

C OXALIC-ACID

Chemid

OXALICACID

*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	8	103	-0.30066937175115394	--
Acacia nilotica	Plant	--	--		--
Aconitum napellus	Plant	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Acorus calamus	Plant	--	--		--
Aframomum melegueta	Fruit	--	--		Wealth of India.
Agave americana	Plant	--	--		--
Allium ampeloprasum	Plant	--	--		--
Allium cepa	Bulb	10	10		--
Allium cepa	Leaf	--	--		Gad, S. S., Esmat El-Zalaki, M., Hohamed, M. S., Mohasseb, S. Z. 1982. Oxalate Content of Some Leafy Vegetables and Dry Legumes Consumed Widely in Egypt. Food Chem., 8(3): 169-177. (Coll. Agric. Alexandria Univ. Ale.)
Allium schoenoprasum	Plant	--	--		Pakistan Encyclopedia Planta Medica. 1986.

Plant	Part	Low PPM	High PPM	StdDev	Reference
<i>Alocasia macrorrhiza</i>	Plant	--	--		--
<i>Anacardium occidentale</i>	Seed	3184	3184	-0.025633807973314167	--
<i>Ananas comosus</i>	Fruit	50	58	-0.3031507791033899	--
<i>Angelica archangelica</i>	Plant	--	--		Pakistan Encyclopedia Planta Medica. 1986.
<i>Apium graveolens</i>	Plant	--	--		Pakistan Encyclopedia Planta Medica. 1986.
<i>Arctostaphylos uva-ursi</i>	Leaf	--	--		--
<i>Avena sativa</i>	Plant	400	400	-0.5323291024119612	List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
<i>Averrhoa carambola</i>	Fruit	50000	95800	4.976291503513891	Morton, J.F., Major Medicinal Plants. 1977. Atlas of Medicinal Plants of Middle America. Bahamas to Yucatan. 1981.
<i>Benincasa hispida</i>	Fruit	34	34	-0.3044741963579158	--
<i>Beta vulgaris</i>	Root	3000	15000	-0.40279401570173323	Watt, J.M. and Breyer-Brandwijk, M.G. 1962. The Medicinal and Poisonous Plants of Southern and Eastern Africa. E. & S. Livingstone, Ltd. Edinburg & London. 1457 pp.
<i>Brassica juncea</i>	Leaf	1287	1287	-0.43841505748050075	Watt, J.M. and Breyer-Brandwijk, M.G. 1962. The Medicinal and Poisonous Plants of Southern and Eastern Africa. E. & S. Livingstone, Ltd. Edinburg & London. 1457 pp.
<i>Brassica oleracea</i> var. <i>botrytis</i> l.	Plant	--	68	-0.5351320075910592	--
<i>Brassica oleracea</i> var. <i>capitata</i> l.	Leaf	30	350	-0.46587265245095044	--
<i>Byrsonima crassifolia</i>	Bark	27300	27300		Morton, J.F., Major Medicinal Plants. 1977. Atlas of Medicinal Plants of Middle America. Bahamas to Yucatan. 1981.

