-FARNESENE	Fruit Essent. Oil				--
22	MYRCENE	Seed Essent. Oil				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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
0	4-METHYL-TRITRIACONTANE	Leaf				--
0	RHAMNETIN-O-TRIGLUCOSIDE	Fruit				--
0	ALPHA-TRANS-BERGAMOTENE	Fruit				--
7	ASTRAGALIN	Fruit				--
3	N-HENTRIACONTANE	Leaf				--
10	PIPERIDINE	Seed				--
41	CAMPHOR	Fruit				--
0	CIS-2,8-MENTHADIEN-2-OL	Fruit				--
0	3,4-DIHYDROXY-6-(N-ETHYL-AMINO)-BENZAMIDE	Fruit				--
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	DELTA-CADINENE	Leaf Essent. Oil				--
9	TERPINOLENE	Seed Essent. Oil				--
37	CARVACROL	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	ALPHA-COPAENE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
2	HEXANOIC-ACID	Fruit				--
0	CRYPTONE	Fruit				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
5	BETA-ELEMENE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
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	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	CALAMENENE	Fruit Essent. Oil				--
0	(+)-LIMONENE	Essential Oil				--
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	ALPHA-THUJENE	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.
0	M-MENTHA-3(8),6-DIENE	Seed Essent. Oil				--
16	P-CYMENE	Fruit Essent. Oil				--
13	BETA-PINENE	Seed Essent. Oil				--
18	CINNAMIC-ACID	Fruit				--
0	P-CYMENE-8-METHYL-ETHER	Fruit				--
0	N-BUTYOPHENONE	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	ALPHA-CIS-BERGAMOTENE	Fruit				--
0	HELIOTROPIN	Fruit				Guenther, E., The Essential Oils, 6 volumes, D. van Nostrand, New York, 1948-1952.
0	BETA-CUBEBINE	Fruit				--
0	METHYL-CARVACROL	Fruit				--
67	1,8-CINEOLE	Fruit				--
0	DIHYDROCARVONE	Fruit				--
0	(+)-LIMONENE	Seed Essent. Oil				--
61	PIPERINE	Shoot				--
22	ISOQUERCITRIN	Fruit				--
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
0	PIPERYLINE	Fruit				--
31	CARYOPHYLLENE	Seed Essent. Oil				--
44	QUERCITRIN	Fruit				--
23	ALPHA-TERPINEOL	Fruit				--
0	L-ALPHA-PHELLANDRENE	Fruit				--
35	BORNEOL	Fruit				--
16	P-CYMENE	Seed Essent. Oil				--
0	CRYPTONE	Essential Oil				--
0	ALPHA-SANTALENE	Fruit Essent. Oil				--
0	TERPIN-1-EN-4-OL	Fruit Essent. Oil				--
2	MYRTENOL	Fruit				--



Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	5,10(15)-CADINEN-4-OL	Fruit				--
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	PIPERANINE	Fruit				--
0	BETA-CARYOPHYLLENE-ALCOHOL	Fruit				--
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	1,8(9)-P-MENTHADIEN-5-OL	Fruit				--
2	DIHYDROCARVEOL	Fruit				--
35	BORNEOL	Fruit Essent. Oil				--
61	PIPERINE	Seed Oil				--
2	ALPHA-HUMULENE	Leaf Essent. Oil				--
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
0	PIPERONIC-ACID	Fruit				--
0	QUERCETIN-3-O-ALPHA-D-GALACTOSIDE	Fruit				--
13	ALPHA-TERPINENE	Fruit				--
0	P-CYMEN-8-OL	Fruit Essent. Oil				--
13	BETA-PINENE	Essential Oil				--
0	TRICHOSTACHINE	Fruit				--
0	CRYPTONE	Fruit Essent. Oil				--
28	ALPHA-PINENE	Seed Essent. Oil				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	CALAMENENE	Fruit				--
5	MYRTENAL	Fruit				--
0	4,10,10-TRIMETHYL-7-METHYLENE-BICYCLO-(6.2.0)DECANE-4-CAR...	Plant				--
