

Dr. Duke's Phytochemical and Ethnobotanical Databases

Chemicals and their Biological Activities in: *Moringa oleifera* LAM. (Moringaceae) -- Ben Nut, Benzolive Tree, Drumstick Tree, Horseradish Tree, Jacinto (Sp.), Moringa, West Indian Ben

Chemicals

[4-\(ALPHA-L-RHAMNOSYLOXY\)-BENZYLISOTHIOCYANATE](#) *Seed* 80,000
- 100,000 ppm [TRA](#)

No activity reported.

[4-HYDROXYMELLEIN](#) *Stem:* [MPI](#)

No activity reported.

[ALANINE](#) *Shoot* 5,320 - 24,930 ppm [USA](#)

Antioxidant [PC27:969](#) ; Cancer-Preventive [525](#) ; Oxidant [PC27:969](#)

[ALKALOIDS](#) *Bark* 1,000 ppm; [WOI](#)

No activity reported.

[ARACHIDIC-ACID](#) *Seed* 27,065 - 28,195 ppm [HHB](#) [WOI](#)

No activity reported.

[ARGININE](#) *Shoot* 5,320 - 24,930 ppm [USA](#)

Antidiabetic? [WIC](#) ; Antiencephalopathic [M29](#) ; Antihepatitic [M29](#) ;
Antihypertensive [NP6:1](#) ; Antiimpotence [JMF1\(3\)](#) ; Antiinfertility 4 g/day
[WER](#) ; Antioxidant? [PC27:976](#) ; Aphrodisiac 3 g/day; Diuretic [BJP3:10](#) ;
Hypoammonemic [JBH](#) ; NO-Genic [JMF1\(3\)](#) ; Pituitary-Stimulant [PJB1](#)
[\(2\):260](#) ; Spermigenic 4 g/day [WER](#) ; Vasodilator [NP6:1](#)

[ASCORBIC-ACID](#) *Leaf* 2,200 - 8,800 ppm [WOI](#) *Shoot* 517 - 2,425 ppm [USA](#)

Acidulant *FEMA* 6,000 [ARC](#) ; Aldose-Reductase-Inhibitor [SYN-X](#) ; Analgesic
5-10 g/day; Angiotensin-Receptor-Blocker [NP6:1](#) ; AntiAGE 2,000 mg/day

[SYN-X](#) ; Antiaggregant [SYN-X](#) ; Antiaging 400 mg/day; Antiallergic [PIL](#) ;
 Antialzheimeran 2,000-6,000 mg/day; Antiarthritic 0.2-1 g/day; Antiasthmatic
 1,000 mg/day [WER](#) ; Antiatherosclerotic; Antibacterial [DAS](#) ; Anticataract 1 g
 3x/day 350 mg/day [WER](#) 400 mg/day [SYN-X](#) ; Anticervicaldysplastic 1,000-
 2,000 mg/day; AntiCFS 500-1,000 mg [TE2](#) ; Anticlimacteric 500-5,000 mg/day
[WAF](#) ; Anticold 1-2 g/man/day; AntiCrohn's 50-100 mg/day/orl/man [M29](#) ;
 AntiCTS 1,000 mg 3x/day [WAF](#) ; Antidecubitic 500 mg/man/2x/day [MAR](#) ;
 Antidementia [MPP](#) ; Antidepressant 2,000 mg/day [WER](#) ; Antidiabetic [SYN-
 X](#) ; Antidote (Aluminum) [EMP6:189](#) ; Antidote (Cadmium) [DAS](#) ; Antidote
 (Lead) [DAS](#) ; Antidote (Paraquat) [MAR](#) ; Antieczemic 3.5-5 g/day [WER](#) ;
 Antiedemic 1 g/man/day [DAS](#) ; Antiencephalitic [DAS](#) ; Antiendometriotic
 2,000 mg/day [WAF](#) ; Antifatigue 500-1,000 mg [TE2](#) ; Antifibrotic 1,000-2,000
 mg [WAF](#) ; Antigallstone 1,000-3,000 mg/day [WAF](#) ; Antigastric [PIL](#) ;
 Antigingivitic; Antiglaucomic 2 g/day [WER](#) ; Antihangover 1,000 mg [WAF](#) ;
 Antihemorrhagic 1 g/man/day [DAS](#) ; Antihepatic 2-6 g/man/day [DAS](#) ;
 Antihepatotoxic [EMP6:189](#) ; Antiherpetic 1-5 g/day; Antihistaminic 2 g/day orl
 man; Antihypertensive [NP6:1](#) ; Antiinfertility 1 g/day [WER](#) ; Antiinflammatory
[PAM](#) ; Antileptic 1.5 g/man/day [MAR](#) ; Antilithic 1,000-3,000 mg/day [WAF](#) ;
 AntiLyme 500-2,000 mg [KEN](#) ; Antimaculitic; Antimeasles [DAS](#) ;
 Antimenopausal 500-5,000 mg/day [WAF](#) ; Antimigraine [M29](#) ; Antimutagenic
[EMP6:235](#) ; Antineuramidase [X634178](#) ; Antinitrosic 1 g/man/day [MAR](#) ;
 Antiobesity 1 g 3x/day [WER](#) ; Antiorchitic [DAS](#) ; Antiosteoarthritic 1 g 2x/day
[WER](#) ; Antiosteoporotic 500 mg/day; Antioxidant 100 ppm [DUKE1992B](#) ;
 Antiparkinsonian 1 g 2-3x/day; Antiparotitic [DAS](#) ; Antiperiodontitic 1 g
 2x/day [WER](#) ; Antipneumonic [PAM](#) ; Antipodriac [DAS](#) ; Antipoliomyelitic
[DAS](#) ; Antipyretic [EMP6:189](#) ; Antiradicular [SYN-X](#) ; AntiRaynaud's 500 mg
 1-2x/day [WAF](#) ; Antiretinotic [PIL](#) ; Antirheumatic [MPP](#) ; Antirhinitic 1,000 mg
 3x/day [WAF](#) ; Antiscorbutic 10 mg/man/day [MAR](#) ; Antiseptic 4-8 g/day [SYN-
 X](#) MIC=3.3-217 mg/ml [MAR](#) ; Antishingles [DAS](#) ; Antispasmodic 500-5,000
 mg/day [WAF](#) ; Antistress 500-1,000 mg; Antisyndrome-X 1-4 g/day [SYN-X](#) ;
 Antitumor (Gastric) [PIL](#) ; Antitumor (Lung) [NR54:S71](#) ; Antiulcer; Antiviral 1-
 5 g/day; Apoptotic 1-10 mM [BO2](#) ; Asthma-preventive 1,000 mg/day/orl [PAM](#) ;
 Beta-Adrenergic Receptor Blocker [NP6:1](#) ; Beta-Glucuronidase-Inhibitor 1.5
 g/day/man [BO2](#) ; Calcium-Antagonist [NP6:1](#) ; Cancer-Preventive [525](#) ;
 Cardioprotective [PIL](#) ; Cold-preventive 1-2 g/day [DAS](#) ; Collagenic [BO2](#) ;
 Detoxicant [DUKE1992B](#) ; Diuretic 700 mg/man/orl [NP6:1](#) ; Fistula-Preventive
[PAM](#) ; Hypocholesterolemic 300-1,000 mg/day [DAS](#) ; Hypoglycemic [SYN-X](#) ;
 Hypotensive 1,000 mg/man/day; Immunomodulator [PIL](#) ; Immunostimulant
[SYN-X](#) ; Interferonogenic [PAM](#) ; Lithogenic [DAS](#) ; Mucolytic 1 g/woman/day
[MAR](#) ; Pesticide [DUKE1992B](#) ; Uricosuric 4 g/man/day [DAS](#) ; Urinary-
 Acidulant [M29](#) ; Vasodilator [NP6:1](#) ; Vulnerary [PAM](#)

[ASH Fruit](#) 9,700 - 82,200 ppm [USA Leaf](#) 23,000 - 92,000 ppm [WOI Seed](#) 32,000 -
 33,333 ppm [WOI Shoot](#) 22,600 - 105,900 ppm [USA](#)

No activity reported.

