

C ALUMINUM

Chemid

ALUMINUM

ubiquitous

Yes

*Unless otherwise noted all references are to Duke, James A. 1992. Handbook of phytochemical constituents of GRAS herbs and other economic plants. Boca Raton, FL. CRC Press.

Plant	Part	Low PPM	High PPM	StdDev	Reference
Acacia nilotica	Plant	--	--		--
Achillea millefolium	Plant	6	34	-0.6894552686751528	--
Actaea racemosa	Root	--	226	-0.1912183621931245	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
Agathosma betulina	Leaf	1360	1360	0.6789856525717123	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
Allium cepa	Bulb	0.3	385	1	--
Allium sativum var. sativum	Bulb	52	52	-1	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
Allium sativum var. sativum	Root	19	52	-0.28457925346062496	--
Alocasia macrorrhiza	Root	3.6	12	-0.30604152731522277	--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Aloe spp.	Leaf	0.1	22	-0.756963512814621	--
Aloe vera	Leaf	22	22	-0.756963512814621	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
Althaea officinalis	Root	73	680	0.052378446056560675	--
Amorphophallus campanulatus	Root	4	18	-0.3028221862370331	--
Amorphophallus konjac	Root	--	--		--
Anacardium occidentale	Seed	2	2	-0.3603210889839242	--
Anethum graveolens	Plant	4	210	-0.3394094982503418	ACTA AGRIC SCAND SUPPL 22: 1980
Angelica sinensis	Root	93	422	-0.0860532203055952	--
Annona muricata	Fruit	5	5	-0.2220668016128611	--
Apium graveolens	Root	0.3	9	-0.3076511978543176	ACTA AGRIC SCAND SUPPL 22: 1980
Arachis hypogaea	Seed	14	14	-0.3403462875832767	--
Arctium lappa	Root	54	231	-0.18853557796129974	--
Arctostaphylos uva-ursi	Leaf	83	719	-0.008939171802457953	--
Armoracia rusticana	Root	4	30	-0.2963835040806538	ACTA AGRIC SCAND SUPPL 22: 1980
Aspalathus linearis	Shoot	--	9900	1.0787185957210077	--
Asparagus officinalis	Shoot	13	700	-1.6477130198375833	--
Avena sativa	Plant	--	--		--
Averrhoa carambola	Fruit	3	41	-0.21159362207772017	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.

