

Dr. Duke's Phytochemical and Ethnobotanical Databases

Chemicals found in *Allium cepa*

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
2	DIMETHYL-SULFIDE	Essential Oil				Schultz, O. E., Mohrmann, H. L. 1965. Analysis of Constituents of Garlic <i>Allium sativum</i> . II. Gas Chromatography of Garlic Oil. <i>Pharmazie</i> , 20(7): 441-447.
14	SUCROSE	Leaf				Osman, S. A. 1980. Chemical and Biological Studies of Onion and Garlic in an Attempt to Isolate a Hypoclycaemic Extract. <i>Abstr. 4th Asian Symp. Med. Plants Spices Bangkok, Thailand, September 15-19: 117.</i>
8	FRUCTOSE	Leaf				Osman, S. A. 1980. Chemical and Biological Studies of Onion and Garlic in an Attempt to Isolate a Hypoclycaemic Extract. <i>Abstr. 4th Asian Symp. Med. Plants Spices Bangkok, Thailand, September 15-19: 117.</i>
43	PROTocatechuic-acid	Bulb	4500.0	17540.0		--
3	ALLYL-PROPYL-DISULFIDE	Essential Oil				Wilcox, B. F., Joseph, P. K., Augusti, K. T. 1984. Effects of Allylpropyl Disulphide Isolated from <i>Allium cepa</i> Linn. on High-Fat Fed Rats. <i>Indian J. Biochem. Biophys.</i> , 21(3): 214-216.
14	SUCROSE	Bulb				Osman, S. A. 1980. Chemical and Biological Studies of Onion and Garlic in an Attempt to Isolate a Hypoclycaemic Extract. <i>Abstr. 4th Asian Symp. Med. Plants Spices Bangkok, Thailand, September 15-19: 117.</i>
4	TRANS-5-ETHYL-4,6,7-TRITHIA-2-DECENE-4-S-OXIDE	Bulb				--
67	ALLICIN	Bulb				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
1	RAFFINOSE	Leaf				Osman, S. A. 1980. Chemical and Biological Studies of Onion and Garlic in an Attempt to Isolate a Hypoclycaemic Extract. Abstr. 4th Asian Symp. Med. Plants Spices Bangkok, Thailand, September 15-19: 117.
2	S-METHYL-CYSTEINE-SULFOXIDE	Bulb				Kumari, K., Augusti, K. T. 1995. Antidiabetic Effects of S-Methylcysteine Sulphoxide on Alloxan Diabetes. Planta Medica, 61(1): 72-74.
1	ETHYLENE	Bulb				LAWSON in Koch, H. P. and Lawson, L. D., eds. 1996. Garlic- The Science and therapeutic application of Allium sativum L. and related species. Williams & Wilkins, Baltimore. 329 pp.
23	MELATONIN	Bulb				Hattori, A., et. al. 1995. Identification of Melatonin in Plants and its Effects on Plasma Melatonin Levels and Binding to Melatonin Receptors in Vertebrates. Biochem. Mol. Biol. Int., 35(3): 627-634.
2	DIMETHYL-DISULFIDE	Bulb				--
2	ASPARAGINE	Bulb				--
7	SUCCINIC-ACID	Leaf				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.
61	FERULIC-ACID	Root				Das, V. S. R., Rao, J. V. S. 1964. Phenolic Acids of Onion Plant. Curr. Sci., 33(15): 471-472.
2	PROSTAGLANDIN-A-1	Bulb		1.0		--
21	ALLIIN	Essential Oil				Bekdairova, K. Z., Klyshev, L. K. 1982. Garlic Essential Oil and its Quantitative Analysis. Izv Akad Nauk Kaz Ssr Ser Biol, 1: 6-11.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
7	SUCCINIC-ACID	Bulb				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.
25	P-COUMARIC-ACID	Bulb				--
11	LITHIUM	Bulb	0.152	0.324		--
1	PYRUVIC-ACID	Bulb				Malkki, Y., Nikkila, O. E., Aalto, M. 1978. The Composition and Aroma of Onions and Influencing Factors. J. Sci. Agr. Soc. Finland, 50: 103-.
