

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

**Chemicals Found in *Agathosma betulina***

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	(+)-4-HYDROXYMENTHONE	Leaf Essent. Oil	--	--		
0	(+)-8-HYDROXYMENTHONE	Leaf Essent. Oil	--	--		
0	(+)-ISOPULEGONE	Leaf Essent. Oil	--	--		
0	(+)-LIMONENE	Leaf	1500	2500	0.707106781186547	List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	(+)-LIMONENE	Leaf Essent. Oil	--	--		
0	(+)-LINALOOL	Leaf Essent. Oil	--	--		
0	(+)-MENTHONE	Leaf	1350	2250		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	(+)-MENTHONE	Leaf Essent. Oil	--	--		
4	(+)-PULEGONE	Leaf	1500	3000	-0.15169172521226934	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.
0	(-)-ISOMENTHONE	Leaf Essent. Oil	--	--		
0	(-)-ISOMENTHONE	Leaf	5250	8750		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	(-)-ISOPULEGONE	Leaf Essent. Oil	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	(-)-ISOPULEGONE	Leaf	450	900		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.
0	(-)-PULEGONE	Leaf Essent. Oil	--	--		
0	(-)-PULEGONE	Leaf	1650	2750	-0.7071067811865475	List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	1,8-CINEOL	Leaf Essent. Oil	--	--		
0	1-4-CINEOL	Leaf Essent. Oil	--	--		
0	2-EPI-P-MENTHANE-8-THIOL-1-ONE	Plant	--	--		J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.
0	3-METHYL-CYCLOHEXANONE	Leaf Essent. Oil	--	--		
0	4-ACETOXY-ISOMENTHONE	Leaf Essent. Oil	--	--		
0	4-ACETOXY-ISOPULEGONE	Leaf Essent. Oil	--	--		
0	4-HYDROXY-DIOSPHENOL	Leaf Essent. Oil	--	--		
0	4-HYDROXY-ISOPULEGONE	Leaf Essent. Oil	--	--		
8	4-TERPINEOL	Leaf	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	5-METHYL-FURFURAL	Leaf Essent. Oil	--	--		
0	8-ACETOXYMENTHONE	Leaf Essent. Oil	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	8-ACETYL-THIOPIPERITONE	Leaf Essent. Oil	--	--		
0	8-ACETYLTIO-P-MENTHAN-3-ONE	Essential Oil	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
0	8-MERCAPTO-P-MENTHA-3-ONE	Leaf	--	--		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.
0	ALPHA-MUUROLENE	Leaf Essent. Oil	--	--		
11	ALPHA-PHELLANDRENE	Leaf Essent. Oil	--	--		
0	ALPHA-PHELLANDROL	Leaf Essent. Oil	--	--		
28	ALPHA-PINENE	Leaf	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
28	ALPHA-PINENE	Leaf Essent. Oil	--	--		
13	ALPHA-TERPINENE	Leaf	--	--		
13	ALPHA-TERPINENE	Leaf Essent. Oil	--	--		
23	ALPHA-TERPINEOL	Leaf Essent. Oil	--	--		
5	ALUMINUM	Leaf	1360	1360	0.6789856525717123	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
3	AROMADENDRENE	Leaf Essent. Oil	--	--		
112	ASCORBIC-ACID	Leaf	4900	4900	0.010737464231764774	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	ASH	Leaf	81000	81000	-0.666900349430093	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
