

Dr. Duke's Phytochemical and Ethnobotanical Databases

Chemicals and their Biological Activities in: *Citrus paradisi* MacFAD. (Rutaceae) -- Grapefruit

Chemicals

(+)-6-ISO-PROPENYL-4,8-ALPHA-DIMETHYL-4-ALPHA-(R)-5,6-(R)-7,8,8-ALPHA(R)-HEXAHYDRO-2-(1H)NAPHTHALENONE *Fruit:*

No activity reported.

(+)-8,9-DIDEHYDRO-ALPHA-VETIVONE *Fruit:*

No activity reported.

(+)-8,9-DIDEHYDRO-NOOTKATONE *Fruit:*

No activity reported.

(+)-ALPHA-CYPERONE *Fruit:*

No activity reported.

(+)-ALPHA-VETIVONE *Fruit:*

No activity reported.

(+)-NOOTKATONE *Plant:*

No activity reported.

1,10-DIHYDRO-ALPHA-VETIVONE *Fruit:*

No activity reported.

10-EPI-ALPHA-CYPERONE *Fruit:*

No activity reported.

2-H-1:8(3-BETA-D-GLUCOPYRANOSYL-OXY-2-HYDROXY-3-METHYL-BUTYL)-7-METHOXY-BENZOPYRAN-2-ONE *Plant:*

No activity reported.

24-METHYLENE-CYCLOARTENOL *Pericarp:*

No activity reported.

24-METHYLENE-LOPHENOL *Pericarp:*

No activity reported.

3',4',5,6,7,8-HEXAMETHOXYFLAVONE *Pericarp:*

Cancer-Preventive

3,7(11)-EUDESMADIEN-2-ONE *Plant:*

No activity reported.

3-HYDROXY-ETHYL-HEXANOATE *Fruit:*

No activity reported.

4',5,6,7,8-PENTAMETHOXY-FLAVONE *Pericarp:*

Cancer-Preventive

4',5,6,7-TETRAHYDROXY-FLAVONE-8-O-BETA-D-GLUCOSIDE *Fruit:*

No activity reported.

4',5,7-TRIHYDROXY-FLAVONE-6-C-GLUCOSIDE *Fruit:*

No activity reported.

4',5-DIHYDROXY-FLAVONONE-7-O-BETA-D-RHAMNOSYL-GLUCOSIDE *Fruit:*

No activity reported.

5,6-DIHYDROERGOSTEROL *Plant:*

No activity reported.

5-(3,7-DIMETHYL-6-EPOXY-2-OCTENYL)-OXYPSORALEN *Pericarp:*

No activity reported.

5-(6,7-DIHYDROXY-3,7-DIMETHYL-2-OCTENYL)-OXYPSORALEN *Pericarp:*

No activity reported.

5-HYDROXY-4'-METHOXY-FLAVANONE-7-O-BETA-D-RHAMNOSYL-GLUCOSIDE *Fruit:*

No activity reported.

7-(3,7-DIMETHYL-6-EPOXY-OCT-TRANS-2-ENYL)-OXYCOUMARIN *Pericarp:*

No activity reported.

7-GERANYL-OXYCOUMARIN *Pericarp:*

No activity reported.

7-METHOXY-8(2,3-DIHYDROXY-ISOPENTYL)-COUMARIN *Pericarp:*

No activity reported.

7-METHOXY-8(2,3-EPOXY-ISOPENTENYL)-COUMARIN *Pericarp:*

No activity reported.

7-OBACUNOL *Seed 8 - 9 ppm*

No activity reported.

ACETIC-ACID *Fruit:*

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

ALPHA-AMINO-BUTYRIC-ACID *Fruit 190 ppm;*

No activity reported.

ALPHA-CAROTENE *Fruit:*

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

ALPHA-CRYTOXANTHIN *Fruit:*

No activity reported.

ALPHA-LINOLENIC-ACID *Fruit 50 - 550 ppm*

5-Alpha-Reductase-Inhibitor; Antiaggregant; Antihypertensive; Antiinflammatory
IC50=42 uM; Antileukotriene-D4; Antimenorrhagic; Antimetastatic; Antiprosthetic;
Cancer-Preventive; Hypotensive; Immunostimulant *0.12 ml/man/day*; Lymphocytogenic
0.5 ug/ml; Propecic; Prostaglandin-Synthesis-Inhibitor *39.5 g/day/hmn*; Vasodilator

ALPHA-PINENE *Fruit:*

Allelochemic; Allergenic; Antiacne; Antibacterial; Antifeedant; Antiflu;
Antiinflammatory *500 mg/kg*; Antipneumonic; Antiseptic; Antispasmodic;
Antistaphylococcic; Antiviral; Cancer-Preventive; Coleoptophile; Expectorant; FLavor
FEMA 15-150; Herbicide *IC50=30 uM*; Insecticide *0.82 uM/fly*; Insectifuge *50 ppm*;
Insectiphile; Irritant; P450-2B1-Inhibitor *IC50=0.087 uM*; Perfumery; Pesticide;
Sedative; Spasmogenic; Tranquilizer; Transdermal

APIGENIN-7-O-BETA-D-RUTINOSIDE *Leaf 5 ppm;*

No activity reported.

