

List of All Chemicals

P Aconitum napellus (Ranunculaceae)

Common name(s)

Bear's-Foot; Garden Wolfsbane; Turk's Cap; Garden Monkshood; Monkshood; Soldier's Cap; Helmet Flower; Queen's Fettle; Aconite; Blue Rocket; European Aconite; Friar's Cap

How used

Medicinal

*Unless otherwise noted all references are to Duke, James A. 1992. Handbook of phytochemical constituents of GRAS herbs and other economic plants. Boca Raton, FL. CRC Press.

| Chemical | Part <input type="button" value="All"/> | Low PPM | High PPM | StdDev | *Reference |
|-------------------------------|--|------------|-------------|--------|---|
| 1,14-DIACETYLNEOLINE | Root | -- | -- | | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| 12-EPIACETYLDEHYDRONAPPELLINE | Root | -- | -- | | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| 12-EPIDEHYDRONAPPELLINE | Root | -- | -- | | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| 14-ACETYLNEOLINE | Root | -- | -- | | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| ACONINE | Root | -- | -- | | * |

Activities (5)

| | |
|-------------|---|
| Analgesic | |
| Anesthetic | |
| Antipyretic | Merck 11th Edition |
| Insecticide | Grainge, M. and Ahmed, S., Handbook of Plants with Pest-Control Properties, John Wiley & Sons, New York, NY, 1988, 470. |
| Pesticide | |

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|---------------|------|----|----|--|--|
| ACONITIC-ACID | Leaf | -- | -- | | List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979. |
|---------------|------|----|----|--|--|

Activities (1)

| | | | | | |
|-------------------------|---|--|--|--|--|
| Perfumery FEMA 1-30 ppm | Aloe Research Council - Duke writeup of non-peer reviewd book by Coats and draft by Henry | | | | |
|-------------------------|---|--|--|--|--|

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|-----------|------|----|----|--|---|
| ACONITINE | Root | -- | -- | | * |
|-----------|------|----|----|--|---|

Activities (26)

| | |
|----------------------------------|--|
| (+)-Inotropic 0.1 mg/kg scu gpg | Hansel, R., Keller, K., Rimpler, H., and Schneider, G. eds. 1992. Hager's Handbuch der Pharmazeutischen Praxis, Drogen (A-D), 1209 pp., 1993 (E-O), 970 pp., 1994 (P-Z), 1196 pp. Springer-Verlag, Berlin. |
| Analgesic | |
| Anesthetic | |
| Antiinflammatory | Williamson, E. M. and Evans, F. J., Potter's New Cyclopaedia of Botanical Drugs and Preparations, Revised Ed., Saffron Walden, the C. W. Daniel Co., Ltd., Essex UK, 362 pp, 1988, reprint 1989. |
| Antineuralgic 0.1 g/man | |
| Antinociceptive | |
| Antipyretic | Merck 11th Edition |
| Arrhythmigenic 0.1 mg/kg scu gpg | |
| Bradycardic 0.01 mg/kg scu cat | Hansel, R., Keller, K., Rimpler, H., and Schneider, G. eds. 1992. Hager's Handbuch der Pharmazeutischen Praxis, Drogen (A-D), 1209 pp., 1993 (E-O), 970 pp., 1994 (P-Z), 1196 pp. Springer-Verlag, Berlin. |
| Calcium-Antagonist 50 ug/ml rat | |
| Cardiotonic | Williamson, E. M. and Evans, F. J., Potter's New Cyclopaedia of Botanical Drugs and Preparations, Revised Ed., Saffron Walden, the C. W. Daniel Co., Ltd., Essex UK, 362 pp, 1988, reprint 1989. |
| Cardiotoxic | |
| Dermal | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. |
| Diaphoretic | |
| Emetic 400-500 ppb | |
| Gastric-Anesthetic | |
| Hypotensive 0.01 mg/kg scu cat | |
| Immunomodulator | |
| Insecticide | Grainge, M. and Ahmed, S., Handbook of Plants with Pest-Control Properties, John Wiley & Sons, New York, NY, 1988, 470. |
| Mydriatic 400-500 ppb | |
| Paralytic 400-500 ppb | |
| Pediculicide | Grainge, M. and Ahmed, S., Handbook of Plants with Pest-Control Properties, John Wiley & Sons, New York, NY, 1988, 470. |
| Pesticide | |
| Respiraparalytic | |
| Sialogogue 400-500 ppb | |
| Toxic | |

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|-------------|------|--------|---------|------|--|
| ACONOSINE | Root | -- | -- | | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| ALKALOIDS | Root | 2000.0 | 20000.0 | 0.06 | * |
| ALKALOIDS | Leaf | 1200.0 | 9600.0 | 0.04 | List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979. |
| BENZACONINE | Root | -- | -- | | * |

Activities (2)

| | |
|-------------|---|
| Insecticide | Grainge, M. and Ahmed, S., Handbook of Plants with Pest-Control Properties, John Wiley & Sons, New York, NY, 1988, 470. |
| Pesticide | |

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|--------------|-------|----|----|--|--|
| CAFFEIC-ACID | Plant | -- | -- | | List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979. |
|--------------|-------|----|----|--|--|