0	BAROSMA-CAMPHOR	Leaf	1800	3000		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
3	BETA-DAMASCENONE	Leaf Essent. Oil	--	--		
5	BETA-ELEMENE	Leaf Essent. Oil	--	--		
13	BETA-IONONE	Leaf Essent. Oil	--	--		
3	BETA-PHELLANDRENE	Leaf Essent. Oil	--	--		
0	BETA-PHELLANDROL	Leaf Essent. Oil	--	--		
13	BETA-PINENE	Leaf Essent. Oil	--	--		
3	BETA-TERPINEOL	Leaf Essent. Oil	--	--		
35	BORNEOL	Leaf Essent. Oil	--	--		
0	BUCHU-CAMPHOR	Leaf Essent. Oil	--	--		
0	CALAMENENE	Leaf Essent. Oil	--	--		
28	CALCIUM	Leaf	38800	38800	1.391343499963003	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
9	CAMPHENE	Leaf	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
9	CAMPHENE	Leaf Essent. Oil	--	--		
19	CARVONE	Leaf Essent. Oil	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
24	CHROMIUM	Leaf	29	29	1.832564064465539	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
0	CIS-2-ACETOXY-PULEGONE	Leaf Essent. Oil	--	--		
0	CIS-BETA-OCIMENE	Leaf Essent. Oil	--	--		
0	CIS-CARVEOL	Leaf Essent. Oil	--	--		
0	CIS-CARVEYL-ACETATE	Leaf Essent. Oil	--	--		
0	CIS-LINALOOL-OXIDE	Leaf Essent. Oil	--	--		
15	CITRONELLOL	Leaf Essent. Oil	--	--		
2	CITRONELLYL-ACETATE	Leaf Essent. Oil	--	--		
2	COBALT	Leaf	--	87	0.21821961505531773	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
0	CYMOPYROCATECHOL	Leaf Essent. Oil	--	--		
19	D-LIMONENE	Leaf	--	--		Jim Duke's personal files.
0	DEC-CIS-4-ENOL	Leaf Essent. Oil	--	--		
0	DEC-TRANS-4-ENOL	Leaf Essent. Oil	--	--		
0	DELTA-TERPINEOL	Leaf Essent. Oil	--	--		
0	DIHYDROCARVONE	Leaf Essent. Oil	--	--		
13	DIOSMETIN	Leaf	--	--		Newall, C. A., Anderson, L. A. and Phillipson, J. D. 1996. Herbal Medicine - A Guide for Health-care Professionals. The Pharmaceutical Press, London. 296pp.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
34	DIOSMIN	Leaf	200	500		
4	DIOSPHENOL	Leaf Essent. Oil	--	--		
4	DIOSPHENOL	Leaf	1800	3600	0.7071067811865478	
0	DIOSPHENOL-METHYL-ETHER	Leaf Essent. Oil	--	--		
0	DIOSPHENOLENE	Leaf Essent. Oil	--	--		
7	DIPENTENE	Essential Oil	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
0	DL-PIPERITONE-EPOXIDE	Leaf	1425	2375		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	DL-PIPERITONEPOXIDE	Leaf	1425	2375		
0	DODECA-CIS-CIS-3,6-DIENOL	Leaf Essent. Oil	--	--		
0	DODECA-CIS-CIS-3,6-DIENYL-ACETATE	Leaf Essent. Oil	--	--		
0	EO	Leaf	10000	35000	2.0639741997608496	
12	ESTRAGOLE	Leaf Essent. Oil	--	--		
76	EUGENOL	Leaf Essent. Oil	--	--		
6	FURFURAL	Leaf Essent. Oil	--	--		
0	GAMMA-MUUROLENE	Leaf Essent. Oil	--	--		
11	GAMMA-TERPINENE	Leaf	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
11	GAMMA-TERPINENE	Leaf Essent. Oil	--	--		
18	GUAIACOL	Leaf Essent. Oil	--	--		
31	HESPERIDIN	Leaf	10000	34000	0.7071067811865476	List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
6	IRON	Leaf	867	867	1.2770392926238854	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
3	ISOMENTHONE	Leaf Essent. Oil	--	--		
3	ISOMENTHONE	Leaf	5250	8750	2.193021261596281	List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	ISONEOMENTHOL	Leaf Essent. Oil	--	--		
