

C LYSINE

Chemid

LYSINE

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
Abelmoschus esculentus	Fruit	810	8100	1.0322270292855846	USDA's Ag Handbook 8 and sequelae)
Acacia farnesiana	Leaf	3760	20170	1.6628021945345992	CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
Acacia farnesiana	Seed	1750	1800	-1.3950017923225162	Rizk, A.F.M. and Al-Nowaihi, A.S., The Phytochemistry of the Horticultural Plants of Qatar, Scientific and Applied Research Centre, University of Qatar.
Achillea millefolium	Plant	--	--		Tunon, H., Thorsell, W., and Bohlin, L. 1993. Mosquito Repelling Activity of Compounds Occurring in Achillea millefolium L. (Asteraceae). Economic Botany 48(2): 111-120, 1994.
Albizia lebeck	Seed	--	--		Wealth of India.
Allium ampeloprasum	Plant	--	--		--
Allium cepa	Bulb	560	6104	-1	USDA's Ag Handbook 8 and sequelae)

Plant	Part	Low PPM	High PPM	StdDev	Reference
Allium sativum var. sativum	Bulb	10	6552	1	--
Allium sativum var. sativum	Leaf	--	--		--
Allium schoenoprasum	Leaf	1630	17435	1.0400528624977512	USDA's Ag Handbook 8 and sequelae)
Aloe vera	Leaf	7748	7748	-1.1656410239523205	--
Alpinia galanga	Leaf	--	--		--
Amaranthus sp.	Leaf	1270	15278	0.5489119816189648	--
Anacardium occidentale	Seed	8170	8311	-0.5130521224284408	--
Ananas comosus	Fruit	46	1852	-0.5859651529954232	--
Anethum graveolens	Fruit	10380	11242	1.8459850057143503	--
Anethum graveolens	Seed	10380	11242	-0.11603254287698407	USDA's Ag Handbook 8 and sequelae)
Angelica sinensis	Root	--	--		Jim Duke's personal files.
Annona muricata	Fruit	600	3180	-0.24202161617257129	--
Annona reticulata	Fruit	370	1300	-0.7289296351687773	--
Annona squamosa	Fruit	550	2055	-0.533389446688918	--
Apium graveolens	Pt	260	5410		USDA's Ag Handbook 8 and sequelae)
Arachis hypogaea	Seed	9390	10627	-0.19933757236321603	--
Arctium lappa	Root	670	3350	-0.3553603353392198	USDA's Ag Handbook 8 and sequelae)
Artemisia dracunculus	Shoot	--	--		--
Artemisia dracunculus	Root	--	--		--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Artemisia dracunculus	Leaf	--	--		--
Artocarpus altilis	Fruit	370	1258	-0.7398073675080542	--
Artocarpus altilis	Seed	5700	13035	0.12683886829181903	USDA's Ag Handbook 8 and sequelae)
Asimina triloba	Fruit	339	3831	-0.07341676491377869	--
Asparagus officinalis	Shoot	1450	18710	0.3111156963571142	--
Avena sativa	Plant	14000	14000	0.48205927294439394	Jim Duke's personal files.*
Avena sativa	Seed	2000	7000	-0.6906340633332377	Jim Duke's personal files.*
Averrhoa carambola	Fruit	400	4400	0.0739506089207113	USDA's Ag Handbook 8 and sequelae)
Basella alba	Leaf	860	12465	-0.09159766043575311	--
Benincasa hispida	Fruit	90	2305	-0.46864103990750755	--
Bertholletia excelsa	Seed	5410	5597	-0.880677894827845	USDA's Ag Handbook 8 and sequelae)
Beta vulgaris	Root	530	4180	0.4061670574806671	USDA's Ag Handbook 8 and sequelae)
Bixa orellana	Seed	10130	14250	0.29141709727681386	--
Brassica chinensis	Leaf	890	19019	1.4007237736298783	--
Brassica napus var. napobrassica	Root	390	3770	0.029990875485301268	USDA's Ag Handbook 8 and sequelae)
Brassica nigra	Leaf	1130	16642	0.8594897106494074	USDA's Ag Handbook 8 and sequelae)
Brassica oleracea	Stem	560	6222		--
Brassica oleracea var. botrytis l.	Leaf	1410	15143	0.5181729835111131	--
