

Dr. Duke's Phytochemical and Ethnobotanical Databases

Chemicals found in *Echinacea angustifolia*

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
1	1-PENTADECENE	Root				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	2-METHYLTETRADECA-5,12-DIENE	Root				Jim Duke's personal files.
0	2-METHYLTETRADECA-6,12-DIENE	Root				Jim Duke's personal files.
0	3,4-EPOXY-TRIDECA-1,5-DIENE-7,9,11-TRIYNE	Stem		100.0		Jim Duke's personal files.
0	3,4-EPOXY-TRIDECA-1,5-DIENE-7,9,11-TRIYNE	Flower				Jim Duke's personal files.
0	3,4-EPOXY-TRIDECA-1,5-DIENE-7,9,11-TRIYNE	Root	8000.0	10000.0	-1.0	Jim Duke's personal files.
0	8-HYDROXY-PENTADEC-TRANS-9-ENE-11,13-DIYN-2-ONE	Root				Jim Duke's personal files.
0	8-HYDROXY-PENTADEC-TRANS-9-EN-11,13-DIYN-2-ONE	Root				Jim Duke's personal files.
0	ALKANES(C10-C33)	Leaf				Jim Duke's personal files.
0	ALKYLAMIDES	Root				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
101	APIGENIN	Leaf				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	BEHENIC-ACID-ETHYL-ESTER	Root				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
47	BETA-SITOSTEROL	Root				--
14	BETAINE	Root		1000.0	-0.2884566503805383	Jim Duke's personal files.
35	BORNEOL	Shoot				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
12	BORNYL-ACETATE	Shoot				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
3	CAFTARIC-ACID	Root				Jim Duke's personal files.
31	CARYOPHYLENE	Shoot				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
6	CARYOPHYLENE-EPOXIDE	Shoot				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	CEROTIC-ACID	Root				--
0	CHICHORIC-ACID	Flower				Jim Duke's personal files.
0	CHICHORIC-ACID	Leaf				Jim Duke's personal files.
0	CHICHORIC-ACID	Stem				Jim Duke's personal files.
0	CHICHORIC-ACID	Root				Jim Duke's personal files.
0	CHICHORIC-ACID-DIMETHYL-ETHER	Flower				Jim Duke's personal files.
0	CHICHORIC-ACID-DIMETHYL-ETHER	Leaf				Jim Duke's personal files.
0	CHICHORIC-ACID-DIMETHYL-ETHER	Stem				Jim Duke's personal files.
0	CHICHORIC-ACID-DIMETHYL-ETHER	Root				Jim Duke's personal files.
0	CHICHORIC-ACID-MONOMETHYL-ETHER	Flower				Jim Duke's personal files.
0	CHICHORIC-ACID-MONOMETHYL-ETHER	Leaf				Jim Duke's personal files.
0	CHICHORIC-ACID-MONOMETHYL-ETHER	Stem				Jim Duke's personal files.
0	CHICHORIC-ACID-MONOMETHYL-ETHER	Root				Jim Duke's personal files.
10	CHICORIC-ACID	Root				Jim Duke's personal files.
77	CHLOROGENIC-ACID	Leaf				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.