ASPARTIC-ACID *Shoot* 9,200 - 43,110 ppm USA

Antimorphinic MAR ; Neuroexcitant MAR ; Roborant M11

BASSORIN *Stem*: TRA

No activity reported.

BAYRENOL *Bark*: MPI

No activity reported.

BEHENIC-ACID *Seed* 29,840 - 31,085 ppm WOI

Cosmetic JBH

BENZYL-AMINE *Bark*: WOI

No activity reported.

BETA-CAROTENE *Leaf* 18 - 72 ppm WOI *Seed* 100 ppm; NUT *Shoot* 45 - 215 ppm USA

Allergenic M&R610 ; Androgenic? PAM ; Antiacne PAM ; Antiaging DUKE1992B ; Antiarthritic MPP ; Antiasthmatic PAM ; Anticancer JNU ; Anticarcinomic PAM ; Anticervicaldysplastic MPP ; Anticoronary 50 mg/man/2 days CMR3/4/91:16 ; Antihyperkeratotic; Antiichthyotic PAM ; Antileukoplakic; Antilipoperoxidant *IC71=50 ug/ml* X16277432 ; Antilupus 150 mg/man/day/2 mos MAR ; Antimaculitic; Antimastitic PAM ; Antimutagenic EMP6:235 ; Antioxidant PAM ; Antiozenic DUKE1992B ; Antipapillomic MPP ; Antiphotophobic 30-300 mg/man/day M29 ; Antipityriasis PAM ; AntiPMS JAF44:409 ; Antiporphyrin MAR ; Antiproliferant JNU ; Antipsoriasis PAM ; Antiradicular PAM ; Antirheumatic MPP ; Antistress DAS ; Antitumor HSC25:1495 ; Antitumor (Breast) *IC45=60 ug/ml* X16277432 ; Antitumor (CNS) *IC43=45 ug/ml* X16277432 ; Antitumor (Colon) X16277432 ; Antitumor (Lung) *IC30=60 ug/ml* X16277432 ; Antitumor (Prostate) MES ; Antitumor (Stomach) *IC26=45 ug/ml* X16277432 ; Antiulcer 12 mg 3x/day/man/orl PAM 15,000-25,000 IU/day WAF ; Antixerophthalmic DAS ; Cancer-Preventive 22 ppm 505 ; Chemopreventive MES ; Colorant JBH ; COX-1-Inhibitor *IC78=50 ug/ml* X16277432 ; COX-2-Inhibitor *IC82=50 ug/ml* X16277432 ; Gastroprotective X6654625 ; Immunostimulant 180 mg/man/day/orl PAM ; Interferon-Synergist PJB1(2):264 ; Mucogenic PAM ; Phagocytotic PAM ; Prooxidant 20 ug/g JAF44:2096 ; Thymoprotective PAM ; Ubiquitin JBH

BETA-SITOSTEROL *Stem*: MPI

Androgenic DUKE1992B ; Angiogenic X11988857 ; Anorexic MAR ; Antiadenomic M11 ; Antiandrogenic JE28:221 ; Antibacterial QJC28:155 ; Anticancer (Breast) PS131:95 ; Anticancer (Cervix) PJB1(2):287 ; Anticancer

(Lung) [PJB1\(2\):287](#) ; Antiedemic $IC_{50}=320$ mg/kg orl [DFN:160](#) ;
 Antiestrogenic [JE28:221](#) ; Antifeedant [382](#) ; Antifertility [JE28:221](#) ;
 Antigonadotrophic [JE28:221](#) ; Antihyperlipoproteinaemic [JBH](#) ;
 Antiinflammatory; Antileukemic [PJB1\(2\):287](#) ; Antilymphomic [PJB1\(2\):287](#) ;
 Antimutagenic 250 ug/ml [JAFC37:1365](#) ; Antiophidic 2.3 mg mus [EMP5:363](#) ;
 Antioxidant $IC_{44}=10$ uM [JMF5:1](#) ; Antiprogestational [JE28:221](#) ;
 Antiprostaglandin 30 mg/day/12 wks [FT68\(4\):291](#) ; Antiprostataadenomic [M11](#) ;
 Antiprostatic 10-20 mg 3 x/day/orl man; Antipyretic [HDN](#) ; Antitumor
 (Breast) [PS131:95](#) ; Antitumor (Cervix) [PJB1\(2\):287](#) ; Antitumor (Lung) [PJB1\(2\):287](#) ;
 Antiviral [PS75:161](#) ; Apoptotic [X17350814](#) ; Artemicide $LC_{50}=110$ ppm [PC29\(5\):1667](#) ;
 Cancer-Preventive [525](#) ; Candidicide [QJC28:155](#) ;
 Caspase-8-Inducer [X17358014](#) ; Estrogenic [PHM9:52](#) ; Febrifuge [HDN](#) ;
 Gonadotrophic [JE28:221](#) ; Hepatoprotective [PMP23:60](#) ; Hypocholesterolemic
 2-6 g/man/day/orl [M30](#) 9-3,330 mg/man/day/orl [MAR](#) ; Hypoglycemic
[JE27:243](#) ; Hypolipidemic 2-6 g/day; Pesticide [DUKE1992B](#) ; Spermicide
[JE28:221](#) ; Ubiquiot [JBH](#) ; Ulcerogenic 500 mg/kg ipr rat [FT63\(1\):3](#)

BETA-SITOSTERONE Stem: [MPI](#)

No activity reported.

CALCIUM Fruit 300 - 2,545 ppm [USA](#) Leaf 4,400 - 17,600 ppm [WOI](#)

Antiallergic 500 mg/day; Antianxiety [DAS](#) ; Antiarrhythmic 500-1,500 mg
[RAF](#) ; Antiarthritic 1,000 mg/day [WAF](#) ; Antiatherosclerotic 500 mg/day
[WER](#) ; Anticlimacteric 1,000-1,500 mg/day [WAF](#) ; Antidepressant [DAS](#) ;
 Antidote (Aluminum) [DAS](#) ; Antidote (Lead) [DAS](#) ; Antihyperkinetic [DAS](#) ;
 Antihypertensive; Antiinsomniac [DAS](#) ; Antimenopausal; Antiobesity [PIL](#) ;
 Antiosteoporotic 500-2,000 mg/day; Antiperiodontitic 750 mg/day [WER](#) ;
 AntiPMS 1 g/day; Antirheumatic 1,000 mg/day [WAF](#) ; Antistress 500-1,500
 mg/day [WAF](#) ; Antitic [DAS](#) ; Anxiolytic; Calcium-Channel-Blocker [NP6:1](#) ;
 Diuretic [NP6:1](#) ; Hypocholesterolemic 500 mg/day [WER](#) ; Hypotensive 1 g/day
[WER](#) ; Laxative 1,000-1,200 mg [WAF](#) ; Tranquilizer 500-1,500 mg/day [WAF](#) ;
 Vasodilator [NP6:1](#)

CARBOHYDRATES Fruit 85,300 - 722,880 ppm [USA](#) Leaf 134,000 - 536,000 ppm [USA](#) Seed 199,000 - 207,290 ppm [WOI](#) Shoot 82,800 - 388,000 ppm [USA](#)

No activity reported.