Brassica oleracea var. botrytis l.	Flower	1070	13825		--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Brassica oleracea var. capitata l.	Leaf	570	7621	-1.1945584518019292	USDA's Ag Handbook 8 and sequelae)
Brassica oleracea var. gemmifera	Leaf	1540	10996	-0.426083499105636	USDA's Ag Handbook 8 and sequelae)
Brassica oleracea var. italica	Leaf	1410	15143	0.5181729835111131	USDA's Ag Handbook 8 and sequelae)
Brassica oleracea var. sabellica l.	Leaf	1970	12675	-0.04378144115687264	--
Brassica oleracea var. viridis l.	Leaf	750	12293	-0.13076142098797902	--
Brassica rapa	Root	360	4425	0.630955263794971	--
Brassica rapa	Leaf	890	19019	1.4007237736298783	USDA's Ag Handbook 8 and sequelae)
Cajanus cajan	Seed	13750	17010	0.6652738149711231	--
Calathea allouia	Root	3810	4190	0.41534208630982233	--
Camellia sinensis	Leaf	--	--		--
Capsicum annum	Fruit	380	5183	0.27674261896008856	USDA's Ag Handbook 8 and sequelae)
Capsicum frutescens	Fruit	890	7262	0.8151903697542972	USDA's Ag Handbook 8 and sequelae)
Carica papaya	Fruit	250	2238	-0.48599361292492554	USDA's Ag Handbook 8 and sequelae)
Carum carvi	Seed	10310	11445	-0.08853511037990262	Revised USDA data received 1993.
Castanea dentata	Seed	2687	4784	-0.9908030801486687	--
Castanea mollissima	Seed	2313	4116	-1.0812872422572914	--
Castanea sativa	Seed	1189	2617	-1.2843347856717007	--
Ceratonia siliqua	Seed	26320	26320	1.926362960526928	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
Chenopodium album	Seed	3540	22550	1.4156963570097005	--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Cicer arietinum	Seed	12910	14595	0.3381491869886026	USDA's Ag Handbook 8 and sequelae)
Cichorium endivia	Leaf	630	10145	-0.619853035326242	--
Cichorium intybus	Leaf	350	7956	-1.1182801972380008	USDA's Ag Handbook 8 and sequelae)
Citrullus lanatus	Fruit	7303	7303	0.8258091084664485	Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
Citrullus lanatus	Seed	8932	8932	-0.4289343609472212	Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
Citrus aurantiifolia	Fruit	140	1190	-0.7574189341525978	USDA's Ag Handbook 8 and sequelae)
Citrus paradisi	Fruit	160	1760	-0.6097925666909821	--
Citrus reticulata	Fruit	40	2579	-0.3976767860750818	--
Citrus sinensis	Fruit	470	3548	-0.1467119613903352	USDA's Ag Handbook 8 and sequelae)
Cnidioscolus chayamansa	Leaf	3040	15190	0.528874708778291	--
Cocos nucifera	Endosperm	--	--		Jim Duke's personal files.
Cocos nucifera	Leaf	--	--		Jim Duke's personal files.
Cocos nucifera	Seed	1470	2775	-1.2629328431370264	USDA's Ag Handbook 8 and sequelae)
Colocasia esculenta	Leaf	2460	17155	0.9762979034592439	--
Colocasia esculenta	Root	670	2280	-1.337088420058833	--
Corchorus olitorius	Leaf	1540	17825	1.1288544125871007	--
Coriandrum sativum	Fruit	--	--		--
Coriandrum sativum	Leaf	--	--		--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Crocus sativus	Bulb	--	--		--
Cryptotaenia japonica	Root	--	--		--
Cucumis sativus	Fruit	220	5570	0.3769731526577118	--
Cucurbita foetidissima	Seed	10130	33000	2.8312045816131546	--
Cucurbita pepo	Fruit	470	6429	0.5994486783586378	--
Cucurbita pepo	Seed	15580	19693	1.221995231537649	--
Cucurbita spp	Fruit	650	10285	1.5981281045551112	--
Daucus carota	Root	400	3275	-0.4241730515578843	--
Dioscorea pentaphylla	Root	520	2800	-0.8599869209427593	--
Eryngium creticus	Shoot	3980	3980	-1.3502985177843803	Laferriere, J.E., 1988, Nutricomp Program, Nutricomp Database; reviewed in J. Ethnobiology 9(1):27-29.
