

List of Plants

GLUTAMIC-ACID

Chemid

GLUTAMICACID

Dosage

ADI=120 mg/kg

Martindale's 28th

ADI=5-12 g/man/day

Martindale's 28th

*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	2710.0	27100.0	1.08	USDA's Ag Handbook 8 and sequelae)
Acacia farnesiana	Leaf	10080.0	54070.0	0.87	CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
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.
Allium sativum var. sativum	Leaf	--	--		*
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.
Allium sativum var. sativum	Bulb	5.0	19320.0		*
Allium ampeloprasum	Plant	--	--		*
Allium schoenoprasum	Leaf	5790.0	72400.0	1.86	USDA's Ag Handbook 8 and sequelae)
Aloe vera	Leaf	--	43256.0	0.29	*
Alpinia galanga	Leaf	--	--		*
Amaranthus sp.	Leaf	2920.0	35128.0	-0.15	*
Anabasis aphylla	Plant	--	--		*
Anacardium occidentale	Seed	36240.0	36867.0	-0.2	*
Ananas comosus	Fruit	90.0	3333.0	-0.77	*
Angelica sinensis	Root	--	--		Jim Duke's personal files.
Apium graveolens	Pt	860.0	18285.0		USDA's Ag Handbook 8 and sequelae)
Apium graveolens	Shoot	--	--		*
Arachis hypogaea	Seed	54650.0	65281.0	0.99	*
Arctium lappa	Root	1570.0	7850.0	-0.63	USDA's Ag Handbook 8 and sequelae)
Artemisia dracunculus	Leaf	--	--		*

<i>Artemisia dracunculus</i>	Root	--	--		*
<i>Artemisia dracunculus</i>	Shoot	--	--		*
<i>Artocarpus altilis</i>	Seed	10360.0	23690.0	-0.76	USDA's Ag Handbook 8 and sequelae)
<i>Asimina triloba</i>	Fruit	622.0	7332.0	-0.46	*
<i>Asparagus officinalis</i>	Shoot	5010.0	64645.0	0.98	*
<i>Astragalus membranaceus</i>	Root	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
<i>Avena sativa</i>	Seed	29000.0	31000.0	-0.45	Jim Duke's personal files.*
<i>Avena sativa</i>	Plant	--	19000.0	-0.18	Jim Duke's personal files.*
<i>Averrhoa carambola</i>	Fruit	770.0	8480.0	-0.37	USDA's Ag Handbook 8 and sequelae)
<i>Bacopa monnieri</i>	Plant	--	--		Wealth of India.
<i>Basella alba</i>	Leaf	2830.0	41015.0	0.17	*
<i>Bertholletia excelsa</i>	Seed	31510.0	32600.0	-0.38	*
<i>Beta vulgaris</i>	Root	3930.0	30994.0	1.34	USDA's Ag Handbook 8 and sequelae)
<i>Brassica oleracea</i> var. <i>sabellica</i> l.	Leaf	3740.0	24065.0	-0.75	*
<i>Brassica oleracea</i> var. <i>botrytis</i> l.	Leaf	3750.0	40275.0	0.13	*
<i>Brassica rapa</i>	Leaf	3600.0	76932.0	2.11	USDA's Ag Handbook 8 and sequelae)
<i>Brassica oleracea</i> var. <i>botrytis</i> l.	Flower	2650.0	34240.0		*
<i>Brassica oleracea</i> var. <i>viridis</i> l.	Leaf	1310.0	21471.0	-0.89	*
<i>Brassica napus</i> var. <i>napobrassica</i>	Root	1420.0	13730.0	-0.13	USDA's Ag Handbook 8 and sequelae)
<i>Brassica rapa</i>	Root	1300.0	15990.0	0.07	*
<i>Brassica oleracea</i> var. <i>capitata</i> l.	Leaf	2700.0	36099.0	-0.1	USDA's Ag Handbook 8 and sequelae)
<i>Brassica chinensis</i>	Leaf	3600.0	76932.0	2.11	*
<i>Brassica oleracea</i> var. <i>italica</i>	Leaf	3750.0	40275.0	0.13	USDA's Ag Handbook 8 and sequelae)
<i>Cajanus cajan</i>	Seed	40790.0	56270.0	0.61	*
<i>Calathea allouia</i>	Root	8825.0	9710.0	-0.47	*
<i>Capsella bursa-pastoris</i>	Plant	--	--		*
<i>Capsicum frutescens</i>	Fruit	2640.0	21542.0	0.65	USDA's Ag Handbook 8 and sequelae)
<i>Capsicum annuum</i>	Fruit	1120.0	15277.0	0.16	USDA's Ag Handbook 8 and sequelae)
<i>Carica papaya</i>	Fruit	--	--		USDA's Ag Handbook 8 and sequelae)
<i>Carum carvi</i>	Seed	31690.0	35175.0	-0.28	Revised USDA data received 1993.
<i>Castanea sativa</i>	Seed	2558.0	5628.0	-1.52	*
<i>Castanea mollissima</i>	Seed	5393.0	9600.0	-1.35	*
<i>Castanea dentata</i>	Seed	6204.0	11043.0	-1.29	*