11	GAMMA-TERPINENE	Fruit				--
2	N-ISOBUTYL-OCTADECATRANS-2-TRANS-4-DIENAMIDE	Fruit				--
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	BETA-CARYOPHYLLENE	Fruit				Chemical Constituents of Oriental Herbs (3 diff. books)
0	1,8(9)-P-MENTHADIEN-4-OL	Fruit				--
0	DELTA-ELEMENE	Fruit				--
0	BETA-CUBEBENE	Fruit Essent. Oil				--
0	P-MENTH-CIS-2-EN-1-OL	Seed Essent. Oil				--
61	PIPERINE	Leaf				--
11	GAMMA-TERPINENE	Seed Essent. Oil				--
2	PIPERONAL	Fruit				--
0	PYRROPERINE	Seed				--
3	ALPHA-SELINENE	Fruit				--
3	ISOPULEGOL	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	ALPHA-CIS-BERGAMOTENE	Seed Essent. Oil				--
60	LIMONENE	Seed Essent. Oil				--
2	PHENYLACETIC-ACID	Essential Oil				--
25	P-COUMARIC-ACID	Fruit				--
1	CHAVICINE	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	SESQUISABINENE	Seed Essent. Oil				--
0	CALAMENE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
31	MYRISTICIN	Fruit				--
0	3-METHYL-BUTYRIC-ACID	Fruit				--
0	GAMMA-MUUROLENE	Fruit				--
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	N-ISOBUTYL-13-(3,4-METHYLENEDIOXY-PHENYL)-TRIDECA-TRANS-2-TRANS-4-TRANS-12-TRIENAMIDE	Fruit				--
20	CITRONELLAL	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	1,1,4-TRIMETHYLCYCLOHEPTA-2,4-DIEN-6-ONE	Fruit				--
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	BETA-CARYOPHYLLENE	Essential Oil				--
61	PIPERINE	Leaf Essent. Oil				--
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

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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	1-PIPERYL-PYRROLIDINE	Fruit				--
1	PYRROLIDINE	Seed				--
0	ISOCHAVINIC-ACID	Fruit				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	ALPHA-CIS-BERGAMOTENE	Fruit Essent. Oil				--
0	KAEMPFEROL-3-O-ARABINOSYL-7-O-RHAMNOSIDE	Fruit				--
2	PELLITORINE	Fruit				--
8	UBIQUINONE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
1	ISOCARYOPHYLLENE	Fruit Essent. Oil				--
3	BETA-PHELLANDRENE	Seed Essent. Oil				--
8	CARYOPHYLLENE-OXIDE	Fruit				Chemical Constituents of Oriental Herbs (3 diff. books)
0	ALPHA-SANTALENE	Fruit				--
0	SESQUISABINENE	Plant				J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.
28	ALPHA-PINENE	Essential Oil				--
0	SESQUISABINENE	Fruit				--
6	BUTYRIC-ACID	Fruit				--
0	3,8(9)-P-MENTHADIEN-1-OL	Fruit				--
0	GAMMA-CADINENE	Fruit				--
176	QUERCETIN	Fruit				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
5	EUGENOL-METHYL-ETHER	Fruit Essent. Oil				--
0	N-ISOBUTYL-11-(3,4-METHYLENEDIOXY-PHENYL)-UNDECA-TRANS-2-TRANS-4-TRANS-10-TRIENAMIDE	Seed				--
53	CITRAL	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
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	M-METHYL-ACETOPHENONE	Fruit				--
0	1(7),2-P-MENTHADIEN-6-OL	Fruit				--
0	P-MENTH-8-EN-2-OL	Fruit Essent. Oil				--
61	PIPERINE	Root				--
0	DIHYDROPIPERCIDE	Fruit				--
0	CAR-3-ENE	Seed Essent. Oil				--
0	1-ALPHA-PHELLANDRENE	Essential Oil				--
0	PIPERYLIN	Fruit				--
30	HYPEROSIDE	Fruit				--
0	TRANS-SABINENE-HYDRATE	Fruit				--
0	GAMMA-CADINENE	Fruit Essent. Oil				--
2	TRANS-PINOCARVEOL	Seed Essent. Oil				--
0	CARYOPHYLLENE-KETONE	Fruit				--
1	ISOCARYOPHYLLENE	Fruit				--