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14	CICHORIC-ACID	Root				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
23	CYNARIN	Root				--
0	DOCECA-2E,4E,8Z,10E/Z-TETRAENOIC-ACID-ISOBUTYLAMIDES	Shoot				Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
0	DOCECA-2E,4E,8Z,10E/Z-TETRAENOIC-ACID-ISOBUTYLAMIDES	Root				Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
0	DODECA-2,4,8,10-TETRAEN-1-OIC-ACID-ISOBUTYLAMIDE	Root		298.5	0.9999999999999996	Jim Duke's personal files.
0	DODECA-2,4-DIEN-1-YL-ISOVALERATE	Root				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	DODECA-2-TRANS-4-CIS-10-CIS-TRIEN-8-YNOIC-ACID-ISOBUTYLAMIDE	Root				Jim Duke's personal files.
0	DODECA-2-TRANS-4-CIS-DIENE-8,10-DIYNOIC-ACID-ISOBUTYLAMIDE	Shoot				Jim Duke's personal files.
0	DODECA-2-TRANS-4-CIS-DIENE-8,10-DIYNOIC-ACID-ISOBUTYLAMIDE	Root				Jim Duke's personal files.
0	DODECA-2-TRANS-4-TRANS-10-CIS-TRIEN-8-YNOIC-ACID-ISOBUTYLAMIDE	Shoot				Jim Duke's personal files.
0	DODECA-2-TRANS-4-TRANS-8-CIS-10-CIS-TETRAENOIC-ACID-ISOBUTYLAMIDE	Shoot				Jim Duke's personal files.
0	DODECA-2-TRANS-4-TRANS-8-CIS-10-CIS-TETRAENOIC-ACID-ISOBUTYLAMIDE	Root				Jim Duke's personal files.
0	DODECA-2-TRANS-4-TRANS-8-CIS-10-TRANS-TETRAENOIC-ACID-ISOBUTYLAMIDE	Shoot				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	DODECA-2-TRANS-4-TRANS-8-CIS-10-TRANS-TETRAENOIC-ACID-ISOBUTYLAMIDE	Root				Jim Duke's personal files.
0	DODECA-2-TRANS-4-TRANS-8-CIS-TRIENOIC-ACID-ISOBUTYLAMIDE	Shoot				Jim Duke's personal files.
0	DODECA-2-TRANS-4-TRANS-DIENOIC-ACID-ISOBUTYLAMIDE	Root				Jim Duke's personal files.
0	DODECA-2-TRANS-4-TRANS-DIENOIC-ACID-ISOBUTYLAMIDE	Shoot				Jim Duke's personal files.
0	DODECA-2-TRANS-ENE-8,10-DIYNOIC-ACID-2-METHYL-BUTYLAMIDE	Root				Jim Duke's personal files.
0	DODECA-2-TRANS-ENE-8,10-DIYNOIC-ACID-ISOBUTYLAMIDE	Root				Jim Duke's personal files.
0	DODECA-CIS-2-TRANS-4-DIENE-8,10-DIYN-1-OIC-ACID-ISOBUTYLAMIDE	Root		298.5	0.9999999999999996	Jim Duke's personal files.
0	DODECA-TRANS-2-CIS-4-CIS-10-TRIEN-8-YNOIC-ACID-ISOBUTYLAMIDE	Root		13.7		Jim Duke's personal files.
0	DODECA-TRANS-2-CIS-4-DIENE-8,10-DIYNOIC-ACID-ISOBUTYLAMIDE	Root		6.8	1.0000000000000002	Jim Duke's personal files.
0	DODECA-TRANS-2-ENE-8,10-DIYNOIC-ACID-2-METHYL-BUTYLAMIDE	Root		6.8		Jim Duke's personal files.
0	DODECA-TRANS-2-ENE-8,10-DIYNOIC-ACID-ISOBUTYLAMIDE	Root		241.3		Jim Duke's personal files.
0	DODECA-TRANS-2-TRANS-4-CIS-8-CIS-10-TETRAENOIC-ACID-ISOBUTYLAMIDE	Root				Jim Duke's personal files.
0	DODECA-TRANS-2-TRANS-4-CIS-8-TRANS-10-TETRAENOIC-ACID-ISOBUTYLAMIDE	Root				Jim Duke's personal files.
0	DODECA-TRANS-2-TRANS-4-DIENOIC-ACID-ISOBUTYLAMIDE	Root		103.4		Jim Duke's personal files.
0	ECHINACEA-FACTOR-A	Root				Jim Duke's personal files.
0	ECHINACEA-FACTOR-B	Root				Jim Duke's personal files.
0	ECHINACEA-POLYSACCHARIDE	Tissue Culture				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
3	ECHINACEIN	Root	4.0	100.0	0.7071067811865475	--
1	ECHINACIN-B	Root				Jim Duke's personal files.
10	ECHINACOSIDE	Root	3000.0	13000.0	-1.414213562373095	--
10	ECHINACOSIDE	Flower	1000.0	10000.0		Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
0	ECHINACOSIDE-1	Root				Jim Duke's personal files.
0	ECHINACOSIDE-2	Root				Jim Duke's personal files.
2	ECHINOLONE	Root		3.0		Jim Duke's personal files.
0	EO	Root	400.0	13000.0	-0.04245829959638836	--
0	FRUCTANS	Root				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
2	GERMACRENE-D	Shoot				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	GLYCINE-BETAINE	Leaf		1130.0	-1.0	Jim Duke's personal files.
0	GLYCINE-BETAINE	Root		3100.0	-1.0	Jim Duke's personal files.
0	GLYCINE-BETAINE	Stem		4900.0	-1.0	Jim Duke's personal files.
0	GLYCINE-BETAINE	Flower		8050.0	-1.0	Jim Duke's personal files.
0	HEXADECA-2-TRANS-9-CIS-DIENE-12,14-DIYNOIC-ACID-ISOBUTYLAMIDE	Root				Jim Duke's personal files.
0	HEXADECA-TRANS-2-CIS-9-DIENE-12,14-DIYNOIC-ACID-ISOBUTYLAMIDE	Root		6.8		Jim Duke's personal files.
0	HYDROCARBONS	Root Essent. Oil				Jim Duke's personal files.
19	INULIN	Root	50000.0	90000.0	-0.9004071864868817	--
0	ISOBUTYLAMIDES	Root	90.0	1510.0		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.

