Dr. Duke's Phytochemical and Ethnobotanical Databases

Chemicals found in Zingiber officinale

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
67	1,8-CINEOLE	Rhizome		490.0	-0.7528854377140122	--
67	1,8-CINEOLE	Rhizome Essent. Oil	26000.0	100000.0		--
3	10-DEHYDROGINGERDIONE	Rhizome				--
2	10-GINGERDIONE	Root				--
2	10-GINGERDIONE	Rhizome		11.0		--
3	10-GINGEROL	Root				--
3	10-GINGEROL	Rhizome	2.6	1862.0		--
8	4-TERPINEOL	Rhizome				--
2	6-DEHYDROGINGERDIONE	Rhizome				--
1	6-GINGERDIOL	Rhizome				--
2	6-GINGERDIONE	Rhizome	3.3	10.0		--
28	6-GINGEROL	Rhizome	130.0	7138.0		--
28	6-GINGEROL	Rhizome Essent. Oil				--
28	6-GINGEROL	Root Essent. Oil				--
28	6-GINGEROL	Root				--
28	6-GINGEROL	Essential Oil				--
1	6-GINGESULFONIC-ACID	Rhizome		13.0		--
32	6-SHOGAOL	Rhizome	40.0	330.0		--
1	8-BETA-17-EPOXY-LABD-TRANS-12-ENE-15,16-DIAL	Rhizome		400.0		--
5	8-GINGEROL	Rhizome	110.0	1069.0		--
5	8-GINGEROL	Rhizome Essent. Oil				--
5	8-GINGEROL	Root				--
2	8-SHOGAOL	Rhizome	48.0	130.0		--
2	9-OXO-NEROLIDOL	Rhizome				--
2	9-OXO-NEROLIDOL	Rhizome Essent. Oil				--
6	ACETALDEHYDE	Rhizome				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
6	ACETALDEHYDE	Essential Oil				Kameoka, H. and Nakai, K. 1987. Components of essential oil from the root of Glycyrrhiza-glabra. Nippon Gogeikagaku Kaishi 61(9): 1119-1122.
16	ACETIC-ACID	Rhizome Essent. Oil				--
16	ACETIC-ACID	Rhizome				--
3	ACETONE	Rhizome				--
3	ACETONE	Essential Oil				Kameoka, H. and Nakai, K. 1987. Components of essential oil from the root of Glycyrrhiza-glabra. Nippon Gogeikagaku Kaishi 61(9): 1119-1122.