Activities (102)

| | |
|--|---|
| Aldose-Reductase-Inhibitor 4 ug/ml (weak activity) | Ichikawa, K., et al. 1991. Isolation and Structure Determination of Aldose Reductase Inhibitors from Traditional Thai Medicine, and Syntheses of Their Derivatives. Sankyo Kenkyusho Nempo, 43: 99-110. |
| Allergenic | |
| Analgesic | |
| AntiHIV EC50=200 ug/ml | |
| AntiLegionella | |
| Antiadenoviral | Economic & Medicinal Plant Research, 5: 207. |
| Antiaggregant | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. |
| Antiaging | |
| Antiatherogenic | |
| Antibacterial | |
| Anticancer | |
| Anticarcinogenic | Economic & Medicinal Plant Research, 6: 189. |
| Antidepressant | |
| Antiedemic | Economic & Medicinal Plant Research, 6: 189. |
| Antielastase IC50=93 um/l | |

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|---|---|
| Antielastase IC50=86 ug/ml (475 uM) | |
| Antiescherichic | |
| Antiflu | Economic & Medicinal Plant Research, 5: 207. |
| Antigonadotropic | Jim Duke's personal files. |
| Antihemolytic 25 uM | Ohnishi, M., Morishita, H., Iwahashi, H., Toda, S., Shirataki, Y., Kimura, M., and Kido, R. 1993. Inhibitory Effects of Chlorogenic Acids on Linoleic Acid Peroxidation and Haemolysis. <i>Phytochemistry</i> . 36(3): 579-583. 1994. |
| Antihepatoadenomic 200 ppm diet orl mus | |
| Antihepatotoxic | |
| Antiherpetic 50 ug/ml | |
| Antiherpetic EC50=>50 ug/ml | |
| Antihistaminic | |
| Antihypercholesterolemic | Economic & Medicinal Plant Research, 6: 189. |
| Antihyperthyroid | |
| Antiinflammatory | |
| Antileukemic | Chiang, L. C., Chiang, W., Chang, M. Y., Ng, L. T., Lin, C. C. 2003. Antileukemic activity of selected natural products in Taiwan. <i>Am J Chin Med</i> , 31(1):37-46. |
| Antileukotriene | |
| Antimelanogenic | |
| Antimutagenic | Ki Soon Rhee. <i>Oilseed Food Ingredients Used To Minimize Oxidative Flavor Deterioration in Meat Products. Phenolic Compounds in Food and Their Effects on Health</i> , Ch.18. |
| Antinitrosaminic | Ki Soon Rhee. <i>Oilseed Food Ingredients Used To Minimize Oxidative Flavor Deterioration in Meat Products. Phenolic Compounds in Food and Their Effects on Health</i> , Ch.18. |
| Antiophidic | |
| Antioxidant 50 uM | |
| Antioxidant IC57=30 ppm | |
| Antioxidant 1/3 quercetin | |
| Antioxidant 30 mM | |
| Antioxidant 1.3 x Vit. E | |
| Antioxidant 1/2 BHA | |
| Antiperoxidant IC50=44 uM | <i>Planta Medica</i> , 57: A54, 1991. |
| Antiperoxidant IC35=200 ug/ml | |
| Antiperoxidant IC85=100 ug/ml | |
| Antiproliferant | Chiang, L. C., Chiang, W., Chang, M. Y., Ng, L. T., Lin, C. C. 2003. Antileukemic activity of selected natural products in Taiwan. <i>Am J Chin Med</i> , 31(1):37-46. |
| Antiprostaglandin | |
| Antiradicular 10 uM | Ohnishi, M., Morishita, H., Iwahashi, H., Toda, S., Shirataki, Y., Kimura, M., and Kido, R. 1993. Inhibitory Effects of Chlorogenic Acids on Linoleic Acid Peroxidation and Haemolysis. <i>Phytochemistry</i> . 36(3): 579-583. 1994. |
| Antiradicular 1/3 quercetin | |
| Antiradicular 30 mM | |
| Antiradicular IC50=32-35 uM | |
| Antiseptic | |
| Antispasmodic EC50=3.4-15 uM | <i>Phytotherapy Research</i> , 4: 73. |
| Antistaphylococcic | |
| Antistomatitic | Economic & Medicinal Plant Research, 5: 207. |
| Antisunburn | |
| Antithiamin | <i>Phenolic Compounds in Food and Their Effects on Health</i> , 69. |
| Antithyroid | Jim Duke's personal files. |
| Antitumor 200 ppm diet orl mus | |
| Antitumor (Skin) | |
| Antitumor-Promoter IC42=10 uM | <i>Cancer Research</i> , 48: 5941. |
| Antiulcerogenic | |
| Antivaccinia | Economic & Medicinal Plant Research, 5: 207. |
| Antiviral IC50=62.5 ug/ml | |
| Anxiolytic | |
| CNS-Active | Wichtl, M. 1984. <i>Teedrogen. Ein Handbuch fur Apotheker und Arzte. Wissenschaftliche Verlagsgesellschaft. mbH Stuttgart</i> . 393 pp. |
| COX-2-Inhibitor IC32=100 uM | |
| Calcium-Antagonist IC50=1.2 uM rbt | |
| Cancer-Preventive | Stitt, P. A. <i>Why George Should Eat Broccoli</i> . Dougherty Co, Milwaukee, WI, 1990, 399 pp. |
| Carcinogenic 2% (diet) | |
| Chemopreventive | |
| Cholagogue | Wichtl, M. 1984. <i>Teedrogen. Ein Handbuch fur Apotheker und Arzte. Wissenschaftliche Verlagsgesellschaft. mbH Stuttgart</i> . 393 pp. |
| Choleretic | Williamson, E. M. and Evans, F. J., <i>Potter's New Cyclopaedia of Botanical Drugs and Preparations, Revised Ed.</i> , Saffron Walden, the C. W. Daniel Co., Ltd., Essex UK, 362 pp, 1988, reprint 1989. |
| Clastogenic | Jeffery B. Harborne and H. Baxter, eds. 1983. <i>Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants</i> . Taylor & Frost, London. 791 pp. |
| Co-carcinogenic | |
| Collagen-Sparing | |
| Cytoprotective | Newall, C. A., Anderson, L. A. and Phillipson, J. D. 1996. <i>Herbal Medicine - A Guide for Health-care Professionals</i> . The Pharmaceutical Press, London. 296pp. |