CHOLINE Fruit 4,230 ppm; [EB34:278](#) Leaf 4,230 ppm; [EB34:278](#)

Antialzheimeran 5-16 g/man/day; Antichoreic [DAS](#) ; Anticirrhotic 6,000
 mg/man/day [DUKE1992B](#) ; Anticystinuric [DUKE1992B](#) ; Antidementia [PJB1\(1\):171](#) ;
 Antidiabetic [DUKE1992B](#) ; Antidyskinetic 150-200 mg/kg/man/day
[MAR](#) ; Antihomocysteine [SN160:282](#) ; Antimanic 15-30 g/man/day/orl [PAM](#) ;
 Antinociceptive [X579998](#) ; Antisteatotic [JN133:1302](#) ; Cardiodepressant
[SN160:282](#) ; Cerebrotonic [SN160:282](#) ; Cholinergic [CAN](#) ; Hepatoprotective

[JN127:893S](#) ; Hypotensive [DUKE1992B](#) ; Ileorelaxant [FT1990:509](#) ;
Lipotropic [JE26:86](#) ; Memorigenic [SN160:282](#) ; Parasympathomimetic
(1/1,000th acetylcholine) [HDN](#)

[COPPER](#) *Leaf* 1 - 4 ppm [WOI](#)

Antianemic [HYL](#) ; Antiarthritic; Antidiabetic 2-4 mg/day [WER](#) ; Antifatigue
[HYL](#) ; Antiinflammatory [WER](#) ; Antinociceptive [WER](#) ; Antiosteoporotic
[MPP](#) ; Cardioprotective [HYL](#) ; Contraceptive [MAR](#) ; Hypocholesterolemic
[DAS](#) ; Immunomodulator; Schizophrenogenic [DAS](#)

[CYSTINE](#) *Shoot* 1,400 - 6,560 ppm [USA](#)

Adjuvant [M11](#) ; Antihomocystinuric [M29](#)

[D-GALACTOSE](#) *Resin, Exudate, Sap:* [ABS](#)

No activity reported.

[D-GLUCURONIC-ACID](#) *Resin, Exudate, Sap:* [ABS](#)

No activity reported.

[D-MANNOSE](#) *Resin, Exudate, Sap:* [ABS](#)

No activity reported.

[D-XYLOSE](#) *Resin, Exudate, Sap:* [ABS](#)

No activity reported.

[EMULSIN](#) *Stem:* [TRA](#)

No activity reported.

[FAT](#) *Fruit* 2,000 - 16,950 ppm [USA](#) *Leaf* 17,000 - 68,000 ppm [USA](#) *Seed* 210,000 -
361,460 ppm [TRA](#) [WOI](#) *Shoot* 14,000 - 65,600 ppm [USA](#)

No activity reported.

[FIBER](#) *Fruit* 13,000 - 110,170 ppm [USA](#) *Leaf* 9,000 - 36,000 ppm [USA](#) *Seed*
35,000 - 36,450 ppm [WOI](#) *Shoot* 15,000 - 70,290 ppm [USA](#)

Angiotensin-Receptor-Blocker [NP6:1](#) ; Antidiabetic [DUKE1992B](#) ;
Antihypertensive [NP6:1](#) ; Antiobesity [DUKE1992B](#) ; Antitumor [PAM](#) ;
Antiulcer [PAM](#) ; Beta-Blocker [NP6:1](#) ; Cancer-Preventive [525](#) ;
Cardioprotective [DUKE1992B](#) ; Diuretic [NP6:1](#) ; Hypocholesterolemic
[DUKE1992B](#) ; Hypotensive 10 g/man/day/orl [PAM](#) ; Hypouricemic
[X12350076](#) ; Laxative [DUKE1992B](#) ; Vasodilator [NP6:1](#)

[FLUORINE](#) *Leaf* 4 ppm; [MPI](#)

No activity reported.

[GLUTAMIC-ACID](#) *Shoot* 10,350 - 48,500 ppm [USA](#)

Antialkali? 500-1,000 mg/day/orl/man [M29](#) ; Antiepileptic [DUKE1992B](#) ;
Antihyperammonemic [M29](#) ; Antilithic [PAM](#) ; Antiprosthetic 125-250 mg 3
x/day [WER](#) ; Antiretardation [JBH](#) ; Anxiolytic [M11](#) ; Neurotoxic [JBH](#)

GLYCINE *Shoot* 5,170 - 24,225 ppm [USA](#)

Antiacid [M29](#) ; Antialdosteronic [PAM](#) ; Antidote (Hypoglycin-A) [M29](#) ;
Antiencephalopathic [M29](#) ; Antigastric [M29](#) ; Antiprosthetic 125-250 mg 3
x/day [WER](#) ; Antipruritic [M11](#) ; Antisickling [PM56\(1\):41](#) ; Antiulcer [M29](#) ;
Cancer-Preventive [525](#) ; Neuroinhibitor [WER](#) ; Uricosuric [DUKE1992B](#)

HISTIDINE *Shoot* 1,960 - 9,185 ppm [USA](#)

Antiartherosclerotic [JE26:80](#) ; Antinephritic [JBH](#) ; Antioxidant [PC27:976](#) ;
Antiulcer [JE26:80](#) ; Antiuremic [JBH](#) ; Essential [JBH](#) ; Oxidant [PC27:976](#)

INDOLE-ACETIC-ACID *Fruit:* [NUT](#)

Hormone [M11](#)

INDOLEACETONITRILE *Fruit:* [NUT](#)

No activity reported.

IODINE *Leaf* 0.05 - 0.7 ppm [MPI](#) [WOI](#)

Acnegenic [DAS](#) ; Antibacterial [AHP146](#) ; Antigoiter [DAS](#) ; Antiseptic
[AHP146](#) ; Antithyrototoxic [DAS](#) ; Antiviral [AHP146](#) ; Dermatitogenic [DAS](#) ;
Fungicide [AHP146](#) ; Goitrogenic [DAS](#) ; Hyperthyroid >1 mm/day/diet
[AHP146](#) ; Protistocidal [AHP146](#) ; Thyrotropic [DAS](#)

IRON *Fruit* 3 - 30 ppm [USA](#) *Leaf* 70 - 280 ppm [WOI](#) *Shoot* 40 - 185 ppm [USA](#)

Antiakathic [M29](#) ; Antianemic [M29](#) ; Anticancer; Anticellitic [DAS](#) ;
Antimenorrhagic 100 mg/day/wmn/orl [PAM](#) ; Prooxidant [PIL](#)

ISOLEUCINE *Shoot* 4,510 - 21,135 ppm [USA](#)

Antiencephalopathic? [M29](#) ; Antipellagic [MAR](#) ; Essential [JBH](#)

KAEMPFEROL *Flower:* [WOI](#)