3	ALANINE	Root	310.0	1793.0	-0.8118285216311718	USDA's Ag Handbook 8 and sequelae)
3	ALANINE	Rhizome	310.0	1793.0	-1.0	--
3	ALPHA-CADINOL	Rhizome				--
3	ALPHA-CADINOL	Rhizome Essent. Oil				--
3	ALPHA-CURCUMENE	Rhizome Essent. Oil		19400.0		--
3	ALPHA-CURCUMENE	Rhizome		280.0		--
15	ALPHA-LINOLENIC-ACID	Rhizome	340.0	3190.0		--
15	ALPHA-LINOLENIC-ACID	Root	340.0	3190.0	1.9620665358845129	USDA's Ag Handbook 8 and sequelae)
11	ALPHA-PHELLANDRENE	Rhizome Essent. Oil		4000.0		--
11	ALPHA-PHELLANDRENE	Rhizome	3.0	200.0	-1.0	--
28	ALPHA-PINENE	Rhizome Essent. Oil		39000.0	1.392186073629917	--
28	ALPHA-PINENE	Rhizome		720.0	1.111167799007431	--
3	ALPHA-SELINENE	Rhizome				--
3	ALPHA-SELINENE	Rhizome Essent. Oil				--
13	ALPHA-TERPINENE	Rhizome Essent. Oil		700.0		--
13	ALPHA-TERPINENE	Rhizome	0.5	35.0	1.0	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
23	ALPHA-TERPINEOL	Rhizome Essent. Oil		10000.0		--
23	ALPHA-TERPINEOL	Rhizome	8.0	500.0	-0.26863716905966795	--
1	ALPHA-ZINGIBERENE	Rhizome Essent. Oil		442600.0		--
1	ALPHA-ZINGIBERENE	Rhizome	74.0	4600.0	1.0	--
1	ALPHA-ZINGIBERENE	Rhizome		200.0	-1.0	--
5	ALUMINUM	Root	46.0	663.0	0.04325697966835661	--
5	ALUMINUM	Rhizome		663.0		--
3	AR-CURCUMENE	Root				--
3	AR-CURCUMENE	Rhizome Essent. Oil		25000.0		--
3	AR-CURCUMENE	Rhizome	20.0	9520.0	1.0	--
3	AR-CURCUMENE	Root Essent. Oil				--
14	ARGININE	Tuber				--
14	ARGININE	Rhizome	430.0	2486.0	-1.0	--
14	ARGININE	Root	430.0	2486.0	-0.41425783754112155	USDA's Ag Handbook 8 and sequelae)
3	AROMADENDRENE	Rhizome Essent. Oil				--
112	ASCORBIC-ACID	Root	20.0	288.0	-0.48133996980232785	--
112	ASCORBIC-ACID	Rhizome	0.0	317.0	-0.3087839350199982	--
2	ASPARAGINE	Rhizome		500.0	-0.734470603058131	--
3	ASPARTIC-ACID	Tuber				--
3	ASPARTIC-ACID	Rhizome	2080.0	11990.0	-1.0	--
3	ASPARTIC-ACID	Root	2080.0	11990.0	0.26543138626572105	USDA's Ag Handbook 8 and sequelae)
3	ASPARTIC-ACID	Shoot				--
24	BENZALDEHYDE	Rhizome				--
6	BETA-BISABOLENE	Rhizome	5.0	3600.0	-1.0	--
6	BETA-BISABOLENE	Rhizome Essent. Oil	25000.0	105100.0	1.0	--
53	BETA-CAROTENE	Root	0.1	1.0	-0.43002798118623115	--
53	BETA-CAROTENE	Rhizome	0.0	4.0	-0.6667259338283312	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
5	BETA-ELEMENE	Rhizome Essent. Oil		3000.0		--
5	BETA-ELEMENE	Rhizome	2.0	500.0	0.26691736651361464	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
13	BETA-EUDESMOL	Rhizome Essent. Oil		9300.0		--
13	BETA-EUDESMOL	Rhizome	7.0	465.0	1.0	--
13	BETA-IONONE	Rhizome Essent. Oil				--
13	BETA-IONONE	Rhizome				--
2	BETA-MYRCENE	Rf	2.0	950.0		--
2	BETA-MYRCENE	Rhizome Essent. Oil				--
2	BETA-MYRCENE	Rhizome		330.0		--
3	BETA-PHELLANDRENE	Rhizome	32.0	2850.0		--
3	BETA-PHELLANDRENE	Rhizome Essent. Oil	57000.0	106700.0		--
13	BETA-PINENE	Rhizome		100.0	0.1867718419094071	--
13	BETA-PINENE	Rhizome Essent. Oil		5300.0	1.248959633610851	--