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|---|---|
| Cytotoxic TC50=200 ug/ml | |
| DNA-Active | Jeffery B. Harborne and H. Baxter, eds. 1983. <i>Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants.</i> Taylor & Frost, London. 791 pp. |
| DNA-Protective | |
| Diuretic | Wichtl, M. 1984. <i>Teedrogen. Ein Handbuch fur Apotheker und Arzte.</i> Wissenschaftliche Verlagsgesellschaft. mbH Stuttgart. 393 pp. |
| Fungicide MIC=0.4 mg/ml | |
| Hepatocarcinogenic 400 ppm diet orl mus (in the absence of alcohol) | |
| Hepatoprotective | Advance in Chinese Medicinal Materials Research. 1985. Eds. H. M. Chang, H. W. Yeung, W. -W. Tso and A. Koo. World Scientific Publishing Co., Philadelphia Pa., page 210. |
| Hepatotropic | |
| Histamine-Inhibitor | |
| Immunostimulant | |
| Insectifuge | Tunon, H., Thorsell, W., and Bohlin, L. 1993. Mosquito Repelling Activity of Compounds Occurring in <i>Achillea millefolium</i> L. (Asteraceae). <i>Economic Botany</i> 48(2): 111-120, 1994. |
| Leukotriene-Inhibitor | |
| Lipoxygenase-Inhibitor IC27=5 mM | Oszmianski, J. and Lee, C.Y. 1990. Inhibitory Effect of Phenolics on Carotene Bleaching in Vegetables. <i>J. Agric. Food Chem.</i> 38: 688-690. |
| Lipoxygenase-Inhibitor IC50=62-148 uM | |
| Lyase-Inhibitor IC50=94-164 uM | |
| Metal-Chelator | McEvily, A.J., Iyengar, R., and Gross, A.T. Inhibition of Polyphenol Oxidase by Phenolic Compounds. <i>Phenolic Compounds in Food and Their Effects on Health</i> , Ch.25. |
| Ornithine-Decarboxylase-Inhibitor | Hagerman, A.E. Tannin-Protein Interactions. <i>Phenolic Compounds in Food and Their Effects on Health</i> , Ch.19. |
| Pesticide | |
| Prooxidant | |
| Prostaglandigenic | |
| Sedative 500 mg | |
| Sunscreen IC50=2.5 mg/l | Lazarova* G., Kostova, I., Neychev, H. 1992. Photodynamic damage prevention by some hydroxycoumarins. <i>Fitoterapia</i> 64(2): 134-136, 1993. |
| Sunscreen IC91=5 mg/l | Lazarova* G., Kostova, I., Neychev, H. 1992. Photodynamic damage prevention by some hydroxycoumarins. <i>Fitoterapia</i> 64(2): 134-136, 1993. |
| Sunscreen IC98=25 mg/l | Lazarova* G., Kostova, I., Neychev, H. 1992. Photodynamic damage prevention by some hydroxycoumarins. <i>Fitoterapia</i> 64(2): 134-136, 1993. |
| Tumorigenic | Jim Duke's personal files. |
| Vulnerary | |
| Xanthine-Oxidase-Inhibitor IC50=39.21 uM | Mills, Simon and Bone, Kerry. 2000. <i>Phytotherapy.</i> Churchill Livinston, Edinburgh. |

CHLOROGENIC-ACID Plant -- -- List, P.H. and Horhammer, L., *Hager's Handbuch der Pharmazeutischen Praxis*, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.

