Dr. Duke's Phytochemical and Ethnobotanical Database

Chemicals Found in Zingiber officinale

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
67	1,8-CINEOLE	Rhizome	--	490	-0.7528854377140122	
67	1,8-CINEOLE	Rhizome Essent. Oil	26000	100000		
3	10-DEHYDROGINGERDIONE	Rhizome	--	--		
2	10-GINGERDIONE	Rhizome	--	11		
2	10-GINGERDIONE	Root	--	--		
3	10-GINGEROL	Rhizome	2.6	1862		
3	10-GINGEROL	Root	--	--		
8	4-TERPINEOL	Rhizome	--	--		
2	6-DEHYDROGINGERDIONE	Rhizome	--	--		
1	6-GINGERDIOL	Rhizome	--	--		
2	6-GINGERDIONE	Rhizome	3.3	10		
28	6-GINGEROL	Rhizome	130	7138		
28	6-GINGEROL	Essential Oil	--	--		
28	6-GINGEROL	Root	--	--		
28	6-GINGEROL	Root Essent. Oil	--	--		
28	6-GINGEROL	Rhizome Essent. Oil	--	--		
1	6-GINGESULFONIC-ACID	Rhizome	--	13		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
32	6-SHOGAOL	Rhizome	40	330		
1	8-BETA-17-EPOXY-LABD-TRANS-12-ENE-15,16-DIAL	Rhizome	40	400		
5	8-GINGEROL	Rhizome	110	1069		
5	8-GINGEROL	Rhizome Essent. Oil	--	--		
5	8-GINGEROL	Root	--	--		
2	8-SHOGAOL	Rhizome	48	130		
2	9-OXO-NEROLIDOL	Rhizome	--	--		
2	9-OXO-NEROLIDOL	Rhizome Essent. Oil	--	--		
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.
6	ACETALDEHYDE	Rhizome	--	--		
16	ACETIC-ACID	Rhizome	--	--		
16	ACETIC-ACID	Rhizome Essent. Oil	--	--		
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.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
3	ACETONE	Rhizome	--	--		
3	ALANINE	Rhizome	310	1793	-1	
3	ALANINE	Root	310	1793	-0.8118285216311718	USDA's Ag Handbook 8 and sequelae)
3	ALPHA-CADINOL	Rhizome	--	--		
3	ALPHA-CADINOL	Rhizome Essent. Oil	--	--		
3	ALPHA-CURCUMENE	Rhizome	--	280		
3	ALPHA-CURCUMENE	Rhizome Essent. Oil	--	19400		
15	ALPHA-LINOLENIC-ACID	Rhizome	340	3190		
15	ALPHA-LINOLENIC-ACID	Root	340	3190	1.9620665358845129	USDA's Ag Handbook 8 and sequelae)
11	ALPHA-PHELLANDRENE	Rhizome	3	200	-1	
11	ALPHA-PHELLANDRENE	Rhizome Essent. Oil	--	4000		
28	ALPHA-PINENE	Rhizome	--	720	1.111167799007431	
28	ALPHA-PINENE	Rhizome Essent. Oil	--	39000	1.392186073629917	
3	ALPHA-SELINENE	Rhizome	--	--		
3	ALPHA-SELINENE	Rhizome Essent. Oil	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
13	ALPHA-TERPINENE	Rhizome	0.5	35	1	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
13	ALPHA-TERPINENE	Rhizome Essent. Oil	--	700		
23	ALPHA-TERPINEOL	Rhizome	8	500	-0.26863716905966795	
23	ALPHA-TERPINEOL	Rhizome Essent. Oil	--	10000		
1	ALPHA-ZINGIBERENE	Rhizome	--	200	-1	
1	ALPHA-ZINGIBERENE	Rhizome	74	4600	1	
1	ALPHA-ZINGIBERENE	Rhizome Essent. Oil	--	442600		
5	ALUMINUM	Rhizome	--	663		
5	ALUMINUM	Root	46	663	0.04325697966835661	
3	AR-CURCUMENE	Rhizome	20	9520	1	
3	AR-CURCUMENE	Rhizome Essent. Oil	--	25000		
3	AR-CURCUMENE	Root	--	--		
3	AR-CURCUMENE	Root Essent. Oil	--	--		
14	ARGININE	Rhizome	430	2486	-1	
14	ARGININE	Root	430	2486	-0.41425783754112155	USDA's Ag Handbook 8 and sequelae)