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
Ceratonia siliqua	Seed	--	131600.0	3.79	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
Chenopodium album	Leaf	5210.0	33188.0	-0.26	*
Chondrus crispus	Thallus	--	--		Jim Duke's personal files.
Cicer arietinum	Seed	33600.0	38150.0	-0.15	*
Cichorium endivia	Leaf	1660.0	26731.0	-0.61	*
Citrullus lanatus	Fruit	--	7420.0	-0.45	Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
Citrullus lanatus	Seed	--	53000.0	0.48	Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
Citrus reticulata	Fruit	160.0	5158.0	-0.63	Lawrence, B.M., Essential Oils 1976-1977, Essential Oils 1978, Essential Oils 1979-1980.
Citrus paradisi	Fruit	220.0	2800.0	-0.81	*
Citrus limon	Plant	--	--		*
Citrus sinensis	Fruit	60.0	7097.0	-0.48	*
Cnidioscolus chayamansa	Leaf	11780.0	58900.0	1.13	*
Coccinia grandis	Flower	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Cocos nucifera	Endosperm	--	--		Jim Duke's personal files.
Cocos nucifera	Seed	7610.0	14355.0	-1.15	USDA's Ag Handbook 8 and sequelae)
Cocos nucifera	Leaf	--	--		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.
Colocasia esculenta	Root	1740.0	5925.0	-0.79	*
Corchorus olitorius	Leaf	4930.0	40130.0	0.12	*
Coriandrum sativum	Fruit	--	--		*
Crocus sativus	Bulb	--	--		*
Cryptotaenia japonica	Shoot	--	--		*
Cucumis sativus	Fruit	1540.0	38987.0	2.0	*
Cucurbita spp	Fruit	1260.0	19935.0	0.52	*
Cucurbita pepo	Seed	43150.0	101820.0	2.54	*
Cucurbita foetidissima	Seed	52800.0	73530.0	1.34	*
Cucurbita pepo	Fruit	1840.0	35000.0	1.69	*
Daucus carota	Root	2020.0	16545.0	0.11	*
Dioscorea pentaphylla	Root	1590.0	8565.0	-0.56	*
Dryopteris marginalis	Plant	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Elaeagnus angustifolia	Root	--	0.48	-1.29	Wheller, C. T., Bond, G. 1970. The Amino Acids of Non-Legume Root Nodules. Phytochemistry 9: 705-708. Dept. Botany Univ. Glasgow Glasgow, Scotland.
Fagopyrum esculentum	Seed	--	23300.0	-0.78	Laferriere, J.E., 1988, Nutricomp Program, Nutricomp Database; reviewed in J. Ethnobiology 9(1):27-29.
Ficus carica	Fruit	720.0	3447.0	-0.76	USDA's Ag Handbook 8 and sequelae)
Foeniculum vulgare	Seed	29560.0	32427.0	-0.39	USDA's Ag Handbook 8 and sequelae)