Activities (77)

| | |
|--|--|
| Aldose-Reductase-Inhibitor IC50=1.8 uM rat (strong activity) | Yoshikawa, M., et al. 1999. <i>Medicinal Flowers. I. Aldose Reductase Inhibitors and Three New Eudesmane-Type Sesquiterpenes</i> , Kikkanols A, B, and C, From the Flowers of <i>Chrysanthemum indicum</i> L. <i>Chem Pharm Bull</i> , 47(3): 340-345. |
| Allelochemic | |
| Allergenic | |
| Analgesic | |
| AntiEBV | <i>Economic & Medicinal Plant Research</i> , 6: 189. |
| AntiHIV | <i>Economic & Medicinal Plant Research</i> , 6: 189. |
| AntiLegionella | |
| Antiatherosclerotic | |
| Antibacterial | |
| Anticancer (Colon) | |
| Anticancer (Forestomach) | |
| Anticancer (Liver) | |
| Anticancer (Skin) | |
| Anticarcinogenic | |
| Antidiabetic | |
| Antifeedant | |
| Antigenotoxic | |
| Antigonadotropic | Jim Duke's personal files. |
| Antihemolytic 10 uM | Ohnishi, M., Morishita, H., Iwashashi, H., Toda, S., Shirataki, Y., Kimura, M., and Kido, R. 1993. Inhibitory Effects of Chlorogenic Acids on Linoleic Acid Peroxidation and Haemolysis. <i>Phytochemistry</i> . 36(3): 579-583. 1994. |
| Antihepatotoxic | |
| Antihyperpetic | <i>Economic & Medicinal Plant Research</i> , 5: 194. |
| Antihistaminic | |
| Antihypercholesterolemic | <i>Economic & Medicinal Plant Research</i> , 6: 189. |
| Antihyperthyroid | |
| Antiinflammatory | Hagerman, A.E. Tannin-Protein Interactions. <i>Phenolic Compounds in Food and Their Effects on Health</i> , Ch.19. |
| Antileukotriene | |
| Antimelanogenic | |
| Antimutagenic | |
| Antinitrosaminic | |

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|-----------------------------------|--|
| Antioxidant IC53=200 ppm | Huang, M-T., and Ferraro, T. Phenolic Compounds in Food and Cancer Prevention. Phenolic Compounds in Food and Their Effects on Health, Ch.2 p.21. |
| Antioxidant IC80=12 uM | |
| Antioxidant IC50=54.2 uM | |
| Antiperoxidant IC50=36 uM | Planta Medica, 57: A54, 1991. |
| Antipolio | Jim Duke's personal files. |
| Antiradicular 10 uM | Ohnishi, M., Morishita, H., Iwashashi, H., Toda, S., Shirataki, Y., Kimura, M., and Kido, R. 1993. Inhibitory Effects of Chlorogenic Acids on Linoleic Acid Peroxidation and Haemolysis. Phytochemistry. 36(3): 579-583. 1994. |
| Antiradicular 9 x quercetin | |
| Antiseptic | |
| Antisunburn | |
| Antithyroid | Jim Duke's personal files. |
| Antitumor | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. |
| Antitumor (Colon) | |
| Antitumor (Forestomach) | |
| Antitumor (Liver) | |
| Antitumor (Skin) | |
| Antitumor-Promoter IC25=10 uM | |
| Antiulcer | Economic & Medicinal Plant Research, 6: 189. |
| Antiviral | Vlietinck, A.J. and Dommissie, R.A. eds. 1985. Advances in Medicinal Plant Research. Wiss. Verlag. Stuttgart. |
| Autotoxic | |
| CNS-Active | Wichtl, M. 1984. Teedrogen. Ein Handbuch fur Apotheker und Arzte. Wissenschaftliche Verlagsgesellschaft. mbH Stuttgart. 393 pp. |
| CNS-Stimulant 1/6 Caffeine | |
| Cancer-Preventive | Stitt, P. A. Why George Should Eat Broccoli. Dougherty Co, Milwaukee, WI, 1990, 399 pp. |
| Cardioprotective | |
| Chemopreventive | |
| Cholagogue | Wichtl, M. 1984. Teedrogen. Ein Handbuch fur Apotheker und Arzte. Wissenschaftliche Verlagsgesellschaft. mbH Stuttgart. 393 pp. |
| Choleretic | Huang, K. C. 1993. The Pharmacology of Chinese Herbs. CRC Press, Boca Raton, FL 388 pp. |
| Clastogenic | Friedman, M. and Dao, L. 1990. Effect of Autoclaving and Conventional and Microwave Baking on the Ergot Alkaloid and Chlorogenic Acid Contents of Morning Glory (Ipomoea tricolor Cav. cv.) Heavenly Blue Seeds. J. Agric. Food Chem. 38: 805-808. |
| Collagen-Sparing | |
| Diuretic | |
| Fungicide | Nigg, H.N. and Seigler, D.S., eds. 1992. Phytochemical Resources for Medicine and Agriculture. Plenum Press, New York. 445 pp. |
| Hepatoprotective | Huang, K. C. 1993. The Pharmacology of Chinese Herbs. CRC Press, Boca Raton, FL 388 pp. |
| Histamine-Inhibitor | |
| Hypoglycemic | |
| Immunostimulant | |
| Insectifuge | Tunon, H., Thorsell, W., and Bohlin, L. 1993. Mosquito Repelling Activity of Compounds Occurring in Achillea millefolium L. (Asteraceae). Economic Botany 48(2): 111-120, 1994. |
| Interferonogenic | Economic & Medicinal Plant Research, 1: 124. |
| Juvabional | Jacobson, M., Glossary of Plant-Derived Insect Deterrents, CRC Press, Inc., Boca Raton, FL, 213 p, 1990. |
| Larvostat | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. |
| Leukotriene-Inhibitor | |
| Lipoxigenase-Inhibitor IC23=5 mM | Oszmianski, J. and Lee, C.Y. 1990. Inhibitory Effect of Phenolics on Carotene Bleaching in Vegetables. J. Agric. Food Chem. 38: 688-690. |
| Metal-Chelator | McEvily, A.J., Iyengar, R., and Gross, A.T. Inhibition of Polyphenol Oxidase by Phenolic Compounds. Phenolic Compounds in Food and Their Effects on Health, Ch.25. |
| NO-Genic | |
| Ornithine-Decarboxylase-Inhibitor | Hagerman, A.E. Tannin-Protein Interactions. Phenolic Compounds in Food and Their Effects on Health, Ch.19. |
| Oviposition-Stimulant | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. |
| Pesticide | |
| Sunscreen | |
| Sweetener | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| Vulnerary | |

