

# C SULFUR

Chemid

SULFUR

ubiquitous

Yes

\*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.

| Plant                       | Part  | Low PPM | High PPM | StdDev                | Reference  |
|-----------------------------|-------|---------|----------|-----------------------|--|
| Abelmoschus esculentus      | Fruit | 140     | 1400     | -0.010141453327068681 | ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes.   |
| Allium ampeloprasum         | Leaf  | 600     | 700      | -0.9714371042032756   | --   |
| Allium cepa                 | Bulb  | 80      | 4075     | -1                    | --   |
| Allium sativum var. sativum | Bulb  | 2300    | 10570    | 1                     | LAWSON in Koch, H. P. and Lawson, L. D., eds. 1996. Garlic- The Science and therapeutic application of Allium sativum L. and related species. Williams & Wilkins, Baltimore. 329 pp. |
| Alocasia macrorrhiza        | Root  | 119     | 400      | -0.6859186774799687   | --   |
| Amorphophallus campanulatus | Root  | 118     | 530      | -0.6475371031735823   | --   |
| Anacardium occidentale      | Seed  | 4800    | 4800     | 1.2812471470152922    | --   |
| Ananas comosus              | Fruit | 70      | 200      | -0.8453199626150852   | --   |

| <b>Plant</b>                       | <b>Part</b> | <b>Low PPM</b> | <b>High PPM</b> | <b>StdDev</b>        | <b>Reference</b>   |
|------------------------------------|-------------|----------------|-----------------|----------------------|--|
| Anethum graveolens                 | Plant       | 1400           | 11175           | 3.111094705278092    | ACTA AGRIC SCAND SUPPL 22: 1980  |
| Annona muricata                    | Fruit       | 210            | 2700            | 0.8946352650682826   | --   |
| Apium graveolens                   | Root        | 100            | 1000            | -0.5087729499120315  | ACTA AGRIC SCAND SUPPL 22: 1980  |
| Arachis hypogaea                   | Seed        | 2100           | 2100            | -0.24595858077137775 | --   |
| Armoracia rusticana                | Root        | 1800           | 10000           | 2.1484129636070275   | ACTA AGRIC SCAND SUPPL 22: 1980  |
| Artemisia vulgaris                 | Plant       | 2300           | 2800            | -0.4501644139144041  | Chem. & Pharm. Bull. 38: 2205.   |
| Artocarpus altilis                 | Fruit       | 120            | 530             | -0.6156458725608807  | --   |
| Asimina triloba                    | Fruit       | 620            | 3333            | 1.3351919287177112   | --   |
| Asparagus officinalis              | Shoot       | 56             | 864             | -0.721231049722943   | --   |
| Avena sativa                       | Plant       | 800            | 4100            | 0.1026280463781624   | Jim Duke's personal files.*  |
| Avena sativa                       | Seed        | 1500           | 3100            | 0.31967317026072223  | Jim Duke's personal files.*  |
| Averrhoa carambola                 | Fruit       | 1000           | 1300            | -0.07973966243440339 | Duke, J. A. Writeups or information summaries on approximately 2,000 economic plants, USDA, ARS, Beltsville, MD 20705. |
| Azadirachta indica                 | Seed        | 1921           | 1921            | -0.3472066642061236  | --   |
| Beta vulgaris                      | Root        | 130            | 2000            | -0.21353007063213605 | ACTA AGRIC SCAND SUPPL 22: 1980  |
| Boehmeria nivea                    | Plant       | 3000           | 3700            | -0.06746194140416575 | --   |
| Brassica napus var. napobrassica   | Root        | 350            | 5000            | 0.6721985672075504   | ACTA AGRIC SCAND SUPPL 22: 1980  |
| Brassica oleracea var. botrytis l. | Leaf        | 1200           | 11800           | 1.6302603378370644   | --   |
| Brassica oleracea var. capitata l. | Leaf        | 385            | 8750            | 0.9153795091683222   | --   |
| Brassica oleracea var. italica     | Leaf        | 1200           | 11800           | 1.6302603378370644   | ACTA AGRIC SCAND SUPPL 22: 1980  |

