

A Mini-Course in

# **MEDICAL BOTANY**

## **SYLLABUS**

[James A. Duke](#)

Ethnobotanist

The Herbal Village

8210 Murphy Road

Fulton, Maryland 20759

<http://www.ars-grin.gov/duke/syllabus/>

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**WARNING:** This syllabus is offered as an informational compilation, none of which is intended for diagnosis or treatment of disease. As an ethnobotanist, James A. Duke does not diagnose or prescribe. He has compiled folk remedies from throughout the world and has sought chemical data that might support their applications. Physicians and other licensed practitioners are urged to be open to new information on the effectiveness of herbs that may suggest that an herbal alternative may be as good as a synthetic pharmaceutical option. Neither the University of Maryland, the University of Maryland Foundation Inc., nor the author of this syllabus recommends self diagnosis, self medication or use of unproven folk remedies. Dr. Duke does encourage unbiased scientific analyses that will result in less costly, more efficacious, and/or safer medicines.

Website created by [Michael Tims](#), Dept. of Plant Biology, Univ. of Maryland, College Park, MD 20742-5815

# Are You Skipping Yet?

## ●●● [Just A Game](#)

### Phytochemical Databases

#### [Phytochemical and Ethnobotanical Databases](#)

This is Dr. Jim Duke's home page. The links listed below that have the yellow ball, are subsets of this page.

#### ● [Phytochemical Database](#)

This site affords you an opportunity to choose whether to search under a common or scientific plant name. If you're not sure of the spelling, leave the plant name blank, and go to a grouping of plants by their first letter. You can then scroll the list until you find the correct plant spelling.

#### ● [High Concentration Chemical Query](#)

This query allows the user to find examples of chemicals found in high concentration, based on a series of standard deviations.

#### ● [Specific Activity in a Particular Plant](#)

This returns information on which types of biological are found in the plant. In the Specific Activity search, note that you can specify text output, and non-ubiquitous compounds.

#### ● [High Low Chemical Query](#)

At this search site, you can specify whether you want the top 40 plants with quantifiable data, or a list of plants without quantifiable data.

#### ● [Activities of a Specific Chemical Query](#)

#### ● [Synergy Query](#)

In this search you have a choice of two fields: whether to search for plants with high concentrations of one or more compounds that have the specified activity, or to search plants that have a large number of chemicals with the specified activity. In each field you can choose in which categories to search.

#### ● [Chemicals with a Specific Activity Query](#)

#### ● [Toxicity Query](#)

#### [Michael Tims' Medicinal Plant Database Page](#)

Contains links to sites on Natural Products, Ethnobotany, Economy Botany, Alternative and Allopathic Medicine, Specific Plant usage, Pharmacology and Technology.

## HELPFUL SITES TO GO SKIPPING ALONG THE WEB

[Resource Guide to Net Novices](#)

[MCT's Webpage Links](#)

[Dictionaries on FindIt](#)

Use these to help you with science terms.

[How to Search a WAIS Database](#)

[FindIt: Web Design](#)

[Netscape Tips](#)

## Module 1: Introductory Botany For Health Care Professionals

General Introduction to Botany for Health Practitioners (History of Botany and Herbalism; Definitions; General Orientation; Q & A)

### A. Taxonomy (Classification, Nomenclature and Ordination)

1. Variety
2. Subspecies
3. Species & Authority
4. Genus
5. Family (With characterization, e.g., of several important medicinal plant families: asters, celery, crucifers, dogbane, heather, legume, lily and yam, madder, mint, nightshade, and rue families.

### B. Morphology and Anatomy (of Medicinal Plant Parts)

#### [Vegetative Characteristics \(Texas AMU\)](#) Vegetative Characters

1. Latices, resins and other exudates
2. Stem
3. Bark
4. Wood
5. Pith
6. Thorn, tendrils, etc.
7. Leaves, leaf-stalks, and stipules
8. Indument, margins, and venation

#### [Vegetative Characteristics \(Texas AMU\)](#) Reproductive Characters

9. Inflorescence
10. Flowers (sepals, petals, stamens, pistils)
11. Fruits
12. Seeds
13. Roots

### C. Chemosystematics (See also [Module 2](#))

### D. Physiology

### E. Phenology

### F. Palynology

## Evolution of Man and Medicine

### A. Paleolithic Man (Coevolution of Animals, Diseases, Plants, and Man)

B. Neolithic Man (Coevolution of Animals, Diseases, Crops, Plants and Man)

C. Modern Man (Lifestyle Diseases Replace Germs as Major Killers)

### Evolution of Systems of Herbal Medicine

#### Ethnic Functional

A. African Allopathic

B. Amerindian ([Next Module](#)) Homeopathic

C. Arabic Naturopathy

D. Ayurvedic Napropathy

E. Biblical (Graeco/Roman) Aromatherapy

F. Chinese Balneology

G. Latino Massage

## Module 2: Phytochemicals (Minerals, Phytamins, and Vitamins)

### Introduction to the Database: <http://www.ars-grin.gov/duke/>

#### RUN 1: Phytochemical Constituents of a Given Species

With the [database online](#), one can ask for a list of all compounds reported from any of some 2,000 species including most of the more important foods, spices, herbs and medicinal plants.