2	BETA-SANTALOL	Rhizome Essent. Oil		162000.0		--
3	BETA-SELINENE	Rhizome				--
3	BETA-SELINENE	Rhizome Essent. Oil				--
5	BETA-SESQUIPHELLANDRENE	Rhizome		460.0		--
5	BETA-SESQUIPHELLANDRENE	Rhizome Essent. Oil		43000.0		--
5	BETA-SESQUIPHELLANDRENE	Root Essent. Oil				--
47	BETA-SITOSTEROL	Plant				--
47	BETA-SITOSTEROL	Root	100.0	500.0	-0.26375908041164936	--
5	BETA-THUJONE	Rhizome				--
5	BETA-THUJONE	Rhizome Essent. Oil				--
35	BORNEOL	Rhizome		180.0		--
35	BORNEOL	Rhizome Essent. Oil		18000.0		--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
12	BORNYL-ACETATE	Rhizome	2.0	105.0		--
12	BORNYL-ACETATE	Root	2.0	105.0	-0.5636066792773037	--
4	BORON	Rhizome	1.0	4.0		--
4	BORON	Root	1.0	4.0	-0.7413065903382969	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).
102	CAFFEIC-ACID	Rhizome				--
28	CALCIUM	Rhizome	150.0	3458.0	-0.7549394061569589	--
28	CALCIUM	Root	116.0	1650.0	-0.6300358799835268	--
2	CAMPESTEROL	Root	10.0	100.0	-0.2945736885682078	Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)
9	CAMPHENE	Rhizome Essent. Oil		126000.0		--
9	CAMPHENE	Rhizome		3080.0	1.0	--
9	CAMPHENE	Essential Oil				--
41	CAMPHOR	Rhizome	1.0	60.0		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
41	CAMPHOR	Rhizome Essent. Oil		1200.0	1.0	--
3	CAPRIC-ACID	Rhizome	1800.0	1980.0		--
3	CAPRIC-ACID	Root	1800.0	1980.0		USDA's Ag Handbook 8 and sequelae)
5	CAPRYLIC-ACID	Rhizome	70.0	380.0		--
5	CAPRYLIC-ACID	Root	70.0	380.0		USDA's Ag Handbook 8 and sequelae)
5	CAPRYLIC-ACID	Rhizome Essent. Oil				--
44	CAPSAICIN	Plant				Stitt, Paul. Why George should eat broccoli.
44	CAPSAICIN	Rhizome				--
31	CARYOPHYLLENE	Essential Oil				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
3	CHAVICOL	Rhizome				--
3	CHAVICOL	Rhizome Essent. Oil				--
77	CHLOROGENIC-ACID	Plant				Stitt, Paul. Why George should eat broccoli.
24	CHROMIUM	Root		0.6	-0.44035111981195524	--
24	CHROMIUM	Rhizome	6.0	20.0	1.0	--
53	CITRAL	Root	0.0	13500.0		--
53	CITRAL	Rhizome Essent. Oil		130000.0		--
53	CITRAL	Rhizome	0.0	13500.0		--
20	CITRONELLAL	Rhizome Essent. Oil		2900.0		--
20	CITRONELLAL	Rhizome		10.0		--
15	CITRONELLOL	Rhizome Essent. Oil	3000.0	130000.0		--
15	CITRONELLOL	Rhizome	2.0	6500.0		--
2	CITRONELLYL-ACETATE	Rhizome Essent. Oil				--
2	CITRONELLYL-ACETATE	Rhizome				--
2	COBALT	Rhizome	0.9	42.0	1.0	--
2	COBALT	Root	0.3	4.2	-0.454047411785451	--
12	COPPER	Rhizome	3.0	16.0	1.223047708525459	--
12	COPPER	Root	3.0	16.0	0.47378131766732856	--
1	CUMENE	Root		1.0		--
1	CUMENE	Rhizome		1.0		--
135	CURCUMIN	Plant				Stitt, Paul. Why George should eat broccoli.
135	CURCUMIN	Rhizome				--
5	CYANIN	Rhizome				--
13	CYSTEINE	Tuber				--
13	CYSTEINE	Shoot				--
2	CYSTINE	Rhizome	80.0	462.0	-1.0	--
2	CYSTINE	Root	80.0	462.0	-0.8891832694867765	USDA's Ag Handbook 8 and sequelae)

