

Dr. Duke's Phytochemical and Ethnobotanical Databases

Chemicals found in *Elettaria cardamomum*

| Activities Count | Chemical | Plant Part | Low PPM | High PPM | StdDev | Reference Citation |
|------------------|-------------------------|-------------------|----------|----------|----------------------|--|
| 77 | ZINC | Fruit | 23.0 | 28.0 | -0.06924407952072656 | -- |
| 24 | VANILLIC-ACID | Leaf | | | | -- |
| 0 | TRANS-SABINENE-HYDRATE | Fruit | 875.0 | 2500.0 | 1.9988936839515734 | -- |
| 0 | TRANS-P-MENTH-2-EN-1-OL | Fruit | | | | Duke, J. A. and duCellier, J. L. 1993. CRC Handbook of Alternative Cash Crops. CRC Press. Boca Raton, FL 33431. 536 pp. US \$312.50. |
| 31 | THIAMIN | Seed | 1.0 | 2.0 | -1.0937002421726418 | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses |
| 0 | TERPINEOL-FORMIATE | Fruit | | | | List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979. |
| 2 | TERPINEOL-ACETATE | Seed Essent. Oil | | 382000.0 | | -- |
| 23 | TERPINEN-4-OL | Fruit | 252.0 | 23200.0 | 3.155848425568043 | -- |
| 23 | TERPINEN-4-OL | Seed Essent. Oil | | 13000.0 | -0.5404286322399808 | -- |
| 23 | TERPINEN-4-OL | Fruit Essent. Oil | | 27000.0 | 1.4135559855648545 | -- |
| 0 | TERPENYL-ACETATE | Fruit Essent. Oil | | 377000.0 | | -- |
| 0 | SUGAR | Seed | | 50000.0 | -0.33796445974687406 | List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979. |
| 12 | STIGMASTEROL | Seed | 60.0 | 80.0 | -0.4285915570564291 | -- |
| 8 | STEARIC-ACID | Seed | 1830.0 | 18300.0 | -0.16834218160275924 | List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979. |
| 8 | STEARIC-ACID | Seed Oil | | | | -- |
| 8 | STEARIC-ACID | Fruit | 600.0 | 650.0 | -0.23611473454753784 | Revised USDA data received 1993. |
| 5 | STARCH | Seed | 200000.0 | 400000.0 | 0.3637981937344068 | List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979. |

| Activities Count | Chemical | Plant Part | Low PPM | High PPM | StdDev | Reference Citation |
|------------------|--------------|-------------------|----------|----------|----------------------|--|
| 1 | SODIUM | Seed | 180.0 | 196.0 | -0.4045824561803137 | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses |
| 9 | SINAPIC-ACID | Leaf | | | | -- |
| 0 | SFA | Fruit | 6800.0 | 7390.0 | -0.2169348019998841 | Revised USDA data received 1993. |
| 7 | SALICYLATES | Fruit | | 75.0 | -0.12168222884000186 | Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705. |
| 5 | SABINENE | Seed Essent. Oil | | 21100.0 | -0.38732143908896777 | -- |
| 5 | SABINENE | Fruit | 500.0 | 1425.0 | -0.08802822268836079 | List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979. |
| 5 | SABINENE | Root Essent. Oil | | 384000.0 | -1.0 | -- |
| 5 | SABINENE | Fruit Essent. Oil | 27000.0 | 49000.0 | -0.4324265291346702 | -- |
| 15 | RIBOFLAVIN | Seed | 1.0 | 2.0 | -0.5841625019907875 | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses |
| 4 | PUFA | Fruit | 4300.0 | 4675.0 | -0.5048519402783854 | Revised USDA data received 1993. |
| 0 | PROTEIN | Seed | 108000.0 | 118000.0 | -1.0300659888675268 | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses |
| 0 | PROTEIN | Fruit | 100000.0 | 128000.0 | 0.24802011650290137 | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses |
| 14 | POTASSIUM | Seed | 11790.0 | 12857.0 | 0.025234953019076498 | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses |
| 2 | PHYTOSTEROLS | Fruit | 460.0 | 500.0 | -0.5737684759640957 | Revised USDA data received 1993. |
| 2 | PHYTOSTEROLS | Seed | 460.0 | 600.0 | -0.4861647488503628 | Spiller, G. A. 1996 (Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.) |
| 1 | PHYTOL | Seed | | | | -- |
| 4 | PHOSPHORUS | Seed | 1780.0 | 1941.0 | -0.90174516903946 | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses |

| Activities Count | Chemical | Plant Part | Low PPM | High PPM | StdDev | Reference Citation |
|------------------|---------------------------|-------------------|---------|----------|----------------------|--|
| 4 | PHOSPHORUS | Fruit | 1600.0 | 2000.0 | -0.3693459584082821 | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses |
| 0 | PHOSPHATIDYL-INOSITOL | Seed | | | | -- |
| 0 | PHOSPHATIDYL-ETHANOLAMINE | Seed | | | | -- |
| 1 | PERILLIC-ACID | Fruit | | | | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| 1 | PENTADECANOIC-ACID | Seed Oil | | | | -- |
| 2 | PALMITOLEIC-ACID | Fruit | 200.0 | 650.0 | -0.2266299178669845 | Revised USDA data received 1993. |
| 13 | PALMITIC-ACID | Seed | 5828.0 | 8400.0 | -0.5262817939159874 | List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979. |
| 13 | PALMITIC-ACID | Fruit | 840.0 | 6195.0 | -0.2690925616143795 | Revised USDA data received 1993. |
| 13 | PALMITIC-ACID | Seed Oil | | | | -- |
| 0 | P-MENTHENE | Fruit Essent. Oil | | | | -- |
| 0 | P-MENTH-TRANS-2-EN-1-OL | Seed Essent. Oil | | | | -- |
| 0 | P-MENTH-CIS-2-EN-1-OL | Seed Essent. Oil | | | | -- |
| 16 | P-CYMENE | Fruit | 130.0 | 28000.0 | 3.1268626509574724 | Duke, J. A. and duCellier, J. L. 1993. CRC Handbook of Alternative Cash Crops. CRC Press. Boca Raton, FL 33431. 536 pp. US \$312.50. |
| 16 | P-CYMENE | Root Essent. Oil | | 7000.0 | -0.5801460208228617 | -- |
| 16 | P-CYMENE | Seed Essent. Oil | | | | -- |
| 16 | P-CYMENE | Fruit Essent. Oil | | 5000.0 | -0.9962725072187498 | -- |
| 25 | P-COUMARIC-ACID | Leaf | | | | -- |
| 25 | P-COUMARIC-ACID | Fruit | | 19.0 | -0.682898261666777 | -- |
| 18 | OLEIC-ACID | Seed | 41942.0 | 62600.0 | -0.46449145602655795 | List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979. |

| Activities Count | Chemical | Plant Part | Low PPM | High PPM | StdDev | Reference Citation |
|------------------|------------------|-------------------|---------|----------|----------------------|--|
| 18 | OLEIC-ACID | Fruit | 8500.0 | 9240.0 | -0.4095293861159601 | Revised USDA data received 1993. |
| 18 | OLEIC-ACID | Seed Oil | | | | -- |
| 0 | OCTAN-1-OL | Fruit Essent. Oil | | | | -- |
| 39 | NIACIN | Seed | 11.0 | 12.0 | -0.9245464566376991 | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses |
| 0 | NERYLIC-ACID | Fruit | | | | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| 5 | NERYL-ACETATE | Fruit | | | | Duke, J. A. and duCellier, J. L. 1993. CRC Handbook of Alternative Cash Crops. CRC Press. Boca Raton, FL 33431. 536 pp. US \$312.50. |
| 5 | NERYL-ACETATE | Seed Essent. Oil | | | | -- |
| 11 | NEROLIDOL | Fruit | 448.0 | 1280.0 | -0.27992970059610406 | Duke, J. A. and duCellier, J. L. 1993. CRC Handbook of Alternative Cash Crops. CRC Press. Boca Raton, FL 33431. 536 pp. US \$312.50. |
| 11 | NEROLIDOL | Seed Essent. Oil | | 12000.0 | | -- |
| 10 | NEROL | Seed Essent. Oil | | 3000.0 | -1.0 | -- |
| 10 | NEROL | Fruit | 10.0 | 30.0 | 1.7314244526151554 | Duke, J. A. and duCellier, J. L. 1993. CRC Handbook of Alternative Cash Crops. CRC Press. Boca Raton, FL 33431. 536 pp. US \$312.50. |
| 0 | N-TRITRIACONTENE | Seed | | | | -- |
| 0 | N-TRITRIACONTANE | Seed | | | | -- |
| 0 | N-TRICOSENE | Seed | | | | -- |
| 0 | N-TRICOSANE | Seed | | | | -- |
| 0 | N-PENTACOSENE | Seed | | | | -- |
| 0 | N-PENTACOSANE | Seed | | | | -- |
| 0 | N-NONACOSENE | Seed | | | | -- |
| 1 | N-NONACOSANE | Seed | | | | -- |
| 1 | N-HEPTANE | Seed Essent. Oil | | 17900.0 | | -- |