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4	ISOCHLOROGENIC-ACID	Leaf				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
11	ISORHAMNETIN	Leaf				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	ISOTUSSILAGIN	Plant				Jim Duke's personal files.
0	ISOTUSSILAGINE	Root	15.0	60.0		Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
75	KAEMPFEROL	Leaf				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	KAEMPFEROL-GLUCOSIDE	Leaf				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
27	LINOLEIC-ACID	Root				--
0	LINOLENIC-ACID	Root				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
78	LUTEOLIN	Leaf				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
7	LUTEOLIN-7-GLUCOSIDE	Leaf				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
6	MYRISTIC-ACID	Root				--
0	N-TRIACONTANOL	Root				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
18	OLEIC-ACID	Root				--

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13	PALMITIC-ACID	Root				--
0	PENTA-(1,8Z)-DIENE	Root				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	PENTADEC-1-ENE	Root				Jim Duke's personal files.
0	PENTADEC-1-ENE	Root Essent. Oil				Jim Duke's personal files.
0	PENTADEC-8-EN-2-ONE	Root	3600.0	4000.0		Jim Duke's personal files.
0	PENTADECA-1-CIS-8-DIENE	Root Essent. Oil				Jim Duke's personal files.
0	PENTADECA-2-TRANS-9-CIS-DIENE-12,14-DIYNOIC-ACID-ISOBUTYLAMIDE	Root				Jim Duke's personal files.
0	PENTADECA-8-EN-2-ONE	Shoot				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	PENTADECA-TRANS-2-CIS-9-DIENE-12,14-DIYNOIC-ACID-ISOBUTYLAMIDE	Root		13.7		Jim Duke's personal files.
0	PENTADECA-TRANS-9-CIS-13-DIEN-11-YN	Root				Jim Duke's personal files.
0	QUERCETAGETIN-7-GLUCOSIDE	Leaf				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
176	QUERCETIN	Leaf				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
4	RUTOSIDE	Leaf				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	SITOSTEROL-3-O-BETA-D-GLUCOSIDE	Leaf				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.

