

P **Zingiber officinale**

Common Name(s)

Ginger

How Used

G

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	(+)-6-GINGEROL	Root	--	--		
0	(+)-ALPHA-CURCUMENE	Essential Oil	--	--		
0	(+)-ANGELICOIDENOL	Rhizome	--	14		
0	(+)-BETA-PHELLANDRENE	Essential Oil	--	--		
0	(+)-BORNEOL	Rhizome Essent. Oil	--	--		
0	1,5-EPOXY-3-EPIHYDROXY-1-(3,4-DIHYDROXY-5-METHOXY-PHENYL)-7-(4-HYDROXY-3-METHOXY-PHENYL)-HEPTANE	Rhizome	--	--		
0	1,5-EPOXY-3-HYDROXY-1-(3,4-DIHYDROXY-5-METHOXY-PHENYL)-7-(4-HYDROXY-3-METHOXY-PHENYL)-HEPTANE	Rhizome	--	--		
0	1,5-EPOXY-3-HYDROXY-1-(4-HYDROXY-3,5-DIMETHOXY-PHENYL)-7-(4-HYDROXY-3-METHOXY-PHENYL)-HEPTANE	Rhizome	--	--		
67	1,8-CINEOLE	Rhizome	490	-0.7528854377140122		
67	1,8-CINEOLE	Rhizome Essent. Oil	26000	100000		
0	1-(4-HYDROXY-3-METHOXYPHENYL)-3,5-DIACETOXYOCTANE	Rhizome	--	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	1-(4-HYDROXY-3-METHOXYPHENYL)-3,5-DIACETOXYOCTANE	Root	--	--		Chemical Constituents of Oriental Herbs (3 diff. books)
0	1-(4-HYDROXY-3-METHOXYPHENYL)-3,5-OCTANEDIOL	Rhizome	--	--		
0	1-(4-HYDROXY-3-METHOXYPHENYL)-3,5-OCTANEDIOL	Root	--	--		Chemical Constituents of Oriental Herbs (3 diff. books)
0	1-(4-O-BETA-D-GLUCOPYRANOSYL-3-METHOXYPHENYL)-3,5-DIHYDROXYDECANE	Rhizome	--	2		
0	1-7-BIS-(4-HYDROXY-3-METHOXY-PHENYL)-HEPTANE-3(S)-DIOL	Rhizome	--	4		
3	10-DEHYDROGINGERDIONE	Rhizome	--	--		
0	10-DIHYDROGINGERDIONE	Rhizome	--	6.3		
0	10-EPIZONARENE	Essential Oil	--	--		Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
0	10-GINGEDIOL	Rhizome	--	--		
2	10-GINGERDIONE	Rhizome	--	11		
2	10-GINGERDIONE	Root	--	--		
3	10-GINGEROL	Rhizome	2.6	1862		
3	10-GINGEROL	Root	--	--		
0	10-SHOGAOL	Rhizome	--	74		
0	10-SHOGOAL	Rhizome	--	--		
0	12-GINGEDIOL	Rhizome	--	--		
0	12-GINGEROL	Rhizome	--	--		
0	14-GINGEROL	Rhizome	--	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	16-GINGEROL		Rhizome --	--		
0	2(R)-5(S)-DIHYDROXY-1-7-BIS-(4-HYDROXY-3-METHOXY-PHENYL)-HEPTANE		Rhizome --	5.6		
0	2,2,4-TRIMETHYL-HEPTANE		Rhizome --	--		
0	2,2,4-TRIMETHYL-HEPTANE		Rhizome -- Essent. Oil	--		
0	2-(2'-3'-EPOXY-3-METHYL-BUTYL)-3-METHYL-FURAN		Rhizome --	--		
0	2-(3'-METHYL-2'-BUTENYL)-3-METHYL-FURAN		Rhizome --	--		
0	2-6-DIMETHYL-HEPT-5-EN-1-AL		Rhizome --	--		
0	2-6-DIMETHYL-OCTA-2-6-DIENE-1-8-DIOL		Rhizome --	--		
0	2-6-DIMETHYL-OCTA-3-7-DIENE-1-6-DIOL		Rhizome --	--		
0	3(R)-5(S)-DIACETOXY-1-(3-4-DIMETHOXY-PHENYL)-DECANE		Rhizome --	14.9		
0	3(R)-5(S)-DIACETOXY-1-(4-HYDROXY-3-METHOXY-PHENYL)-DECANE		Rhizome --	41.8		
0	3(R)-ACETOXY-5(S)-DYDROXY-1-(4-HYDROXY-3-METHOXY-PHENYL)-DECANE		Rhizome --	15.8		
0	3(S)-5(S)-DIACETOXY-1-(4'-HYDROXY-3'-5'-DIMETHOXY-PHENYL)-7-(4'-HYDROXY-3'-METHOXY-PHENYL)-HEPTANE		Rhizome --	20		
0	3(S)-5(S)-DIACETOXY-1-7-BIS-(3-4-DIHYDROXY-PHENYL)-HEPTANE		Rhizome --	15.7		
0	3(S)-5(S)-DIHYDROXY-1-(4'-HYDROXY-3'-5'-DIMETHOXY-PHENYL)-7-(4'-HYDROXY-3'-METHOXY-PHENYL)-HEPTANE		Rhizome --	2		
0	3(S)-5(S)-DIHYDROXY-1-7-BIS-(4-HYDROXY-3-METHOXY-PHENYL)-HEPTANE		Rhizome --	5.3		
0	3-5-DIACETOXY-1-(4-HYDROXY-3-5-DIMETHOXY-PHENYL)-7-(4-HYDROXY-3-METHOXY-PHENYL)-HEPTANE		Rhizome --	30.3		
0	3-5-DIACETOXY-7-(3-4-DIHYDROXY-PHENYL)-1-(4-HYDROXY-3-METHOXY-PHENYL)-HEPTANE		Rhizome --	3.5		
0	3-6-EPOXY-1-(4-HYDROXY-3-METHOXY-PHENYL)-DECA-3-5-DIENE		Rhizome --	--		
0	3-7-DIMETHYL-OCTA-3-CIS-6-DIEN-1-AL		Rhizome --	--		
0	3-7-DIMETHYL-OCTA-3-TRANS-6-DIEN-1-AL		Rhizome --	--		
0	3-ACETOXY-1,5-EPOXY-1-(3,4-DIHYDROXY-5-METHOXY-PHENYL)-7-(4-HYDROXY-3-METHOXY-PHENYL)-HEPTANE		Rhizome --	--		
0	3-EPIACETOXY-1,5-EPOXY-1-(3,4-DIHYDROXY-5-METHOXY-PHENYL)-7-(4-HYDROXY-3-METHOXY-PHENYL)-HEPTANE		Rhizome --	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	3-PHENYL-BENZALDEHYDE		Rhizome	--	--	
0	3-PHENYL-BENZALDEHYDE		Rhizome	--	--	
			Essent.			
			Oil			
0	4-GINGEROL		Rhizome	--	--	
0	4-GINGEROL		Rhizome	--	--	
			Essent.			
			Oil			
0	4-PHENYL-BENZALDEHYDE		Rhizome	--	--	
0	4-PHENYL-BENZALDEHYDE		Rhizome	--	--	
			Essent.			
			Oil			
8	4-TERPINEOL		Rhizome	--	--	
0	5(S)-3(R)-DIHYDROXY-1-(4-HYDROXY-3-METHOXY-PHENYL)-DECANE		Rhizome	--	53.1	
0	5(S)-ACETOXY-3(R)-HYDROXY-1-(4-HYDROXY-3-METHOXY-PHENYL)-DECANE		Rhizome	--	15.8	
0	5-HYDROXY-1-(4-HYDROXY-3-5-DIMETHOXY-PHENYL)-7-(4-HYDROXY-3-METHOXY-PHENYL)-HEPTAN-3-ONE		Rhizome	--	0.52	
0	5-HYDROXY-7-(4-HYDROXY-3-5-DIMETHOXY-PHENYL)-1-(4-HYDROXY-3-METHOXY-PHENYL)-HEPTAN-3-ONE		Rhizome	--	0.52	
0	5-HYDROXY-7-(4-HYDROXY-PHENYL)-1-(4-HYDROXY-3-METHOXY-PHENYL)-HEPTAN-3-ONE		Rhizome	--	2.09	
0	5-O-BETA-D-GLUCOPYRANOSYL-3-HYDROXY-1-(4-HYDROXYPHENYL)-DECANE		Rhizome	--	3	
0	6,10-DEHYDROGINGERDIONE		Rhizome	--	--	
0	6,10-DEHYDROGINGERDIONE		Root	--	--	
0	6-10-GINGERDIONE		Root	--	--	
2	6-DEHYDROGINGERDIONE		Rhizome	--	--	
0	6-DIHYDROGINGERDIONE		Rhizome	--	--	
0	6-GINGEDIOL		Rhizome	21	30	

