

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

**Chemicals Found in *Mentha x piperita***

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
4	(+)-PULEGONE	Leaf	--	440	-1.0016634166889522	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
4	(-)-MENTHOL	Leaf	570	22800	1.2873367692180553	
2	(-)-MENTHONE	Leaf	310	12400	1.4793055504316144	
67	1,8-CINEOLE	Leaf	45	1390	-0.14434750238417682	
6	ACETALDEHYDE	Plant	--	--		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
16	ACETIC-ACID	Plant	--	--		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
3	ALANINE	Leaf	1950	9135	-0.8050413111598015	USDA's Ag Handbook 8 and sequelae)
7	ALPHA-CAROTENE	Plant	--	--		
7	ALPHA-CAROTENE	Leaf	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
28	ALPHA-PINENE	Leaf	5	230	-0.20961187746232532	
13	ALPHA-TERPINENE	Plant	20	20	-0.471448810117065	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
23	ALPHA-TERPINEOL	Essential Oil	--	--		
6	ALPHA-THUJONE	Essential Oil	--	--		
32	ALPHA-TOCOPHEROL	Leaf	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
32	ALPHA-TOCOPHEROL	Plant	--	--		
5	ALUMINUM	Leaf	9	62	-0.714035286644626	
1	AMYL-ALCOHOL	Plant	--	--		
36	ANETHOLE	Leaf	0.001	0.01	-0.4885520732733946	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
14	ARGININE	Plant	1730	8105	-0.5964833395353818	USDA's Ag Handbook 8 and sequelae)
112	ASCORBIC-ACID	Leaf	30	201	-0.4252698582409893	
3	ASPARTIC-ACID	Leaf	4430	20750	-0.3965260834123852	USDA's Ag Handbook 8 and sequelae)
10	AZULENE	Plant	--	--		Williamson, E. M. and Evans, F. J., Potter's New Cyclopaedia of Botanical Drugs and Preparations, Revised Ed., Saffron Walden, the C. W. Daniel Co., Ltd., Essex UK, 362 pp, 1988, reprint 1989.
20	BENZOIC-ACID	Leaf	0.02	0.2	-1.0444099465857013	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
9	BENZYL-ALCOHOL	Leaf	0.01	0.1	-0.9218445129286937	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
53	BETA-CAROTENE	Leaf	35	238	-0.10146187878336067	
13	BETA-IONONE	Leaf	0.3	3	-0.8660322478830228	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
13	BETA-PINENE	Leaf	10	400	0.16086697214271078	
5	BETA-THUJONE	Essential Oil	--	--		
14	BETAINE	Leaf	--	--		
4	CADINENE	Essential Oil	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
102	CAFFEIC-ACID	Shoot	--	--		
28	CALCIUM	Leaf	2414	16200	-0.15286128578990477	
9	CAMPHENE	Leaf	2	25	-0.183243207929448	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
37	CARVACROL	Essential Oil	--	--		
1	CARVEOL	Essential Oil	--	--		
19	CARVONE	Leaf	4	132	-0.2557908806749495	USDA's Ag Handbook 8 and sequelae)
8	CARYOPHYLLENE-OXIDE	Essential Oil	--	--		
1	CEDRENE	Essential Oil	--	--		
3	CEDROL	Essential Oil	--	--		
77	CHLOROGENIC-ACID	Shoot	--	--		
20	CHOLINE	Plant	--	--		Williamson, E. M. and Evans, F. J., Potter's New Cyclopaedia of Botanical Drugs and Preparations, Revised Ed., Saffron Walden, the C. W. Daniel Co., Ltd., Essex UK, 362 pp, 1988, reprint 1989.
24	CHROMIUM	Leaf	--	--		
15	CITRONELLOL	Essential Oil	--	--		
2	COBALT	Leaf	1.4	9.3	-0.24360871001374768	
12	COPPER	Plant	3	15	0.10889562727041327	
4	COSMOSIIN	Shoot	--	--		
57	COUMARIN	Leaf	0.02	0.2	-0.9931104006289337	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.