87	RUTIN	Bulb		14000.0		--
13	MUFA	Bulb	230.0	2230.0		USDA's Ag Handbook 8 and sequelae)
5	GLUTAMINE	Bulb				--
15	LUTEIN	Bulb		0.02		Granado, F., Olmedilla, B., Blanco, I., Rojas-Hidalgo, E. 1992. Carotenoid Composition in Raw and Cooked Spanish Vegetables. J. Agr. Food Chem., 40(11): 2135-2140.
12	STIGMASTEROL	Seed				Kintia, P. K., Degtiaryova, L. P., Balashova, N. N., Shvets, S. A. 1987. Sterols and Steroidal Glycosides of Bulb Onion Seeds. Fecs. Int. Conf. Chem. Biotechol. Biol. Act. Nat. Prod., (Proc.) 3rd: 166-170.
61	FERULIC-ACID	Leaf				Das, V. S. R., Rao, J. V. S. 1964. Phenolic Acids of Onion Plant. Curr. Sci., 33(15): 471-472.
2	PROPIONALDEHYDE	Bulb				Wilkens, W. F. 1964. Isolation and Identification of the Lachrymogenic Compound of Onion. Cornell Univ., Agr. Expt. Sta. Mem. No., 385: 31 pp.
28	DIALLYL-TRISULFIDE	Essential Oil				Schultz, O. E., Mohrmann, H. L. 1965. Analysis of Constituents of Garlic Allium sativum. II. Gas Chromatography of Garlic Oil. Pharmazie, 20(7): 441-447.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
12	STIGMASTEROL	Bulb		40.0		--
9	OXALIC-ACID	Bulb		10.0		--
16	ACETIC-ACID	Bulb				Wilkens, W. F. 1964. Isolation and Identification of the Lachrymogenic Compound of the Onion. Cornell Univ., Agr. Expt. Sta. Mem. No., 385: 31 pp.
43	PROTocatechuic-ACID	Leaf				Das, V. S. R., Rao, J. V. S. 1964. Phenolic Acids of Onion Plant. Curr. Sci., 33(15): 471-472.
28	ADENOSINE	Bulb				--
7	GLUCOSE	Bulb				Osman, S. A. 1980. Chemical and Biological Studies of Onion and Garlic in an Attempt to Isolate a Hypoclycaemic Extract. Abstr. 4th Asian Symp. Med. Plants Spices Bangkok, Thailand, September 15-19: 117.
102	CAFFEIC-ACID	Bulb				--
27	LINOLEIC-ACID	Bulb				Osman, S. A. 1980. Chemical and Biological Studies of Onion and Garlic in an Attempt to Isolate a Hypoclycaemic Extract. Abstr. 4th Asian Symp. Med. Plants Spices Bangkok, Thailand, September 15-19: 117.
2	DIMETHYL-DISULFIDE	Essential Oil				Jirovetz, L., Koch, H. P., Jager, W., Remberg, G. 1992. Investigations of German Onion Oil by GC-FID, GC-MS and GC-FTIR. Pharmazie, 47(6): 455-456.
112	ASCORBIC-ACID	Bulb				--
12	STIGMASTEROL	Seed Oil				Grujic-Injac, B., Basarevic-Dinic, L., Lajsic, S., Stefanovic, D. 1985. Chemical Analysis of Seed Oil of the Onion ( <i>Allium cepa</i> ). Hrana Ishrana, 25: 167-169 (Inst Ishr Vet Fak Belgrade, Yugoslavia)
4	DIPROPYL-DISULFIDE	Bulb				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
1	TULIPOSIDE-A	Root				Slob, A., Jekel, B., De Jong, B., Schlatmann, E. 1975. On the Occurrence of Tuliposides in the Liliiflorae. <i>Phytochemistry</i> , 14: 1997-2005.
