

Chemid

ASPARTICACID

*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	1450.0	14820.0	0.61	*
Acacia senegal	Plant	--	--		Pakistan Encyclopedia Planta Medica. 1986.
Acacia farnesiana	Plant	7040.0	37770.0	1.34	*
Allium sativum var. sativum	Bulb	0.1	11736.0	1.0	*
Allium sativum var. sativum	Leaf	--	--		*
Allium cepa	Bulb	640.0	6967.0	-1.0	USDA's Ag Handbook 8 and sequelae)
Allium schoenoprasum	Leaf	2590.0	32400.0	0.34	USDA's Ag Handbook 8 and sequelae)
Allium ampeloprasum	Plant	--	--		*
Aloe vera	Plant	--	--		Pakistan Encyclopedia Planta Medica. 1986.
Aloe vera	Leaf	--	--		Waller, G. R., Mangiafico, S., Ritchey, C. R. 1978. A Chemical Investigation of Aloe barbadensis. Proc. Okla. Acad. Sci. 58: 69-.
Alpinia galanga	Leaf	--	--		*
Amaranthus sp.	Leaf	2290.0	27549.0	0.03	*
Anacardium occidentale	Seed	15050.0	15310.0	-0.65	*
Ananas comosus	Fruit	293.0	4222.0	-0.78	*
Anastatica hierochuntica	Fruit	--	--		*
Angelica sinensis	Root	--	--		Jim Duke's personal files.
Angelica archangelica	Leaf	--	--		*
Apium graveolens	Pt	1130.0	23880.0		USDA's Ag Handbook 8 and sequelae)
Apium graveolens	Shoot	--	--		*
Arachis hypogaea	Seed	31900.0	36968.0	1.28	*
Arctium lappa	Root	1770.0	8850.0	-0.14	USDA's Ag Handbook 8 and sequelae)
Artemisia dracunculus	Root	--	--		*
Artemisia dracunculus	Leaf	--	--		*
Artocarpus altilis	Seed	8170.0	18685.0	-0.35	USDA's Ag Handbook 8 and sequelae)
Asimina triloba	Fruit	424.0	5167.0	-0.66	*
Asparagus officinalis	Shoot	3550.0	45805.0	0.77	*

<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	--	7000.0	-1.38	Jim Duke's personal files.*
<i>Averrhoa carambola</i>	Fruit	510.0	5615.0	-0.6	USDA's Ag Handbook 8 and sequelae)
<i>Bacopa monnieri</i>	Plant	--	--		Wealth of India.
<i>Basella alba</i>	Leaf	1080.0	15650.0	-0.72	*
<i>Bertholletia excelsa</i>	Seed	13550.0	14019.0	-0.76	*
<i>Beta vulgaris</i>	Root	1060.0	8360.0	-0.21	USDA's Ag Handbook 8 and sequelae)
<i>Borago officinalis</i>	Leaf	--	--		Jim Duke's personal files.
<i>Brassica rapa</i>	Root	630.0	7750.0	-0.29	*
<i>Brassica oleracea</i> var. <i>capitata</i> L.	Leaf	1190.0	15910.0	-0.7	USDA's Ag Handbook 8 and sequelae)
<i>Brassica chinensis</i>	Leaf	1080.0	23080.0	-0.25	*
<i>Brassica rapa</i>	Leaf	1080.0	23080.0	-0.25	USDA's Ag Handbook 8 and sequelae)
<i>Brassica oleracea</i> var. <i>sabellica</i> L.	Leaf	2950.0	18985.0	-0.51	*
<i>Brassica oleracea</i> var. <i>botrytis</i> L.	Leaf	2130.0	22876.0	-0.26	*
<i>Brassica oleracea</i> var. <i>viridis</i> L.	Leaf	1200.0	19668.0	-0.46	*
<i>Brassica napus</i> var. <i>napobrassica</i>	Root	870.0	8410.0	-0.2	USDA's Ag Handbook 8 and sequelae)
<i>Brassica oleracea</i> var. <i>italica</i>	Leaf	2130.0	22876.0	-0.26	USDA's Ag Handbook 8 and sequelae)
<i>Cajanus cajan</i>	Seed	17940.0	24000.0	0.13	*
<i>Calathea allouia</i>	Root	7650.0	8415.0	-0.2	*
<i>Cannabis sativa</i>	Plant	--	--		Turner, C. E., El Sohly, M. A., Boeren, E. G. 1980. Constituents of <i>Cannabis sativa</i> L. XVII. A Review of the Natural Constituents. J Natural Products, 432: 169-234.
<i>Capsella bursa-pastoris</i>	Plant	--	--		*
<i>Capsicum annuum</i>	Fruit	1200.0	16504.0	0.83	*
<i>Capsicum frutescens</i>	Fruit	2860.0	23338.0	1.73	USDA's Ag Handbook 8 and sequelae)
<i>Carica papaya</i>	Fruit	490.0	4387.0	-0.76	USDA's Ag Handbook 8 and sequelae)
<i>Carum carvi</i>	Seed	20840.0	23130.0	0.05	Revised USDA data received 1993.
<i>Castanea dentata</i>	Seed	8071.0	14362.0	-0.73	*
<i>Castanea sativa</i>	Seed	3381.0	7438.0	-1.35	*
<i>Castanea mollissima</i>	Seed	8522.0	15169.0	-0.66	*
<i>Centella asiatica</i>	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
<i>Ceratonia siliqua</i>	Seed	--	42300.0	1.75	Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
<i>Chenopodium album</i>	Plant	4310.0	27457.0	0.5	*
<i>Cicer arietinum</i>	Seed	22700.0	25660.0	0.27	USDA's Ag Handbook 8 and sequelae)

