

Dr. Duke's Phytochemical and Ethnobotanical Databases

Chemicals found in Piper nigrum

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
77	ZINC	Fruit	11.2	35.7	0.16241717653889182	--
8	UBIQUINONE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
2	TRANS-PINOCARVEOL	Seed Essent. Oil				--
2	TRANS-PINOCARVEOL	Fruit				--
1	TRANS-CARVEOL	Fruit Essent. Oil		100.0	-1.0	--
1	TRANS-CARVEOL	Fruit				--
31	THIAMIN	Fruit	0.5	1.6	-0.4778065908058602	--
5	TERPINYL-ACETATE	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	Fruit				--
9	TERPINOLENE	Seed Essent. Oil				--
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.
23	TERPINEN-4-OL	Fruit Essent. Oil		1900.0	-0.669433558721516	--
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.
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.)

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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	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.
1	SODIUM	Fruit	320.0	627.0	-0.1244930806267503	USDA's Ag Handbook 8 and sequelae)
7	SALICYLATES	Fruit	10.0	65.0	-0.1503568703758442	--
29	SAFROLE	Fruit Essent. Oil				--
29	SAFROLE	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	--
87	RUTIN	Fruit				--
15	RIBOFLAVIN	Fruit	0.4	2.8	-0.4731582297112136	--
18	RHAMNETIN	Fruit				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
44	QUERCITRIN	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.
1	PYRROLIDINE	Seed				--
14	POTASSIUM	Fruit	11718.0	15077.0	-0.251221490492334	USDA's Ag Handbook 8 and sequelae)
2	PIPERONAL	Essential Oil				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
2	PIPERONAL	Fruit				--
7	PIPERITONE	Fruit Essent. Oil		400.0	-1.0	--
61	PIPERINE	Fruit	5000.0	150000.0	1.0	--
61	PIPERINE	Shoot				--
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		--
10	PIPERIDINE	Seed				--
10	PIPERIDINE	Fruit	606.0	2700.0	0.7468101297426346	--
10	PIPERIDINE	Essential Oil				--
2	PHYTOSTEROLS	Fruit	550.0	1028.0	0.10644427802757993	--
4	PHOSPHORUS	Fruit	700.0	2040.0	-0.3571963668725839	--
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.
11	PERILLALDEHYDE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
2	PELLITORINE	Fruit				--
13	PALMITIC-ACID	Fruit	12200.0	13633.0	-0.1532986318862056	USDA's Ag Handbook 8 and sequelae)
2	P-METHYL-ACETOPHENONE	Fruit				--
16	P-CYMENE	Fruit Essent. Oil				--
16	P-CYMENE	Seed Essent. Oil				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
16	P-CYMENE	Fruit		150.0	-0.5599100466638004	--
25	P-COUMARIC-ACID	Fruit				--
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.
18	OLEIC-ACID	Fruit	13700.0	15309.0	-0.3627535701002104	USDA's Ag Handbook 8 and sequelae)
2	OCIMENE	Fruit Essent. Oil		1000.0		--
2	OCIMENE	Seed Essent. Oil				--
3	NICKEL	Fruit	0.7	2.4	-0.04957166517347313	--
39	NIACIN	Fruit	2.0	14.5	-0.6175885994937399	--
11	NEROLIDOL	Fruit				--
11	NEROLIDOL	Fruit Essent. Oil				--
2	N-ISOBUTYL-OCTADECAN-2-TRANS-4-DIENAMIDE	Fruit				--
3	N-HENTRIACONTANE	Stem		110.0		--
3	N-HENTRIACONTANE	Leaf				--
2	MYRTENOL	Fruit				--
2	MYRTENOL	Fruit Essent. Oil		2000.0		--
5	MYRTENAL	Fruit				--
31	MYRISTICIN	Fruit				--
31	MYRISTICIN	Fruit Essent. Oil				--
6	MYRISTIC-ACID	Fruit	700.0	782.0	-0.23225222845607665	USDA's Ag Handbook 8 and sequelae)
22	MYRCENE	Fruit Essent. Oil	22300.0	64000.0	1.0393197116265955	--
22	MYRCENE	Fruit				--
22	MYRCENE	Seed Essent. Oil				--
20	METHYL-EUGENOL	Fruit				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
5	METHYL-CINNAMATE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
14	MANGANESE	Fruit	19.0	56.0	-0.03428079513973251	--