25	DIALLYL-SULFIDE	Essential Oil				Schultz, O. E., Mohrmann, H. L. 1965. Analysis of Constituents of Garlic <i>Allium sativum</i> . II. Gas Chromatography of Garlic Oil. <i>Pharmazie</i> , 20(7): 441-447.
8	STEARIC-ACID	Bulb	20.0	195.0		--
23	CITRIC-ACID	Bulb				Soldatenkov, S. V., Mazurova, T. A., Ranteleev, A. N. 1960. Organic Acids of Onion and Spinach. <i>Trudy Petergof Biol. Inst., Leningrad Gosudarst Univ Im AA Zhdanova</i> , 18: 55-61.
2	QUERCETIN-3,4'-DIGLUCOSIDE	Bulb				--
3	ABSCISSIC-ACID	Bulb				--
2	PROSTAGLANDIN-E-1	Bulb				Ustunes, L., Claeys, M., Laekeman, G., Herman, A.G., Vlietinck, A.J., Ozer, A. 1985. Isolation and Identification of Two Isomeric Trihydroxy Octadecenoic Acids with Prostaglandin E-Like Activity from Onion Bulbs( <i>Allium cepa</i> ). <i>Prostaglandins</i> , 29(5):847-865
1	RAFFINOSE	Bulb				Osman, S. A. 1980. Chemical and Biological Studies of Onion and Garlic in an Attempt to Isolate a Hypoclycaemic Extract. <i>Abstr. 4th Asian Symp. Med. Plants Spices Bangkok, Thailand, September 15-19: 117.</i>
7	FUMARIC-ACID	Bulb				--
3	CADMIUM	Bulb	0.005	0.38		--
4	CIS-N-PROPYLSULPHINOTHIOIC-ACID-S-1-PROPENYLESTER	Bulb				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
7	GLUTATHIONE	Bulb				Ueda, Y., Taubuku, T., Miyajima, R. 1994. Composition of Sulfur-Containing Components in Onion and Their Flavor Characters. Biosci. Biotech. Biochem., 58(1): 108-110.
5	24-METHYLENE-CYCLOARTANOL	Bulb				Itoh, T., Tamura, T., Mitsuhashi, T., Matsumoto, T. 1977. Sterols of Liliaceae. Phytochemistry, 16: 140-141.
2	ARSENIC	Bulb	0.002	0.076		--
3	DIPHENYLAMINE	Plant		500.0		Karawy, M. S., Ehayyal, A. S. E., Farrag, N. M., Ayad, M. M. 1986. Screening of Diphenylamine as an Antihyperglycaemic Agent in Certain Edible Plant Organs. Acta. Pharm. Hung, 56: 55-58.
26	DIALLYL-DISULFIDE	Essential Oil				Schultz, O. E., Mohrmann, H. L. 1965. Analysis of Constituents of Garlic Allium sativum. II. Gas Chromatography of Garlic Oil. Pharmazie, 20(7): 441-447.
4	SPIRAEOSIDE	Bulb	10000.0	11300.0		--
75	KAEMPFEROL	Bulb		2.0		--
2	5-OCTYL-CYCLOPENTA-1,3-DIONE	Bulb				--
2	PROPIONALDEHYDE	Leaf				Burtsev, A. F., Pashchenko, T. W., Rik, G. R. 1974. Mass-Spectrometric Analysis of Volatile Phytonocide Substances of Cucumber and Common Onion Leaves. Fiziol Biokhim Kul't Rast, 6: 516-.
1	QUINIC-ACID	Bulb				--
2	METHANOL	Bulb				--
8	FRUCTOSE	Bulb				Osman, S. A. 1980. Chemical and Biological Studies of Onion and Garlic in an Attempt to Isolate a Hypoclycaemic Extract. Abstr. 4th Asian Symp. Med. Plants Spices Bangkok, Thailand, September 15-19: 117.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
4	CIS-METHYLSULPHINOTHIOIC-ACID-S-1-PROPENYLESTER	Bulb				--
8	GLUTAMIC-ACID	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.
1	PYRUVIC-ACID	Fruit Juice		1034.0		Morgan, E. J. 1946. Pyruvic Acid in the Juice of Onion ( <i>Allium cepa</i> ). Nature (London), 157: 512.
