

Dr. Duke's Phytochemical and Ethnobotanical Database

Chemicals Found in *Aesculus hippocastanum*

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
30	(+)-CATECHIN	Fruit Epidermis	--	--		Jim Duke's personal files.
30	(+)-CATECHIN	Bark	--	--		Jim Duke's personal files.
30	(+)-CATECHIN	Leaf	--	--		Jim Duke's personal files.
0	(+)-PINITOL	Pericarp	--	--		Jim Duke's personal files.
38	(-)-EPICATECHIN	Fruit Epidermis	--	--		Jim Duke's personal files.
38	(-)-EPICATECHIN	Leaf	--	--		Jim Duke's personal files.
38	(-)-EPICATECHIN	Seed Coat	816.3	4000		Jim Duke's personal files.
38	(-)-EPICATECHIN	Bark	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	(-)-QUERBRACHITOL	Pericarp	--	--		Jim Duke's personal files.
0	(-)-QUINIC-ACID	Pericarp	--	--		Jim Duke's personal files.
0	1,8-CINEOL	Flower Essent. Oil	--	66000		Jim Duke's personal files.
0	1-KESTOSE	Seed	--	--		Gruenwald, J. et al. 1998. PDR for Herbal Medicine. 1st ed. Medical Economics Co., Montvale, NJ. 1244 pp. (abbreviated as PHR or Physicians Herbal Reference in my mind)

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	16-DESOXY-BARRINGTOGENOL	Seed	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	2,3-DIMETHYL-HEPT-5-EN-1-AL	Flower Essent. Oil	--	--		Jim Duke's personal files.
0	2-CARBOXYARABINITOL	Leaf	--	11	-0.8556705725703454	Jim Duke's personal files.
0	2-KESTOSE	Seed	--	--		Gruenwald, J. et al. 1998. PDR for Herbal Medicine. 1st ed. Medical Economics Co., Montvale, NJ. 1244 pp. (abbreviated as PHR or Physicians Herbal Reference in my mind)
0	2-METHYL-BUTEN-1-AL	Flower Essent. Oil	--	--		Jim Duke's personal files.
0	24-METHYLENE-CYCLOARTENOL	Seed Oil	--	--		Jim Duke's personal files.
0	3',4',7-TRIMETHYL-ETHER	Plant	--	--		J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.
0	3,5-DIHYDROXY-3',4'7-TRIMETHOXYFLAVONE	Plant	--	--		J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.
0	3-METHYL-BUTAN-1-AL	Flower Essent. Oil	--	4000		Jim Duke's personal files.
0	3[2'(BETA-D-GLUCOPYRANOSIDO)4'(BETA-D-GLUCOPYRANOSIDO)BETA-D-GLUCURONOPYRANOSIDO]21-BETA-ANGELOYL-22-ALPHA-ACETYL-PROTOA	Seed	--	--		Jim Duke's personal files.
0	3[2'(BETA-D-GLUCOPYRANOSIDO)4'(BETA-D-GLUCOPYRANOSIDO)BETA-D-GLUCURONOPYRANOSIDO]21-BETA-TIGLOYL-22-ALPHA-ACETYL-PROTOAE	Seed	--	--		Jim Duke's personal files.
0	5-ALPHA-TIRUCALLA-8-23-DIEN-3-BETA-OL	Seed Oil	--	--		Jim Duke's personal files.
0	5-HYDROXY-METHYL-FURFURAL	Flower Essent. Oil	--	4000		Jim Duke's personal files.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