11B-HSD-Inhibitor [CPT59:62](#) ; 5-Lipoxygenase-Inhibitor IC_{50} (μM)=20;
Aldose-Reductase-Inhibitor 100 μM [JBC8:211](#) ; Antiaflatoxin IC_{50} =3.28 ppm
[X11714299](#) IC_{50} =8.73 μM [X11714299](#) ; Antiaggregant 30 μM ; Antiallergic
[RWG122](#) ; Antibacterial 20 $\mu g/ml$; Anticancer [JAF47:397](#) ; Antifertility 250
mg/kg/day/60 days/orl rat [PMP23:193](#) ; Antigingivitic 20 $\mu g/ml$ [JNP59:987](#) ;
Antiherpetic 23-92 $\mu g/ml$ [JNP55:1732](#) ; Antihistaminic [411](#) ; Antiimplantation
[JE32:175](#) ; Antiinflammatory 20 mg/kg [DUKE1992B](#) 200 mg/kg ipr rat
[DUKE1992B](#) ; Antileukemic IC_{50} =3.1 $\mu g/ml$ [LS55:1061](#) ; Antilymphocytic
[JBH](#) ; Antimutagenic ID_{50} =10-40 nM [PCF](#) ; Antioxidant 3/4 quercetin
[JAF49:3653](#) IC_{50} =1.2 $\mu g/ml$ [JAF50:3150](#) IC_{50} =40 μM [PC27:972](#) ;
Antiperiodontic 20 $\mu g/ml$ [JNP59:987](#) ; Antiplaque [JNP59:987](#) ; Antiradicular 7

x quercetin; Antiseptic 20 ug/ml [JNP59:987](#) ; Antiserotonin 200 mg/kg ipr rat [FT63\(1\):3](#) ; Antispasmodic [411](#) ; Antistaphylococcic [PR14:561](#) ; Antitumor [JAF47:397](#) ; Antitumor-Promoter [CPB38:774](#) ; Antiulcer 50-200 mg/kg ipr rat; Antiviral 23-92 ug/ml; Apoptotic 60 uM [X10673981](#) ; Aromatase-Inhibitor $IC_{12}=1$ uM/l [JMF2:235](#) ; cAMP-Phosphodiesterase-Inhibitor [AFR27:180](#) ; Cancer-Preventive [525](#) ; Carcinogenic [ZUL](#) ; Choloretic [LAF](#) ; Copper-Chelator [X10976523](#) ; COX-2-Inhibitor [COX:50](#) ; Cyclooxygenase-Inhibitor IC_{50} (uM) =20; Cytotoxic [JAF50:850](#) ; Diaphoretic? [LRN-DEC90](#) ; Diuretic [BJP3:10](#) ; Estrogenic $EC_{50}=0.1-25$ uM/l [JMF2:227](#) $EC_{50}=0.56$ uM [X10923837](#) ; Fungicide 20 ug/ml [FNF](#) ; Hepatoprotective $IC_{50}=1.30$ ppm [X11714299](#) $IC_{50}=5.46$ uM [X11714299](#) ; HIV-RT-Inhibitor $IC_{50}=50-150$ ug/ml [JNP54:142](#) ; Hypotensive [FT1990:508](#) ; ICAM-1-Inhibitor [X15322261](#) ; iNOS-Inhibitor $IC_{50}=13.9$ uM [X15832817](#) $IC_{50}<15$ uM [X10506109](#) ; Inotropic [X10404425](#) ; Iodothyronine-Deiodinase-Inhibitor [JBH](#) ; JNK-Inhibitor [X15322261](#) ; Lipoxygenase-Inhibitor [JBH](#) ; MAO-Inhibitor [X10813558](#) ; Mutagenic; Natriuretic [BJP3:10](#) ; Neuroprotective [X10813558](#) ; NO-Inhibitor $IC_{50}=13.9$ uM [X15832817](#) ; PAF-Inhibitor [FT67:548](#) ; Pesticide [DUKE1992B](#) ; Protisticide [PR13:102](#) ; Quinone-Reductase-Inducer 3 uM; Teratologic [DUKE1992B](#) ; TNF-alpha-Inhibitor $IC_{50}=3.99$ uM [JMF6:365](#) ; Topoisomerase-I-Inhibitor [TIH14:223](#) ; Topoisomerase-II-Inhibitor $IC_{50}=8.1$ ug/ml [JNP58:217](#) ; Tyrosinase-Inhibitor $ID_{50}=230$ uM; Uterotrophic $EC_{50}=0.1-25$ uM/l [JMF2:227](#) ; Vasodilator [JAF48:220](#)

KILOCALORIES *Fruit* 370 - 3,135 /kg [USA](#) *Shoot* 640 - 3,000 /kg [USA](#)

No activity reported.

L-ARABINOSE *Resin, Exudate, Sap*: [ABS](#)

No activity reported.

L-RHAMNOSE *Resin, Exudate, Sap*: [ABS](#)

No activity reported.

LEUCINE *Shoot* 7,910 - 37,065 ppm [USA](#)

Antiencephalopathic [M29](#) ; Essential [JBH](#)

LIGNOCERIC-ACID *Seed*: [HHB](#)

Antihepatotoxic

LYSINE *Shoot* 5,370 - 25,165 ppm [USA](#)

Antialkalotic [M29](#) ; Antiherpetic 0.5-3 g/day; Essential [JBH](#) ; Hypoarginanemic 250 mg/kg [M29](#)

MAGNESIUM *Fruit* 450 - 3,815 ppm [USA](#) *Shoot* 1,470 - 6,890 ppm [USA](#)

Antiaggregant 400 mg/day; Antialcoholic [PIL](#) ; Antianginal [WER](#) ; Antianorectic [DAS](#) ; Antianxiety [WER](#) ; Antiarrhythmic; Antiarthritic [DAS](#) ;

Antiasthmatic [PAM](#) ; Antiatherosclerotic; Anticephalagic [PIL](#) ; AntiCFS [PIL](#) ; Anticlimacteric 500-750 mg/day; Anticonvulsant [FAC](#) ; Anticoronary 400 mg/day [SYN-X](#) ; Antidepressant [DAS](#) ; Antidiabetic 400-800 mg/man/day; Antidysmenorrheic 100 mg 4 x/day [WER](#) ; Antiendometriotic 500 mg/day [WAF](#) ; Antienterotic [KEN](#) ; Antiepileptic 450 mg/day; Antifatigue [KEN](#) ; Antifibromyalgic 200-300 mg 3x/day; Antigastrotic [KEN](#) ; Antiglaucomic [ABEL1999](#) ; Antihyperkinetic [DAS](#) ; Antihypertensive [NP6:1](#) ; Antihypoglycemic [DAS](#) ; Antiinflammatory 100 mg 4 x/day [WER](#) ; Antiinsomniac [DAS](#) ; Antilithic [PAM](#) ; AntiLyme 400-1,000 mg; Antimastalgic [PAM](#) ; Antimenopausal 500-750 mg/day; Antimigraine 200 mg/day/man [WER](#) ; Antimitral-valve-prolapse [PIL](#) ; AntiMS; Antinephrolytic; Antineurotic [DAS](#) ; Antiosteoporotic 500-1,000 mg/day/wmn/orl; Antiplaque 500-1,000 mg/day [WAF](#) ; AntiPMS 400-800 mg/day/wmn orl 400-800 mg/day/wmn/orl; AntiRaynaud's 280-350 mg/day [WAF](#) ; Antiretinopathic 400 mg/day [SYN-X](#) ; Antispasmodic [PIL](#) ; Antispasmophilic 500 mg/day [WER](#) ; Antistress 500-750 mg/day [WAF](#) ; Antistroke 400 mg/day [SYN-X](#) ; Antisyndrome-X 400 mg/man/day [SYN-X](#) ; Anxiolytic 500-750 mg/day; Calcium-Antagonist; Cardioprotective [PIL](#) ; CNS-Depressant [FAC](#) ; Diuretic [NP6:1](#) ; Hypocholesterolemic 400 mg/day [WER](#) ; Hypotensive 260-500 mg/day; Immunomodulator [KEN](#) ; Insulinogenic 400 mg/day [SYN-X](#) ; Laxative 300-500 mg/day; Litholytic [PIL](#) ; Myorelaxant 100 mg 4 x/day [WER](#) ; Neurotransmitter; Tranquilizer 500-750 mg/day [WAF](#) ; Uterorelaxant 100 mg 4 x/day [WER](#) ; Vasodilator

[METHIONINE](#) *Shoot* 1,230 - 5,765 ppm [USA](#)

Anticataract [PAM](#) ; Antidote (Acetaminophen) 10 g/16hr/man/orl [M29](#) ; Antidote (Paracetamol) [M29](#) ; Antieczemic [JE26:80](#) ; Antihepatotic [JBH](#) ; Antioxidant [PC27:976](#) ; Antiparkinsonian 1-5 g/day [WER](#) ; Cancer-Preventive [525](#) ; Emetic [M29](#) ; Essential [JBH](#) ; Glutathionigenic [M29](#) ; Hepatoprotective [ACN:207](#) ; Lipotropic [M11](#) ; Urine-Acidifier 200 mg/3x/day/man/orl [MAR](#) ; Urine-Deodorant [M29](#)

[MORINGINE](#) *Bark:* [WOI](#)

No activity reported.