4	SPIRAEOSIDE	Epidermis				Ito, Y., Ono, M., Masuoka, C., Yahara, S., Nohara, T. 1995. Hyaluronidase Inhibitors of Onion ( <i>Allium cepa</i> L.) Skin. Kyushu Tokai Daigaku Nogakubu Kiyo, 14: 43-48.
3	DI-N-PROPYL-DISULFIDE	Bulb				Wilkens, W. F. 1962. The Isolation and Identification of the Lachrymogenic Compound of Onion. Diss. Abstr. Int. B, 22: 3978.
64	OLEANOLIC-ACID	Bulb				--
2	5-HEXYL-CYCLOPENTA-1,3-DIONE	Bulb				--
11	ISORHAMNETIN	Bulb				Park, Y. K., Lee, C. Y. 1996. Identification of Isorhamnetin 4'-Glucoside in Onions. J. Agric. Food Chem., 44(1): 34-36.
2	QUERCETIN-3-O-BETA-D-GLUCOSIDE	Bulb	0.0	40.0		Abstract (See species file)
30	ANTHOCYANINS	Bulb				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
7	GLUCOSE	Leaf				Osman, S. A. 1980. Chemical and Biological Studies of Onion and Garlic in an Attempt to Isolate a Hypoclycaemic Extract. Abstr. 4th Asian Symp. Med. Plants Spices Bangkok, Thailand, September 15-19: 117.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
9	SINAPIC-ACID	Root				Das, V. S. R., Rao, J. V. S. 1964. Phenolic Acids of Onion Plant. Curr. Sci., 33(15): 471-472.
23	CITRIC-ACID	Leaf				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.
13	CYSTEINE	Bulb				Ueda, Y., Taubuku, T., Miyajima, R. 1994. Composition of Sulfur-Containing Components in Onion and Their Flavor Characters. Biosci. Biotech. Biochem., 58(1): 108-110.
9	SINAPIC-ACID	Bulb				Das, V. S. R., Rao, J. V. S. 1964. Phenolic Acids of Onion Plant. Curr. Sci., 33(15): 471-472.
20	CHOLINE	Bulb		830.0		Dakshinamurti, K. 1955. Choline Content of South Indian Foods. Curr. Sci., 24: 194-195.
4	N-PROPYLSULPHINOTHIOIC-ACID-S-N-PROPYLESTER	Bulb				--
1	1-(METHYLSULFINYL)-PROPYL-METHYL-DISULFIDE	Bulb				--
22	ISOQUERCITRIN	Bulb				Kiviranta, J., Huovinen, K., Hiltunen, R. 1986. Variation of Flavonoids in Allium cepa. Planta Medica, 6: 517-518.
2	ALLYLMETHYLSULFIDE	Bulb				Wealth of India.
15	ALPHA-LINOLENIC-ACID	Bulb				Ustunes, L., Claeys, M., Laekeman, G., Herman, A.G., Vlietinck, A.J., Ozer, A. 1985. Isolation and Identification of Two Isomeric Trihydroxy Octadecenoic Acids with Prostaglandin E-Like Activity from Onion Bulbs (Allium cepa). Prostaglandins, 29(5):847-865
9	SINAPIC-ACID	Leaf				Das, V. S. R., Rao, J. V. S. 1964. Phenolic Acids of Onion Plant. Curr. Sci., 33(15): 471-472.



Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
1	CHOLESTEROL	Seed				Kintia, P. K., Degtiaryova, L. P., Balashova, N. N., Shvets, S. A. 1987. Sterols and Steroidal Glycosides of Bulb Onion Seeds. Fecs. Int. Conf. Chem. Biotechol. Biol. Act. Nat. Prod., (Proc.) 3rd: 166-170.