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12	STIGMASTEROL	Root				Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
14	SUCROSE	Root		69200.0	-0.5583180295224436	Jim Duke's personal files.
0	TRIDEC-1-ENE-3-5-7-9-11-PENTAYNE	Stem		500.0	1.0	Jim Duke's personal files.
0	TRIDEC-1-ENE-3-5-7-9-11-PENTAYNE	Flower		800.0	-1.0	Jim Duke's personal files.
0	TRIDEC-1-ENE-3-5-7-9-11-PENTAYNE	Root	3.0	9000.0	0.6386915774792771	Jim Duke's personal files.
0	TRIDECA-1,3-DIENE-5,7,9,11-TETRAYNE	Root		100.0		Jim Duke's personal files.
0	TRIDECA-1-11-DIENE-3-5-7-9-TETRAYNE	Root		100.0	-0.5513525242543177	Jim Duke's personal files.
0	TRIDECA-2-TRANS-7-CIS-DIENE-10,12-DIYNOIC-ACID-ISOBUTYLAMINE	Root				Jim Duke's personal files.
0	TRIDECA-8,10,12-TRIENE-2,4,6-TRIYNE	Flower				Jim Duke's personal files.
0	TRIDECA-8,10,12-TRIENE-2,4,6-TRIYNE	Root	100.0	200.0	-1.0	Jim Duke's personal files.
0	TRIDECA-TRANS-2-CIS-7-DIENE-10,12-DIYNOIC-ACID-ISOBUTYLAMIDE	Root		6.8	1.0000000000000007	Jim Duke's personal files.
0	TUSSILAGIN	Plant				Jim Duke's personal files.
1	TUSSILAGINE	Root	15.0	60.0		Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
0	UNDECA-2-CIS-4-TRANS-DIENE-8,10-DIYNOIC-ACID-ISOBUTYLAMIDE	Root				Jim Duke's personal files.
0	UNDECA-2-CIS-ENE-8,10-DIYNOIC-ACID-2-METHYLBUTYLAMIDE	Root				Jim Duke's personal files.
0	UNDECA-2-CIS-ENE-8,10-DIYNOIC-ACID-ISOBUTYLAMIDE	Root				Jim Duke's personal files.
0	UNDECA-2-TRANS-4-CIS-8,10-DIYNOIC-ACID-ISOBUTYLAMIDE	Root				Jim Duke's personal files.
0	UNDECA-2-TRANS-4-CIS-DIENE-8,10-DIYNOIC-ACID-ISOBUTYLAMIDE	Shoot				Jim Duke's personal files.

Activities Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	UNDECA-2-TRANS-ENE-8,10-DIYNOIC-ACID-ISOBUTYLAMIDE	Root				Jim Duke's personal files.
0	UNDECA-CIS-2,8,10-DIYNOIC-ACID-ISOBUTYLAMIDE	Root		31.0		Jim Duke's personal files.
0	UNDECA-CIS-2-ENE-8,10-DIYNOIC-ACID-2-METHYL-BUTYLAMIDE	Root		6.8		Jim Duke's personal files.
0	UNDECA-CIS-2-ENE-8,10-DIYNOIC-ACID-ISOBUTYLAMIDE	Root		103.4		Jim Duke's personal files.
0	UNDECA-CIS-2-TRANS-4-DIENE-2,4-DIYN-1-OIC-ACID-ISOBUTYLAMIDE	Root		298.5	0.9999999999999996	Jim Duke's personal files.
0	UNDECA-CIS-2-TRANS-4-DIENE-8,10-DIYNOIC-ACID-ISOBUTYLAMIDE	Root		13.7	1.0	Jim Duke's personal files.
0	UNDECA-TRANS-2-CIS-4-DIENE-8,10-DIYNOIC-ACID-ISOBUTYLAMIDE	Root		10.3	1.0000000000000004	Jim Duke's personal files.