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
14	ARGININE	Tuber	--	--		
3	AROMADENDRENE	Rhizome Essent. Oil	--	--		
112	ASCORBIC-ACID	Rhizome	--	317	-0.3087839350199982	
112	ASCORBIC-ACID	Root	20	288	-0.48133996980232785	
2	ASPARAGINE	Rhizome	500	500	-0.734470603058131	
3	ASPARTIC-ACID	Rhizome	2080	11990	-1	
3	ASPARTIC-ACID	Root	2080	11990	0.26543138626572105	USDA's Ag Handbook 8 and sequelae)
3	ASPARTIC-ACID	Shoot	--	--		
3	ASPARTIC-ACID	Tuber	--	--		
24	BENZALDEHYDE	Rhizome	--	--		
6	BETA-BISABOLENE	Rhizome	5	3600	-1	
6	BETA-BISABOLENE	Rhizome Essent. Oil	25000	105100	1	
53	BETA-CAROTENE	Rhizome	--	4	-0.6667259338283312	
53	BETA-CAROTENE	Root	0.1	1	-0.43002798118623115	
5	BETA-ELEMENE	Rhizome	2	500	0.26691736651361464	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
5	BETA-ELEMENE	Rhizome Essent. Oil	--	3000		
13	BETA-EUDESMOL	Rhizome	7	465	1	
13	BETA-EUDESMOL	Rhizome Essent. Oil	--	9300		
13	BETA-IONONE	Rhizome	--	--		
13	BETA-IONONE	Rhizome Essent. Oil	--	--		
2	BETA-MYRCENE	Rf	2	950		
2	BETA-MYRCENE	Rhizome	--	330		
2	BETA-MYRCENE	Rhizome Essent. Oil	--	--		
3	BETA-PHELLANDRENE	Rhizome	32	2850		
3	BETA-PHELLANDRENE	Rhizome Essent. Oil	57000	106700		
13	BETA-PINENE	Rhizome	--	100	0.1867718419094071	
13	BETA-PINENE	Rhizome Essent. Oil	--	5300	1.248959633610851	
2	BETA-SANTALOL	Rhizome Essent. Oil	--	162000		
3	BETA-SELINENE	Rhizome	--	--		
3	BETA-SELINENE	Rhizome Essent. Oil	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
5	BETA-SESQUIPHELLANDRENE	Rhizome	--	460		
5	BETA-SESQUIPHELLANDRENE	Rhizome Essent. Oil	--	43000		
5	BETA-SESQUIPHELLANDRENE	Root Essent. Oil	--	--		
47	BETA-SITOSTEROL	Plant	--	--		
47	BETA-SITOSTEROL	Root	100	500	-0.26375908041164936	
5	BETA-THUJONE	Rhizome	--	--		
5	BETA-THUJONE	Rhizome Essent. Oil	--	--		
35	BORNEOL	Rhizome Essent. Oil	--	18000		
35	BORNEOL	Rhizome	--	180		
12	BORNYL-ACETATE	Rhizome	2	105		
12	BORNYL-ACETATE	Root	2	105	-0.5636066792773037	
4	BORON	Rhizome	1	4		
4	BORON	Root	1	4	-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	3458	-0.7549394061569589	

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
28	CALCIUM	Root	116	1650	-0.6300358799835268	
2	CAMPESTEROL	Root	10	100	-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	--	3080	1	
9	CAMPHENE	Rhizome Essent. Oil	--	126000		
9	CAMPHENE	Essential Oil	--	--		
41	CAMPHOR	Rhizome	1	60		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
41	CAMPHOR	Rhizome Essent. Oil	--	1200	1	
3	CAPRIC-ACID	Rhizome	1800	1980		
3	CAPRIC-ACID	Root	1800	1980		USDA's Ag Handbook 8 and sequelae)
5	CAPRYLIC-ACID	Rhizome	70	380		
5	CAPRYLIC-ACID	Root	70	380		USDA's Ag Handbook 8 and sequelae)
5	CAPRYLIC-ACID	Rhizome Essent. Oil	--	--		
44	CAPSAICIN	Plant	--	--		Stitt, Paul. Why George should eat broccoli.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