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	6-GINGEDIOL-ACETATE		Rhizome --	--	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.	
0	6-GINGEDIOL-ACETATE-METHYL-ETHER		Rhizome --	--	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.	
0	6-GINGEDIOL-DIACETATE		Rhizome --	3.3		
0	6-GINGEDIOL-DIACETATE-METHYL-ETHER		Rhizome --	--		
0	6-GINGEDIOL-METHYL-ETHER		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	--	--	
28	6-GINGEROL		Essent. Oil	--		
28	6-GINGEROL		Rhizome --	--		
1	6-GINGESULFONIC-ACID		Rhizome --	13		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	6-METHYL-HEPT-5-EN-2-OL		Rhizome	--	--	
0	6-METHYL-HEPT-5-EN-2-ONE		Rhizome	2	50	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	6-METHYL-HEPT-5-EN-2-ONE		Rhizome	--	--	Essent. Oil
0	6-METHYLGINGEDIACETATE		Rhizome	--	--	
0	6-METHYLGINGEDIACETATE		Root	--	--	Chemical Constituents of Oriental Herbs (3 diff. books)
0	6-METHYLGINGEDIOL		Rhizome	--	--	
0	6-METHYLGINGEDIOL		Root	--	--	Chemical Constituents of Oriental Herbs (3 diff. books)
0	6-PARADOL		Rhizome	--	9	
32	6-SHOGAOL		Rhizome	40	330	
0	7-(3-4-DIHYDROXY-PHENYL)-1-(4-HYDROXY-3-METHOXY-PHENYL)-HEPT-4-EN-3-ONE		Rhizome	--	1.4	
0	7-GINGEROL		Rhizome	--	--	
1	8-BETA-17-EPOXY-LABD-TRANS-12-ENE-15,16-DIAL		Rhizome	40	400	
0	8-GINGEDIOL		Rhizome	--	--	
5	8-GINGEROL		Rhizome	110	1069	

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
5	8-GINGEROL		Rhizome -- Essent. Oil	--		
5	8-GINGEROL	Root	--	--		
2	8-SHOGAOL		Rhizome 48	130		
0	9-GINGEROL		Rhizome --	--		
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 <i>Glycyrrhiza-glabra</i> . 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 <i>Glycyrrhiza-glabra</i> . Nippon Gogeikagaku Kaishi 61(9): 1119-1122.	