65	MAGNESIUM	Fruit	1809.0	2319.0	0.08763983825273146	USDA's Ag Handbook 8 and sequelae)
27	LINOLEIC-ACID	Fruit	13200.0	14750.0	-0.1472997456034458	USDA's Ag Handbook 8 and sequelae)
7	LINALYL-ACETATE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
53	LINALOOL	Fruit		90.0	-0.5606025868093102	--
53	LINALOOL	Fruit Essent. Oil		2200.0	-0.6866142547714452	--
60	LIMONENE	Fruit	1500.0	8000.0	0.397130905101767	--
60	LIMONENE	Fruit Essent. Oil	130500.0	210600.0	-0.6891296619826244	--
60	LIMONENE	Seed Essent. Oil				--
7	LAURIC-ACID	Fruit	400.0	447.0	-0.44001415319735687	USDA's Ag Handbook 8 and sequelae)
2	L-LIMONENE	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.
22	ISOQUERCITRIN	Fruit				--
3	ISOPULEGOL	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				--
1	ISOCARYOPHYLLENE	Fruit				--
6	IRON	Fruit	24.0	407.0	1.0869711226719216	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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.
30	HYPEROSIDE	Fruit				--
2	HEXANOIC-ACID	Fruit				--
2	GERMACRENE-D	Fruit Essent. Oil	400.0	49300.0		--
5	GERANYL-ACETATE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
11	GAMMA-TERPINENE	Fruit				--
11	GAMMA-TERPINENE	Fruit Essent. Oil	100.0	11000.0	-0.34330658093433575	--
11	GAMMA-TERPINENE	Seed Essent. Oil				--
22	GABA	Fruit				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
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
15	FIBER	Fruit	130056.0	148449.0	0.06390968642828075	USDA's Ag Handbook 8 and sequelae)
5	EUGENOL-METHYL-ETHER	Fruit Essent. Oil				--
5	EUGENOL-METHYL-ETHER	Leaf Essent. Oil				--
76	EUGENOL	Fruit				--
76	EUGENOL	Leaf Essent. Oil				--
2	ELEMOL	Fruit Essent. Oil		1100.0		--
3	ELEMENE	Fruit		225.0		--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
2	DIHYDROCARVEOL	Essential Oil				--
2	DIHYDROCARVEOL	Fruit Essent. Oil		100.0	-1.0	--
2	DIHYDROCARVEOL	Fruit				--
9	DELTA-CADINENE	Fruit Essent. Oil		1200.0		--
9	DELTA-CADINENE	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				--
8	DELTA-3-CARENE	Fruit	500.0	2000.0	2.7325194789368674	--
19	D-LIMONENE	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
1	CUPARENE	Fruit Essent. Oil		13800.0		--
12	COPPER	Fruit	9.0	20.0	0.5588968590110831	--
2	COBALT	Fruit	0.3	0.4	-0.48669151400918487	--
2	CITRONELLYL-ACETATE	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				--
20	CITRONELLAL	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
53	CITRAL	Fruit				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
3	CIS-OCIMENE	Fruit				--
18	CINNAMIC-ACID	Fruit				--
24	CHROMIUM	Fruit	3.0	3.5	-0.01602978329031414	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
20	CHOLINE	Seed		1642.0	-0.028583716787024864	--
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.
1	CHAVICINE	Fruit				--
3	CEDROL	Fruit Essent. Oil		700.0		--
8	CARYOPHYLLENE-OXIDE	Fruit Essent. Oil		9000.0	1.0	--
8	CARYOPHYLLENE-OXIDE	Fruit				Chemical Constituents of Oriental Herbs (3 diff. books)
1	CARYOPHYLLENE-ALCOHOL	Fruit Essent. Oil		700.0		--
31	CARYOPHYLLENE	Seed Essent. Oil				--
31	CARYOPHYLLENE	Fruit	1000.0	6000.0	-0.21726348790373295	--
19	CARVONE	Fruit				--
19	CARVONE	Fruit Essent. Oil		50.0	-0.7219111602348719	--
37	CARVACROL	Fruit				--
41	CAMPHOR	Fruit				--
9	CAMPHENE	Fruit		120.0	-0.3020426178192843	--
9	CAMPHENE	Seed Essent. Oil				--
9	CAMPHENE	Fruit Essent. Oil	1000.0	1400.0	-1.0221892865520528	--
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.)
28	CALCIUM	Fruit	2700.0	4989.0	0.26138541132704457	--
102	CAFFEIC-ACID	Fruit		6.0	-0.33780275264769194	--
6	BUTYRIC-ACID	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).

