Dr. Duke's Phytochemical and Ethnobotanical Databases

Chemicals found in Spinacia oleracea

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
77	ZINC	Plant	4.0	185.0	1.3103512331616465	--
5	ZEAXANTHIN	Leaf		4.0		--
10	XYLITOL	Leaf				Counsell, J. N., Roberton, D. J. 1976. Xylitol-A Sweetener Which is Kind to the Teeth. Food Process Ind., 45(54): 24-26.
0	WATER	Plant	913120.0	930000.0	0.6809832665754842	--
0	VIT-K-1	Leaf		5.0		--
0	VIT-B-6	Plant	1.9	24.0	1.0	USDA's Ag Handbook 8 and sequelae)
3	VALINE	Plant	1610.0	19120.0	1.555158000620152	USDA's Ag Handbook 8 and sequelae)
8	TYROSINE	Plant	1080.0	12826.0	1.690477622671528	USDA's Ag Handbook 8 and sequelae)
29	TRYPTOPHAN	Plant	390.0	4632.0	1.4033196129047203	USDA's Ag Handbook 8 and sequelae)
0	TRIMETHYLHISTAMINE	Leaf				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
4	THREONINE	Plant	1220.0	14489.0	0.9163251148553258	USDA's Ag Handbook 8 and sequelae)
4	THREONINE	Leaf				--
31	THIAMIN	Plant	0.7	10.2	0.2209949208584362	USDA's Ag Handbook 8 and sequelae)
14	SULFUR	Plant	270.0	5700.0	0.782987997507475	--
0	SULFOLIPIDS	Plant				--
0	STRONTIUM	Plant	0.06	0.77	-1.006777905093239	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	STIGMAST-7-EN-3-BETA-OL-BETA-D-GLUCOSIDE	Shoot				--
8	STEARIC-ACID	Leaf				--
8	STEARIC-ACID	Plant	7.0	356.0	-0.6655276409333674	--
0	SPINATOSIDE	Plant				--
0	SPINASTEROL	Leaf				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
0	SPINASTEROL	Seed				--
0	SPINASAPONINS	Plant				--
0	SPINACOSIDE-D	Root				--
0	SPINACOSIDE-D	Shoot		10.0		--
0	SPINACOSIDE-C	Shoot		10.0		--
0	SPINACOSIDE-C	Root				--
0	SPINACOSIDE-B	Root				--
0	SPINACOSIDE-A	Root				--
0	SPINACETIN-3-O-BETA-D-GLUCOPYRANOSYL(1,6)-BETA-D-GLUCOPYRANOSIDE	Leaf				--
0	SPINACETIN-3-O-BETA-D-GLUCOPYRANOSYL(1,6)-(BETA-D-APIOFURANOSYL(1,2))-BETA-D-GLUCOPYRANOSIDE	Leaf				--
0	SPINACETIN-3-O-BETA-D-(2"-P-COUMAROYL-GLUCOPYRANOSYL)-(1,6)-(BETA-D-APIOFURANOSYL(1,2))-BETA-D-GLUCOPYRANOSIDE	Leaf				--
0	SPINACETIN-3-O-BETA-D-(2"-FERULOYL-GLUCOPYRANOSYL)-(1,6)-BETA-D-GLUCOPYRANOSIDE	Leaf				--
0	SPINACETIN-3-O-BETA-D-(2"-FERULOYL-GLUCOPYRANOSYL)-(1,6)-(BETA-D-APIOFURANOSYL(1,2))-BETA-D-GLUCOPYRANOSIDE	Leaf				--
0	SPINACETIN	Leaf				--
1	SODIUM	Plant	585.0	10669.0	0.28651825352805566	--
4	SILICON	Leaf	1.0	855.0	2.1298618434688388	ACTA AGRIC SCAND SUPPL 22: 1980
1	SERINE	Plant	1040.0	12351.0	1.0594826529274783	USDA's Ag Handbook 8 and sequelae)

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
60	SELENIUM	Leaf		0.057	-0.3781672517204582	ACTA AGRIC SCAND SUPPL 22: 1980
5	SAPONINS	Leaf		47000.0	-0.23418857166033838	Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)
7	SALICYLATES	Leaf	0.3	60.0	-0.4464338695640787	--
87	RUTIN	Shoot				--
87	RUTIN	Leaf		170.0	-0.993991147325029	--
0	RUBIDIUM	Leaf	0.9	90.0	1.8189036458711207	ACTA AGRIC SCAND SUPPL 22: 1980
15	RIBOFLAVIN	Plant	1.8	23.4	0.8354117066800743	USDA's Ag Handbook 8 and sequelae)
44	QUERCITRIN	Leaf		500.0	-0.4939476620574426	--
176	QUERCETIN	Leaf	1.0	19.0	-0.35172338839946077	--
1	PYRROLIDINE	Leaf		2.5		--
