

Dr. Duke's Phytochemical and Ethnobotanical Database

Chemicals Found in Helianthus annuus

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
3	(-)-KAUR-16-EN-19-OIC-ACID	Flower	--	--		
67	1,8-CINEOLE	Flower	--	--		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.
1	ACONITIC-ACID	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.
3	ALANINE	Seed	11170	11800	0.3494340343120688	USDA's Ag Handbook 8 and sequelae)
10	ALPHA-AMYRIN	Seed	--	--		
28	ALPHA-PINENE	Plant	--	--		Stitt, Paul. Why George should eat broccoli.
13	ALPHA-TERPINENE	Flower	--	--		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.
23	ALPHA-TERPINEOL	Flower	--	--		
32	ALPHA-TOCOPHEROL	Oil	622	622	0.2186734260494272	
2	ANNUITHRIN	Leaf	--	--		Chemical Constituents of Oriental Herbs (3 diff. books)
2	ANNUITHRIN	Shoot	40	40		
14	ARGININE	Seed	24030	82000	2.428816543007727	USDA's Ag Handbook 8 and sequelae)
2	ARGOPHYLLIN-A	Leaf	--	--		
2	ARGOPHYLLIN-B	Leaf	176	176		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
1	ARNIDIOL	Flower	--	--		
3	ASPARTIC-ACID	Seed	24460	25800	0.2850604453864925	USDA's Ag Handbook 8 and sequelae)
1	BEHENIC-ACID	Fruit	--	--		
1	BEHENIC-ACID	Seed	--	--		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.
9	BETA-AMYRIN	Seed	--	--		
53	BETA-CAROTENE	Seed	--	0.3	-0.41055580088060895	USDA's Ag Handbook 8 and sequelae)
13	BETA-PINENE	Flower	--	--		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.
47	BETA-SITOSTEROL	Seed	3490	3510	0.7159177552484736	Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)
35	BORNEOL	Flower	--	--		
3	BRASSINOLIDE	Pollen Or Spore	--	--		
102	CAFFEIC-ACID	Pollen Or Spore	4	4		
102	CAFFEIC-ACID	Seed	1600	1800	0.9502356432760076	
28	CALCIUM	Seed	917	1225	-0.5365417460978219	USDA's Ag Handbook 8 and sequelae)
2	CAMPESTEROL	Seed	750	770	0.9683913917867137	Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
9	CAMPHENE	Essential Oil	--	--		
41	CAMPHOR	Flower	--	--		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.
3	CAPRIC-ACID	Seed	--	--		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.
1	CELLULOSE	Fruit	--	--		
1	CELLULOSE	Seed	--	--		
1	CEPHALIN	Seed	615	1230	-0.7370340011227791	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
77	CHLOROGENIC-ACID	Seed	1900	28000	0.33366434629149755	
1	CHOLESTEROL	Seed	1500	1500	1	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
20	CHOLINE	Seed	1200	1200	-0.4445983553028156	
18	CINNAMIC-ACID	Seed	--	--		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.
53	CITRAL	Flower	--	--		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.
23	CITRIC-ACID	Seed	1900	1900	-1.228406167330634	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
12	COPPER	Seed	15	19	0.3796476594234794	USDA's Ag Handbook 8 and sequelae)
2	CRYPTOXANTHIN	Flower	--	--		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.
1	CUMIN-ALCOHOL	Flower	--	--		
7	CYCLOARTENOL	Seed	--	--		
13	CYSTEINE	Seed	4510	16000	2.5164597908165307	
5	DAUCOSTEROL	Seed	--	--		
1	DELTA-7-AVENASTEROL	Seed	--	--		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.
1	DELTA-CADINOL	Flower	--	--		
4	DELTA-TOCOPHEROL	Oil	--	--		
76	EUGENOL	Flower	--	--		
2	FARADIOL	Flower	7800	7800		
61	FERULIC-ACID	Pollen Or Spore	2	3		
15	FIBER	Seed	37550	323000	1.486226562630823	
8	FRUCTOSE	Flower	--	--		
7	FUMARIC-ACID	Leaf	--	--		
1	GALACTOSE	Flower	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
14	GAMMA-TOCOPHEROL	Oil	27	27	-1.241582556791874	
7	GLUCOSE	Seed	--	--		
12	GLYCINE	Seed	14610	15400	0.6430760701183263	USDA's Ag Handbook 8 and sequelae)
54	GOSSYPOL	Seed	10	10	-0.5512186425263101	
6	GRANDIFLORIC-ACID	Flower	--	--		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.
1	HELIANGIN	Plant	--	--		Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
1	HELIANTHOSIDE-A	Flower	--	--		
3	HEXAHYDRO-2H-AZEPIN-2-ONE	Sprout Seedling	--	--		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.
7	HISPIDULIN	Plant	--	--		Stitt, Paul. Why George should eat broccoli.
18	HISTAMINE	Tissue Culture	--	--		
7	HISTIDINE	Seed	6320	20000	3.688881333268414	
3	HYMENOXIN	Plant	--	--		Stitt, Paul. Why George should eat broccoli.
12	IODINE	Seed	0.042	0.042	-0.2745141613777973	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
6	IRON	Seed	60	70	-0.37538951089484696	
4	ISOCHLOROGENIC-ACID	Plant	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
4	ISOFERULIC-ACID	Seed	1400	1700	1.4142093214695879	Jim Duke's personal files.
3	ISOLEUCINE	Seed	11390	46500	4.594732547635374	
28	ISOLIQUIRITIGENIN	Plant	--	--		Stitt, Paul. Why George should eat broccoli.
1	ISOMENTHOL	Flower	--	--		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.
3	KAUR-16-EN-19-OIC-ACID	Flower	--	--		
8	LACTIC-ACID	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.
20	LECITHIN	Seed	385	2300	-0.6765969690609044	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
2	LEUCINE	Seed	16590	35500	1.7630018192536456	
13	LIGNIN	Pericarp	250000	300000		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.
1	LIGNOCERIC-ACID	Fruit	--	--		
1	LIGNOCERIC-ACID	Seed	--	--		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.
60	LIMONENE	Flower	--	--		
53	LINALOOL	Flower	--	--		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.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
7	LINALYL-ACETATE	Flower	--	--		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.
27	LINOLEIC-ACID	Seed	89000	350000	2.0810011317954165	
2	LOLIOLIDE	Flower	--	--		
21	LUPEOL	Shoot	--	--		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.
15	LUTEIN	Flower	--	--		
4	LYSINE	Seed	9370	9900	-0.29781359908921706	
65	MAGNESIUM	Seed	3540	5176	0.8810173298853301	
15	MALIC-ACID	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.
1	MALONIC-ACID	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.
2	MALTOSE	Flower	--	--		
14	MANGANESE	Seed	20	21	-0.40511016640256897	USDA's Ag Handbook 8 and sequelae)
63	MENTHOL	Flower Essent. Oil	235000	310000		
15	METHIONINE	Seed	4940	20500	4.1793275654576725	

