

# P Arctium lappa

## Common Name(s)

Burdock, Gobo, Great Burdock

## How Used

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Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
7	(-)-ARCTIGENIN	Fruit	--	--	
0	(4E,6E)-4,6-TETRADECADIEN-8,10,12-TRIYN-1,3-DIYL-DIACETATE	Plant	--	--	
0	(4E,6E,12E)-4,6,12-TETRADECADIEN-8,10,12-TRIYN-1,3-DIYL-DIAC	Plant	--	--	
0	(4E,6Z)-4,6,TETRADECADIEN-8,10,12-TRIYN-1,3-DIYL-DIACETATE	Plant	--	--	
0	(4E,6Z,12E)-4,6,12-TETRADECADIEN-8,10,12-TRIYN-1,3-DIYL-DIAC	Plant	--	--	
0	1,11-TRIDECADIENE	Plant	--	--	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
0	1,11-TRIDECADIENE-3,5,7,9-TETRAYNE	Root	--	15	
0	1,11-TRIDECADIENE-3,5,7,9-TETRAYNE	Plant	--	--	
0	1,2-EPOXY-TRIDEC-1-ENE-5,7,9,11-TETRAYNE	Root	--	--	Jim Duke's personal files.

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference Citation
0	1,2-EPOXY-TRIDEC-TRANS-3-ENE-5,7,9-TRIYNE	Root	--	--	Jim Duke's personal files.
0	1,3,1,1-TRIDECATRIENE	Plant	--	--	
0	1,3,11-TRIDECATRIENE-5,7,9-TRIYNE	Plant	--	2	
0	1-TRIDECENE-3,5,7,9,11-PENTAYNE	Root	--	11	
0	2-ALKYL-3-METHOXPYRAZINES	Root	--	--	Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
0	2-METHOXY-3-METHYLPYRAZINE	Root	--	--	
0	2-METHOXY-3-PYRAZINE	Root	--	--	
0	2-METHYL-BUTYRIC-ACID	Root	--	--	Jim Duke's personal files.
0	2-METHYL-PROPIONIC-ACID	Root	--	--	Jim Duke's personal files.
0	3,5,7,9-TETRAYNE	Plant	--	--	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
0	3-HEXENOIC-ACID	Root	--	--	Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.

Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	3-OCTENOIC-ACID	Root	--	--	Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	5'-(1-PROPYNYL)-2,2'-BITHIENYL-5-YL...	Plant	--	--	
0	5,7,9-TRIYNE	Plant	--	--	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
0	9(10)-DEHYDROFUKINONE	Leaf	--	--	Jim Duke's personal files.
16	ACETIC-ACID	Plant	--	--	
3	ALANINE	Root	250	1250	-1.0791749981456504 USDA's Ag Handbook 8 and sequelae)
10	ALPHA-AMYRIN	Leaf	--	--	
10	ALPHA-AMYRIN	Plant	--	--	Jim Duke's personal files.
2	ALPHA-AMYRIN-ACETATE	Plant	--	--	Jim Duke's personal files.
0	ALPHA-GUAIENE	Root	--	--	Jim Duke's personal files.
5	ALUMINUM	Root	54	231	-0.18853557796129974
0	APLOTEXENE	Plant	--	--	

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference Citation
0	APLOTAXENE	Root	--	--	Jim Duke's personal files.
0	ARCTIC-ACID	Plant	--	--	
0	ARCTIC-ACID-B	Root	--	--	Jim Duke's personal files.
0	ARCTIC-ACID-B-METHYL-ESTER	Root	--	--	Jim Duke's personal files.
0	ARCTIC-ACID-C	Root	0.1	0.1	Jim Duke's personal files.
22	ARCTIGENIN	Fruit	--	--	Jim Duke's personal files.
22	ARCTIGENIN	Plant	--	--	
22	ARCTIGENIN	Seed	165.5	166.6	Jim Duke's personal files.
0	ARCTIGENIN-4-BETA-D-GLUCOPYRANOSIDE	Plant	--	--	J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.
0	ARCTIGENIN-4-O-GLUCOSIDE	Fruit	--	--	Jim Duke's personal files.
0	ARCTIGNAN-A	Fruit	125	125	Jim Duke's personal files.
0	ARCTIGNAN-B	Fruit	150	150	Jim Duke's personal files.
0	ARCTIGNAN-C	Fruit	140	140	Jim Duke's personal files.

