

Dr. Duke's Phytochemical and Ethnobotanical Databases

Chemicals and their Biological Activities in: *Pinus sylvestris* L. (Pinaceae) -- Scotch Pine

Chemicals

(+)-CATECHIN *Plant*:

ACE-Inhibitor 0.24 mg/ml rbt (weak activity) $IC_{50}=0.155$ mM/l; Antiaggregant $IC_{68}=200$ ug/ml; Anticoagulant; Anticomplementary 1/2 aspirin; AntiHIV $EC_{50}=4$ ug/ml; Antiinflammatory $IC_{50}=40-943$ uM (cf indomethacin $IC_{50}=1$ uM); Antimutagenic $ID_{50}=50-100$ nM; Antioxidant; Antiperoxidant; Antiprostaglandin $IC_{50}=40-943$ uM (cf indomethacin $IC_{50}=1$ uM); Antiradicular; Antiulcer; Beta-Adrenergic Receptor Blocker 10 uM (weak activity); cAMP-Phosphodiesterase-Inhibitor; Cancer-Preventive; Cardiotonic; COX-1-Inhibitor $IC_{50}=183-279$ uM (cf indomethacin $IC_{50}=1$ uM); COX-2-Inhibitor $IC_{50}=546-5,910$ uM (cf indomethacin $IC_{50}=1$ uM); Cyclooxygenase-Inhibitor; Cytotoxic $TC_{50}>100$ ug/ml; Dermatitigenic; Hemostat; Hepatoprotective; Immunostimulant; Neuroprotective 1-10 uM; NO-Inhibitor $IC_{11}=250$ uM; Phagocytotic; Vasoconstrictor; Xanthine-Oxidase-Inhibitor

(+)-PINIFOLIC-ACID *Plant*:

No activity reported.

1,8-CINEOLE *Leaf*:

(-)-Chronotropic 87 nl/ml; (-)-Inotropic; Acaricide $LC_{100}=6$ uM; Allelopathic; Allergenic; Anesthetic; Anthelmintic; Antiacetylcholinesterase $IC_{50}=41$ ug/ml; Antiallergic; Antibacterial 50 ppm; Antibronchitic; Anticariogenic; Anticatarrh; Anticholinesterase $IC_{50}=50-70$; Antifatigue; Antihalitosis; Antiinflammatory; Antilaryngitic; Antinociceptive; Antipharyngitic; Antiplateau; Antirheumatic; Antirhinitic; Antiseptic; Antisinusitic; Antispasmodic; Antistaphylococcic 50 ppm; Antitussive; Antiulcer; Candidicide; Carcinogenic; Choloretic; CNS-Stimulant; Convulsant; Counterirritant; Cytochrome-P450-Inducer; Decongestant; Degranulant 0.3 ul/ml; Dentifrice; Edemagenic inj; Expectorant; FLavor FEMA 1-200; Fungicide; Gastroprotective; Gram(+)-icide; Gram(-)-icide; Hepatotonic; Herbicide $IC_{50}=78$ uM; Hypotensive; Inflammatory inj; Insectifuge; Irritant; Myorelaxant; Nematicide; Neurotoxic; P450-Inducer; Pediculicide 2.3 x pyrethrin; Perfume; Pesticide; Rubefacient; Secretogogue; Sedative; Spasmogenic; Surfactant; Testosterone-Hydroxylase-Inducer; Transdermal; Trichomonicide $LD_{100}=1,000$ ug/ml

18-NORDEHYDROABIET-4(19)-ENE *Resin, Exudate, Sap*:

No activity reported.

18-NORDEHYDROABIETAN-4-ALPHA-OL *Plant*:

No activity reported.

18-NORDEHYDROYABIET-4-ALPHA-OL Resin, Exudate, Sap:

No activity reported.

18-NORPIMARA-8,15-DIEN-4-ALPHA-OL Resin, Exudate, Sap:

No activity reported.

19-NORISOPIMARA-8,14,15-DIEN-3-ONE Plant:

No activity reported.

19-NORPIMARA-8(14),15-DIEN-3-ONE Plant:

No activity reported.

3-HYDROXY-1(4-HYDROXY-3-METHOXYPHENYL)-1-PROPANONE Bark:

No activity reported.

8,9-ISOPIMARIC-ACID Plant:

No activity reported.

ABIETA-8,11,13-TRIENE-15,18-DIOL Plant:

No activity reported.