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
4	D-BORNEOL	Root	14.0	1102.0		--
4	D-BORNEOL	Rhizome	14.0	1102.0	1.0	--
1	DECAN-1-AL	Rhizome				--
9	DELPHINIDIN	Plant				Stitt, Paul. Why George should eat broccoli.
9	DELTA-CADINENE	Rhizome	1.0	65.0	-0.6681865179092669	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
9	DELTA-CADINENE	Rhizome Essent. Oil		1300.0		--
1	DODECANOIC-ACID	Rhizome				Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
2	ELEMOL	Rhizome	3.0	190.0		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
2	ELEMOL	Rhizome Essent. Oil		3800.0		--
6	ETHYL-ACETATE	Rhizome				--
6	ETHYL-ACETATE	Essential Oil				Kameoka, H. and Nakai, K. 1987. Components of essential oil from the root of Glycyrrhiza-glabra. Nippon Gogeikagaku Kaishi 61(9): 1119-1122.
1	ETHYL-MYRISTATE	Rhizome Essent. Oil				--
1	ETHYL-MYRISTATE	Rhizome				--
76	EUGENOL	Rhizome Essent. Oil				--
2	FARNESAL	Rhizome Essent. Oil		2000.0		--
2	FARNESAL	Rhizome	1.0	100.0		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
2	FARNESENE	Essential Oil				--
2	FARNESENE	Rhizome	245.0	4910.0		--
17	FARNESOL	Rhizome				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
17	FARNESOL	Root				Chemical Constituents of Oriental Herbs (3 diff. books)
17	FARNESOL	Rhizome Essent. Oil				--
61	FERULIC-ACID	Plant				Stitt, Paul. Why George should eat broccoli.
15	FIBER	Root	9000.0	171000.0	1.8408067359156413	--
15	FIBER	Rhizome	9000.0	171000.0	-0.07465068104411866	--
3	FLUORIDE	Rhizome		7.9	1.0	--
8	FRUCTOSE	Root				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
8	FRUCTOSE	Rhizome				--
6	FURFURAL	Rhizome Essent. Oil				--
6	FURFURAL	Plant				--
4	GALANOLACTONE	Rhizome				--
4	GALANOLACTONE	Root				--
22	GAMMA-AMINOBUTYRIC-ACID	Root				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
22	GAMMA-AMINOBUTYRIC-ACID	Rhizome				--
2	GAMMA-BISABOLENE	Rhizome Essent. Oil				--
11	GAMMA-TERPINENE	Rhizome Essent. Oil		500.0		--
11	GAMMA-TERPINENE	Rhizome		1230.0	1.0	--
13	GERANIAL	Rhizome Essent. Oil	159000.0	400000.0		--
13	GERANIAL	Rhizome		980.0		--
35	GERANIOL	Rhizome Essent. Oil		6900.0		--
35	GERANIOL	Rhizome	2.0	345.0		--
5	GERANYL-ACETATE	Rhizome Essent. Oil				--
5	GERANYL-ACETATE	Rhizome				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
3	GINGERENONE-A	Rhizome	118.0	136.0		--
2	GINGERENONE-B	Rhizome		4.7		--
2	GINGERENONE-C	Rhizome		14.2		--
27	GINGEROL	Rhizome				--
27	GINGEROL	Root Essent. Oil				--
27	GINGEROL	Root				--
7	GLUCOSE	Root				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
7	GLUCOSE	Rhizome				--
8	GLUTAMIC-ACID	Rhizome	1620.0	9328.0	1.0	--
8	GLUTAMIC-ACID	Root	1620.0	9328.0	-0.49975515668744586	USDA's Ag Handbook 8 and sequelae)
12	GLYCINE	Root	430.0	2486.0	-0.22589147640123697	USDA's Ag Handbook 8 and sequelae)
12	GLYCINE	Tuber				--
12	GLYCINE	Shoot				--
12	GLYCINE	Rhizome	430.0	2486.0	-1.0	--
3	GUAIOL	Rhizome Essent. Oil				--
1	HEPTADECANOIC-ACID	Rhizome				Newall, C. A., Anderson, L. A. and Phillipson, J. D. 1996. Herbal Medicine - A Guide for Health-care Professionals. The Pharmaceutical Press, London. 296pp.