| Activities Count | Chemical | Plant Part | Low PPM | High PPM | StdDev | Reference Citation |
|------------------|-------------------------|-------------------|---------|----------|----------------------|--|
| 0 | N-HEPTACOSENE | Seed | | | | -- |
| 0 | N-HEPTACOSANE | Seed | | | | -- |
| 0 | N-HENTRIACTANE | Seed | | | | -- |
| 0 | N-HENTRIACONTENE | Seed | | | | -- |
| 5 | MYRTENAL | Fruit Essent. Oil | | | | -- |
| 6 | MYRISTIC-ACID | Seed Oil | | | | -- |
| 6 | MYRISTIC-ACID | Fruit | 300.0 | 325.0 | -0.2538115654361021 | Revised USDA data received 1993. |
| 22 | MYRCENE | Fruit | 336.0 | 3000.0 | 0.08390905500959031 | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| 22 | MYRCENE | Root Essent. Oil | | 186000.0 | 1.9897792117406918 | -- |
| 22 | MYRCENE | Seed Essent. Oil | | 271400.0 | 2.188477209267345 | -- |
| 22 | MYRCENE | Fruit Essent. Oil | 14000.0 | 19000.0 | -0.7123427236991273 | -- |
| 13 | MUFA | Fruit | 8700.0 | 9455.0 | -0.11635628749295267 | Revised USDA data received 1993. |
| 0 | METHYL-HEPTENONE | Plant | 18.0 | 51.0 | -0.18660125966624988 | -- |
| 0 | METHYL-HEPTENONE | Seed Essent. Oil | | | | -- |
| 0 | METHYL-HEPTENONE | Fruit Essent. Oil | 300.0 | 1000.0 | | -- |
| 0 | METHYL-HEPTENONE | Seed | 18.0 | 51.0 | | Duke, J. A. and duCellier, J. L. 1993. CRC Handbook of Alternative Cash Crops. CRC Press. Boca Raton, FL 33431. 536 pp. US \$312.50. |
| 0 | METHYL-HEPTANONE | Fruit | | | | Duke, J. A. and duCellier, J. L. 1993. CRC Handbook of Alternative Cash Crops. CRC Press. Boca Raton, FL 33431. 536 pp. US \$312.50. |
| 30 | MENTHONE | Seed Essent. Oil | | 57700.0 | | -- |
| 14 | MANGANESE | Fruit | 66.0 | 280.0 | 1.4427459841229469 | -- |
| 0 | LYSOPHOSPHATIDYLCHOLINE | Seed | | | | -- |
| 0 | LINOLENIC-ACID | Fruit | 1200.0 | 1305.0 | -0.7476429173800373 | Revised USDA data received 1993. |
| 27 | LINOLEIC-ACID | Fruit | 3100.0 | 3370.0 | -0.30785428228838985 | Revised USDA data received 1993. |