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
3	ACETONE		Rhizome --	--		
0	AFRAMODIAL	Seed	--	400	1	
3	ALANINE		Rhizome 310	1793	-1	
3	ALANINE	Root	310	1793	-0.8118285216311718	USDA's Ag Handbook 8 and sequelae)
0	ALBUMIN		Rhizome 4984	45924		
0	ALBUMIN	Root	4984	45924		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	ALLO-AROMADENDRENE		Rhizome -- Essent. Oil	1400		
0	ALLO-AROMADENDRINE		Rhizome 1	70		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	ALPHA-CADINENE		Rhizome --	--		
0	ALPHA-CADINENE		Rhizome -- Essent. Oil	--		
3	ALPHA-CADINOL		Rhizome --	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
3	ALPHA-CADINOL		Rhizome -- Essent. Oil	--		
0	ALPHA-CEDROL		Rhizome -- Essent. Oil	--		
0	ALPHA-COPAENE		Rhizome --	--		
0	ALPHA-COPAENE		Rhizome -- Essent. Oil	--		
0	ALPHA-CUBEBENE		Rhizome -- Essent. Oil	--		
3	ALPHA-CURCUMENE		Rhizome --	280		
3	ALPHA-CURCUMENE		Rhizome -- Essent. Oil	19400		
0	ALPHA-FARNESENE	Rhizome 20	1250		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.	
0	ALPHA-FARNESENE	Rhizome -- Essent. Oil	25000			
0	ALPHA-FARNESENE	Root --	--	--		
15	ALPHA-LINOLENIC-ACID	Rhizome 340	3190			

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
15	ALPHA-LINOLENIC-ACID	Root	340	3190	1.9620665358845129	USDA's Ag Handbook 8 and sequelae)
0	ALPHA-MUROLENE	Rhizome	--	--		
0	ALPHA-MUROLENE	Rhizome -- Essent. Oil	--			
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	--			
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	

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
23	ALPHA-TERPINEOL		Rhizome -- Essent. Oil	10000		
0	ALPHA-YLANGENE		Rhizome --	--		
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	
0	ANGELICOIDENOL-2-O-BETA-D-GLUCOPYRANOSIDE		Rhizome --	14		
0	ANTI-METHYL-10-SHOGAOL		Rhizome --	--		
0	ANTI-METHYL-10-SHOGOAL		Rhizome --	--		
0	ANTI-METHYL-6-SHOGAOL		Rhizome --	--		
0	ANTI-METHYL-8-SHOGAOL		Rhizome --	--		
3	AR-CURCUMENE		Rhizome 20	9520	1	
3	AR-CURCUMENE		Rhizome -- Essent. Oil	25000		
3	AR-CURCUMENE	Root	--	--		
3	AR-CURCUMENE	Root	--	--		
14	ARGININE		Rhizome 430	2486	-1	
14	ARGININE	Root	430	2486	-0.41425783754112155	USDA's Ag Handbook 8 and sequelae)
14	ARGININE	Tuber	--	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
3	AROMADENDRENE		Rhizome -- Essent. Oil	--		
0	AROMADENDRINE		Rhizome --	--		
112	ASCORBIC-ACID		Rhizome --	317	-0.3087839350199982	
112	ASCORBIC-ACID		Root 20	288	-0.48133996980232785	
0	ASH		Rhizome 7700	200000	1.829986028498204	
0	ASH		Root 2450	35000	-0.9297321702301228	
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 25000	105100	1	Essent. Oil
0	BETA-BISABOLOL		Rhizome 5	295		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	BETA-BISABOLOL		Rhizome -- Essent. Oil	5900		
53	BETA-CAROTENE		Rhizome --	4	-0.6667259338283312	
53	BETA-CAROTENE		Root 0.1	1	-0.43002798118623115	
0	BETA-CARYOPHYLLENE		Rhizome 0.7	45	-1	
0	BETA-CARYOPHYLLENE		Rhizome -- Essent. Oil	900	-1	
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.
5	BETA-ELEMENE		Rhizome -- Essent. Oil	3000		
13	BETA-EUDESMOL		Rhizome 7	465	1	
13	BETA-EUDESMOL		Rhizome -- Essent. Oil	9300		
0	BETA-FARNESENE		Root -- Essent. Oil	--	--	
0	BETA-HIMACHALENE		Rhizome --	--		
0	BETA-HIMACHALENE		Rhizome -- Essent. Oil	--		
13	BETA-IONONE		Rhizome --	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
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 57000 Essent. Oil	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	--		
5	BETA-SESQUIHELLANDRENE		Rhizome --	460		
5	BETA-SESQUIHELLANDRENE		Rhizome -- Essent. Oil	43000		
5	BETA-SESQUIHELLANDRENE	Root	-- Essent. Oil	--		
0	BETA-SESQUIHELLANDROL		Rhizome --	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
47	BETA-SITOSTEROL	Plant	--	--		
47	BETA-SITOSTEROL	Root	100	500	-0.26375908041164936	
5	BETA-THUJONE	Rhizome	--	--		
5	BETA-THUJONE	Rhizome	--	--		
		Essent.				
		Oil				
0	BETA-ZINGIBERENE	Rhizome	--	--	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.	
0	BISABOLENE	Root	--	--		
0	BISABOLENE	Root	--	--		
		Essent.				
		Oil				
0	BISABOLENE	Essential	--	--		
		Oil				
0	BISABOLENE	Rhizome	--	--		
35	BORNEOL	Rhizome	--	18000		
		Essent.				
		Oil				
35	BORNEOL	Rhizome	--	180		
0	BORNEOL-ACETATE	Rhizome	--	2100		
		Essent.				
		Oil				
0	BORNEOL-METHYL-ETHER	Rhizome	--	--		
12	BORNYL-ACETATE	Rhizome	2	105		
12	BORNYL-ACETATE	Root	2	105	-0.5636066792773037	