8	PHLOROGLUCINOL	Bulb		100.0		--
3	CYCLOEUCALENOL	Bulb				Itoh, T., Tamura, T., Mitsuhashi, T., Matsumoto, T. 1977. Sterols of Liliaceae. Phytochemistry, 16: 140-141.
3	SILVER	Bulb	0.038	0.054		--
1	CHOLESTEROL	Bulb				--
3	MURAMIDASE	Leaf		0.3		LAWSON in Koch, H. P. and Lawson, L. D., eds. 1996. Garlic- The Science and therapeutic application of Allium sativum L. and related species. Williams & Wilkins, Baltimore. 329 pp.
2	ALLYL-METHYL-DISULFIDE	Bulb				Wealth of India.
16	P-CYMENE	Fruit Juice				Schmidt, N. E., et. al. 1996. Rapid Extraction Method of Quantitating the Lachrymatory Factor of Onion Using Gas Chromatography. J. Agric. Food Chem., 44(9): 2690-2693.
1	PYRUVIC-ACID	Fruit		1034.0		--
2	CAMPESTEROL	Seed				Kintia, P. K., Degtiaryova, L. P., Balashova, N. N., Shvets, S. A. 1987. Sterols and Steroidal Glycosides of Bulb Onion Seeds. Fecs. Int. Conf. Chem. Biotechol. Biol. Act. Nat. Prod., (Proc.) 3rd: 166-170.
7	CYCLOARTENOL	Bulb				Itoh, T., Tamura, T., Mitsuhashi, T., Matsumoto, T. 1977. Sterols of Liliaceae. Phytochemistry, 16: 140-141.
4	TRANS-TRANS-5-ETHYL-4,6,7-TRITHIA-2,8-DECADIENE-4-S-OXIDE	Bulb				--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
10	ALPHA-AMYRIN	Bulb				Smoczewiczowa, A., Nitschke, D. 1978. Study of Saponins and Sapogenins in Onions. Zesz Nauk Akad Ekon Poznaniu Ser, 1(73): 40-43.
47	BETA-SITOSTEROL	Seed				Kintia, P. K., Degtiarova, L. P., Balashova, N. N., Shvets, S. A. 1987. Sterols and Steroidal Glycosides of Bulb Onion Seeds. Feccs. Int. Conf. Chem. Biotechol. Biol. Act. Nat. Prod., (Proc.) 3rd: 166-170.
4	SILICON	Bulb	1.0	75.0		ACTA AGRIC SCAND SUPPL 22: 1980
22	CATECHOL	Bulb				Link, K. P., Walker, J. C. 1933. The Isolation of Catechol from Pigmented Onion Scales and its Significance in Relation to Disease Resistance in Onions. J. Biol. Chem., 100: 379-383.
9	OXALIC-ACID	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.)
15	MALIC-ACID	Leaf				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	ETHANOL	Bulb				--
5	SAPONINS	Bulb				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
25	P-COUMARIC-ACID	Root				Das, V. S. R., Rao, J. V. S. 1964. Phenolic Acids of Onion Plant. Curr. Sci., 33(15): 471-472.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
3	XYLOSE	Bulb				Sinha, A. 1959. Chemical Examination of Allium cepa. I. Glycosidic and Sugar Fractions. Indian J. Appl. Chem., 22: 89-91.
12	PYROCATECHOL	Bulb				Hermann, K. 1958. Flavonols and Phenols of the Onion (Allium cepa). Arch. Pharm. (Weinheim), 291: 238-247.