0	ISONEOMENTHOL-ACETATE	Leaf Essent. Oil	--	--		
0	ISOPULEGOLE	Leaf Essent. Oil	--	--		
0	ISOPULEGOLE-ACETATE	Leaf Essent. Oil	--	--		
4	ISOPULEGONE	Leaf Essent. Oil	--	--		
4	ISOPULEGONE	Leaf	450	900	0.7071067811865482	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.
0	L-MENTHONE	Essential Oil	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
60	LIMONENE	Leaf Essent. Oil	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
65	MAGNESIUM	Leaf	2210	2210	-0.7397339063106452	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
14	MANGANESE	Leaf	675	675	0.6622735776500002	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
5	MENTHOFURAN	Leaf Essent. Oil	--	--		
63	MENTHOL	Leaf Essent. Oil	--	--		
0	MENTHOL-ACETATE	Leaf Essent. Oil	--	--		
30	MENTHONE	Leaf Essent. Oil	--	--		
3	MUCILAGE	Leaf	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
22	MYRCENE	Leaf	--	--		
22	MYRCENE	Leaf Essent. Oil	--	--		
0	MYRTANOL	Leaf Essent. Oil	--	--		
0	MYRTANOL-ACETATE	Leaf Essent. Oil	--	--		
2	MYRTENOL	Leaf Essent. Oil	--	--		
1	MYRTENYL-ACETATE	Leaf Essent. Oil	--	--		
0	NEOISOPULEGOLE	Leaf Essent. Oil	--	--		
2	NEOMENTHOL	Leaf Essent. Oil	--	--		
10	NEROL	Leaf Essent. Oil	--	--		
0	NEROL-ACETATE	Leaf Essent. Oil	--	--		
0	NEROL-ACETONE	Leaf Essent. Oil	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
39	NIACIN	Leaf	--	42	-0.6750885614025129	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
0	P-CYMEN-8-OL	Leaf Essent. Oil	--	--		
16	P-CYMENE	Leaf Essent. Oil	--	--		
0	P-CYMOL	Essential Oil	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	P-MENTH-1-EN-9-AL	Leaf Essent. Oil	--	--		
0	P-MENTH-1-EN-9-OL	Leaf Essent. Oil	--	--		
0	P-MENTH-1-EN-9-YL-ACETATE	Leaf Essent. Oil	--	--		
0	P-MENTH-4(8)-EN-7-OL	Leaf Essent. Oil	--	--		
0	P-MENTH-8-EN-7-OL	Leaf Essent. Oil	--	--		
0	P-MENTHA-1,3,6-TRIENE	Leaf Essent. Oil	--	--		
0	P-MENTHA-1,8-DIEN-10-AL	Leaf Essent. Oil	--	--		
0	P-MENTHA-1,8-DIEN-10-OL	Leaf Essent. Oil	--	--		
0	P-MENTHAN-3-ON-8-THIOL	Leaf	--	--		Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
0	P-MENTHANE-8-THIOL-1-ONE	Plant	--	--		J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.
0	P-MENTHANE-8-THIOL-3-ONE	Leaf Essent. Oil	--	--		
6	PHENETHYL-ALCOHOL	Leaf Essent. Oil	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
4	PHOSPHORUS	Leaf	6780	6780	0.33274881093925496	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
0	PINOL	Leaf Essent. Oil	--	--		
3	PIPERITENONE	Leaf Essent. Oil	--	--		
7	PIPERITONE	Leaf Essent. Oil	--	--		
14	POTASSIUM	Leaf	11700	11700	-0.8232807551707827	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
0	PROTEIN	Leaf	92000	92000	-1.1955701649552826	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
0	PSEUDODIOSPHENOL	Leaf Essent. Oil	--	--		
28	PULEGONE	Leaf	1650	2750	-0.32792065886702804	
0	PULEGONE-EPOXIDE-A	Leaf Essent. Oil	--	--		
176	QUERCETIN	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.
0	QUERCETIN-3,7-DI-O-BETA-D-GLUGOSIDE	Leaf	--	--		
0	QUERCETIN-3,7-DIGLUCOSIDE	Leaf	--	--		
0	QUERCETRIN-3,7-DIGLUCOSIDE	Essential Oil	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
0	QUERCETRIN-3,7-GLUCOSIDE	Essential Oil	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	RESIN	Leaf	50000	50000	-0.27511406022450346	CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
15	RIBOFLAVIN	Leaf	1.1	1.1	-0.172705289047245	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
87	RUTIN	Leaf	--	--		
87	RUTIN	Essential Oil	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
5	SABINENE	Leaf Essent. Oil	--	--		
60	SELENIUM	Leaf	--	70	4.995871526729794	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
4	SILICON	Leaf	43	43	-0.28529562369022266	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
1	SODIUM	Leaf	2760	2760	-0.15708991303999795	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
0	SPATHULENOL	Leaf Essent. Oil	--	--		
23	TERPINEN-4-OL	Leaf	--	--		Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
9	TERPINOLENE	Leaf Essent. Oil	--	--		
31	THIAMIN	Leaf	7	19	2.2289490986880964	
4	TIN	Leaf	11	11	-0.5530067419183887	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
0	TRANS-2-ACETOXY-PULEGONE	Leaf Essent. Oil	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	TRANS-2-HYDROXYMENTHONE	Leaf Essent. Oil	--	--		
0	TRANS-BETA-OCIMENE	Leaf Essent. Oil	--	--		
1	TRANS-CARVEOL	Leaf Essent. Oil	--	--		
0	TRANS-CARVEYL-ACETATE	Leaf Essent. Oil	--	--		
0	TRANS-LINALOOL-OXIDE	Leaf Essent. Oil	--	--		
0	VINYL-GUAIACOL	Leaf Essent. Oil	--	--		
77	ZINC	Leaf	84	84	-0.01125863721237699	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.