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
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 --	--		
0	CALAMENEN		Rhizome --	--		
0	CALAMENENE		Rhizome -- Essent. Oil	--		
28	CALCIUM		Rhizome 150	3458	-0.7549394061569589	
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	CAMPHENENE	Rhizome --	3080	1		
9	CAMPHENENE	Rhizome -- Essent. Oil	126000			
9	CAMPHENENE	Essential -- Oil		--		
0	CAMPHENENE-HYDRATE	Rhizome --		--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	CAMPHEN-E-HYDRATE		Rhizome -- Essent. 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.	
44	CAPSAICIN		Rhizome --	--		
0	CAR-3-ENE		Rhizome --	--		
0	CAR-3-ENE		Rhizome -- Essent. Oil	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	CARBOHYDRATES		Rhizome 92000	823240	0.675882053937855	
0	CARBOHYDRATES	Root	47390	677000	-1.9641525828914683	
31	CARYOPHYLLENE		Essential Oil	--	--	
0	CEDOROL		Rhizome	--	--	
0	CEDOROL		Rhizome	--	Essent.	
			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	
0	CHRYSANTHEMIN		Rhizome	--	--	
0	CINEOLE		Rhizome	--	--	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	CIS-1-2-BIS-(TRANS-3-4-DIMETHOXY-STYRYL)-CYCLOBUTANE		Rhizome	--	13.9	
0	CIS-10-SHOGAOL		Rhizome	--	--	
0	CIS-10-SHOGOAL		Rhizome	--	--	
0	CIS-12-SHOGAOL		Rhizome	--	--	

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	CIS-12-SHOGOAL		Rhizome	--	--	
0	CIS-3-(3-4-DIMETHOXY-PHENYL)-4-(TRANS-3-4-DIMETHOXY-STYRYL)-CYCLOHEXENE		Rhizome	--	50.6	
0	CIS-6-SHOGOAL		Rhizome	40	40	
0	CIS-8-SHOGAOL		Rhizome	--	40	
0	CIS-8-SHOGOAL		Rhizome	--	40	
0	CIS-BETA-SEQUIPHELLANDROL		Essential Oil	--		Kameoka, H. and Nakai, K. 1987. Components of essential oil from the root of <i>Glycyrrhiza-glabra</i> . Nippon Gogeikagaku Kaishi 61(9): 1119-1122.
0	CIS-BETA-SEQUIPHELLANDROL		Rhizome Essent. Oil	--	--	
0	CIS-GERANIC-ACID		Rhizome	--	--	
0	CIS-HEXAN-3-OL		Rhizome	--	--	
0	CIS-HEXAN-3-OL		Rhizome Essent. Oil	--	--	
0	CIS-NEROLIDOL		Rhizome Essent. Oil	--	--	
0	CIS-ROSE-OXIDE		Rhizome	--	--	
0	CIS-SELINEN-4-OL		Rhizome	--	--	
0	CIS-SEQUIABINENE-HYDRATE		Rhizome	--	--	
0	CIS-SESQUISABINENE-HYDRATE		Plant	--	--	

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	CIS-SESQUISABINENE-HYDRATE		Rhizome -- Essent. Oil	--		
0	CIS-SESQUISABINENE-HYDRATE		Rhizome --	--		
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 3000	130000		
			Essent. Oil			
0	CITRONELLOL-ACETATE		Rhizome -- Essent. Oil	--		
0	CITRONELLOL-ACETATE		Rhizome --	--		
2	CITRONELLYL-ACETATE		Rhizome --	--		
2	CITRONELLYL-ACETATE		Rhizome -- Essent. Oil	--		
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		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
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		
0 DEC-TRANS-2-EN-1-AL		Rhizome	--	--		
1 DECAN-1-AL		Rhizome	--	--		
0 DECANAL		Plant	5	100	1	
0 DECYL-ALDEHYDE		Rhizome	--	--		
0 DECYL-ALDEHYDE		Root	--	--		
9 DELPHINIDIN		Plant	--	--		Stitt, Paul. Why George should eat broccoli.
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.