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference Citation
0	ARCTIGNAN-D	Fruit	250	250	Jim Duke's personal files.
0	ARCTIGNAN-E	Fruit	270	270	Jim Duke's personal files.
4	ARCTIIN	Fruit	--	--	Jim Duke's personal files.
4	ARCTIIN	Seed	11.7	30000	Jim Duke's personal files.
4	ARCTIIN	Plant	--	--	
0	ARCTINAL	Plant	--	--	
0	ARCTINAL	Root	0.2	0.2	
0	ARCTINOL	Root	--	--	Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
0	ARCTINOL	Plant	--	--	
0	ARCTINOL-A	Root	0.1	0.1	Jim Duke's personal files.
0	ARCTINOL-B	Root	0.3	0.3	Jim Duke's personal files.
0	ARCTINONE	Plant	--	--	

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference Citation
0	ARCTINONE	Root	--	--	Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
0	ARCTINONE-A	Root	3	3	Jim Duke's personal files.
0	ARCTINONE-A-ACETATE	Root	--	--	Jim Duke's personal files.
0	ARCTINONE-ACETATE	Plant	--	--	
0	ARCTINONE-B	Root	--	--	Jim Duke's personal files.
0	ARCTIOL	Leaf	--	--	
4	ARCTIOPICRIN	Leaf	--	--	Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
0	ARCTIUM-ACIDIC-XYLAN	Plant	--	--	Jim Duke's personal files.
0	ARCTIUM-LAPPA-ANTIMUTAGEN	Root	90	90	Jim Duke's personal files.
0	ARCTIUM-LAPPA-SESQUILIGNAN-AL-D	Fruit	--	--	Jim Duke's personal files.

Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference	Citation
0	ARCTIUM-LAPPA-SESQUILIGNAN-AL-F	Fruit	--	--		Jim Duke's personal files.
0	ARCTIUM-XYLOGLUCAN-HC-II-B	Plant	--	--		Jim Duke's personal files.
14	ARGININE	Root	1050	5250	-0.2760103779139148	USDA's Ag Handbook 8 and sequelae)
112	ASCORBIC-ACID	Root	20	85	-0.5973838006253391	
0	ASH	Leaf	8200	35600	-1.466792613638666	Wealth of India.
0	ASH	Root	7990	34000	-0.9582876583301422	
3	ASPARTIC-ACID	Root	1770	8850	-0.1433959040036098	USDA's Ag Handbook 8 and sequelae)
51	ATROPINE	Root	0.3	30	1	Jim Duke's personal files.
0	BENEDICTINOLIDE	Leaf	--	--		
24	BENZALDEHYDE	Root	--	--		
9	BETA-AMYRIN	Plant	--	--		Jim Duke's personal files.
9	BETA-AMYRIN	Leaf	--	--		
4	BETA-AMYRIN-ACETATE	Plant	--	--		Jim Duke's personal files.
53	BETA-CAROTENE	Root	11	45	-0.148681458601344	
5	BETA-ELEMENE	Root	--	--		Jim Duke's personal files.
13	BETA-EUDES MOL	Leaf	--	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
47	BETA-SITOSTEROL	Plant	--	--		Jim Duke's personal files.
0	BIS-5',5'-ARCTIGENIN	Seed	2.3	2.3		Jim Duke's personal files.
6	BUTYRIC-ACID	Plant	--	--		
102	CAFFEIC-ACID	Root	2500	2500	0.16650294770473825	
28	CALCIUM	Root	1723	7330	-0.00797338977234112	
0	CARBOHYDRATES	Root	200925	855000	0.32037194412900694	
31	CARYOPHYLLENE	Root	--	--		Jim Duke's personal files.
77	CHLOROGENIC-ACID	Root	--	--		
24	CHROMIUM	Root	0.5	2	-0.1613147228789458	
0	CLOVENE	Root	--	--		Jim Duke's personal files.
0	CNICINOLIDE	Leaf	--	--		
2	COBALT	Root	3	12	-0.28474799428518266	
12	COPPER	Root	29	29	1.9129739707626465	Chen, H.C. and Lin, S.M. 1988. Determination of Mineral Elements in Certain Crude Drugs (Part 1), Kaohsiung J. Med. Sci., 4: 259-272.
2	COSTIC-ACID	Root	--	--		



Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
2	COSTIC-ACID	Plant	--	--		
2	CYPERENE	Root	--	--		Jim Duke's personal files.
2	CYSTINE	Root	60	300	-1.2393365913901333	USDA's Ag Handbook 8 and sequelae)
5	DAUCOSTEROL	Seed	170.6	170.6	1.3994486472112773	Jim Duke's personal files.
1	DECAN-1-AL	Root	--	--		Jim Duke's personal files.
4	DEHYDROCOSTUS-LACTONE	Root	--	--		Jim Duke's personal files.
4	DEHYDROCOSTUS-LACTONE	Plant	--	--		
0	DEHYDRODIHYDROCOSTUS-LACTONE	Root	--	--		Jim Duke's personal files.
0	DEHYDRODIHYDROCOSTUS-LACTONE	Plant	--	--		
0	DEHYDROFUKINONE	Plant	--	--		
0	DEHYDROFUKINONE	Leaf	--	--		
1	DESMUTAGENIC FACTOR	Root	146	146		Jim Duke's personal files.
0	DIHYDROAPLOTAXENE	Root	--	--		Jim Duke's personal files.
0	EO	Leaf	285	285	-0.9895505643256359	Wealth of India.
0	EO	Root	600	7500	-0.3015226969562038	Wealth of India.
0	EREMOPHILENE	Leaf	--	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	FAT	Fruit	150000	180000	1.6501237791645091	
0	FAT	Leaf	1300	8335	-0.9590187163643392	Wealth of India.
0	FAT	Root	1645	7000	-0.5295695632589758	
15	FIBER	Leaf	20000	94700	-0.8264904309689535	Wealth of India.
15	FIBER	Root	19400	97000	0.19738976012277715	
0	FIBER(CRUDE)	Root	--	72000	-1.1616741196232196	
0	FIBER(DIETARY)	Root	--	700000	3.29347609665689	
8	FRUCTOSE	Root	--	--		Jim Duke's personal files.
0	FUKINANOLIDE	Leaf	--	--		
0	FUKINONE	Leaf	--	--		
0	FUKIONE	Leaf	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
22	GABA	Root	--	25	-0.7148251719310679	Wealth of India.
0	GAMMA-GUANIDINO-N-BUTYRIC-ACID	Root	25	25		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference Citation
0	GERMACRANOLIDE	Fruit	--	--	Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
7	GLUCOSE	Root	--	--	Jim Duke's personal files.
8	GLUTAMIC-ACID	Root	1570	7850	-0.6250548944791179 USDA's Ag Handbook 8 and sequelae)
12	GLYCINE	Root	310	1550	-0.9327345082827507 USDA's Ag Handbook 8 and sequelae)
0	HEPTADEC-1-ENE	Root	--	--	Jim Duke's personal files.
0	HEPTADECA-1-CIS-8-CIS-15-TRIENE-11,13-DIYNE	Root	--	--	Jim Duke's personal files.
0	HEPTAN-1-AL	Root	--	--	Jim Duke's personal files.
0	HEX-2-EN-1-AL	Root	--	--	Jim Duke's personal files.
0	HEX-3-EN-1-AL	Root	--	--	Jim Duke's personal files.
0	HEX-3-EN-1-OIC-ACID	Root	--	--	Jim Duke's personal files.
7	HISTIDINE	Root	310	1550	-0.235775973025123 USDA's Ag Handbook 8 and sequelae)

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
19	INULIN	Root	94000	500000	0.9709459983314757	
6	IRON	Root	35	147	-0.22809300347724715	
4	ISOCHLOROGENIC-ACID	Leaf	--	--		Wealth of India.
0	ISOLAPPAOL-C	Seed	--	--		Jim Duke's personal files.
0	ISOLAPPAOLA	Seed	--	--		Jim Duke's personal files.
0	ISOLAPPAOLA	Fruit	50	50		Jim Duke's personal files.
3	ISOLEUCINE	Root	300	1500	-1.026448865036451	USDA's Ag Handbook 8 and sequelae)
5	ISOVALERIC-ACID	Plant	--	--		
0	KILOCALORIES	Root	720	3790	0.9325990878892336	Father Nature's Farmacy: The aggregate of all these three-letter citations.
0	LAPPANAESTHIN	Seed	--	--		
0	LAPPANESTHIN	Seed	--	--		Wealth of India.
0	LAPPAOL-A-THRU-H	Plant	--	--		
0	LAPPAOL-B	Seed	--	--		
0	LAPPAOL-C	Seed	--	--		
0	LAPPAOL-C	Fruit	15	15		Jim Duke's personal files.
0	LAPPAOL-D	Seed	--	--		