1	6,7-DIHYDROXYCOUMARIN	Seed	--	--		
0	6,7-DIHYDROXYCOUMARIN-6-GLUCOSIDE	Seed	--	--		
16	ACETIC-ACID	Seed	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
11	ADENINE	Flower	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
11	ADENINE	Seed	--	--		
28	ADENOSINE	Flower	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
28	ADENOSINE	Seed	--	--		
0	AESCIGENIN	Seed	--	--		
50	AESCIN	Bark	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
50	AESCIN	Seed	--	130000		
32	AESCULETIN	Bark	--	--		Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
1	AESCULETOL	Seed	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
33	AESCOLIN	Bark	--	30000		Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
0	AESCOLITANNIN-A	Seed Coat	--	122.4		Jim Duke's personal files.
0	AESCOLITANNIN-B	Seed Coat	--	132.7		Jim Duke's personal files.
0	AESCOLITANNIN-C	Seed Coat	--	15		Jim Duke's personal files.
0	AESCOLITANNIN-D	Seed Coat	--	2.2		Jim Duke's personal files.
0	AESCOLITANNIN-E	Seed Coat	--	55.1		Jim Duke's personal files.
0	AESCOLITANNIN-F	Seed Coat	--	11.4		Jim Duke's personal files.
0	AESCOLITANNIN-G	Seed Coat	--	17.6		Jim Duke's personal files.
3	AESCULOSIDE	Seed	--	--		
0	ALLANTOIC-ACID	Leaf	--	--		Jim Duke's personal files.
12	ALLANTOIN	Leaf	--	--		Jim Duke's personal files.
12	ALLANTOIN	Branches	--	--		Jim Duke's personal files.
12	ALLANTOIN	Bark	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	ALPHA-AESGIN	Seed	--	--		
0	ALPHA-AESGIN	Fruit	--	--		Jim Duke's personal files.
0	ALPHA-AMURIN	Seed Oil	--	--		Jim Duke's personal files.
7	ALPHA-CAROTENE	Leaf	--	--		Jim Duke's personal files.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	ALPHA-METHYL-BETA-HYDROXYBUTYRIC-ACID	Seed	--	--		
28	ALPHA-PINENE	Flower Essent. Oil	--	177000	1	Jim Duke's personal files.
2	ALPHA-SPINASTEROL	Seed	--	--		Jim Duke's personal files.
2	ALPHA-SPINASTEROL	Bark	--	--		Jim Duke's personal files.
0	AMINO-ACIDS	Leaf	--	--		Jim Duke's personal files.
1	ANGELIC-ACID	Seed	--	--		Chemical Constituents of Oriental Herbs (3 diff. books)
0	APS-SULFOTRANSFERASE	Leaf	--	--		Jim Duke's personal files.
112	ASCORBIC-ACID	Seed	--	24	-0.32404827353208815	Jim Duke's personal files.
112	ASCORBIC-ACID	Leaf	--	147.2	-0.4302618126885385	Jim Duke's personal files.
0	ASH	Seed	14000	30000	-0.537791441673595	
7	ASTRAGALIN	Flower	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	BARRINGTOGENOL-C	Seed	--	--		
1	BARRINGTOGENOL-C-21-ANGELATE	Fruit	--	4.7		Jim Duke's personal files.
0	BARRINGTOGENOL-D	Seed	--	--		Chemical Constituents of Oriental Herbs (3 diff. books)
24	BENZALDEHYDE	Flower Essent. Oil	--	11000		Jim Duke's personal files.
1	BENZYL-FORMATE	Flower Essent. Oil	--	22000		Jim Duke's personal files.
8	BETA-AESKIN	Seed	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
9	BETA-AMYRIN	Bark	--	--		
9	BETA-AMYRIN	Seed Oil	--	--		Jim Duke's personal files.
0	BETA-CARYOPHYLLENE	Flower Essent. Oil	--	13000		Jim Duke's personal files.
13	BETA-PINENE	Flower Essent. Oil	--	122000		Jim Duke's personal files.
47	BETA-SITOSTEROL	Leaf	--	--		Jim Duke's personal files.
47	BETA-SITOSTEROL	Bark	--	--		Jim Duke's personal files.
47	BETA-SITOSTEROL	Seed	--	--		Jim Duke's personal files.
0	BUTYL-ACETATE	Flower Essent. Oil	--	21000		Jim Duke's personal files.
0	BUTYROSPERMOL	Seed	--	--		
0	BUTYROSPERMOL	Seed Oil	--	--		Jim Duke's personal files.
0	CAMPEST-7-EN-3-BETA-OL	Seed	--	--		Jim Duke's personal files.
2	CAMPESTEROL	Leaf	--	--		Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
2	CAMPESTEROL	Bark	--	--		Jim Duke's personal files.
2	CAMPESTEROL	Seed	--	--		Jim Duke's personal files.
9	CAMPHENE	Flower Essent. Oil	--	83000		Jim Duke's personal files.
0	CARBOHYDRATES	Seed	740000	740000	0.8608030703879392	CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	CASTAPRENOL-10	Leaf	--	--		Jim Duke's personal files.