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
9	DELTA-CADINENE		Rhizome -- Essent. Oil	1300		
0	DELTA-CAR-3-ENE		Rhizome --	--	Duke, J. A.	Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	DEMETHYL-HEXAHYDROCURCUMIN		Rhizome --	--		
0	DEMETHYL-HEXAHYDROCURCUMIN		Root --	--		
0	DIETHYLSULFIDE		Essential -- Oil	--	Kameoka, H. and Nakai, K. 1987.	Components of essential oil from the root of <i>Glycyrrhiza-glabra</i> . Nippon Gogeikagaku Kaishi 61(9): 1119-1122.
0	DIETHYLSULFIDE		Rhizome --	--		
0	DIHYDROGINGEROL		Rhizome --	--		
0	DIHYDROGINGEROL		Root -- Essent. Oil	--		
0	DODEC-TRANS-2-EN-1-AL		Rhizome --	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
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		
0	EO		Or	800	50000	
0	EO		Resin, Exudate, Sap	60000	60000	-1.007598115442729
0	EO		Rhizome --	10000	-0.5317116167359565	
0	EO		Root	700	30000	0.7582862013339499
6	ETHYL-ACETATE		Essential -- Oil	--	Kameoka, H. and Nakai, K. 1987.	Components of essential oil from the root of <i>Glycyrrhiza-glabra</i> . Nippon Gogeikagaku Kaishi 61(9): 1119-1122.
6	ETHYL-ACETATE		Rhizome --	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	ETHYL-ISOPROPYL-SULFIDE			Essential -- Oil	--	Kameoka, H. and Nakai, K. 1987. Components of essential oil from the root of <i>Glycyrrhiza-glabra</i> . Nippon Gogeikagaku Kaishi 61(9): 1119-1122.
0	ETHYL-ISOPROPYL-SULFIDE		Rhizome --	--		
1	ETHYL-MYRISTATE		Rhizome --	--		
1	ETHYL-MYRISTATE		Rhizome -- Essent. Oil	--		
76	EUGENOL		Rhizome -- Essent. Oil	--		
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 --	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
17	FARNESOL	Root	--	--		Chemical Constituents of Oriental Herbs (3 diff. books)
17	FARNESOL	Rhizome	--	--		Essent. Oil
0	FAT	Rhizome	7000	77000	0.7203322628500908	
0	FAT	Root	5040	72000	1.6380886391848568	
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	
0	FIBER(CRUDE)	Root	--	171000	1.7664789948967667	
0	FIBER(DIETARY)	Root	--	242000	-1.7083639629745593	
3	FLUORIDE	Rhizome	--	7.9	1	
0	FLUORINE	Rhizome	--	2		
0	FLUORINE	Root	2	2	1.3347186593784242	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
8	FRUCTOSE	Rhizome	--	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
8	FRUCTOSE		Root	--	--	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	FURANOGERMENONE		Rhizome	--	--	
6	FURFURAL		Plant	--	--	
6	FURFURAL		Rhizome Essent. Oil	--	--	
0	GADOLEIC-ACID		Rhizome	70	380	1
0	GADOLEIC-ACID		Root	70	380	USDA's Ag Handbook 8 and sequelae)
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	--	--	

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	GAMMA-EUDESMOL		Rhizome 2	115		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	GAMMA-EUDESMOL		Rhizome -- Essent. Oil	2300		
0	GAMMA-MUROLENE		Rhizome 7	455	1	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	GAMMA-MUROLENE		Rhizome -- Essent. Oil	9100		
0	GAMMA-SELINENE		Rhizome 35	700		
0	GAMMA-SELINENE		Root 35	700		
11	GAMMA-TERPINENE		Rhizome --	1230	1	
11	GAMMA-TERPINENE		Rhizome -- Essent. Oil	500		
13	GERANIAL		Rhizome --	980		
13	GERANIAL		Rhizome 159000 Essent. Oil	400000		
35	GERANIOL		Rhizome 2	345		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
35	GERANIOL		Rhizome -- Essent. Oil	6900		
0	GERANIOL-ACETATE		Rhizome -- Essent. Oil	2000		
0	GERANIOL-ACETATE		Rhizome --	--		
5	GERANYL-ACETATE		Rhizome --	--		
5	GERANYL-ACETATE		Rhizome -- Essent. Oil	--		
0	GERMANIUM		Rhizome 87	169		
0	GINGEDIACETATE		Rhizome --	--		
0	GINGEDIACETATE		Root --	--		Chemical Constituents of Oriental Herbs (3 diff. books)
3	GINGERENONE-A		Rhizome 118	136		
2	GINGERENONE-B		Rhizome 4.7	4.7		
2	GINGERENONE-C		Rhizome 14.2	14.2		
0	GINGERGLYCOLIPID-A		Rhizome --	13		
0	GINGERGLYCOLIPID-B		Rhizome 14	15		
0	GINGERGLYCOLIPID-C		Rhizome --	14		
27	GINGEROL		Rhizome --	--		
27	GINGEROL		Root --	--		
27	GINGEROL		Root -- Essent. Oil	--		
0	GINGEROL-METHYL-ETHER		Rhizome --	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	GINGEROLS		Rhizome 13200	13200		
0	GINGERONE		Rhizome --	--		
0	GINGERONE		Root --	--		
0	GLANOLACTONE		Rhizome --	120		
0	GLOBULIN		Rhizome 2366	21801		
0	GLOBULIN		Root 2366	21801		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
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)
0	GLUTELIN		Rhizome 2506	23091		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	GLUTELIN		Root 2506	23091		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
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 --	--			
0	GLYOXAL	Essential Oil --	--			Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
0	GUAIL	Rhizome --	--			
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.
0	HEPTAN-2-OL	Rhizome 1	135			

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	HEPTAN-2-OL		Rhizome -- Essent. Oil	2700		
0	HEPTAN-2-ONE		Rhizome --	--	Duke, J. A.	Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	HEPTAN-2-ONE		Rhizome -- Essent. Oil	--		
2	HEXAHYDROCURCUMIN		Rhizome 21.3	25.1		
2	HEXAHYDROCURCUMIN		Rhizome -- Essent. Oil	--		
0	HEXAN-1-AL		Rhizome 2	35		
0	HEXAN-1-AL		Rhizome 2 Essent. Oil	700		
0	HEXAN-1-OL		Rhizome -- Essent. Oil	--		
0	HEXAN-1-OL		Rhizome --	--		
3	HEXANOL		Rhizome --	--	Duke, J. A.	Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
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	--	--		
0	HUMULENE-EPOXIDE-1	Rhizome	--	--		
0	HUMULENE-EPOXIDE-2	Rhizome	--	--		
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	--	--		
0	ISOEUGENOL-METHYL-ETHER	Rhizome	0.6	40		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	ISOEUGENOL-METHYL-ETHER	Rhizome Essent. Oil	--	800		
2	ISOGINGERENONE-B	Rhizome	4.7	4.7		
3	ISOLEUCINE	Rhizome	510	2926	1	