ABIETIC-ACID Resin, Exudate, Sap 180,000 ppm;

Antifeedant; Protisticide; Schistosomicide

ABIETINAL Resin, Exudate, Sap:

No activity reported.

ABIETINOL Resin, Exudate, Sap:

No activity reported.

ADENINE Flower:

Antianemic 1.5 g/day; Antigranulocytopenic; Antiviral; CNS-Stimulant; Diuretic; Hyperuricemic; Insectifuge; Lithogenic; Myocardiotoxic; Pesticide; Vasodilator

ALPHA-CAROTENE Leaf:

Anticancer; Anticancer (Liver); Anticancer (Lung); Anticancer (Skin); Antiproliferant 10 x beta-carotene; Colorant; Previtamin-A

ALPHA-LONGIPINENE Resin, Exudate, Sap:

No activity reported.

ALPHA-MUUROLENE Stem:

No activity reported.

ALPHA-PHELLANDRENE Leaf:

Antibacterial; Antistaphylococcic; Dermal; Emetic; FLavor FEMA 10-130; Fungicide; Insectiphile; Irritant; Laxative; Perfumery; Pesticide

ALPHA-PINENE Leaf 600 - 2,500 ppm Resin, Exudate, Sap: Root Essent. Oil:

Allelochemic; Allergenic; Antiacne; Antibacterial; Antifeedant; Antiflu; Antiinflammatory 500 mg/kg; Antipneumonic; Antiseptic; Antispasmodic; Antistaphylococcic; Antiviral; Cancer-Preventive; Coleoptophile; Expectorant; FLavor

FEMA 15-150; Herbicide $IC_{50}=30\ \mu M$; Insecticide $0.82\ \mu M/fly$; Insectifuge $50\ ppm$; Insectiphile; Irritant; P450-2B1-Inhibitor $IC_{50}=0.087\ \mu M$; Perfumery; Pesticide; Sedative; Spasmogenic; Tranquilizer; Transdermal

ALPHA-TERPINENE *Root*:

Acaricide; ACE-Inhibitor $100\ \mu g/ml$ (*weak activity*); Aldose-Reductase-Inhibitor $100\ \mu g/ml$; Antiacetylcholinesterase $IC_{50}=1.0\ mM$; Antinitrosaminic; Antispasmodic; FLavor *FEMA 1-40*; Insecticide $0.86\ \mu M/fly$; Insectifuge; P450-2B1-Inhibitor $IC_{50}=0.76\ \mu M$; Perfumery; Pesticide; Spasmogenic

ANDROSTENEDIONE *Pollen Or Spore*:

Androgenic

ANISALDEHYDE *Leaf*:

Antimutagenic; Fungicide; Insecticide; Pesticide; Tyrosinase-Inhibitor $ID_{50}=0.32\ mM$
 $ID_{50}=320\ \mu M$ $ID_{50}=380-970\ \mu M$

ARABINOSE *Leaf 600 ppm*:

No activity reported.

BETA-COPAENE *Stem*:

No activity reported.

BETA-MYRCENE *Leaf*:

Cancer-Preventive; Perfumery

BETA-PHELLANDRENE *Resin, Exudate, Sap*:

Expectorant; Fungicide; Perfumery

BETA-PINENE *Leaf 200 - 1,500 ppm Resin, Exudate, Sap: Root Essent. Oil*:

Allergenic; Antiinflammatory; Antiseptic; Antispasmodic; Candidicide; FLavor *FEMA 15-600*; Herbicide; Insectifuge; Irritant; Perfumery; Pesticide; Spasmogenic; Transdermal

BETA-YLANGENE *Leaf*:

No activity reported.

BORNEOL *Leaf*:

(-)-Chronotropic $29\ \mu g/ml$; (-)-Inotropic; Allelochemic; Analgesic; Antiacetylcholine; Antibacterial $MIC=125-250\ \mu g/ml$; Antibronchitic; Antiescherichic $MIC=125\ \mu g/ml$; Antifeedant; Antiinflammatory; Antiotitic; Antipyretic; Antisalmonella; Antispasmodic $ED_{50}=0.008\ mg/ml$; Antistaphylococcic $MIC=250\ \mu g/ml$; Antiyeast; Candidicide; Choleric; CNS-Stimulant; CNS-Toxic; FLavor *FEMA <1*; Fungicide; Hepatoprotective; Herbicide $IC_{50}=470\ mM$ $IC_{50}=470\ \mu M$; Inhalant; Insect-Repellent; Insectifuge; Irritant; Myorelaxant; Nematicide $MLC=1\ mg/ml$; Perfumery; Pesticide; Sedative; Tranquilizer