| Activities Count | Chemical | Plant Part | Low PPM | High PPM | StdDev | Reference Citation |
|------------------|------------------|-------------------|---------|----------|----------------------|--|
| 27 | LINOLEIC-ACID | Seed | 7035.0 | 10500.0 | -0.82786857321412 | List, P.H. and Horhammer, L., Hager's Handbuch der Pharmazeutischen Praxis, Vols. 2-6, Springer-Verlag, Berlin, 1969-1979. |
| 27 | LINOLEIC-ACID | Seed Oil | | | | -- |
| 7 | LINALYL-ACETATE | Plant | 1197.0 | 8000.0 | 3.2689973925149545 | -- |
| 7 | LINALYL-ACETATE | Fruit | 1197.0 | 8000.0 | | -- |
| 0 | LINALOOL-ACETATE | Seed Essent. Oil | | 16000.0 | -0.7015834378873093 | -- |
| 0 | LINALOOL-ACETATE | Fruit Essent. Oil | 26000.0 | 31000.0 | | -- |
| 53 | LINALOOL | Fruit | 1288.0 | 8000.0 | 1.651823927016786 | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| 53 | LINALOOL | Fruit Essent. Oil | 51000.0 | 64000.0 | 1.4140174751728773 | -- |
| 53 | LINALOOL | Seed Essent. Oil | | 26000.0 | -0.4608027687850245 | -- |
| 0 | LINALOL | Fruit | 1288.0 | 8000.0 | 0.7335098243244321 | -- |
| 60 | LIMONENE | Seed Essent. Oil | | 84600.0 | -0.5175355633899679 | -- |
| 60 | LIMONENE | Fruit | 595.0 | 9481.0 | 0.6095312442214162 | -- |
| 60 | LIMONENE | Fruit Essent. Oil | | 25000.0 | -1.1610447246264288 | -- |
| 7 | LAURIC-ACID | Seed Oil | | | | -- |
| 6 | IRON | Seed | 140.0 | 153.0 | 0.01025391749776786 | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses |
| 6 | IRON | Fruit | 42.0 | 66.0 | -0.26568397107756236 | -- |
| 0 | HUMULENE-OXIDE | Fruit Essent. Oil | | | | -- |
| 2 | HUMULENE | Fruit Essent. Oil | | | | -- |
| 2 | HEXANOIC-ACID | Fruit | | | | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| 0 | HEPTANONE | Fruit | | | | Duke, J. A. and duCellier, J. L. 1993. CRC Handbook of Alternative Cash Crops. CRC Press. Boca Raton, FL 33431. 536 pp. US \$312.50. |

| Activities Count | Chemical | Plant Part | Low PPM | High PPM | StdDev | Reference Citation |
|------------------|------------------|-------------------|----------|----------|----------------------|--|
| 0 | HEPTANOIC-ACID | Fruit | | | | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| 5 | GERANYL-ACETATE | Fruit | 525.0 | 1500.0 | 1.586814525845496 | Duke, J. A. and duCellier, J. L. 1993. CRC Handbook of Alternative Cash Crops. CRC Press. Boca Raton, FL 33431. 536 pp. US \$312.50. |
| 0 | GERANIOL-ACETATE | Seed Essent. Oil | | 7000.0 | -0.843229874438314 | -- |
| 35 | GERANIOL | Fruit Essent. Oil | | 12000.0 | | -- |
| 35 | GERANIOL | Seed Essent. Oil | | 5000.0 | -1.2760191391363693 | -- |
| 35 | GERANIOL | Plant | 49.0 | 140.0 | -0.42560309181043426 | -- |
| 0 | GERANIC-ACID | Fruit | | | | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| 14 | GAMMA-TOCOPHEROL | Seed | | | | -- |
| 11 | GAMMA-TERPINENE | Fruit | 49.0 | 140.0 | -0.6255612447127588 | Jeffery B. Harborne and H. Baxter, eds. 1983. Phytochemical Dictionary. A Handbook of Bioactive Compounds from Plants. Taylor & Frost, London. 791 pp. |
| 11 | GAMMA-TERPINENE | Root Essent. Oil | | 33000.0 | -1.0 | -- |
| 15 | FIBER | Seed | 113000.0 | 123000.0 | -0.09300759572615179 | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses |
| 15 | FIBER | Fruit | 201000.0 | 251000.0 | 1.0316302183851198 | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses |
| 0 | FAT | Seed | 67000.0 | 100000.0 | -0.8711556020733713 | -- |
| 0 | FAT | Fruit | 10000.0 | 100000.0 | 0.12253986651771635 | -- |
| 6 | EUGENYL-ACETATE | Seed | | | | -- |
| 0 | EO | Fruit | 25000.0 | 100000.0 | 1.1237392472820933 | -- |
| 0 | EO | Seed Essent. Oil | | 64500.0 | 1.0 | -- |

