

Dr. Duke's Phytochemical and Ethnobotanical Databases

List of Plants for GLUTAMIC-ACID

Plant	Part	Low PPM	High PPM	StdDev	Reference
Allium sativum var. sativum	Leaf				--
Myrica cerifera	Root				--
Glycine max	Shoot				--
Silybum marianum	Seed				--
Huperzia spp	Plant				--
Cryptotaenia japonica	Shoot				--
Melia azedarach	Plant				--
Stachys officinalis	Shoot				--
Lentinus edodes	Fruit				--
Angelica sinensis	Root				Jim Duke's personal files.
Oryza sativa	Hay				--
Coriandrum sativum	Fruit				--
Chondrus crispus	Thallus				Jim Duke's personal files.
Coffea arabica	Seed				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
Taraxacum officinale	Leaf				Hansel, R., Keller, K., Rimpler, H., and Schneider, G. eds. 1992. Hager's Handbuch der Pharmazeutischen Praxis, Drogen (A-D), 1209 pp., 1993 (E-O), 970 pp., 1994 (P-Z), 1196 pp. Springer-Verlag, Berlin.
Cocos nucifera	Endosperm				Jim Duke's personal files.
Plantago ovata	Seed				--
Allium cepa	Bulb				Thomas, D. J., Parkin, K. L. 1994. Quantification of Alk(en)yl-L-Cysteine Sulfoxides and Related Amino Acids in Alliums by High-Performance Liquid Chromatography. J. Agr. Food Chem., 42(8): 1632-1638.
Cocos nucifera	Leaf				Jim Duke's personal files.
Alpinia galanga	Leaf				--
Prunus cerasus	Fruit				--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Crocus sativus	Bulb				--
Astragalus membranaceus	Root				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
Capsella bursa-pastoris	Plant				--
Pinellia ternata	Tuber				--
Artemisia dracunculus	Root				--
Momordica charantia	Fruit				Jim Duke's personal files.
Bacopa monnieri	Plant				Wealth of India.
Opuntia ficus-indica	Bud		16000.0		Laferriere, J.E., 1988, Nutricomp Program, Nutricomp Database; reviewed in J. Ethnobiology 9(1):27-29.
Brassica oleracea var. botrytis l.	Flower	2650.0	34240.0		--
Citrus limon	Plant				--
Artemisia dracunculus	Shoot				--
Coccinia grandis	Flower				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Glechoma hederacea	Plant				Oriental Materia Medica (three volumes by Dr. Hsu and collaborators)
Apium graveolens	Shoot				--
Scutellaria baicalensis	Root				--
Centella asiatica	Plant				=ICMR(Indian Council of Medical Research).1976.Medicinal Plants of India.Vol.1.Indian Council of Med. Res.Cambridge Printing Works, New Delhi.487 pp:ICMR.1987.Medicinal Plants of India.Vol.2.Indian Council of Med. Res.Cambr. Printing Works,New Delhi.600pp
Allium sativum var. sativum	Bulb	5.0	19320.0		--
Anabasis aphylla	Plant				--
Ribes nigrum	Fruit Juice		210.0		--

Plant	Part	Low PPM	High PPM	StdDev	Reference
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.
Tribulus terrestris	Fruit				--
Allium ampeloprasum	Plant				--
Urtica dioica	Leaf				Jim Duke's personal files.
Panax ginseng	Root				--
Dryopteris marginalis	Plant				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Panax ginseng	Leaf				--
Artemisia dracunculus	Leaf				--
Ricinus communis	Seed				List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Harpagophytum procumbens	Root				--
Carica papaya	Fruit				USDA's Ag Handbook 8 and sequelae)
Morus alba	Leaf				--
Valeriana officinalis	Root				--
Trifolium pratense	Plant				--
Apium graveolens	Pt	860.0	18285.0		USDA's Ag Handbook 8 and sequelae)
Tilia sp.	Fruit				--
Linum usitatissimum	Seed		1.153	-1.7598687378912001	--
Momordica charantia	Seed		212.0	-1.7509729163492929	Jim Duke's personal files.