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
35	BORNEOL	Fruit				--
35	BORNEOL	Fruit Essent. Oil				--
47	BETA-SITOSTEROL	Stem		160.0	-1.327402794862025	--
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.)
3	BETA-SELINENE	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 Essent. Oil		6400.0	-1.0	--
13	BETA-PINENE	Fruit		2355.0	-0.2223943577434541	--
13	BETA-PINENE	Seed Essent. Oil				--
13	BETA-PINENE	Fruit Essent. Oil	85000.0	138000.0	0.9556217102868814	--
13	BETA-PINENE	Essential Oil				--
3	BETA-PHELLANDRENE	Seed Essent. Oil				--
3	BETA-PHELLANDRENE	Fruit Essent. Oil		41000.0	-0.47230877878271366	--
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	BETA-ELEMENE	Fruit Essent. Oil		900.0	-0.8343192281159078	--
53	BETA-CAROTENE	Fruit	0.114	0.128	-0.1505532074368425	--
6	BETA-BISABOLENE	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 Essent. Oil	21200.0	111600.0	1.0	--
20	BENZOIC-ACID	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
7	ASTRAGALIN	Fruit				--
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.
3	AR-CURCUMENE	Fruit Essent. Oil		2600.0		--
3	AR-CURCUMENE	Fruit				--
1	ALPHA-ZINGIBERENE	Fruit Essent. Oil		50100.0		--
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.
23	ALPHA-TERPINEOL	Fruit				--
23	ALPHA-TERPINEOL	Fruit Essent. Oil		1000.0	-0.910301229242406	--
13	ALPHA-TERPINENE	Fruit				--
13	ALPHA-TERPINENE	Seed Essent. Oil				--
13	ALPHA-TERPINENE	Fruit Essent. Oil		3000.0	-0.5711872077128709	--
3	ALPHA-SELINENE	Fruit Essent. Oil		700.0		--
3	ALPHA-SELINENE	Fruit				--
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	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
11	ALPHA-PHELLANDRENE	Seed Essent. Oil				--
11	ALPHA-PHELLANDRENE	Fruit Essent. Oil	6800.0	36000.0	-0.5597624933275978	--
15	ALPHA-LINOLENIC-ACID	Fruit	2200.0	2458.0	-0.03933424045785113	USDA's Ag Handbook 8 and sequelae)
2	ALPHA-HUMULENE	Fruit				--
2	ALPHA-HUMULENE	Fruit Essent. Oil	2100.0	19500.0	-1.0	--
2	ALPHA-HUMULENE	Leaf Essent. Oil				--
19	ACETYL-CHOLINE	Seed		23.0	-1.1887435300844578	--
6	ACETOPHENONE	Fruit Essent. Oil		5000.0		--
4	2-UNDECANONE	Fruit				--
67	1,8-CINEOLE	Fruit				--