Plant	Part	Low PPM	High PPM	StdDev	Reference
Barosma betulina	Leaf	1360	1360	0.6789856525717123	--
Berberis vulgaris	Root	489	489	-0.050103911599143874	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
Berberis vulgaris	Bark	--	489	1.2160510458026077	--
Bertholletia excelsa	Seed	5	5	-0.3553273886337623	--
Beta vulgaris	Root	1	420	-0.08712633399832509	--
Brassica napus var. napobrassica	Root	0.3	1	-0.31194365262523716	ACTA AGRIC SCAND SUPPL 22: 1980
Brassica oleracea var. botrytis l.	Leaf	1	27	-0.7515974845433717	--
Brassica oleracea var. botrytis l.	Flower	1	150	0.9080903837793464	--
Brassica oleracea var. capitata l.	Plant	--	--		--
Brassica oleracea var. capitata l.	Leaf	1	4350	3.88787055877884	--
Brassica oleracea var. italica	Leaf	1	27	-0.7515974845433717	ACTA AGRIC SCAND SUPPL 22: 1980
Brassica pekinensis	Leaf	28	42	-0.7354993997296235	--
Brassica rapa	Root	2	10	-0.30711464100795266	--
Camellia sinensis	Leaf	--	--		--
Capsicum annuum	Fruit	--	--		--
Capsicum frutescens	Fruit	--	--		--
Carthamus tinctorius	Flower	12	84	-0.24989404157549264	--
Carya glabra	Shoot	40	7700	0.42674581808743167	--
Carya illinoensis	Seed	11	11	-0.34533998793343856	--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Carya ovata	Seed	2.6	2.6	-0.35932234891389175	--
Caulophyllum thalictroides	Root	84	762	0.0963761074584862	--
Centaurea cyanus	Flower	--	--		--
Centella asiatica	Leaf	220	2060	1.430229610546625	--
Chamaemelum nobile	Flower	27	27	-1.24997149983649	--
Chondrus crispus	Plant	355	355	-0.05101951693444631	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
Chrysanthemum parthenium	Plant	--	6	-0.7451443685154636	--
Chrysanthemum parthenium	Leaf	1.1	6.2	-0.7739201621517691	--
Cichorium endivia	Leaf	60	168	-0.6002754872941394	--
Cichorium intybus	Root	--	--		--
Cimicifuga racemosa	Root	48	226	-0.1912183621931245	--
Citrus paradisi	Fruit	1	330	-0.12751726414283882	--
Citrus reticulata	Fruit	1	15	-0.21915758507532193	ACTA AGRIC SCAND SUPPL 22: 1980
Citrus sinensis	Fruit	1	165	-0.17551933701223474	--
Cnicus benedictus	Plant	11.3	85	-0.5880215511088723	--
Cocos nucifera	Seed	7.2	7.2	-0.3516653417103102	--
Cocos nucifera	Leaf	--	--		Jim Duke's personal files.
Colocasia esculenta	Leaf	18	18	-0.7612563354316205	--
Colocasia esculenta	Root	3.9	3.9	-0.31038763777077877	--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Commiphora wightii	Inflorescence	--	--		Jim Duke's personal files.
Corylus avellana	Seed	2.6	2.6	-0.35932234891389175	--
Crataegus laevigata	Fruit	8	29	-0.21508468192276714	--
Crataegus rhipidophylla	Fruit	--	29	-0.21508468192276714	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
Cucumis melo	Fruit	26	77	-0.20112044254257924	--
Cucumis sativus	Fruit	0.4	21000	5.885833318950578	--
Cucurbita pepo	Seed	11	11	-0.34533998793343856	--
Cymbopogon citratus	Plant	515	515	0.2672039107244728	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
Cypripedium pubescens	Root	238	238	-0.18477968003674514	--
Cyrtosperma chamissonis	Root	13	63	-0.2786771281506106	--
Daucus carota	Root	1	1050	0.2509044792115904	--
Dioscorea alata	Root	1	12	-0.30604152731522277	--
Dioscorea sp.	Root	210	210	-0.1998032717349636	--
Dioscorea villosa	Root	50	210	-0.1998032717349636	--
Diospyros virginiana	Stem	4	378	-0.6174306750381806	--
Echinacea purpurea	Root	197	786	0.10925347177124488	--
Echinacea spp	Root	786	12900	6.609103108636193	Economic & Medicinal Plant Research, 5: 253.
Elytrigia repens	Plant	331	331	-0.09875303108328418	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.

Plant	Part	Low PPM	High PPM	StdDev	Reference
Ephedra sinica	Plant	13	63	-0.6317772724119737	--
Equisetum arvense	Plant	81	378	-0.005274899208476688	--
Erythroxylum coca	Leaf	395	420	-0.32982766242317074	--
Euphrasia officinalis	Plant	15.3	99	-0.5601770011887169	--
Foeniculum vulgare	Seed	6	56	-0.27043448268101034	--
Fragaria spp	Fruit	3	70	-0.20315689411885662	ACTA AGRIC SCAND SUPPL 22: 1980
Frangula purshiana	Bark	27	99	-0.42073897270651045	--
Fucus vesiculosus	Plant	75	631	0.4979158957771894	--
Genipa americana	Fruit	4	20	-0.21770297680655237	--
Genipa americana	Seed	20	20	-0.3303588868829529	--
Gentiana lutea	Root	64	291	-0.15634216717940302	--
Glycine max	Seed	2	60	-0.26377621554746117	--
Glycyrrhiza glabra	Root	29	182	-0.21482686343318208	--
Harpagophytum procumbens	Root	178	939	0.1913466692650815	--
Hibiscus sabdariffa	Flower	14	125	0.46945991962978617	--
Hordeum vulgare	Seed	7	7	-0.35199825506698773	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
Hordeum vulgare	Stem	212	212	-0.7859500634899037	--
Humulus lupulus	Fruit	4.7	4.7	-0.22215407810898732	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.