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1	CUMIN-ALCOHOL	Leaf	0.001	0.01		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
2	CYSTINE	Leaf	410	1920	-0.8393859041373689	USDA's Ag Handbook 8 and sequelae)
1	DELTA-DODECALACTONE	Leaf	0.001	0.01		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
1	DIMETHYL-SULFOXIDE	Essential Oil	--	--		
4	DIOSPHENOL	Leaf	0.01	0.1	-1.414213562373095	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
7	DIPENTENE	Essential Oil	--	--		
76	EUGENOL	Essential Oil	--	--		
8	EUPATORIN	Essential Oil	--	--		
15	FIBER	Leaf	80000	370000	2.5779097637042825	
3	GAMMA-DECALACTONE	Leaf	0.001	0.01		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
11	GAMMA-TERPINENE	Leaf	2	20	-0.3333608316460293	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
14	GAMMA-TOCOPHEROL	Leaf	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
14	GAMMA-TOCOPHEROL	Plant	--	--		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
1	GARDENIN-D	Leaf	--	--		
13	GERANIAL	Leaf	0.005	0.05	-0.40622213468772406	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.

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2	GERMACRENE-D	Essential Oil	--	--		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
2	GERMACRENE-D	Plant	40	1600	0.9268193060783411	
8	GLUTAMIC-ACID	Leaf	4090	19155	-1.0148279814319057	USDA's Ag Handbook 8 and sequelae)
12	GLYCINE	Leaf	1800	8430	-0.5274517393414566	USDA's Ag Handbook 8 and sequelae)
18	GUAIACOL	Leaf	0.01	0.1	-0.9999999999999998	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
8	HESPERETIN	Leaf	--	--		
7	HISTIDINE	Leaf	750	3515	-0.9341083079663628	USDA's Ag Handbook 8 and sequelae)
3	HYMENOXIN	Leaf	--	--		
6	IRON	Leaf	9	60	-0.7684938892798674	
2	ISOBUTYRIC-ACID	Leaf	0.03	0.3		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
4	ISOCHLOROGENIC-ACID	Shoot	--	--		
3	ISOLEUCINE	Leaf	1540	7215	-1.249160448308607	USDA's Ag Handbook 8 and sequelae)
1	ISOMENTHOL	Leaf	19	310		
3	ISOMENTHONE	Leaf	30	1000	-0.3512773577706616	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
1	ISOVALERALDEHYDE	Plant	--	--		
5	ISOVALERIC-ACID	Plant	--	--		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.

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8	JASMONE	Essential Oil	--	--		
2	LEUCINE	Leaf	2810	13160	-0.5164603640137028	USDA's Ag Handbook 8 and sequelae)
60	LIMONENE	Leaf	2	320	-0.1111439982811531	
60	LIMONENE	Leaf	--	--		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
53	LINALOOL	Leaf	12	120	-0.5643452828489668	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
27	LINOLEIC-ACID	Leaf	690	3230	-0.836657589234807	USDA's Ag Handbook 8 and sequelae)
3	LITHOSPERMIC-ACID	Shoot	--	--		
78	LUTEOLIN	Leaf	--	--		
4	LYSINE	Leaf	1610	7540	-1.2130018506666402	USDA's Ag Handbook 8 and sequelae)
65	MAGNESIUM	Leaf	985	6610	0.9592560865006985	
14	MANGANESE	Leaf	0.9	6.1	-0.449744887822011	
5	MENTHOFURAN	Ay	--	2200		
5	MENTHOFURAN	Plant	--	2200	-0.21169960706553295	
63	MENTHOL	Leaf	156	6750	1.712736280041748	
30	MENTHONE	Plant	20	2730	1.1206421982612318	
2	MENTHYL-ACETATE	Leaf	8	5080	1	
1	MENTHYL-VALERATE	Leaf	--	--		
15	METHIONINE	Leaf	530	2480	-0.5044307630520085	USDA's Ag Handbook 8 and sequelae)

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
13	MUFA	Leaf	330	1545	-0.5776850115332612	USDA's Ag Handbook 8 and sequelae)
22	MYRCENE	Leaf	1	10	-0.1690670199378623	
6	MYRISTIC-ACID	Leaf	60	280	-0.5487621803585421	USDA's Ag Handbook 8 and sequelae)
5	MYRTENAL	Leaf	0.002	0.02	-0.6615846316788583	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
2	MYRTENOL	Leaf	0.5	5	-0.4111878513407326	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
2	NEOMENTHOL	Leaf	33	820	-0.5511420219113455	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
4	NERAL	Leaf	0.001	0.01	-0.38676724089891473	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
10	NEROL	Tissue Culture	--	--		
11	NEROLIDOL	Leaf	0.05	0.5	-0.720791838993579	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
6	NEVADENSIN	Leaf	--	--		
39	NIACIN	Leaf	17	114	0.20068986644013934	
6	O-CRESOL	Leaf	0.001	0.01		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
2	OCIMENE	Essential Oil	--	--		
18	OLEIC-ACID	Leaf	290	1360	-0.4812366612025926	USDA's Ag Handbook 8 and sequelae)
25	P-COUMARIC-ACID	Shoot	--	--		