0	CASTAPRENOL-11	Leaf	--	--		Jim Duke's personal files.
0	CASTAPRENOL-12	Leaf	--	--		Jim Duke's personal files.
0	CASTAPRENOL-13	Leaf	--	--		Jim Duke's personal files.
1	CHOLESTEROL	Seed	--	--		Jim Duke's personal files.
1	CHOLESTEROL	Bark	--	--		Jim Duke's personal files.
20	CHOLINE	Flower	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
4	CINNAMTANNIN-B-1	Seed Coat	--	408.2		Jim Duke's personal files.
2	CINNAMTANNIN-B-2	Seed Coat	--	132.7		Jim Duke's personal files.
23	CITRIC-ACID	Bark	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	CRYPTOAESCIENIN	Seed	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
1	CRYPTOESCIN	Seed	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
1	CRYPTOAESCIN-A	Seed	--	--		
0	CRYPTOAESCIN-B	Seed	--	--		
7	CYANIDIN	Leaf	--	--		Jim Duke's personal files.
0	DECAN-1-OL	Flower Essent. Oil	--	82000	1	Jim Duke's personal files.
0	DODEC-2-EN-1-OL	Flower Essent. Oil	--	14000		Jim Duke's personal files.
1	ELEUTHEROSIDE-B-1	Stem	--	--		Jim Duke's personal files.
0	EPI-CATECHIN-(4-BETA-6)-EPI-CATECHIN-(4-BETA-6)-EPI-CATECHIN	Fruit Epidermis	--	46.6		Jim Duke's personal files.
0	EPI-CATECHIN-(4-BETA-8)-EPI-CATECHIN-(4-BETA-8,2-BETA-8)-EPI-CATECHIN	Fruit Epidermis	--	22.6		Jim Duke's personal files.
0	EPI-CATECHIN-(4-BETA-8,2-BETA-7)-CATECHIN-(4-BETA-8)-EPI-CATECHIN	Fruit Epidermis	--	30.6		Jim Duke's personal files.
0	EPI-CATECHIN-(4-BETA-8,2-BETA-7)-EPI-CATECHIN-(4-ALPHA-8)-ENT-EPI-CATECHIN	Fruit Epidermis	--	118.6		Jim Duke's personal files.