44	CAPSAICIN	Rhizome	--	--		
31	CARYOPHYLLENE	Essential Oil	--	--		
3	CHAVICOL	Rhizome	--	--		
3	CHAVICOL	Rhizome Essent. Oil	--	--		
77	CHLOROGENIC-ACID	Plant	--	--		Stitt, Paul. Why George should eat broccoli.
24	CHROMIUM	Rhizome	6	20	1	
24	CHROMIUM	Root	--	0.6	-0.44035111981195524	
53	CITRAL	Rhizome	--	13500		
53	CITRAL	Root	--	13500		
53	CITRAL	Rhizome Essent. Oil	--	130000		
20	CITRONELLAL	Rhizome	--	10		
20	CITRONELLAL	Rhizome Essent. Oil	--	2900		
15	CITRONELLOL	Rhizome	2	6500		
15	CITRONELLOL	Rhizome Essent. Oil	3000	130000		
2	CITRONELLYL-ACETATE	Rhizome	--	--		
2	CITRONELLYL-ACETATE	Rhizome Essent. Oil	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
2	COBALT	Rhizome	0.9	42	1	
2	COBALT	Root	0.3	4.2	-0.454047411785451	
12	COPPER	Rhizome	3	16	1.223047708525459	
12	COPPER	Root	3	16	0.47378131766732856	
1	CUMENE	Rhizome	--	1		
1	CUMENE	Root	1	1		
135	CURCUMIN	Plant	--	--		Stitt, Paul. Why George should eat broccoli.
135	CURCUMIN	Rhizome	--	--		
5	CYANIN	Rhizome	--	--		
13	CYSTEINE	Shoot	--	--		
13	CYSTEINE	Tuber	--	--		
2	CYSTINE	Rhizome	80	462	-1	
2	CYSTINE	Root	80	462	-0.8891832694867765	USDA's Ag Handbook 8 and sequelae)
4	D-BORNEOL	Rhizome	14	1102	1	
4	D-BORNEOL	Root	14	1102		
1	DECAN-1-AL	Rhizome	--	--		
9	DELPHINIDIN	Plant	--	--		Stitt, Paul. Why George should eat broccoli.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
9	DELTA-CADINENE	Rhizome	1	65	-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		
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	190		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
2	ELEMOL	Rhizome Essent. Oil	--	3800		
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.
6	ETHYL-ACETATE	Rhizome	--	--		
1	ETHYL-MYRISTATE	Rhizome	--	--		
1	ETHYL-MYRISTATE	Rhizome Essent. Oil	--	--		
76	EUGENOL	Rhizome Essent. Oil	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
2	FARNESAL	Rhizome	1	100		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
2	FARNESAL	Rhizome Essent. Oil	--	2000		
2	FARNESENE	Rhizome	245	4910		
2	FARNESENE	Essential Oil	--	--		
17	FARNESOL	Rhizome	--	--		
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	Rhizome	9000	171000	-0.07465068104411866	
15	FIBER	Root	9000	171000	1.8408067359156413	
3	FLUORIDE	Rhizome	--	7.9	1	
8	FRUCTOSE	Rhizome	--	--		
8	FRUCTOSE	Root	--	--		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
6	FURFURAL	Plant	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
6	FURFURAL	Rhizome Essent. Oil	--	--		
4	GALANOLACTONE	Root	--	--		
4	GALANOLACTONE	Rhizome	--	--		
22	GAMMA-AMINOBUTYRIC-ACID	Rhizome	--	--		
22	GAMMA-AMINOBUTYRIC-ACID	Root	--	--		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
2	GAMMA-BISABOLENE	Rhizome Essent. Oil	--	--		
11	GAMMA-TERPINENE	Rhizome	--	1230	1	
11	GAMMA-TERPINENE	Rhizome Essent. Oil	--	500		
13	GERANIAL	Rhizome	--	980		
13	GERANIAL	Rhizome Essent. Oil	159000	400000		
35	GERANIOL	Rhizome	2	345		
35	GERANIOL	Rhizome Essent. Oil	--	6900		
5	GERANYL-ACETATE	Rhizome	--	--		