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	LAPPAOL-E	Seed	--	--		
0	LAPPAOL-E	Fruit	60	60		Jim Duke's personal files.
0	LAPPAOL-F	Seed	2.3	2.3		
0	LAPPAOL-F	Fruit	60	60		Jim Duke's personal files.
0	LAPPAOL-H	Seed	--	--		
0	LAPPAOLA	Seed	--	--		Jim Duke's personal files.
0	LAPPAOLA	Fruit	100	100		Jim Duke's personal files.
0	LAPPAPHEN-A	Plant	--	--		
0	LAPPAPHEN-A	Root	--	--		Jim Duke's personal files.
0	LAPPAPHEN-B	Plant	--	--		
0	LAPPAPHEN-B	Root	--	--		Jim Duke's personal files.
0	LAPPAURIC-ACID	Plant	--	--		
0	LAPPAURIN	Seed	--	--		Wealth of India.

Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference	Citation
7	LAURIC-ACID	Root	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
7	LAURIC-ACID	Plant	--	--		
2	LEUCINE	Root	320	1600	-1.5972475612886774	USDA's Ag Handbook 8 and sequelae)
13	LIGNIN	Plant	--	--		
27	LINOLEIC-ACID	Fruit	103500	124200	1.3968737201405899	Wealth of India.
0	LINOLENIC-ACID	Fruit	6000	7200	0.057806087658539305	Wealth of India.
21	LUPEOL	Plant	--	--		Jim Duke's personal files.
21	LUPEOL	Leaf	--	--		
2	LUPEOL-ACETATE	Plant	--	--		Jim Duke's personal files.
4	LYSINE	Root	670	3350	-0.3553603353392198	USDA's Ag Handbook 8 and sequelae)
65	MAGNESIUM	Root	1262	5370	1.4943915864476263	
14	MANGANESE	Root	1.4	6	-0.47422778363505214	
4	MATAIRESINOL	Seed	170.6	170.6		Jim Duke's personal files.

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference Citation
4	MATAIRESINOL	Fruit 60	350		Jim Duke's personal files.
4	MATAIRESINOL	Plant --	--		
1	MERCURY	Root 1.27	1.27	4.056631483285861	Chen, H.C. and Lin, S.M. 1988. Determination of Mineral Elements in Certain Crude Drugs (Part 1), Kaohsiung J. Med. Sci., 4: 259-272.
15	METHIONINE	Root 90	450	-1.0886471756957197	USDA's Ag Handbook 8 and sequelae)
0	METHYL-ARCTATE-B	Plant --	--		
3	MUCILAGE	Plant 50000	120000	-0.25051722911671365	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
3	MUCILAGE	Root 11750	120000	-0.2513892222400114	
6	MYRISTIC-ACID	Plant --	--		
0	NEOARC-B	Seed --	--		Jim Duke's personal files.
0	NEOARCTIN-B	Seed 38	38		Jim Duke's personal files.
39	NIACIN	Root 3	13	-1.079268462705004	
0	OCT-2-EN-1-AL	Root --	--		Jim Duke's personal files.

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	OCT-3-EN-1-OIC-ACID	Root	--	--		Jim Duke's personal files.
18	OLEIC-ACID	Fruit	30000	36000	-0.20328110195358376	Wealth of India.
13	PALMITIC-ACID	Root	--	--		Jim Duke's personal files.
13	PALMITIC-ACID	Fruit	10500	12600	-0.16938025724372155	Wealth of India.
0	PECTINESTERASE	Leaf	--	--		Wealth of India.
0	PENTADEC-1-ENE	Root	--	--		Jim Duke's personal files.
0	PEROXIDASE	Leaf	--	--		Wealth of India.
0	PETASITALONE	Leaf	--	--		
0	PETASITOLONE	Leaf	--	--		
2	PHENYL-ACETALDEHYDE	Root	--	--		
7	PHENYLALANINE	Root	330	1650	-1.1170286109180518	USDA's Ag Handbook 8 and sequelae)
4	PHOSPHORUS	Root	1027	4370	0.14974951763203476	
1	PHYTOL	Leaf	--	--		
2	PHYTOSTEROLS	Root	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.



Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	POLYACETYLENES	Root 10	20			Wealth of India.
0	POLYGALACTURONASE	Leaf --	--			Wealth of India.
0	POLYPHENOL-OXIDASE	Leaf --	--			Wealth of India.
30	POLYPHENOLS	Root 19000	36500	1		Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
14	POTASSIUM	Root 3948	16800	0.07477700255119245		
0	PROLINE	Root 520	2600	0.43323535572821265		USDA's Ag Handbook 8 and sequelae)
6	PROPIONIC-ACID	Plant --	--			
0	PROTEIN	Leaf 32000	140150	-0.7152273911894512		Wealth of India.
0	PROTEIN	Root 24910	106000	-0.13939391839403442		
0	PSEUDOTARAXASTEROL	Plant --	--			Jim Duke's personal files.
0	PSEUDOTARAXASTEROL-ACETATE	Plant --	--			Jim Duke's personal files.
0	PSI-TARAXASTEROL	Leaf --	--			
15	RIBOFLAVIN	Root 0.8	3.4	-0.14761901787013534		
60	SELENIUM	Root 0.3	1.4	-0.26286169402261483		
1	SERINE	Root 250	1250	-1.1895044313950447		USDA's Ag Handbook 8 and sequelae)

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference Citation
0	SESQUILIGNANS	Plant --	--		J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.
4	SILICON	Root 5.3	22.5	-0.23954668838760487	
0	SITOSTEROL	Root --	--		Wealth of India.
1	SODIUM	Root 357	1520	0.1949623126900184	
5	STARCH	Root 28200	120000	-0.818804895582863	
8	STEARIC-ACID	Plant --	--		
8	STEARIC-ACID	Root --	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	STEROLS	Root 200	200		Wealth of India.
12	STIGMASTEROL	Plant --	--		Jim Duke's personal files.
12	STIGMASTEROL	Root --	--		Wealth of India.
0	SUGARS	Root 35250	150000	0.44638269230228217	
2	TARAXASTEROL	Plant --	--		Jim Duke's personal files.
2	TARAXASTEROL	Leaf --	--		Wealth of India.
2	TARAXASTEROL-ACETATE	Plant --	--		Jim Duke's personal files.

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference Citation
2	TARAXASTEROL-ACETATE	Leaf	--	--	Wealth of India.
0	TARAXASTEROL-PALMITATE	Leaf	--	--	Jim Duke's personal files.
0	TETRADECA-TRANS-4-CIS-6-DIENE-8,12-DIYNE-1,3-DIOL-DIACETATE	Root	--	--	Jim Duke's personal files.
0	TETRADECA-TRANS-4-CIS-6-TRANS-12-TRIENE-8,10-DIYNE-1,3-DIOL-DIACETATE	Root	--	--	Jim Duke's personal files.
0	TETRADECA-TRANS-4-TRANS-6-DIENE-8,10,12-TRIYNE-1,3-DIOL-DIACETATE	Root	--	--	Jim Duke's personal files.
0	TETRADECA-TRANS-4-TRANS-6-TRANS-12-TRIENE-8,10-DIYNE-1,3-DIOL-DIACETATE	Root	--	--	Jim Duke's personal files.
31	THIAMIN	Root	1	11	0.384789019052169
0	THIAMINE	Root	2.6	11	1.3683576310645862
4	THREONINE	Root	260	1300	-0.7216409513599528 USDA's Ag Handbook 8 and sequelae)
1	TIGLIC-ACID	Plant	--	--	
4	TIN	Root	5	21	0.4588256824495934
12	TRACHELOGENIN	Fruit	--	--	Jim Duke's personal files.
12	TRACHELOGENIN	Plant	--	--	
0	TRIDEC-1-ENE-3-5-7-9-11-PENTAYNE	Root	1	1	-1.0644228771428472 Jim Duke's personal files.
0	TRIDECA-1-11-DIENE-3-5-7-9-TETRAYNE	Root	1	2	-0.6284867817517097

Chemical Plant Part		Low PPM	High PPM	StdDev	Reference	Citation
0	TRIDECA-1-TRANS-11-DIENE-3,5,7,9-TETRAYNE	Root	--	--		Jim Duke's personal files.
0	TRIDECA-1-TRANS-3-TRANS-11-TRIENE-5,7,9-TRIYNE	Root	--	--		Jim Duke's personal files.
29	TRYPTOPHAN	Root	60	300	-1.7641966493136618	USDA's Ag Handbook 8 and sequelae)
8	TYROSINE	Root	180	900	-1.7927983636148572	USDA's Ag Handbook 8 and sequelae)
3	VALINE	Root	330	1650	-1.4093638383718028	USDA's Ag Handbook 8 and sequelae)
0	WATER	Leaf	730000	738000	-0.3474211280143851	Wealth of India.
0	WATER	Root	--	765000	-0.02778414569046033	
77	ZINC	Root	0.5	2.2	-0.9625912271962561	