

Dr. Duke's Phytochemical and Ethnobotanical Database

Chemicals Found in *Camellia sinensis*

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
30	(+)-CATECHIN	Leaf	85.2	13200		
30	(+)-CATECHIN	Tissue Culture	--	--		
30	(+)-CATECHIN	Stem	--	--		
30	(+)-CATECHIN	Anther	--	--		
4	(+)-CATECHOL	Tissue Culture	--	--		
7	(+)-GALLOCATECHIN	Leaf	--	2100		
2	(-)-EPIAFZELECHIN	Leaf	6	6		
38	(-)-EPICATECHIN	Flower	--	--		
38	(-)-EPICATECHIN	Stem	0.1	--		
38	(-)-EPICATECHIN	Leaf	960	32500	1.4139218779018574	
38	(-)-EPICATECHIN	Tissue Culture	--	--		
7	(-)-EPICATECHIN-3-O-GALLATE	Leaf	3077	3188		
2	(-)-EPICATECHIN-GALLATE	Leaf	15900	16600		
21	(-)-EPIGALLOCATECHIN	Leaf	880	31000		
2	(-)-EPIGALLOCATECHIN-3-GALLATE	Leaf	--	--		
8	(-)-EPIGALLOCATECHIN-3-O-GALLATE	Leaf	7140	8718		
41	(-)-EPIGALLOCATECHIN-GALLATE	Leaf	--	--		
1	1,2,4-TRIHYDROXY-BENZENE	Leaf	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
1	1,3,5-TRIHYDROXY-BENZENE	Leaf	--	--		
8	4-TERPINEOL	Leaf	--	--		
6	ACETALDEHYDE	Leaf	--	--		
16	ACETIC-ACID	Plant	--	--		
3	ACETONE	Leaf	--	--		
6	ACETOPHENONE	Plant	--	--		
11	ADENINE	Leaf	--	--		Leung, A.Y., Encyclopedia of Common Natural Ingredients Used in Food, Drugs, and Cosmetics, John Wiley & Sons, New York, 1980.
3	ALANINE	Plant	--	--		
12	ALLANTOIN	Plant	--	--		
10	ALPHA-AMYRIN	Seed Oil	--	--		
5	ALPHA-IONONE	Shoot	300	500		
5	ALPHA-IONONE	Leaf	--	--		
28	ALPHA-PINENE	Leaf	--	--		
2	ALPHA-SPINASTEROL	Leaf	--	--		Chemical Constituents of Oriental Herbs (3 diff. books)
23	ALPHA-TERPINEOL	Shoot	700	1000	0.7452365129535146	
23	ALPHA-TERPINEOL	Leaf	--	--		
5	ALUMINUM	Leaf	--	--		
1	ANGELIC-ACID	Plant	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
101	APIGENIN	Leaf	--	--		
14	ARGININE	Plant	--	--		
3	AROMADENDRIN	Shoot	--	--		
112	ASCORBIC-ACID	Leaf	--	--		
2	ASPARAGINE	Plant	--	--		
7	ASTRAGALIN	Leaf	--	--		
24	BENZALDEHYDE	Shoot	2100	2300	5.505869120167252	
24	BENZALDEHYDE	Leaf	--	--		
20	BENZOIC-ACID	Leaf	--	--		
9	BENZYL-ACETATE	Leaf	--	--		
9	BENZYL-ALCOHOL	Leaf	--	--		
9	BENZYL-ALCOHOL	Shoot	900	1400	1	
9	BENZYL-ALCOHOL	Leaf Essent. Oil	--	10100		
1	BENZYL-BUTYRATE	Leaf	--	--		
9	BETA-AMYRIN	Seed Oil	--	76		
53	BETA-CAROTENE	Leaf	27	84	-0.7721236413068051	CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
3	BETA-DAMASCENONE	Leaf	--	--		
13	BETA-IONONE	Leaf	--	31	0.13674821696188616	
13	BETA-IONONE	Shoot	1700	2900	1.9998947757918648	