[MORINGINE](#) *Bark:* [WOI](#)

Cardiotonic [IWU](#) ; Enterodepressant [IWU](#) ; Hypertensive [IWU](#) ; Myodepressant [IWU](#) ; Sympathomimetic [IWU](#) ; Vasoconstrictor [IWU](#)

[MYRISTIC-ACID](#) *Shoot:* [HHB](#)

Antioxidant $IC71=60$ [JAF50:2231](#) ; Cancer-Preventive [525](#) ; Cosmetic [JBH](#) ; Hypercholesterolemic [GAS](#) ; Lubricant [JBH](#) ; Nematicide [NIG](#)

[MYROSIN](#) *Stem:* [TRA](#)

No activity reported.

NIACIN *Fruit* 6 - 52 ppm USA *Shoot* 22 - 105 ppm USA

Allergenic WER ; Antiacrodynic DUKE1992B ; Antiallergic 50 mg/2x/day WER ; Antialzheimeran PIL ; Antiamblyopic DUKE1992B ; Antianginal DUKE1992B ; Anticataract DUKE1992B ; Antichilblain JBH ; Anticonvulsant 3 g/day WER ; Antidementia PIL ; Antidermatitic DAS ; Antidiabetic DUKE1992B ; Antidysphagic DUKE1992B ; Antiepileptic WER ; Antihangover 50 mg WAF ; Antihistaminic 50 mg 2x/day WER ; Antihyperactivity 1.5-6 g/day WER ; Antiinsomnic 1 g/day WER ; AntiLyme 50 mg/day; AntiMeniere's JAD ; Antineuralgic DUKE1992B ; Antiparkinsonian 100 mg/day WER ; Antipellagic DAS ; AntiRaynaud's 1,500-4,000 mg/day WAF ; Antiscotomic DUKE1992B ; Antispasmodic 100 mg 2x/day WER ; Antivertigo DUKE1992B ; Cancer-Preventive 525 ; Cardioprotective PIL ; Circulotonic PIL ; Fibrinolytic MPP ; Hepatoprotective DUKE1992B ; Hepatotoxic PIL ; Hypocholesterolemic 50-100 mg 3x/day; Hypoglycemic DUKE1992B ; Hypolipidemic RWG:17 ; Sedative PAM ; Serotonergic PAM ; Vasodilator M29

OCTACOSANOIC-ACID *Stem*: MPI

No activity reported.

OLEIC-ACID *Seed* 227,980 - 237,470 ppm WOI

5-Alpha-Reductase-Inhibitor; Allergenic M&R495 ; Alpha-Reductase-Inhibitor X12033503 ; Anemiagenic DUKE1992B ; Antiallopecic X12033503 ; Antiandrogenic X12033503 ; Antiinflammatory $IC_{50}=21 \mu M$ POP:153 ; Antileukotriene-D4 POP:153 ; Cancer-Preventive 525 ; Choloretic 5 ml/man DUKE1992B ; Dermatitigenic M&R495 ; FLavor *FEMA 1-30* ARC ; Hypocholesterolemic GAS ; Insectifuge 382 ; Irritant M11 ; Percutaneostimulant CPB38:3086 ; Perfumery ARC ; Propecic X12033503

OXALATE *Leaf* 32,400 ppm; MPI

No activity reported.

OXALIC-ACID *Fruit* 1,010 ppm; EB34:278 *Leaf* 1,010 ppm; EB34:278

Acaricide X12090773 ; Antiseptic DUKE1992B ; CNS-Paralytic JBH ; Fatal M29 ; Hemostatic M11 ; Irritant M&R499 ; Pesticide DUKE1992B ; Renotoxic M11 ; Varroacide X12090773

PALMITIC-ACID *Seed* 32,270 - 33,615 ppm WOI

5-Alpha-Reductase-Inhibitor; Antiallopecic X12033503 ; Antiandrogenic X12033503 ; Antifibrinolytic EMP1:53 ; Antioxidant $IC_{40}=60$ JAF50:2231 ; FLavor *FEMA 1* ARC ; Hemolytic BIS ; Hypercholesterolemic GAS ; Lubricant JBH ; Nematicide NIG ; Pesticide DUKE1992B ; Propecic X12033503 ; Soap JBH

PHENYLALANINE *Shoot* 4,870 - 22,820 ppm USA

AntiADD 587 mg/day/orl [M29](#) ; Antidepressant 50-4,000 mg/day/man;
 Antiparkinsonian 200-500 mg/day/man [MAR](#) ; Antisickling 690 ug/ml;
 Antivertiginous 100 mg/kg/day/orl/man [M29](#) ; Monoamine-Precursor [PAM](#) ;
 Tremorigenic 1,600-12,600 mg/man/day [MAR](#)

[PHOSPHORUS](#) *Fruit* 500 - 4,235 ppm [USA](#) *Leaf* 700 - 2,800 ppm [USA](#)
 Antiosteoporotic [DAS](#) ; Anxiolytic [WAF](#) ; Immunostimulant [DAS](#) ; Osteogenic
[DAS](#)

[POTASSIUM](#) *Fruit* 4,610 - 39,065 ppm [USA](#) *Shoot* 3,370 - 15,790 ppm [USA](#)
 Angiotensin-Receptor-Blocker [NP6:1](#) ; Antiarrhythmic [DAS](#) ; Antidepressant
[DAS](#) ; Antifatigue [DAS](#) ; Antihypertensive; Antispasmodic [DAS](#) ; Antistroke;
 Anxiolytic [WAF](#) ; Beta-Blocker [NP6:1](#) ; Cardioprotective 3,000-5,000 mg [PIL](#) ;
 Cardiotoxic 18,000 mg/man/day [DUKE1992B](#) ; Diuretic [NP6:1](#) ; Hypotensive;
 Vasodilator [NP6:1](#)

[PROLINE](#) *Shoot* 4,510 - 21,135 ppm [USA](#)
 No activity reported.

[PROTEIN](#) *Fruit* 21,000 - 177,965 ppm [USA](#) *Leaf* 67,000 - 268,000 ppm [WOI](#) *Seed*
 384,000 - 400,000 ppm [WOI](#) *Shoot* 94,000 - 440,485 ppm [USA](#)
 No activity reported.