| Plant                 | Part      | Low PPM | High PPM | StdDev               | Reference  |
|-----------------------|-----------|---------|----------|----------------------|--|
| Brassica pekinensis   | Shoot     | 1216    | 1365     | -0.3064973270128203  | --   |
| Brassica rapa         | Root      | 510     | 5100     | 0.70172285513554     | --   |
| Camellia sinensis     | Leaf      | 880     | 880      | -0.9292474159539728  | ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes. |
| Capsicum annuum       | Fruit     | 190     | 2440     | 0.7136799213892123   | --   |
| Carica papaya         | Fruit     | 300     | 900      | -0.35813249886374227 | --   |
| Carya illinoensis     | Seed      | 800     | 800      | -0.9812798571131076  | --   |
| Carya ovata           | Seed      | 2180    | 2180     | -0.20070804068880974 | --   |
| Cichorium endivia     | Shoot     | 740     | 912      | -0.6814960822776618  | --   |
| Cinnamomum aromaticum | Bark      | 1200    | 1200     | -0.12803687993289598 | --   |
| Cinnamomum burmannii  | Bark      | 1000    | 1000     | -0.6401843996644798  | --   |
| Cinnamomum sieboldii  | Bark      | 900     | 900      | -0.8962581595302718  | --   |
| Cinnamomum sieboldii  | Root Bark | 800     | 800      |                      | --   |
| Cinnamomum verum      | Bark      | 1900    | 1900     | 1.6644794391276476   | --   |
| Citrus paradisi       | Fruit     | 7       | 2090     | 0.4700861895135408   | --   |
| Citrus reticulata     | Fruit     | 130     | 1000     | -0.28853428975640755 | ACTA AGRIC SCAND SUPPL 22: 1980  |
| Citrus sinensis       | Fruit     | 46      | 1000     | -0.28853428975640755 | --   |
| Cocos nucifera        | Seed      | 440     | 1370     | -0.6588697590248107  | --   |
| Colocasia esculenta   | Leaf      | 240     | 240      | -1.0792551963959383  | --   |
| Colocasia esculenta   | Root      | 85      | 565      | -0.6372036023987859  | --   |

| Plant                   | Part  | Low PPM | High PPM | StdDev               | Reference  |
|-------------------------|-------|---------|----------|----------------------|--|
| Corylus avellana        | Seed  | 1500    | 2070     | -0.26292753330234075 | --   |
| Cucumis melo            | Fruit | 139     | 198      | -0.846711926797232   | --   |
| Cucumis sativus         | Fruit | 140     | 5250     | 2.669389597305318    | --   |
| Cyrtosperma chamissonis | Root  | 26      | 195      | -0.7464434677323473  | --   |
| Daucus carota           | Root  | 52      | 1635     | -0.32129372156929786 | --   |
| Dioscorea alata         | Root  | 98      | 990      | -0.5117253787048304  | --   |
| Fallopia japonica       | Plant | 2300    | 2600     | -0.5352094078055681  | Chem. & Pharm. Bull. 38: 2205.   |
| Fragaria spp            | Fruit | 77      | 1270     | -0.1006191251666038  | ACTA AGRIC SCAND SUPPL 22: 1980  |
| Genipa americana        | Fruit | 140     | 2000     | 0.4074478013169396   | --   |
| Genipa americana        | Seed  | 1300    | 1300     | -0.6984639815970577  | --   |
| Glechoma hederacea      | Plant | 3100    | 3400     | -0.19502943224091188 | Chem. & Pharm. Bull. 38: 2205.   |
| Glycine max             | Seed  | 4066    | 4066     | 0.8660734417577307   | ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes. |
| Helianthus annuus       | Seed  | 2574    | 4880     | 1.3264976870978602   | --   |
| Hibiscus sabdariffa     | Seed  | --      | 4000     | 0.8287417461896122   | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses  |
| Hordeum vulgare         | Seed  | 200     | 200      | -1.3206589077323676  | ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes. |
| Ipomoea batatas         | Root  | 130     | 610      | -0.6239176728311907  | --   |
| Juglans cinerea         | Seed  | 2870    | 2870     | 0.18957786752333922  | --   |
| Juglans nigra           | Seed  | 2652    | 2652     | 0.06627014579834144  | Furr, A.K., et al. 1979  |