Here for example, is what one would find on pomegranate, so far the richest plant source of estrone.

<i>Punica Granatum</i> L.	CASUARIIN PL 411/
"POMEGRANATE"	CASUARININ PL 411/
ALKALOIDS 1,000-7,000 RT BK HHB WOI	CEREBROSIDE SD RAA
ARACHIDIC-ACID SD HHB	CHLOROGENIC-ACID FR RAA
ASCORBIC-ACID 40-636 FR CRC USA	CITRIC-ACID 8,100-12,300 FR JU WOI
ASH 5,000-35,858 FR USA	COPPER 2 FR WOI
ASIATIC-ACID FL HHB	CORILAGIN LF RAA
BETULIC-ACID BK LF WOI	P-COUMARINIC-ACID FR RAA
BORIC-ACID 50 FR HHB	CYANIDIN-3-GLUCOSIDE FR RAA
BREVIFOLIN LF PC36:963	CYANIDIN-3,5-DIGLUCOSIDE FR RAA
BREVIFOLIN-CARBOXYLIC-ACID LF PC36:963	DELPHINIDIN-3,5-DIGLUCOSIDE PC RAA
CALCIUM 30-650 FR CRC USA	DELPHINIDIN-3-GLUCOSIDE FR RAA
CALCIUM-OXALATE 40,000 RIND FR WOI	ELAIDIC-ACID 5,500 PC RAA
CARBOHYDRATES 162,000-927,000 FR CRC USA	ELLAGIC-ACID BK CCO
CAROTENE 0-2 FR CRC WOI	ELLAGIC-ACID LF PC36:963
CASUARIIN BK RAA	ELLAGITANNIN BK 411/
CASUARININ BK RAA	ESTRA DIOL SD RAA
CHLORINE 20 FR WOI	ESTRONE 17 SD JBH WOI



FAT 50,000-200,000 SD HHB	MANNITOL 18,000 PC WOI
FAT 1,000-38,000 FR CRC USA WOI	D-MANNITOL SD LF ST RT BK
FIBER 2,000-232,000 FR CRC USA WOI	MASLINIC-ACID FL HHB
FIBER 224,000 SD WOI	METHYL-ISOPelletierine BK JBH
FLAVOGALLOL PC RAA	METHYL-PELLETIERINE BK WOI
FRIEDELIN BK WOI	MUCILAGE 6,000-340,000 RIND HHB WOI
FRUCTOSE FR WOI	NEOCHLOROGENIC-ACID FR RAA
GALLIC-ACID 900-40,000 PC RAA WOI	NIACIN 3-50 FR CRC USA
2-O-GALLOYLPUNICALIN LF RAA	OLEIC-ACID SD HHB
GLUCOSE FR WOI	OXALIC-ACID 140 FR USA
GRANATIN-A PC RAA	PALMITIC-ACID SD HHB
GRANATIN-B PC RAA	PANTOTHENIC-ACID 6-31 FR USA
GRANATINS 15,000 LF RAA	PECTIN 20,000-40,000 PC RAA
GUMS 32,000 RIND FR WOI	PECTIN 2,700 FR WOI
3,6-(R)-HEXAHYDROXYDIPHENOYL- (ALPHA,BETA)-1C-4-GLUCOPYRANOSE LF PC36:963	PELARGONIDIN-3,5-DIGLUCOSIDE FL WOI
INULIN 10,000 RIND FR WOI	PELARGONIDIN-3-GLUCOSIDE SD RAA
IRON 3-16 FR USA	PELLETIERINE BK WOI
ISOPELLETIERINE BK WOI	(-)-PELLETIERINE PL JBH
ISOQUERCETRIN PC RAA	1,2,3,4,6-PENTA-O-GALLOYL-BETA-D-GLUCOSE LF RAA
LINOLEIC-ACID SD HHB	3,4,8,9,10-PENTAHYDROXYDIBENZO(B,D)- PYRAN-6-ONE LF PC36:963
MAGNESIUM 120 FR WOI	PHOSPHATIDYLCHOLINE SD RAA
MALIC-ACID FR WOI	PHOSPHATIDYLINOSITOL SD RAA
MALVIDIN FR RAA	PHOSPHATIDYLSERINE SD RAA
MALTOSE FR WOI	PHOSPHORUS 80-3,182 FR CRC USA WOI
MALVIDIN-PENTOSE-GLYCOSIDE FR JU WOI	PHYTOSTEROLS 170-892 FR USA

