

Dr. Duke's Phytochemical and Ethnobotanical Databases

Chemicals and their Biological Activities in: *Citrus limon* (L.) BURMAN f. (Rutaceae) -- Lemon

Chemicals

1,8-CINEOLE *Leaf Essent. Oil 11,000 - 70,000 ppm*

(-)-Chronotropic 87 nl/ml; (-)-Inotropic; Acaricide $LC_{100}=6 \mu M$; Allelopathic; Allergenic; Anesthetic; Anthelmintic; Antiacetylcholinesterase $IC_{50}=41 \mu g/ml$; Antiallergic; Antibacterial 50 ppm; Antibronchitic; Anticariogenic; Anticatarrh; Anticholinesterase $IC_{50}=50-70$; Antifatigue; Antihalitosis; Antiinflammatory; Antilaryngitic; Antinociceptive; Antipharyngitic; Antiplaque; 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 $IC_{50}=78 \mu M$; Hypotensive; Inflammatory inj; Insectifuge; Irritant; Myorelaxant; Nematicide; Neurotoxic; P450-Inducer; Pediculicide 2.3 x pyrethrin; Perfume; Pesticide; Rubefacient; Secretagogue; Sedative; Spasmogenic; Surfactant; Testosterone-Hydroxylase-Inducer; Transdermal; Trichomonicide $LD_{100}=1,000 \mu g/ml$

2"-O-XYLOSYL-VITEXIN *Flower:*

No activity reported.

2',4',5-TRIHYDROXY-FLAVONONE-7-O-BETA-D-GLUCOSYL-RHAMNOSIDE

Pericarp:

No activity reported.

3',4',5-TRIHYDROXY-FLAVONE-7-O-BETA-D-RHAMNOSYL *Plant:*

No activity reported.

3',4',5-TRIHYDROXY-FLAVONONE-7-O-BETA-D-RHAMNOSYL *Plant:*

No activity reported.

3-(4-HYDROXY-3-METHOXY-PHENYL)-1-GLUCOSYL-PROP-2-ENE *Pericarp:*

No activity reported.

3-HEXEN-1-OL *Essential Oil:*

No activity reported.

4',5,7-TRIHYDROXY-3',6,8-TRIMETHOXY-FLAVONE-3-O-BETA-D-GLUCOSIDE *Plant:*

No activity reported.

4',5,7-TRIHYDROXY-3',8-DIMETHOXY-FLAVONE-3-O-BETA-D-GLUCOSIDE

Pericarp:

No activity reported.

4',5,7-TRIHYDROXY-3',8-DIMETHOXY-FLAVONE-3-O-BETA-D-GLUCOSYL-RHAMNOSIDE

Pericarp:

No activity reported.

4',5,7-TRIHYDROXY-FLAVONE-6,8-DI-C-GLUCOSIDE

Pericarp:

No activity reported.

4',5,7-TRIHYDROXY-FLAVONE-6-O-BETA-D-RHAMNOSYL

Plant:

No activity reported.

4',5,7-TRIHYDROXY-FLAVONE-8-O-BETA-D-RHAMNOSYL

Plant:

No activity reported.

4',7-DIHYDROXY-3'-METHOXY-FLAVONONE-8-O-BETA-D-GLUCOSYL-RHAMNOSIDE

Pericarp:

No activity reported.

4-(3-METHYL-2-BUTENOXY)-ACETOPHENONE

Pericarp:

No activity reported.

5,7-DIMETHOXYCOUMARIN

Essential Oil:

No activity reported.

5-GERANOXY-7-METHOXYCOUMARIN

Essential Oil 630 ppm;

No activity reported.

5-GERANOXY-7-METHOXYPSORALEN

Essential Oil:

No activity reported.

5-GERANYL-OXYPSORALEN

Pericarp:

No activity reported.

5-ISOPENTENOXY-7-METHOXYCOUMARIN

Essential Oil:

No activity reported.

6,7-DIMETHOXYCOUMARIN

Bark 162 ppm;

No activity reported.

6-8-DI-C-GLUCOSYL-DIOSMETIN

Pericarp:

No activity reported.

6-C-GLUCOSYL-DIOSMETIN

Pericarp:

No activity reported.

7-GLUCOSYL-APIGENIN

Flower:

No activity reported.

7-PENTAHYDROXY-2',3',5,5'-PENTAHYDROXY-FLAVANONE-7-(6-O-ALPHA-L-RHAMNOSYL-BETA-D-GLUCOSIDE *Pericarp:*

No activity reported.

7-RHAMNO-GLUCOSYL-DIOSMETIN *Flower:*

No activity reported.

7-RHAMNO-GLUCOSYL-LUTEOLIN *Flower:*

No activity reported.

8-C-GLUCOSYL-DIOSMETIN *Pericarp:*

No activity reported.

8-GERAN-OXYPSORALEN *Pericarp:*

No activity reported.

ACETIC-ACID *Essential Oil:*

Acidulant; Antibacterial 5,000 ppm; Antitotic; Antisalmonella; Antivaginitic 1-2%;
Expectorant; Fungicide; Keratitogenic; Mucolytic; Osteolytic; Perfumery FEMA 6,000-
40,000 ppm; Pesticide; Protisticide; Spermicide; Ulcerogenic; Verrucolytic

ADENOSINE *Pericarp:*

Analgesic; Antiaggregant; Antiarrhythmic; Antidiuretic; Antiendotoxic 500 mg/kg *ipr mus*;
Antihypertensive; Antiinsomniac; Antilipolytic; Antispasmodic; Antitachycardic
50-250 ug/kg/*ivn*; Anxiolytic; Arteriodilator; Glucogonogenic; Hypocholesterolemic;
Hypoglycemic; Hypotensive; Immunomodulator; Insulinic; Laxative; Lipolytic;
Myorelaxant; PAF-Inhibitor 0.024 ug/ml $IC_{50}=90$ nM; Pyrogenic 0.09 mg/kg *ivn hmn*;
Respirastimulant; Secretomotor; Sedative; Vasodilator

ALPHA,ALPHA-P-TRIMETHYLBENZYL-ALCOHOL *Plant:*

No activity reported.

ALPHA-AMINO-BUTYRIC-ACID *Plant:*

No activity reported.

ALPHA-BERGAMOTENE *Essential Oil 250 ppm;*

No activity reported.

ALPHA-COPAENE *Essential Oil:*

No activity reported.

ALPHA-CUBEBENE *Essential Oil:*

No activity reported.