[PTERYGOSPERMIN](#) *Root*: [WOI](#)
 Antibacterial [DUKE1992B](#) ; Antibiotic [DUKE1992B](#) ; Fungicide
[DUKE1992B](#) ; Pesticide [DUKE1992B](#)

[QUERCETIN](#) *Flower*: [WOI](#)
 11B-HSD-Inhibitor [CPT59:62](#) ; 5-Lipoxygenase-Inhibitor IC_{50} (μ M)=4;
 Aldehyde-Oxidase-Inhibitor IC_{70-96} =10 μ M [X16394541](#) ; Aldose-Reductase-
 Inhibitor 100 μ M 4 ug/ml [SKN43:99](#) IC_{50} =0.344 μ M [ZZZ18:623](#) IC_{50} =0.84
 ug/ml cow [CPB43:1385](#) ; Allelochemic IC_{82} =1 mM [438](#) ; Allergenic [JBH](#) ;
 Analgesic [FT63\(3\):197](#) ; Antiaflatoxin IC_{50} =25 μ M [X11714299](#) IC_{50} =7.5
 ppm [X11714299](#) ; Antiaggregant 30 μ M [JAF45:4505](#) IC_{50} =55 μ M [EMP5:333](#) ;
 Antiaging [PM69:1125](#) ; Antiallergic IC_{50} =14 μ M [JIM127:546](#) ;
 Antialzheimeran [COX](#) ; Antianaphylactic [PR4\(5\):201](#) ; Antiangiogenic
[EJP459:255](#) ; Antiarthritic [COX](#) ; Antiasthmatic; Antiatherosclerotic
[X11020457](#) ; Antibacterial [JBH](#) ; Anticarcinomic (Breast) IC_{50} =1.5 μ M [MED](#) ;
 Anticariogenic ID_{50} =120 ug/ml [JAF48:5666](#) ; Anticataract [PM56\(3\):258](#) ;
 Anticolitic 400 mg/man/3x/day [PAM](#) ; Anticomplementary [JNP65:1457](#) ;
 AntiCrohn's [PAM](#) ; Anticystitic 1,000 mg/day/4 weeks [X11272677](#) ;
 Antidepressant [JMF6:391](#) ; Antidermatitic [PAM](#) ; Antidiabetic; Antielastase
 IC_{50} =0.8 ug/ml [DUKE1992B](#) ; Antiencephalitic [EMP5:199](#) ; Antiescherichic
[X10857921](#) ; Antiestrogenic; Antifeedant IC_{52} =<1,000 ppm diet [438](#) ;
 Antifibrosarcomic [JAF45:4505](#) ; Antiflu [V&D](#) ; Antigastric [RR21:85](#) ;

Antigonadotropic [JBH](#) ; AntiGTF $ID_{50}=120\text{ ug/ml}$ [JAF48:5666](#) ;
 Antihepatotoxic [PM56\(2\):171](#) ; Antiherpetic 48-150 ug/ml; Antihistaminic
 $IC_{50}<10\text{ uM}$; AntiHIV [JNP60\(9\):884](#) ; Antihydrophobic [V&D](#) ;
 Antihypertensive [KCH](#) ; Antiinflammatory 20-150 mg/kg [FT5:1990](#) ;
 Antileishmanic $IC_{50}=64$ [JNP65:1457](#) ; Antileukemic 5.5-60 uM [BO2](#) $IC_{50}=10\text{ uM}$ [EMP5:225](#) $IC_{50}>10\text{ ug/ml}$ [LS55:1061](#) ; Antileukotriene [PAM](#) ;
 Antilipoperoxidant $IC_{67}=50$; Antimalarial $IC_{50}=1-6.4\text{ ug/ml}$ [MPT](#) ;
 Antimelanomic; Antimetastatic [BO2](#) ; Antimutagenic $ID_{50}=0.62\text{ ug/ml}$
[X14586095](#) $ID_{50}=2-5\text{ nM}$ [PCF](#) ; Antimyocarditic [EMP5:199](#) ;
 Antinitrosaminic [PAL:339](#) ; Antinociceptive [PR14:40](#) ; Antioxidant 4.7 x Vit. E
[BO2](#) $ED_{50}=2.3\text{ uM}$ [PR14:93](#) $IC_{47}=10\text{ uM}$ [JMF5:1](#) $IC_{96}=300\text{ ppm}$ [PCF](#) ;
 Antipancreatic [JNU](#) ; Antiperiodontal [PAM](#) ; Antiperistaltic [X14646351](#) ;
 Antipermeability [DUKE1992B](#) ; Antiperoxidant [PM57:A110](#) ; Antipharyngitic
[PAM](#) ; Antiplaque [PAM](#) ; Antiplasmodial $IC_{50}=13-64$ [JNP65:1457](#) ; AntiPMS
 500 mg/2x/day/wmn [PAM](#) ; Antipodriac; Antipolio [PAM](#) ; Antiproliferant 10
 nM; Antiprostanoid [PCF:51](#) ; Antiprostatic [JNU](#) ; Antipsoriac [PAM](#) ;
 Antiradicular $IC_{50}=4.6\text{ uM}$ [PM56\(6\):695](#) ; Antispasmodic; Antistreptococcic
 $ID_{50}=120\text{ ug/ml}$ [JAF48:5666](#) ; Antithiamin [PCF:69](#) ; Antithrombic [PAL:339](#) ;
 Antitrypanosomic $IC_{50}=13$ [JNP65:1457](#) ; Antitumor 10 uM; Antitumor
 (Bladder) [JNM7:51](#) ; Antitumor (Breast) [JNM7:51](#) ; Antitumor (Colon)
[JAF45:4505](#) ; Antitumor (Lung) [X10918203](#) ; Antitumor (Ovary) [JNM7:51](#) ;
 Antitumor (Skin) 20 uM [BO2](#) ; Antitumor-Promoter [PAM](#) ; Antiulcer
[PR14:581](#) ; Antiviral 48-150 ug/ml [JNP55:1732](#) $IC_{50}=10\text{ uM}$ [EMP5:225](#) ;
 Apoptotic 20-60 uM; ATPase-Inhibitor [NIG](#) ; Bacteristat 10 mg/ml [QRNM](#)
[\(SUMMER\):91](#) ; Bradycardiac [KCH](#) ; Calmodulin-Antagonist [PAM](#) ; cAMP-
 Phosphodiesterase-Inhibitor [PAM](#) ; Cancer-Preventive [525](#) ; Candidicide
[X10857921](#) ; Capillariprotective [M11](#) ; Carcinogenic 40,000 ppm (diet) mus
[NIG](#) ; Catabolic [AFR27:173](#) ; COMT-Inhibitor [QRNM1997:293](#) ; Copper-
 Chelator; COX-2-Inhibitor $<40\text{ uM}$ [BO2](#) ; Cyclooxygenase-Inhibitor [PCF:49](#) ;
 Cytochrome-P450-1A2-Inhibitor [X11752233](#) ; Cytotoxic $ED_{50}=70\text{ ug/ml}$
[PM56\(6\):677](#) $IC_{82}=100\text{ ug/ml}$ [PM57:A113](#) ; Deiodinase-Inhibitor [JNM1:10](#) ;
 Diaphoretic? [LRN-DEC90](#) ; Differentiator 5.5 uM [BO2](#) ; Estrogenic 10%
genistein [BO2](#) ; Fungicide [X10857921](#) ; Glucosyl-Transferase-Inhibitor
 $ID_{50}=120\text{ ug/ml}$ [JAF48:5666](#) ; Hemostat [KCH](#) ; Hepatomagenic 5,000 ppm
 (diet) rat [PCF](#) ; Hepatoprotective [FT67:200](#) ; HIV-RT-Inhibitor $IC_{50}<1$
 ug/ml [JNP53\(5\):1239](#) ; Hypoglycemic 100 mg/kg orl rat [JE27:243](#) ; iNOS-
 Inhibitor $IC_{50}=20\text{ uM}$; Inotropic [X10404425](#) ; Insulinogenic [PAM](#) ; Juvabional
[438](#) ; Larvistat 8,000 ppm diet [438](#) ; Lipoxygenase-Inhibitor $IC_{11}=1.25\text{ mM}$
[JAF38:688](#) $IC_{50}=0.1-5\text{ uM}$ [DFN:154](#) ; MAO-A-Inhibitor [QRNM1997:293](#) ;
 Mast-Cell-Stabilizer [DUKE1992B](#) ; Metal-Chelator (Copper) [PR14:93](#) ;
 Metalloproteinase-Inhibitor $IC_{50}>42\text{ uM}$ [X10723772](#) ; MMP-9-Inhibitor 20
 uM [BO2](#) ; Mutagenic [HG22:27](#) ; NADH-Oxidase-Inhibitor [BJP3:10](#) ; NEP-
 Inhibitor $IC_{50}>42\text{ uM}$ [X10723772](#) ; Neuroprotective 5-25 uM; NF-kB-
 Inhibitor [X15180920](#) ; NO-Inhibitor $IC_{50}=20\text{ uM}$ [X15832817](#) $IC>50=125\text{ uM}$

