

Dr. Duke's Phytochemical and Ethnobotanical Database

Chemicals Found in *Borago officinalis*

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	(-)-BORNESITOL	Plant	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	7-ACETYL-INTERMEDINE	Leaf	0.1	0.1		
0	7-ACETYL-LYCOPSAMINE	Leaf	0.1	3		
16	ACETIC-ACID	Leaf	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
16	ACETIC-ACID	Plant	--	--		
1	ACETYLINTERMEDINE	Shoot	--	--		Jim Duke's personal files.
1	ACETYLLYCOPSAMINE	Shoot	--	--		Jim Duke's personal files.
3	ALANINE	Leaf	--	--		Jim Duke's personal files.
0	ALKALOIDS	Leaf	2	98	-0.6091138813378191	
0	ALKALOIDS	Seed	--	300	-0.8008331835428224	
0	ALKALOIDS	Plant	2	98	-0.4383926585856858	
12	ALLANTOIN	Sprout Seedling	--	--		
12	ALLANTOIN	Leaf	61	61	-1	Jim Duke's personal files.
12	ALLANTOIN	Root	49	49	-0.7051198369303746	Jim Duke's personal files.
12	ALLANTOIN	Seed	423	423	-1	Jim Duke's personal files.
12	ALLANTOIN	Embryo	--	--		Jim Duke's personal files.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
12	ALLANTOIN	Rhizome	--	--		Jim Duke's personal files.
15	ALPHA-LINOLENIC-ACID	Seed Essent. Oil	--	--		Jim Duke's personal files.
1	AMABILINE	Shoot	--	--		Jim Duke's personal files.
1	AMABILINE	Leaf	0.1	3		
1	AMABILINE	Seed	20	20		Jim Duke's personal files.
0	ARABINOSE	Plant	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
112	ASCORBIC-ACID	Leaf	30	5005	0.020480126257650957	
112	ASCORBIC-ACID	Shoot	39	39	-0.3692514552082671	Jim Duke's personal files.
3	ASPARTIC-ACID	Leaf	--	--		Jim Duke's personal files.
53	BETA-CAROTENE	Leaf	25	360	0.42984159542352385	USDA's Ag Handbook 8 and sequelae)
0	BORAGO-TRIACYLGLYCEROLS	Seed Oil	--	--		Jim Duke's personal files.
0	BORNESITOL	Plant	--	--		
28	CALCIUM	Leaf	930	5005	-0.9177892759006925	USDA's Ag Handbook 8 and sequelae)
0	CARBOHYDRATES	Leaf	30600	437580	-1.3858995814533719	USDA's Ag Handbook 8 and sequelae)
20	CHOLINE	Leaf	--	--		
2	COBALT	Plant	--	--		
7	CYANIDIN	Plant	--	--		Jim Duke's personal files.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	CYANOGENS	Leaf	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	CYNAUSTINE	Shoot	--	--		Jim Duke's personal files.
9	DELPHINIDIN	Plant	--	--		Jim Duke's personal files.
1	DHURRIN	Plant	35	350		
2	ERUCIC-ACID	Seed	2500	7390	-0.7373722556756456	Heredity 65: 249-257. 1990.
0	FAT	Leaf	7000	100000	0.8675702877100614	
0	FAT	Seed	130000	383000	0.6195066267978355	
15	FIBER	Leaf	9200	131560	-0.3706742625139754	USDA's Ag Handbook 8 and sequelae)
8	FRUCTOSE	Leaf	--	--		Jim Duke's personal files.
1	GALACTOSE	Plant	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
20	GAMMA-LINOLENIC-ACID	Leaf	--	--		Jim Duke's personal files.
20	GAMMA-LINOLENIC-ACID	Fruit Essent. Oil	185000	240000		Jim Duke's personal files.
20	GAMMA-LINOLENIC-ACID	Seed Oil	249000	249000	-1	Jim Duke's personal files.
20	GAMMA-LINOLENIC-ACID	Seed	26000	84260	1.2128075738135886	J. Pharm. Belg. 43:359-363. 1988.
20	GAMMA-LINOLENIC-ACID	Seed Essent. Oil	190000	190000	0.9057529185791032	Jim Duke's personal files.
7	GLUCOSE	Leaf	--	--		Jim Duke's personal files.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
7	GLUCOSE	Plant	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
12	GLYCINE	Leaf	--	--		Jim Duke's personal files.
9	HCN	Plant	--	15		
1	HYDROXYPROLINE	Seed	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
1	INTERMEDINE	Shoot	--	--		Jim Duke's personal files.
1	INTERMEDINE	Leaf	--	0.1		
6	IRON	Leaf	33	472	0.2758179706263857	USDA's Ag Handbook 8 and sequelae)
75	KAEMPFEROL	Plant	--	--		Jim Duke's personal files.
8	LACTIC-ACID	Leaf	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
8	LACTIC-ACID	Plant	--	--		
2	LEUCINE	Leaf	--	--		Jim Duke's personal files.
27	LINOLEIC-ACID	Seed	45500	149370	0.36198337357431687	
27	LINOLEIC-ACID	Seed Essent. Oil	360000	360000	-0.9883274356612421	Jim Duke's personal files.
0	LINOLENIC-ACID	Seed	25000	73000	0.6945369520909026	Wealth of India.
1	LYCOPSAMINE	Shoot	--	--		Jim Duke's personal files.
1	LYCOPSAMINE	Leaf	1	3		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
65	MAGNESIUM	Leaf	520	7436	1.2782028442421007	USDA's Ag Handbook 8 and sequelae)
15	MALIC-ACID	Plant	--	--		
15	MALIC-ACID	Leaf	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
3	MUCILAGE	Shoot	--	--		Jim Duke's personal files.
3	MUCILAGE	Plant	110000	300000	1.7081599483402181	
13	MUFA	Seed	74750	220225	0.8015642841623266	J. Pharm. Belg. 43:359-363. 1988.
39	NIACIN	Leaf	9	129	0.3831437055740252	USDA's Ag Handbook 8 and sequelae)
0	OCTADECA-6,9,12,15-TETRAENOIC-ACID	Seed	--	--		Jim Duke's personal files.
0	OCTADECADIENOIC-ACID	Seed	--	--		Jim Duke's personal files.
0	OCTADECATETRA-6,9,12,15-ENOIC-ACID	Seed	--	--		Jim Duke's personal files.
0	OCTADECATRIENOIC-ACID	Seed	--	--		Jim Duke's personal files.
0	OCTADECENOIC-ACID	Seed	--	--		Jim Duke's personal files.
18	OLEIC-ACID	Seed Essent. Oil	200000	200000	1.4142135623730951	Jim Duke's personal files.
18	OLEIC-ACID	Seed	22100	100000	-0.1570414967328784	
13	PALMITIC-ACID	Seed	15600	46600	0.26190815437347253	
4	PHOSPHORUS	Leaf	530	7579	0.47975440555798987	USDA's Ag Handbook 8 and sequelae)
14	POTASSIUM	Leaf	4700	67210	1.6279167435353101	USDA's Ag Handbook 8 and sequelae)
0	PROTEIN	Leaf	18000	257400	0.4544546487699197	USDA's Ag Handbook 8 and sequelae)