| Activities Count | Chemical | Plant Part | Low PPM | High PPM | StdDev | Reference Citation |
|------------------|------------------------------|-------------------|---------|----------|----------------------|--|
| 1 | DODECANOIC-ACID | Fruit | | | | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| 0 | DESMOSTEROL | Seed | | | | -- |
| 0 | DELTA-TERPINEOL | Fruit Essent. Oil | | | | -- |
| 0 | DELTA-LIMONENE | Seed Essent. Oil | | 26000.0 | | -- |
| 0 | DELTA-5,7,22-CHOLESTATRIENOL | Seed | | | | -- |
| 3 | DECANOIC-ACID | Fruit | | | | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| 0 | D-PHI-TERPINYL-ACETATE | Seed | | | | Chemical Constituents of Oriental Herbs (3 diff. books) |
| 0 | D-ALPHA-TERPINYL-ACETATE | Fruit | | | | Chemical Constituents of Oriental Herbs (3 diff. books) |
| 7 | CYANIDIN | Leaf | | | | -- |
| 12 | COPPER | Fruit | 3.8 | 15.4 | 0.20088141553943706 | -- |
| 2 | COBALT | Fruit | 0.4 | 0.8 | -0.43826781025666195 | -- |
| 15 | CITRONELLOL | Fruit Essent. Oil | | 5000.0 | 1.0 | -- |
| 15 | CITRONELLOL | Fruit | 14.0 | 40.0 | 2.194384347727115 | -- |
| 0 | CITRONELLIC-ACID | Fruit | | | | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| 20 | CITRONELLAL | Plant | | | | -- |
| 0 | CIS-P-MENTH-2-EN-1-OL | Fruit | 525.0 | 1500.0 | | Duke, J. A. and duCellier, J. L. 1993. CRC Handbook of Alternative Cash Crops. CRC Press. Boca Raton, FL 33431. 536 pp. US \$312.50. |
| 24 | CHROMIUM | Fruit | 20.5 | 29.5 | 3.6358814153792958 | -- |
| 20 | CHOLINE | Pericarp | | 2663.0 | 1.0 | -- |
| 20 | CHOLINE | Seed | | 4195.0 | 2.3743243649568977 | -- |
| 1 | CHOLESTEROL | Seed | | | | -- |

| Activities Count | Chemical | Plant Part | Low PPM | High PPM | StdDev | Reference Citation |
|------------------|---------------|-------------------|----------|----------|-----------------------|---|
| 31 | CARYOPHYLLENE | Fruit Essent. Oil | | | | -- |
| 19 | CARVONE | Fruit Essent. Oil | | | | -- |
| 0 | CARDIOLIPIN | Seed | | | | -- |
| 0 | CARBOHYDRATES | Seed | 685000.0 | 747000.0 | 0.8886224845650202 | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses |
| 0 | CARBOHYDRATES | Fruit | 421000.0 | 778000.0 | -0.026104839799594735 | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses |
| 5 | CAPRYLIC-ACID | Seed Oil | | | | -- |
| 3 | CAPRIC-ACID | Seed Oil | | | | -- |
| 41 | CAMPHOR | Fruit | 7.0 | 20.0 | -0.8661900913537282 | Duke, J. A. and duCellier, J. L. 1993. CRC Handbook of Alternative Cash Crops. CRC Press. Boca Raton, FL 33431. 536 pp. US \$312.50. |
| 9 | CAMPHENE | Fruit | 10.0 | 30.0 | -0.33936437581442985 | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| 9 | CAMPHENE | Seed Essent. Oil | | | | -- |
| 2 | CAMPESTEROL | Seed | 40.0 | 55.0 | -0.5085407308824086 | -- |
| 28 | CALCIUM | Seed | 3830.0 | 4177.0 | 0.005616516315891836 | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses |
| 28 | CALCIUM | Fruit | 1300.0 | 1625.0 | -0.5148924842800362 | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses |
| 102 | CAFFEIC-ACID | Fruit | | 2.0 | -0.3385433113198586 | -- |
| 6 | BUTYRIC-ACID | Fruit | | | | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| 4 | BORON | Seed | 1.0 | 14.0 | -0.4796351890415661 | Betting on Boron, Unpublished draft by J. A. Duke on file at USDA, draft and papers relating to boron percentages. Includes Internat. Z. Vit. Ern. Forschung 43:1973 (boron). |