[JAF50:850](#) ; NO-Synthase-Inhibitor 5-50 μ M; Ornithine-Decarboxylase-Inhibitor <10 μ M; P450-Inducer 5 μ M [FNF](#) ; P450-Inhibitor 50-100 μ M [FNF](#) ; Pesticide [DUKE1992B](#) ; PGE2-Inhibitor [X12144868](#) ; Phospholipase-Inhibitor [BJP3:10](#) ; Plasmodicide [HDN](#) ; Proliferant [X12224631](#) ; Prostaglandin-Synthesis-Inhibitor 40 μ g/ml [PR11:281](#) ; Protein-Kinase-C-Inhibitor [PCF:14](#) ; PTK-Inhibitor 0.4-24 μ M [BO2](#) ; Quinone-Reductase-Inducer 13 μ M 6 μ M [CLE120:213](#) ; Teratologic [DUKE1992B](#) ; TNF-alpha-Inhibitor $IC_{50}=3.11 \mu$ M [JMF6:365](#) ; Topoisomerase-I-Inhibitor $IC_{50}=12.8 \mu$ g/ml $IC_{50}=42 \mu$ M [BO2](#) ; Topoisomerase-II-Inhibitor $IC_{50}=1-6.9 \mu$ g/ml $IC_{50}=23-40 \mu$ M [BO2](#) ; Tumorigenic 0.1% diet orl rat/yr [505](#) ; Tyrosinase-Inhibitor $ID_{50}=70 \mu$ M; Tyrosine-Kinase-Inhibitor [EMP6:170](#) ; Vasodilator; VEGF-Inhibitor [X16737615](#) ; Xanthine-Oxidase-Inhibitor 3.1 μ M [PM69:1125](#) $IC_{50}=10.6 \mu$ g/ml [X12591129](#) $IC_{50}=>0.4 \mu$ g/ml [CPB38:1772](#)

[RIBOFLAVIN](#) Fruit 0.7 - 6.3 ppm [USA](#) Shoot 6 - 30 ppm [USA](#)

Antiarabiflavinotic 2-10 mg/day orl [MAR](#) ; Anticarpal-Tunnel 50 mg/day [WER](#) ; Anticataract 15 mg/day [WER](#) ; Anticephalagic [PIL](#) ; Anticervicaldysplasic 1.6-10 mg/day [WAF](#) ; Anticheilitic [DUKE1992B](#) ; Antidecubitic [DUKE1992B](#) ; Antiglossitic [DAS](#) ; Antikeratitic [DUKE1992B](#) ; AntiLyme 50 mg/day [KEen](#) ; Antimigraine [DUKE1992B](#) ; Antioxidant [PIL](#) ; Antipellagic [DUKE1992B](#) ; Antiphotophobic [DAS](#) ; Cancer-Preventive [525](#)

[SERINE](#) Shoot 4,140 - 19,400 ppm [USA](#)

Cancer-Preventive [525](#)

[SODIUM](#) Fruit 420 - 3,560 ppm [USA](#) Shoot 90 - 420 ppm [USA](#)

Hypertensive [DAS](#)

[SPIROCHIN](#) Root: [WOI](#)

Abortifacient [DUKE1992B](#) ; Analgesic [DUKE1992B](#) ; Antipyretic [DUKE1992B](#) ; Antiseptic [DUKE1992B](#) ; Fungicide [DUKE1992B](#) ; Hypotensive [DUKE1992B](#) ; Myocardiotoxic [DUKE1992B](#) ; Pesticide [DUKE1992B](#) ; Uterotonic [DUKE1992B](#)

[STEARIC-ACID](#) Seed 25,675 - 26,745 ppm [WOI](#)

5-Alpha-Reductase-Inhibitor [X10830511](#) ; Cosmetic [JBH](#) ; FLavor FEMA 2-4,000 [ARC](#) ; Hypocholesterolemic [GAS](#) ; Lubricant [JBH](#) ; Perfumery [ARC](#) ; Propepic [X10830511](#) ; Suppository [JBH](#)

[SULFUR](#) Fruit 1,370 ppm; [EB34:278](#) Leaf 1,370 ppm; [EB34:278](#)

Acarifuge [DUKE1992B](#) ; Antiacne [M29](#) ; Antiarthritic [WER](#) ; Antidandruff [M29](#) ; Antigrey [M29](#) ; Antiosteoarthritic [WER](#) ; Antiseborrheic [M29](#) ; Antiseptic [M29](#) ; Comedogenic [M29](#) ; Keratolytic [M29](#) ; Laxative [M29](#) ; Parasiticide [M29](#) ; Pesticide [DUKE1992B](#) ; Scabicide [M29](#)

THIAMIN *Fruit* 0.5 - 4.5 ppm USA *Shoot* 2 - 12 ppm USA

Analgesic 1-4 g/day WER ; Antialcoholic 50-100 mg/day; Antialzheimeran 100-3,000 mg/day WER ; Antianorectic JBH ; Antibackache 1-4 g/day WER ; Antiberiberi DUKE1992B ; Anticanker MPP ; Anticardiospasmic DUKE1992B ; Anticataract PIL ; Anticolitic DUKE1992B ; Antidecubitic DUKE1992B ; Antideliriant DUKE1992B ; Antidementia PIL ; Antidyspeptic PIL ; Antiencephalopathic M29 ; Antifatigue JBH ; Antigastritic JBH ; Antihangover 50 mg WAF ; Antiheartburn DUKE1992B ; Antiherpetic DUKE1992B ; AntiLyme; Antimigraine DUKE1992B ; Antimyocarditic DUKE1992B ; Antineuralgic 1-4 g/day WER ; Antineurasthenic DUKE1992B ; Antineuritic DUKE1992B ; Antineuropathic 50 mg WER ; Antipoliomyelitic DUKE1992B ; Insectifuge 75-150 mg/man/day MAR ; Neuroprotective PIL ; Pesticide DUKE1992B