ARABAN *Fruit:*

No activity reported.

ASPARAGINE *Fruit 420 ppm;*

Antisickling; Diuretic

BERGAMOTTIN *Pericarp:*

Calcium-Antagonist *20 ug/ml gpg*; Cytochrome-P450-Inhibitor

BERGAPTOL *Fruit:*

No activity reported.

BRAYLIN *Root:*

No activity reported.

CAFFEIC-ACID *Fruit 40 - 51 ppm*

Aldose-Reductase-Inhibitor *4 ug/ml (weak activity)*; Allergenic; Analgesic;
Antiadenoviral; Antiaggregant; Antiaging; Antiatherogenic; Antibacterial; Anticancer;
Anticarcinogenic; Antidepressant; Antiedemic; Antielastase *IC50=86 ug/ml (475 uM)*
IC50=93 um/l; Antiescherichic; Antiflu; Antigonadotropic; Antihemolytic *25 uM*;
Antihepatadenomic *200 ppm diet orl mus*; Antihepatotoxic; Antiherpetic *50 ug/ml*
EC50=>50 ug/ml; Antihistaminic; AntiHIV *EC50=200 ug/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 uM IC57=30*
ppm; Antiperoxidant *IC35=200 ug/ml IC50=44 uM IC85=100 ug/ml*; Antiproliferant;

Antiprostaglandin; Antiradical *1/3 quercetin 10 uM 30 mM IC50=32-35 uM*;
Antiseptic; Antispasmodic *EC50=3.4-15 uM*; Antistaphylococcic; Antistomatitic;
Antisunburn; Antithiamin; Antithyroid; Antitumor *200 ppm diet orl mus*; Antitumor
(Skin); Antitumor-Promoter *IC42=10 uM*; Antiulcerogenic; Antivaccinia; Antiviral
IC50=62.5 ug/ml; Anxiolytic; Calcium-Antagonist *IC50=1.2 uM rbt*; Cancer-
Preventive; Carcinogenic *2% (diet)*; Chemopreventive; Cholagogue; Cholaretic;
Clastogenic; CNS-Active; Co-carcinogenic; Collagen-Sparing; COX-2-Inhibitor
IC32=100 uM; Cytoprotective; Cytotoxic *TC50=200 ug/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 *IC27=5*
mM IC50=62-148 uM; Lyase-Inhibitor *IC50=94-164 uM*; Metal-Chelator; Ornithine-
Decarboxylase-Inhibitor; Pesticide; Prooxidant; Prostaglandigenic; Sedative *500 mg*;
Sunscreen *IC50=2.5 mg/l IC91=5 mg/l IC98=25 mg/l*; Tumorigenic; Vulnerary;
Xanthine-Oxidase-Inhibitor *IC50=39.21 uM*

CAFFEINE Flower 29 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; Cholaretic; 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 uM*; Topoisomerase-II-Inhibitor *99 mM*;
Vasodilator

CAMPESTEROL Fruit:

Antioxidant *IC37=10 uM*; Hypocholesterolemic

CARYOPHYLLENE Fruit:

Aldose-Reductase-Inhibitor; Allergenic; Analgesic; Antiacne; Antiasthmatic;
Antibacterial; Anticariogenic *MIC=>1,600 ug/ml*; Antidermatitic; Antiedemic;
Antifeedant *500 ppm*; Antiinflammatory *IC50=100 uM*; Antileishmanic;
Antionychotic; Antiproliferant; Antispasmodic; Antistaphylococcic; Antistreptococcic;
Antitumor; Antiulcer; Candidicide; FLavor *FEMA 20-200*; Fungicide; Gastroprotective;
Insectifuge; Irritant; Larvicide; Mosquitocide; Perfumery; Pesticide; Sedative;
Termitifuge

CATECHOL Plant:

Allelochemic *IC50=0.65 mM*; Allergenic; Anticancer (Breast); Antigonadotropic;
Antioxidant; Antiseptic; Antistomatitic; Antithiamin; Antithyreotropic; Antitumor;
Antitumor (Breast); Antiviral; Cancer-Preventive; Carcinogenic *0.8% diet 2% diet*; Co-
carcinogenic; Convulsant; Dermatitigenic; Herbicide; Pesticide; Quinone-Reductase-
Inducer; Tumor-Promoter *<0.2% diet*

CHALCONASE *Fruit*:

No activity reported.