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
13	BETA-IONONE	Leaf Essent. Oil	200	3100	1	
5	BETA-SESQUIPELLANDRENE	Leaf	--	--		
47	BETA-SITOSTEROL	Seed	--	--		
47	BETA-SITOSTEROL	Seed Oil	--	--		
47	BETA-SITOSTEROL	Leaf	2130	2230	0.1261995916446916	Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)
3	BRASSINOLIDE	Leaf	--	--		
2	BUTYRALDEHYDE	Leaf	--	--		
6	BUTYRIC-ACID	Plant	--	--		
102	CAFFEIC-ACID	Plant	--	--		
62	CAFFEINE	Leaf	3810	93000	1.3844065007008324	
62	CAFFEINE	Shoot	38100	47900		
62	CAFFEINE	Seed	--	--		
62	CAFFEINE	Pericarp	--	--		
62	CAFFEINE	Anther	0.1	--		
62	CAFFEINE	Tissue Culture	--	--		
62	CAFFEINE	Seed Coat	--	--		
62	CAFFEINE	Flower	--	--		
62	CAFFEINE	Plant	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
62	CAFFEINE	Stem	--	--		
28	CALCIUM	Leaf	327	2456	-1.0919564439929121	
2	CAMPESTEROL	Seed	--	--		
2	CAMPESTEROL	Seed Oil	--	--		
1	CAPROIC-ACID	Leaf	--	--		
37	CARVACROL	Leaf	--	--		
77	CHLOROGENIC-ACID	Leaf	--	--		
77	CHLOROGENIC-ACID	Tissue Culture	--	--		
21	CHLOROPHYLL	Leaf	--	5000	-0.6842987324142965	
18	CINNAMIC-ACID	Leaf	--	--		
15	CITRONELLOL	Leaf	--	--		
12	COPPER	Leaf	20	20	-0.2107254556903997	
2	CRYPTOXANTHIN	Leaf	--	--		
13	CYSTEINE	Leaf	--	--		
2	CYSTINE	Leaf	--	--		
3	DAMMARADIENOL	Seed Oil	--	30		
9	DELTA-CADINENE	Leaf	--	--		
2	DIMETHYL-SULFIDE	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
3	DIPHENYLAMINE	Leaf	130	11700		
1	EPIAFZELECHIN	Leaf	--	6		
40	EPICATECHIN	Leaf	149	21250	1	
1	EPICATECHIN-3-O-GALLATE	Leaf	20	20		Jim Duke's personal files.
12	EPICATECHIN-GALLATE	Leaf	5417	31000		
6	EPIGALLOCATECHIN	Leaf	--	10866.7		
3	EPIGALLOCATECHIN-3-O-GALLATE	Leaf	224	224		Jim Duke's personal files.
3	EPIGALLOCATECHIN-GALLATE	Leaf	16600	54300		
2	ERUCIC-ACID	Seed	--	--		
2	ERUCIC-ACID	Seed Oil	--	--		
6	ETHYL-ACETATE	Leaf	--	--		
1	ETHYL-LACTATE	Leaf	--	--		
1	ETHYL-PHENYLACETATE	Leaf	--	--		
76	EUGENOL	Fruit	--	--		
76	EUGENOL	Fruit Essent. Oil	--	--		
1	EUPHOL	Seed	--	--		
1	EUPHOL	Seed Oil	--	--		
17	FARNESOL	Leaf	--	--		
15	FIBER	Leaf	87000	270000	1.712279492628632	

