

**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
0	(+)-ALPHA-PINENE	Leaf	14	145		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	(+)-ISOMINTLACTONE	Leaf	0.03	0.3		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	(+)-LIMONENE	Leaf	160	1590	-1.4142135623730956	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
4	(+)-PULEGONE	Leaf	--	440	-1.0016634166889522	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	(-)-LIMONENE	Leaf	--	--		Jim Duke's personal files.
0	(-)-LINALOOL	Leaf	--	5100	1.230534258357786	
0	(-)-LINALYL-ACETATE	Leaf	--	3900	1	
4	(-)-MENTHOL	Leaf	570	22800	1.2873367692180553	
2	(-)-MENTHONE	Leaf	310	12400	1.4793055504316144	

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	(-)-MINTLACTONE	Leaf	0.3	3		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	1,3-DIMETHYL-CYCLOHEXANONE	Essential Oil	--	--		
0	1,4-DIMETHOXY-BENZENE	Leaf	0.001	0.01		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
67	1,8-CINEOLE	Leaf	45	1390	-0.14434750238417682	
0	1-MENTHYL-BETA-D-GLUCOSIDE	Plant	--	--		J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.
0	2,6-DIMETHYL-PYRIDINE	Leaf	--	--		
0	2-BUTYL-ISOVALERIC-ACID-METHYL-ESTER	Leaf	2	20		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	2-ETHYL-HEX-AN-1-OL	Leaf	0.001	0.01		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
0	2-HYDROXY-BENZALDEHYDE	Leaf	0.003	0.03		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	2-METHYL-BUT-2-EN-1-AL	Leaf	0.007	0.07		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	2-METHYL-BUTYRIC-ACID-METHYL-ESTER	Leaf	0.004	0.04		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	2-METHYL-CINNAMALDEHYDE	Leaf	0.001	0.01		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	2-PHENYLETHANOL	Leaf	0.2	2	1	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	2-PHENYLETHANOL-ACETATE	Leaf	0.05	0.5		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
0	2-PHENYLETHANOL-BUTYRATE	Leaf	0.05	0.5		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	2-PHENYLETHANOL-ISOBUTYRATE	Leaf	0.05	0.5		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	2-PHENYLETHANOL-N-VALERATE	Leaf	0.4	4		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	2-PROPYL-5-PHENYL-PYRIDINE	Leaf	--	--		
0	3(5',5'-DIMETHYL-TETRAHYDROFURAN-2'-YL)-BUT-CIS-2-EN-1-OL	Essential Oil	1.15	2.26	-0.7068025178754254	
0	3,4-DIMETHOXY-BENZALDEHYDE	Leaf	0.002	0.02		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	3,4-DIMETHOXY-SUDACHIUTIN	Leaf	--	--		
0	3,4-DIMETHYL-PSEUDACHITIN	Leaf	--	--		
0	3,4-DIMETHYL-SUDACHITIN	Leaf	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	3,6-DIMETHYL-6-OXO-OCTANOIC-ACID	Leaf	0.001	0.01		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	3,6-DIMETHYL-7-OXO-OCTANOIC-ACID	Leaf	0.001	0.01		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	3,6-DIMETHYL-7-OXO-OCTANOIC-ACID-ETHYL-ESTER	Leaf	0.001	0.01		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	3-METHYL-CYCLOHEXANONE	Leaf	0.4	4		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	3-PHENYL-4-PROPYL-PYRIDINE	Leaf	--	--		
0	3-PHENYL-PYRIDINE	Leaf	--	--		
0	4-HYDROXY-4-METHYL-CYCLOHEX-2-EN-1-ONE	Leaf	0.07	0.7		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
0	4-METHYL-2-PHENYL-PENT-2-EN-1-AL	Leaf	0.006	0.06		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	5,6-DIHYDROXY-3',4',7,8-TETRAMETHOXY-FLAVONE	Leaf	--	--		
0	5-ETHYL-2-METHYL-PYRIDINE	Leaf	--	--		
0	5-HYDROXY-3',4',6,7-TETRAMETHOXY-FLAVONE	Leaf	--	--		
0	5-METHYL-2-(2'-OXO-3'-BUTYL)-PHENOL	Leaf	0.05	3.85		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	5-METHYL-2-(3'-OXO-3'-PENTYL)-PHENOL	Leaf	0.01	0.04		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	5-METHYL-2-PHENYL-HEX-2-EN-1-AL	Leaf	0.003	0.03		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	5-METHYL-HEPTAN-3-ONE	Leaf	0.001	0.01		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	5-O-DEMETHYL-NOBILETIN	Leaf	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	6-METHYL-HEPT-5-EN-2-ONE	Leaf	0.01	0.1	-1	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	6-METHYL-JASMONATE	Leaf	0.001	0.01		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
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)
0	ALPHA-AMORPHENE	Essential Oil	--	--		
0	ALPHA-CADINENE	Essential Oil	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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.
7	ALPHA-CAROTENE	Plant	--	--		
0	ALPHA-COPAENE	Essential Oil	--	--		
0	ALPHA-GURJUNENE	Essential Oil	--	--		
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.
32	ALPHA-TOCOPHEROL	Plant	--	--		
5	ALUMINUM	Leaf	9	62	-0.714035286644626	
1	AMYL-ALCOHOL	Plant	--	--		



Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	AMYL-VALERATE	Leaf	0.1	1		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
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	
0	ASH	Leaf	21009	141000	0.3902259909336596	
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.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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.
0	BENZYL-CYANIDE	Leaf	0.002	0.02		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	BETA-BETULENOL	Plant	--	--		J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.
53	BETA-CAROTENE	Leaf	35	238	-0.10146187878336067	
0	BETA-CARYOPHYLLENE	Leaf	8	80	-0.2956599615229847	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	BETA-COPAENE	Essential Oil	--	--		
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	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	BETA-YLANGENE	Essential Oil	--	--		
14	BETAINE	Leaf	--	--		
0	BICYCLOELEMENE	Plant	--	--		Leung, A.Y., Encyclopedia of Common Natural Ingredients Used in Food, Drugs, and Cosmetics, John Wiley & Sons, New York, 1980.
0	BISABOLENE	Essential Oil	--	--		Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
0	BOVOLIDE	Leaf	0.001	0.01		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	BUTAN-2-ONE	Essential Oil	0.001	0.01		
4	CADINENE	Essential Oil	--	--		
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.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	CARBOHYDRATES	Leaf	82993	557000	-0.43619828700074176	
37	CARVACROL	Essential Oil	--	--		
1	CARVEOL	Essential Oil	--	--		
0	CARVEOL-ACETATE	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	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	CINEOLE	Leaf	2	1200	-0.7253068172850167	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	CINEROL	Essential Oil	--	--		
0	CINNAMIC-ACID-METHYL-ESTER	Essential Oil	--	--		
0	CIS-PIPERITOL	Leaf	0.5	5	-0.33738082371128875	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	CIS-ROSE-OXIDE	Plant	0.03	0.3		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	CIS-SABINOL	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.
0	CITRONELIC-ACID	Leaf	0.01	0.1		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
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.
0	CRYPTONE	Leaf	0.001	0.01	-0.2982453276081836	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
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.
0	CYCLOPENTANOL	Leaf	0.01	0.1		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)

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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.
0	DELTA-JASMINLACTONE	Leaf	0.05	0.5		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	DIHYDRO-LIMONENE-10-OL	Essential Oil	--	--		
0	DIHYDRO-TERPINEOL-ACETATE	Leaf	0.001	0.01		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	DIHYDROCARVONE	Leaf	--	--		
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	--	--		
0	EO	Leaf	2980	30000	1.624175155531196	