Fagopyrum esculentum	Seed	7110	7110	-0.6757339767584645	--
Ficus carica	Fruit	300	1436	-0.69370650187969	USDA's Ag Handbook 8 and sequelae)
Fragaria spp	Fruit	250	2966	-0.29744625237745853	USDA's Ag Handbook 8 and sequelae)
Ginkgo biloba	Seed	2060	4594	-0.8748533155304336	USDA's Ag Handbook 8 and sequelae)
Glycine max	Seed	24290	26560	1.9588722403264331	USDA's Ag Handbook 8 and sequelae)
Glycine max	Shoot	--	--		--
Harpagophytum procumbens	Root	--	--		--
Helianthus annuus	Seed	9370	9900	-0.29781359908921706	--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Helianthus tuberosus	Tuber	4288	4288	-0.812095239335622	Izidoost, M. & Robinson, T., Synergism & antagonism in the pharmacology of alkaloidal plants, pp 137-58 in Craker, L. & Simon, J., eds., Herbs, Spices & Medicinal Plants: Recent Advances in Botany, Horticulture & Pharmacology, v. 2, 1987, 255pp.
Humulus lupulus	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Hypericum perforatum	Plant	--	--		--
Ipomoea batatas	Root	810	3280	-0.41958553714330665	--
Juglans cinerea	Seed	7700	7966	-0.5597842121402294	--
Juglans nigra	Seed	7210	7540	-0.6174881837843511	USDA's Ag Handbook 8 and sequelae)
Juglans regia	Seed	3880	4025	-1.0936136775146037	USDA's Ag Handbook 8 and sequelae)
Lablab purpureus	Seed	190	18000	0.799374594144082	--
Lactuca sativa	Leaf	840	14000	0.25791613286463505	--
Lagenaria siceraria	Fruit	210	4700	0.15164869705840375	--
Lens culinaris	Seed	19570	22035	1.3459368607732625	USDA's Ag Handbook 8 and sequelae)
Lens culinaris	Sprout Seedling	7120	23735	0.4097902073122836	USDA's Ag Handbook 8 and sequelae)
Lentinus edodes	Fruit	--	--		--
Lepidium meyenii	Root	--	5450	1.5713957187833856	Taylor, Leslie. 2005. The Healing Power of Rainforest Herbs. SquareOne Publisher, Garden City Park, NY. 519 pp.
Linum usitatissimum	Plant	--	0.209	-1.2551253944019245	--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Linum usitatissimum	Seed	--	2.5	-1.63848275248756	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
Lupinus albus	Seed	19330	21585	1.2849819611491902	--
Lycopersicon esculentum	Fruit	20	5455	0.34718888553826305	--
Macadamia spp	Seed	3240	3330	-1.1877551336006706	USDA's Ag Handbook 8 and sequelae)
Malus domestica	Fruit	20	746	-0.8724121045963826	--
Mangifera indica	Fruit	410	3200	-0.23684174363005844	--
Manihot esculenta	Root	1000	3175	-0.515923339849437	--
Medicago sativa	Plant	--	--		--
Melia azedarach	Seed	--	--		--
Melicoccus bijugatas	Fruit	170	545	-0.9244698236486365	Morton, J.F., Major Medicinal Plants. 1977. Atlas of Medicinal Plants of Middle America. Bahamas to Yucatan. 1981.
Mentha spicata	Leaf	1410	9760	-0.7075161040041896	--
Mentha x piperita	Leaf	1610	7540	-1.2130018506666402	USDA's Ag Handbook 8 and sequelae)
Momordica charantia	Seed	--	149	-1.618638546276612	Jim Duke's personal files.
Moringa oleifera	Shoot	5370	25165	1.0391828214272667	USDA's Ag Handbook 8 and sequelae)
Mucuna pruriens	Seed	9700	20564	1.1466820666687954	--
Murraya sp	Fruit	600	1728	-0.6180803627590027	--
Musa x paradisiaca	Fruit	600	1728	-0.6180803627590027	USDA's Ag Handbook 8 and sequelae)
Nasturtium officinale	Herb	1340	26800	1	USDA's Ag Handbook 8 and sequelae)

Plant	Part	Low PPM	High PPM	StdDev	Reference
Nelumbo nucifera	Rhizome	940	4500	1	--
Nelumbo nucifera	Seed	2640	8000	-0.5551787308352996	--
Nigella sativa	Seed	16200	20700	1.1651039918885149	--
Ocimum basilicum	Leaf	6180	6180	-1.5226687945679613	USDA's Ag Handbook 8 and sequelae)
Oenothera biennis	Seed	3100	3842	-1.1184020033617263	--
Opuntia ficus-indica	Bud	6005	6005		Laferriere, J.E., 1988, Nutricomp Program, Nutricomp Database; reviewed in J. Ethnobiology 9(1):27-29.