2	HEXAHYDROCURCUMIN	Rhizome Essent. Oil				--
2	HEXAHYDROCURCUMIN	Rhizome	21.3	25.1		--
3	HEXANOL	Rhizome				Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
7	HISTIDINE	Rhizome	300.0	1738.0	-1.0	--
7	HISTIDINE	Root	300.0	1738.0	-0.05270016889774364	USDA's Ag Handbook 8 and sequelae)

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
2	HUMULENE	Rhizome				--
2	HUMULENE	Root				--
6	IRON	Root	1.1	15.0	-0.4198613477374219	--
6	IRON	Rhizome	4.0	162.0	-0.5945282624931012	--
7	ISOBORNEOL	Rhizome				--
7	ISOBORNEOL	Rhizome Essent. Oil				--
16	ISOEUGENOL	Rhizome				--
2	ISOGINGERENONE-B	Rhizome		4.7		--
3	ISOLEUCINE	Rhizome	510.0	2926.0	1.0	--
3	ISOLEUCINE	Tuber				--
3	ISOLEUCINE	Root	510.0	2926.0	-0.2833451886291646	USDA's Ag Handbook 8 and sequelae)
1	ISOVALERALDEHYDE	Essential Oil				Kameoka, H. and Nakai, K. 1987. Components of essential oil from the root of Glycyrrhiza-glabra. Nippon Gogeikagaku Kaishi 61(9): 1119-1122.
1	ISOVALERALDEHYDE	Rhizome				--
75	KAEMPFEROL	Plant				Stitt, Paul. Why George should eat broccoli.
1	LABDA-TRANS-8(17)-12-DIENE-15-16-DIAL	Rhizome				--
7	LAURIC-ACID	Rhizome Essent. Oil		900.0		--
7	LAURIC-ACID	Rhizome	390.0	3630.0		--
7	LAURIC-ACID	Root	390.0	3630.0	1.4134619657773633	USDA's Ag Handbook 8 and sequelae)
20	LECITHIN	Root				Leung, A.Y., Encyclopedia of Common Natural Ingredients Used in Food, Drugs, and Cosmetics, John Wiley & Sons, New York, 1980.
20	LECITHIN	Rhizome				--
2	LEUCINE	Tuber				--
2	LEUCINE	Rhizome	740.0	4257.0	1.0	--
2	LEUCINE	Root	740.0	4257.0	-0.0564322869347267	USDA's Ag Handbook 8 and sequelae)

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
60	LIMONENE	Rhizome	17.0	1050.0	0.6650265305559545	--
60	LIMONENE	Rhizome Essent. Oil		21000.0	1.411888259893775	--
53	LINALOOL	Rhizome Essent. Oil	3200.0	30000.0	1.0	--
53	LINALOOL	Root Essent. Oil				--
53	LINALOOL	Rhizome		50.0	-1.0	--
27	LINOLEIC-ACID	Rhizome	1200.0	11220.0	1.0	--
27	LINOLEIC-ACID	Root	1200.0	11220.0	3.017959618154365	USDA's Ag Handbook 8 and sequelae)
4	LYSINE	Rhizome	570.0	3110.0	-1.0	--
4	LYSINE	Root	570.0	3110.0	-0.5755610272389462	USDA's Ag Handbook 8 and sequelae)
65	MAGNESIUM	Rhizome	430.0	2690.0	1.0779788333953992	--
65	MAGNESIUM	Root	188.0	2690.0	0.0683510412136399	--
14	MANGANESE	Rhizome	106.0	350.0	1.4980699854714286	--
14	MANGANESE	Root	2.4	33.8	-0.14226990626562633	--
23	MELATONIN	Rhizome		0.001		Hattori, A., et. al. 1995. Identification of Melatonin in Plants and its Effects on Plasma Melatonin Levels and Binding to Melatonin Receptors in Vertebrates. Biochem. Mol. Biol. Int., 35(3): 627-634.