POLYPHENOLS 2,200-10,500 FR RAA	STEARIC-ACID SD HHB
POTASSIUM 1,330-18,950 FR CRC USA WOI	STRICTININ LF RAA
2-(2-PROPENYL)-DELTA'-PIPERIDEINE LF WOI	STYPTIC-ACID FL RAA
PROTEIN 7,700-73,000 FR CRC USA	SULFUR 120 FR WOI
PROTEIN 25,000 SD CRC	TANNIN 1,700 FR JU WOI
PROTocatechuic-ACID FR RAA	TANNIN 104,000-336,000 PC RAA WOI
PSEUDOPELLETIERINE BK WOI JBH	TANNIN 100,000-250,000 ST BK WOI
PUNICACORTEINS BK RAA	TANNIN 280,000 RT BK WOI
PUNICAFOLIN LF PC36:963	TANNIN 110,000 LF WOI
PUNICALAGIN PC CCO	1,2,4,6-TETRA-O-GALLOYL-BETA-D-GLUCOSE LF RAA
PUNICALIN PC CCO	THIAMIN 0-4 FR CRC USA
PUNICIC-ACID 35,000-140,000 SD JBH WOI	CIS-9,TRANS-11,CIS-13-TRIENE-ACID SD HHB
PUNIGLUCONIN BK RAA	1,2,6-TRI-O-GALLOYL-BETA-4C-1-GLUCOPYRANOSE LF PC36:963
RESINS 45,000 PC RAA WOI	1,4,6-TRI-O-GALLOYL-BETA-4C-1-GLUCOPYRANOSE LF PC36:963
RIBOFLAVIN 0-4 FR CRC USA	URSOLIC-ACID LF FR WOI
SALICYLATES 0.7-3.5 FR JAD85:950 <sup>1</sup>	VIT-B-6 1-5 FR USA
BETA-SITOSTEROL BK HHB	WATER 350,000 SD WOI
BETA-SITOSTEROL 16-800 FR GAS	WATER 780,000-823,220 FR USA WOI
SODIUM 9-350 FR CRC USA WOI	WAX 8,000 PC WOI
SORBITOL HHB	
STARCH 0 SD HHB	

## RUN 2: [Superlative Query](#)

One can also ask in what phytochemicals a given herb exceeds the norm (as defined by you, the user). In this so-called **High Concentration Chemicals Query**, one can display a list of the chemicals in a particular plant with concentrations greater than a selected number of standard deviations above the mean for concentration among all plants in the database. One can request also the biological activities of these high concentration chemicals and the activities will be listed subsequently. To enter the query, I typed the generic name *Punica*, the species epithet, *granatum*, and plant part, *various*. Then I clicked on the

Submit button. Seeking real super chemicals I first clicked on 2 Standard Deviations; nothing came out for fruit or seed. Clicking on 1 Standard deviation I got only estrone for the seed. Relaxing my standards, I clicked on 0.5 Standard deviations and got interesting details for the fruit, confirming very well what Nagle and Yeykal had suggested. Here's part of the printout.

High Concentration Chemicals in the Fruit of

*Punica granatum* L. (Punicaceae) - [Pomegranate]

(chemical concentrations 0.5 standard deviation(s) above the mean)

BORIC-ACID 50 ppm DUKE1992A

CARBOHYDRATES 162,000 - 927,000 ppm DUKE1992A

ESTRONE 17 ppm DUKE1992A

FIBER 2,000 - 232,000 ppm DUKE1992A

PANTOTHENIC-ACID 6 - 31 ppm DUKE1992A

PHOSPHORUS 80 - 3,182 ppm DUKE1992A

POTASSIUM 1,330 - 18,950 ppm DUKE1992A

WATER 780,000 - 823,220 ppm DUKE1992A

*Phytochemeco Database - USDA - ARS - NGRL*  
*Stephen M. Beckstrom-Sternberg and James A. Duke*

CAVEAT: The USDA does not recommend self diagnosis or self medication. Please see the disclaimer for more information.

### **RUN 3. HIGH-LOWS**

One can also query to see which botanicals are reportedly highest in any one of more than 2000 phytochemicals. Depending how the query is structured, the database will list out all quantified entries for a given chemical. The following Nutritional Highs tabulations results from several such queries over the last couple of years.

### ***NUTRITIONAL HIGHS***

James A. Duke

My database is available on internet at: <http://www.ars-grin.gov/duke/>

It is constantly being revised. At the University of Maryland site, we have twenty computers available for medicinal workshops where twenty participants can work interactively with the workshop. In such

workshops we can walk users through the various routines in the database, routines that could lead practitioners to the IC-50s for biological active compounds, LD-50s of poisonous chemicals, the best sources of a newly emerging medicinal phytochemical. Should your associates be attending symposia in the Greater Washington, DC/Baltimore/College Park, Maryland, we could arrange for a 1-2 hour hands-on workshop for up groups of 10 to 20 scientists or practitioners.