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
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 <i>Glycyrrhiza-glabra</i> . Nippon Gogeikagaku Kaishi 61(9): 1119-1122.
1	ISOVALERALDEHYDE		Rhizome --	--		
0	JUNIPER-CAMPHOR		Rhizome -- Essent. Oil	--		
75	KAEMPFEROL		Plant --	--		Stitt, Paul. Why George should eat broccoli.
0	KILOCALORIES		Rhizome 690	3764	1	
0	KILOCALORIES		Root 690	3764	0.8753423179683022	USDA's Ag Handbook 8 and sequelae)
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 --	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation	
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	
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	--	21000	1.411888259893775	Essent. Oil
0	LINALOL		Rhizome	--	50	-1	
53	LINALOOL		Rhizome	--	50	-1	
53	LINALOOL		Root	--	--		Essent. Oil
53	LINALOOL		Rhizome	3200	30000	1	Essent. Oil
0	LINALOOL-OXIDE		Rhizome	--	--		
0	LINALOOL-PROPIONATE		Rhizome	--	--		Essent. Oil
27	LINOLEIC-ACID		Rhizome	1200	11220	1	
27	LINOLEIC-ACID		Root	1200	11220	3.017959618154365	USDA's Ag Handbook 8 and sequelae)

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
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	
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.
0	MENTHOL-ACETATE		Rhizome --	--		
0	MENTHOL-ACETATE		Rhizome -- Essent. Oil	--		
15	METHIONINE		Rhizome 130	737	-1	
15	METHIONINE	Root	130	737	-0.5917219440063812	USDA's Ag Handbook 8 and sequelae)
0	METHYL-10-GINGEROL		Rhizome --	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	METHYL-10-SHOGOAL		Rhizome --	--	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.	
0	METHYL-12-GINGEDIOL		Rhizome --	--		
0	METHYL-12-GINGEROL		Rhizome --	--		
0	METHYL-6-GINGEROL		Rhizome --	--		
0	METHYL-6-SHOGOAL		Rhizome --	--		
0	METHYL-8-GINGEROL		Rhizome --	--		
0	METHYL-8-SHOGOAL		Rhizome --	--	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.	
3	METHYL-ACETATE		Essential -- Oil	--	Kameoka, H. and Nakai, K. 1987. Components of essential oil from the root of <i>Glycyrrhiza-glabra</i> . Nippon Gogeikagaku Kaishi 61(9): 1119-1122.	
3	METHYL-ACETATE		Rhizome --	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	METHYL-ALLYL-SULFIDE		Essential -- Oil	--	Kameoka, H. and Nakai, K. 1987.	Components of essential oil from the root of <i>Glycyrrhiza-glabra</i> . Nippon Gogeikagaku Kaishi 61(9): 1119-1122.
0	METHYL-ALLYL-SULFIDE	Rhizome	--	--		
2	METHYL-CAPRYLATE		Essential -- Oil	--	Kameoka, H. and Nakai, K. 1987.	Components of essential oil from the root of <i>Glycyrrhiza-glabra</i> . Nippon Gogeikagaku Kaishi 61(9): 1119-1122.
0	METHYL-GINGEROL		Essential -- Oil	--		
0	METHYL-GLYOXAL		Essential -- Oil	--	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.	
0	METHYL-HEPTENONE		Rhizome	--	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.	
0	METHYL-HEPTENONE		Rhizome -- Essent. Oil	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	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 --	--		
3	METHYL-NONYL-KETONE		Rhizome -- Essent. Oil	--		
13	MUFA		Rhizome	1540	8400	1
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.