| Activities Count | Chemical | Plant Part | Low PPM | High PPM | StdDev | Reference Citation |
|------------------|--------------------|-------------------|---------|----------|----------------------|--|
| 35 | BORNEOL | Fruit | 32.0 | 8000.0 | 1.414213259765724 | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| 35 | BORNEOL | Seed Essent. Oil | | | | -- |
| 0 | BISABOLENE | Seed | | | | -- |
| 3 | BETA-TERPINEOL | Seed Essent. Oil | | | | -- |
| 47 | BETA-SITOSTEROL | Seed | 360.0 | 480.0 | -0.44678266643949144 | -- |
| 0 | BETA-SITOSTENONE | Seed | | | | -- |
| 13 | BETA-PINENE | Root Essent. Oil | | 28000.0 | -0.8323706430172229 | -- |
| 13 | BETA-PINENE | Seed Essent. Oil | 3800.0 | 26000.0 | -0.661153509784313 | -- |
| 13 | BETA-PINENE | Fruit | 70.0 | 1094.0 | -0.26279401706162475 | Duke, J. A. and duCellier, J. L. 1993. CRC Handbook of Alternative Cash Crops. CRC Press. Boca Raton, FL 33431. 536 pp. US \$312.50. |
| 13 | BETA-PINENE | Fruit Essent. Oil | | | | -- |
| 3 | BETA-PHELLANDRENE | Seed Essent. Oil | | 32500.0 | 0.2534211311349079 | -- |
| 0 | BETA-CARYOPHYLLENE | Fruit Essent. Oil | | | | -- |
| 0 | ASH | Seed | | 58000.0 | 0.30438219732588906 | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses |
| 0 | ASH | Fruit | | 54000.0 | -0.06897899594447202 | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses |
| 15 | ASCARIDOLE | Fruit | | | | Duke, J. A. and duCellier, J. L. 1993. CRC Handbook of Alternative Cash Crops. CRC Press. Boca Raton, FL 33431. 536 pp. US \$312.50. |
| 0 | ARACHIDIC-ACID | Seed Oil | | | | -- |
| 0 | ALPHA-YLANGENE | Seed | | | | -- |
| 32 | ALPHA-TOCOPHEROL | Seed | | | | -- |
| 0 | ALPHA-THUJENE | Plant | 1330.0 | 3047.0 | 1.2969582121204046 | -- |
| 0 | ALPHA-THUJENE | Root Essent. Oil | | 11000.0 | -0.638798325513007 | -- |