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|-------------|-------|----|----|--|
| CITRIC-ACID | Plant | -- | -- | List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979. |
|-------------|-------|----|----|--|

Activities (49)

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|--|--|
| Adrenergic | Martindale's 29th |
| Allergenic | Martindale's 29th |
| Anesthetic | |
| Antiallergic | |
| Antianaphylactic | |
| Antiappetant | |
| Antiarachidonate | |
| Antiasthmatic 15-60 mg/3-4 x/day/orl/man | Martindale's 29th |
| Antibronchitic | |
| Anticholinesterase | |
| Antiedemic 30 mg/3-4x/day/man | Martindale's 29th |
| Antiemphysemic | |
| Antienuretic 60 mg/man/night | Martindale's 29th |
| Antiepileptic | |
| Antiherpetic | |
| Antihiccup 5-10 mg/ivn/man | Martindale's 29th |
| Antihistaminic | |
| Antiinflammatory | |
| Antimyasthenic 30 mg/3x/day/man | Martindale's 29th |
| Antinarcoleptic | Martindale's 29th |
| Antirhinitic | Martindale's 29th |
| Antisinusitic | Martindale's 29th |
| Antisyncopic 25 mg/4 x/day/man | Martindale's 29th |
| Antitussive 0.01 mg/kg | Schulz, V, Hansel, R and Tyler, VE. 1998. Rational Phytotherapy - A Physician's Guide to Herbal Medicine. 3rd ed. 1st English Edition. Translated by Terry C. Telger. Springer Verlag, Heidelberg. 306 pp. |
| Antiviral | |
| Bronchodilator 1.5-3 mg/kg orl dog | Borchard, R. E., Barnes, C. D., and Eltherton, L. G. 1991. Drug Dosage in Laboratory Animals: A Handbook. (3rd Ed.) The Telford Press, Inc., P. O. Box 287, Caldwell NJ 07006. |
| Bronchodilator 5 mg/cat orl | Borchard, R. E., Barnes, C. D., and Eltherton, L. G. 1991. Drug Dosage in Laboratory Animals: A Handbook. (3rd Ed.) The Telford Press, Inc., P. O. Box 287, Caldwell NJ 07006. |
| Bronchorelaxant | Huang, K. C. 1993. The Pharmacology of Chinese Herbs. CRC Press, Boca Raton, FL 388 pp. |
| CNS-Stimulant 20 mg/dog | Borchard, R. E., Barnes, C. D., and Eltherton, L. G. 1991. Drug Dosage in Laboratory Animals: A Handbook. (3rd Ed.) The Telford Press, Inc., P. O. Box 287, Caldwell NJ 07006. |
| Cardiotonic 1 mg/kg ivn rat | Borchard, R. E., Barnes, C. D., and Eltherton, L. G. 1991. Drug Dosage in Laboratory Animals: A Handbook. (3rd Ed.) The Telford Press, Inc., P. O. Box 287, Caldwell NJ 07006. |
| Cerebrostimulant | Huang, K. C. 1993. The Pharmacology of Chinese Herbs. CRC Press, Boca Raton, FL 388 pp. |
| Controlled | |
| Decongestant | Williamson, E. M. and Evans, F. J., Potter's New Cyclopaedia of Botanical Drugs and Preparations, Revised Ed., Saffron Walden, the C. W. Daniel Co., Ltd., Essex UK, 362 pp, 1988, reprint 1989. |
| Dermatitogenic | |
| Diuretic | |
| Hallucinogenic | Martindale's 29th |
| Hypertensive 30 mg/man/day | Martindale's 28th |
| Insecticide | Grainge, M. and Ahmed, S., Handbook of Plants with Pest-Control Properties, John Wiley & Sons, New York, NY, 1988, 470. |
| Mydriatic | Merck 11th Edition |
| Myocardiotoxic | Huang, K. C. 1993. The Pharmacology of Chinese Herbs. CRC Press, Boca Raton, FL 388 pp. |
| Myorelaxant | |
| Pesticide | |
| Respirastimulant | Martindale's 29th |
| Stimulant | Nigg, H.N. and Seigler, D.S., eds. 1992. Phytochemical Resources for Medicine and Agriculture. Plenum Press, New York. 445 pp. |
| Sympathomimetic | Merck 11th Edition |
| Tachycardic | Martindale's 28th |
| Tracheorelaxant | |
| Uterocontractant | |
| Vasoconstrictor | Martindale's 29th |