Plant	Part	Low PPM	High PPM	StdDev	Reference
Camellia sinensis	Leaf	2192	10000	-0.18309165835827215	--
Capparis spinosa	Plant	--	--		--
Capsella bursa-pastoris	Plant	--	--		--
Capsicum annuum	Fruit	257	1171	-0.24177730392475322	Watt, J.M. and Breyer-Brandwijk, M.G. 1962. The Medicinal and Poisonous Plants of Southern and Eastern Africa. E. & S. Livingstone, Ltd. Edinburg & London. 1457 pp.
Capsicum frutescens	Fruit	--	--		--
Chenopodium album	Plant	140000	300000	1.9970395471595714	--
Cicer arietinum	Seed	24	24	-0.6702186875144752	Watt, J.M. and Breyer-Brandwijk, M.G. 1962. The Medicinal and Poisonous Plants of Southern and Eastern Africa. E. & S. Livingstone, Ltd. Edinburg & London. 1457 pp.
Cinnamomum verum	Bark	--	--		--
Citrus aurantiifolia	Fruit	--	--		--
Citrus paradisi	Plant	--	--		--
Citrus reticulata	Fruit	--	--		--
Citrus sinensis	Fruit	87	87	-0.3015516499208378	Watt, J.M. and Breyer-Brandwijk, M.G. 1962. The Medicinal and Poisonous Plants of Southern and Eastern Africa. E. & S. Livingstone, Ltd. Edinburg & London. 1457 pp.
Coffea arabica	Fruit	154	154	-0.2978571100852865	Watt, J.M. and Breyer-Brandwijk, M.G. 1962. The Medicinal and Poisonous Plants of Southern and Eastern Africa. E. & S. Livingstone, Ltd. Edinburg & London. 1457 pp.
Colocasia esculenta	Root	1334	1334	0.19298878287100935	--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Coriandrum sativum	Leaf	50	50	-0.4746637714382876	Watt, J.M. and Breyer-Brandwijk, M.G. 1962. The Medicinal and Poisonous Plants of Southern and Eastern Africa. E. & S. Livingstone, Ltd. Edinburg & London. 1457 pp.
Coriandrum sativum	Fruit	--	120	-0.29973195119586477	--
Crataegus laevigata	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Crataegus laevigata	Bark	--	--		--
Crataegus rhipidophylla	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Crataegus rhipidophylla	Bark	--	--		--
Cucurbita pepo	Juice	400	400		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Daucus carota	Root	56	56	-0.6257320951676627	--
Ephedra sinica	Shoot	--	--		Jim Duke's personal files.
Equisetum arvense	Plant	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
Eucalyptus citriodora	Bark	--	--		--
Fagopyrum esculentum	Leaf	111000	111000	2.7765850673785675	List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Ficus carica	Fruit	--	--		--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Ficus carica	Fruit Juice	--	--		Shiraishi, S. C., Kawakami, K., Widodo, S. E., Shiraishi, M., Kitazaki, M. 1996. Organic acid profiles in the juice of fig fruits. Journal of the Faculty of Agriculture Kyushu University, 41(1-2): 29-33.
Glycine max	Root	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Glycine max	Seed	770	770	-0.5180477001291252	--
Glycyrrhiza glabra	Plant	--	--		--
Haematoxylum campechianum	Wood	--	--		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
Hibiscus sabdariffa	Flower	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Ipomoea batatas	Root	1000	1000	-0.020980523283072386	--
Juniperus communis	Leaf	--	--		--
Kalanchoe daegrिमontiana	Plant	--	--		--
Kalanchoe pinnata	Plant	--	--		Tramil
Lactuca sativa	Leaf	110	136	-0.4721436506619176	--
Lactuca scariola	Latex Exudate	--	--		--
Lactuca virosa	Latex Exudate	10000	10000		--
Ledum palustre	Plant	--	--		--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Lens culinaris	Seed	212	212	-0.6318699668329124	Watt, J.M. and Breyer-Brandwijk, M.G. 1962. The Medicinal and Poisonous Plants of Southern and Eastern Africa. E. & S. Livingstone, Ltd. Edinburg & London. 1457 pp.
Lupinus albus	Seed	--	--		--
Lycopersicon esculentum	Fruit	36	263	-0.29184659005431485	--
Malus domestica	Plant	--	--		--
Mangifera indica	Fruit	300	300	-0.28980632178692084	--
Manihot esculenta	Root	171	171	-0.5520600286774848	--
Medicago sativa	Plant	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
Mentha spicata	Leaf	38	38	-0.4750154161977811	Watt, J.M. and Breyer-Brandwijk, M.G. 1962. The Medicinal and Poisonous Plants of Southern and Eastern Africa. E. & S. Livingstone, Ltd. Edinburg & London. 1457 pp.
Momordica charantia	Fruit	5	5	-0.30607332554046784	Watt, J.M. and Breyer-Brandwijk, M.G. 1962. The Medicinal and Poisonous Plants of Southern and Eastern Africa. E. & S. Livingstone, Ltd. Edinburg & London. 1457 pp.
Moringa oleifera	Fruit	1010	1010	-0.25065522800719753	--
Moringa oleifera	Leaf	1010	1010	-0.4465321906788087	--
Morus alba	Leaf	--	--		--
Murraya koenigii	Leaf	--	1320	-0.43744803439189367	=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
Murraya sp	Fruit	22	5240	-0.01740293689701496	--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Musa x paradisiaca	Leaf	--	--		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.
Musa x paradisiaca	Fruit	22	5240	-0.01740293689701496	Watt, J.M. and Breyer-Brandwijk, M.G. 1962. The Medicinal and Poisonous Plants of Southern and Eastern Africa. E. & S. Livingstone, Ltd. Edinburg & London. 1457 pp.
Nicotiana tabacum	Leaf	--	--		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
Opuntia ficus-indica	Fruit	--	--		--
Oryza sativa	Seed	46	46	-0.665731071264505	--
Papaver somniferum	Seed	16200	16200	2.629403151554455	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
Parthenocissus quinquefolia	Fruit	--	20000	0.796498674636388	--
Pastinaca sativa	Root	205	205	-0.5302787220629975	--
Phaseolus vulgaris	Fruit	312	312	-0.2891446131596579	Watt, J.M. and Breyer-Brandwijk, M.G. 1962. The Medicinal and Poisonous Plants of Southern and Eastern Africa. E. & S. Livingstone, Ltd. Edinburg & London. 1457 pp.
Phoenix dactylifera	Seed	--	--		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
Physalis ixocarpa	Fruit	109	536	-0.27679271878408324	--
Piper betel	Leaf	--	--		--
Piper methysticum	Root	--	--		Madaus, G. 1976. Lehrbuch der Biologischen Hilfsmittel. Vol., 1-3. 2862 pp. (+ 144 p. index). Georg Olms Verlag, Hildesheim. Reprint of 1938 Madaus.