| Activities Count | Chemical | Plant Part | Low PPM | High PPM | StdDev | Reference Citation |
|------------------|-------------------------|-------------------|----------|----------|----------------------|--|
| 0 | ALPHA-THUJENE | Fruit | 1330.0 | 3047.0 | 2.2243250322627803 | Duke, J. A. and duCellier, J. L. 1993. CRC Handbook of Alternative Cash Crops. CRC Press. Boca Raton, FL 33431. 536 pp. US \$312.50. |
| 0 | ALPHA-TERPINYL-ACETATE | Fruit | 1050.0 | 50000.0 | 1.4142077668473696 | -- |
| 0 | ALPHA-TERPINYL-ACETATE | Seed Essent. Oil | | | | -- |
| 0 | ALPHA-TERPINEOL ACETATE | Seed | | | | -- |
| 0 | ALPHA-TERPINEOL ACETATE | Fruit Essent. Oil | 303300.0 | 430000.0 | 1.0 | -- |
| 23 | ALPHA-TERPINEOL | Seed Essent. Oil | 44000.0 | 448400.0 | 2.14826195942333 | -- |
| 23 | ALPHA-TERPINEOL | Fruit | 301.0 | 4300.0 | 3.129748982046047 | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| 23 | ALPHA-TERPINEOL | Fruit Essent. Oil | 17000.0 | 28000.0 | 0.3488244464514957 | -- |
| 13 | ALPHA-TERPINENE | Fruit | 21.0 | 60.0 | -0.12467700979131179 | Duke, J. A. and duCellier, J. L. 1993. CRC Handbook of Alternative Cash Crops. CRC Press. Boca Raton, FL 33431. 536 pp. US \$312.50. |
| 13 | ALPHA-TERPINENE | Root Essent. Oil | | 7000.0 | -0.6459900875555472 | -- |
| 28 | ALPHA-PINENE | Fruit | 217.0 | 3000.0 | 0.06445786160358473 | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| 28 | ALPHA-PINENE | Root Essent. Oil | | 123000.0 | 0.14189313736220527 | -- |
| 28 | ALPHA-PINENE | Seed Essent. Oil | 6900.0 | 17000.0 | -0.6246262641585064 | -- |
| 28 | ALPHA-PINENE | Fruit Essent. Oil | 12000.0 | 16000.0 | -0.6371982242858282 | -- |
| 11 | ALPHA-PHELLANDRENE | Fruit | | | | Duke, J. A. and duCellier, J. L. 1993. CRC Handbook of Alternative Cash Crops. CRC Press. Boca Raton, FL 33431. 536 pp. US \$312.50. |
| 0 | ALPHA-COPAENE | Seed | | | | -- |
| 19 | ACETYL-CHOLINE | Pericarp | | 70.0 | 1.0 | -- |
| 19 | ACETYL-CHOLINE | Seed | | 165.0 | 1.8803761294063241 | -- |

| Activities Count | Chemical | Plant Part | Low PPM | High PPM | StdDev | Reference Citation |
|------------------|-----------------------------|-------------------|----------|----------|---------------------|--|
| 16 | ACETIC-ACID | Fruit | | | | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| 0 | 7-ERGOSTEROL | Seed | | | | -- |
| 0 | 4-HYDROXY-BENZOIC-ACID | Leaf | | | | -- |
| 0 | 3-TRIDECANE | Fruit | | | | Duke, J. A. and duCellier, J. L. 1993. CRC Handbook of Alternative Cash Crops. CRC Press. Boca Raton, FL 33431. 536 pp. US \$312.50. |
| 0 | 3-(BUT-CIS-1-ENYL)-PYRIDINE | Essential Oil | | | | -- |
| 0 | 2-UNDECANE | Fruit | | | | Duke, J. A. and duCellier, J. L. 1993. CRC Handbook of Alternative Cash Crops. CRC Press. Boca Raton, FL 33431. 536 pp. US \$312.50. |
| 67 | 1,8-CINEOLE | Seed Essent. Oil | 23100.0 | 308000.0 | 1.0 | -- |
| 67 | 1,8-CINEOLE | Fruit Essent. Oil | 342000.0 | 360000.0 | -0.4996991087091834 | -- |
| 67 | 1,8-CINEOLE | Fruit | 525.0 | 56000.0 | 2.8178415879493794 | Duke, J. A. and duCellier, J. L. 1993. CRC Handbook of Alternative Cash Crops. CRC Press. Boca Raton, FL 33431. 536 pp. US \$312.50. |
| 0 | 1,4-CINEOLE | Fruit | | | | Leung, A. Y. and Foster, S. 1995. Encyclopedia of Common Natural Ingredients 2nd Ed. John Wiley & Sons, New York. 649 pp. |
| 0 | 1,4-CINEOLE | Seed Essent. Oil | | | | -- |
| 0 | (+)-LIMONENE | Root Essent. Oil | | 214000.0 | | -- |
| 0 | (+)-LIMONENE | Fruit Essent. Oil | | | | -- |
| 0 | (+)-ALPHA-TERPINEOL | Seed | | | | -- |