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8	P-CRESOL	Leaf	0.002	0.02		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
16	P-CYMENE	Leaf	2.5	30	-0.37518958392793345	
13	PALMITIC-ACID	Leaf	1760	8245	-0.2305670638390828	USDA's Ag Handbook 8 and sequelae)
2	PALMITOLEIC-ACID	Leaf	20	95	-0.5678932637249902	USDA's Ag Handbook 8 and sequelae)
11	PANTOTHENIC-ACID	Leaf	3	16	-0.5412275078515588	USDA's Ag Handbook 8 and sequelae)
24	PECTIN	Shoot	30000	30000	-1	
14	PERILLYL-ALCOHOL	Leaf	0.05	0.5	-1	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
4	PHELLANDRENE	Leaf	2	20	-0.7590978770025517	
2	PHENYLACETIC-ACID	Leaf	0.001	0.01	-0.9999999999999999	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
7	PHENYLALANINE	Leaf	1910	8945	-0.3435334143135559	USDA's Ag Handbook 8 and sequelae)
4	PHOSPHORUS	Leaf	1150	7720	0.5056965693142372	
1	PHYTOL	Leaf	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
2	PHYTOSTEROLS	Leaf	130	610	-0.6257204414433416	USDA's Ag Handbook 8 and sequelae)
12	PINENE	Leaf	2	23	-1.0108249650551153	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
3	PIPERITENONE	Essential Oil	--	--		
7	PIPERITONE	Leaf	--	500	-0.09373547780090898	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.



Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
14	POTASSIUM	Leaf	3367	22600	-0.3419611238269452	
4	PUFA	Leaf	5080	23795	0.5812447226029958	USDA's Ag Handbook 8 and sequelae)
28	PULEGONE	Leaf	3	6530	-0.16632182702943415	
3	PYRIDINE	Leaf	--	0.001		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
15	RIBOFLAVIN	Leaf	6	38.9	0.004481667283210983	
57	ROSMARINIC-ACID	Shoot	700	1800	-0.771027454835924	
57	ROSMARINIC-ACID	Plant	30000	30000	0.09914512201035752	Fitoterapia No.62: 166.
87	RUTIN	Plant	--	--		Williamson, E. M. and Evans, F. J., Potter's New Cyclopaedia of Botanical Drugs and Preparations, Revised Ed., Saffron Walden, the C. W. Daniel Co., Ltd., Essex UK, 362 pp, 1988, reprint 1989.
5	SABINENE	Essential Oil	--	--		
7	SALICYLATES	Leaf	700	700	0.9464615674670505	
60	SELENIUM	Leaf	0.2	1.1	-0.2980288183400826	
1	SERINE	Leaf	1460	6840	-0.887454734220509	USDA's Ag Handbook 8 and sequelae)
4	SIDERITOFILAVONE	Leaf	--	--		
4	SILICON	Leaf	--	--		
1	SODIUM	Leaf	291	1950	-0.30095148580568315	
8	STEARIC-ACID	Leaf	250	1170	0.14050356783238777	
35	TANNIN	Plant	--	--		
23	TERPINEN-4-OL	Essential Oil	--	--		

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9	TERPINOLENE	Leaf	--	--		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
31	THIAMIN	Leaf	--	12.1	0.7909632587159201	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
4	THREONINE	Leaf	1540	7215	-0.8631035461719366	USDA's Ag Handbook 8 and sequelae)
71	THYMOL	Essential Oil	--	--		
4	TIN	Leaf	2	11	-0.5530067419183887	
2	TRANS-BETA-FARNESENE	Essential Oil	--	--		
29	TRYPTOPHAN	Leaf	580	2715	-0.29998211418836496	USDA's Ag Handbook 8 and sequelae)
8	TYROSINE	Leaf	1130	5295	-0.7531896889832713	USDA's Ag Handbook 8 and sequelae)
3	VALINE	Leaf	1870	8760	-1.1025941184400472	USDA's Ag Handbook 8 and sequelae)
28	VANILLIN	Leaf	0.001	0.01		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
1	VIRIDIFLOROL	Leaf	1	15	-0.6497303988183931	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
3	XANTHOMICROL	Leaf	--	--		
77	ZINC	Leaf	--	--		