Plant	Part	Low PPM	High PPM	StdDev	Reference
Piper nigrum	Fruit	4000	34000	1.5684920731098055	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
Pisum sativum	Fruit	60	60	-0.30304049433217944	--
Plantago psyllium	Seed	--	--		--
Plectranthus amboinicus	Leaf	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Polygonum hydropiperoides	Plant	--	--		--
Portulaca oleracea	Plant	1679	16790	-0.3939567654076973	--
Prunus dulcis	Seed	4073	4073	0.1557066850368414	Watt, J.M. and Breyer-Brandwijk, M.G. 1962. The Medicinal and Poisonous Plants of Southern and Eastern Africa. E. & S. Livingstone, Ltd. Edinburg & London. 1457 pp.
Prunus persica	Hh	--	10		--
Prunus persica	Plant	10	10	-0.5356216717488533	List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Psidium guajava	Fruit	140	140	-0.2986291034837599	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
Punica granatum	Fruit	140	140	-0.2986291034837599	--
Raphanus sativus	Root	92	92	-0.6026695352229113	--
Rheum officinale	Rhizome	--	--		--
Rheum rhabarbarum	Leaf	3000	11000	-0.15378792840048167	--
Rheum rhabarbarum	Pt	4400	13360		--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Ribes nigrum	Fruit	200	200	-0.29532056034744525	--
Ribes rubrum	Fruit	--	--		--
Ribes uva-crispa	Fruit	--	--		--
Rubus fruticosus	Leaf	--	--		--
Rumex acetosa	Leaf	3000	3000	-0.3882177680628056	--
Rumex acetosella	Plant	--	--		--
Rumex crispus	Root	--	--		Pedersen, M. 1987. Nutritional Herbology. Pederson Publishing. Bountiful, Utah. 377 pp.
Rumex crispus	Leaf	5170	6970	-0.27188196013037735	--
Salvia officinalis	Plant	--	--		--
Sambucus nigra	Fruit	--	410	-0.283740659370344	--
Sechium edule	Fruit	340	340	-0.28760062636271105	--
Sesamum indicum	Seed	--	--		--
Sinapis alba	Seed	--	--		--
Solanum melongena	Fruit	291	291	-0.290302603257368	--
Solanum tuberosum	Tuber	150	150		--
Sophora pachycarpa	Leaf	--	--		--
Spinacia oleracea	Leaf	5000	93900	2.2754912851003497	--
Stellaria media	Shoot	2950	4330		--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Syzygium cumini	Fruit	--	--		Morton, J.F., Major Medicinal Plants. 1977. Atlas of Medicinal Plants of Middle America. Bahamas to Yucatan. 1981.
Tamarindus indica	Fruit	--	--		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
Tamarindus indica	Leaf	1000	1960	-0.4186936472189077	--
Taraxacum officinale	Leaf	--	1700	-0.42631261700793327	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.
Terminalia arjuna	Bark	--	--		Bharadwaj, K., Chandra, V. 1983. Comparative Incidence of Calcium Oxalate as a Source of Oxalic Acid in Barks of Seven Species of Terminalia. Biol. Mem. 8 1/2: 54-62.
Terminalia bellirica	Bark	--	--		Bharadwaj, K., Chandra, V. 1983. Comparative Incidence of Calcium Oxalate as a Source of Oxalic Acid in Barks of Seven Species of Terminalia. Biol. Mem. 8 1/2: 54-62.
Terminalia bellirica	Fruit	--	--		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
Terminalia catappa	Bark	--	--		Bharadwaj, K., Chandra, V. 1983. Comparative Incidence of Calcium Oxalate as a Source of Oxalic Acid in Barks of Seven Species of Terminalia. Biol. Mem. 8 1/2: 54-62.
Terminalia chebula	Bark	--	--		Bharadwaj, K., Chandra, V. 1983. Comparative Incidence of Calcium Oxalate as a Source of Oxalic Acid in Barks of Seven Species of Terminalia. Biol. Mem. 8 1/2: 54-62.
Theobroma cacao	Seed	1520	5000	0.3447985152060364	--
Trichosanthes anguina	Fruit	10	340	-0.28760062636271105	--
Trifolium pratense	Plant	--	--		--