THREONINE *Shoot* 4,110 - 19,260 ppm USA

Antioxidant? PC27:976 ; Antiulcer M29 ; Essential JBH ; FLavor *FEMA* 1,000 ARC

TOCOPHEROL *Leaf* 74 - 296 ppm WOI

5-HETE-Inhibitor BO2 ; Allergenic NAH19(9):4 ; Analgesic 100 IU 3 x day WER ; Antiaggregant MAR ; Antiaging SYN-X ; Antialzheimeran 2,000 IU SYN-X ; Antianginal 1,067 mg/man/day DUKE1992B ; Antiartherosclerotic DUKE1992B ; Antiarthritic PIL ; Antiatherosclerotic PAM ; Antibronchitic DUKE1992B ; Anticancer (Breast) $IC_{50}=125 \text{ ug/ml}$ JN:1997 ; Anticariogenic JD23:101 ; Anticataract PIL ; Antichorea DUKE1992B ; Antichoreic DUKE1992B ; Anticonvulsant DUKE1992B ; Anticoronary 100-200 IU/day; Antidecubitic DAS ; Antidementia PIL ; Antidermatitic PJB1(3):250 ; Antidiabetic 600-1,200 mg/day EMP6:164 ; Antidysmenorrhic DAS ; Antiepileptic PCF:20 ; Antifibrositic MAR ; Antiglycosation SYN-X ; Antiherpetic MAR ; Antiinfertility PIL ; Antiinflammatory SYN- ; Antiischemic JE29:31 ; Antileukemic 100-250 uM BO2 ; Antileukotriene PAM ; Antilithic 600 mg/day WER ; Antilupus DUKE1992B ; Antimaculitic PIL ; Antimastalgic DAS ; AntiMD DUKE1992B ; Antimelanomic DUKE1992B ; AntiMS DUKE1992B ; Antimyoclonic PAM ; Antineuritic M29 ; Antineuropathic PIL ; Antinitrosaminic PCF:20 ; Antiophthalmic DUKE1992B ; Antiosteoarthritic DAS ; Antioxidant $IC_{36}=10 \text{ uM}$ JMF5:1 $IC_{50}=30 \text{ ug/ml}$ CPB38:1051 $IC_{95}=650 \text{ uM}$ PM56(6):678 ; Antiparkinsonian ARN45:1350 ; AntiPMS 300 IU 2 x day; Antiproliferant $IC_{50}=150 \text{ ug/ml}$ JN:1997 ; Antiradicular PAM ; Antiretinopathic? M29 ; Antirheumatic PIL ; Antisenility PJB1(3):250 ; Antisickling MAR ; Antispasmodic 300 mg/man/day MAR ; Antisterility PJB1(3):250 ; Antistroke DAS ; Antisunburn NAH18(9):4 ; Antisyndrome-X SYN-X ; Antithalassemic DAS ; Antithrombotic 600 IU/day WER ; Antithromboxane-B2 SYN-X ; Antitoxemic DUKE1992B ; Antitumor 7 uM *ckn* PCF:19 ; Antitumor (Breast) 100-250 uM BO2 $IC_{50}=125$

ug/ml [SYN-X](#) ; Antitumor (Colorectal) *500-10,000 uM* [BO2](#) ; Antitumor (Prostate) *100-250 uM*; Antitumor (Stomach) [PIL](#) ; Antiulcerogenic *67 mg/man/3 x/day/orl*; Apoptotic *100-250 uM* [BO2](#) ; Calcium-Antagonist [NP6:1](#) ; Cancer-Preventive [525](#) ; Cardioprotective [PIL](#) ; Cerebroprotective [KCH](#) ; Circulatory-Stimulant [DAS](#) ; Circulotonic; Hepatoprotective [DUKE1992B](#) ; Hypocholesterolemic *100-450 IU/man/day*; Hypoglycemic *600 IU/man/day* [SYN-X](#) ; Immunomodulator [PIL](#) ; Immunostimulant *60-800 IU*; Insulin-Sparing *1,000 IU* [WER](#) ; Lipoxygenase-Inhibitor [PAM](#) ; NO-Inhibitor [PIL](#) ; Ornithine-Decarboxylase-Inhibitor *400 mg/kg* [BO2](#) ; P21-Inducer *500-10,000 uM* [BO2](#) ; Phospholipase-A2-Inhibitor [BO2](#) ; Protein-Kinase-C-Inhibitor *10-50 uM* [BO2](#) *IC50=450 uM* [BO2](#) ; Vasodilator [SYN-X](#)

TRYPTOPHAN Shoot 1,440 - 6,745 ppm [USA](#)

Analgesic *750 mg/4x/day/orl/man* [M29](#) ; Antianxiety *500-1,000 mg/meal* [WER](#) ; Antidementia *3 g/day* [WER](#) ; Antidepressant *1-3 g/3x/day/orl/man* [M29](#) ; Antidyskinetic *2-8 g/orl/wmn/day* [M29](#) ; Antihypertensive [JAF36:1079](#) ; Antiinsomniac *1-3 g/day* [WER](#) ; Antimanic *12 g/man/day/orl* [PAM](#) ; Antimenopausal *6 g/day* [WER](#) ; Antimigraine *500 mg/man/4x/day* [M29](#) ; Antioxidant *125 ug/ml*; Antiparkinsonian *2 g 3 x/day* [WER](#) ; Antiphenylketonuric [M29](#) ; Antiprostaglandin *250 pg/ml* [X12120812](#) ; Antipsychotic *12 g/man/day* [M29](#) ; Antirheumatic [M29](#) ; Antiscoliotic [ACS791:267](#) ; Carcinogenic [CRC](#) ; Essential [JBH](#) ; Hypnotic [M29](#) ; Hypoglycemic [EMP6:157](#) ; Hypotensive *3 g/day* [WER](#) ; Insulinase-Inhibitor [EMP6:157](#) ; Insulinotonic [JAF36:1079](#) ; Monoamine-Precursor [PAM](#) ; Prolactinogenic [PAM](#) ; Sedative *3-10 g/man/day*; Serotonergic *6-12 g/day/orl/man* [MAR](#) ; Tumor-Promoter [JAF36:1079](#)

TYROSINE Shoot 3,470 - 16,260 ppm [USA](#)

Antidepressant?; Antiencephalopathic [M29](#) ; Antiparkinsonian *100 mg/kg/day* [WER](#) ; Antiphenylketonuric [M29](#) ; Antiulcer *256 mg scu* [BBE](#) *400 mg/kg ipr rat* [BBE](#) ; Cancer-Preventive [525](#) ; Monoamine-Precursor [PAM](#)

VALINE Shoot 6,110 - 28,630 ppm [USA](#)

Antiencephalopathic [M29](#) ; Essential [DUKE1992B](#) ; FLavor *FEMA 1,000-2,000* [ARC](#)

VANILLIN Stem: [MPI](#)

Allelochemic *IC50=4.26 mM* [438](#) ; Allergenic [M&R416](#) ; Antianemic [X15180869](#) ; Anticancer [JAF47:397](#) ; Antidrepanocytic [X15180869](#) ; Antiescherichic *10-100 mmol/l* [X15186447](#) ; Antilactobacillic [X15186447](#) ; Antilisteria [X14968973](#) ; Antimutagenic [EMP6:235](#) ; Antioxidant =*ascorbic acid*; Antipolio [EMP5:194](#) ; Antiradicular *7 x quercetin* [JAF47:397](#) ; Antisickling; Antitumor [JAF47:397](#) ; Antitumor-Promoter [JAF47:397](#) ; Antiviral [EMP5:194](#) ; Antiyeast *8-30 mM* [X14968976](#) ; Bacteristat *10-40*

mmol/l [X15186447](#) ; Cancer-Preventive [525](#) ; Candidicide 8-20 *mM* [X14968976](#) ; Choleric [RIN](#) ; FLavor *FEMA* 50-20,000 [ARC](#) ; Fungicide [JBH](#) ; Immunosuppressant [RWG29](#) ; Insectifuge? [MAR](#) ; Irritant; Perfumery; Pesticide [DUKE1992B](#)

VIT-B-6 *Fruit* 1 - 10 ppm [USA](#) *Shoot* 12 - 56 ppm [USA](#)

No activity reported.

WATER *Fruit* 882,000 ppm; [USA](#) *Leaf* 750,000 ppm; [WOI](#) *Seed* 40,000 ppm; [WOI](#) *Shoot* 786,600 ppm; [USA](#)

No activity reported.

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ppm = parts per million
tr = trace

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