CIS-LINALOL-OXIDE *Fruit*:

No activity reported.

CITRAL *Fruit*:

Allergenic; Antiallergic; Antianaphylactic; Antibacterial; Antihistaminic; Antiseptic 5.2 *x phenol*; Antishock; Barbituate-Synergist; Bronchorelaxant; Cancer-Preventive; Expectorant; FLavor *FEMA 4-170*; Fungicide *MIC 625 ug/ml*; Glaucomagenic; Herbicide *IC50=115 uM*; Nematicide *IC52=100 ug/ml MLC=100-260 ug/ml*; Perfumery; Pesticide; Prostatitogenic *185 mg/kg/day/3 ms*; Sedative *ED 1-32 mg/kg*; Teratogenic; Trichomonicide *LD100=150 ug/ml*; Tyrosinase-Inhibitor *ID50=1.5 mM*

CITROSTADIENOL *Pericarp*:

Antirheumatic *2-5 mg/man*

CONIFERIN *Pericarp*:

Herbicide *IC90-95=1,000 uM*; Pesticide

CRYPTOXANTHIN *Fruit 0.03 - 0.3 ppm*

Antimutagenic; Vitamin-A-Activity

CYCLOARTENOL *Pericarp*:

Antibacterial; Antiinflammatory; Antirheumatic *2-5 mg/man*; Antistaphylococcic; Hypocholesterolemic; Pesticide; Ubiquiot

CYCLOEUCALENOL *Pericarp*:

Antibacterial; Antistaphylococcic; Pesticide

D-CADINENE *Plant*:

No activity reported.

D-LIMONENE *Plant 9,000 ppm*:

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

DEACETYL-NOMILIN *Seed*:

No activity reported.

DEACETYL-NOMILINIC-ACID-17-O-BETA-D-GLUCOSIDE *Seed*:

No activity reported.

DECYL-ALDEHYDE *Fruit*:

No activity reported.

DECYLIC-ACID *Fruit*:

No activity reported.

DEOXY-LIMONOL *Seed 8 ppm;*

No activity reported.

DIHYDROKAEMPFEROL *Fruit:*

No activity reported.

EPI-ISO-OBACUNOIC-ACID-17-O-BETA-D-GLUCOSIDE *Seed:*

No activity reported.

ERIODICTYOL *Fruit:*

Antibacterial; Antifeedant $IC_{50} < 1,000$ ppm diet; Antiinflammatory; Antioxidant; Antiperoxidant; Aphidifuge; Cancer-Preventive; Expectorant; Juvabional; Pesticide

ESCULETIN *Fruit:*

5-Lipoxygenase-Inhibitor $IC_{50} = 0.1-5$ μ M; Analgesic; Antiarrhythmic; Antiasthmatic?; Antibacterial; Anticapillary-Fragility; Antidysenteric; Antiescherichic; Antiinflammatory; Antimutagenic; Antipyretic; Antiseptic; Antistaphylococcic; Cancer-Preventive; Cardiodepressant; Choleric; Cosmetic; Cytotoxic; Dermatitigenic; Fungicide; Hepatoprotective 6 mg/kg mus; Hypertensive; Lipoxygenase-Inhibitor; Musculotropic; Myorelaxant; Pesticide; Sunscreen $IC_{100} = 50$ mg/l $IC_{98} = 20$ mg/l; UV-Screen; Xanthine-Oxidase-Inhibitor $IC_{52} = 10$ μ M

FERULIC-ACID *Fruit 30 - 34 ppm*

Allelopathic; Analgesic; Antiaggregant; Antiallergic; Antiarrhythmic; Antibacterial; Anticancer (Colon); Anticancer (Forestomach); Anticancer (Liver); Anticancer (Skin); Anticarcinogenic; Antidysmenorrhic; Antiestrogenic; Antihepatotoxic; Antiherpetic; Antiinflammatory; Antileukemic $IC_{50} = 25-56$ μ g/ml; Antimitotic; Antimutagenic; Antineoplastic (*Stomach*); Antinitrosaminic; Antioxidant 1/2 BHA 1/3 quercetin 3,000 μ M $EC_{50} = 9-15$ μ g/ml $IC_{51} = 200$ ppm; Antiradicular $EC_{50} = 9-15$ μ g/ml $IC_{50} = 116-124$ μ M; Antiserotonin; Antispasmodic; Antithrombic; Antitumor; Antitumor (Colon); Antitumor (Forestomach); Antitumor (Liver); Antitumor (Skin); Antitumor-Promoter $IC_{46} = 10$ μ M; Antiviral; Arteriodilator; Cancer-Preventive; Candidicide; Cardiac; Cholagogue; Choleric; Fungicide; Hepatoprotective; Hepatotropic; Herbicide; Hydrocholeric; 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*

FERULOYL-PUTRESINE *Plant 15 - 41 ppm*

No activity reported.