Cichorium endivia	Leaf	1300.0	20934.0	-0.38	*
Citrullus lanatus	Seed	--	25500.0	0.26	Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
Citrullus lanatus	Fruit	--	4594.0	-0.73	Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
Citrus paradisi	Fruit	810.0	4700.0	-0.72	*
Citrus sinensis	Fruit	70.0	8607.0	-0.2	*
Citrus reticulata	Fruit	240.0	6206.0	-0.52	*
Cnidoscolus chayamansa	Leaf	8495.0	42470.0	0.97	*
Cocos nucifera	Seed	3250.0	6130.0	-1.46	USDA's Ag Handbook 8 and sequelae)
Cocos nucifera	Leaf	--	--		Jim Duke's personal files.
Cocos nucifera	Endosperm	--	--		Jim Duke's personal files.
Coffea arabica	Seed	--	--		*
Colocasia esculenta	Root	1920.0	6540.0	-0.44	*
Corchorus olitorius	Leaf	5670.0	46150.0	1.21	*
Coriandrum sativum	Fruit	--	--		*
Crocus sativus	Bulb	--	--		*
Cryptotaenia japonica	Root	--	--		*
Cryptotaenia japonica	Shoot	--	--		*
Cucumis sativus	Fruit	320.0	8101.0	-0.27	*
Cucurbita pepo	Fruit	1020.0	12143.0	0.26	USDA's Ag Handbook 8 and sequelae)
Cucurbita foetidissima	Seed	29165.0	37280.0	1.3	*
Cucurbita spp	Fruit	1440.0	22785.0	1.66	*
Cucurbita pepo	Seed	24770.0	41080.0	1.64	*
Daucus carota	Root	1370.0	11220.0	0.17	*
Dioscorea pentaphylla	Root	1360.0	7330.0	-0.34	*
Fagopyrum esculentum	Seed	--	12000.0	-0.94	*
Ficus carica	Fruit	1760.0	3447.0	-0.88	CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
Foeniculum vulgare	Seed	18333.0	20111.0	-0.22	USDA's Ag Handbook 8 and sequelae)
Foeniculum vulgare	Fruit	18333.0	20111.0	1.31	*
Fragaria spp	Fruit	1380.0	16370.0	0.82	USDA's Ag Handbook 8 and sequelae)
Ginkgo biloba	Seed	5430.0	14815.0	-0.69	USDA's Ag Handbook 8 and sequelae)
Glechoma hederacea	Plant	--	--		Chemical Constituents of Oriental Herbs (3 diff. books)
Glycine max	Shoot	--	--		*
Glycine max	Seed	45890.0	50175.0	2.45	*
Harpagophytum procumbens	Root	--	160.0	-1.27	*
Helianthus annuus	Seed	24460.0	25800.0	0.29	USDA's Ag Handbook 8 and sequelae)
Helianthus tuberosus	Tuber	--	16852.0	-1.33	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.
Hibiscus sabdariffa	Plant	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses

<i>Ipomoea batatas</i>	Root	2730.0	10383.0	0.06	*
<i>Ipomoea aquatica</i>	Leaf	6500.0	86320.0	3.74	*
<i>Juglans cinerea</i>	Seed	30960.0	32030.0	0.84	*
<i>Juglans regia</i>	Seed	14750.0	15310.0	-0.65	USDA's Ag Handbook 8 and sequelae)
<i>Juglans nigra</i>	Seed	24620.0	25740.0	0.28	USDA's Ag Handbook 8 and sequelae)
<i>Lablab purpureus</i>	Seed	2560.0	31130.0	0.76	*
<i>Lactuca sativa</i>	Leaf	1420.0	23667.0	-0.21	*
<i>Larrea tridentata</i>	Plant	--	5700.0	-1.28	*
<i>Lens culinaris</i>	Seed	31020.0	34900.0	1.09	USDA's Ag Handbook 8 and sequelae)
<i>Lens culinaris</i>	Sprout Seedling	14330.0	47765.0	-0.96	USDA's Ag Handbook 8 and sequelae)
<i>Lentinus edodes</i>	Fruit	--	--		*
<i>Lepidium meyenii</i>	Root	--	9170.0	-0.1	Taylor, Leslie. 2005. The Healing Power of Rainforest Herbs. SquareOne Publisher, Garden City Park, NY. 519 pp.
<i>Linum usitatissimum</i>	Seed	--	0.557	-2.01	*
<i>Lupinus albus</i>	Seed	38770.0	43290.0	1.84	*
<i>Lycium barbarum</i>	Fruit	--	12000.0	0.24	Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
<i>Lycopersicon esculentum</i>	Fruit	1230.0	20332.0	1.34	*
<i>Macadamia spp</i>	Seed	8270.0	8500.0	-1.25	USDA's Ag Handbook 8 and sequelae)
<i>Malus domestica</i>	Fruit	210.0	2115.0	-1.06	USDA's Ag Handbook 8 and sequelae)
<i>Mangifera indica</i>	Fruit	420.0	4100.0	-0.8	*
<i>Manihot esculenta</i>	Root	1810.0	5750.0	-0.55	*
<i>Mentha x piperita</i>	Leaf	4430.0	20750.0	-0.4	USDA's Ag Handbook 8 and sequelae)
<i>Mentha spicata</i>	Leaf	3880.0	26850.0	-0.01	USDA's Ag Handbook 8 and sequelae)
<i>Momordica charantia</i>	Seed	--	90.0	-2.0	Jim Duke's personal files.
<i>Moringa oleifera</i>	Shoot	9200.0	43110.0	0.64	USDA's Ag Handbook 8 and sequelae)
<i>Mucuna pruriens</i>	Seed	19850.0	42080.0	1.73	*
<i>Murraya sp</i>	Fruit	1080.0	3110.0	-0.93	*
<i>Musa x paradisiaca</i>	Fruit	1080.0	3110.0	-0.93	USDA's Ag Handbook 8 and sequelae)
<i>Nasturtium officinale</i>	Herb	1870.0	37400.0	1.0	USDA's Ag Handbook 8 and sequelae)
<i>Nelumbo nucifera</i>	Seed	5050.0	15303.0	-0.65	*
<i>Nelumbo nucifera</i>	Rhizome	3690.0	17655.0	1.0	*
<i>Nigella sativa</i>	Seed	10670.0	13650.0	-0.79	*
<i>Ocimum basilicum</i>	Leaf	--	16960.0	-0.64	USDA's Ag Handbook 8 and sequelae)
<i>Oenothera biennis</i>	Seed	11800.0	12593.0	-0.89	*
<i>Opuntia ficus-indica</i>	Seed	--	15900.0	-0.59	Laferriere, J.E., 1988, Nutricomp Program, Nutricomp Database; reviewed in J. Ethnobiology 9(1):27-29.
<i>Opuntia ficus-indica</i>	Bud	--	8315.0		Laferriere, J.E., 1988, Nutricomp Program, Nutricomp Database; reviewed in J. Ethnobiology 9(1):27-29.
<i>Oryza sativa</i>	Hay	--	--		*

Pachyrhizus erosus	Tuber	3870.0	35670.0	0.67	*
Panax ginseng	Root	--	--		*
Panax quinquefolius	Plant	1265.0	4310.0	-1.39	*
Panax ginseng	Leaf	--	--		*
Papaver bracteatum	Seed	17000.0	20350.0	-0.2	*
Papaver somniferum	Seed	22020.0	23622.0	0.09	*
Perideridia gairdneri	Root	--	7556.0	-0.31	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	2270.0	11000.0	0.11	*
Phaseolus vulgaris	Seed	26130.0	29366.0	0.6	USDA's Ag Handbook 8 and sequelae)
Phaseolus vulgaris	Fruit	2550.0	26208.0	2.11	USDA's Ag Handbook 8 and sequelae)
Phaseolus vulgaris	Leaf	--	--		*
Phaseolus vulgaris	Sprout Seedling	5460.0	58710.0	1.38	USDA's Ag Handbook 8 and sequelae)
Phaseolus lunatus	Seed	7350.0	30802.0	0.73	USDA's Ag Handbook 8 and sequelae)
Phoenix dactylifera	Fruit	20.0	3150.0	-0.92	*
Phyllanthus emblica	Fruit	361.0	1785.0	-1.1	*
Pinellia ternata	Tuber	--	--		*
Pinus edulis	Seed	10540.0	11200.0	-1.01	USDA's Ag Handbook 8 and sequelae)
Pinus pinea	Seed	21870.0	26000.0	0.3	*
Pistacia vera	Seed	21160.0	22012.0	-0.05	*
Pisum sativum	Fruit	2280.0	22552.0	1.63	*
Pisum sativum	Shoot	--	22.0	-1.41	*
Pisum sativum	Seed	4950.0	23415.0	0.07	*
Portulaca oleracea	Herb	770.0	19600.0	-1.0	*
Prunus domestica	Fruit	2490.0	16824.0	0.88	USDA's Ag Handbook 8 and sequelae)
Prunus persica	Fruit	1170.0	8586.0	-0.21	*
Prunus cerasus	Fruit	--	--		*
Prunus dulcis	Seed	23490.0	24571.0	0.18	USDA's Ag Handbook 8 and sequelae)
Prunus armeniaca	Fruit	3140.0	23000.0	1.69	USDA's Ag Handbook 8 and sequelae)
Psidium cattleianum	Fruit	370.0	1915.0	-1.08	*
Psidium guajava	Fruit	520.0	3744.0	-0.84	USDA's Ag Handbook 8 and sequelae)
Psophocarpus tetragonolobus	Seed	31870.0	34770.0	1.08	*
Psophocarpus tetragonolobus	Leaf	5170.0	22333.0	-0.3	*
Psophocarpus tetragonolobus	Tuber	17350.0	40728.0	1.21	*
Psoralea esculenta	Root	--	8989.0	-0.13	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.