5	GERANYL-ACETATE	Rhizome Essent. Oil	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
3	GINGERENONE-A	Rhizome	118	136		
2	GINGERENONE-B	Rhizome	4.7	4.7		
2	GINGERENONE-C	Rhizome	14.2	14.2		
27	GINGEROL	Rhizome	--	--		
27	GINGEROL	Root	--	--		
27	GINGEROL	Root Essent. Oil	--	--		
7	GLUCOSE	Rhizome	--	--		
7	GLUCOSE	Root	--	--		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
8	GLUTAMIC-ACID	Rhizome	1620	9328	1	
8	GLUTAMIC-ACID	Root	1620	9328	-0.49975515668744586	USDA's Ag Handbook 8 and sequelae)
12	GLYCINE	Rhizome	430	2486	-1	
12	GLYCINE	Root	430	2486	-0.22589147640123697	USDA's Ag Handbook 8 and sequelae)
12	GLYCINE	Shoot	--	--		
12	GLYCINE	Tuber	--	--		
3	GUAIOL	Rhizome Essent. Oil	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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	21.3	25.1		
2	HEXAHYDROCURCUMIN	Rhizome Essent. Oil	--	--		
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	1738	-1	
7	HISTIDINE	Root	300	1738	-0.05270016889774364	USDA's Ag Handbook 8 and sequelae)
2	HUMULENE	Rhizome	--	--		
2	HUMULENE	Root	--	--		
6	IRON	Rhizome	4	162	-0.5945282624931012	
6	IRON	Root	1.1	15	-0.4198613477374219	
7	ISOBORNEOL	Rhizome Essent. Oil	--	--		
7	ISOBORNEOL	Rhizome	--	--		
16	ISOEUGENOL	Rhizome	--	--		
2	ISOGINGERENONE-B	Rhizome	4.7	4.7		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
3	ISOLEUCINE	Rhizome	510	2926	1	
3	ISOLEUCINE	Root	510	2926	-0.2833451886291646	USDA's Ag Handbook 8 and sequelae)
3	ISOLEUCINE	Tuber	--	--		
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	390	3630		
7	LAURIC-ACID	Root	390	3630	1.4134619657773633	USDA's Ag Handbook 8 and sequelae)
7	LAURIC-ACID	Rhizome Essent. Oil	--	900		
20	LECITHIN	Rhizome	--	--		
20	LECITHIN	Root	--	--		Leung, A.Y., Encyclopedia of Common Natural Ingredients Used in Food, Drugs, and Cosmetics, John Wiley & Sons, New York, 1980.
2	LEUCINE	Rhizome	740	4257	1	

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
2	LEUCINE	Root	740	4257	-0.0564322869347267	USDA's Ag Handbook 8 and sequelae)
2	LEUCINE	Tuber	--	--		
60	LIMONENE	Rhizome	17	1050	0.6650265305559545	
60	LIMONENE	Rhizome Essent. Oil	--	21000	1.411888259893775	
53	LINALOOL	Rhizome	--	50	-1	
53	LINALOOL	Root Essent. Oil	--	--		
53	LINALOOL	Rhizome Essent. Oil	3200	30000	1	
27	LINOLEIC-ACID	Rhizome	1200	11220	1	
27	LINOLEIC-ACID	Root	1200	11220	3.017959618154365	USDA's Ag Handbook 8 and sequelae)
4	LYSINE	Rhizome	570	3110	-1	
4	LYSINE	Root	570	3110	-0.5755610272389462	USDA's Ag Handbook 8 and sequelae)
65	MAGNESIUM	Rhizome	430	2690	1.0779788333953992	
65	MAGNESIUM	Root	188	2690	0.0683510412136399	
14	MANGANESE	Rhizome	106	350	1.4980699854714286	
14	MANGANESE	Root	2.4	33.8	-0.14226990626562633	

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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	Rhizome	130	737	-1	
15	METHIONINE	Root	130	737	-0.5917219440063812	USDA's Ag Handbook 8 and sequelae)
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.