FRIEDELIN *Pericarp:*

Antiinflammatory 30 mg/kg; Diuretic

GALACTAN *Plant:*

No activity reported.

GALACTURONIC-ACID *Fruit:*

No activity reported.

GAMMA-CAROTENE *Fruit:*

Colorant; Previtamin-A

GERANIAL Fruit 420 - 700 ppm

Antibacterial; AntiEBV $IC_{50}=16 \mu M$; Antiviral; Pesticide

GERANIOL Plant:

Allergenic; Anthelmintic; Antibacterial $MBC=800 \mu g/ml$ $MIC=400 \mu g/ml$ $MIC=64 \mu g/ml$; Anticancer (Pancreas) $IC_{50}=265 \mu M$; Anticariogenic $MIC=400 \mu g/ml$; Antimelanomic $IC_{50}=150 \mu M/l$; Antisalmonella $MIC=400 \mu g/ml$; Antiseptic 400-800 $\mu g/ml$ 7 x phenol $MIC=64 \mu g/ml$; Antispasmodic; Antitubercular; Antitumor; Antitumor (Pancreas) $IC_{50}=265 \mu M$; Ascaricide; Cancer-Preventive; Candidicide; CNS-Stimulant; Embryotoxic; Emetic 3 x *ipecac*; Expectorant; FLavor FEMA 1-10; Fungicide $IC_{93}=2 mM$; Herbicide $IC_{100-2,000} \mu M$; Insectifuge 50 ppm; Insectiphile; Mycobactericide $MIC=64 \mu g/ml$; Nematicide $IC_{86}=100 \mu g/ml$ $MLC=1,000 \mu g/ml$; Perfumery; Pesticide; Sedative; Trichomonicide $LD_{100}=300 \mu g/ml$

GERANYL-ACETATE Fruit:

Allergenic; FLavor FEMA 1-20; Insectiphile; Perfumery; Sedative

GERANYL-OXY-PYRANOCOUMARIN Root:

No activity reported.

GLUCOSAN Plant:

No activity reported.

HEPTULOSE Pericarp:

No activity reported.

HESPERETIN Fruit:

Antibacterial $MIC=500 \mu g/ml$; Antifeedant; Antilipolytic; Antiviral; Cancer-Preventive; Fungistat; Hepatoprotective; Pesticide

HESPERIDIN Fruit:

Analgesic; Anti-LDL; Antiallergenic; Antibradykinic; Anticapillary-Fragility; AntiDNA; Antiflu; Antihistaminic; Antiinflammatory $IC_{47}=50 mg/kg scu$ $IC_{63}=100 mg/kg scu$; Antileukotriene; Antioxidant $IC_{50}=8 ppm$; Antiprostaglandin; AntiRNA; Antistomatitic; Antitriglyceride; Antiulcer 100-150 $mg/kg ipr$; Antivaccinia; Antiviral; Anxiolytic; Calcium-Antagonist $IC_{50}=1.2 \mu M rbt$; Capillariprotective; Catabolic; Choleric; CNS-Depressant 100-150 $mg/kg ipr$; Cyclooxygenase-Inhibitor; Hypolipidemic; Lipoxygenase-Inhibitor; Pesticide; ProHDL; Vasopressor

HORDENENE Fruit:

No activity reported.

HUMULENE Fruit:

Antimalarial $IC_{50}=86 \mu g/ml$; Antiplasmodial

ISO-OBACUNOIC-ACID-17-O-BETA-D-GLUCOSIDE Seed:

No activity reported.

ISOMERANZIN Pericarp:

No activity reported.

ISORHAMNETIN Fruit:

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

ISORHOIFOLIN Leaf:

No activity reported.

ISOSAKURANETIN Fruit:

No activity reported.

KAEMPFEROL Fruit:

11B-HSD-Inhibitor; 5-Lipoxygenase-Inhibitor IC_{50} (μM)=20; Aldose-Reductase-Inhibitor 100 μM ; Antiaflatoxin IC_{50} =3.28 ppm IC_{50} =8.73 μM ; Antiaggregant 30 μM ; Antiallergic; Antibacterial 20 $\mu g/ml$; Anticancer; Antifertility 250 mg/kg/day/60 days/orl rat; Antigingivitic 20 $\mu g/ml$; Antiherpetic 23-92 $\mu g/ml$; Antihistaminic; Antiimplantation; Antiinflammatory 20 mg/kg 200 mg/kg ipr rat; Antileukemic IC_{50} =3.1 $\mu g/ml$; Antilymphocytic; Antimutagenic ID_{50} =10-40 nM; Antioxidant 3/4 quercetin IC_{50} =1.2 $\mu g/ml$ IC_{50} =40 μM ; Antiperiodontic 20 $\mu g/ml$; Antiplateau; Antiradicular 7 x quercetin; Antiseptic 20 $\mu g/ml$; Antiserotonin 200 mg/kg ipr rat; Antispasmodic; Antistaphylococcic; Antitumor; Antitumor-Promoter; Antiulcer 50-200 mg/kg ipr rat; Antiviral 23-92 $\mu g/ml$; Apoptotic 60 μM ; Aromatase-Inhibitor IC_{12} =1 $\mu M/l$; cAMP-Phosphodiesterase-Inhibitor; Cancer-Preventive; Carcinogenic; Choleric; Copper-Chelator; COX-2-Inhibitor; Cyclooxygenase-Inhibitor IC_{50} (μM) =20; Cytotoxic; Diaphoretic?; Diuretic; Estrogenic EC_{50} =0.1-25 $\mu M/l$ EC_{50} =0.56 μM ; Fungicide 20 $\mu g/ml$; Hepatoprotective IC_{50} =1.30 ppm IC_{50} =5.46 μM ; HIV-RT-Inhibitor IC_{50} =50-150 $\mu g/ml$; Hypotensive; ICAM-1-Inhibitor; iNOS-Inhibitor IC_{50} =13.9 μM IC_{50} <15 μM ; Inotropic; Iodothyronine-Deiodinase-Inhibitor; JNK-Inhibitor; Lipoxygenase-Inhibitor; MAO-Inhibitor; Mutagenic; Natriuretic; Neuroprotective; NO-Inhibitor IC_{50} =13.9 μM ; PAF-Inhibitor; Pesticide; Protisticide; Quinone-Reductase-Inducer 3 μM ; Teratologic; TNF-alpha-Inhibitor IC_{50} =3.99 μM ; Topoisomerase-I-Inhibitor; Topoisomerase-II-Inhibitor IC_{50} =8.1 $\mu g/ml$; Tyrosinase-Inhibitor ID_{50} =230 μM ; Uterotrophic EC_{50} =0.1-25 $\mu M/l$; Vasodilator

LEUCINES Fruit 240 ppm;

No activity reported.

LIMONIN Fruit: Plant 9 - 140 ppm

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

LIMONOATE-A-RING-LACTONE Fruit:

No activity reported.

LIMONOL Seed 23 ppm;

No activity reported.

LINALOL Fruit:

No activity reported.

LINALYL-ACETATE Fruit:

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* 0.095 - 0.95 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

LYCOPENE *Fruit*:

Anticancer (Bladder); Anticancer (Breast); Anticancer (Cervix); Anticancer (Prostate); Antioxidant; Antiprostaitic; Antiradicular; Antitumor; Antitumor (Bladder); Antitumor (Breast); Antitumor (Cervix); Antitumor (Prostate); Cancer-Preventive; Colorant; Hypocholesterolemic 60 mg/man/day/3 mos; Prooxidant 20 ug/g

MALIC-ACID *Fruit* 400 - 600 ppm

Antiatherosclerotic; Antibacterial; Antifibromyalgic 300 mg 3x/day; Antioxidant Synergist; Antiseborrheic; Antiseptic; Antitubercular; Antitumor; Bacteristat; Bruchiphobe; Hemopoietic; Laxative?; Mycobactericide; Pesticide; Sialogogue

MALONIC-ACID *Fruit*:

Irritant

MANNOSE *Fruit*:

Antiadhesive; Anticystitic 0.25-1 tsp 3-4 x/day orl man; AntiUTI

MERANZIN *Pericarp*:

No activity reported.

MERANZIN-HYDRATE *Pericarp*:

No activity reported.

METHYL-ANTHRALINATE *Fruit*:

No activity reported.

MYRCENE *Fruit* 72 - 190 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 IC50=0.14 uM; Perfumery; Pesticide

N-DODECASANE *Fruit*:

No activity reported.

N-DORIACONTANE *Fruit*:

No activity reported.

N-EICOSANE *Fruit*:

No activity reported.

N-HENEICOSANE *Fruit*:

No activity reported.

N-HENTRIACONTANE *Fruit*:

Antiinflammatory; Cosmetic; Diuretic

N-HEPTACOSANE *Fruit*:

No activity reported.

N-HEXACOSANE *Fruit*:

Bacteristat; Pesticide

N-METHYL-TYRAMINE *Fruit*:

Cancer-Preventive

N-NONACOSANE *Fruit*:

Antimutagenic

N-NONYL-ALCOHOL *Fruit*:

No activity reported.

N-OCTACOSANE *Fruit*:

No activity reported.

N-OCTYL-ACETATE *Fruit*:

No activity reported.

N-OCTYL-ALCOHOL *Fruit*:

No activity reported.