ALPHA-HUMULENE *Essential Oil 10 ppm;*

Antitumor; Perfumery

ALPHA-PHELLANDRENE *Essential Oil 20 ppm;*

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

ALPHA-PINENE *Essential Oil 40 - 500 ppm Leaf Essent. Oil 500 - 2,000 ppm Pericarp*

Essent. Oil 5,000 - 14,000 ppm

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 Essential Oil 70 ppm; Pericarp:

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

ALPHA-TERPINEOL Essential Oil 6 - 50 ppm Leaf Essent. Oil 11,000 - 125,000 ppm

Pericarp Essent. Oil 4,000 - 73,000 ppm

ACE-Inhibitor 100 $\mu g/ml$ (weak activity); Aldose-Reductase-Inhibitor 100 $\mu g/ml$;
Allelopathic; Antiacne; Antibacterial $MIC=800-1,600 \mu g/ml$; Anticancer;
Anticariogenic; Antiinflammatory; Antiproliferant; Antiseptic; Cicatrizant $ED_{50}=240$
 $\mu g/g$ mus; FLavor FEMA 5-40; Insecticide 1.29 $\mu M/fly$; Interleukin-6-Inhibitor;
Mosquitofuge > Deet; Motor-Depressant; Nematicide $MLC=1 mg/ml$; Perfumery;
Pesticide; Sedative; Termiticide $IC_{100}=5 mg/g$; Transdermal; Vulnerary $ED_{50}=240$
 $\mu g/g$ mus

ALPHA-TERPINYL-PROPIONATE Essential Oil:

No activity reported.

ALPHA-THUJENE Essential Oil 16 - 40 ppm

No activity reported.

APIGENIN-C-GLYCOSIDE Plant:

No activity reported.

AUREUSIDIN Plant:

Iodothyronine-Deiodinase-Inhibitor; Pigment

AUREUSIDIN-6-GLUCOSIDE Plant:

No activity reported.

AUREUSIDIN-6-RHAMNOGLUCOSIDE Plant:

No activity reported.

BERGAMOTENE Essential Oil 16 - 40 ppm

No activity reported.

BERGAMOTTIN Essential Oil 649 ppm;

Calcium-Antagonist 20 $\mu g/ml$ gpg; Cytochrome-P450-Inhibitor

BERGAPTEN Essential Oil 10 ppm;

Antiaggregant; Antiapertif; Anticonvulsant; Antihistaminic 25 mg/kg ipr mus;
Antiinflammatory; Antijet-lag; Antileukodermic; Antimitotic 5-25 $\mu g/ml$; Antiplatelet;
Antipsoriac; Antispasmodic; Antitumor; Calcium-Antagonist; Cancer-Preventive;

Carcinogenic; Clastogenic; CNS-Depressant; DME-Inhibitor $IC_{50}=96\ \mu M$;
Hypotensive; Insecticide; Lipolytic; Molluscicide; Mutagenic; Pesticide; Phototoxic;
Piscicide

BETA-BISABOLENE *Essential Oil* 23 - 400 ppm

Abortifacient; Antirhinoviral $IC_{50}=1,800?$; Antiulcer $IC_{57}=100\ mg/kg$; Antiviral
 $IC_{50}=1,800?$; Perfumery; Stomachic

BETA-CARYOPHYLLENE *Leaf Essent. Oil* 100 ppm;

No activity reported.

BETA-ELEMENE *Essential Oil*:

Anticancer (Cervix); Antigliomic; Antiproliferant; Antitumor (Cervix); Apoptotic

BETA-HUMULENE *Essential Oil* 10 ppm;

No activity reported.

BETA-PHELLANDRENE *Essential Oil* 80 ppm;

Expectorant; Fungicide; Perfumery

BETA-PINENE *Essential Oil* 40 - 1,270 ppm

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

BRAYLIN *Root*:

No activity reported.

BYAKANGELICIN *Essential Oil* 29 ppm;

Antiestrogenic; Antigonadotropic; Antihistaminic $25\ mg/kg\ ipr\ mus$; Antilipogenic;
Calcium-Antagonist

BYAKANGELICOL *Essential Oil*:

No activity reported.

CADINENE *Essential Oil*:

Antifeedant; FLavor *FEMA* *400-4,000*; Perfumery; Pesticide

CAFFEIC-ACID *Fruit* 21 - 35 ppm

Aldose-Reductase-Inhibitor $4\ \mu g/ml$ (*weak activity*); Allergenic; Analgesic;
Antiadenoviral; Antiaggregant; Antiaging; Antiatherogenic; Antibacterial; Anticancer;
Anticarcinogenic; Antidepressant; Antiedemic; Antielastase $IC_{50}=86\ \mu g/ml$ ($475\ \mu M$)
 $IC_{50}=93\ \mu m/l$; Antiescherichic; Antiflu; Antigonadotropic; Antihemolytic $25\ \mu M$;
Antihepatoadenomic $200\ ppm\ diet\ orl\ mus$; Antihepatotoxic; Antiherpetic $50\ \mu g/ml$
 $EC_{50}=>50\ \mu g/ml$; Antihistaminic; AntiHIV $EC_{50}=200\ \mu g/ml$;
Antihypercholesterolemic; Antihyperthyroid; Antiinflammatory; AntiLegionella;
Antileukemic; Antileukotriene; Antimelanogenic; Antimutagenic; Antinitrosaminic;
Antiophidic; Antioxidant $1.3\ x\ Vit.\ E\ 1/2\ BHA\ 1/3\ quercetin\ 30\ mM\ 50\ \mu M\ IC_{57}=30$
 ppm ; Antiperoxidant $IC_{35}=200\ \mu g/ml\ IC_{50}=44\ \mu M\ IC_{85}=100\ \mu g/ml$; Antiproliferant;
Antiprostaglandin; Antiradicular $1/3\ quercetin\ 10\ \mu M\ 30\ mM\ IC_{50}=32-35\ \mu M$;
Antiseptic; Antispasmodic $EC_{50}=3.4-15\ \mu M$; Antistaphylococcic; Antistomatitic;
Antisunburn; Antithiamin; Antithyroid; Antitumor $200\ ppm\ diet\ orl\ mus$; Antitumor

(Skin); Antitumor-Promoter $IC_{42}=10\ \mu M$; Antiulcerogenic; Antivaccinia; Antiviral $IC_{50}=62.5\ \mu g/ml$; Anxiolytic; Calcium-Antagonist $IC_{50}=1.2\ \mu M\ rbt$; Cancer-Preventive; Carcinogenic 2% (diet); Chemopreventive; Cholagogue; Choloretic; Clastogenic; CNS-Active; Co-carcinogenic; Collagen-Sparing; COX-2-Inhibitor $IC_{32}=100\ \mu M$; Cytoprotective; Cytotoxic $TC_{50}=200\ \mu g/ml$; Diuretic; DNA-Active; DNA-Protective; Fungicide $MIC=0.4\ mg/ml$; Hepatocarcinogenic 400 ppm diet orl mus (in the absence of alcohol); Hepatoprotective; Hepatotropic; Histamine-Inhibitor; Immunostimulant; Insectifuge; Leukotriene-Inhibitor; Lipoxygenase-Inhibitor $IC_{27}=5\ mM\ IC_{50}=62-148\ \mu M$; Lyase-Inhibitor $IC_{50}=94-164\ \mu M$; Metal-Chelator; Ornithine-Decarboxylase-Inhibitor; Pesticide; Prooxidant; Prostaglandinogenic; Sedative 500 mg; Sunscreen $IC_{50}=2.5\ mg/l\ IC_{91}=5\ mg/l\ IC_{98}=25\ mg/l$; Tumorigenic; Vulnerary; Xanthine-Oxidase-Inhibitor $IC_{50}=39.21\ \mu M$