Remember that the database is constantly being updated as new data come in, and revisions are made. Notably, some of our early folic acid entries were three orders of magnitude high, because our sources for the data had used mg where they intended ug. Those mistakes suggested erroneously that a few grams e.g. of lentils could prevent spina bifida. The same error was made by one scientist who meant grams when he said milligrams when discussing GABA. His error led us to believe initially that an ounce or two of tomato juice might contain enough GABA to alleviate or obviate hypertension. He said that clinical hypertension is treated by oral administration of GABA, at a dose of "1.5-4.0 mg/day" for over a week, and in most cases hypotensive and diuretic effects will ensue, together with the disappearance of such symptoms as headache, tinnitus, stiff shoulders and insomnia, which often accompany hypertension. He should have said 1.5-4 g/day, not 1.5-4.0 mg/day. A new health newsletter recently talked of 3 g borons being useful in osteoporosis, when the MD author of the newsletter would surely have intended 3 mg. He ran a correction after I contacted his office and pointed out the rather dangerous 3-magnitude error. I used to site hot pepper and cayenne as our best food sources of salicylates. But recent new analyses lowered the salicylate values two orders of magnitude. And I used to talk about chocolate as a jungle source of antiasthmatic theophylline, citing my sources accurately. A new source suggested that the theophylline in the literature was in error, and that other xanthines were probably mistaken for theophylline.

I have not listed below the biological activities but these too are all catalogued in the ever growing database.

**ALANINE:** Highs for alanine on a dry weight basis (ZMB) in the Father Nature's Farmacy database include watercress (2.7%), followed by jute and lambsquarter at 2.1%, bean sprouts, carob and soy at 1.9, chinese cabbage at 1.8, pigweed and spinach at 1.7, chives at 1.6, sesame and watermelon seed at 1.5%, butternut, cauliflower, chaya, lupine and swamp cabbage at 1.4%, adzuki bean, broccoli, lentil, poppyseed, and purslane at 1.3%, rounded on a dry weight basis.

**ALUMINUM:** Those convinced that aluminum might contribute to Alzheimer's disease might be alarmed by the concentrations of aluminum published in my CRC Handbook of Phytochemical Constituents, based mostly on data from the USGS. Highest (and near lowest, depending on where grown) was cucumber, at up to 21,000 ppms; then coneflower at 12,900, butter bean at 3,000, chickweed at 1,960, pennyroyal at 1,850, tomato at 1,700, butcher's broom at 1,300, bean, carrot and grape at around 1,000, thyme around 900, cowpea ca 850, and cohosh and saffron at around 760 ppms, on a calculated dry weight basis.

**ANTHOCYANINS:** In a review of anthocyanins in fruits, Mazza and Miniati (1993) report 300-700 mg/100 g fresh fruit for bilberries, 80-325 for blackberries, 725-1050 in black chokeberry (*Aronia melanocarpa*) 160 in boysenberries, 250 in black currants, 7-495 for blueberries, 350-450 in cherries, 75-80 for cranberries, 50-400 in hawthorn 30-330 in lingonberry, 1,500 in mountain ash, 10-20 in red currants, 30 to 750 for red grapes 20-60 in red raspberries, 25-180 in saskatoon berry (*Amelanchier alnifolia*), 140-380 in sea buckthorn 115-225 in whortleberries, (Mazza & Miniati, 1993). Boik (1995) notes that some anthocyanins, as anticoagulants, might prevent blood clots, even strokes. He reports also that they may protect collagen from degradation by inducing cross-linking of collagen fibers, by promoting collagen synthesis, and by preventing enzymatic cleavage of collagen. Anthocyanins inhibit collagenase. By inhibiting collagenase activity, anthocyanins may inhibit invasions by cancer cells. (However, like vitamin

C, they may stimulate collagen synthesis and angiogenesis; this latter conflicts with what we read elsewhere, that they might prevent diabetic retinopathy, which at least in some circumstances is caused by new blood vessels proliferation. Boik suggests for arthritis and capillary permeability, doses of 20 to 40 mg pure anthocyanins thrice daily, or 120 mg/day. Remember that 100 g usually calculates to about half a cup. Consult the list above to see where you can get your daily 120 mg anthocyanins. (Boik, 1995; Mazza & Miniati, 1993)

**ARGININE:** Highs for arginine on a dry weight basis (ZMB) in the Father Nature's Pharmacy database include sunflower highest at 8.2%, followed by carob at 5.5, butternut at 5.0, watermelon seed at 4.7, white lupine at 4.4, peanut at 3.7, chaya and sesame at 3.5, soy at 3.1, watercress at 3.0, fenugreek, mustard, and Indian fig at 2.7%, almond and velvetbean at 2.6, bean sprouts, brazilnut and chives at 2.5%, and broad-beans and lentils at 2.4%, on a zero-moisture basis.

**ASCORBIC ACID:** Citrus is by no means king of the vitamin C mountain. On a zero-moisture basis, camu-camu (*Myrciaria dubia*) is reported to be nearly 50% ascorbic acid, so incredible that I obtained a new sample to verify the analyses. (On the summer solstice of 1995, I got the great news: camu-camu juice, preserved in 50:50 ethanol:juice, contained 2,110 ppms ascorbic acid, fresh weight basis. That means pure juice would have had at least 4,220 ppms ascorbic acid, even when it left the jungle in a two-bit thermus. Assuming that the fruit juice is 95% water, that calculates to 8% vitamin C on a dry weight basis. Even if you take a more conservative estimate of 90% water, camu-camu still tops 4% vitamin C on a dry weight basis! Following camu-camu is the antidiabetic anti-HIV bitter melon (to 3.6%), emblic (to 2.7), rosehip (to 2.5), bell pepper (to 2.1), cayenne (to 2.0), cashew apple (to 1.8), pokeweed shoots (to 1.6) vine spinach (*Basella*) and Cherokee rose (*Rosa laevigata*) (to 1.5), guava (to 1.4) and watercress (to 1.4%), all on calculated dry weight bases. The highest citrus in my database is the calamansi (*Citrus mitis*) at 1.1%, with even the lemon trailing far behind at 0.56%. I'm not ready to accept the 9.4% vitamin C suggested for red bush tea by the Lawrence Review (Aug. 1990).