BORNYL-ACETATE *Leaf 60 - 175 ppm*:

(-)-Chronotropic $933\ nl/ml$; (-)-Inotropic; Antibacterial; Antifeedant; Antispasmodic $ED_{50}=0.09\ mg/ml$; Antiviral; Expectorant; FLavor *FEMA 70-80*; Insectifuge; Myorelaxant; Pesticide; Sedative

CAMPESTEROL Bark:

Antioxidant $IC_{37}=10 \mu M$; Hypocholesterolemic

CAMPHENE Resin, Exudate, Sap:

Allelopathic; Antilithic?; Antioxidant; Expectorant; FLavor *FEMA 15-175*;
Hypocholesterolemic?; Insectifuge; Pesticide; Spasmogenic

CAPRIC-ACID Leaf:

Fungicide; Irritant; Pesticide

CAPRONALDEHYDE Leaf:

No activity reported.

CAROTENES Leaf 170 ppm;

No activity reported.

CARYOPHYLLENE Leaf:

Aldose-Reductase-Inhibitor; Allergenic; Analgesic; Antiacne; Antiasthmatic;
Antibacterial; Anticariogenic $MIC=>1,600 \mu g/ml$; Antidermatitic; Antiedemic;
Antifeedant 500 ppm; Antiinflammatory $IC_{50}=100 \mu M$; Antileishmanic;
Antionychyotic; Antiproliferant; Antispasmodic; Antistaphylococcic; Antistreptococcic;
Antitumor; Antiulcer; Candidicide; FLavor *FEMA 20-200*; Fungicide; Gastroprotective;
Insectifuge; Irritant; Larvicide; Mosquitocide; Perfumery; Pesticide; Sedative;
Termitifuge

CEROTIC-ACID Flower:

No activity reported.

CHAMAZULENE Leaf:

Analgesic; Antiallergic; Antiinflammatory; Antileukotriene; Antioxidant; Antipyretic;
Antiseptic; Antispasmodic; Pesticide; Vulnerary

CIS-BETA-OCIMENE Leaf:

No activity reported.

CITRAL Leaf:

Allergenic; Antiallergic; Antianaphylactic; Antibacterial; Antihistaminic; Antiseptic 5.2
x phenol; Antishock; Barbituate-Synergist; Bronchorelaxant; Cancer-Preventive;
Expectorant; FLavor *FEMA 4-170*; Fungicide $MIC 625 \mu g/ml$; Glaucomagenic;
Herbicide $IC_{50}=115 \mu M$; Nematicide $IC_{52}=100 \mu g/ml$ $MLC=100-260 \mu g/ml$;
Perfumery; Pesticide; Prostatitigenic 185 mg/kg/day/3 ms; Sedative $ED 1-32 \text{ mg/kg}$;
Teratogenic; Trichomonicide $LD_{100}=150 \mu g/ml$; Tyrosinase-Inhibitor $ID_{50}=1.5 \text{ mM}$

COPABORNEOL Stem:

No activity reported.

COPAENE Resin, Exudate, Sap:

Carminative

CRYPTONE Leaf:

No activity reported.

CUMINALDEHYDE *Leaf*:

Antibacterial; FLavor *FEMA* <1; Fungicide; Irritant; Larvicide; Perfumery; Pesticide; Sedative; Tyrosinase-Inhibitor *ID50*=0.05 mM; Ulcerogenic

D-DELTA-4-CARENE *Root*:

No activity reported.

D-INOSITOL *Bark*:

No activity reported.

D-LIMONENE *Leaf*:

Antiacetylcholinesterase *IC22*=1.2 mM; Anticancer (Breast) 8,000 mg/kg; Anticancer (Gastric); Antimelanomic *IC50*=450 uM/l; Antitumor (Breast) 8,000 mg/kg; Antitumor (Gastric); Antitumor-Promoter; Apoptotic; Cancer-Preventive; Chemopreventive; Differentiator; FLavor *FEMA* 30-2,300; Hypocholesterolemic; Insecticide; Insectifuge; Litholytic; Nephrotoxic; P450-2B1-Inhibitor *IC50*=0.19 uM; Pesticide

D-MYRCENE *Resin, Exudate, Sap*:

No activity reported.