FRUCTOSE

Plant

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| Activities (8) | | | | |
|-----------------------|--|--|--|--|
| Antialcoholic | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. | | | |
| Antidiabetic | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. | | | |
| Antihangover | | | | |
| Antiketotic | Merck 11th Edition | | | |
| Antinauseant | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. | | | |
| Laxative | | | | |
| Neoplastic | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses | | | |
| Sweetener 2 x glucose | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. | | | |

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|----------|------|----|----|---|
| FRUCTOSE | Root | -- | -- | * |
|----------|------|----|----|---|

| Activities (8) | | | | |
|-----------------------|--|--|--|--|
| Antialcoholic | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. | | | |
| Antidiabetic | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. | | | |
| Antihangover | | | | |
| Antiketotic | Merck 11th Edition | | | |
| Antinauseant | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. | | | |
| Laxative | | | | |
| Neoplastic | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses | | | |
| Sweetener 2 x glucose | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. | | | |

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|-------------|------|----|----|---|
| HOKBUSINE-A | Root | -- | -- | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
|-------------|------|----|----|---|

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|------------------|------|----|----|--|
| HOMOISOACONITINE | Leaf | -- | -- | List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979. |
|------------------|------|----|----|--|

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|--------------|------|----|----|---|
| HYPACONITINE | Root | -- | -- | * |
|--------------|------|----|----|---|

| Activities (4) | | | | |
|------------------|--|--|--|--|
| Analgesic | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. | | | |
| Antiinflammatory | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. | | | |
| Insecticide | Grainge, M. and Ahmed, S., Handbook of Plants with Pest-Control Properties, John Wiley & Sons, New York, NY, 1988, 470. | | | |
| Pesticide | | | | |

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|----------|------|----|----|--|
| INOSITOL | Leaf | -- | -- | List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979. |
|----------|------|----|----|--|

| Activities (8) | | | | |
|----------------------------------|--|--|--|--|
| Antialopecic | | | | |
| Anticirrhotic | | | | |
| Antidiabetic? | Martindale's 29th | | | |
| Antineuropathic? 2 g/day | Werbach, M. 1993. Healing with Food. Harper Collins, New York, 443 pp. | | | |
| Cholesterolytic 2,000 mg/man/day | | | | |
| Lipotropic | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. | | | |
| Sweetener | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. | | | |
| Ubiquiot | Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705. | | | |

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|----------------|-------|----|----|--|
| ISOCITRIC-ACID | Plant | -- | -- | List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979. |
|----------------|-------|----|----|--|

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|--------------|-------|----|----|--|
| ISONAPELLINE | Plant | -- | -- | J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991. |
|--------------|-------|----|----|--|

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|-----------------|-------|----|----|--|
| ITACONITIC-ACID | Plant | -- | -- | List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979. |
|-----------------|-------|----|----|--|

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|------------|-------|----|----|--|
| LUCICULINE | Plant | -- | -- | J.S. Glasby Dict.Pls Containing 2ndary Metabolite. 1991. |
|------------|-------|----|----|--|

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|------------|-------|----|----|--|
| MALIC-ACID | Plant | -- | -- | List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979. |
|------------|-------|----|----|--|

Activities (15)

| | |
|--------------------------------|--|
| Antiatherosclerotic | |
| Antibacterial | |
| Antifibromyalgic 300 mg 3x/day | |
| Antioxidant Synergist | Merck 11th Edition |
| Antiseborrheic | |
| Antiseptic | Martindale's 29th |
| Antitubercular | |
| Antitumor | Economic & Medicinal Plant Research, 6: 235. |
| Bacteristat | |
| Bruchiphobe | Jacobson, M., Glossary of Plant-Derived Insect Deterrents, CRC Press, Inc., Boca Raton, FL, 213 p, 1990. |
| Hemopoietic | |
| Laxative? | Lawrence Review of Natural Products, Sep-91. |
| Mycobactericide | |
| Pesticide | |
| Sialogogue | Martindale's 29th |

MALONIC-ACID Root -- -- Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.

Activities (1)

Irritant Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.