CAFFEINE Flower 50 ppm;

(+)-Inotropic; Adenosine-Antagonist; Analeptic 200 scu mus; Analgesic-Synergist; Antiapneic; Antiapoptotic; Antiasthmatic 5-10 mg/kg orl/man; Anticarcinogenic; Anticariogenic; Antidermatitic; Antiemetic; Antifeedant; Antiflu; Antiherpetic; Antihypotensive 250 mg/day/orl/man; Antinarcotic; Antiobesity; Antioxidant; Antirhinitic 140 mg/day/orl/man; Antiserotonergic 40 ipr rat 40 scu rat; Antitumor; Antitumor (Lung); Antivaccinia; Antiviral; Apoptotic; Arrhythmigenic 1,500 mg/man; cAMP-Phosphodiesterase-Inhibitor; Cancer-Preventive; Cardiogenic 10-25 orl dog 65-500 orl cat; Catabolic; cGMP-Phosphodiesterase-Inhibitor; Choloretic; CNS-Stimulant 100 orl mus 30 orl rat; Coronary-Dilator; Diuretic; Energizer 20-200 mg/man; Ergotamine-Enhancer; FLavor FEMA 125; Herbicide; Hypertensive; Hypoglycemic; Insecticide; Lypolytic; Myorelaxant; Neurotoxic; Pesticide; Phosphodiesterase-Inhibitor; Pyrogenic 13.3 mg/kg ipr rbt 15 mg/kg ipr cat 60 mg/day oral hmn; Respirastimulant; Spasmogenic 1,500 mg/man; Stimulant; Tachycardic; Teratogenic 14 orl rat; Topoisomerase-I-Inhibitor 0.1 nM 75 μM ; Topoisomerase-II-Inhibitor 99 mM; Vasodilator

CAMPHENE Essential Oil 2 - 50 ppm

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

CARVEOL Essential Oil:

CNS-Stimulant

CARVONE Essential Oil:

Allergenic; Antiacetylcholinesterase $IC_{50}=1.4-1.8\ mM$; Antiproliferative; Antiseptic 1.5 x phenol; Cancer-Preventive; Candidistat; Carminative; CNS-Stimulant; FLavor FEMA 80-3,000; Fungistat; Insecticide; Insectifuge; Motor-Depressant; Nematicide $MLC=1\ mg/ml$; Perfumery; Pesticide; Sedative; Trichomonicide $LD_{100}=300\ \mu g/ml$; Vermicide

CARYOPHYLLENE Essential Oil 11 - 28 ppm

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; Antionychotic; Antiproliferant; Antispasmodic; Antistaphylococcic; Antistreptococcic; Antitumor; Antiulcer; Candidicide; FLavor FEMA 20-200; Fungicide; Gastroprotective; Insectifuge; Irritant; Larvicide; Mosquitocide; Perfumery; Pesticide; Sedative; Termitifuge

CARYOPHYLLENE-OXIDE Leaf Essent. Oil 0.8 ppm;

Antiedemic; Antifeedant; Antiinflammatory; Antitumor; Calcium-Antagonist $ED_{50}=32$ μM *gpg*; Fungicide; Insecticide; Pesticide

CHLOROPHYLL-A Leaf:

No activity reported.

CHLOROPHYLL-B Leaf:

No activity reported.

CIS-LIMONENE-1,2-OXIDE Essential Oil:

No activity reported.

CITRAL Essential Oil 250 - 300 ppm

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

CITRONELLAL Leaf Essent. Oil 25,000 - 89,000 ppm

Acaricide; Allergenic; Antibacterial; Antiseptic 3.8 \times *phenol*; Antistaphylococcic; Antistreptococcic; Candidicide; Embryotoxic; FLavor *FEMA <1*; Fungicide; Insectifuge; Irritant; Motor-Depressant; Mutagenic?; Nematicide *MIC 1* mg/ml ; P450-2B1-Inhibitor $IC_{50}=1.56$ μM ; Perfumery; Pesticide; Sedative *ED=1* mg/kg ; Teratogenic

CITRONELLOL Leaf Essent. Oil 20 ppm;

Allergenic; Antibacterial; Antiseptic; Antistaphylococcic; Antistreptococcic; Candidicide; FLavor *FEMA 1-50*; Fungicide; Herbicide $IC_{50}=160$ μM ; Irritant; Nematicide *MLC=100* $\mu g/ml$; Perfumery; Pesticide; Sedative; Trichomonicide $LD_{100}=300$ $\mu g/ml$

CITRONELLYL-ACETATE Plant 4 - 20 ppm

FLavor *FEMA <1-700*; Irritant

CITRONETIN Plant:

No activity reported.

CITRONIN Plant:

No activity reported.

CITROPTEN Fruit:

No activity reported.

CITRUSIN-A Pericarp:

No activity reported.

CITRUSIN-B Pericarp:

No activity reported.

CITRUSIN-C Pericarp:

No activity reported.

CONIFERIN *Pericarp*:

Herbicide $IC_{90-95}=1,000 \mu M$; Pesticide

D-GALACTURONIC-ACID *Fruit*:

No activity reported.

DEACETYL-NOMILIN *Seed*:

No activity reported.

DEACETYL-NOMILIN-17-O-BETA-D-GLUCOPYRANOSIDE *Seed*:

No activity reported.

DECAN-1-AL *Pericarp*:

Cancer-Preventive

DECANAL *Essential Oil* 6 - 20 ppm

No activity reported.

DECANOIC-ACID *Essential Oil*:

FLavor $FEMA <1-1$; Nematicide; Pesticide

DECANOL *Essential Oil*:

Nematicide $MLC 100-700 \mu g/ml$; Pesticide

DECYL-ACETATE *Plant* 5 ppm;

FLavor $FEMA <1-1$

DECYL-ALDEHYDE *Leaf*:

No activity reported.

DELTA-CARENE *Essential Oil*:

No activity reported.

DICONIFERYL-ALCOHOL-4-BETA-D-GLUCOSIDE *Pericarp*:

No activity reported.