Opuntia ficus-indica	Seed	6275	6275	-0.7888391793942429	Laferriere, J.E., 1988, Nutricomp Program, Nutricomp Database; reviewed in J. Ethnobiology 9(1):27-29.
Oryza sativa	Hay	--	--		--
Pachyrhizus erosus	Tuber	510	4700	-0.705310514654771	--
Panax ginseng	Leaf	--	--		--
Panax ginseng	Root	--	--		--
Panax quinquefolius	Plant	2080	2100	-0.994569738261644	--
Papaver bracteatum	Seed	7200	8150	-0.5348604309606089	--
Papaver somniferum	Seed	10990	11789	-0.0419384760006119	--
Perideridia gairdneri	Root	2984	2984	-0.6911663904863025	Izadoost, M. & Robinson, T., Synergism & antagonism in the pharmacology of alkaloidal plants, pp 137-58 in Craker, L. & Simon, J., eds., Herbs, Spices & Medicinal Plants: Recent Advances in Botany, Horticulture & Pharmacology, v. 2, 1987, 255pp.
Persea americana	Fruit	750	3653	-0.11951763054214287	J. Ethnobiology.

Plant	Part	Low PPM	High PPM	StdDev	Reference
Petroselinum crispum	Plant	2190	18724	1.068243764451732	USDA's Ag Handbook 8 and sequelae)
Phaseolus acutifolius	Seed	17800	19400	0.9890120596411954	Laferriere, J.E., 1988, Nutricomp Program, Nutricomp Database; reviewed in J. Ethnobiology 9(1):27-29.
Phaseolus lunatus	Seed	4520	19010	0.9361844799669995	--
Phaseolus vulgaris	Fruit	880	9044	1.2767170132921903	USDA's Ag Handbook 8 and sequelae)
Phaseolus vulgaris	Seed	14830	16667	0.6188126359243304	USDA's Ag Handbook 8 and sequelae)
Phaseolus vulgaris	Sprout Seedling	2390	25700	0.9673053866582134	USDA's Ag Handbook 8 and sequelae)
Phoenix dactylifera	Fruit	30	2450	-0.4310869639742895	--
Phyllanthus emblica	Fruit	170	1168	-0.7631167939493619	--
Pinus edulis	Seed	4340	4615	-1.0136950313408202	USDA's Ag Handbook 8 and sequelae)
Pinus pinea	Seed	9010	9655	-0.3310001555512119	USDA's Ag Handbook 8 and sequelae)
Pistacia vera	Seed	12780	13295	0.16205725474128296	--
Pisum sativum	Fruit	2020	19980	4.109071319538206	--
Pisum sativum	Seed	3170	14995	0.3923313199877778	--
Portulaca oleracea	Herb	650	13200	-1	--
Pouteria caimito	Fruit	3160	3160	-0.2472014887150841	Morton, J.F., Major Medicinal Plants. 1977. Atlas of Medicinal Plants of Middle America. Bahamas to Yucatan. 1981.
Pouteria campechiana	Fruit	840	2130	-0.5139649246544948	Morton, J.F., Major Medicinal Plants. 1977. Atlas of Medicinal Plants of Middle America. Bahamas to Yucatan. 1981.