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	EO	Plant	1000	10000	2.2998004823343745	
0	ERIODICTYOL-7-O-RUTINOSIDE	Leaf	860	860		
76	EUGENOL	Essential Oil	--	--		
8	EUPATORIN	Essential Oil	--	--		
0	FAT	Leaf	8046	54000	-0.049061951284346775	
0	FENCHENE	Essential Oil	--	--		
15	FIBER	Leaf	80000	370000	2.5779097637042825	
0	FIBER(CRUDE)	Leaf	--	114000	-0.3493395715646385	
0	FIBER(DIETARY)	Leaf	--	323000	-0.6193479291932424	
0	FOLATE	Leaf	1	5	-0.50709255283711	
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.
0	GAMMA-JASMINLACTONE	Leaf	0.001	0.01		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.



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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.
0	GARDENIN-B	Leaf	--	--		
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.
0	GERANIC-ACID	Leaf	0.01	0.1	-1	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.

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0	GERANIOL-ACETATE	Leaf	0.1	1		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
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.
0	HEPTAN-2-ONE	Leaf	0.001	0.01		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
0	HEPTAN-3-OL	Leaf	0.5	5		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
8	HESPERETIN	Leaf	--	--		
0	HEX-TRANS-2-ENOIC-ACID	Leaf	0.001	0.01		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
7	HISTIDINE	Leaf	750	3515	-0.9341083079663628	USDA's Ag Handbook 8 and sequelae)
0	HYDROXY-BOVOLIDE	Leaf	0.001	0.01		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
3	HYMENOXIN	Leaf	--	--		
6	IRON	Leaf	9	60	-0.7684938892798674	
0	ISOAMYL-PHENYLACETATE	Leaf	0.05	0.5		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
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		
0	ISOMENTHOL-ACETATE	Leaf	8	80		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
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.
0	ISOMENTHYL-ACETATE	Plant	40	40		
0	ISOPULEGOL-ACETATE	Leaf	0.01	0.1		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	ISORHOIFOLIN	Leaf	--	--		
1	ISOVALERALDEHYDE	Plant	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
5	ISOVALERIC-ACID	Plant	--	--		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	ISOVALERIC-ACID-N-OCTYL-ESTER	Leaf	0.005	0.05		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
8	JASMONE	Essential Oil	--	--		
0	KILOCALORIES	Leaf	700	3280	0.42218860005660086	
0	LAVANDULOL	Leaf	0.001	0.01	-0.5763235266790874	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	LEDOL	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.
2	LEUCINE	Leaf	2810	13160	-0.5164603640137028	USDA's Ag Handbook 8 and sequelae)
60	LIMONENE	Leaf	2	320	-0.1111439982811531	

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
60	LIMONENE	Leaf	--	--		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	LIMONENE-10-OL-ACETATE	Essential Oil	--	--		
0	LINALOL	Leaf	12	120	-0.37152122337493615	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)
0	LINOLENIC-ACID	Leaf	4350	20375	-0.25757849096892454	USDA's Ag Handbook 8 and sequelae)
3	LITHOSPERMIC-ACID	Shoot	--	--		
78	LUTEOLIN	Leaf	--	--		
0	LUTEOLIN-7-O-RUTINOSIDE	Leaf	120	120		
4	LYSINE	Leaf	1610	7540	-1.2130018506666402	USDA's Ag Handbook 8 and sequelae)
65	MAGNESIUM	Leaf	985	6610	0.9592560865006985	