15	METHIONINE	Root	130.0	737.0	-0.5917219440063812	USDA's Ag Handbook 8 and sequelae)
15	METHIONINE	Rhizome	130.0	737.0	-1.0	--
3	METHYL-ACETATE	Rhizome				--
3	METHYL-ACETATE	Essential Oil				Kameoka, H. and Nakai, K. 1987. Components of essential oil from the root of Glycyrrhiza-glabra. Nippon Gogeikagaku Kaishi 61(9): 1119-1122.
2	METHYL-CAPRYLATE	Essential Oil				Kameoka, H. and Nakai, K. 1987. Components of essential oil from the root of Glycyrrhiza-glabra. Nippon Gogeikagaku Kaishi 61(9): 1119-1122.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
2	METHYL-ISOBUTYL-KETONE	Essential Oil				Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
3	METHYL-NONYL-KETONE	Rhizome Essent. Oil				--
3	METHYL-NONYL-KETONE	Rhizome				--
13	MUFA	Root	1540.0	8400.0	2.513577974996003	USDA's Ag Handbook 8 and sequelae)
13	MUFA	Rhizome	1540.0	8400.0	1.0	--
22	MYRCENE	Rhizome	2.0	950.0	-1.0	--
22	MYRCENE	Rf	2.0	950.0		--
22	MYRCENE	Rhizome Essent. Oil		19000.0	-1.0	--
34	MYRICETIN	Plant				Stitt, Paul. Why George should eat broccoli.
6	MYRISTIC-ACID	Rhizome	180.0	1650.0	-1.0	--
6	MYRISTIC-ACID	Root	180.0	1650.0	1.7305384293651185	USDA's Ag Handbook 8 and sequelae)
5	MYRTENAL	Rhizome	0.5	30.0		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
5	MYRTENAL	Rhizome Essent. Oil		600.0		--
1	N-BUTYRALDEHYDE	Essential Oil				Kameoka, H. and Nakai, K. 1987. Components of essential oil from the root of Glycyrrhiza-glabra. Nippon Gogeikagaku Kaishi 61(9): 1119-1122.
1	N-BUTYRALDEHYDE	Rhizome				--
1	N-DECANAL	Essential Oil				Kameoka, H. and Nakai, K. 1987. Components of essential oil from the root of Glycyrrhiza-glabra. Nippon Gogeikagaku Kaishi 61(9): 1119-1122.
1	N-HEPTANE	Rhizome				--
4	NERAL	Rhizome Essent. Oil	81000.0	260000.0		--
4	NERAL	Rhizome		410.0		--
10	NEROL	Rhizome Essent. Oil				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
10	NEROL	Rhizome				--
11	NEROLIDOL	Rhizome Essent. Oil				--
11	NEROLIDOL	Rhizome		60.0		--
11	NEROLIDOL	Essential Oil				Kameoka, H. and Nakai, K. 1987. Components of essential oil from the root of Glycyrrhiza-glabra. Nippon Gogeikagaku Kaishi 61(9): 1119-1122.