DIOSMETIN *Plant*:

Aldose-Reductase-Inhibitor $IC_{17}=10 \mu M$; Antimutagenic $IC_{50}=10-40 nM$;
Antirhinoviral; Antiviral; Cancer-Preventive

DIOSMIN *Fruit* 5 ppm;

Anticancer; Anticapillary-Fragility $300 mg/2x/day/woman$; Anticarcinogenic;
Anticlastogen; AntiCVI; Anticytotoxic; Antiedemic $50-200 mg/kg/day$ $600 mg/kg rat$;
Antihemorrhoidal $450 mg 2x/day x7days$ then $1x/day x2months$; Antihistaminic;
Antiinflammatory $600 mg/kg rat$; Antileukotriene; Antimelanomic; Antimetastatic;
Antimetrorrhagic; Antioxidant; Antiperoxidant; Antiproliferant; Antiprostaglandin;
Antiradicular; Antithromboxane; Antiulcer; Chemopreventive; COMT-Inhibitor $200-400 mg/kg ip$;
Cyclooxygenase-Inhibitor; Cytoprotective; Diuretic; Hypoglycemic;
Lipoxygenase-Inhibitor; MDR-Inhibitor $100 \mu M$; P450-Inhibitor; Radioprotective;
Venoprotective; Venotonic

DODECANAL *Essential Oil* 10 ppm;

FLavor *FEMA* 1-100; Irritant

DODECANOIC-ACID *Essential Oil*:

FLavor *FEMA* 2-40

EPIJASMONIC-ACID-METHYL-ESTER *Pericarp*:

No activity reported.

ERIOCITRIN *Fruit* 1 ppm;

No activity reported.

ERIODICTYOSIDE *Fruit*:

No activity reported.

FARNESENE *Essential Oil*:

Pesticide; Pheromone

FERULIC-ACID *Fruit* 14 - 40 ppm

Allelopathic; Analgesic; Antiaggregant; Antiallergic; Antiarrhythmic; Antibacterial; Anticancer (Colon); Anticancer (Forestomach); Anticancer (Liver); Anticancer (Skin); Anticarcinogenic; Antidysmenorrheic; 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*

GAMMA-SITOSTEROL *Plant*:

No activity reported.

GAMMA-TERPINENE *Essential Oil* 290 - 1,400 ppm *Leaf Essent. Oil* 3,000 - 44,000 ppm *Pericarp Essent. Oil* 12,000 - 58,000 ppm

Acaricide; ACE-Inhibitor 100 ug/ml (*weak activity*); Aldose-Reductase-Inhibitor 100 ug/ml; Antiacetylcholinesterase *IC*23=1.2 mM; Antifeedant; Antioxidant; FLavor *FEMA* 1-40; Insectifuge; Irritant; Perfumery; Pesticide

GERANIAL *Essential Oil* 42 - 236 ppm *Leaf Essent. Oil* 3,000 - 270,000 ppm

Antibacterial; AntiEBV *IC*50=16 uM; Antiviral; Pesticide

GERANIOL *Essential Oil*:

Allergenic; Anthelmintic; Antibacterial *MBC*=800 ug/ml *MIC*=400 ug/ml *MIC*=64 ug/ml; Anticancer (Pancreas) *IC*50=265 uM; Anticariogenic *MIC*=400 ug/ml; Antimelanomic *IC*50=150 uM/l; Antisalmonella *MIC*=400 ug/ml; Antiseptic 400-800 ug/ml 7 x *phenol* *MIC*=64 ug/ml; Antispasmodic; Antitubercular; Antitumor; Antitumor (Pancreas) *IC*50=265 uM; Ascaricide; Cancer-Preventive; Candidicide; CNS-Stimulant;

Embryotoxic; Emetic *3 x ipecac*; Expectorant; FLavor *FEMA 1-10*; Fungicide *IC93=2 mM*; Herbicide *IC100-2,000 uM*; Insectifuge *50 ppm*; Insectiphile; Mycobactericide *MIC=64 ug/ml*; Nematicide *IC86=100 ug/ml MLC=1,000 ug/ml*; Perfumery; Pesticide; Sedative; Trichomonicide *LD100=300 ug/ml*

GERANIOL-ACETATE *Leaf Essent. Oil 3,000 ppm*;
No activity reported.

GERANYL-ACETATE *Essential Oil 12 - 310 ppm*
Allergenic; FLavor *FEMA 1-20*; Insectiphile; Perfumery; Sedative

GERANYL-BUTYRATE *Essential Oil*;
FLavor *FEMA 1-10*; Perfumery; Sedative

GERANYL-FORMATE *Essential Oil*;
FLavor *FEMA 1-10*; Perfumery

GERANYL-OXY-PYRANOCOUMARIN *Root*;
No activity reported.

HEPTADECANAL *Essential Oil*;
No activity reported.

HEPTANAL *Essential Oil 4 ppm*;
No activity reported.

HESPERIDIN *Fruit 44 ppm; Pericarp 68,800 ppm*;
Analgesic; Anti-LDL; Antiallergenic; Antibradykinic; Anticapillary-Fragility;
AntiDNA; Antiflu; Antihistaminic; Antiinflammatory *IC47=50 mg/kg scu IC63=100 mg/kg scu*; Antileukotriene; Antioxidant *IC50=8 ppm*; Antiprostaglandin; AntiRNA;
Antistomatitic; Antitriglyceride; Antiulcer *100-150 mg/kg ipr*; Antivaccinia; Antiviral;
Anxiolytic; Calcium-Antagonist *IC50=1.2 uM rbt*; Capillariprotective; Catabolic;
Choleretic; CNS-Depressant *100-150 mg/kg ipr*; Cyclooxygenase-Inhibitor;
Hypolipidemic; Lipoxygenase-Inhibitor; Pesticide; ProHDL; Vasopressor

HESPERIDOSIDE *Fruit*;
No activity reported.

HEXADECANAL *Essential Oil*;
No activity reported.