| Plant                   | Part  | Low PPM | High PPM | StdDev                | Reference  |
|-------------------------|-------|---------|----------|-----------------------|--|
| Juglans regia           | Seed  | 1040    | 1040     | -0.8455282368654037   | CRC Handbook of Medicinal Herbs and/or CRC Handbook of Proximate Analyses  |
| Lactuca sativa          | Shoot | 29      | 3800     | 1.7092244590134251    | --   |
| Larrea tridentata       | Plant | 1600    | 1600     | -0.9604343772613888   | --   |
| Lens culinaris          | Seed  | 1220    | 1220     | -0.7437145216796257   | ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes. |
| Lepidium sativum        | Seed  | 9000    | 9545     | 3.9651698056626064    | --   |
| Linum usitatissimum     | Seed  | 608     | 1147     | 0.9418680963960322    | --   |
| Lycopersicon esculentum | Fruit | 107     | 2330     | 0.6371218913711442    | --   |
| Malus domestica         | Fruit | 1.65    | 23       | -0.9685087927350676   | --   |
| Mangifera indica        | Fruit | 70      | 615      | -0.5564873948196462   | --   |
| Mangifera indica        | Seed  | 2300    | 2300     | -0.13283223056495774  | --   |
| Manihot esculenta       | Root  | 54      | 250      | -0.730205109371953    | --   |
| Moringa oleifera        | Fruit | 1370    | 1370     | -0.031020916059269096 | --   |
| Moringa oleifera        | Leaf  | 1370    | 1370     | -0.8143977090530928   | --   |
| Morus alba              | Leaf  | 3000    | 5600     | 0.177059964805523     | --   |
| Murraya sp              | Fruit | 150     | 450      | -0.6713244398467485   | --   |
| Musa x paradisiaca      | Fruit | --      | 100      | -0.91491817172242     | ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes. |
| Oryza sativa            | Plant | 1000    | 1000     | -1.215569358934881    | --   |
| Panax quinquefolius     | Plant | 1500    | 1500     | -1.0029568742069708   | --   |

| <b>Plant</b>              | <b>Part</b> | <b>Low PPM</b> | <b>High PPM</b> | <b>StdDev</b>        | <b>Reference</b>   |
|---------------------------|-------------|----------------|-----------------|----------------------|--|
| Panicum maximum           | Leaf        | 1800           | 1800            | -0.7136112315686473  | ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes. |
| Pastinaca sativa          | Root        | 270            | 11050           | 2.4584179868509173   | --   |
| Petasites japonicus       | Plant       | 6500           | 7300            | 1.4633479486367877   | Chem. & Pharm. Bull. 38: 2205.   |
| Petroselinum crispum      | Plant       | 380            | 4700            | 0.35776302805165466  | --   |
| Peucedanum decursivum     | Plant       | 3700           | 5200            | 0.5703755127795649   | --   |
| Phaseolus vulgaris        | Fruit       | 54             | 875             | -0.3755320511405759  | --   |
| Phaseolus vulgaris        | Seed        | 54             | 137             | -1.35629370804739    | --   |
| Phoenix dactylifera       | Fruit       | 510            | 590             | -0.5738869470964798  | --   |
| Phyllanthus emblica       | Fruit       | 166            | 820             | -0.41381106614961    | --   |
| Physalis ixocarpa         | Fruit       | 270            | 3250            | 1.2774254151586235   | --   |
| Physalis peruviana        | Fruit       | 430            | 2515            | 0.7658785782197134   | --   |
| Pinus sylvestris          | Leaf        | --             | --              |                      | --   |
| Piper nigrum              | Fruit       | 1750           | 5760            | 3.0243404637527247   | ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes. |
| Pistacia vera             | Seed        | 2870           | 2870            | 0.18957786752333922  | --   |
| Pisum sativum             | Plant       | 2300           | 2300            | -0.6627768986423143  | --   |
| Pisum sativum             | Seed        | 410            | 2290            | -0.13848854807527874 | --   |
| Polystichum polyblepharum | Plant       | 1700           | 2100            | -0.7478218925334784  | --   |
| Portulaca oleracea        | Plant       | 630            | 6300            | 1.0381229791809672   | --   |