<i>Pyrus communis</i>	Fruit	770.0	4756.0	-0.71	*
<i>Raphanus sativus</i>	Root	480.0	9300.0	-0.08	*
<i>Rehmannia glutinosa</i>	Root	1000.0	39000.0	3.78	*
<i>Ribes nigrum</i>	Fruit Juice	--	23.0		*
<i>Rosmarinus officinalis</i>	Leaf	3910.0	12130.0	-0.94	USDA's Ag Handbook 8 and sequelae)
<i>Sambucus canadensis</i>	Fruit	580.0	2871.0	-0.96	USDA's Ag Handbook 8 and sequelae)
<i>Scutellaria baicalensis</i>	Root	--	--		*
<i>Secale cereale</i>	Seed	11770.0	13215.0	-0.83	USDA's Ag Handbook 8 and sequelae)
<i>Sechium edule</i>	Fruit	1010.0	14430.0	0.56	*
<i>Senna obtusifolia</i>	Seed	--	15000.0	-0.67	*
<i>Sesamum indicum</i>	Seed	9890.0	23795.0	0.11	*
<i>Sinapis alba</i>	Seed	19670.0	21050.0	-0.14	*
<i>Solanum melongena</i>	Fruit	1770.0	21933.0	1.55	*
<i>Solanum tuberosum</i>	Tuber	4340.0	24050.0	-0.56	*
<i>Spinacia oleracea</i>	Plant	2400.0	28502.0	0.58	USDA's Ag Handbook 8 and sequelae)
<i>Stachys officinalis</i>	Shoot	--	--		*
<i>Tribulus terrestris</i>	Fruit	--	--		*
<i>Trigonella foenum-graecum</i>	Seed	23220.0	29790.0	0.64	*
<i>Triticum aestivum</i>	Seed	5106.0	5957.0	-1.48	*
<i>Urtica dioica</i>	Leaf	--	--		Jim Duke's personal files.
<i>Vaccinium corymbosum</i>	Fruit	520.0	3379.0	-0.89	*
<i>Valeriana officinalis</i>	Rhizome	--	--		*
<i>Valerianella locusta</i>	Plant	1760.0	24440.0	0.25	*
<i>Vicia faba</i>	Seed	6310.0	33210.0	0.94	USDA's Ag Handbook 8 and sequelae)
<i>Vigna radiata</i>	Seed	27560.0	30302.0	0.68	USDA's Ag Handbook 8 and sequelae)
<i>Vigna unguiculata</i>	Seed	25730.0	32254.0	0.86	*
<i>Vigna angularis</i>	Seed	23550.0	27207.0	0.41	*
<i>Vigna unguiculata</i>	Seed	29380.0	32085.0	0.84	USDA's Ag Handbook 8 and sequelae)
<i>Vigna radiata</i>	Sprout Seedling	4790.0	50315.0	-0.42	USDA's Ag Handbook 8 and sequelae)
<i>Vitis vinifera</i>	Fruit	810.0	4167.0	-0.79	USDA's Ag Handbook 8 and sequelae)
<i>Zea mays</i>	Seed	2440.0	10150.0	-1.1	USDA's Ag Handbook 8 and sequelae)
<i>Zingiber officinale</i>	Root	2080.0	11990.0	0.27	USDA's Ag Handbook 8 and sequelae)
<i>Zingiber officinale</i>	Tuber	--	--		*
<i>Zingiber officinale</i>	Rhizome	2080.0	11990.0	-1.0	*
<i>Zingiber officinale</i>	Shoot	--	--		*