43	PROTOCATECHUIC-ACID	Shoot				--
0	PROTEIN	Plant	27480.0	352954.0	1.4709058523233878	USDA's Ag Handbook 8 and sequelae)
0	PROLINE	Plant	1120.0	13301.0	1.2034784447687357	USDA's Ag Handbook 8 and sequelae)
14	POTASSIUM	Plant	2060.0	69077.0	3.297249785037831	--
0	POLYPODINE-B	Seed		2.3		--
0	POLYPODINE-B	Leaf				--
0	POLYPHENOL-OXIDASE	Leaf				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	PHYTYLPLASTOQUINOL	Leaf				--
2	PHYTOSTEROLS	Plant	90.0	1800.0	1.0768787487624356	--
9	PHYTIC-ACID	Leaf		80.0		--
5	PHYLLOQUINONE	Tuber		3.8	1.0000000000000002	--
4	PHOSPHORUS	Plant	250.0	6232.0	1.2702244799414446	--
0	PHOSPHATIDYL-SERINE	Leaf				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
0	PHOSPHATIDYL-INOSITOL	Leaf				--
0	PHOSPHATIDYL-GLYCEROL	Leaf				--
0	PHOSPHATIDYL-ETHANOLAMINE	Plant				--
2	PHOSPHATIDYL-CHOLINE	Plant				--
3	PHEOPHYTIN-A	Leaf				--
7	PHENYLALANINE	Plant	1290.0	15320.0	1.6518849106475164	USDA's Ag Handbook 8 and sequelae)
7	PHENYLALANINE	Leaf				--
3	PHENETHYLAMINE	Leaf		1.1	-0.9841987738690897	--
0	PATULETIN-3-O-BETA-D-GLUCOPYRANOSYL-(1,6)-(BETA-D-APIOFURANOSYL-(1,2))-BETA-D-GLUCOPYRANOSIDE	Leaf				--
0	PATULETIN-3-O-BETA-D-(2"-FERULOYL-GLUCOPYRANOSYL)-(1,6)-(BETA-D-APIOFURANOSYL-(1,2))-BETA-D-GLUCOPYRANOSIDE	Leaf				--
2	PATULETIN	Leaf				--
11	PANTOTHENIC-ACID	Plant	0.57	8.7	-1.2357577104072583	--
2	PALMITOLEIC-ACID	Leaf				--
2	PALMITOLEIC-ACID	Plant	21.0	475.0	-1.0	--
13	PALMITIC-ACID	Leaf				--
13	PALMITIC-ACID	Plant	106.0	4869.0	-0.7374530233038146	--
25	P-COUMARIC-ACID	Leaf		133.0	-0.31505669620268567	--
9	OXALIC-ACID	Leaf	5000.0	93900.0	2.2754912851003497	--
0	OLERAGENOSIDE	Plant		0.06		--
18	OLEIC-ACID	Leaf				--
18	OLEIC-ACID	Plant	18.0	475.0	-0.8580334988525617	--
0	NITROGEN	Leaf	3200.0	45700.0	0.09626842491686814	ACTA AGRIC SCAND SUPPL 22: 1980
3	NICKEL	Plant	0.05	5.7	-0.37306200253035504	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
39	NIACIN	Plant	6.9	89.8	0.18336375742880084	USDA's Ag Handbook 8 and sequelae)
2	NEO-CHLOROGENIC-ACID	Shoot				--
0	N-PENTYL-AMINE	Leaf		0.3	-0.8053872662568291	--
0	N-METHYL-PHENETHYLAMINE	Leaf		2.4	-0.4133836909571625	--
0	N-METHYL-ANILINE	Leaf		3.4	1.0000000000000002	--
0	N-ACETYLHISTAMINE	Leaf				--
0	N,N-DIMETHYLHISTAMINE	Leaf				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
6	MYRISTIC-ACID	Plant	1.0	950.0	-0.34172508190823475	--
0	MONOGALACTOSYLDIACYLGLYCEROL	Plant				--
2	MOLYBDENUM	Plant	0.06	0.8	-0.6403529503457794	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
1	METHYL-AMINE	Leaf		12.0	-0.9038170440976104	--
15	METHIONINE	Leaf				--
15	METHIONINE	Plant	530.0	6294.0	2.224241040054928	USDA's Ag Handbook 8 and sequelae)
1	MERCURY	Leaf	0.003	0.11	1.6807373133361998	ACTA AGRIC SCAND SUPPL 22: 1980
14	MANGANESE	Plant	3.0	485.0	2.7811803446646057	--
2	MALTOSE	Leaf				--
15	MALIC-ACID	Leaf		4300.0	-0.7530674316188777	Soldatenkov, S. V., Mazurova, T. A., Ranteleev, A. N. 1960. Organic Acids of Onion and Spinach. Trudy Petergof Biol. Inst., Leningrad Gosudarst Univ Im AA Zhdanova, 18: 55-61.