Foeniculum vulgare	Fruit	29560.0	32427.0	1.49	*
Fragaria spp	Fruit	900.0	10676.0	-0.2	USDA's Ag Handbook 8 and sequelae)
Ginkgo biloba	Seed	8360.0	22840.0	-0.8	USDA's Ag Handbook 8 and sequelae)
Glechoma hederacea	Plant	--	--		Oriental Materia Medica (three volumes by Dr. Hsu and collaborators)
Glycine max	Seed	70680.0	77280.0	1.5	USDA's Ag Handbook 8 and sequelae)
Glycine max	Shoot	--	--		*
Harpagophytum procumbens	Root	--	--		*
Helianthus tuberosus	Tuber	--	26493.0	0.99	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.
Hordeum vulgare	Seed	32000.0	38000.0	-0.16	Jim Duke's personal files.*
Huperzia spp	Plant	--	--		*
Ipomoea batatas	Root	1590.0	6360.0	-0.75	*
Ipomoea aquatica	Leaf	2520.0	33465.0	-0.24	*
Juglans cinerea	Seed	60840.0	62942.0	0.9	*
Juglans regia	Seed	28090.0	29155.0	-0.53	USDA's Ag Handbook 8 and sequelae)
Juglans nigra	Seed	52130.0	54505.0	0.54	USDA's Ag Handbook 8 and sequelae)
Lablab purpureus	Seed	1720.0	42815.0	0.05	*
Lactuca sativa	Leaf	1820.0	30333.0	-0.41	*
Larrea tridentata	Plant	--	13600.0	-0.61	*
Lens culinaris	Sprout Seedling	12580.0	41935.0	0.25	USDA's Ag Handbook 8 and sequelae)
Lens culinaris	Seed	43500.0	49000.0	0.31	USDA's Ag Handbook 8 and sequelae)
Lentinus edodes	Fruit	--	--		*
Lepidium meyenii	Root	--	15650.0	0.04	Taylor, Leslie. 2005. The Healing Power of Rainforest Herbs. SquareOne Publisher, Garden City Park, NY. 519 pp.
Linum usitatissimum	Seed	--	1.153	-1.76	*
Lupinus albus	Seed	21650.0	96985.0	2.33	*
Lycium barbarum	Fruit	--	6300.0	-0.54	Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
Lycopersicon esculentum	Fruit	90.0	54053.0	3.18	*
Macadamia spp	Seed	17820.0	18330.0	-0.99	USDA's Ag Handbook 8 and sequelae)
Malus domestica	Fruit	156.0	1244.0	-0.93	*
Mangifera indica	Fruit	600.0	6800.0	-0.5	*
Manihot esculenta	Root	4700.0	14925.0	-0.03	*
Melia azedarach	Plant	--	--		*
Mentha spicata	Leaf	3580.0	24775.0	-0.71	USDA's Ag Handbook 8 and sequelae)
Mentha x piperita	Leaf	4090.0	19155.0	-1.01	USDA's Ag Handbook 8 and sequelae)
Momordica charantia	Fruit	--	--		Jim Duke's personal files.
Momordica charantia	Seed	--	212.0	-1.75	Jim Duke's personal files.
Moringa oleifera	Shoot	10350.0	48500.0	0.39	USDA's Ag Handbook 8 and sequelae)
Morus alba	Leaf	--	--		*

Mucuna pruriens	Seed	19075.0	40440.0	-0.05	*
Murraya sp	Fruit	1160.0	3341.0	-0.77	*
Musa x paradisiaca	Fruit	1160.0	3341.0	-0.77	USDA's Ag Handbook 8 and sequelae)
Myrica cerifera	Root	--	--		*
Nasturtium officinale	Herb	1900.0	38000.0	1.0	USDA's Ag Handbook 8 and sequelae)
Nelumbo nucifera	Seed	9570.0	29000.0	-0.54	*
Nelumbo nucifera	Rhizome	1390.0	6650.0	-1.0	*
Nigella sativa	Seed	28085.0	35900.0	-0.25	*
Ocimum basilicum	Leaf	--	15650.0	-1.2	USDA's Ag Handbook 8 and sequelae)
Oenothera biennis	Seed	26300.0	28068.0	-0.58	*
Opuntia ficus-indica	Bud	--	16000.0		Laferriere, J.E., 1988, Nutricomp Program, Nutricomp Database; reviewed in J. Ethnobiology 9(1):27-29.
Opuntia ficus-indica	Seed	--	37500.0	-0.18	Laferriere, J.E., 1988, Nutricomp Program, Nutricomp Database; reviewed in J. Ethnobiology 9(1):27-29.
Oryza sativa	Hay	--	--		*
Pachyrhizus erosus	Tuber	820.0	7560.0	-1.6	*
Panax ginseng	Leaf	--	--		*
Panax quinquefolius	Plant	396.0	4450.0	-1.35	*
Panax ginseng	Root	--	--		*
Papaver bracteatum	Seed	37600.0	43200.0	0.06	*
Papaver somniferum	Seed	45410.0	48713.0	0.3	*
Perideridia gairdneri	Root	--	12319.0	-0.25	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	1660.0	8045.0	-0.4	*
Phaseolus vulgaris	Seed	32940.0	37019.0	-0.2	USDA's Ag Handbook 8 and sequelae)
Phaseolus vulgaris	Fruit	1870.0	19219.0	0.47	USDA's Ag Handbook 8 and sequelae)
Phaseolus vulgaris	Sprout Seedling	5120.0	55054.0	1.08	USDA's Ag Handbook 8 and sequelae)
Phaseolus lunatus	Seed	8810.0	33820.0	-0.33	USDA's Ag Handbook 8 and sequelae)
Phoenix dactylifera	Fruit	400.0	6160.0	-0.55	*
Phyllanthus emblica	Fruit	1320.0	6535.0	-0.52	*
Pinellia ternata	Tuber	--	--		*
Pinus edulis	Seed	19690.0	20925.0	-0.88	USDA's Ag Handbook 8 and sequelae)
Pinus pinea	Seed	40840.0	59800.0	0.76	*
Pistacia vera	Seed	49160.0	51139.0	0.4	*
Pisum sativum	Fruit	4480.0	44313.0	2.42	*
Pisum sativum	Shoot	--	70.0	-1.37	*
Pisum sativum	Seed	7400.0	35005.0	-0.28	*
Plantago ovata	Seed	--	--		*
Portulaca oleracea	Herb	1500.0	33792.0	-1.0	*