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3	METHYL-ACETATE	Flower	--	--		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.
13	MUFA	Seed	94620	100000	-0.06817898704459366	
6	MYRISTIC-ACID	Seed	500	900	-0.2842214392424068	
5	MYRTENAL	Flower	--	--		
3	N-HENTRIACONTANE	Seed	--	--		
2	N-HEXACOSANE	Seed	--	--		
1	N-NONACOSANE	Seed	--	--		
2	NEO-CHLOROGENIC-ACID	Seed	--	--		
39	NIACIN	Seed	45	48	0.1530815697418368	
2	NIVEUSIN-C	Leaf	114	114		Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
64	OLEANOLIC-ACID	Flower	--	--		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.
18	OLEIC-ACID	Seed	36000	178000	0.48416430072452843	
25	P-COUMARIC-ACID	Pollen Or Spore	11	11		
25	P-COUMARIC-ACID	Seed	900	1100	2.709983056618278	Jim Duke's personal files.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
16	P-CYMENE	Flower	--	--		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.
13	P-HYDROXY-BENZOIC-ACID	Seed	--	--		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.
13	PALMITIC-ACID	Seed	14250	32000	-0.039337218532970196	
2	PALMITOLEIC-ACID	Seed	490	515	-0.28610525841718454	USDA's Ag Handbook 8 and sequelae)
24	PECTIN	Plant	110000	110000	1.4120278901082428	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.
2	PECTOLINARIGENIN	Plant	--	--		Stitt, Paul. Why George should eat broccoli.
2	PHENYL-ACETALDEHYDE	Flower	--	--		
7	PHENYLALANINE	Seed	11690	48000	4.353920008819304	
2	PHOSPHATIDYL-CHOLINE	Seed	--	--		
4	PHOSPHORUS	Seed	6930	7450	0.5540577574564426	
5	PHYLLOQUINONE	Seed Oil	--	0.06	-1.0587137637796051	
9	PHYTIC-ACID	Seed	--	--		
2	PHYTOSTEROLS	Seed	5340	5642	0.8999907123518872	
14	POTASSIUM	Seed	6890	7280	-0.46522595774426684	
4	PUFA	Seed	327350	345900	1.828849417347788	
176	QUERCETIN	Flower	100	400	-0.4773236748162204	