**ASPARTIC-ACID:** Highs for aspartic-acid on a dry weight basis (ZMB) in the Father Nature's Pharmacy include swamp cabbage at 8.6%, bean sprouts at 5.9, soybean at 5.0, lentil sprouts at 4.8. asparagus and jute greens at 4.6, lupine at 4.3, carob, chaya and velvetbean at 4.2, winged bean at 4.1, peanut and watercress 3.7, yambean at 3.6, lentil at 3.5,, broad bean at 3.3, butternut, cowpea, chives and yardlong bean at 3.2% on a dry weight basis.

**BIOTIN:** Lamentably, when my database was published in 1992, these were the only quantitative data I had for biotin which occurs in all living plants. Soybean was highest at 750 ppm, followed by garlic at 22 ppm, american ginseng 9, oats 1.4, coca 1, barley 0.9, chinese ginseng 0.9, avocado 0.4, cottonseed 0.3, alfalfa 0.2, sesame and corn 0.06, faba bean 0.03, and last and lowest elderberry at 0.009 ppms, on a dry weight basis. I believe the low numbers more than the high ones. But I hope the soybean figure is true; if so there are strong food pharmacy implications, for dandruff, dermatitis, and seborrhea, if not baldness.

**BORNEOL:** Cardamom tops my data base at 8,000 ppm (ZMB), followed by sage at 7,000, rosemary at 4,225, japanese fir at 3,775, reverchon's pennyroyal at 2,525, mucous mountain mint at 1,350, douglas' savory at 910, ageratum at 500, wild oregano at 250, oswego tea at 75, and coriander at 50 ppms (on a ZMB).

**BORON:** Corn salad tops my data base at 350 ppm (ZMB)(but new materials checked were not nearly so high) followed by plum at 250, quince at 180, strawberry 160, peach 150, cabbage 145, dandelion 125, asparagus 104, fig 100, ginseng, poppyseed, and tomato 95, broccoli and lettuce at 85 ppm, beet, cherry, currant and pear at 80, cauliflower 75, apricot 70, and black currants and radishes at 65, on a rounded zero-moisture basis.

**CALCIUM:** On a dry weight basis, leaves are our best sources of calcium, pigweed at 5.3%, lambsquarter at 3.4%, nettle at 3.3%, broadbeans at 3.1%, blackgram fruits at 2.7%, watercress, licorice, and marjoram at 2.4%, savory at 2.3, red clover shoots and thyme at 2.3, chinese cabbage and basil, and celery (seed), chaya, dandelion and purslane at 2.1%. Chicory and endive are below 2.0% on a dry weight basis. In females over 12 years old in the US, mean calcium intakes are below 88% of RDA. (Nickel et al, J. Nutr. 126{5}:1406. 1996).

**CAMPHENE:** Highs among edible plants for camphene in FNF are sage (to 1.96% on a dry weight basis), ginger (to 0.63%) citronella (0.09), caraway (0.09) nutmeg (0.06); fennel (0.05) and basil (0.04% on a calculated ZMB).

**CAMPHOR:** The highs for camphor in my database include some obscure plants like ho leaf (to 22%), douglas-savory (to 0.6%), montane mountain mint (to 0.4%), spike lavender (to 0.3%), hyssop (to 0.3%), lavandin (to 0.16%), and coriander (to 0.13%).

**BETA-CAROTENE:** Purslane was by far the best source of beta-carotene in my database, at 4,700 ppms, followed by sorrel at 1,100, jujube at 700, barley grass, carrot, jujube, nasturtium, spinach and water spinach at 700 ppm, gotu kola, pokeweed, roselle, and watercress at 600, bell peppers, chives, chrysanthemum, jute, mustard greens, pigweed, swamp cabbage and sweet potatoes at 500 ppm, on a rounded dry weight basis. Leung and Foster (1995) report 6,300 ppms (0.63%) carotene in the roots of comfrey. I fear this value has to be discounted. Otherwise the relatively colorless root would be higher than anything else in my database for carotene. A recent paper Deli, Matus, Toth (1996) showed that paprika pepper (*Capsicum annuum*) can contain almost 10,000 ppms total carotenoids when fully ripe and dry. This new paper moved paprika up to third in my database for beta-carotene at 885 ppms. Deli, J., Matus, Z., and Toth, G. 1996. Carotenoid composition in the fruits of *Capsicum annuum* ca Szentesi Kosszarvu during ripening. J. Agric. Food Chem. 44(3): 711-716.