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
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 <i>Glycyrrhiza-glabra</i> . 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 <i>Glycyrrhiza-glabra</i> . Nippon Gogeikagaku Kaishi 61(9): 1119-1122.	
1	N-HEPTANE		Rhizome --	--		
0	N-NONANE		Essential -- Oil	--	Kameoka, H. and Nakai, K. 1987. Components of essential oil from the root of <i>Glycyrrhiza-glabra</i> . Nippon Gogeikagaku Kaishi 61(9): 1119-1122.	
0	N-NONANE		Rhizome --	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	N-NONANOL		Essential -- Oil	--	Kameoka, H. and Nakai, K. 1987.	Components of essential oil from the root of <i>Glycyrrhiza-glabra</i> . Nippon Gogeikagaku Kaishi 61(9): 1119-1122.
0	N-NONANOL	Rhizome	--	--		
0	N-NONANONE	Rhizome	--	--		
0	N-NONANONE	Rhizome -- Essent. Oil	--	--		
0	N-OCTANE	Essential -- Oil	--	--		
0	N-OCTANE	Rhizome	--	--		
0	N-OCTANE	Rhizome -- Essent. Oil	--	--	Kameoka, H. and Nakai, K. 1987.	Components of essential oil from the root of <i>Glycyrrhiza-glabra</i> . Nippon Gogeikagaku Kaishi 61(9): 1119-1122.
0	N-OCTANOL	Rhizome	--	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	N-PROPANOL		Essential -- Oil	--	Kameoka, H. and Nakai, K. 1987.	Components of essential oil from the root of <i>Glycyrrhiza-glabra</i> . Nippon Gogeikagaku Kaishi 61(9): 1119-1122.
0	N-PROPANOL		Rhizome --	--		
0	N-UNDECANONE		Rhizome --	--		
0	N-UNDECANONE		Rhizome -- Essent. Oil	--		
0	NEO-ISOPULEGOL		Rhizome --	--		
0	NEOISOPULEGOLE		Rhizome -- Essent. Oil	--		
4	NERAL		Rhizome --	410		
4	NERAL		Rhizome 81000	260000		
			Essent. Oil			
10	NEROL		Rhizome --	--		
10	NEROL		Rhizome -- Essent. Oil	--		
0	NEROL-OXIDE		Rhizome --	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
11	NEROLIDOL		Essential -- Oil	--		Kameoka, H. and Nakai, K. 1987. Components of essential oil from the root of <i>Glycyrrhiza-glabra</i> . 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	
0	NITROGEN		Rhizome 16000	24440		
0	NITROGEN		Root 16000	24440	-0.453393339582228	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	NONAN-1-AL		Rhizome --	--		
0	NONAN-2-OL		Rhizome --	10		
0	NONAN-2-OL		Rhizome -- Essent. Oil	2000		
0	NONAN-2-ONE		Rhizome 8	160		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	NONAN-2-ONE		Rhizome -- Essent. Oil	3200		
0	NONANAL	Rhizome 2	50	1		
0	NONANAL	Root 2	50			
0	NONYL-ALDEHYDE	Rhizome --	--			
0	NONYL-ALDEHYDE	Rhizome -- Essent. Oil	--			
0	OCT-TRANS-2-EN-1-AL	Rhizome --	--			
0	OCTAN-1-AL	Rhizome 2	40			
0	OCTAN-1-AL	Rhizome -- Essent. Oil	800			
0	OCTAN-1-OL-ACETATE	Rhizome --	--			
0	OCTAN-2-OL	Rhizome --	--			
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		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	P-CYMEN-8-OL		Rhizome 0.5	35		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	P-CYMEN-8-OL		Rhizome -- Essent. Oil	700		
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.
0	P-MENTHA-1,5-DIEN-7-OL		Rhizome --	--		
0	P-MENTHA-1-8-DIEN-7-OL		Rhizome --	--		
0	P-MENTHA-2,8-DIEN-1-OL		Rhizome --	--		
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		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
11	PANTOTHENIC-ACID	Root	2	11	-0.9376231626080279	USDA's Ag Handbook 8 and sequelae)
3	PARADOL	Rhizome	--	--		
4	PATCHOULI-ALCOHOL	Rhizome	--	--		
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.	
0	PENTAN-2-OL	Rhizome	--	--		
0	PENTOSANS	Rhizome	--	--	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.	
11	PERILLALDEHYDE	Rhizome Essent. Oil	--	--		
0	PERILLEN	Rhizome	--	--		
0	PERILLEN	Rhizome Essent. Oil	--	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0 PERILLENE			Rhizome 1	95		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0 PERILLENE			Rhizome -- Essent. Oil	1900		
7 PHENYLALANINE			Rhizome 450	2455	1	
7 PHENYLALANINE			Root 450	2455	-0.39322284344633335	USDA's Ag Handbook 8 and sequelae)
0 PHOSPHATIDIC-ACID			Rhizome --	--		
0 PHOSPHATIDIC-ACID			Root --	--		Leung, A.Y., Encyclopedia of Common Natural Ingredients Used in Food, Drugs, and Cosmetics, John Wiley & Sons, New York, 1980.
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)
0 PIN-2-EN-5-OL			Rhizome --	--		
2 PIPECOLIC-ACID			Rhizome 320	320		
14 POTASSIUM			Rhizome 2640	25079	1.345332062692374	

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
14	POTASSIUM	Root	1323	18900	0.22854620707535842	
0	PROLAMINE	Plant	1540	14190		
0	PROLINE	Rhizome	410	2376	-1	
0	PROLINE	Root	410	2376	0.2837932421997398	USDA's Ag Handbook 8 and sequelae)
2	PROPIONALDEHYDE	Essential Oil	--	--		Kameoka, H. and Nakai, K. 1987. Components of essential oil from the root of <i>Glycyrrhiza-glabra</i> . Nippon Gogeikagaku Kaishi 61(9): 1119-1122.
2	PROPIONALDEHYDE	Rhizome	--	--		
0	PROTEASE	Rhizome	--	--		
0	PROTEIN	Rhizome	14000	129000	-0.1125496505640368	
0	PROTEIN	Root	7000	100000	-0.20677098370529998	
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	--	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
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
0	ROSEFURAN		Rhizome	1	90	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	ROSEFURAN		Rhizome	--	1800	Essent. Oil
5	SABINENE		Rhizome	--	20	
5	SABINENE		Rhizome	--	700	Essent. Oil
7	SALICYLATES		Root	45	250	0.1478264757482174
0	SEC-BUTANOL		Essential	--	--	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
60	SELENIUM		Rhizome	--	--	
60	SELENIUM		Root	0.1	1	-0.29131634494743897