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
3	FLUORIDE	Leaf	--	188	0.9999999999999997	
1	FURFURYL-ALCOHOL	Leaf	--	--		Leung, A.Y., Encyclopedia of Common Natural Ingredients Used in Food, Drugs, and Cosmetics, John Wiley & Sons, New York, 1980.
4	GALEGINE	Leaf	--	--		ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
62	GALLIC-ACID	Leaf	--	3500	-0.7468561442003636	
1	GALLOCATECHIN-GALLATE	Leaf	--	1880		
13	GERANIAL	Leaf	--	--		Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.
35	GERANIOL	Leaf	2	2546	0.9520713467876748	
35	GERANIOL	Shoot	800	1200	0.24305714647507012	
35	GERANIOL	Leaf Essent. Oil	31600	1200	1.4840612491853453	
5	GLUTAMINE	Leaf	--	--		
12	GLYCINE	Leaf	--	--		
18	GUAIACOL	Leaf	--	--		
1	HEXYL-BUTYRATE	Leaf	--	--		
1	HEXYL-FORMATE	Leaf	--	--		
7	HISTIDINE	Leaf	--	--		
30	HYPEROSIDE	Leaf	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
15	INDOLE	Leaf	--	--		
8	INOSITOL	Leaf	--	--		
6	IRON	Leaf	189	1500	2.8815281453439296	
2	ISOAMYL-ACETATE	Leaf	--	--		
3	ISOAMYL-ALCOHOL	Leaf	--	--		
2	ISOBUTYL-ALCOHOL	Leaf	--	--		
1	ISOBUTYRALDEHYDE	Leaf	--	--		
22	ISOQUERCITRIN	Leaf	--	1820	2.4455344686299503	
1	ISOVALERALDEHYDE	Leaf	--	--		
4	ISOVITEXIN	Leaf	--	--		
8	JASMONE	Leaf	--	--		
1	KAEMPFERITRIN	Leaf	--	--		
75	KAEMPFEROL	Plant	--	--		
75	KAEMPFEROL	Leaf	--	520	1.8918097649170893	
75	KAEMPFEROL	Shoot	--	--		
4	KAEMPFEROL-3-RHAMNOGLUCOSIDE	Leaf	--	4300		
7	LAURIC-ACID	Seed	--	--		
7	LAURIC-ACID	Seed Oil	--	--		
2	LEUCINE	Leaf	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
13	LIGNIN	Leaf	--	65000		
3	LIGUSTRAZINE	Leaf	--	--		
60	LIMONENE	Leaf	--	--		
53	LINALOOL	Leaf	6	1984	0.7264525313916458	
53	LINALOOL	Leaf Essent. Oil	82000	198400	0.5604322107337334	
53	LINALOOL	Shoot	4000	10300	0.15629492685233945	
27	LINOLEIC-ACID	Seed	--	--		
27	LINOLEIC-ACID	Seed Oil	--	--		
27	LINOLEIC-ACID	Leaf	--	--		
2	LOLIOLIDE	Leaf	--	--		
2	LOLIOLIDE	Leaf Essent. Oil	--	--		
21	LUPEOL	Seed	--	--		
21	LUPEOL	Seed Oil	--	--		
15	LUTEIN	Leaf	--	--		
16	LYCOPENE	Leaf	--	--		
4	LYSINE	Leaf	--	--		
8	M-CRESOL	Leaf	--	--		
65	MAGNESIUM	Leaf	2200	2200	-0.7435952472033982	
15	MALIC-ACID	Leaf	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
14	MANGANESE	Leaf	1200	1200	1.5350642703885349	
63	MENTHOL	Leaf	--	--		
1	METHYL-AMINE	Leaf	50	50	1.6736724625222175	
1	METHYL-ETHYL-KETONE	Leaf	--	--		
21	METHYL-SALICYLATE	Leaf	--	--		
22	MYRCENE	Leaf	--	--		
34	MYRICETIN	Plant	--	--		
34	MYRICETIN	Leaf	--	340		
6	MYRISTIC-ACID	Seed	--	--		
6	MYRISTIC-ACID	Seed Oil	--	--		
6	MYRISTIC-ACID	Leaf	--	--		
56	NARINGENIN	Shoot	--	--		
2	NEO-CHLOROGENIC-ACID	Leaf	--	--		
4	NERAL	Leaf	--	--		
10	NEROL	Leaf	--	--		
11	NEROLIDOL	Shoot	800	1200	3.236724073060916	
11	NEROLIDOL	Leaf	--	--		
39	NIACIN	Leaf	46	76	-0.2615265260323716	
11	NICOTINIC-ACID	Leaf	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
6	O-CRESOL	Leaf	--	--		
18	OLEIC-ACID	Seed	--	--		
18	OLEIC-ACID	Seed Oil	--	--		
18	OLEIC-ACID	Leaf	--	--		
25	OPCS	Plant	--	--		
9	OXALIC-ACID	Leaf	2192	10000	-0.18309165835827215	
8	P-CRESOL	Leaf	--	--		
13	PALMITIC-ACID	Leaf	--	--		
13	PALMITIC-ACID	Seed Oil	--	--		
11	PANTOTHENIC-ACID	Leaf	--	--		
9	PEDUNCULAGIN	Plant	--	--		Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
26	PHENOL	Leaf	--	--		
2	PHENYL-ACETALDEHYDE	Shoot	15200	17800		
2	PHENYLACETIC-ACID	Leaf	1850	3130	0.9999999999999999	
4	PHOSPHORUS	Leaf	3200	4150	-0.15113693855670607	CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
2	PHYTOSTEROLS	Leaf	2600	11400	3.0806495427319205	Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.)