**CARVACROL:** Highs for carvacrol in the published database (Duke, 1992) include wild bergamot, *Monarda fistulosa*, (to 2.0%), thyme (1.9), winter savory (1.7), horsebalm (1.3), mother of thyme (1.0), summer savory (0.6%), ajwan (0.3) and betel leaf, (to 0.24% on a dry weight basis).

**CARVONE:** Caraway is high for its namesake carvone (to 4.4%), dillseed (3.8), biblical mint (3.0), cornmint (2.6), spearmint (to 2.0%) black cumin (1.0), applemint (to 0.5% on a dry weight basis). Celeryseed and other umbelliferous seeds may be rich in closely related compounds. Epazote (*Chenopodium ambrosioides*) may contain up to 1.1% pinocarvone.

**CHOLINE:** As for choline itself, fruits of the white-flowered bottle-gourd, *Lagenaria siceraria*, were highest in choline ZMB, sometimes exceeding a calculated 1.6% choline. Fenugreek leaves can exceed 1.3%, shepherd's purse 1.0%. Horehound, ginseng, cowpea, english pea, mung bean, sponge gourd, lentil, and dong-quai are other herbs reported to attain as much as 0.2% choline ZMB (FNF, Duke, 1992). Scientists at the UNC School of Medicine (Zeisel et al, 1995) advise that, in male rats, dietary choline deficiency causes fatty infiltration of the liver, compromises renal function, and is associated with bone abnormalities, decreased hematopoiesis, growth impairment, hepatocarcinogenesis, hypertension and infertility. "Recommendations for dietary choline are needed... Extra dietary choline may be advantageous during pregnancy and lactation in rats." Prenatal choline may improve memory in offspring rats. (Zeisel et al, 1995)

Zeisel, S. H., Mr, M. H., Zhou, Z. W. and Da Costa, K. A. 1995. Pregnancy and lactation are associated with diminished concentrations of choline and its metabolites in rat liver. J. Nutr. 125(12): 3049-3054.

**CINEOLE:** Plants containing more than 300 ppm's cineole (as their maximum reported dry weight content) are basil (to 776), beebalm (to 2,735), cardamom (to 56,000), cinnamon (to 800), eucalypt (to

29,750), fennel (to 300), ginger (to 5,000), hyssop (to 610), large cardamom (to 15,000), lavender (to 3,435), lemon leaf (to 700), lemon verbena (to 450), nutmeg (to 3,520), peppermint (to 1,390), rosemary (to 8,125), spearmint (to 9,375), sweet annie (to 6,600), tansy (to 1,300), tarragon (to 500), turmeric (to 720), and yarrow (to 960).

**CITRAL:** Highs for citral in my published database include ginger (to 1.35%), basil (to 0.7%), East Indian lemongrass (to 0.42%), West Indian lemongrass (to 0.34%), bois-de-rose (to 0.15%), clary sage (to 0.09%), lemon (to 0.03%) and carrot seed (to 0.02%) on a dry weight basis.

**CITRIC-ACID:** Far exceeding anything else in FNF is the calamansi (*Citrus mitis*) at 28.1% citric acid on a dry weight basis. Then there's lemon at 6% and the Amazonian maracuya (*Passiflora edulis*) 4.6%, soy at 1.3, pomegranate and tangerine at , strawberry and cacao at 0.8%, mamey at 0.6, and prickly pear and purslane at 0.5. American ginseng has 0.3, with lime, potatoes, and citrus weighing in close to 0.1%, on a dry weight basis.

**COPPER:** Food plants richest in copper in my database include tomato at 100 ppms ZMB, cabbage at 85, filberts at 80, broccoli at 50, blackbeans and collards at 45, cucumber at 40, cashew, coconut, pistachio, plum, rosehip and winged bean at 35, bitter melon, black cherry, gobo, lettuce, peach, pumpkin, sorrel at 30, and artichokes, asparagus, cacao, fennel, jicama oats, and spinach at 25 ppm on a rounded calculated dry weight basis.

**COUMARIN:** Highs for coumarin in FNF (Duke, 1992b) are tonka bean (to 3.5% ZMB), deer tongue (to 1.6%), woodruff, to 1.3%, peru balsam seeds 0.4%, jujube leaves 0.3% and sweet clover, to 0.2% coumarin, on a dry weight basis (ZMB). Deer's Tongue, at 1.6% coumarin is second only to the tonka bean as a cheap source of the controversial coumarin.

**CYSTINE:** Leading off in FNF for cystine is white mustard at 6,200 ppm, winged bean seed at 5,900, lambsquarter at 5,700, sesame seed at 5,500, mustard greens at 5,400, chaya and pistachio at 5,300, bean sprouts at 5,200, butternuts, oats and lupine at 5,000, poppyseed at 4,900 asparagus at 4,600 taro leaves at 4,500, purslane and spinach at 4,200, and fenugreek and lentils at 4,100 ppms, on a rounded calculated dry weight basis. Zello et al (1995) suggest a requirement of 13 mg/kg/day methionine plus cystine for adults, based on nitrogen-balance studies, but they maintain that such estimates are too low.