65	MAGNESIUM	Plant	420.0	11000.0	2.1524585904189935	--
4	LYSINE	Plant	1740.0	20664.0	1.308971519219775	USDA's Ag Handbook 8 and sequelae)
4	LYSINE	Leaf				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
15	LUTEIN	Leaf		42.0		--
0	LINOLENIC-ACID	Leaf				--
27	LINOLEIC-ACID	Leaf				--
27	LINOLEIC-ACID	Plant	104.0	2613.0	-0.541791899786887	--
2	LEUCINE	Leaf				--
2	LEUCINE	Plant	2230.0	26483.0	1.3907214750103931	USDA's Ag Handbook 8 and sequelae)
20	LECITHIN	Leaf				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	LEAD	Leaf	0.03	3.0	-0.5904546176203417	ACTA AGRIC SCAND SUPPL 22: 1980
1	L-HOMOCYSTEINE	Plant				Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
0	KILOCALORIES	Plant	220.0	2613.0	-0.6337239292634677	USDA's Ag Handbook 8 and sequelae)
75	KAEMPFEROL	Leaf		2.0	-0.7448470733619753	--
75	KAEMPFEROL	Plant				--
0	JACEIDIN-4'-GLUCURONIDE	Leaf				--
0	ISOPENTYL-AMINE	Leaf		3.8	0.9999999999999998	--
3	ISOLEUCINE	Leaf				--
3	ISOLEUCINE	Plant	1470.0	17458.0	1.3309580391447728	USDA's Ag Handbook 8 and sequelae)
0	ISOCELOSIANIN	Pt				--
1	ISOBETANIN	Pt				--
6	IRON	Plant	8.0	384.0	-0.28609078404129584	--
6	IRON	Leaf				--
12	IODINE	Plant		0.2	-0.4468248895819287	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
7	INDOLE-3-ACETIC-ACID	Sprout Seedling				--
30	HYPEROSIDE	Shoot				--
7	HISTIDINE	Plant	640.0	7601.0	1.1356385926026882	USDA's Ag Handbook 8 and sequelae)
18	HISTAMINE	Plant				Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
0	HEXOSAMINE	Seed		380.0		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	HEXADECATRIENOIC-ACID	Leaf				--
0	HEXADECA-7,10,13-TRIENOIC-ACID	Leaf				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
12	GLYCINE	Plant	1340.0	15914.0	1.6896690344750718	USDA's Ag Handbook 8 and sequelae)
7	GLUTATHIONE	Plant	90.0	1065.0		--
8	GLUTAMIC-ACID	Plant	3430.0	40735.0	1.5707193839545637	USDA's Ag Handbook 8 and sequelae)
23	FOLIC-ACID	Plant	1.2	15.0	-0.4505134514039695	--
15	FOLACIN	Plant	1.59	27.13	-0.0465638733379045	USDA's Ag Handbook 8 and sequelae)
0	FLUORINE	Leaf	0.3	5.7	0.5178738172246513	ACTA AGRIC SCAND SUPPL 22: 1980
15	FIBER	Plant	6000.0	111634.0	-0.8219381795308445	--
61	FERULIC-ACID	Inflorescence				--
61	FERULIC-ACID	Leaf		16.0	0.37081029570000157	--
0	FAT	Plant	3070.0	46672.0	-0.07406978675946051	USDA's Ag Handbook 8 and sequelae)
0	ETHYL-AMINE	Leaf		8.4	1.0000000000000002	--
3	ECDYSONE	Seed				--
0	DIGALACTOSYLDIACYLGLYCEROL	Plant				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
2	DIETHYL-AMINE	Leaf		15.0		--
0	DEHYDROASCORBIC-ACID	Leaf				--
2	CYSTINE	Plant	350.0	4157.0	0.9786663998162064	USDA's Ag Handbook 8 and sequelae)
0	CYSTATHIONINE	Leaf		0.2		--
13	COUMESTROL	Leaf	0.1	100.0	-1.0	--
12	COPPER	Plant	0.1	24.0	1.1055674700843674	--
0	COLAMINE	Leaf				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
2	COBALT	Plant	0.001	1.2	-0.4382119966012714	--
23	CITRIC-ACID	Leaf		2300.0	-0.5219939763024926	Soldatenkov, S. V., Mazurova, T. A., Ranteleev, A. N. 1960. Organic Acids of Onion and Spinach. Trudy Petergof Biol. Inst., Leningrad Gosudarst Univ Im AA Zhdanova, 18: 55-61.