D-PIMARIC-ACID *Resin, Exudate, Sap* 80,000 ppm;

No activity reported.

DEHYDROABIETANE *Resin, Exudate, Sap*:

Antibacterial; Cytostatic *ID50*=100 ug/ml; Pesticide

DEHYDROABIETIC-ACID *Resin, Exudate, Sap* 70,000 ppm;

Allergenic; Antifeedant; Pesticide; Protisticide; Schistosomicide

DEHYDROABIETINAL *Resin, Exudate, Sap*:

No activity reported.

DEHYDROPINIFOLIC-ACID *Leaf*:

No activity reported.

DELTA-3-CARENE *Resin Essent. Oil: Root Essent. Oil*:

Allergenic?; Antibacterial; Antiinflammatory *ipr*; Dermatitigenic; FLavor *FEMA*; Insectifuge; Irritant; Pesticide

DELTA-CADINENE *Resin, Exudate, Sap*:

Aldose-Reductase-Inhibitor; Antiacne; Antibacterial *MIC*800 ug/ml; Anticariogenic; Antistreptococcic; Cytochrome-P450-Inducer; P450-Inducer; Pesticide; Testosterone-Inducer

DIHYDRO-BETA-SITOSTEROL *Bark*:

No activity reported.

DIHYDRO-P-COUMARIC-ALCOHOL *Bark*:

No activity reported.

DIHYDROCONIFERYL-ALCOHOL *Bark*:

No activity reported.

DIHYDROQUERCETIN Bark:

Antimutagenic $ID_{50}=50-100$ nM; Antioxidant; Antithiamin

DIPENTENE Resin, Exudate, Sap:

Allergenic; Antibacterial; Antiviral; Expectorant; Irritant; Pesticide; Sedative

EPICATECHIN Plant:

Allelochemic $IC_{100}=1$ mM; Anabolic; Antiaggregant $IC_{94}=200$ ug/ml; Antianaphylactic; Antibacterial $MIC=>1,000$ ug/ml; Anticomplementary $1/2$ aspirin; Antidiabetic 30 mg/kg rat; AntiEBV; Antifeedant; Antihepatitic; AntiHIV $EC_{50}=2$ ug/ml; Antihyperglycemic; Antiinflammatory; Antileukemic $IC_{50}>10$ ug/ml; Antilipoperoxidant; Antimutagenic; Antioxidant 2.5 x Vit. E $3/4$ quercetin $IC_{50}=10.2$ uM $IC_{50}=6.3$ ug/ml; Antiperoxidant; Antiviral; Cancer-Preventive; Cardiotonic; Choline-Sparing; Hepatotropic; Hypocholesterolemic; Hypoglycemic; Insulinogenic; Interleukin-1-alpha-Inhibitor; Interleukin-6-mRNA-Inhibitor; Lipoxygenase-Inhibitor $IC_{50}=140$ uM $IC_{97}=5$ mM; NO-Inhibitor; Pancreatogenic; Peroxynitrite-Scavenger $IC_{50}=0.181$ ug/ml; Pesticide; Propeptic; TNF-alpha-Inhibitor; Xanthine-Oxidase-Inhibitor $IC_{50}>40$

EPIMANOILOXIDE Resin, Exudate, Sap:

No activity reported.

EPSILON-MUROLENE Stem:

No activity reported.

ESTERS Leaf 64 - 122 ppm

No activity reported.

ESTRAGOLE Plant:

Antiaggregant $IC_{50}=320$ uM; Calcium-Antagonist $IC_{50}=257.6$ uM gpg; Cancer-Preventive; Carcinogenic 4.4 uM/15 mos. scu mus; DNA-Binder; FLavor FEMA 4-150; Hepatocarcinogenic $0.23-0.46\%$ diet/12 mos.; Hypothermic; Insecticide; Insectifuge; Mutagenic; Perfumery

EUGENOL-METHYL-ETHER Plant:

Cancer-Preventive; CNS-Depressant; DNA-Binder; Hypothermic; Myorelaxant

FERULIC-ACID Bark:

Allelopathic; Analgesic; Antiaggregant; Antiallergic; Antiarrhythmic; Antibacterial; Anticancer (Colon); Anticancer (Forestomach); Anticancer (Liver); Anticancer (Skin); Anticarcinogenic; Antidysmenorrhic; Antiestrogenic; Antihepatotoxic; Antiherpetic; Antiinflammatory; Antileukemic $IC_{50}=25-56$ ug/ml; Antimitotic; Antimutagenic; Antineoplastic (Stomach); Antinitrosaminic; Antioxidant $1/2$ BHA $1/3$ quercetin $3,000$ uM $EC_{50}=9-15$ ug/ml $IC_{51}=200$ ppm; Antiradicular $EC_{50}=9-15$ ug/ml $IC_{50}=116-124$ uM; Antiserotonin; Antispasmodic; Antithrombic; Antitumor; Antitumor (Colon); Antitumor (Forestomach); Antitumor (Liver); Antitumor (Skin); Antitumor-Promoter $IC_{46}=10$ uM; Antiviral; Arteriodilator; Cancer-Preventive; Candidicide; Cardiac; Cholagogue; Choloretic; Fungicide; Hepatoprotective; Hepatotropic; Herbicide; Hydrocholoretic; Hypolipidemic; Immunostimulant; Insectifuge; Metal-Chelator; Ornithine-Decarboxylase-Inhibitor; Pesticide; Phagocytotic; Preservative; Prostaglandinogenic; Prostaglandin-Synthesis-Inhibitor $0.58-3.2$ mM; Sunscreen; Uterosedative $30-100$ mg/kg ivn rat

FURFURAL Root:

Antiseptic; FLavor *FEMA 1-30*; Fungicide; Insecticide; Irritant; Pesticide

GAMMA-CADINENE Resin, Exudate, Sap:

No activity reported.

GAMMA-CAROTENE Leaf:

Colorant; Previtamin-A

GAMMA-MUROLENE Stem:

No activity reported.

GUAIACYL-GLYCERIN-BETA-D-GLUCOSIDE Leaf:

No activity reported.

GUANOSINE Flower:

No activity reported.

ISOCAPROIC-ACID Leaf:

No activity reported.

ISODEXTROPIMARIC-ACID Resin, Exudate, Sap 80,000 ppm;

No activity reported.

ISOPIMARA-7,15-DIEN-18-AL Plant:

No activity reported.

ISOPIMARA-7,15-DIENE Plant:

No activity reported.

ISOPIMARIC-ACID Plant:

Antifeedant; Pesticide

ISOPIMARINAL Resin, Exudate, Sap:

No activity reported.

JUNIPERIC-ACID Leaf:

No activity reported.

L-HISTIDINE Flower:

No activity reported.

L-LIMONENE Leaf:

Antiacetylcholinesterase $IC_{25}=1.2\text{ mM}$ $IC_{27}=164\text{ ug/ml}$

L-PIMARIC-ACID Resin, Exudate, Sap 180,000 ppm;

No activity reported.

LIMONENE Resin, Exudate, Sap:

Acaricide $LC_{100}=8\text{ uM}$; AChE-Inhibitor; Allelochemical; Allergenic *1/20th carene*;
Antiacetylcholinesterase $IC_{22-26}=1.2\text{ mM}$; Antiadenomic; Antialzheimeran?;
Antiasthmatic; Antibacterial; Anticancer; Antiesophagitic; Antifeedant; Antiflu;

Antiinflammatory; Antilithic; Antilymphomic; Antimetastatic (Stomach); Antimutagenic; Antiobesity; Antiseptic; Antispasmodic $ED_{50}=0.197\text{ mg/ml}$; Antitumor; Antitumor (Breast); Antitumor (Colon); Antitumor (Pancreas); Antitumor (Prostate); Antitumor (Stomach); Antiviral; Apoptotic; Bronchoprotectant; Cancer-Preventive; Candidistat; Chemopreventive; Cholesterolytic; Detoxicant; Enterocontractant; Expectorant; FLavor; Fungiphilic; Fungistat; GST-Inducer; Herbicide $IC_{50}=45\text{ }\mu\text{M}$; Histaminic; Immunomodulator; Insecticide $0.37\text{ }\mu\text{M/fly}$; Insectifuge; Interleukin-6-Inhibitor; Irritant; Lipolytic; Myorelaxant 50 mg/kg ; Nematicide $IC=100\text{ }\mu\text{g/ml}$; NO-Genic; Ornithine-Decarboxylase-Inhibitor $\sim 750\text{ mg/kg (diet)}$; Ozone-Scavenger; P450-Inducer; Peristaltic; Pesticide; Photosensitizer; Sedative $ED=1-32\text{ mg/kg}$; Transdermal

LONGICYCLENE Resin, Exudate, Sap:

No activity reported.