HEXANAL *Essential Oil*;
Antibacterial *MBC=800 ug/ml*; Antisalmonella *MIC=400 ug/ml*; Antiseptic *400-800 ug/ml*; FLavor *FEMA <1-5*; Pesticide

HEXANOL *Essential Oil*;
Antiseptic; FLavor *FEMA 0.2-25*; Pesticide

IMPERATORIN *Fruit*;
Antiaflatoxin *0.7 ppm IC50=2.66 uM*; Antiaggregant; Antiallopecic; Anticonvulsant;
Antiinflammatory; Antileukodermic; Antimitotic *5-25 ug/ml*; Antimutagenic;
Antiplatelet; Antitumor-Promoter *IC86=50 ug/ml*; Antivitaligic; Bufocide; Calcium-

Antagonist 31.6 ug/ml gpg IC50=4 ug/ml; Cancer-Preventive 5-25 ug/ml; Cytochrome-P450-Inhibitor 2 nM; DME-Inhibitor IC50=116 uM; Hepatoprotective 0.7 ppm IC50=2.66 uM; Hepatotoxic; Lipolytic; Molluscicide; Piscicide; Sedative

ISOIMPERATORIN *Essential Oil:*

Antitumor-Promoter IC94=50 ug/ml; Artemicide ED50=6->100 ug/ml; Calcium-Antagonist; Cytochrome-P450-Inhibitor 2 nM; Cytotoxic (Breast) ED50=6.56 ug/ml; Cytotoxic (Colon) ED50=>10 ug/ml; DME-Inhibitor IC50=46 uM; Pesticide

ISOLIMOCITROL *Pericarp:*

No activity reported.

ISOLIMOCITROL-3,7,4'-TRIMETHYL-ETHER *Plant:*

No activity reported.

ISOLIMOCITROL-3-BETA-D-GLUCOSIDE *Plant:*

No activity reported.

ISOPIMPINELLIN *Plant:*

Antiappetant; Antifeedant; Antiinflammatory 100 ppm; Antilipogenic; Antimitotic 5-25 ug/ml; Antitubercular; Calcium-Antagonist; Cancer-Preventive; Diuretic 125 mg/kg; Fungicide; Insecticide; Molluscicide; Mutagenic; Pesticide; Piscicide

ISOPULEGOL *Leaf Essent. Oil 40,000 ppm;*

Antiacetylcholinesterase IC50=2.0 mM; FLavor FEMA 5-30; Perfumery

ISOPULEGOLE *Leaf Essent. Oil 18,000 - 114,000 ppm*

No activity reported.

ISORHAMNETIN *Flower:*

Antibacterial; Antihistaminic; Antiinflammatory; Antioxidant; Antispasmodic; Cancer-Preventive; Hepatoprotective; MAO-Inhibitor; Pesticide; Quinone-Reductase-Inducer; Vasodilator

ISORHAMNETIN-3-ARABINOGLUCOSIDE *Plant:*

No activity reported.

ISORHOIFOLIN *Leaf:*

No activity reported.

ISOVITEXIN *Pericarp:*

ACE-Inhibitor IC50=0.28 mM/l; Antioxidant =tocopherol >BHA; Cancer-Preventive

JASMONIC-ACID-METHYL-ESTER *Pericarp:*

No activity reported.

LAURALDEHYDE *Fruit:*

No activity reported.

LIMETTIN *Essential Oil 295 ppm;*

No activity reported.

LIMOCITRIN *Pericarp*:

No activity reported.

LIMOCITRIN-3-(6-O-ALPHA-L-RHAMNOSYL-BETA-D-GLUCOSIDE) *Pericarp*:

No activity reported.

LIMOCITRIN-3-O-(3 *Plant*):

No activity reported.

LIMOCITRIN-3-O-(5-ALPHA-GLUCOSYL-3 *Plant*):

No activity reported.

LIMOCITROL *Pericarp*:

No activity reported.

LIMOCITROL-3-O-(5-ALPHA-GLUCOSYL-3 *Plant*):

No activity reported.

**LIMONENE *Essential Oil* 2,796 - 8,000 ppm *Leaf Essent. Oil* 284,000 - 754,000 ppm
Pericarp Essent. Oil 512,000 - 774,000 ppm**

Acaricide $LC_{100}=8\ \mu M$; AChE-Inhibitor; Allelochemic; Allergenic *1/20th carene*;
Antiacetylcholinesterase $IC_{22-26}=1.2\ mM$; Antiadenomic; Antialzheimeran?;
Antiasthmatic; Antibacterial; Anticancer; Antiesophagitic; Antifeedant; Antiflu;
Antiinflammatory; Antilithic; Antilymphomic; Antimetastatic (Stomach);
Antimutagenic; Antiobesity; Antiseptic; Antispasmodic $ED_{50}=0.197\ mg/ml$; 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 $IC_{50}=45\ \mu M$;
Histaminic; Immunomodulator; Insecticide $0.37\ \mu M/fly$; Insectifuge; Interleukin-6-
Inhibitor; Irritant; Lipolytic; Myorelaxant $50\ mg/kg$; Nematicide $IC=100\ \mu g/ml$; NO-
Genic; Ornithine-Decarboxylase-Inhibitor $\sim 750\ mg/kg$ (*diet*); Ozone-Scavenger; P450-
Inducer; Peristaltic; Pesticide; Photosensitizer; Sedative $ED=1-32\ mg/kg$; Transdermal

LIMONIN *Fruit: Seed*:

Anticataleptic; Antifeedant; Antileukemic $IC_{50}=>10\ \mu g/ml$; Antimalarial $IC_{50}=>100\ \mu g/ml$; Pesticide

LIMONIN-17-O-BETA-D-GLUCOPYRANOSIDE *Seed*:

No activity reported.

LIMONOATE-A-RING-LACTONE *Fruit*:

No activity reported.

LINALOL *Essential Oil* 8 - 30 ppm *Leaf Essent. Oil* 17,000 - 81,000 ppm *Pericarp Essent. Oil* 7,000 - 110,000 ppm

No activity reported.

LINALYL-ACETATE *Essential Oil*:

Anesthetic $0.01-1\ \mu g/ml$; Antioxidant 400 ppm; Antispasmodic $ED_{50}=0.21\ mg/ml$;
FLavor *FEMA 2-15*; Motor-Depressant; Perfumery; Sedative

LUTEIN *Fruit* 0.12 - 1.2 ppm

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

LUTEOLIN *Flower*:

Aldose-Reductase-Inhibitor $EC=3$ ppm $IC_{50}=0.45$ uM rat; Antiallergic; Antiangiogenic $IC_{60-75}=10$ uM; Antiatherogenic; Antibacterial $MIC=500$ ug/ml; Anticarcinogenic; Anticarcinomic; Anticataract $EC=3$ ppm; Anticomplementary; Antidermatic; Antiestrogenic; Antifeedant $IC_{52}<1,000$ ppm diet; Antiherpetic 11-23 ug/ml; Antihistaminic <10-15 uM; AntiHIV; Antiinflammatory =indomethacin; Antileukemic 20-50 uM; Antilymphomic; Antimelanomic; Antimutagenic $ID_{50}=0.44$ ug/ml $ID_{50}=2-5$ nM; Antinociceptive; Antioxidant $IC_{50}=10$ uM; Antipolio; Antiproliferant; Antispasmodic; Antitumor 1-50 uM; Antitumor (brain); Antitumor (Colon); Antitumor (Kidney); Antitumor (Lung); Antitumor (Ovary); Antitumor (Pancreas); Antitumor (Skin) 20 uM; Antitumor (Stomach); Antitumor (Thyroid) 12-50 uM; Antitussive; Antiviral 11-23 ug/ml; Aphidifuge; Apoptotic 12-50 uM; Aromatase-Inhibitor $IC_{35}=1$ uM/l; Beta-Glucuronidase-Inhibitor $IC_{50}\sim 40$ uM; Calcium-Antagonist $IC_{50}=1.2$ uM rbt; Cancer-Preventive; Chemopreventive; Choleric; Cytotoxic 1-50 uM; Deiodinase-Inhibitor; Differentiator $IC>40=40$ uM; Diuretic; Estrogenic 58% genistein; Hepatoprotective; Hyaluronidase-Inhibitor $IC_{50+}=100-250$ uM; Hypocholesterolemic; ICAM-1-Inhibitor; IKK-Inhibitor; iNOS-Inhibitor; Iodothyronine-Deiodinase-Inhibitor; Lipoxigenase-Inhibitor; MAPK-Inhibitor; Metalloproteinase-Inhibitor; MMP-9-Inhibitor 20 uM; Myorelaxant; NEP-Inhibitor $IC_{50}>42$ uM; NF-kB-Inhibitor; NO-Inhibitor; Pesticide; Proliferant; Prostaglandin-Synthetase-Inhibitor; Protein-Kinase-C-Inhibitor $IC_{70}=50$ uM; PTK-Inhibitor 10-100 uM; Succinoxidase-Inhibitor; TNF-alpha-Inhibitor $IC_{50}=14.44$ uM; Topoisomerase-I-Inhibitor; Vasodilator; VEGF-Inhibitor $IC_{50}=2-7$ uM; Xanthine-Oxidase-Inhibitor $IC_{50}=0.11$ ug/ml

LUTEOLIN-7-O-BETA-RUTINOSIDE *Leaf*:

No activity reported.

MENTH-1-EN-9-OL *Essential Oil*:

No activity reported.

METHYL-HEPTANONE *Essential Oil*:

No activity reported.

METHYL-HEPTENONE *Leaf Essent. Oil* 6,000 ppm;

No activity reported.

MUCILAGE *Fruit*:

Cancer-Preventive; Demulcent; Hypocholesterolemic

MYRCENE *Essential Oil* 65 - 1,270 ppm *Leaf Essent. Oil* 13,000 ppm;

ACE-Inhibitor 100 ug/ml; Aldose-Reductase-Inhibitor; Allergenic; Analgesic; Antibacterial; Anticonvulsant; Antimutagenic; Antinitrosaminic; Antinociceptive 10-20 mg/kg ipr mus 20-40 mg/kg scu mus; Antioxidant; Antispasmodic; Chemopreventive; FLavor FEMA 0.5-9; Fungicide; Hypothermic; Insectifuge; Irritant; Myorelaxant 100-200 mg/kg; P450-2B1-Inhibitor $IC_{50}=0.14$ uM; Perfumery; Pesticide

N-METHYL-TYRAMINE *Leaf*:

Cancer-Preventive

NARINGIN *Pericarp*:

Aldose-Reductase-Inhibitor; Antidermatitic; Antiinflammatory; Antimutagenic;
Antineuropathic; Antioxidant; Antiviral; Cancer-Preventive; FLavor *FEMA*;
Myorelaxant; Oviposition-Stimulant; Pesticide

NARINGOSIDE *Fruit*:

No activity reported.

NARIRUTIN *Pericarp*:

Oviposition-Stimulant

NEOHESPERIDIN *Pericarp*:

Anticancer; Antioxidant *7 x quercetin*; Antiradicular; Antitumor-Promoter; Cancer-
Preventive

NEOXANTHIN *Leaf*:

Colorant; Ubiquit

NERAL *Essential Oil* 27 - 130 ppm *Leaf Essent. Oil* 4,000 - 270,000 ppm

Antibacterial; Antispasmodic; Pesticide; Termiticide *LD100=5 mg/g*

NEROL *Leaf Essent. Oil* 18,000 - 76,000 ppm

Antibacterial; Antiseptic; FLavor *FEMA 1-20*; Perfumery; Pesticide; Sedative;
Trichomonicide *ED100=300 ug/ml*

NEROL-ACETATE *Essential Oil* 16 - 310 ppm *Leaf Essent. Oil* 40 ppm;

No activity reported.

NERYL-FORMATE *Essential Oil* 20 ppm;

FLavor *FEMA 5-15*; Perfumery

NOMILIN *Seed*:

Antifeedant; Pesticide

NOMILIN-17-O-BETA-D-GLUCOPYRANOSIDE *Seed*:

No activity reported.

NONAN-1-AL *Essential Oil* 3 - 7 ppm

No activity reported.

NONANAL *Essential Oil* 9 - 30 ppm

No activity reported.

NONYL-ACETATE *Plant*:

No activity reported.

NONYL-ALDEHYDE *Essential Oil*:

No activity reported.

NOOTKATONE *Plant*:

Antiulcer 20 mg/kg *orl rat*; FLavor *FEMA 3-50*; Perfumery

O-PHENYLPHENOL *Essential Oil*:

No activity reported.

OBACUNONE *Seed*:

Anticataleptic; Antifeedant; Pesticide

OBACUNONE-17-O-BETA-D-GLUCOPYRANOSIDE *Seed*:

No activity reported.

OCIMENE *Leaf Essent. Oil 10,000 ppm*:

Insecticide; Perfumery

OCTAN-1-AL *Pericarp*:

No activity reported.

OCTANOIC-ACID *Essential Oil*:

Candidicide; FLavor *FEMA 3-20*; Fungicide; Perfumery; Pesticide

OCTANOL *Essential Oil 10 - 15 ppm*

No activity reported.

OCTOPAMINE *Leaf*:

No activity reported.

OCTYL-ACETATE *Essential Oil*:

No activity reported.

OCTYL-ALDEHYDE *Essential Oil*:

No activity reported.

OSTHOLE *Root*:

Antimalarial; Calcium-Antagonist; Juvabional; Pesticide

OXYPEUCEDANIN *Essential Oil 207 ppm*:

Antitumor-Promoter *IC32=50 ug/ml*; Calcium-Antagonist *IC50=1.2 ug/ml*; DME-Inhibitor *IC50=81 uM*; Fungicide *MIC=10 ug*; Lipolytic; Mutagenic

OXYPEUCEDANIN-HYDRATE *Essential Oil 64 ppm*:

Antihistaminic 25 mg/kg *ipr mus*; Calcium-Antagonist

P-ALPHA-DIMETHYLSTYRENE *Plant*:

No activity reported.