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
14	MANGANESE	Leaf	0.9	6.1	-0.449744887822011	
0	MENTHACUBANONE	Shoot	--	--		
0	MENTHOCUBANONE	Shoot	--	--		
5	MENTHOFURAN	Ay	--	2200		
5	MENTHOFURAN	Plant	--	2200	-0.21169960706553295	
0	MENTHOKUBANONE	Shoot	--	--		
63	MENTHOL	Leaf	156	6750	1.712736280041748	
30	MENTHONE	Plant	20	2730	1.1206421982612318	
0	MENTHOSIDE	Leaf	--	--		
2	MENTHYL-ACETATE	Leaf	8	5080	1	
0	MENTHYL-ISOVALERATE	Leaf	0.01	0.1		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
1	MENTHYL-VALERATE	Leaf	--	--		
15	METHIONINE	Leaf	530	2480	-0.5044307630520085	USDA's Ag Handbook 8 and sequelae)
0	MINTLACTONE	Leaf	0.3	3		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
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.
0	NEO-ISOPULEGOL	Essential Oil	--	--		
0	NEOISOMENTHOL-ACETATE	Essential Oil	--	--		
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.
0	NEOMENTHONE	Leaf	70	700		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
0	NEOMENTHYL-ACETATE	Leaf	15	150		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	
0	NONAN-1-OL	Leaf	0.001	0.01		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
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.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
2	OCIMENE	Essential Oil	--	--		
0	OCT-TRANS-2-EN-OL	Leaf	0.001	0.01		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	OCTAN-3-OL	Leaf	4	70	-0.44215414473573506	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
18	OLEIC-ACID	Leaf	290	1360	-0.4812366612025926	USDA's Ag Handbook 8 and sequelae)
25	P-COUMARIC-ACID	Shoot	--	--		
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	
0	P-CYMOL	Leaf	4	130	-0.49340535570543737	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	P-MENTH-TRANS-2-EN-1-OL	Essential Oil	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	P-MENTHANE	Essential Oil	--	--		
0	P-METHOXY-ACETOPHENONE	Leaf	0.01	0.1		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
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	
0	PENT-CIS-2-EN-1-OL	Leaf	0.5	5		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	PENTAL-1-OL	Essential Oil	--	--		
0	PERILLYA-ALCOHOL	Leaf	0.05	0.5		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	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	PELLANDRENE	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	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
7	PIPERITONE	Leaf	--	500	-0.09373547780090898	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	PIPERITONE-OXIDE	Plant	--	--		
14	POTASSIUM	Leaf	3367	22600	-0.3419611238269452	
0	PROLINE	Leaf	1540	7215	-0.5836536791989987	USDA's Ag Handbook 8 and sequelae)
0	PROTEIN	Leaf	36952	248000	0.3606805662486567	
0	PROTEIN	Plant	127000	127000	-0.3807803570376024	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
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	Plant	30000	30000	0.09914512201035752	Fitoterapia No.62: 166.
57	ROSMARINIC-ACID	Shoot	700	1800	-0.771027454835924	

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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	--	--		
0	SABINENE-ACETATE	Plant	--	--		
0	SABINENE-HYDRATE	Leaf	5	110	-0.9948320067476139	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
7	SALICYLATES	Leaf	700	700	0.9464615674670505	
0	SALVIGENIN	Essential Oil	--	--		
60	SELENIUM	Leaf	0.2	1.1	-0.2980288183400826	
1	SERINE	Leaf	1460	6840	-0.887454734220509	USDA's Ag Handbook 8 and sequelae)
0	SFA	Leaf	2460	11520	-0.127821093255717	USDA's Ag Handbook 8 and sequelae)
4	SIDERITOFILAVONE	Leaf	--	--		
4	SILICON	Leaf	--	--		
1	SODIUM	Leaf	291	1950	-0.30095148580568315	

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
8	STEARIC-ACID	Leaf	250	1170	0.14050356783238777	
35	TANNIN	Plant	--	--		
0	TANNINS	Plant	60000	120000	-0.050903777361345805	Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
23	TERPINEN-4-OL	Essential Oil	--	--		
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.
0	THIAMINE	Leaf	2	12.1	1.6818266481789117	
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	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	TRANS-PIPERITOL	Leaf	0.5	5	-0.5608284179543459	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	TRANS-ROSE-OXIDE	Plant	0.01	0.1		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
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.
0	VITAMIN-B-6	Leaf	1.3	6		
0	WATER	Leaf	--	851000	0.21633383145045382	



Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
3	XANTHOMICROL	Leaf	--	--		
77	ZINC	Leaf	--	--		