LONGIFOLENE Resin, Exudate, Sap:

No activity reported.

LUTEIN Leaf:

Antiatherosclerotic; Anticancer (Breast); Antimaculitic; Antinycctalopic; Antioxidant; Antiproliferant; Antiradicular; Antiretinitic Optometry; Antitumor (Breast); Antitumor (Colon); Colorant; Prooxidant $5-40\text{ }\mu\text{g/g}$; Quinone-Reductase-Inducer $2.5\text{ }\mu\text{g}$; Retinoprotectant Optometry; Ubiquiot

LUTEIN-EPOXIDE Leaf:

No activity reported.

M-MENTH-6-EN-8-OL Resin, Exudate, Sap:

No activity reported.

MALONIC-ACID Bark:

Irritant

MELIBIOSE Leaf 3,000 ppm;

No activity reported.

MESO-INOSITOL Leaf 3,000 ppm;

No activity reported.

METHYL-DEHYDROABIETANE Resin, Exudate, Sap:

No activity reported.

MUUROLENE Resin, Exudate, Sap:

No activity reported.

MYO-INOSITOL Bark:

No activity reported.

N-NONACOSANE Bark:

Antimutagenic

NEOABIETIC-ACID Resin, Exudate, Sap 180,000 ppm;

Antifeedant; Pesticide; Protisticide; Schistosomicide

NEOXANTHIN *Leaf*:

Colorant; Ubiquit

P-MENTHANOL-4 *Root*:

No activity reported.

PALUSTRIC-ACID *Resin, Exudate, Sap 100,000 ppm*:

No activity reported.

PARAHYDROXYBENZOIC-ACID *Bark*:

No activity reported.

PHENOL *Wood*:

Analgesic; Anesthetic; Antibacterial; Antihemorrhoidal; Antihydrocoele;
Antiincontinence; AntiMS; Antionychogryphotic; Antiotitic; Antioxidant;
Antiprostaitic; Antipyruvetic; Antiseptic; Antisinusitic; Antispastic; Antiviral;
Antiwrinkle; Cancer-Preventive; Carcinogenic; CNS-Depressant; Emetic; Fungicide;
Hemolytic 5,400 ppm; Pesticide; Rodenticide LD50=1,040 cut rat; Vasodilator

PIMAR-15-EN-4,8-DIOL *Resin, Exudate, Sap*:

No activity reported.

PIMARADIENE *Resin, Exudate, Sap*:

No activity reported.

PIMARINAL *Resin, Exudate, Sap*:

No activity reported.

PIMARINOL *Resin, Exudate, Sap*:

No activity reported.

PINICORRETIN *Bark*:

No activity reported.

PINIPICRIN *Leaf*:

No activity reported.

PINITOL *Bark: Leaf 20,000 ppm*:

Antidiabetic; Antifeedant; Expectorant FEA; Insectifuge; Pesticide

PINOBANKSIN *Stem*:

No activity reported.

PINOCEMBRIN *Wood*:

Anesthetic; Antibacterial IC 3 ug/ml; Antileukemic; Antiseptic; Artemicide LC50=12
ppm; Candidicide IC 0.1-3 mg/ml; Cytotoxic ED50=21; Fungicide; Pesticide

PINOSYLVIN *Wood: 8,000 ppm*:

Antibacterial; Antifeedant; Fungicide; Pesticide; Phytoalexin

PINOSYLVINMONOMETHYLETHER *Wood*:

No activity reported.

PROPIONALDEHYDE Root:

FLavor *FEMA 5-12*; Perfumery

PROTocatechuic-ACID Bark:

Allergenic; Alpha-Glucosidase-Inhibitor; Antiarrhythmic; Antiasthmatic; Antibacterial; Anticlastogen; Antihepatotoxic; Antiherpetic; Antiinflammatory; Antiischemic; AntiLegionella; Antileukemic; Antimelanogenic *ID60=0.5 uM/ml*; Antimutagenic; Antiophidic; Antioxidant *1/2 BHT 10 x alpha-tocopherol 2/3 quercetin*; Antiperoxidant *IC50=>100 uM IC75=200 ug/ml*; Antiradicular; Antiseptic; Antispasmodic *EC50=4.6-17 uM*; Antitumor (Colon); Antitumor (Mouth); Antitumor (Skin); Antitussive; Antiviral; Apoptotic; Carcinogenic; Cardioprotective; Chemopreventive *100 ppm orl rat*; Fungicide *500 ug/ml*; Glutathione-Depleting; Hepatotoxic; Immunostimulant; Nephrotoxic; Pesticide; Phagocytotic; Prostaglandinogenic; Secretagogue; Tyrosinase-Inhibitor *ID60=0.5 uM/ml*; Ubiquitin