Pachyrhizus erosus	Tuber	820.0	7560.0	-1.6000445771204561	--
Castanea sativa	Seed	2558.0	5628.0	-1.5224670828730211	--
Rosmarinus officinalis	Leaf	3610.0	11200.0	-1.4449537951023277	USDA's Ag Handbook 8 and sequelae)

Plant	Part	Low PPM	High PPM	StdDev	Reference
<i>Pisum sativum</i>	Shoot		70.0	-1.3728059371053247	--
<i>Castanea mollissima</i>	Seed	5393.0	9600.0	-1.354884887421073	--
<i>Panax quinquefolius</i>	Plant	396.0	4450.0	-1.3461930909311184	--
<i>Vigna radiata</i>	Sprout Seedling	1610.0	16912.0	-1.3307273280388923	USDA's Ag Handbook 8 and sequelae)
<i>Theobroma cacao</i>	Seed		10200.0	-1.3295703563860357	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
<i>Castanea dentata</i>	Seed	6204.0	11043.0	-1.294003440281808	--
<i>Elaeagnus angustifolia</i>	Root		0.48	-1.2905101027270787	Wheller, C. T., Bond, G. 1970. The Amino Acids of Non-Legume Root Nodules. Phytochemistry 9: 705-708. Dept. Botany Univ. Glasgow Glasgow, Scotland.
<i>Ocimum basilicum</i>	Leaf		15650.0	-1.204342874821576	USDA's Ag Handbook 8 and sequelae)
<i>Cocos nucifera</i>	Seed	7610.0	14355.0	-1.154267228968401	USDA's Ag Handbook 8 and sequelae)
<i>Psophocarpus tetragonolobus</i>	Leaf	3890.0	16803.0	-1.142000315027485	--
<i>Mentha x piperita</i>	Leaf	4090.0	19155.0	-1.0148279814319057	USDA's Ag Handbook 8 and sequelae)
<i>Portulaca oleracea</i>	Herb	1500.0	33792.0	-1.0	--
<i>Nelumbo nucifera</i>	Rhizome	1390.0	6650.0	-1.0	--
<i>Macadamia spp</i>	Seed	17820.0	18330.0	-0.9865584608612779	USDA's Ag Handbook 8 and sequelae)
<i>Malus domestica</i>	Fruit	156.0	1244.0	-0.9333642189445454	--
<i>Pyrus communis</i>	Fruit	280.0	1729.0	-0.8956208835154862	--
<i>Brassica oleracea</i> var. <i>viridis</i> l.	Leaf	1310.0	21471.0	-0.8896021631464629	--
<i>Pinus edulis</i>	Seed	19690.0	20925.0	-0.8770731141347408	USDA's Ag Handbook 8 and sequelae)
<i>Prunus domestica</i>	Fruit	370.0	2500.0	-0.8356206533798067	USDA's Ag Handbook 8 and sequelae)
<i>Citrus paradisi</i>	Fruit	220.0	2800.0	-0.8122742603309042	--
<i>Ginkgo biloba</i>	Seed	8360.0	22840.0	-0.7962775692479128	USDA's Ag Handbook 8 and sequelae)
<i>Colocasia esculenta</i>	Root	1740.0	5925.0	-0.7882497491807205	--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Fagopyrum esculentum	Seed		23300.0	-0.7768697621210507	Laferriere, J.E., 1988, Nutricomp Program, Nutricomp Database; reviewed in J. Ethnobiology 9(1):27-29.