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	PROTEIN	Seed	209000	209000	-0.22057386196586456	
4	PUFA	Seed	27300	80430	-0.19333848445579574	J. Pharm. Belg. 43:359-363. 1988.
0	PYRROLIZIDINES	Plant	2	10		
176	QUERCETIN	Plant	--	--		Jim Duke's personal files.
0	RESIN	Plant	--	--		
15	RIBOFLAVIN	Leaf	1	21	-0.07942432526480918	USDA's Ag Handbook 8 and sequelae)
57	ROSMARINIC-ACID	Inflorescence	--	--		Jim Duke's personal files.
57	ROSMARINIC-ACID	Shoot	500	500	-0.8320524588716441	Jim Duke's personal files.
57	ROSMARINIC-ACID	Plant	500	7000	-1.2991752308715747	Fitoterapia No.62: 166.
5	SAPONINS	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.
1	SERINE	Sprout Seedling	--	--		Jim Duke's personal files.
1	SERINE	Leaf	--	--		Jim Duke's personal files.
0	SFA	Seed	21710	63960	0.05001349654521198	J. Pharm. Belg. 43:359-363. 1988.
1	SILICIC-ACID	Plant	15000	22000	-1.0451241158585747	
1	SODIUM	Plant	800	11440	0.3291979572172995	
8	STEARIC-ACID	Seed	6110	18000	-0.17485116289238925	
0	STERIDONIC-ACID	Leaf	--	--		Jim Duke's personal files.
0	SUPINIDINE?	Leaf	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
4	SUPININE	Leaf	0.1	3		
4	SUPININE	Shoot	--	--		Jim Duke's personal files.
0	SUPININE-VIRIDIFLORATE	Plant	--	--		
0	SUPININE-VIRIDIFLORATE	Leaf	--	--		Wealth of India.
35	TANNIN	Plant	30000	30000	-0.783056468120132	
0	THESININE	Flower	--	--		Jim Duke's personal files.
0	THESININE	Seed Oil	--	--		Jim Duke's personal files.
0	THESININE	Seed	200	200		
31	THIAMIN	Leaf	1	9	0.144911649453059	USDA's Ag Handbook 8 and sequelae)
3	VALINE	Leaf	--	--		Jim Duke's personal files.
0	WATER	Herb	--	930000	-1.412953309430929	USDA's Ag Handbook 8 and sequelae)
77	ZINC	Plant	--	--		Abstract (See species file)