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
176	QUERCETIN	Leaf	60	210	-0.34863362562221356	
2	QUERCETIN-3'-GLUCOSIDE	Flower	--	--		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.
1	QUINIC-ACID	Seed	--	--		
1	RAFFINOSE	Pericarp	--	--		
15	RIBOFLAVIN	Seed	2	3	-0.20090831129253928	Laferriere, J.E., 1988, Nutricomp Program, Nutricomp Database; reviewed in J. Ethnobiology 9(1):27-29.
1	RUBIXANTHIN	Flower	--	--		Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
5	SABINENE	Flower	--	--		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.
5	SABINOL	Flower	--	--		
7	SALICYLATES	Seed	--	1	-0.33481239090631587	
44	SCOPOLETIN	Plant	--	--		Stitt, Paul. Why George should eat broccoli.
1	SERINE	Seed	10750	11400	0.15824437140006012	
14	SHIKIMIC-ACID	Seed	--	--		
9	SINAPIC-ACID	Seed	4800	5700	1.7320468327716805	Jim Duke's personal files.
1	SODIUM	Seed	30	32	-0.6649190286723775	

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
10	SQUALENE	Seed	--	--		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
1	STACHYOSE	Seed	--	--		
8	STEARIC-ACID	Seed	9000	28000	0.04211488009527745	
12	STIGMASTEROL	Seed	610	650	0.2956718243575674	Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)
7	SUCCINIC-ACID	Leaf	--	--		
14	SUCROSE	Flower	--	--		
14	SULFUR	Seed	2574	4880	1.3264976870978602	
6	SYRINGIC-ACID	Seed	--	--		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.
2	TARAXASTEROL	Shoot	--	--		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.
6	TARTARIC-ACID	Seed	1900	1900		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
5	TERPINYL-ACETATE	Flower	--	--		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.
31	THIAMIN	Seed	22	24	4.155129863917932	
4	THREONINE	Seed	9280	9805	0.37302144205015586	

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
93	TOCOPHEROL	Seed	--	34000	2.641805493100346	Laferriere, J.E., 1988, Nutricomp Program, Nutricomp Database; reviewed in J. Ethnobiology 9(1):27-29.
3	TRACHYLOBAN-19-OIC-ACID	Flower	--	--		
29	TRYPTOPHAN	Seed	3480	15900	4.288467497944186	
8	TYROSINE	Seed	6660	7035	-0.16359025398761914	
3	VALINE	Seed	13150	50000	4.678652580685171	
28	VANILLIN	Fruit	--	--		
28	VANILLIN	Root	0.9	0.9		
28	VANILLIN	Seed	--	--		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.
5	VERBENONE	Flower	--	--		
2	VIOLAXANTHIN	Flower	--	--		
77	ZINC	Seed	46	54	0.2517628230210634	