Ananas comosus	Fruit	90.0	3333.0	-0.7707955020140207	--
Murraya sp	Fruit	1160.0	3341.0	-0.7701729315327166	--
Musa x paradisiaca	Fruit	1160.0	3341.0	-0.7701729315327166	USDA's Ag Handbook 8 and sequelae)
Ficus carica	Fruit	720.0	3447.0	-0.7619238726554377	USDA's Ag Handbook 8 and sequelae)
Artocarpus altilis	Seed	10360.0	23690.0	-0.7604153169482764	USDA's Ag Handbook 8 and sequelae)
Ipomoea batatas	Root	1590.0	6360.0	-0.7513719508455532	--
Brassica oleracea var. sabellica l.	Leaf	3740.0	24065.0	-0.749344921077189	--
Psidium cattleianum	Fruit	760.0	3930.0	-0.7243361798467046	--
Mentha spicata	Leaf	3580.0	24775.0	-0.7109553135717208	USDA's Ag Handbook 8 and sequelae)
Sambucus canadensis	Fruit	960.0	4752.0	-0.6603670628927117	USDA's Ag Handbook 8 and sequelae)
Zea mays	Seed	6360.0	26457.0	-0.6436731379916952	USDA's Ag Handbook 8 and sequelae)
Citrus reticulata	Fruit	160.0	5158.0	-0.6287716109665302	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
Arctium lappa	Root	1570.0	7850.0	-0.6250548944791179	USDA's Ag Handbook 8 and sequelae)
Larrea tridentata	Plant		13600.0	-0.6106343436470067	--
Vaccinium corymbosum	Fruit	830.0	5393.0	-0.6104836030782232	--
Cichorium endivia	Leaf	1660.0	26731.0	-0.6051946483876423	--
Oenothera biennis	Seed	26300.0	28068.0	-0.5757036221626196	--
Dioscorea pentaphylla	Root	1590.0	8565.0	-0.5644396627328083	--
Phoenix dactylifera	Fruit	400.0	6160.0	-0.5507946581831958	--
Lycium barbarum	Fruit		6300.0	-0.5398996747603746	Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
Nelumbo nucifera	Seed	9570.0	29000.0	-0.5363817172881947	--
Juglans regia	Seed	28090.0	29155.0	-0.5298421301041434	USDA's Ag Handbook 8 and sequelae)

Plant	Part	Low PPM	High PPM	StdDev	Reference
Phyllanthus emblica	Fruit	1320.0	6535.0	-0.5216116668720676	--
Mangifera indica	Fruit	600.0	6800.0	-0.5009890196788704	--
Zingiber officinale	Root	1620.0	9328.0	-0.49975515668744586	USDA's Ag Handbook 8 and sequelae)
Citrus sinensis	Fruit	60.0	7097.0	-0.4778760905604569	--
Vitis vinifera	Fruit	1380.0	7099.0	-0.47772044794013085	USDA's Ag Handbook 8 and sequelae)
Calathea allouia	Root	8825.0	9710.0	-0.4673705153908161	--
Asimina triloba	Fruit	622.0	7332.0	-0.4595880826721499	--
Citrullus lanatus	Fruit		7420.0	-0.45273980737780517	Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
Avena sativa	Seed	29000.0	31000.0	-0.4519999471714031	Jim Duke's personal files.*
Psidium guajava	Fruit	1070.0	7704.0	-0.43063855529151074	USDA's Ag Handbook 8 and sequelae)
Lactuca sativa	Leaf	1820.0	30333.0	-0.4104349776345486	--
Persea americana	Fruit	1660.0	8045.0	-0.40410148852592487	--
Foeniculum vulgare	Seed	29560.0	32427.0	-0.3917935541930723	USDA's Ag Handbook 8 and sequelae)
Bertholletia excelsa	Seed	31510.0	32600.0	-0.3844945310779699	--
Averrhoa carambola	Fruit	770.0	8480.0	-0.3702492186050162	USDA's Ag Handbook 8 and sequelae)
Prunus persica	Fruit	1060.0	8586.0	-0.3620001597277373	--
Phaseolus lunatus	Seed	8810.0	33820.0	-0.333021651306727	USDA's Ag Handbook 8 and sequelae)
Pisum sativum	Seed	7400.0	35005.0	-0.283025452512528	--
Carum carvi	Seed	31690.0	35175.0	-0.2758530020526007	Revised USDA data received 1993.
Chenopodium album	Leaf	5210.0	33188.0	-0.25606549956678565	--
Vigna angularis	Seed	30990.0	35802.0	-0.24939931712098654	--
Psoralea esculenta	Root	4093.0	12319.0	-0.24618850192770889	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.

Plant	Part	Low PPM	High PPM	StdDev	Reference
Perideridia gairdneri	Root		12319.0	-0.24618850192770889	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.