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	SELINA-3,7(11)-DIENE		Rhizome 1	65		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	SELINA-3,7(11)-DIENE		Rhizome -- Essent. Oil	1300		
1	SERINE		Rhizome 450	2596	-1	
1	SERINE		Root 450	2596	-0.4317372218630029	USDA's Ag Handbook 8 and sequelae)
1	SERINE		Shoot --	--		
1	SERINE		Tuber --	--		
0	SESQUPHELLANDRENE		Rhizome -- Essent. Oil	--		
0	SESQUITERPENE-HYDROCARBON		Rhizome -- Essent. Oil	--		
0	SESQUITHUJENE		Essential -- Oil	--		
0	SESQUITHUJENE		Rhizome --	--		
0	SFA		Rhizome 2030	11085		
0	SFA		Root 2030	11085	3.076072794631063	USDA's Ag Handbook 8 and sequelae)
14	SHIKIMIC-ACID		Leaf --	--		
18	SHOGAOL		Root --	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
18	SHOGAOL	Root Essent. Oil	--	--		
18	SHOGAOL	Rhizome Essent. Oil	--	--		
18	SHOGAOL	Essential Oil	--	--		
18	SHOGAOL	Rhizome	1800	--		
0	SHOGAOLS	Rhizome	--	1800		
0	SHOGAOLS	Root	--	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)
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	--	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
14	SUCROSE		Root	--	--	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	SUGARS		Root	5600	80000	-0.231158975572398
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	--	1800	Essent. Oil
0	TERT-BUTANOL		Essential	--	--	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
31	THIAMIN		Rhizome	--	3	-0.9831353843426084
31	THIAMIN		Root	--	3	-0.32687193108858614
0	THIAMINE		Root	0.1	1.5	-0.5634413774971821
4	THREONINE		Rhizome	360	2057	-1

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
4	THREONINE		Root	360	2057	-0.4948266685368329
						USDA's Ag Handbook 8 and sequelae)
4	THREONINE		Tuber	--	--	
4	THREONINE		Shoot	--	--	
4	TIN		Rhizome	--	13	
4	TIN		Root	0.1	1.3	-1.5436732662398835
0	TRAN-6-SHOGOAL		Rhizome	--	40	
0	TRAN-8-SHOGOAL		Rhizome	--	40	
0	TRANS-10-SHOGAOL		Rhizome	--	--	
0	TRANS-10-SHOGOAL		Rhizome	--	--	
0	TRANS-12-SHOGAOL		Rhizome	--	--	
0	TRANS-12-SHOGOAL		Rhizome	--	--	
0	TRANS-3-(2-4-5-TRIMETHOXY-PHENYL)-4-(TRANS-3-4-DIMETHOXY-STYRYL)-CYCLOHEXENE		Rhizome	--	13.9	
0	TRANS-3-(3-4-DIMETHOXY-PHENYL)-4-(TRANS-3-4-DIMETHOXY-STYRYL)-CYCLOHEXENE		Rhizome	--	55.8	
0	TRANS-6-SHOGAOL		Rhizome	--	40	
0	TRANS-8-SHOGAOL		Rhizome	--	40	
2	TRANS-BETA-FARNESENE		Rhizome	1	60	-1
0	TRANS-BETA-SESQUIPHELLANDROL		Rhizome	6	360	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	TRANS-BETA-SESQUIPHELLANDROL		Rhizome Essent. Oil	--	7200	

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	TRANS-GERANIC-ACID		Rhizome --	--		
0	TRANS-LINALOL-OXIDE		Rhizome --	--		
0	TRANS-LINALOOL-OXIDE		Rhizome -- Essent. Oil	--		
0	TRANS-NEROLIDOL		Rhizome 5	350		
0	TRANS-NEROLIDOL		Rhizome 5 Essent. Oil	7000		
0	TRANS-OCTEN-2-AL		Rhizome --	--		
0	TRANS-OCTEN-2-AL		Rhizome -- Essent. Oil	--		
0	TRANS-ROSE-OXIDE		Rhizome --	--		
0	TRICYCLENE		Rhizome 2	115		
0	TRICYCLENE		Rhizome -- Essent. Oil	2300		
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)

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	UNDECAN-2-OL		Rhizome 1	25		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	UNDECAN-2-OL		Rhizome -- Essent. Oil	500		
0	UNDECAN-2-ONE		Rhizome --	--		
0	UNDECAN-2-ONE		Rhizome -- Essent. Oil	--		
0	URIDINE		Rhizome --	11	1.0000000000000002	
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.
0	VIT-B-6		Rhizome 1.6	8.7		
0	VIT-B-6		Root 1.6	8.7	-0.2586482502443934	USDA's Ag Handbook 8 and sequelae)

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	WATER		Rhizome 93090	930000	0.9531262707913175	
0	WATER	Root	--	930000	1.052183415545071	
0	XANTHORRHIZOL		Rhizome 1	50		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	XANTHORRHIZOL	Rhizome -- Essent. Oil		1000		
0	ZERUMBODIENONE		Rhizome --	--		
77	ZINC		Rhizome --	57	-0.18700695320743768	
77	ZINC	Root	--	--		
0	ZINGERBERONE		Essential -- Oil	--		
13	ZINGERONE		Rhizome --	--		
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	

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
6	ZINGIBERENE	Root Essent. Oil	--	--		
6	ZINGIBERENE	Essential Oil	--	--		
6	ZINGIBERENE	Rhizome Essent. Oil	--	--		
0	ZINGIBERENES	Rhizome	890	17836	Duke, J. A.	Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
0	ZINGIBERENOL	Rhizome	--	100		
0	ZINGIBERENOL	Rhizome Essent. Oil	--	--		
0	ZINGIBERINE	Root	--	--		
0	ZINGIBEROL	Rhizome	--	8000		
0	ZINGIBEROL	Rhizome Essent. Oil	2900	160000		
0	ZINGIBEROL	Essential Oil	--	--		
2	ZINGIBERONE	Rhizome	0.3	20		
2	ZINGIBERONE	Rhizome Essent. Oil	--	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	ZONARENE		Essential -- Oil	--		Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.