P-COUMARIC-ACID *Fruit 6 - 102 ppm*

Aldose-Reductase-Inhibitor 4 ug/ml (*weak activity*); Allelopathic; Antibacterial; Anticlastogen; Antifertility; Antihepatotoxic; Antileukemic *IC50=25-56 ug/ml*; Antinitrosaminic; Antioxidant 1/3 *BHA IC24=30 ppm*; Antiperoxidant *IC50=>100 uM*; Antiseptic; Antispasmodic; Antitumor; Cancer-Preventive; Chemopreventive; Choleric; Cytotoxic; Diaphoretic?; Fungicide; Lipoxigenase-Inhibitor *IC11=5 mM*;

Pesticide; Prostaglandigenic; Prostaglandin-Synthesis-Inhibitor; Tyrosinase-Inhibitor
ID50=3,650 uM

P-CYMENE *Essential Oil 12 - 31 ppm*

Analgesic; Antiacetylcholinesterase *IC40=1.2 mM*; Antibacillary; Antibacterial; Antiflu;
Antirheumatologic; Antiviral; FLavor *FEMA 12-250*; Fungicide; Herbicide *IC50=50 uM*;
Insectifuge; Irritant; Laxative; Pesticide; Sedative; Trichomonicide *LD100=50 ug/ml*

P-CYMOL *Essential Oil:*

No activity reported.

P-MENTHA-1,8-DIEN-9-YL-ACETATE *Essential Oil:*

No activity reported.

P-MENTHA-2,8-DIEN-1-OL *Essential Oil:*

No activity reported.

PE *Plant:*

No activity reported.

PENTADECANAL *Essential Oil:*

No activity reported.

PENTADECANE *Plant:*

No activity reported.

PERILLALDEHYDE *Fruit:*

Acaricide; Antibacterial *MIC=500->1,000 ug/ml*; Antimelanomic *IC50=120 uM/l*;
Antiproliferative; Antiseptic; Candidicide *MIC=500 ug/ml*; Fungicide *MIC=250-500*
ug/ml; Mutagenic; Nematicide *MLC=1 mg/ml*; Sedative; Vibriocide *250 ug/ml*

PHELLOPTERIN *Essential Oil:*

Calcium-Antagonist; Lipolytic

PHLORIN *Plant:*

No activity reported.

PONCIRIN *Plant:*

No activity reported.

QUERCETIN *Flower:*

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;
Antiartihritic; 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; Antiplaque; 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; Bacteristat 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; Lipoyxygenase-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-3,5-DIGLUCOSIDE Plant:

No activity reported.

RUTIN Fruit 1 - 2 ppm Leaf:

5-HT-Inhibitor; Aldehyde-Oxidase-Inhibitor IC27-52=10 uM; Aldose-Reductase-Inhibitor 100 uM 4 ug/ml; Allelochemic; Antiaggregant ED50=33 nmol/kg iv; Antiallergic; Antiapoplectic; Antiatherogenic; Antiatherosclerotic; Antibacterial; Anticancer; Anticapillary-Fragility 20-100 mg orl man; Anticataract; Anticlastogen; Anticonvulsant; AntiCVI 270 mg/man/day; Antidementia; Antidermatitic; Antidiabetic; Antiedemic 270 mg/day orl man; Antierhythmic; Antifeedant; Antiglaucomic 60 mg/day; Antihematuric; Antihemorrhoidal; Antihepatotoxic; Antiherpetic; Antihistaminic; Antihypertensive; Antiinflammatory 20 mg/kg; Antimalarial IC50=>100 ug/ml; Antimelanomic; Antimetastatic; Antimutagenic ID50=2-5 nM; Antinephritic; Antinociceptive; Antioxidant IC28=30 ppm IC50=120 uM IC54=10 uM; Antiperoxidant IC50=10-20 uM; Antiplatelet; Antiproliferant 50-75 uM/l;

Antiprotozoal; Antipurpuric; Antiradicular *9 x quercetin*; Antispasmodic; Antisunburn; Antithrombogenic *EC50=500 nM*; Antithyroid *IC50=68 uM*; Antitrypanosomic *100 mg/kg*; Antitumor; Antitumor-Promoter; Antiulcer; Antivaricose; Antiviral; Apoptotic *75 uM/l*; cAMP-Phosphodiesterase-Inhibitor; Cancer-Preventive; Capillariprotective; Catabolic; Chemopreventive; Cytoprotective *IC50=3 uM*; Estrogenic?; Hemostat; Hepatomagenic *20,000 ppm (diet) rat*; Hepatoprotective *20 mg/kg rat*; Hypocholesterolemic; Hypotensive; Immunomodulator; Insecticide; Insectiphile; Juvabional; Larvostat *IC95=4,000-8,000 ppm diet*; Lipoxygenase-Inhibitor *IC75=2.5 mM*; Mutagenic; Myoprotective; Myorelaxant; Oviposition-Stimulant; PAF-Inhibitor; Pesticide; Protisticide; Radioprotective; Sunscreen; Topoisomerase-II-Inhibitor *IC50=1 ug/ml*; Vasodilator; Vasopressor

SABINENE Essential Oil 50 - 175 ppm Leaf Essent. Oil 2,700 ppm;
Antibacterial; Antihelicobacter; Antiseptic; Antiulcer; Perfumery

SALICYLATES Fruit:

Antiaggregant; Antiinflammatory; Antipyretic; Antiuricosuric; Hyperglycemic;
Hypoglycemic; Uricosuric

SCOPOLETIN Shoot:

Aldose-Reductase-Inhibitor *IC50=6.2 ug/ml cow*; Allelochemic *IC89=2 mM*;
Analgesic; Anesthetic; Antiadrenergic; Antiaflatoxin *11.4 ppm IC50=65 uM*;
Antiarrhythmic; Antiasthmatic; Antibacterial; Antibronchoconstrictor; Anticholinergic;
Antiedemic; Antifeedant; Antihepatotoxic; Antiinflammatory *ED 1-10 ug/ear*;
Antileukotrienogenic; Antimutagenic; Antioxidant; Antiproliferant; Antiprostaglandin;
Antiseptic; Antispasmodic; Antitumor *2.9 ug/ml*; Apoptotic; Bronchorelaxant; Cancer-
Preventive; Cholagogue; Choloretic; CNS-Depressant; CNS-Stimulant; Cytotoxic;
Fungicide *2 mM*; Hepatoprotective; Herbicide; Hypoglycemic; Hypotensive; MAO-
Inhibitor; Musculotropic; Myorelaxant; Pesticide; Phytoalexin; Phytohormonal;
Uterosedative

SELINENE Essential Oil:

Expectorant

SESELIN Root:

Antileukemic *IC50=17.3 ug/ml*; Fungicide; Pesticide

SINAPIC-ACID Fruit 14 - 18 ppm

Antibacterial; Antihepatotoxic; Antioxidant *IC27=30 ppm*; Antiperoxydinitrite *IC39=5 uM IC60=20 uM IC75=100 uM*; Cancer-Preventive; Fungicide; Pesticide

STACHYDRINE Plant:

Cardiotonic; Emmenagogue; Insectifuge; Lactagogue; Oxytocic?; Systolic-Depressant

SUBEROSIN Root:

No activity reported.