| <b>Plant</b>      | <b>Part</b> | <b>Low PPM</b> | <b>High PPM</b> | <b>StdDev</b>        | <b>Reference</b>   |
|-------------------|-------------|----------------|-----------------|----------------------|--|
| Prunus domestica  | Fruit       | 4              | 400             | -0.7061235444004158  | --   |
| Prunus dulcis     | Seed        | 3420           | 3420            | 0.5006753305909942   | --   |
| Prunus persica    | Fruit       | 3              | 700             | -0.49732891707841165 | --   |
| Psidium guajava   | Fruit       | 140            | 140             | -0.8870788880794861  | ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes. |
| Punica granatum   | Fruit       | 120            | 120             | -0.900998529900953   | ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes. |
| Pyrus communis    | Fruit       | 3              | 300             | -0.7757217535077505  | --   |
| Quercus rubra     | Seed        | 1160           | 1160            | -0.7776524267415517  | --   |
| Raphanus sativus  | Root        | 350            | 6140            | 1.0087754495866312   | --   |
| Rheum rhabarbarum | Pt          | 62             | 1240            |                      | --   |
| Rhizophora mangle | Leaf        | 7900           | 7900            | 0.7161504257688367   | --   |
| Ribes nigrum      | Fruit       | 200            | 1385            | -0.02058118469316889 | ACTA AGRIC SCAND SUPPL 22: 1980  |
| Ribes rubrum      | Fruit       | 130            | 1782            | 0.2557237054629499   | --   |
| Ribes uva-crispa  | Fruit       | 96             | 1113            | -0.2098883134651193  | --   |
| Rosa canina       | Fruit       | 400            | 1000            | -0.28853428975640755 | ACTA AGRIC SCAND SUPPL 22: 1980  |
| Rubus chamaemorus | Fruit       | 190            | 1185            | -0.15977760290783832 | --   |
| Secale cereale    | Seed        | 1460           | 1640            | -0.5061491862461437  | USDA's Ag Handbook 8 and sequelae)   |
| Solanum melongena | Fruit       | 126            | 152             | -0.8787271029866058  | --   |
| Solanum tuberosum | Tuber       | 16             | 1900            |                      | --   |

| Plant                     | Part  | Low PPM | High PPM | StdDev                | Reference  |
|---------------------------|-------|---------|----------|-----------------------|--|
| Spinacia oleracea         | Plant | 270     | 5700     | 0.782987997507475     | --   |
| Spondias dulcis           | Fruit | 36      | 180      | -0.8592396044365521   | --   |
| Spondias dulcis           | Seed  | 900     | 900      | -0.9247166820098977   | --   |
| Spondias tuberosa         | Fruit | 120     | 120      | -0.900998529900953    | --   |
| Stellaria media           | Plant | 3828    | 3828     | -0.013033145313820741 | ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes. |
| Syzygium cumini           | Fruit | 130     | 800      | -0.42773070797107693  | Morton, J.F., Major Medicinal Plants. 1977. Atlas of Medicinal Plants of Middle America. Bahamas to Yucatan. 1981.         |
| Syzygium jambos           | Fruit | 130     | 840      | -0.39989142432814306  | Morton, J.F., Major Medicinal Plants. 1977. Atlas of Medicinal Plants of Middle America. Bahamas to Yucatan. 1981.         |
| Tamarindus indica         | Leaf  | 630     | 630      | -0.9878442051891155   | ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes. |
| Taraxacum officinale      | Plant | 2600    | 3300     | -0.2375519291864939   | Chem. & Pharm. Bull. 38: 2205.   |
| Tragopogon porrifolius    | Root  | 250     | 250      | -0.730205109371953    | --   |
| Trichosanthes anguina     | Fruit | 350     | 6480     | 3.5254475693255345    | --   |
| Trigonella foenum-graecum | Plant | 1670    | 1670     | -0.9306686293994814   | --   |
| Triticum aestivum         | Plant | 1300    | 2900     | -0.40764191696882207  | --   |
| Triticum aestivum         | Seed  | 1200    | 3200     | 0.3762363453639322    | --   |
| Urtica dioica             | Leaf  | 1200    | 6665     | 0.4266822869472313    | --   |
| Vaccinium macrocarpon     | Fruit | 65      | 500      | -0.6365253352930811   | ACTA AGRIC SCAND SUPPL 22: 1980  |
| Vaccinium myrtillus       | Fruit | 130     | 1075     | -0.2363356329259065   | ACTA AGRIC SCAND SUPPL 22: 1980  |



| Plant                    | Part  | Low PPM | High PPM | StdDev               | Reference  |
|--------------------------|-------|---------|----------|----------------------|--|
| Vaccinium vitis-idaea    | Fruit | 130     | 1075     | -0.2363356329259065  | --   |
| Vicia faba               | Fruit | 530     | 3630     | 1.5418986097664955   | ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes. |
| Vigna aconitifolia       | Seed  | 1800    | 2018     | -0.29234038435600995 | --   |
| Vigna mungo              | Seed  | 1740    | 1953     | -0.3291064481730964  | --   |
| Vigna radiata            | Seed  | 1880    | 2378     | -0.08871295398445395 | ANON. 1948-1976. The Wealth of India raw materials. Publications and Information Directorate, CSIR, New Delhi. 11 volumes. |
| Vitis vinifera           | Fruit | 7       | 888      | -0.3664842839566224  | --   |
| Xanthosoma sagittifolium | Root  | 79      | 580      | -0.6327749592095876  | --   |
| Zea mays                 | Fruit | 6       | 1140     | -0.19109679700613894 | --   |