Nigella sativa	Seed	28085.0	35900.0	-0.24526461038526376	--
Ipomoea aquatica	Leaf	2520.0	33465.0	-0.24108814565268047	--
Anacardium occidentale	Seed	36240.0	36867.0	-0.20446602453379503	--
Fragaria spp	Fruit	900.0	10676.0	-0.19935362148704966	USDA's Ag Handbook 8 and sequelae)
Phaseolus vulgaris	Seed	32940.0	37019.0	-0.19805301000491887	USDA's Ag Handbook 8 and sequelae)
Opuntia ficus-indica	Seed		37500.0	-0.17775919429183049	Laferriere, J.E., 1988, Nutricomp Program, Nutricomp Database; reviewed in J. Ethnobiology 9(1):27-29.
Avena sativa	Plant		19000.0	-0.17653409934818678	Jim Duke's personal files.*
Hordeum vulgare	Seed	32000.0	38000.0	-0.15666375176263259	Jim Duke's personal files.*
Amaranthus sp.	Leaf	2920.0	35128.0	-0.15116995229832328	--
Cicer arietinum	Seed	33600.0	38150.0	-0.15033511900387322	--
Prunus armeniaca	Fruit	1570.0	11500.0	-0.13522886191273067	USDA's Ag Handbook 8 and sequelae)
Brassica napus var. napobrassica	Root	1420.0	13730.0	-0.12656879284513156	USDA's Ag Handbook 8 and sequelae)
Brassica oleracea var. capitata l.	Leaf	2700.0	36099.0	-0.09866810879436606	USDA's Ag Handbook 8 and sequelae)
Psophocarpus tetragonolobus	Tuber	8000.0	18779.0	-0.06387581149516006	--
Mucuna pruriens	Seed	19075.0	40440.0	-0.05371799222014686	--
Secale cereale	Seed	36610.0	41110.0	-0.025450099231021674	USDA's Ag Handbook 8 and sequelae)
Manihot esculenta	Root	4700.0	14925.0	-0.025260818108292494	--
Lepidium meyenii	Root		15650.0	0.036202179116986435	Taylor, Leslie. 2005. The Healing Power of Rainforest Herbs. SquareOne Publisher, Garden City Park, NY. 519 pp.
Lablab purpureus	Seed	1720.0	42815.0	0.04648535979354315	--
Vigna unguiculata	Seed		43190.0	0.06230694169044158	--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Vigna unguiculata	Seed		43190.0	0.06230694169044158	--
Papaver bracteatum	Seed	37600.0	43200.0	0.06272885054102553	--
Brassica rapa	Root	1300.0	15990.0	0.06502620540194483	--
Psophocarpus tetragonolobus	Seed	40100.0	43749.0	0.08589164643808482	--
Trigonella foenum-graecum	Seed	39880.0	43870.0	0.0909967435301507	--
Daucus carota	Root	2020.0	16545.0	0.11207718948474456	--
Corchorus olitorius	Leaf	4930.0	40130.0	0.11928753607118647	--
Brassica oleracea var. botrytis l.	Leaf	3750.0	40275.0	0.12712766718145815	--
Brassica oleracea var. italica	Leaf	3750.0	40275.0	0.12712766718145815	USDA's Ag Handbook 8 and sequelae)
Vicia faba	Seed	8550.0	45000.0	0.13867244364613796	USDA's Ag Handbook 8 and sequelae)
Capsicum annuum	Fruit	1120.0	15277.0	0.15870222657295222	USDA's Ag Handbook 8 and sequelae)
Basella alba	Leaf	2830.0	41015.0	0.1671393707787067	--
Vigna radiata	Seed	42640.0	46883.0	0.21811788021109724	USDA's Ag Handbook 8 and sequelae)
Lens culinaris	Sprout Seedling	12580.0	41935.0	0.25078727322053307	USDA's Ag Handbook 8 and sequelae)
Aloe vera	Leaf		43256.0	0.28830994883469857	--
Papaver somniferum	Seed	45410.0	48713.0	0.2953271998679615	--
Lens culinaris	Seed	43500.0	49000.0	0.30743598387972115	USDA's Ag Handbook 8 and sequelae)
Moringa oleifera	Shoot	10350.0	48500.0	0.39220423591385656	USDA's Ag Handbook 8 and sequelae)
Pistacia vera	Seed	49160.0	51139.0	0.3976822870196297	--