102	CAFFEIC-ACID	Root				Das, V. S. R., Rao, J. V. S. 1964. Phenolic Acids of Onion Plant. Curr. Sci., 33(15): 471-472.
6	TARTARIC-ACID	Bulb				--
24	PECTIN	Bulb				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
3	CYCLOALLIIN	Bulb				--
4	TRANS-N-PROPYLSULPHINOTHIOIC-ACID-S-1-PROPENYLESTER	Bulb				--
3	ALLYL-PROPYL-DISULFIDE	Bulb				--
47	BETA-SITOSTEROL	Seed Oil				Grujic-Injac, B., Basarevic-Dinic, L., Lajsic, S., Stefanovic, D. 1985. Chemical Analysis of Seed Oil of the Onion (Allium cepa). Hrana Ishrana, 25: 167-169 (Inst Ishr Vet Fak Belgrade, Yugoslavia)
6	MYRISTIC-ACID	Seed Oil				Reddy, P. N., Azeemoddin, G., Rao, S. D. T. 1989. Processing and Analysis of Onionseed (Allium cepa) and its Fixed Oil. J. Amer. Oil Chem. Soc., 66(3): 365.
15	MALIC-ACID	Bulb				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.
3	DIPHENYLAMINE	Bulb		23000.0		--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
20	BENZYL-ISOTHIOCYANATE	Bulb				Dorsch, W., Adam, O., Weber, J., Ziegeltrum, T. 1985. Antiasthmatic Effects of Onion Extracts - Detection of Benzyl- and Other Isothiocyanates (Mustard Oils) as Antiasthmatic Compounds of Plant Origin. Eur. J. Pharmacol., 107(1): 17-24.
5	ZEAXANTHIN	Bulb				Granado, F., Olmedilla, B., Blanco, I., Rojas-Hidalgo, E. 1992. Carotenoid Composition in Raw and Cooked Spanish Vegetables. J. Agr. Food Chem., 40(11): 2135-2140.
25	P-COUMARIC-ACID	Leaf				Das, V. S. R., Rao, J. V. S. 1964. Phenolic Acids of Onion Plant. Curr. Sci., 33(15): 471-472.
10	XYLITOL	Bulb				Counsell, J. N., Robertson, D. J. 1976. Xylitol-A Sweetener Which is Kind to the Teeth. Food Process Ind., 45(54): 24-26.
4	PUFA	Bulb	620.0	6005.0		USDA's Ag Handbook 8 and sequelae)
102	CAFFEIC-ACID	Leaf				Das, V. S. R., Rao, J. V. S. 1964. Phenolic Acids of Onion Plant. Curr. Sci., 33(15): 471-472.
4	TRANS-METHYLSULPHINOTHIOIC-ACID-S-1-PROPENYLESTER	Bulb				--
21	ALLIIN	Bulb				--
32	ALPHA-TOCOPHEROL	Seed Oil				Grujic-Injac, B., Basarevic-Dinic, L., Lajsic, S., Stefanovic, D. 1985. Chemical Analysis of Seed Oil of the Onion (Allium cepa). Hrana Ishrana, 25: 167-169 (Inst Ishr Vet Fak Belgrade, Yugoslavia)
1	N-PROPYL-MERCAPTAN	Bulb				Nishimura, H., Mizutani, J. 1975. Effect of Gamma-Irradiation on Development of Lachrymator of Onion. Agic. Biol. Chem., 39: 2245-

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
4	GLYCOLIC-ACID	Bulb				Balansard, J., Arnoux, M. 1951. A Study of the Hepato-Renaldiuretics. III. The Active Principle of Onion Juice. Med. Trop. (Marseille), 11: 632-634.
4	CALCIUM-OXALATE	Bulb				Walter-Levy, L., Strauss, R. 1954. Inorganic Deposits in Plants. C. R. Acad. Sci., 239: 897-.
1	ISORHAMNETIN-3-GLUCOSIDE	Bulb				--
2	METHANOL	Leaf				Burtsev, A. F., Pashchenko, T. W., Rik, G. R. 1974. Mass-Spectrometric Analysis of Volatile Phytonocide Substances of Cucumber and Common Onion Leaves. Fiziol Biokhim Kul't Rast, 6: 516-.