40	EPICATECHIN	Bark	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
40	ESCIN	Tissue Culture	--	--		Jim Duke's personal files.
40	ESCIN	Leaf	--	--		Jim Duke's personal files.
40	ESCIN	Bark	--	--		
40	ESCIN	Seed	22000	125300		Jim Duke's personal files.
30	ESCULETIN	Seed	--	--		Jim Duke's personal files.
30	ESCULETIN	Bark	--	--		
29	ESCULIN	Seed	--	--		Jim Duke's personal files.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
29	ESCULIN	Pericarp	--	--		Jim Duke's personal files.
29	ESCULIN	Stem	--	--		Jim Duke's personal files.
29	ESCULIN	Bark	30000	30000		
0	FAT	Seed	30000	50000	-1.1345234870329484	
0	FLAVAZIDE	Leaf	--	--		Jim Duke's personal files.
0	FLAVONES	Seed	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
12	FRAXETIN	Bark	--	--		
10	FRAXIN	Seed	--	--		Jim Duke's personal files.
10	FRAXIN	Stem	--	--		Jim Duke's personal files.
10	FRAXIN	Pericarp	--	--		Jim Duke's personal files.
10	FRAXIN	Bark	--	--		
2	FRIEDELIN	Seed	--	--		
1	GALACTOSE	Seed	--	--		
1	GALACTOSE	Pericarp	--	--		Jim Duke's personal files.
0	GAMMA-BUTYROLACTONE	Flower Essent. Oil	--	--		Jim Duke's personal files.
35	GERANIOL	Flower Essent. Oil	--	4000		Jim Duke's personal files.
7	GLUCOSE	Seed	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
4	GLUCURONIC-ACID	Seed	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
1	GUANINE	Flower	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
1	GUANINE	Seed	--	--		
0	HIPPOAESCULIN	Seed	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
1	HIPPOAESCULIN	Fruit	--	3.1		Jim Duke's personal files.
0	HIPPOCASTANINE	Seed	--	--		
0	HIPPOCASTANOSIDE	Pericarp	--	--		Jim Duke's personal files.
7	HISTIDINE	Leaf	--	--		Jim Duke's personal files.
0	ISOKAEMPFERIDE	Bud	--	--		Jim Duke's personal files.
22	ISOQUERCITRIN	Flower	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
22	ISOQUERCITRIN	Leaf	--	--		Jim Duke's personal files.
11	ISORHAMNETIN	Bud	--	--		Jim Duke's personal files.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
1	JUGLANIN	Plant	--	--		Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
75	KAEMPFEROL	Bud	--	--		Jim Duke's personal files.
75	KAEMPFEROL	Seed	--	--		
0	KAEMPFEROL-3-O-GLUCOSIDE	Flower	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	KAEMPFEROL-3-ARABINOSIDE	Flower	--	--		
0	KAEMPFEROL-3-ARABINOSIDE	Leaf	--	--		
4	KAEMPFEROL-3-O-GLUCOSIDE	Flower	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	KAEMPFEROL-3-RHAMNOFURANOSIDE	Leaf	--	--		
0	KAEMPFEROL-3-RHAMNOFURANOSIDE	Flower	--	--		
4	KAEMPFEROL-3-RHAMNOGLUCOSIDE	Flower	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	KAEMPFEROL-4',7-DIMETHYL-ETHER	Bud	--	--		Jim Duke's personal files.
0	L-(+)-LYSINE	Seed	--	--		
0	L-(-)-TRYPTOPHAN	Seed	--	--		
7	LAURIC-ACID	Leaf	--	--		Jim Duke's personal files.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	LEUCOANTHOCYANS	Leaf	--	--		Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
1	LEUCOCYANIDIN	Bark	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
2	LEUCODELPHINIDIN	Bark	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
60	LIMONENE	Flower Essent. Oil	--	42000	-1.4135017793261806	Jim Duke's personal files.
27	LINOLEIC-ACID	Seed	--	6415	-0.8628692587662965	
27	LINOLEIC-ACID	Leaf	--	--		Jim Duke's personal files.
0	LINOLENIC-ACID	Seed	--	620	-0.5690384903493066	
0	LINOLENIC-ACID	Leaf	--	--		Jim Duke's personal files.
3	LUTEOLOL	Seed	--	--		
0	MYO-INOSITOL	Pericarp	--	--		Jim Duke's personal files.
34	MYRICETIN	Plant	--	--		J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991.
0	MYRICETIN-3',4',7-TRIMETHYL-ETHER	Seed	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	MYRICETIN-3',4',7-TRIMETHYL-ETHER	Bud	--	--		Jim Duke's personal files.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
6	MYRISTIC-ACID	Leaf	--	--		Jim Duke's personal files.
0	NONAN-1-AL	Flower Essent. Oil	--	23000		Jim Duke's personal files.
18	OLEIC-ACID	Seed	--	18990	-0.8229912615024234	
25	OPCS	Seed	--	--		Gruenwald, J. et al. 1998. PDR for Herbal Medicine. 1st ed. Medical Economics Co., Montvale, NJ. 1244 pp. (abbreviated as PHR or Physicians Herbal Reference in my mind)
13	PALMITIC-ACID	Leaf	--	--		Jim Duke's personal files.
13	PALMITIC-ACID	Seed	--	1245	-0.6739126598848639	
2	PALMITOLEIC-ACID	Leaf	--	--		Jim Duke's personal files.
0	PARKEOL	Seed Oil	--	--		Jim Duke's personal files.
2	PHYTOSTEROLS	Plant	--	--		Newall, C. A., Anderson, L. A. and Phillipson, J. D. 1996. Herbal Medicine - A Guide for Health-care Professionals. The Pharmaceutical Press, London. 296pp.