N-PENTACOSANE *Fruit*:

No activity reported.

N-PENTATRIACONTANE *Pericarp*:

No activity reported.

N-TETRACOSANE *Fruit*:

No activity reported.

N-TETRATRIACONTANE *Pericarp*:

No activity reported.

N-TRIACONTANE *Fruit*:

No activity reported.

NARINGENIN *Fruit*:

11B-HSD-Inhibitor; Aldose-Reductase-Inhibitor *1 ug/ml 100 uM IC25=1 uM IC78=10 uM*; Acetylcholinesterase; Antiaflatoxin *IC50=12 uM IC50=3.37 ppm*; Antiaggregant; Antialzheimeran; Antiamnesic; Antiamyloid-Beta; Antibacterial *MIC=250-500 ug/ml*; Anticancer; Antiescherichic; Antiestrogenic; Antifibrotic; Antihepatotoxic; Antiherpetic; AntiHIV *IC35=200 ug/ml*; Antiinflammatory *20 ppm*; Antileukemic *IC50=>10 ug/ml*; Antimutagenic *ID50=50-100 nM*; Antioxidant *7 x quercetin*; Antiperistaltic; Antiperoxidative; Antiradicular; Antisindhis *IC50=15 ug/ml*; Antispasmodic; Antistaphylococcic; Antitumor; Antitumor-Promoter; Antiulcer; Antiviral; Aphidifuge; Aromatase-Inhibitor *IC45=1 uM/l*; cAMP-Phosphodiesterase-Inhibitor; Cancer-Preventive; Candidicide; Choloretic; Cytochrome-P450-Inhibitor;

Decarboxylase-Inhibitor; Embryotoxic; Estrogenic $EC_{50}=0.1-25 \mu M/l$; Fungicide 2.5 mM ; Fungistat; Hepatoprotective $IC_{50}=12 \mu M$ $IC_{50}=3.37 ppm$; Neuroprotective; P450-Inhibitor; Pesticide; Serotonin-Inhibitor; Teratogenic; TNF-alpha-Inhibitor $IC_{50}=14.41 \mu M$; Topoisomerase-I-Inhibitor; Uterotrophic $EC_{50}=0.1-25 \mu M/l$

NARINGENIN-7-BETA-(4-BETA-D-GLUCOSYL)-NEOHESPERIDOSIDE *Fruit*:

No activity reported.

NARINGENIN-7-BETA-(4-BETA-D-GLUCOSYL)-RUTINOSIDE *Fruit*:

No activity reported.

NARINGENIN-7-O-BETA-D-RUTINOSIDE *Fruit*:

No activity reported.

NARINGENIN-RUTINOSIDE *Fruit*:

No activity reported.

NARINGIN *Fruit* 245 ppm; *Pericarp* 4,500 - 14,000 ppm *Seed* 200 ppm;

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

NARINGIN-4-BETA-D-GLUCOSIDE *Plant*:

No activity reported.

NARIRUTIN *Fruit*:

Oviposition-Stimulant

NEOHESPERIDIN *Fruit*:

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

NERAL *Fruit* 136 - 210 ppm

Antibacterial; Antispasmodic; Pesticide; Termiticide $LD_{100}=5 mg/g$

NEUROSPORENE *Fruit*:

No activity reported.

NOMILIN *Seed*:

Antifeedant; Pesticide

NOMILINIC-ACID *Plant*:

No activity reported.

NOMILINIC-ACID-17-O-BETA-D-GLUCOSIDE *Seed*:

No activity reported.

OBACUNONE *Seed*:

Anticatalaptic; Antifeedant; Pesticide

OCTOPAMINE *Hull Husk*:

No activity reported.

OCTYL-ALDEHYDE *Fruit:*

No activity reported.

OCTYLIC-ACID *Fruit:*

No activity reported.

OSTHOLE *Root:*

Antimalarial; Calcium-Antagonist; Juvabional; Pesticide

OXALIC-ACID *Plant:*

Acaricide; Antiseptic; CNS-Paralytic; Fatal; Hemostatic; Irritant; Pesticide; Renotoxic; Varroacide

P-COUMARIC-ACID *Fruit 53 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; Lipoxygenase-Inhibitor *IC11=5 mM*; Pesticide; Prostaglandigenic; Prostaglandin-Synthesis-Inhibitor; Tyrosinase-Inhibitor *ID50=3,650 uM*

P-MENTH-1-ENE-8-THIOL *Fruit:*

No activity reported.

PARADISIOL *Fruit:*

No activity reported.

PENTAN-1-OL *Fruit:*

No activity reported.

PHLORIN *Plant:*

No activity reported.