2	COBALT	Bulb	0.001	0.2	-1.0000000000000002	--
60	SELENIUM	Bulb	0.001	0.003	-1.0000000000000002	--
3	ASPARTIC-ACID	Bulb	640.0	6967.0	-1.0	USDA's Ag Handbook 8 and sequelae)
13	PALMITIC-ACID	Bulb	240.0	2325.0	-1.0	--
4	LYSINE	Bulb	560.0	6104.0	-1.0	USDA's Ag Handbook 8 and sequelae)
6	MYRISTIC-ACID	Bulb	10.0	100.0	-1.0	USDA's Ag Handbook 8 and sequelae)
3	VALINE	Bulb	270.0	2943.0	-1.0	--
3	ENDOLYSIN	Leaf		0.3	-1.0	LAWSON in Koch, H. P. and Lawson, L. D., eds. 1996. Garlic- The Science and therapeutic application of Allium sativum L. and related species. Williams & Wilkins, Baltimore. 329 pp.
8	TYROSINE	Bulb	290.0	3161.0	-1.0	USDA's Ag Handbook 8 and sequelae)
3	ENDOLYSIN	Bulb		0.033	-1.0	LAWSON in Koch, H. P. and Lawson, L. D., eds. 1996. Garlic- The Science and therapeutic application of Allium sativum L. and related species. Williams & Wilkins, Baltimore. 329 pp.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
2	LEUCINE	Bulb	410.0	4469.0	-1.0	USDA's Ag Handbook 8 and sequelae)
15	METHIONINE	Bulb	100.0	1090.0	-1.0	--
14	ARGININE	Bulb	1580.0	17222.0	-1.0	USDA's Ag Handbook 8 and sequelae)
3	ISOLEUCINE	Bulb	420.0	4578.0	-1.0	USDA's Ag Handbook 8 and sequelae)
1	MERCURY	Bulb		0.001	-1.0	--
47	BETA-SITOSTEROL	Bulb	120.0	510.0	-1.0	--
4	THREONINE	Bulb	280.0	3052.0	-1.0	USDA's Ag Handbook 8 and sequelae)
4	PHOSPHORUS	Bulb	275.0	4038.0	-1.0	--
61	FERULIC-ACID	Bulb		0.5	-1.0	--
31	THIAMIN	Bulb	0.3	6.0	-1.0	--
7	PHENYLALANINE	Bulb	300.0	3270.0	-1.0	USDA's Ag Handbook 8 and sequelae)
3	MURAMIDASE	Bulb		0.033	-1.0	LAWSON in Koch, H. P. and Lawson, L. D., eds. 1996. Garlic- The Science and therapeutic application of Allium sativum L. and related species. Williams & Wilkins, Baltimore. 329 pp.
1	SERINE	Bulb	350.0	3815.0	-1.0	USDA's Ag Handbook 8 and sequelae)
7	HISTIDINE	Bulb	190.0	2071.0	-1.0	USDA's Ag Handbook 8 and sequelae)
2	CAMPESTEROL	Bulb	10.0	50.0	-1.0	--
14	SULFUR	Bulb	80.0	4075.0	-1.0	--
28	CALCIUM	Leaf	420.0	5385.0	-0.8918247706535197	CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
13	PALMITIC-ACID	Seed Oil		73000.0	-0.723771059427567	--
8	STEARIC-ACID	Seed Oil		35000.0	-0.6541098145281985	--
18	OLEIC-ACID	Seed		46800.0	-0.5943767329474172	Wealth of India.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
15	TRIGONELLINE	Seed		13.0	-0.46591212987573255	Evans, L. S., Tramontano, W. A. 1984. Trigonelline and Promotion of Cell Arrest in G2 of Various Legumes. <i>Phytochemistry</i> , 23(9): 1837-1840.