0	PLASTOQUINONE-8	Plant	--	--		
0	PLASTOQUINONE-8	Seed	--	--		
0	POLYPRENOLS	Leaf	--	--		Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
0	PROANTHOCYANIDIN-A-4	Seed	--	--		Jim Duke's personal files.
0	PROANTHOCYANIDIN-A-6	Seed Coat	--	17.9		Jim Duke's personal files.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	PROANTHOCYANIDIN-A-7	Seed Coat	--	12.7		Jim Duke's personal files.
0	PROANTHOCYANIDIN-POLYMER	Fruit	--	--		Jim Duke's personal files.
0	PROANTHOCYANIN-A-2	Fruit	--	--		Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
0	PROCYANIDIN-A-1	Fruit Epidermis	--	--		Jim Duke's personal files.
0	PROCYANIDIN-A-1	Leaf	--	--		Jim Duke's personal files.
17	PROCYANIDIN-A-2	Fruit	--	--		Jim Duke's personal files.
17	PROCYANIDIN-A-2	Seed Coat	510.2	1733.3		Jim Duke's personal files.
17	PROCYANIDIN-A-2	Leaf	--	--		Jim Duke's personal files.
17	PROCYANIDIN-A-2	Fruit Epidermis	--	--		Jim Duke's personal files.
0	PROCYANIDIN-A-4	Seed Coat	--	204.1		Jim Duke's personal files.
1	PROCYANIDIN-B-1	Seed Coat	--	240		Jim Duke's personal files.
1	PROCYANIDIN-B-1	Leaf	--	--		Jim Duke's personal files.
1	PROCYANIDIN-B-1	Fruit Epidermis	--	--		Jim Duke's personal files.
1	PROCYANIDIN-B-2	Seed Coat	612.2	3066.7		Jim Duke's personal files.
1	PROCYANIDIN-B-2	Leaf	--	--		Jim Duke's personal files.
1	PROCYANIDIN-B-2	Fruit Epidermis	--	--		Jim Duke's personal files.
2	PROCYANIDIN-B-3	Leaf	--	--		Jim Duke's personal files.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
2	PROCYANIDIN-B-3	Fruit Epidermis	--	--		Jim Duke's personal files.
4	PROCYANIDIN-B-4	Leaf	--	--		Jim Duke's personal files.
4	PROCYANIDIN-B-4	Fruit Epidermis	--	--		Jim Duke's personal files.
0	PROCYANIDIN-B-5	Leaf	--	--		Jim Duke's personal files.
0	PROCYANIDIN-B-5	Fruit Epidermis	--	--		Jim Duke's personal files.
0	PROCYANIDIN-B-5	Seed Coat	40	204.1		Jim Duke's personal files.
0	PROCYANIDIN-C-1	Seed Coat	13.3	204.1		Jim Duke's personal files.
0	PROCYANIDIN-C-1	Leaf	--	--		Jim Duke's personal files.
0	PROCYANIDIN-C-1	Fruit Epidermis	--	--		Jim Duke's personal files.
0	PROCYANIDIN-D-1	Leaf	--	--		Jim Duke's personal files.
0	PROCYANIDIN-D-1	Fruit Epidermis	--	--		Jim Duke's personal files.
1	PROCYANIDIN-D2	Leaf	--	--		Jim Duke's personal files.
1	PROCYANIDIN-D2	Fruit Epidermis	--	--		Jim Duke's personal files.
0	PROCYANIDIN-E	Leaf	--	--		Jim Duke's personal files.
0	PROCYANIDIN-E	Fruit Epidermis	--	--		Jim Duke's personal files.
0	PROCYANIDIN-G	Leaf	--	--		Jim Duke's personal files.
0	PROCYANIDIN-G	Fruit Epidermis	--	--		Jim Duke's personal files.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	PROTEIN	Seed	80000	110000	-1.1012301318918487	List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	PROTOAESCIGENIN	Seed	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	PROVITAMIN-D	Seed	--	0.9		