PHLOROGLUCINOL *Fruit:*

Antiseptic; Antispasmodic *480 mg/day/orl man*; Antitumor-Promoter; Cancer-Preventive; Decalcifier; Fungicide; Goitrogenic; Pesticide

PHYTOENE *Fruit:*

No activity reported.

PHYTOFLUENE *Fruit:*

No activity reported.

POLYGALACTURONIC-ACID *Fruit:*

No activity reported.

PONCIRIN *Fruit:*

No activity reported.

PONCITRIN *Root:*

No activity reported.

PSI-CAROTENE Plant:

No activity reported.

QUERCETIN Fruit:

11B-HSD-Inhibitor; 5-Lipoxygenase-Inhibitor IC_{50} (μM)=4; Aldehyde-Oxidase-Inhibitor IC_{70-96} =10 μM ; Aldose-Reductase-Inhibitor 100 μM 4 $\mu g/ml$ IC_{50} =0.344 μM IC_{50} =0.84 $\mu g/ml$ cow; Allelochemic IC_{82} =1 mM; Allergenic; Analgesic; Antiaflatoxin IC_{50} =25 μM IC_{50} =7.5 ppm; Antiaggregant 30 μM IC_{50} =55 μM ; Antiaging; Antiallergic IC_{50} =14 μM ; Antialzheimeran; Antianaphylactic; Antiangiogenic; Antiarthritic; Antiasthmatic; Antiatherosclerotic; Antibacterial; Anticarcinomic (Breast) IC_{50} =1.5 μM ; Anticariogenic ID_{50} =120 $\mu g/ml$; Anticataract; Anticolitic 400 mg/man/3x/day; Anticomplementary; AntiCrohn's; Anticystitic 1,000 mg/day/4 weeks; Antidepressant; Antidermatitic; Antidiabetic; Antielastase IC_{50} =0.8 $\mu g/ml$; Antiencephalitic; Antiescherichic; Antiestrogenic; Antifeedant IC_{52} =<1,000 ppm diet; Antifibrosarcomic; Antiflu; Antigastric; Antigonadotropic; AntiGTF ID_{50} =120 $\mu g/ml$; Antihepatotoxic; Antiherpetic 48-150 $\mu g/ml$; Antihistaminic IC_{50} =<10 μM ; AntiHIV; Antihydrophobic; Antihypertensive; Antiinflammatory 20-150 mg/kg; Antileishmanic IC_{50} =64; Antileukemic 5.5-60 μM IC_{50} =10 μM IC_{50} =>10 $\mu g/ml$; Antileukotriene; Antilipoperoxidant IC_{67} =50; Antimalarial IC_{50} =1-6.4 $\mu g/ml$; Antimelanomic; Antimetastatic; Antimutagenic ID_{50} =0.62 $\mu g/ml$ ID_{50} =2-5 nM; Antimyocarditic; Antinitrosaminic; Antinociceptive; Antioxidant 4.7 x Vit. E ED_{50} =2.3 μM IC_{47} =10 μM IC_{96} =300 ppm; Antipancreatic; Antiperiodontal; Antiperistaltic; Antipermeability; Antiperoxidant; Antipharyngitic; Antiplaque; Antiplasmodial IC_{50} =13-64; AntiPMS 500 mg/2x/day/wmn; Antipodriac; Antipolio; Antiproliferant 10 nM; Antiprostanoid; Antiprostatic; Antipsoriac; Antiradicular IC_{50} =4.6 μM ; Antispasmodic; Antistreptococcic ID_{50} =120 $\mu g/ml$; Antithiamin; Antithrombic; Antitrypanosomic IC_{50} =13; Antitumor 10 μM ; Antitumor (Bladder); Antitumor (Breast); Antitumor (Colon); Antitumor (Lung); Antitumor (Ovary); Antitumor (Skin) 20 μM ; Antitumor-Promoter; Antiulcer; Antiviral 48-150 $\mu g/ml$ IC_{50} =10 μM ; Apoptotic 20-60 μM ; 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 μM ; Cyclooxygenase-Inhibitor; Cytochrome-P450-1A2-Inhibitor; Cytotoxic ED_{50} =70 $\mu g/ml$ IC_{82} =100 $\mu g/ml$; Deiodinase-Inhibitor; Diaphoretic?; Differentiator 5.5 μM ; Estrogenic 10% genistein; Fungicide; Glucosyl-Transferase-Inhibitor ID_{50} =120 $\mu g/ml$; Hemostat; Hepatomagenic 5,000 ppm (diet) rat; Hepatoprotective; HIV-RT-Inhibitor IC_{50} =<1 $\mu g/ml$; Hypoglycemic 100 mg/kg orl rat; iNOS-Inhibitor IC_{50} =20 μM ; Inotropic; Insulinogenic; Juvabional; Larvostat 8,000 ppm diet; Lipoxygenase-Inhibitor IC_{11} =1.25 mM IC_{50} =0.1-5 μM ; MAO-A-Inhibitor; Mast-Cell-Stabilizer; Metal-Chelator (Copper); Metalloproteinase-Inhibitor IC_{50} =>42 μM ; MMP-9-Inhibitor 20 μM ; Mutagenic; NADH-Oxidase-Inhibitor; NEP-Inhibitor IC_{50} =>42 μM ; Neuroprotective 5-25 μM ; NF-kB-Inhibitor; NO-Inhibitor IC_{50} =20 μM $IC_{>50}$ =125 μM ; NO-Synthase-Inhibitor 5-50 μM ; Ornithine-Decarboxylase-Inhibitor <10 μM ; P450-Inducer 5 μM ; P450-Inhibitor 50-100 μM ; Pesticide; PGE2-Inhibitor; Phospholipase-Inhibitor; Plasmodicide; Proliferant; Prostaglandin-Synthesis-Inhibitor 40 $\mu g/ml$; Protein-Kinase-C-Inhibitor; PTK-Inhibitor 0.4-24 μM ; Quinone-Reductase-Inducer 13 μM 6 μM ; Teratologic; TNF-alpha-Inhibitor IC_{50} =3.11 μM ; Topoisomerase-I-Inhibitor IC_{50} =12.8 $\mu g/ml$ IC_{50} =42 μM ; Topoisomerase-II-Inhibitor IC_{50} =1-6.9 $\mu g/ml$ IC_{50} =23-40 μM ; Tumorigenic 0.1% diet orl rat/yr; Tyrosinase-Inhibitor ID_{50} =70 μM ; Tyrosine-Kinase-Inhibitor; Vasodilator; VEGF-Inhibitor; Xanthine-Oxidase-Inhibitor 3.1 μM IC_{50} =10.6 $\mu g/ml$ IC_{50} =>0.4 $\mu g/ml$