**EUGENOL:** Highs for eugenol in my database include cloves (to 18%), allspice (to 3.6%), bayrum leaf (to 1.9%), galangal (to 1.2%), clove leaf (to 0.9%), carrot seed (to 0.7%), shrubby basil (to 0.5%), cinnamon (to 0.35%), bayleaf (to 0.11%) and marjoram (to 0.11%) on a dry weight basis.

**FLUORINE:** Can I believe the De Smet (1993) entry of 0.09% (=900 ppms) for *Lycopus europaeus* when my highest entries were parsley and nettle at up to 8 ppm, ZMB, dill and bitter melon closer to 5 ppm, moringa leaves, pistachio nuts and rhubarb at 4, coconut and currant at 3 and brazilnut, cabbage, carrot, cauliflower, cloudberry, ginger, apple, pecan and tomato at closer to 2 ppm (dry matter basis).

**FLUORIDE:** Anticariogenic DAS; Antiosteoporotic DAS; Antiosteosclerotic DAS; PTD=4-20 mg/day. If bugle weed really is 900 ppms fluoride, that means 100 g fresh or 10 g dry bugle would contain up to 9 mg fluorine, a potentially toxic dose.

**FOLACIN:** Folacin (folic acid) is not **abundant** in plants, my highest reliable entries being edible jute (*Corchorus olitorus*) at 32 ppm (ZMB), spinach at 27, endive at 25, asparagus at 18, parsley at 18, okra at 10, pigweed at 10, and cabbage at 9 ppm's, on a calculated zero moisture basis. Nine parts per million converts to 900 micrograms (ug) per 100 g (1/2 cup), but to convert to dry weight you need to divide by 10 if the water content was 90%. Acc to CRH7:p. 63, 1995, on a fresh weight basis, 1/2 cup blackeyed peas will provide 45% of the RDA of 400 micrograms of folic acid, or 180 micrograms (ug); 1/2 cup lentils

180, one avocado 164 ug, 1/2 cup sunflower seed 160, 1/2 cup pinto beans 148, 1/2 cup garbanzos 140, 1/2 cup lima beans 136, 1/2 cup spinach 132 ug, 1/2 cup lima beans 128, 1/2 cup kidney beans 116, 1/2 cup asparagus 96, 1/2 cup peanuts 88, 1 cup orange juice 76, one cup lettuce 76, one cup escarole 72, 1/2 cup peas 52, 1/2 cup broccoli 48, and 1/2 cup brussels sprouts 48 micrograms on an as purchased basis. I fear that Wang and Goldman (1995) may be off a magnitude or three when they report folic acid content varying almost ten-fold in beets, from 1.54 mg to 11.13 mg per gram dry weight (That translates to a highly improbable 1,540-11,130 ppms.). If that were true, a bit of beet could prevent fetal alcohol syndrome and spina bifida. I was also surprised to read in Leung and Foster (1995) that stinging nettles inject folic acid into the skin. I had been saying formic acid.

Wang, M. and Goldman, I. L. 1995. Genetic Variation in Folic Acid Content of Red Beet Genotypes. Abstract. Internat. Symp. Medicinal and Aromatic Plants, U. Mass., Amherst. Aug. 27-30. 1995.

**FRUCTOSE:** On a dry weight basis, dates can have over 30% fructose, chicory roots 22%, onion bulbs 16%, tamarind and turmeric 12%, orange 2.4%, hops 2.0%, and grapefruit 1.2%, on a calculated dry weight basis. There are hereditary diseases like fructosuria and hereditary fructose intolerance. The amount we can digest seems to be related to what other sugars, esp. glucose, are in the GI tract. The fructose:glucose ratio is important. Fructose is believed to cross the intestinal brush border only by facilitated diffusion with the aid of a protein carrier molecule. Glucose crosses thru these cellular membranes both by facilitated diffusion and by energy-requiring active transport. This may explain the greater incidence of fructose vs glucose malabsorption. USDA figures suggest we are close to a 48:21 fructose:glucose ratio. Sorbitol makes things worse requiring fructokinase for its metabolism. Sorbose from which sorbitol is made is a stereoisomer of fructose. Look for more fructose intolerance as technology alters our ratios in the future, taking us farther from our paleolithic frugivorous ratios. (Levin, 1996).

Levin, B. 1996. Honey and fructose malabsorption. QRNM (Spr.):41-2.

**GENISTEIN:** I've been seeking reliable data for three years now, but here's the best I can do for my Independence Day rundown, on a high-low for food grade genistein sources (I'm stretching the point by including clover flowers, rarely consumed by normal non-herbalists); sub-clover 473 ppms, tarhui (*Lupinus mutabilis*) 111 ppms, peanut 54, groundnut (*Apios americana*) 48, soybean 46, crimson-clover blossom 25, red clover blossom 19, fenugreek 18, montane clover 10, fababean 6, zigzag clover 6, strawberry clover 5, mungbean 2. Note that subclover flowers have almost ten times as much as soybean, enough that cattle grazing the sub-clover often have estrogenic problems, even miscarriage. And I like my peanuts even better, now that I see they have more genistein than soybean. Any day now the following table is due for publication.