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
30	POLYPHENOLS	Leaf	100000	390000		
14	POTASSIUM	Plant	17600	17600	-0.29271112666145865	
1	PROCYANIDIN-B-2	Leaf	--	5.8	-0.9999999999999999	
3	PROCYANIDIN-B-2-3'-O-GALLATE	Leaf	167	167		Jim Duke's personal files.
3	PROCYANIDIN-B-2-3,3'-DI-O-GALLATE	Leaf	160	160		Jim Duke's personal files.
2	PROCYANIDIN-B-3	Leaf	10.6	2100		
4	PROCYANIDIN-B-4	Leaf	--	46.6		
2	PROCYANIDIN-B-5-3,3'-DI-O-GALLATE	Leaf	141	141		Jim Duke's personal files.
2	PROPIONALDEHYDE	Leaf	--	--		
6	PROPIONIC-ACID	Leaf	--	--		
3	PYRIDINE	Leaf	--	--		
176	QUERCETIN	Leaf	--	10000	-0.19026306232771106	
176	QUERCETIN	Plant	--	--		
176	QUERCETIN	Shoot	--	--		
2	QUERCETIN-3-O-BETA-D-GLUCOSIDE	Leaf	--	--		Jim Duke's personal files.
6	QUERCIMERITRIN	Leaf	--	--		
44	QUERCITRIN	Leaf	--	--		Leung, A.Y., Encyclopedia of Common Natural Ingredients Used in Food, Drugs, and Cosmetics, John Wiley & Sons, New York, 1980.
1	QUINIC-ACID	Leaf	--	--		Jim Duke's personal files.

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
3	QUINOLINE	Plant	--	--		
15	RIBOFLAVIN	Leaf	8	12	-0.12161169581967965	CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
87	RUTIN	Leaf	1200	1580	-0.9064551745734906	
29	SAFROLE	Leaf	--	--		
5	SALICYLALDEHYDE	Leaf	--	--		
7	SALICYLATES	Leaf	5	65	-0.435551873962273	
34	SALICYLIC-ACID	Leaf	--	--		
1	SERINE	Leaf	--	--		
1	SODIUM	Leaf	300	500	-0.5584814617442552	
5	STARCH	Leaf	5000	5000	-0.820956985490708	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
8	STEARIC-ACID	Seed	--	--		
12	STIGMASTEROL	Seed Oil	--	--		
1	STRICTININ	Leaf	130	130	1.1769646985527409	
14	SULFUR	Leaf	880	880	-0.9292474159539728	ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.
41	TANNIC-ACID	Leaf	--	--		
35	TANNIN	Leaf	33800	270000	1.946796964817541	

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
2	TARAXEROL	Seed Oil	20	20		
22	TETRAMETHYL-PYRAZINE	Leaf	--	--		Jim Duke's personal files.
7	THEAFLAVIN	Leaf	5.4	19		
7	THEAFLAVIN	Shoot	1800	14000		
3	THEAFLAVIN-DIGALLATE	Leaf	700	2500		
1	THEAFLAVIN-MONOGALLATE-B	Leaf	--	--		
2	THEANINE	Cotyledon	5777	577		
2	THEANINE	Leaf	5000	13500		
2	THEANINE	Seed	4560	109		
2	THEANINE	Shoot	63	63		
2	THEANINE	Stem	35	0.035		
2	THEANINE	Anther	16000	29000		
21	THEOBROMINE	Leaf	500	1100	-1	
21	THEOBROMINE	Pericarp	--	--		
21	THEOBROMINE	Flower	--	--		
21	THEOBROMINE	Seed Coat	--	--		
21	THEOBROMINE	Seed	--	--		
21	THEOBROMINE	Stem	--	--		
21	THEOBROMINE	Anther	--	--		

Activity Count	Chemical	Plant Part	Low PPM	High PPM	StdDev	Reference Citation
36	THEOPHYLLINE	Leaf	2	4	-1	
36	THEOPHYLLINE	Seed	--	--		
31	THIAMIN	Leaf	1	4	-0.8971070751644596	CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses
4	THREONINE	Leaf	--	--		
71	THYMOL	Leaf	--	--		
1	TRIACONTAN-1-OL	Leaf	--	--		
22	UMBELLIFERONE	Leaf	--	--		
9	VALERIC-ACID	Leaf	--	--		
3	VALINE	Leaf	--	--		
2	VIOLAXANTHIN	Leaf	--	--		
18	VITEXIN	Leaf	--	--		Jim Duke's personal files.
1	XANTHINE	Leaf	--	--		Leung, A.Y., Encyclopedia of Common Natural Ingredients Used in Food, Drugs, and Cosmetics, John Wiley & Sons, New York, 1980.
5	ZEAXANTHIN	Leaf	--	--		
77	ZINC	Leaf	30	30	-0.34265757200682206	