Prunus armeniaca	Fruit	970	7105	0.7745283702955714	USDA's Ag Handbook 8 and sequelae)
Prunus domestica	Fruit	170	1149	-0.7680376728647491	USDA's Ag Handbook 8 and sequelae)

Plant	Part	Low PPM	High PPM	StdDev	Reference
Prunus dulcis	Seed	6660	6966	-0.6952395446381676	USDA's Ag Handbook 8 and sequelae)
Prunus persica	Fruit	230	1863	-0.5831162230970411	--
Psidium cattleianum	Fruit	160	825	-0.8519516080534569	--
Psidium guajava	Fruit	230	1656	-0.6367279039120489	USDA's Ag Handbook 8 and sequelae)
Psophocarpus tetragonolobus	Leaf	2280	9849	-0.6872511348812355	--
Psophocarpus tetragonolobus	Seed	21360	23304	1.517829677713146	--
Psophocarpus tetragonolobus	Tuber	5920	13897	1.6784251962427683	--
Psoralea esculenta	Root	2743	2743	-0.9122845852689443	Izidoost, M. & Robinson, T., Synergism & antagonism in the pharmacology of alkaloidal plants, pp 137-58 in Craker, L. & Simon, J., eds., Herbs, Spices & Medicinal Plants: Recent Advances in Botany, Horticulture & Pharmacology, v. 2, 1987, 255pp.
Pyrus communis	Fruit	140	865	-0.8415918629684312	--
Raphanus sativus	Root	350	6785	2.796262067475613	--
Rehmannia glutinosa	Root	2000	4000	0.24101653855587235	--
Rosmarinus officinalis	Leaf	1430	4435	-1.91999880714723	USDA's Ag Handbook 8 and sequelae)
Sambucus canadensis	Plant	260	1287	-1.0954520396154683	--
Santalum album	Fruit	--	--		--
Scutellaria baicalensis	Root	--	--		--
Secale cereale	Seed	6050	6795	-0.7184024064953151	USDA's Ag Handbook 8 and sequelae)
Sechium edule	Fruit	430	6145	0.5258944882549557	--
Senna obtusifolia	Seed	9500	9500	-0.35199573208839235	--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Sesamum indicum	Seed	2890	8729	-0.4564317934443026	--
Sinapis alba	Seed	15190	16252	0.5625986729376861	--
Solanum melongena	Fruit	510	6320	0.5712183730019429	--
Solanum tuberosum	Tuber	1260	6800	-0.16101944225237538	--
Spinacia oleracea	Plant	1740	20664	1.308971519219775	USDA's Ag Handbook 8 and sequelae)
Spinacia oleracea	Leaf	--	--		--
Stachys officinalis	Shoot	--	--		--
Tamarindus indica	Fruit	1390	2026	-0.5409002618755615	USDA's Ag Handbook 8 and sequelae)
Theobroma cacao	Seed	800	800	-1.5304571248204542	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
Thymus vulgaris	Plant	2070	2236	-0.977693978133575	USDA's Ag Handbook 8 and sequelae)
Trifolium pratense	Plant	--	--		--
Trigonella foenum-graecum	Seed	15310	18525	0.8704886437054995	--
Trigonella foenum-graecum	Leaf	--	--		--
Triticum aestivum	Plant	15000	18000	0.9784051590640706	--
Triticum aestivum	Seed	2000	9000	-0.4197233983373614	--
Tulipa gesneriana	Stem	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Urtica dioica	Leaf	--	--		Jim Duke's personal files.
Vaccinium corymbosum	Fruit	120	780	-0.8636063212741109	--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Valerianella locusta	Plant	1010	14025	0.4851614347326419	--
Vicia faba	Seed	3660	19265	0.9707255897539737	USDA's Ag Handbook 8 and sequelae)
Vigna aconitifolia	Seed	12480	13818	0.23290039363770462	--
Vigna angularis	Seed	14970	17294	0.7037431294005376	--
Vigna radiata	Seed	16640	18296	0.8394693725634716	USDA's Ag Handbook 8 and sequelae)
Vigna radiata	Sprout Seedling	1666	17437	-1.377095593970498	USDA's Ag Handbook 8 and sequelae)
Vigna unguiculata	Fruit	1840	15144	2.8565781387586036	USDA's Ag Handbook 8 and sequelae)
Vigna unguiculata	Seed	16460	17975	0.7959882108316335	USDA's Ag Handbook 8 and sequelae)
Vigna unguiculata	Seed	1940	18069	0.8087210120864397	USDA's Ag Handbook 8 and sequelae)
Vitis vinifera	Fruit	150	772	-0.8656782702911159	USDA's Ag Handbook 8 and sequelae)
Zea mays	Seed	1370	5699	-0.8668614509130552	USDA's Ag Handbook 8 and sequelae)
Zingiber officinale	Rhizome	570	3110	-1	--
Zingiber officinale	Root	570	3110	-0.5755610272389462	USDA's Ag Handbook 8 and sequelae)