Plant	Part	Low PPM	High PPM	StdDev	Reference
Trigonella foenum-graecum	Leaf	--	--		--
Triticum aestivum	Fruit	111	111	-0.300228232666312	--
Tropaeolum majus	Shoot	--	--		--
Tulipa gesneriana	Bulb	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Urtica dioica	Plant	--	--		--
Vaccinium macrocarpon	Fruit	--	--		Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705.
Vaccinium myrtillus	Leaf	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Vanilla planifolia	Fruit	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
Viburnum prunifolium	Root Bark	--	--		Leung, A.Y., Encyclopedia of Common Natural Ingredients Used in Food, Drugs, and Cosmetics, John Wiley & Sons, New York, 1980.
Vicia faba	Fruit	10	70	-0.302489070476127	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
Vigna mungo	Seed	278	278	-0.6184071180830021	--
Vitis vinifera	Fruit	34	34	-0.3044741963579158	--
Zea mays	Fruit	99	99	-0.3008899412935749	Watt, J.M. and Breyer-Brandwijk, M.G. 1962. The Medicinal and Poisonous Plants of Southern and Eastern Africa. E. & S. Livingstone, Ltd. Edinburg & London. 1457 pp.

Plant	Part	Low PPM	High PPM	StdDev	Reference
Zingiber officinale	Rhizome	--	5000		--
Zingiber officinale	Root	--	5000	2.5415261372448525	--