QUERCETIN Bark:

11B-HSD-Inhibitor; 5-Lipoxygenase-Inhibitor *IC50 (uM)=4*; Aldehyde-Oxidase-Inhibitor *IC70-96=10 uM*; Aldose-Reductase-Inhibitor *100 uM 4 ug/ml IC50=0.344 uM IC50=0.84 ug/ml cow*; Allelochemic *IC82=1 mM*; Allergenic; Analgesic; Antiaflatoxin *IC50=25 uM IC50=7.5 ppm*; Antiaggregant *30 uM IC50=55 uM*; Antiaging; Antiallergic *IC50=14 uM*; Antialzheimeran; Antianaphylactic; Antiangiogenic; Antiarthritic; Antiasthmatic; Antiatherosclerotic; Antibacterial; Anticarcinomic (Breast) *IC50=1.5 uM*; Anticariogenic *ID50=120 ug/ml*; Anticataract; Anticolitic *400 mg/man/3x/day*; Anticomplementary; AntiCrohn's; Anticystitic *1,000 mg/day/4 weeks*; Antidepressant; Antidermatitic; Antidiabetic; Antielastase *IC50=0.8 ug/ml*; Antiencephalitic; Antiescherichic; Antiestrogenic; Antifeedant *IC52=<1,000 ppm diet*; Antifibrosarcomic; Antiflu; Antigastric; Antigonadotropic; AntiGTF *ID50=120 ug/ml*; Antihepatotoxic; Antiherpetic *48-150 ug/ml*; Antihistaminic *IC50=<10 uM*; AntiHIV; Antihydrophobic; Antihypertensive; Antiinflammatory *20-150 mg/kg*; Antileishmanic *IC50=64*; Antileukemic *5.5-60 uM IC50=10 uM IC50=>10 ug/ml*; Antileukotriene; Antilipoperoxidant *IC67=50*; Antimalarial *IC50=1-6.4 ug/ml*; Antimelanomic; Antimetastatic; Antimutagenic *ID50=0.62 ug/ml ID50=2-5 nM*; Antimyocarditic; Antinitrosaminic; Antinociceptive; Antioxidant *4.7 x Vit. E ED50=2.3 uM IC47=10 uM IC96=300 ppm*; Antipancreatic; Antiperiodontal; Antiperistaltic; Antipermeability; Antiperoxidant; Antipharyngitic; Antiplatelet; Antiplasmodial *IC50=13-64*; AntiPMS *500 mg/2x/day/wmn*; Antipodriac; Antipolio; Antiproliferant *10 nM*; Antiprostanoid; Antiprostatic; Antipsoriac; Antiradicular *IC50=4.6 uM*; Antispasmodic; Antistreptococcic *ID50=120 ug/ml*; Antithiamin; Antithrombic; Antitrypanosomic *IC50=13*; Antitumor *10 uM*; Antitumor (Bladder); Antitumor (Breast); Antitumor (Colon); Antitumor (Lung); Antitumor (Ovary); Antitumor (Skin) *20 uM*; Antitumor-Promoter; Antiulcer; Antiviral *48-150 ug/ml IC50=10 uM*; Apoptotic *20-60 uM*; ATPase-Inhibitor; Bacteriostat *10 mg/ml*; Bradycardiac; Calmodulin-Antagonist; cAMP-Phosphodiesterase-Inhibitor; Cancer-Preventive; Candidicide; Capillariprotective; Carcinogenic *40,000 ppm (diet) mus*; Catabolic; COMT-Inhibitor; Copper-Chelator; COX-2-Inhibitor *<40 uM*; Cyclooxygenase-Inhibitor; Cytochrome-P450-1A2-Inhibitor; Cytotoxic *ED50=70 ug/ml IC82=100 ug/ml*; Deiodinase-Inhibitor; Diaphoretic?; Differentiator *5.5 uM*; Estrogenic *10% genistein*; Fungicide; Glucosyl-Transferase-Inhibitor *ID50=120 ug/ml*; Hemostat; Hepatomagenic *5,000 ppm (diet) rat*; Hepatoprotective; HIV-RT-Inhibitor *IC50=<1 ug/ml*; Hypoglycemic *100 mg/kg orl rat*; iNOS-Inhibitor *IC50=20 uM*; Inotropic; Insulinogenic; Juvabional; Larvostat *8,000 ppm diet*; Lipoxygenase-Inhibitor *IC11=1.25 mM IC50=0.1-5 uM*; MAO-A-Inhibitor; Mast-Cell-Stabilizer; Metal-Chelator (Copper); Metalloproteinase-Inhibitor *IC50=>42 uM*;