3	METHYL-ACETATE	Rhizome	--	--		
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.
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	--	--		
3	METHYL-NONYL-KETONE	Rhizome Essent. Oil	--	--		
13	MUFA	Rhizome	1540	8400	1	

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
13	MUFA	Root	1540	8400	2.513577974996003	USDA's Ag Handbook 8 and sequelae)
22	MYRCENE	Rf	2	950		
22	MYRCENE	Rhizome	2	950	-1	
22	MYRCENE	Rhizome Essent. Oil	--	19000	-1	
34	MYRICETIN	Plant	--	--		Stitt, Paul. Why George should eat broccoli.
6	MYRISTIC-ACID	Rhizome	180	1650	-1	
6	MYRISTIC-ACID	Root	180	1650	1.7305384293651185	USDA's Ag Handbook 8 and sequelae)
5	MYRTENAL	Rhizome	0.5	30		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
5	MYRTENAL	Rhizome Essent. Oil	--	600		
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	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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	--	410		
4	NERAL	Rhizome Essent. Oil	81000	260000		
10	NEROL	Rhizome	--	--		
10	NEROL	Rhizome Essent. Oil	--	--		
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.
11	NEROLIDOL	Rhizome	--	60		
11	NEROLIDOL	Rhizome Essent. Oil	--	--		
39	NIACIN	Rhizome	5	135	1.0692722579935732	
39	NIACIN	Root	3.6	51	0.0220587467388613	
3	NICKEL	Rhizome	2	5.2	1	
3	NICKEL	Root	2	5.2	1.752676229894103	

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
18	OLEIC-ACID	Rhizome	1190	11000	1	
18	OLEIC-ACID	Root	1190	11000	3.056426676222409	USDA's Ag Handbook 8 and sequelae)
9	OXALIC-ACID	Rhizome	--	5000		
9	OXALIC-ACID	Root	--	5000	2.5415261372448525	
25	P-COUMARIC-ACID	Rhizome	19	19	-1	
16	P-CYMENE	Rhizome	--	90	-0.47413848530364283	
16	P-CYMENE	Rhizome Essent. Oil	--	26000		
13	P-HYDROXY-BENZOIC-ACID	Plant	--	--		Stitt, Paul. Why George should eat broccoli.
13	PALMITIC-ACID	Rhizome	1200	11220	1	
13	PALMITIC-ACID	Root	1200	11220	0.13536149219761523	USDA's Ag Handbook 8 and sequelae)
2	PALMITOLEIC-ACID	Rhizome	210	1145	1	
2	PALMITOLEIC-ACID	Root	210	1145	0.05724502554235483	USDA's Ag Handbook 8 and sequelae)
11	PANTOTHENIC-ACID	Rhizome	2	11		
11	PANTOTHENIC-ACID	Root	2	11	-0.9376231626080279	USDA's Ag Handbook 8 and sequelae)
3	PARADOL	Rhizome	--	--		
4	PATCHOULI-ALCOHOL	Rhizome	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference 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	Rhizome	450	2455	1	
7	PHENYLALANINE	Root	450	2455	-0.39322284344633335	USDA's Ag Handbook 8 and sequelae)
4	PHOSPHORUS	Rhizome	320	5323	0.4586280406131061	
4	PHOSPHORUS	Root	181	2580	-0.1647701538167895	
2	PHYTOSTEROLS	Rhizome	150	913		
2	PHYTOSTEROLS	Root	150	913	0.021969609312565776	USDA's Ag Handbook 8 and sequelae)
2	PIPECOLIC-ACID	Rhizome	320	320		
14	POTASSIUM	Rhizome	2640	25079	1.345332062692374	
14	POTASSIUM	Root	1323	18900	0.22854620707535842	
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.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
2	PROPIONALDEHYDE	Rhizome	--	--		
4	PUFA	Rhizome	1540	8400	1	