53	BETA-CAROTENE	Leaf	12.0	158.0	-0.4498575995747604	CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
8	STEARIC-ACID	Seed		6300.0	-0.4287014331879593	Wealth of India.
13	PALMITIC-ACID	Seed		13140.0	-0.4284802139449916	Wealth of India.
14	MANGANESE	Seed		19.4	-0.425040968734703	--
31	THIAMIN	Leaf	0.5	6.4	-0.39693808734805064	CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
77	ZINC	Seed		34.0	-0.31604114389068755	--
15	FIBER	Leaf	11000.0	141000.0	-0.2539378373860592	CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
53	BETA-CAROTENE	Flower		28.0	-0.18921282459251038	--
18	OLEIC-ACID	Seed Oil	260000.0	292900.0	-0.1478289753657865	--
3	NICKEL	Seed	0.03	4.0	-0.14389814511946067	--
2	COBALT	Seed		2.5	-0.0975154003240051	--
39	NIACIN	Leaf	7.0	90.0	-0.09123627617407809	CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
27	LINOLEIC-ACID	Seed	103500.0	106200.0	-0.00790147227328753	Wealth of India.
24	CHROMIUM	Seed		4.8	0.016797185555398934	--
112	ASCORBIC-ACID	Leaf	390.0	5000.0	0.020016189970703997	--
4	PHOSPHORUS	Leaf	310.0	5513.0	0.09963731108701822	--
12	COPPER	Bulb	0.3	11.0	0.10619884881071792	--
28	CALCIUM	Bulb	200.0	3008.0	0.11970003608893207	--
6	IRON	Leaf	34.0	436.0	0.18456741976079077	CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
12	COPPER	Seed		18.2	0.3070837559561808	--
6	IRON	Seed		235.0	0.3912510395242066	--

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
65	MAGNESIUM	Bulb	76.0	1230.0	0.7319115529256467	--
6	IRON	Bulb	2.0	135.0	0.7831452902858658	--
27	LINOLEIC-ACID	Seed Oil	575000.0	590600.0	0.7844920848789769	--
3	NICKEL	Bulb	0.05	2.5	0.9999999999999996	--
53	BETA-CAROTENE	Bulb	0.0	52.0	0.9999999999999998	--
24	VANILLIC-ACID	Bulb		258.0	1.0	--
12	GLYCINE	Bulb	490.0	5341.0	1.0	--
3	ALANINE	Bulb	330.0	8597.0	1.0	USDA's Ag Handbook 8 and sequelae)
7	SALICYLATES	Bulb	1.0	20.0	1.0	--
15	RIBOFLAVIN	Bulb	0.4	15.0	1.0	--
14	POTASSIUM	Bulb	1514.0	22164.0	1.0	--
29	TRYPTOPHAN	Bulb	170.0	1853.0	1.0	USDA's Ag Handbook 8 and sequelae)
2	PHYTOSTEROLS	Bulb	150.0	1455.0	1.0	--
18	OLEIC-ACID	Bulb	230.0	2230.0	1.0	--
4	BORON	Bulb	1.0	45.0	1.0	--
2	CYSTINE	Bulb	210.0	2289.0	1.0	USDA's Ag Handbook 8 and sequelae)
24	CHROMIUM	Bulb	0.057	4.0	1.0	--
13	P-HYDROXY-BENZOIC-ACID	Bulb		107.0	1.0	--
5	ALUMINUM	Bulb	0.3	385.0	1.0	--
15	FIBER	Bulb	4400.0	126000.0	1.0	--
176	QUERCETIN	Bulb	0.0	48100.0	1.0	--
32	ALPHA-TOCOPHEROL	Bulb	0.4	30.0	1.0	--
39	NIACIN	Bulb	1.0	75.0	1.0	--
11	PANTOTHENIC-ACID	Bulb	1.0	16.0	1.0	USDA's Ag Handbook 8 and sequelae)
2	MOLYBDENUM	Bulb	0.1	2.3	1.0000000000000002	--
14	MANGANESE	Bulb	1.0	38.0	1.4045726642160135	--



Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Refernce Citation
1	SODIUM	Bulb	8.0	2052.0	1.4085638338778703	--
77	ZINC	Bulb	2.0	53.0	1.4104984605249231	--