SYNEPHRINE Leaf:

Cancer-Preventive; Cardiovascular *0.25 mg/kg ivn dog*; Hypertensive; Oxytocic *2.5 mg/kg ivn mus*; Vasoconstrictor

SYRINGIN Pericarp:

ACE-Inhibitor; Adaptogenic; Anticomplementary; Antipyretic; Antistress;
Immunomodulator; Immunostimulant; Neurotropic; Tonic

TERPINEN-4-OL *Essential Oil 1 - 40 ppm Leaf Essent. Oil 10,000 ppm; Pericarp Essent. Oil 1,000 - 11,000 ppm*

Allelopathic; Antiacetylcholinesterase $IC_{21-24}=1.2\text{ mM}$; Antiacne; Antiallergic;
Antiasthmatic; Antibacterial; Antioxidant; Antiseptic; Antispasmodic; Antitussive;
Antiulcer; Bacteriostatic; Diuretic 0.1 ml/rat ; Fungicide; Herbicide $IC_{50}=200\text{ mM}$
 $IC_{50}=22\text{ }\mu\text{M}$; Insectifuge; Irritant; Nematicide $MLC=1\text{ mg/ml}$; Pesticide; Renoirritant;
Spermicide $ED_{100}=0.015$; Vulnerary

TERPINOLENE *Essential Oil 14 - 120 ppm*

Allelochemic; Antifeedant; Antinitrosaminic; Antioxidant; Deodorant; FLavor *FEMA*
15-60; Fungicide; Perfumery; Pesticide

TETRADECANAL *Essential Oil:*

No activity reported.

TETRADECANE *Essential Oil:*

No activity reported.

TETRAHYDROGERANIOL *Essential Oil 10 ppm;*

No activity reported.

THYMOL *Leaf Essent. Oil 400 ppm; Pericarp Essent. Oil 53,000 - 111,000 ppm*

Acaricide; Allergenic; Analgesic; Ancylostomicide; Anesthetic; Ankylostomacide;
Anthelmintic; Antiacne; Antiaggregant $IC_{50}=0.75$; Antialzheimeran?; Antiarthritic;
Antiatherosclerotic $IC_{50}=4\text{ }\mu\text{M}$; Antibacterial $MIC=50-400\text{ }\mu\text{g/ml}$; Antibronchitic;
Anticariogenic $MIC=200-400\text{ }\mu\text{g/ml}$; Anticholinesterase; Antihalitotic; Antiherpetic;
Antiinflammatory (=indomethacin); Antileptic; Antimelanomic $IC_{50}=120\text{ }\mu\text{M/l}$;
Antineuritic; Antioxidant 100 ppm ; Antioxidant (LDL) $IC_{50}=4\text{ }\mu\text{M}$; Antiperiodontic
 $MIC=50-200\text{ }\mu\text{g/ml}$; Antiplaque $MIC=39-625\text{ }\mu\text{g/ml}$; Antiradicular $EC=60$;
Antirheumatic; Antisalmonella; Antiseptic 20 x phenol ; Antispasmodic;
Antistaphylococcic; Antistreptococcic $MIC=200-400\text{ }\mu\text{g/ml}$; Antitrichinosic 5%;
Antitussive; Ataxigenic; Candidicide $100\text{ }\mu\text{g/ml}$ (>*Nystatin*); Carminative;
Counterirritant; Culicide $LC_{50}=36-49\text{ mg/l}$; Cyclooxygenase-Inhibitor
(=indomethacin); Dentifrice; Deodorant; Dermatitigenic; Enterorelaxant; Enterotoxic;
Expectorant; FLavor *FEMA 2-100*; Fungicide; Gastroirritant; Gram(+)icide $MIC=200-400\text{ }\mu\text{g/ml}$;
Gram(-)icide $MIC=50-200\text{ }\mu\text{g/ml}$; Insecticide $0.22\text{ }\mu\text{M/fly}$ $LC_{50}=36-49\text{ mg/l}$;
Insectifuge; Irritant; Larvicide 10 ppm 58 ppm $LC_{50}=36-49\text{ mg/l}$; Molluscicide;
Myorelaxant; Nematicide $MLC=0.1\text{ mg/ml}$; Perfumery; Pesticide; Sedative; Sprout-
Inhibitor; Tracheorelaxant; Trichomonicide $LD_{100}=25\text{ }\mu\text{g/ml}$; Urinary-Antiseptic;
Varroacide; Vermicide

TRANS-LIMONENE-1,2-OXIDE *Essential Oil:*

No activity reported.

TRIDECANAL *Essential Oil:*

No activity reported.

TYRAMINE *Leaf:*

Adrenergic; Antiaggregant; Cardiovascular 0.8 ivn cat 30 mg/kg scu mus ; Hypertensive;

Insectifuge; Neurotoxic *1 mg/kg ivn dog*; Pesticide; Sympathomimetic; Vasoconstrictor; Vasopressor

UMBELLIFERONE *Shoot*:

Aldose-Reductase-Inhibitor *IC50=4.8 ug/ml cow*; Allelochemic *IC94=2 mM*;
Antibacterial; Antiedemic; Antihistaminic; Antiinflammatory; Antimitotic *5-25 ug/ml*;
Antimutagenic; Antiprostaglandin; Antiseptic; Antispasmodic; Antistaphylococcic;
Cancer-Preventive; Candidicide; Choloretic; Fungicide; Lipoxygenase-Inhibitor;
Perfumery; Pesticide; Photoactive; Sunscreen; Xanthine-Oxidase-Inhibitor

UMBELLIPRENIN *Shoot*:

No activity reported.

UNDECANAL *Essential Oil*:

FLavor *FEMA 1-60*; Perfumery

VICENIN-2 *Pericarp*:

ACE-Inhibitor *IC50=0.2 mM/l*; Antiinflammatory *ED50=148 (ipr mus)*; Oviposition-Stimulant

VIOLAXANTHIN *Leaf*:

Colorant; Ubiquot

XANTHOXYLETIN *Root*:

Anticonvulsant

XANTHYLETIN *Root*:

DME-Inhibitor *IC50=57.5 uM*

XYLOSYL-VITEXIN *Flower*:

No activity reported.

ZEAXANTHIN *Leaf*:

Anticancer (Breast); Antitumor (Breast); Colorant; Hepatoprotective; Quinone-Reductase-Inducer