MALTOSE Root -- -- *

Activities (2)

| | |
|--------------------------|--|
| Antidiabetic | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. |
| Sweetener 0.32 x sucrose | Martindale's 28th |

MALTOSE Plant -- -- *

Activities (2)

| | |
|--------------------------|--|
| Antidiabetic | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. |
| Sweetener 0.32 x sucrose | Martindale's 28th |

MANNITOL Plant -- -- *

Activities (18)

| | |
|------------------|--|
| Allergenic | Martindale's 29th |
| Analgesic | |
| Anthelmintic | ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes. |
| AntiReye's | Martindale's 29th |
| Antiglaucomic | Martindale's 28th |
| Antiinflammatory | ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes. |
| Antimutagenic | |
| Antinephritic | Martindale's 29th |
| Antioxidant | Jim Duke's personal files. |
| Antiradicular | |
| Antispasmodic | ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes. |
| Diuretic | Merck 11th Edition |
| Emetic | Martindale's 28th |
| Flatugenic | Martindale's 29th |
| Laxative | |
| Nephrotoxic | Martindale's 29th |
| Pesticide | |
| Sweetener | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. |

MANNITOL Root -- -- *

| Activities (18) | | | | |
|------------------|--|--|--|--|
| Allergenic | Martindale's 29th | | | |
| Analgesic | | | | |
| Anthelmintic | ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes. | | | |
| AntiReye's | Martindale's 29th | | | |
| Antiglaucomic | Martindale's 28th | | | |
| Antiinflammatory | ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes. | | | |
| Antimutagenic | | | | |
| Antinephritic | Martindale's 29th | | | |
| Antioxidant | Jim Duke's personal files. | | | |
| Antiradicular | | | | |
| Antispasmodic | ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes. | | | |
| Diuretic | Merck 11th Edition | | | |
| Emetic | Martindale's 28th | | | |
| Flatugenic | Martindale's 29th | | | |
| Laxative | | | | |
| Nephrotoxic | Martindale's 29th | | | |
| Pesticide | | | | |
| Sweetener | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. | | | |

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|--------------|-------|----|----|---|
| MELIBIOSE | Root | -- | -- | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| MELLOBIOSE | Plant | -- | -- | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses |
| MESACONITINE | Root | -- | -- | * |

| Activities (13) | | | | |
|-----------------------------|---|--|--|--|
| Analgesic | | | | |
| Antihistaminic | | | | |
| Antiinflammatory | | | | |
| Antileukemic IC50=>10 ug/ml | Life Sciences 55: 1061. | | | |
| Emetic | | | | |
| Insecticide | Grainge, M. and Ahmed, S., Handbook of Plants with Pest-Control Properties, John Wiley & Sons, New York, NY, 1988, 470. | | | |
| Mydriatic | | | | |
| Paralytic | | | | |
| Pesticide | | | | |
| Purgative 0.3-0.5 mg/kg | | | | |
| RNA-Stimulant | | | | |
| Respirainhibitor | | | | |
| Sialogogue | Oriental Materia Medica (three volumes by Dr. Hsu and collaborators) | | | |

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|-------------------|------|----|----|---|
| N-DETHYLACONITINE | Root | -- | -- | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| NAPELLINE | Root | -- | -- | * |

| Activities (4) | | | | |
|----------------|--|--|--|--|
| Cardiactive | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. | | | |
| Hypotensive | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. | | | |
| Insecticide | Grainge, M. and Ahmed, S., Handbook of Plants with Pest-Control Properties, John Wiley & Sons, New York, NY, 1988, 470. | | | |
| Pesticide | | | | |

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|-------------|-------|----|----|---|
| NAPELLONINE | Shoot | -- | -- | * |
| NEOLINE | Root | -- | -- | * |

| Activities (2) | | | | |
|----------------|---|--|--|--|
| Insecticide | Grainge, M. and Ahmed, S., Handbook of Plants with Pest-Control Properties, John Wiley & Sons, New York, NY, 1988, 470. | | | |
| Pesticide | | | | |

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|------------|------|----|----|---|
| NEOPELLINE | Root | -- | -- | * |
|------------|------|----|----|---|

| Activities (2) | | | | |
|----------------|---|--|--|--|
| Insecticide | Grainge, M. and Ahmed, S., Handbook of Plants with Pest-Control Properties, John Wiley & Sons, New York, NY, 1988, 470. | | | |
| Pesticide | | | | |

OXALIC-ACID Plant -- -- List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.

Activities (9)

Acaricide
 Antiseptic
 CNS-Paralytic Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
 Fatal Martindale's 29th
 Hemostatic Merck 11th Edition
 Irritant
 Pesticide
 Renotoxic Merck 11th Edition
 Varroacide

PICRACONITINE Leaf -- -- *

PICRANOTINE Plant -- -- CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses

PICROACONITINE Leaf -- -- *

PSEUDACONITINE Plant -- -- CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses

Activities (2)

Cardiactive Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.
 Respiradepressant Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp.

PYRRILIDONCARBONIC-ACID Plant -- -- List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.

QUINIC-ACID Plant -- -- List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.

Activities (1)

Choleretic Fitoterapia No.5-1986.

SENBUSINE-A Root -- -- Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.

SENBUSINE-C Root -- -- Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.

SONGORAMINE Root -- -- Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp.