4	PUFA	Root	1540	8400	1.333787882042874	USDA's Ag Handbook 8 and sequelae)
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	--	5	-0.10465353747473792	
15	RIBOFLAVIN	Root	0.2	3.1	-0.21327168080429257	
5	SABINENE	Rhizome	--	20		
5	SABINENE	Rhizome Essent. Oil	--	700		
7	SALICYLATES	Root	45	250	0.1478264757482174	
60	SELENIUM	Rhizome	--	--		
60	SELENIUM	Root	0.1	1	-0.29131634494743897	
1	SERINE	Rhizome	450	2596	-1	
1	SERINE	Root	450	2596	-0.4317372218630029	USDA's Ag Handbook 8 and sequelae)

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
1	SERINE	Shoot	--	--		
1	SERINE	Tuber	--	--		
14	SHIKIMIC-ACID	Leaf	--	--		
18	SHOGAOL	Root	--	--		
18	SHOGAOL	Root Essent. Oil	--	--		
18	SHOGAOL	Rhizome Essent. Oil	--	--		
18	SHOGAOL	Essential Oil	--	--		
18	SHOGAOL	Rhizome	1800	--		
4	SILICON	Rhizome	--	285		
4	SILICON	Root	2	28.5	-0.2119845357116175	
1	SODIUM	Rhizome	60	709	0.18755999323325184	
1	SODIUM	Root	30	423	-0.31581734202184225	
5	STARCH	Rhizome	123000	500000	0.41680828464384206	
5	STARCH	Root	35000	600000	1.18913249334548	
8	STEARIC-ACID	Rhizome	170	1540	1	
8	STEARIC-ACID	Root	170	925	2.8114380671291452	USDA's Ag Handbook 8 and sequelae)

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
12	STIGMASTEROL	Root	40	200	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	--	--		
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	90		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
9	TERPINOLENE	Rhizome Essent. Oil	--	1800		
31	THIAMIN	Rhizome	--	3	-0.9831353843426084	
31	THIAMIN	Root	--	3	-0.32687193108858614	
4	THREONINE	Rhizome	360	2057	-1	
4	THREONINE	Root	360	2057	-0.4948266685368329	USDA's Ag Handbook 8 and sequelae)
4	THREONINE	Tuber	--	--		
4	THREONINE	Shoot	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
4	TIN	Rhizome	--	13		
4	TIN	Root	0.1	1.3	-1.5436732662398835	
2	TRANS-BETA-FARNESENE	Rhizome	1	60	-1	
29	TRYPTOPHAN	Rhizome	120	693	-1	
29	TRYPTOPHAN	Root	120	693	-0.48600202664790343	USDA's Ag Handbook 8 and sequelae)
8	TYROSINE	Rhizome	200	1122	-1	
8	TYROSINE	Root	200	1122	-1.4340366854424644	USDA's Ag Handbook 8 and sequelae)
3	VALINE	Rhizome	730	4202	1	
3	VALINE	Root	730	4202	0.07599207749422336	USDA's Ag Handbook 8 and sequelae)
3	VALINE	Shoot	--	--		
3	VALINE	Tuber	--	--		
24	VANILLIC-ACID	Plant	--	--		Stitt, Paul. Why George should eat broccoli.
28	VANILLIN	Plant	--	--		Stitt, Paul. Why George should eat broccoli.
77	ZINC	Rhizome	--	57	-0.18700695320743768	
77	ZINC	Root	--	--		
13	ZINGERONE	Rhizome	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
13	ZINGERONE	Rhizome Essent. Oil	--	--		
13	ZINGERONE	Root Essent. Oil	--	--		
13	ZINGERONE	Essential Oil	--	--		
1	ZINGIBAIN	Rhizome	--	--		
1	ZINGIBAIN	Root	--	--		Abstract (See species file)
6	ZINGIBERENE	Rhizome	0.5	30	-1	
6	ZINGIBERENE	Root Essent. Oil	--	--		
6	ZINGIBERENE	Essential Oil	--	--		
6	ZINGIBERENE	Rhizome Essent. Oil	--	--		
2	ZINGIBERONE	Rhizome	0.3	20		
2	ZINGIBERONE	Rhizome Essent. Oil	--	--		