Sesamum indicum	Seed	24670.0	51927.0	0.4309287044456456	--
Phaseolus vulgaris	Fruit	1870.0	19219.0	0.46547383123553154	USDA's Ag Handbook 8 and sequelae)
Citrullus lanatus	Seed		53000.0	0.4761995241133043	Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
Sinapis alba	Seed	49790.0	53275.0	0.48780201750436314	--
Sechium edule	Fruit	1370.0	19570.0	0.4927891111027475	--
Cucurbita spp	Fruit	1260.0	19935.0	0.5211938893122456	--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Juglans nigra	Seed	52130.0	54505.0	0.53969680612619	USDA's Ag Handbook 8 and sequelae)
Valerianella locusta	Plant	2030.0	28195.0	0.5626421499717483	--
Cajanus cajan	Seed	40790.0	56270.0	0.6141637182542585	--
Capsicum frutescens	Fruit	2640.0	21542.0	0.6462527347442002	USDA's Ag Handbook 8 and sequelae)
Solanum tuberosum	Tuber	3470.0	24150.0	0.6715518059550106	--
Pinus pinea	Seed	40840.0	59800.0	0.7630975425103956	--
Prunus dulcis	Seed	59340.0	62070.0	0.8588708515929542	USDA's Ag Handbook 8 and sequelae)
Acacia farnesiana	Leaf	10080.0	54070.0	0.8730215200517875	CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
Raphanus sativus	Root	1320.0	25580.0	0.8780332997335651	--
Juglans cinerea	Seed	60840.0	62942.0	0.8956613033638753	--
Triticum aestivum	Seed	39000.0	63000.0	0.8981083746972622	--
Solanum melongena	Fruit	2010.0	24907.0	0.9081214434427236	--
Asparagus officinalis	Shoot	5010.0	64645.0	0.9806017011914672	--
Helianthus tuberosus	Tuber		26493.0	0.992368582660606	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.
Arachis hypogaea	Seed	54650.0	65281.0	0.994345783515463	--
Zingiber officinale	Rhizome	1620.0	9328.0	1.0	--
Nasturtium officinale	Herb	1900.0	38000.0	1.0	USDA's Ag Handbook 8 and sequelae)
Abelmoschus esculentus	Fruit	2710.0	27100.0	1.0787835766302012	USDA's Ag Handbook 8 and sequelae)
Phaseolus vulgaris	Sprout Seedling	5120.0	55054.0	1.0799400548183595	USDA's Ag Handbook 8 and sequelae)
Cnidioscolus chayamansa	Leaf	11780.0	58900.0	1.1341789908284232	--
Beta vulgaris	Root	3930.0	30994.0	1.3370135300475792	USDA's Ag Handbook 8 and sequelae)
Cucurbita foetidissima	Seed	52800.0	73530.0	1.3423783943621699	--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Foeniculum vulgare	Fruit	29560.0	32427.0	1.4933376958685471	--
Glycine max	Seed	70680.0	77280.0	1.500594213331154	USDA's Ag Handbook 8 and sequelae)
Spinacia oleracea	Plant	3430.0	40735.0	1.5707193839545637	USDA's Ag Handbook 8 and sequelae)
Cucurbita pepo	Fruit	1840.0	35000.0	1.6935719269179679	--
Allium schoenoprasum	Leaf	5790.0	72400.0	1.864122232129579	USDA's Ag Handbook 8 and sequelae)
Cucumis sativus	Fruit	1540.0	38987.0	2.0038454905378824	--
Brassica chinensis	Leaf	3600.0	76932.0	2.1091668817278633	--
Brassica rapa	Leaf	3600.0	76932.0	2.1091668817278633	USDA's Ag Handbook 8 and sequelae)
Lupinus albus	Seed	21650.0	96985.0	2.3319656034068434	--
Pisum sativum	Fruit	4480.0	44313.0	2.4183217884660655	--
Cucurbita pepo	Seed	43150.0	101820.0	2.535958532664187	--
Lycopersicon esculentum	Fruit	90.0	54053.0	3.1763013494537677	--
Rehmannia glutinosa	Root	2000.0	53000.0	3.202606243067563	--
Ceratonia siliqua	Seed		131600.0	3.7924030897032144	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.