Plant	Part	Low PPM	High PPM	StdDev	Reference
Humulus lupulus	Flower	0.9	4.7	-1.6412298738578974	--
Hydrangea arborescens	Root	77	221	-0.1939011464249492	--
Hydrastis canadensis	Root	90	325	-0.1380992344029949	--
Inula helenium	Plant	--	--		--
Ipomoea batatas	Root	8	8	-0.30818775470068255	--
Juglans cinerea	Seed	2.6	2.6	-0.35932234891389175	--
Juglans nigra	Hull Husk	--	231		--
Juglans nigra	Seed	2.9	2.9	-0.35882297887887565	--
Juglans nigra	Fruit	231	231	-0.15631850786447637	--
Juglans nigra	Pericarp	28	231		--
Juniperus communis	Fruit	19	61	-0.20577518900264186	--
Juniperus virginiana	Shoot	57	8800	0.7527322069042197	--
Lactuca sativa	Leaf	3	126	-0.6453501247726341	--
Larrea tridentata	Plant	95	290	-0.1802977844208822	--
Liquidambar styraciflua	Leaf	40	1230	0.5394689175192284	--
Liquidambar styraciflua	Stem	10	1800	0.8261510742289894	--
Lobelia inflata	Leaf	28	251	-0.5111994179913997	--
Lycopersicon esculentum	Fruit	0.3	1700	0.2710454015000243	--
Malus domestica	Fruit	0.4	129	-0.18599251654737567	--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Manihot esculenta	Root	10	77	-0.2711653323015013	--
Medicago sativa	Plant	25	135	-0.4885767299654601	--
Mentha pulegium	Plant	1850	1850	2.9223806352535795	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
Mentha x piperita	Leaf	9	62	-0.714035286644626	--
Musa x paradisiaca	Fruit	1	35	-0.21333915200024364	ACTA AGRIC SCAND SUPPL 22: 1980
Myrica cerifera	Bark	33	151	-0.2025003035719614	--
Nepeta cataria	Plant	30	250	-0.259853641335612	--
Nyssa sylvatica	Leaf	25	2730	2.1492773988940415	--
Nyssa sylvatica	Stem	22	660	-0.3311507500780245	--
Panax ginseng	Root	5	22	-0.30067595885157333	--
Panax quinquefolius	Plant	24	285	-0.19024226653522344	--
Pastinaca sativa	Root	1	35	-0.293700719848829	--
Petroselinum crispum	Plant	2	22	-0.7133220257495717	--
Phaseolus lunatus	Seed	0.44	3000	4.630050127611181	--
Phaseolus vulgaris	Fruit	1	1050	0.08194632655997974	--
Phaseolus vulgaris	Seed	5	73	-0.24213684736342636	--
Phoenix dactylifera	Fruit	51	51	-0.20868440554018103	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
Phoenix dactylifera	Seed	3	13	-0.34201085436666395	Abstract (See species file)

Plant	Part	Low PPM	High PPM	StdDev	Reference
Pimenta dioica	Plant	110	110	-0.5382991405371662	--
Pinus echinata	Shoot	255	4200	-0.6104836008750758	--
Pistacia vera	Seed	9	9	-0.3486691215002131	--
Pisum sativum	Seed	1	24	-0.32370061974940373	--
Plantago psyllium	Seed	7	34	-0.3070549519155308	--
Polygonum multiflorum	Root	152	152	-0.23092356882413043	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
Prunus domestica	Fruit	1	255	-0.1493363881743824	--
Prunus dulcis	Seed	3	10	-0.34700455471682584	--
Prunus persica	Bark	43	43	-0.6557652317744864	--
Prunus persica	Fruit	2.25	1050	0.08194632655997974	--
Prunus serotina	Leaf	14	1440	0.7648421049117022	--
Prunus serotina	Stem	0	540	-0.45297199474192074	--
Pyrus communis	Fruit	1	105	-0.19297463623746963	--
Quercus alba	Bark	5	21	-0.7480969764083341	--
Quercus alba	Stem	20	1064	0.07898077362375933	--
Quercus phellos	Stem	14	420	-0.574793239405817	--
Quercus rubra	Seed	8.2	8.2	-0.3500007749269229	--
Quercus rubra	Stem	30	660	-0.3311507500780245	--
Quercus stellata	Stem	18	840	-0.14841888308218024	--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Quercus velutina	Stem	24	434	-0.5605807608616957	--
Raphanus sativus	Root	6	185	-0.21321719289408725	--
Rheum rhabarbarum	Pt	1	80		--
Rhodymenia palmata	Plant	615	615	0.4660935530112975	--
Rhus copallina	Leaf	40	1920	1.2799808189516426	--
Rhus copallina	Stem	18	610	-0.38190960202131463	--
Rhus glabra	Stem	2	1005	0.019085328330677026	--
Ribes nigrum	Fruit	3	65	-0.2046115023876262	ACTA AGRIC SCAND SUPPL 22: 1980
Ribes rubrum	Fruit	3	100	-0.1944292445062392	--
Ribes uva-crispa	Fruit	1	33	-0.21392099530775147	--
Rosa canina	Fruit	--	--		--
Rubus chamaemorus	Fruit	1	25	-0.2162483685377828	--
Rubus idaeus	Leaf	66	392	-0.3598774207421672	--
Rumex crispus	Root	100	390	-0.10322303938927345	--
Ruscus aculeatus	Root	396	1310	0.3904092592664762	--
Salix alba	Bark	11	67	-0.5550396921739252	--
Salvia officinalis	Leaf	18	115	-0.6571553869693828	--
Sassafras albidum	Leaf	50	1360	0.6789856525717123	--
Sassafras albidum	Stem	6	740	-0.24993658696876042	--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Schisandra chinensis	Fruit	174	174	-0.1729010421284495	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
Scutellaria lateriflora	Plant	35	258	-0.24394246995266602	--
Senna alexandrina	Leaf	126	620	-0.11518653157319562	--
Silybum marianum	Plant	267	267	-0.22604240214685184	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
Silybum marianum	Leaf	59	267	-0.4940281275234017	--
Smilax officinalis	Root	157	745	0.08725464107028212	--
Smilax spp	Root	157	745	0.08725464107028212	--
Solanum melongena	Fruit	10	16	-0.21886666342156802	--
Solanum tuberosum	Tuber	3.9	255		--
Sorbus aucubaria	Fruit	2	75	-0.20170228585008707	--
Spinacia oleracea	Leaf	5	270	-0.49080851056065206	ACTA AGRIC SCAND SUPPL 22: 1980
Spondias dulcis	Fruit	10	11	-0.2203212716903376	--
Spondias tuberosa	Fruit	7.88	7.88	-0.2212289472500498	--
Stellaria media	Plant	163	1960	3.141159241769086	--
Stevia rebaudiana	Leaf	72	72	-0.7033032301021273	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
Symphoricarpos orbiculatus	Stem	190	4400	3.4656113752800737	--
Symphytum officinale	Root	237	237	-0.18531623688311008	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.