39	NIACIN	Root	3.6	51.0	0.0220587467388613	--
39	NIACIN	Rhizome	5.0	135.0	1.0692722579935732	--
3	NICKEL	Root	2.0	5.2	1.752676229894103	--
3	NICKEL	Rhizome	2.0	5.2	1.0	--
18	OLEIC-ACID	Root	1190.0	11000.0	3.056426676222409	USDA's Ag Handbook 8 and sequelae)
18	OLEIC-ACID	Rhizome	1190.0	11000.0	1.0	--
9	OXALIC-ACID	Rhizome		5000.0		--
9	OXALIC-ACID	Root		5000.0	2.5415261372448525	--
25	P-COUMARIC-ACID	Rhizome		19.0	-1.0	--
16	P-CYMENE	Rhizome Essent. Oil		26000.0		--
16	P-CYMENE	Rhizome		90.0	-0.47413848530364283	--
13	P-HYDROXY-BENZOIC-ACID	Plant				Stitt, Paul. Why George should eat broccoli.
13	PALMITIC-ACID	Root	1200.0	11220.0	0.13536149219761523	USDA's Ag Handbook 8 and sequelae)
13	PALMITIC-ACID	Rhizome	1200.0	11220.0	1.0	--
2	PALMITOLEIC-ACID	Root	210.0	1145.0	0.05724502554235483	USDA's Ag Handbook 8 and sequelae)
2	PALMITOLEIC-ACID	Rhizome	210.0	1145.0	1.0	--
11	PANTOTHENIC-ACID	Root	2.0	11.0	-0.9376231626080279	USDA's Ag Handbook 8 and sequelae)
11	PANTOTHENIC-ACID	Rhizome	2.0	11.0		--
3	PARADOL	Rhizome				--
4	PATCHOULI-ALCOHOL	Rhizome				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
4	PATCHOULI-ALCOHOL	Rhizome Essent. Oil				--
1	PENTADECANOIC-ACID	Rhizome				Newall, C. A., Anderson, L. A. and Phillipson, J. D. 1996. Herbal Medicine - A Guide for Health-care Professionals. The Pharmaceutical Press, London. 296pp.
11	PERILLALDEHYDE	Rhizome Essent. Oil				--
7	PHENYLALANINE	Root	450.0	2455.0	-0.39322284344633335	USDA's Ag Handbook 8 and sequelae)
7	PHENYLALANINE	Rhizome	450.0	2455.0	1.0	--
4	PHOSPHORUS	Root	181.0	2580.0	-0.1647701538167895	--
4	PHOSPHORUS	Rhizome	320.0	5323.0	0.4586280406131061	--
2	PHYTOSTEROLS	Root	150.0	913.0	0.021969609312565776	USDA's Ag Handbook 8 and sequelae)
2	PHYTOSTEROLS	Rhizome	150.0	913.0		--
2	PIPECOLIC-ACID	Rhizome		320.0		--
14	POTASSIUM	Root	1323.0	18900.0	0.22854620707535842	--
14	POTASSIUM	Rhizome	2640.0	25079.0	1.345332062692374	--
2	PROPIONALDEHYDE	Rhizome				--
2	PROPIONALDEHYDE	Essential Oil				Kameoka, H. and Nakai, K. 1987. Components of essential oil from the root of Glycyrrhiza-glabra. Nippon Gogeikagaku Kaishi 61(9): 1119-1122.