SPARTEINE Root -- -- *

Activities (21)

| | |
|----------------------------------|--|
| Abortifacient | Williamson, E. M. and Evans, F. J., <i>Potter's New Cyclopaedia of Botanical Drugs and Preparations</i> , Revised Ed., Saffron Walden, the C. W. Daniel Co., Ltd., Essex UK, 362 pp, 1988, reprint 1989. |
| Abortifacient | |
| Antiarrhythmic | |
| Antiganglionic 1 mg/kg ivn cat | Borchard, R. E., Barnes, C. D., and Eltherton, L. G. 1991. <i>Drug Dosage in Laboratory Animals: A Handbook</i> . (3rd Ed.) The Telford Press, Inc., P. O. Box 287, Caldwell NJ 07006. |
| Antiinflammatory | |
| Antioxidant | |
| Antiperoxidant | |
| Antitachycardic | Williamson, E. M. and Evans, F. J., <i>Potter's New Cyclopaedia of Botanical Drugs and Preparations</i> , Revised Ed., Saffron Walden, the C. W. Daniel Co., Ltd., Essex UK, 362 pp, 1988, reprint 1989. |
| Bradycardic | Newall, C. A., Anderson, L. A. and Phillipson, J. D. 1996. <i>Herbal Medicine - A Guide for Health-care Professionals</i> . The Pharmaceutical Press, London. 296pp. |
| Cardi depressant 5 mg/kg ivn rbt | Borchard, R. E., Barnes, C. D., and Eltherton, L. G. 1991. <i>Drug Dosage in Laboratory Animals: A Handbook</i> . (3rd Ed.) The Telford Press, Inc., P. O. Box 287, Caldwell NJ 07006. |
| Cathartic | |
| Curaroid | Williamson, E. M. and Evans, F. J., <i>Potter's New Cyclopaedia of Botanical Drugs and Preparations</i> , Revised Ed., Saffron Walden, the C. W. Daniel Co., Ltd., Essex UK, 362 pp, 1988, reprint 1989. |
| Diuretic | |
| Hypoglycemic | |
| Insecticide | Grainge, M. and Ahmed, S., <i>Handbook of Plants with Pest-Control Properties</i> , John Wiley & Sons, New York, NY, 1988, 470. |
| Molluscicide | |
| Oxytotic | Williamson, E. M. and Evans, F. J., <i>Potter's New Cyclopaedia of Botanical Drugs and Preparations</i> , Revised Ed., Saffron Walden, the C. W. Daniel Co., Ltd., Essex UK, 362 pp, 1988, reprint 1989. |
| Pesticide | |
| Respiradepressant | Williamson, E. M. and Evans, F. J., <i>Potter's New Cyclopaedia of Botanical Drugs and Preparations</i> , Revised Ed., Saffron Walden, the C. W. Daniel Co., Ltd., Essex UK, 362 pp, 1988, reprint 1989. |
| Tachycardiagenic | Newall, C. A., Anderson, L. A. and Phillipson, J. D. 1996. <i>Herbal Medicine - A Guide for Health-care Professionals</i> . The Pharmaceutical Press, London. 296pp. |
| Uterocontractant | Newall, C. A., Anderson, L. A. and Phillipson, J. D. 1996. <i>Herbal Medicine - A Guide for Health-care Professionals</i> . The Pharmaceutical Press, London. 296pp. |

STARCH Root -- 250000.0 -0.27 List, P.H. and Horhammer, L., *Hager's Handbuch der Pharmazeutischen Praxis*, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979.

Activities (5)

| | |
|----------------------|--|
| Absorbent | Martindale's 29th |
| Antidote (Iodine) | Jeffery B. Harborne and H. Baxter, eds. 1983. <i>Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants</i> . Taylor & Frost, London. 791 pp. |
| Antinesidioblastosic | Martindale's 29th |
| Emollient | Martindale's 29th |
| Poultice | Martindale's 29th |

SUCCINIC-ACID Plant -- -- *

Activities (7)

| | |
|-------------------------|--|
| Additive FEMA 200-2,000 | Aloe Research Council - Duke writeup of non-peer reviewd book by Coats and draft by Henry |
| Antifeedant | |
| Bruchiphobe | Jacobson, M., <i>Glossary of Plant-Derived Insect Deterrents</i> , CRC Press, Inc., Boca Raton, FL, 213 p, 1990. |
| Cancer-Preventive | Stitt, P. A. <i>Why George Should Eat Broccoli</i> . Dougherty Co, Milwaukee, WI, 1990, 399 pp. |
| Dye | Merck 11th Edition |
| Perfumery | Merck 11th Edition |
| Pesticide | |

SUCCINIC-ACID Root -- -- *

Activities (7)

| | |
|-------------------------|--|
| Additive FEMA 200-2,000 | Aloe Research Council - Duke writeup of non-peer reviewd book by Coats and draft by Henry |
| Antifeedant | |
| Bruchiphobe | Jacobson, M., <i>Glossary of Plant-Derived Insect Deterrents</i> , CRC Press, Inc., Boca Raton, FL, 213 p, 1990. |
| Cancer-Preventive | Stitt, P. A. <i>Why George Should Eat Broccoli</i> . Dougherty Co, Milwaukee, WI, 1990, 399 pp. |
| Dye | Merck 11th Edition |
| Perfumery | Merck 11th Edition |
| Pesticide | |