Plant	Part	Low PPM	High PPM	StdDev	Reference
Symphytum officinale	Leaf	26	237	-0.5262242971508979	--
Syzygium aromaticum	Flower	80	160	1.0835425694391705	--
Syzygium aromaticum	Fruit	80	160	-0.17697394528100432	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
Tabebuia heptaphylla	Bark	--	--		--
Tanacetum parthenium	Plant	--	6	-0.7451443685154636	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
Taraxacum officinale	Root	94	656	0.03950108174380199	--
Thymus vulgaris	Leaf	155	920	0.20677516470176702	--
Tragopogon porrifolius	Root	56	56	-0.2824330260751652	--
Trifolium pratense	Flower	25	137	0.6800025424215751	--
Trigonella foenum-graecum	Seed	46	350	0.21894815163485395	--
Turnera diffusa	Leaf	127	605	-0.13128461638694375	--
Ulmus rubra	Bark	3.6	22	-0.7439000789249773	--
Urtica dioica	Leaf	28	138	-0.6324716569216356	--
Vaccinium macrocarpon	Fruit	2	15	-0.21915758507532193	ACTA AGRIC SCAND SUPPL 22: 1980
Vaccinium myrtillus	Fruit	25	318	-0.13100832398788578	--
Vaccinium vitis-idaea	Fruit	5	53	-0.20810256223267318	--
Valeriana officinalis	Root	50	422	-0.0860532203055952	--
Verbascum thapsus	Leaf	--	1090	0.3892201259242459	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.

Plant	Part	Low PPM	High PPM	StdDev	Reference
Viburnum opulus	Bark	702	702	2.1099902097575876	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
Vigna unguiculata	Seed	6	840	1.0345858754946278	--
Vigna unguiculata	Seed	6	840	1.0345858754946278	--
Viscum album	Leaf	283	283	-0.47685683705540366	--
Vitis vinifera	Fruit	1	154	-0.1787194752035278	--
Vitis vinifera	Stem	1030	1030	0.044464754302322065	Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
Xanthosoma sagittifolium	Root	5.3	16.6	-0.30357336582194405	--
Yucca baccata	Root	11	51	-0.2851158103069899	--
Zea mays	Seed	1	275	0.09410564288080694	--
Zea mays	Silk Stigma Style	213	213		--
Zea mays	Leaf	--	--		--
Zingiber officinale	Rhizome	--	663		--
Zingiber officinale	Root	46	663	0.04325697966835661	--