4	PUFA	Root	1540.0	8400.0	1.333787882042874	USDA's Ag Handbook 8 and sequelae)
4	PUFA	Rhizome	1540.0	8400.0	1.0	--
176	QUERCETIN	Plant				Stitt, Paul. Why George should eat broccoli.
1	RAFFINOSE	Rhizome				--
1	RAFFINOSE	Root				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
15	RIBOFLAVIN	Rhizome	0.0	5.0	-0.10465353747473792	--
15	RIBOFLAVIN	Root	0.2	3.1	-0.21327168080429257	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
5	SABINENE	Rhizome		20.0		--
5	SABINENE	Rhizome Essent. Oil		700.0		--
7	SALICYLATES	Root	45.0	250.0	0.1478264757482174	--
60	SELENIUM	Rhizome				--
60	SELENIUM	Root	0.1	1.0	-0.29131634494743897	--
1	SERINE	Rhizome	450.0	2596.0	-1.0	--
1	SERINE	Tuber				--
1	SERINE	Shoot				--
1	SERINE	Root	450.0	2596.0	-0.4317372218630029	USDA's Ag Handbook 8 and sequelae)
14	SHIKIMIC-ACID	Leaf				--
18	SHOGAOL	Essential Oil				--
18	SHOGAOL	Rhizome Essent. Oil				--
18	SHOGAOL	Root Essent. Oil				--
18	SHOGAOL	Root				--
18	SHOGAOL	Rhizome				--
4	SILICON	Rhizome		285.0		--
4	SILICON	Root	2.0	28.5	-0.2119845357116175	--
1	SODIUM	Root	30.0	423.0	-0.31581734202184225	--
1	SODIUM	Rhizome	60.0	709.0	0.18755999323325184	--
5	STARCH	Root	35000.0	600000.0	1.18913249334548	--
5	STARCH	Rhizome	123000.0	500000.0	0.41680828464384206	--
8	STEARIC-ACID	Rhizome	170.0	1540.0	1.0	--
8	STEARIC-ACID	Root	170.0	1540.0	2.8114380671291452	USDA's Ag Handbook 8 and sequelae)
12	STIGMASTEROL	Root	40.0	200.0	0.32535405334624357	Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)
14	SUCROSE	Rhizome				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
14	SUCROSE	Root				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
23	TERPINEN-4-OL	Rhizome				--
23	TERPINEN-4-OL	Rhizome Essent. Oil				--
9	TERPINOLENE	Rhizome	1.0	90.0		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
9	TERPINOLENE	Rhizome Essent. Oil		1800.0		--
31	THIAMIN	Rhizome	0.0	3.0	-0.9831353843426084	--
31	THIAMIN	Root	0.0	3.0	-0.32687193108858614	--
4	THREONINE	Rhizome	360.0	2057.0	-1.0	--
4	THREONINE	Shoot				--
4	THREONINE	Root	360.0	2057.0	-0.4948266685368329	USDA's Ag Handbook 8 and sequelae)
4	THREONINE	Tuber				--
4	TIN	Root	0.1	1.3	-1.5436732662398835	--
4	TIN	Rhizome		13.0		--
2	TRANS-BETA-FARNESENE	Rhizome	1.0	1200.0	-1.0	--
29	TRYPTOPHAN	Rhizome	120.0	693.0	-1.0	--
29	TRYPTOPHAN	Root	120.0	693.0	-0.48600202664790343	USDA's Ag Handbook 8 and sequelae)
8	TYROSINE	Rhizome	200.0	1122.0	-1.0	--
8	TYROSINE	Root	200.0	1122.0	-1.4340366854424644	USDA's Ag Handbook 8 and sequelae)
3	VALINE	Root	730.0	4202.0	0.07599207749422336	USDA's Ag Handbook 8 and sequelae)
3	VALINE	Tuber				--
3	VALINE	Rhizome	730.0	4202.0	1.0	--
3	VALINE	Shoot				--
24	VANILLIC-ACID	Plant				Stitt, Paul. Why George should eat broccoli.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
28	VANILLIN	Plant				Stitt, Paul. Why George should eat broccoli.
77	ZINC	Rhizome		57.0	-0.18700695320743768	--
77	ZINC	Root				--
13	ZINGERONE	Rhizome				--
13	ZINGERONE	Essential Oil				--
13	ZINGERONE	Root Essent. Oil				--
13	ZINGERONE	Rhizome Essent. Oil				--
1	ZINGIBAIN	Rhizome				--
1	ZINGIBAIN	Root				Abstract (See species file)
6	ZINGIBERENE	Rhizome	0.5	600.0	-1.0	--
6	ZINGIBERENE	Essential Oil				--
6	ZINGIBERENE	Rhizome Essent. Oil				--
6	ZINGIBERENE	Root Essent. Oil				--
2	ZINGIBERONE	Rhizome Essent. Oil				--
2	ZINGIBERONE	Rhizome	0.3	400.0		--