0	QUEBRACHITOL	Branches	--	--		Jim Duke's personal files.
0	QUEBRACHITOL	Leaf	--	--		Jim Duke's personal files.
176	QUERCETIN	Bark	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
176	QUERCETIN	Seed	--	--		Jim Duke's personal files.
0	QUERCETIN-3',4',7-TRIMETHYL-ETHER	Bud	--	--		Jim Duke's personal files.
2	QUERCETIN-3'-GLUCOSIDE	Leaf	--	--		Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
1	QUERCETIN-3,3'-DIMETHYLETHER	Bud	--	--		Jim Duke's personal files.
0	QUERCETIN-3-ARABINOSIDE	Leaf	--	--		Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
0	QUERCETIN-3-RHAMNOSIDE	Leaf	--	--		Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
0	QUERCETIN-3-RHAMNOSIDOGUCOSIDE	Leaf	--	--		Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
1	QUERCETOL	Seed	--	--		
1	QUERCETOSIDE	Seed	--	--		
44	QUERCITRIN	Bark	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
44	QUERCITRIN	Leaf	--	--		
44	QUERCITRIN	Seed	--	--		
0	QUINONES	Seed	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
0	RHAMNAZIN	Bud	--	--		Jim Duke's personal files.
1	RHAMNETOL	Seed	--	--		
7	RHAMNOCITRIN	Flower	--	--		Jim Duke's personal files.
7	RHAMNOCITRIN	Bud	--	--		Jim Duke's personal files.
87	RUTIN	Plant	--	--		Jim Duke's personal files.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
87	RUTIN	Flower	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
4	RUTOSIDE	Seed	--	--		
0	SAPONIN	Seed	55000	260000	1.6716596237594439	
5	SAPONINS	Seed	55000	260000	3.4837614172571465	
44	SCOPOLETIN	Bark	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
3	SCOPOLIN	Bark	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
3	SCOPOLIN	Pericarp	--	--		Jim Duke's personal files.
1	SERINE	Leaf	--	--		Jim Duke's personal files.
0	SITOSTEROL	Leaf	--	--		Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
0	SPINASTEROL	Seed	--	--		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
1	STACHYOSE	Seed	--	--		Gruenwald, J. et al. 1998. PDR for Herbal Medicine. 1st ed. Medical Economics Co., Montvale, NJ. 1244 pp. (abbreviated as PHR or Physicians Herbal Reference in my mind)
5	STARCH	Seed	300000	600000	1.1736828138582762	List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
8	STEARIC-ACID	Seed	--	1015	-0.5433679869069411	
8	STEARIC-ACID	Leaf	--	--		Jim Duke's personal files.
1	STIGMAST-4-EN-3-ONE	Seed	--	--		Jim Duke's personal files.
0	STIGMAST-7-EN-3-BETA-OL	Seed	--	--		Jim Duke's personal files.
0	STIGMASTA-5,7-DIEN-3-BETA-OL	Seed	--	--		Jim Duke's personal files.
12	STIGMASTEROL	Leaf	--	--		Bisset, N.G., ed. 1994. Herbal Drugs and Phytopharmaceuticals. CRC Press. Boca Raton, FL. 566 pp.
12	STIGMASTEROL	Seed	--	--		Jim Duke's personal files.
12	STIGMASTEROL	Bark	--	--		Jim Duke's personal files.
14	SUCROSE	Branches	--	--		Jim Duke's personal files.
35	TANNIN	Flower	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
35	TANNIN	Wood	--	--		Jim Duke's personal files.
2	TARAXEROL	Seed	--	--		
2	TARAXEROL	Seed Oil	--	--		Jim Duke's personal files.
1	TIGLIC-ACID	Seed	--	--		List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.
0	TRIACONTANE	Seed	--	--		
0	TRIDEC-2-EN-1-OL	Flower Essent. Oil	--	34000		Jim Duke's personal files.
0	UREA	Leaf	--	--		Jim Duke's personal files.
0	URIC-ACID	Plant	--	--		CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
0	URIC-ACID	Seed	--	--		
0	VITAMIN-K-1	Leaf	--	--		
0	WATER	Seed	30000	400000	0.661543470938804	
1	XANTHORHAMNOSIDE	Seed	--	--		
3	XYLOSE	Seed	--	--		