MMP-9-Inhibitor *20 uM*; Mutagenic; NADH-Oxidase-Inhibitor; NEP-Inhibitor *IC50=>42 uM*; Neuroprotective *5-25 uM*; NF-kB-Inhibitor; NO-Inhibitor *IC50=20 uM IC>50=125 uM*; NO-Synthase-Inhibitor *5-50 uM*; Ornithine-Decarboxylase-Inhibitor *<10 uM*; P450-Inducer *5 uM*; P450-Inhibitor *50-100 uM*; Pesticide; PGE2-Inhibitor; Phospholipase-Inhibitor; Plasmodicide; Proliferant; Prostaglandin-Synthesis-Inhibitor *40 ug/ml*; Protein-Kinase-C-Inhibitor; PTK-Inhibitor *0.4-24 uM*; Quinone-Reductase-Inducer *13 uM 6 uM*; Teratologic; TNF-alpha-Inhibitor *IC50=3.11 uM*; Topoisomerase-I-Inhibitor *IC50=12.8 ug/ml IC50=42 uM*; Topoisomerase-II-Inhibitor *IC50=1-6.9 ug/ml IC50=23-40 uM*; Tumorigenic *0.1% diet orl rat/yr*; Tyrosinase-Inhibitor *ID50=70 uM*; Tyrosine-Kinase-Inhibitor; Vasodilator; VEGF-Inhibitor; Xanthine-Oxidase-Inhibitor *3.1 uM IC50=10.6 ug/ml IC50=>0.4 ug/ml*

QUERCETIN-7-BETA-GLUCOSIDE Leaf:

No activity reported.

QUINIC-ACID Bark:

Choleretic

RAFFINOSE Bark: Leaf 8,000 ppm;

Flatugenic

SABINENE Leaf:

Antibacterial; Antihelicobacter; Antiseptic; Antiulcer; Perfumery

SABINIC-ACID Leaf:

No activity reported.

SEQUOYITOL Bark:

No activity reported.

TERPINENOL Root:

No activity reported.

TERPINEOL Root:

Analgesic *10-100 ug/ml*; Anesthetic; Antiallergenic; Antiasthmatic; Antibacterial; Anticancer; Antiproliferant; Antiseptic; Antispasmodic; Antitussive; Cholagogue; Culicide *LC50=156-194 mg/l*; Expectorant; Insecticide; Insectifuge; Larvicide; Perfumery; Pesticide

TESTOSTERONE Pollen Or Spore:

Anabolic; Androgenic; Antianemic; Anticlimacteric *10-20 mg/man/day*; Antihemophilic; Antihypogonadic *200-600 mg scu implant*; Antiosteoporotic; Antitumor (Breast) *1,500 mg*; Aphrodisiac; Calcium-Sparing; Carcinogenic

TETRACOSANOL-(1) Bark:

No activity reported.

VALERIC-ACID Leaf:

Antihysteretic; Antiinsomniac *1.2-2.4*; Antispasmodic; FLavor *FEMA 1-8*; Hypotensive; Myorelaxant; Perfumery; Sedative; Tranquilizer

VANILLIC-ACID Bark:

Aldose-Reductase-Inhibitor $100 \mu M/l$; Allelopathic; Anthelmintic; Antibacterial $1.5-15 \text{ mg/ml}$; Anticancer; Antifatigue; Antiinflammatory; Antileukemic $IC_{50}=25-56 \text{ ug/ml}$; Antioxidant $1/3 \text{ BHA } IC_{21}=30 \text{ ppm}$; Antiperoxidant $IC_{15-65}=100-200 \text{ ug/ml}$; Antiradicular $7 \times \text{ quercetin}$; Antiseptic; Antisickling; Antitumor; Antitumor-Promoter; Ascaricide; Cancer-Preventive; Choloretic; Fungicide; Immunosuppressant; Laxative; Pesticide; Ubiquiot

VIOLAXANTHIN *Leaf*:

Colorant; Ubiquiot