QUINIC-ACID *Fruit*:

Choleretic

RHOIFOLIN *Leaf*:

Aldose-Reductase-Inhibitor $IC_{32}=10\ \mu M$; Antiarrhythmic

SALICYLATES *Fruit* 70 ppm;

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

SCOPOLETIN *Fruit*:

Aldose-Reductase-Inhibitor $IC_{50}=6.2\ \mu g/ml\ cow$; Allelochemic $IC_{89}=2\ mM$; Analgesic; Anesthetic; Antiadrenergic; Antiaflatoxin $11.4\ ppm\ IC_{50}=65\ \mu M$; Antiarrhythmic; Antiasthmatic; Antibacterial; Antibronchoconstrictor; Anticholinergic; Antiedemic; Antifeedant; Antihepatotoxic; Antiinflammatory $ED\ 1-10\ \mu g/ear$; Antileukotrienogenic; Antimutagenic; Antioxidant; Antiproliferant; Antiprostaglandin; Antiseptic; Antispasmodic; Antitumor $2.9\ \mu g/ml$; Apoptotic; Bronchorelaxant; Cancer-Preventive; Cholagogue; Choleretic; CNS-Depressant; CNS-Stimulant; Cytotoxic; Fungicide $2\ mM$; Hepatoprotective; Herbicide; Hypoglycemic; Hypotensive; MAO-Inhibitor; Musculotropic; Myorelaxant; Pesticide; Phytoalexin; Phytohormonal; Uterosedative

SESELIN *Root*:

Antileukemic $IC_{50}=17.3\ \mu g/ml$; Fungicide; Pesticide

SESLIN *Root*:

No activity reported.

SILVER *Fruit* 0.022 - 0.11 ppm

Antibacterial; Astringent; Pesticide

SINAPIC-ACID *Fruit* 4 - 5 ppm

Antibacterial; Antihepatotoxic; Antioxidant $IC_{27}=30\ ppm$; Antiperoxynitrite $IC_{39}=5\ \mu M\ IC_{60}=20\ \mu M\ IC_{75}=100\ \mu M$; Cancer-Preventive; Fungicide; Pesticide

SUBAPHYLLIN *Fruit: Leaf*:

Antiviral; Hypotensive; Pesticide

SUBEROSIN *Root*:

No activity reported.

SUGARS *Fruit* 33,000 - 99,600 ppm

No activity reported.

SYNEPHERINE *Fruit*:

No activity reported.

TRANS-OBACUNOIC-ACID-17-O-BETA-D-GLUCOSIDE *Seed*:

No activity reported.

TYRAMINE *Fruit*:

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 *Fruit*:

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

XANTHOXYLETIN *Root*:

Anticonvulsant

XANTHYLETIN *Fruit*:

DME-Inhibitor *IC50=57.5 uM*

XYLAN *Fruit*:

No activity reported.

ZETA-CAROTENE *Fruit*:

No activity reported.