Prunus domestica	Fruit	370.0	2500.0	-0.84	USDA's Ag Handbook 8 and sequelae)
Prunus persica	Fruit	1060.0	8586.0	-0.36	*
Prunus cerasus	Fruit	--	--		*
Prunus dulcis	Seed	59340.0	62070.0	0.86	USDA's Ag Handbook 8 and sequelae)
Prunus armeniaca	Fruit	1570.0	11500.0	-0.14	USDA's Ag Handbook 8 and sequelae)
Psidium cattleianum	Fruit	760.0	3930.0	-0.72	*
Psidium guajava	Fruit	1070.0	7704.0	-0.43	USDA's Ag Handbook 8 and sequelae)
Psophocarpus tetragonolobus	Seed	40100.0	43749.0	0.09	*
Psophocarpus tetragonolobus	Leaf	3890.0	16803.0	-1.14	*
Psophocarpus tetragonolobus	Tuber	8000.0	18779.0	-0.06	*
Psoralea esculenta	Root	4093.0	12319.0	-0.25	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.
Pyrus communis	Fruit	280.0	1729.0	-0.9	*
Raphanus sativus	Root	1320.0	25580.0	0.88	*
Rehmannia glutinosa	Root	2000.0	53000.0	3.2	*
Ribes nigrum	Fruit Juice	--	210.0		*
Ricinus communis	Seed	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Rosmarinus officinalis	Leaf	3610.0	11200.0	-1.44	USDA's Ag Handbook 8 and sequelae)
Sambucus canadensis	Fruit	960.0	4752.0	-0.66	USDA's Ag Handbook 8 and sequelae)
Scutellaria baicalensis	Root	--	--		*
Secale cereale	Seed	36610.0	41110.0	-0.03	USDA's Ag Handbook 8 and sequelae)
Sechium edule	Fruit	1370.0	19570.0	0.49	*
Sesamum indicum	Seed	24670.0	51927.0	0.43	*
Silybum marianum	Seed	--	--		*
Sinapis alba	Seed	49790.0	53275.0	0.49	*
Solanum melongena	Fruit	2010.0	24907.0	0.91	*
Solanum tuberosum	Tuber	3470.0	24150.0	0.67	*
Spinacia oleracea	Plant	3430.0	40735.0	1.57	USDA's Ag Handbook 8 and sequelae)
Stachys officinalis	Shoot	--	--		*
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.
Theobroma cacao	Seed	--	10200.0	-1.33	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
Tilia sp.	Fruit	--	--		*
Tribulus terrestris	Fruit	--	--		*
Trifolium pratense	Plant	--	--		*

<i>Trigonella foenum-graecum</i>	Seed	39880.0	43870.0	0.09	*
<i>Triticum aestivum</i>	Seed	39000.0	63000.0	0.9	*
<i>Urtica dioica</i>	Leaf	--	--		Jim Duke's personal files.
<i>Vaccinium corymbosum</i>	Fruit	830.0	5393.0	-0.61	*
<i>Valeriana officinalis</i>	Root	--	--		*
<i>Valerianella locusta</i>	Plant	2030.0	28195.0	0.56	*
<i>Vicia faba</i>	Seed	8550.0	45000.0	0.14	USDA's Ag Handbook 8 and sequelae)
<i>Vigna unguiculata</i>	Seed	--	43190.0	0.06	*
<i>Vigna angularis</i>	Seed	30990.0	35802.0	-0.25	*
<i>Vigna radiata</i>	Sprout Seedling	1610.0	16912.0	-1.33	USDA's Ag Handbook 8 and sequelae)
<i>Vigna radiata</i>	Seed	42640.0	46883.0	0.22	USDA's Ag Handbook 8 and sequelae)
<i>Vigna unguiculata</i>	Seed	--	43190.0	0.06	*
<i>Vitis vinifera</i>	Fruit	1380.0	7099.0	-0.48	USDA's Ag Handbook 8 and sequelae)
<i>Zea mays</i>	Seed	6360.0	26457.0	-0.64	USDA's Ag Handbook 8 and sequelae)
<i>Zingiber officinale</i>	Root	1620.0	9328.0	-0.5	USDA's Ag Handbook 8 and sequelae)
<i>Zingiber officinale</i>	Rhizome	1620.0	9328.0	1.0	*