24	CHROMIUM	Flower	0.01	0.42	-1.2060967413329013	ACTA AGRIC SCAND SUPPL 22: 1980
1	CHOLESTEROL	Leaf				--
0	CHLOROPHYLL-A	Leaf				--
21	CHLOROPHYLL	Fruit Juice		3.0		--
21	CHLOROPHYLL	Leaf				--
77	CHLOROGENIC-ACID	Shoot				--
7	CHLORINE	Plant	540.0	6835.0	0.09562346322025084	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
1	CEPHALIN	Leaf				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	CELOSIANIN	Pt				--
0	CARBONIC-ANHYDRASE	Leaf				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
0	CARBOHYDRATES	Plant	35000.0	415660.0	-1.6530716464562447	USDA's Ag Handbook 8 and sequelae)
2	CAMPESTEROL	Sprout Seedling				Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)
0	CALSEQUESTRIN	Leaf				--
1	CALMODULIN	Leaf				--
1	CALMODULIN	Plant				Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
28	CALCIUM	Plant	730.0	15700.0	0.2257645071195088	--
102	CAFFEIC-ACID	Leaf				--
102	CAFFEIC-ACID	Shoot				--
3	CADMIUM	Leaf	0.05	5.0	1.0824728791014093	ACTA AGRIC SCAND SUPPL 22: 1980
0	BROMINE	Leaf		4.0	-0.9927156521845423	ACTA AGRIC SCAND SUPPL 22: 1980
4	BORON	Leaf	2.4	40.0	-0.5790251325011837	ACTA AGRIC SCAND SUPPL 22: 1980
5	BETANIN	Pt				--
5	BETANIN	Tissue Culture				--
2	BETA-ECDYSONE	Seed		214.5		--
2	BETA-ECDYSONE	Leaf				--
2	BETA-CRYPTOXANTHIN	Leaf				--
53	BETA-CAROTENE	Leaf		32.5	-0.9964033865662687	--
53	BETA-CAROTENE	Plant	4.0	690.0	3.0097842607969785	--
0	BENZYL-AMINE	Leaf		6.1	1.394254707125211	--
7	ASTRAGALIN	Shoot				--
3	ASPARTIC-ACID	Plant	2400.0	28502.0	0.5819483717137405	USDA's Ag Handbook 8 and sequelae)
0	ASH	Plant	16850.0	285700.0	2.9752400785567166	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
112	ASCORBIC-ACID	Fruit Juice		55.0	-1.0	--
112	ASCORBIC-ACID	Leaf				--
112	ASCORBIC-ACID	Plant	239.0	7595.0	1.1893099515743446	--
0	ASCORBATE	Plant	212.0	4450.0	-1.0	--
2	ARSENIC	Leaf	0.02	0.29	0.7318007945426982	ACTA AGRIC SCAND SUPPL 22: 1980
14	ARGININE	Plant	1620.0	19239.0	1.2761740025274024	USDA's Ag Handbook 8 and sequelae)
14	ARGININE	Leaf				--
0	AMMONIA	Leaf		18280.0	1.1391940589308933	--
1	AMARANTHIN	Pt				--
5	ALUMINUM	Leaf	5.0	270.0	-0.49080851056065206	ACTA AGRIC SCAND SUPPL 22: 1980
32	ALPHA-TOCOPHEROL	Leaf	12.0	419.0	0.2913184399571312	--
2	ALPHA-SPINASTEROL	Leaf				--
1	ALPHA-LIPOIC-ACID	Plant	315.0	3150.0	1.0	--
15	ALPHA-LINOLENIC-ACID	Plant	480.0	13657.0	1.4955264890768174	--
15	ALPHA-LINOLENIC-ACID	Leaf				--
7	ALPHA-CAROTENE	Leaf				--
3	ALANINE	Plant	1420.0	16864.0	0.5700171464175169	USDA's Ag Handbook 8 and sequelae)
19	ACETYL-CHOLINE	Leaf				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	7-STIGMASTEROL	Leaf				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	6-PHYTYLTOLUQUINOL	Leaf				--
0	6-(HYDROXYMETHYL)-LUMAZINE	Leaf				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
0	4',5-DIHYDROXY-3,3'-DIMETHOXY-6,7-METHYLENEDIOXYFLAVONE	Leaf				--
0	3-HYDROXYTYRAMINE	Leaf				ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
0	3,3',4',5,7-PENTAHYDROXY-6-METHOXYFLAVONE	Leaf				--
0	24(28)-DEHYDROMAKISTERONE	Seed				--
0	2-CARBOXYARABINITOL	Leaf		5.0	-0.8745646032794931	Moore, B. D., Isidoro, E., Seemann, J. R. 1993. Distribution of 2-Carboxyarabinitol Among Plants. Phytochemistry 34 3: 703-707. Dept. Biochem. Univ. Nevada Reno 89557, USA.