

Dr. Duke's Phytochemical and Ethnobotanical Database

Chemicals Found in *Echinacea angustifolia*

Activity 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	Flower	--	--		Jim Duke's personal files.
0	3,4-EPOXY-TRIDECA-1,5-DIENE-7,9,11-TRIYNE	Stem	--	100		Jim Duke's personal files.
0	3,4-EPOXY-TRIDECA-1,5-DIENE-7,9,11-TRIYNE	Root	8000	10000	-1	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-PENTADECA-TRANS-9-EN-11,13-DIYN-2-ONE	Root	--	--		Jim Duke's personal files.
0	ALKANES(C10-C33)	Leaf	--	--		Jim Duke's personal files.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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	-0.2884566503805383	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.

Activity 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	CARYOPHYLLENE	Shoot	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
6	CARYOPHYLLENE-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	Root	--	--		Jim Duke's personal files.
0	CHICHORIC-ACID	Leaf	--	--		Jim Duke's personal files.
0	CHICHORIC-ACID	Stem	--	--		Jim Duke's personal files.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	CHICHORIC-ACID	Flower	--	--		Jim Duke's personal files.
0	CHICHORIC-ACID-DIMETHYL-ETHER	Leaf	--	--		Jim Duke's personal files.
0	CHICHORIC-ACID-DIMETHYL-ETHER	Flower	--	--		Jim Duke's personal files.
0	CHICHORIC-ACID-DIMETHYL-ETHER	Root	--	--		Jim Duke's personal files.
0	CHICHORIC-ACID-DIMETHYL-ETHER	Stem	--	--		Jim Duke's personal files.
0	CHICHORIC-ACID-MONOMETHYL-ETHER	Flower	--	--		Jim Duke's personal files.
0	CHICHORIC-ACID-MONOMETHYL-ETHER	Root	--	--		Jim Duke's personal files.
0	CHICHORIC-ACID-MONOMETHYL-ETHER	Stem	--	--		Jim Duke's personal files.
0	CHICHORIC-ACID-MONOMETHYL-ETHER	Leaf	--	--		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	Root	--	--		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	Shoot	--	--		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.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	DODECA-2-TRANS-4-CIS-DIENE-8,10-DIYNOIC-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-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	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.
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.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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.
3	ECHINACEIN	Root	4	100	0.7071067811865475	
1	ECHINACIN-B	Root	--	--		Jim Duke's personal files.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
10	ECHINACOSIDE	Flower	1000	10000		Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
10	ECHINACOSIDE	Root	3000	13000	-1.414213562373095	
0	ECHINACOSIDE-1	Root	--	--		Jim Duke's personal files.
0	ECHINACOSIDE-2	Root	--	--		Jim Duke's personal files.
2	ECHINOLONE	Root	--	3		Jim Duke's personal files.
0	EO	Root	400	13000	-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	Root	--	3100	-1	Jim Duke's personal files.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	GLYCINE-BETAINE	Flower	--	8050	-1	Jim Duke's personal files.
0	GLYCINE-BETAINE	Leaf	--	1130	-1	Jim Duke's personal files.
0	GLYCINE-BETAINE	Stem	--	4900	-1	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	90000	-0.9004071864868817	
0	ISOBUTYLAMIDES	Root	90	1510		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
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.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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	60		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	--	--		

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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	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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 Essent. Oil	--	--		Jim Duke's personal files.
0	PENTADEC-1-ENE	Root	--	--		Jim Duke's personal files.
0	PENTADEC-8-EN-2-ONE	Root	3600	4000		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.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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	-0.5583180295224436	Jim Duke's personal files.
0	TRIDEC-1-ENE-3-5-7-9-11-PENTAYNE	Root	3	9000	0.6386915774792771	Jim Duke's personal files.
0	TRIDEC-1-ENE-3-5-7-9-11-PENTAYNE	Flower	--	800	-1	Jim Duke's personal files.
0	TRIDEC-1-ENE-3-5-7-9-11-PENTAYNE	Stem	--	500	1	Jim Duke's personal files.
0	TRIDECA-1,3-DIENE-5,7,9,11-TETRAYNE	Root	--	100		Jim Duke's personal files.
0	TRIDECA-1-11-DIENE-3-5-7-9-TETRAYNE	Root	--	100	-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	Root	100	200	-1	Jim Duke's personal files.
0	TRIDECA-8,10,12-TRIENE-2,4,6-TRIYNE	Flower	--	--		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.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	TUSSILAGIN	Plant	--	--		Jim Duke's personal files.
1	TUSSILAGINE	Root	15	60		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-METHYL-BUTYLAMIDE	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.
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		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.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
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	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.