SEED SAMPLE Genistein (ppms) Daidzein (ppms)	Anasazi beans 29.8 6.5
<i>Psoralea corylifolia</i> 1528.0 539.7	Red kidney beans 29.3 2.7
(Kudzu Root 316.9 949.8)	Red lentils 25.0 5.2
Yellow split pea 45.8 0.4	SOYBEANS 24.1 37.6
Black turtle beans 45.1 0.4	Black eyed peas 23.3 0.3
Baby lima beans 40.1 0.4	Pinto beans 22.3 23.2
Large lima beans 34.4 0.3	Mung beans 21.8 0.3



Azuki beans 21.2 4.6

Great northern beans 17.7 7.2

Faba beans 19.9 5.0

*Anthyllis vulneraria* 3.7 1.8

**GERANIOL:** Highs for geraniol in my published database include horsebalm (to 2.9%), carrot (to 0.8%), skhabar (to 0.7%), merrill flowers (to 0.44%), mahapengiri (to 0.3%), mountain mint (to 0.28%), tea (to 0.25%) and east Indian lemongrass (to 0.25%) on a dry weight basis.

**GLUTAMIC-ACID:** Carob tops the heap at 13.2% on a dry weight basis, followed by lupine at 9.7, chinese cabbage and soybean at 7.7, chives at 7.2, asparagus and peanut at 6.5, butternut and wheat at 6.3, almond at 6.2, chaya at 5.9, pigeonpea at 5.6, bean sprouts at 5.5, tomato at 5.4, mustard and watermelon seed at 5.3, pistachio at 5.1, and lentils and poppyseed at 4.9%, on a rounded and calculated Zero Moisture Basis (ZMB).

**GLYCINE:** Carob tops the FNF heap at 2.5% on a dry weight basis, followed by watercress at 2.2, sesame at 2.0, peanut and pumpkin seed at 1.9, soy at 1.8, chives, jute and lupine at 1.7, butternut, lambsquarter, pigweed and spinach at 1.6, beansprouts, sunflower and velvetbean at 1.5, fenugreek, Indian fig, and white mustard at 1.4, and almond, asparagus and swamp cabbage at 1.3%, on a rounded and calculated Zero Moisture Basis (ZMB).

**HISTIDINE:** In the CRC Handbook of Phytochemical Constituents, sunflower reigns supreme at 2.0% histidine, followed by bean sprouts at 1.3, carob and lupine at 1.2, soy at 1.1, jute, lablab, lentils and sprouts, lima beans, pigeon pea, winged bean at 0.9, with butternut, peanut, taro leaves, watercress, white mustard, yardlong bean at 0.8%, on a rounded and calculated Zero Moisture Basis (ZMB). Zello et al (1995) estimate a requirement of 8-12 mg/kg/day histidine for nitrogen-balance adults, but they maintain that such estimates are too low.

**IRON:** In the CRC Handbook of Phytochemical Constituents, echinacea runs a close second to dandelion as an iron source, followed by cornsalad (0.41%), mugwort (to 0.39%), ramie (0.35%), devil's claw (0.29%), wild gingers (0.28%), mullein (0.24), safflower (0.22), butterbur (0.21) pigweed (0.15), thyme (0.15), tea (0.15), cassava leaves (0.15), gobo root (0.15), and catnip (to 0.14% on a calculated dry weight basis. Many of the high mineral values however trace back to a single source which often proved unreliable. These high iron values need confirmation. If the tincture took the iron from the echinacea roots, then that could be a good idea in anemia, and may even explain some of the reported activities of echinacea. If so, I'd include dandelion, mugwort, and coneflower in my bitters recipes with such things as bogbeans and gentian.

**ISOLEUCINE:** In the CRC Handbook of Phytochemical Constituents, sunflower tops the chart for isoleucine, at 4.6%, followed by blackbean sprouts at 2.0, soy at 1.9, jute greens, lablab, lupine and taro leaves at 1.8, spinach and wheat at 1.7, carob, lambsquarter, pea velvetbean and wingedbean at 1.6, asparagus, butterbeans and chives at 1.5%, fenugreek, greengram, lentil, lettuce, pigweed, pumpkinseed, sesame, swamp cabbage, and tepary at 1.4% on a rounded and calculated Zero Moisture Basis (ZMB). Zello et al (1995) suggest a requirement of 10 mg/kg/day isoleucine for adults, based on nitrogen-balance studies, but they maintain that such estimates are too low.

**LAURIC-ACID:** In the CRC Handbook of Phytochemical Constituents, coconut towers above the other entries for lauric acid, attaining 36.\* lauric acid on a calculated dry weight basis, followed by uchuba (*Virola*) at 11.5, betel nut at 9.0, datepalm at 5.4, calendula at 1.8, macadam at 1.1, cantaloupe seed at 0.9, cashew at 0.8, ginger at 0.4, water melon seed at 0.3, and mace and thyme at 0.2%, on a rounded and calculated Zero Moisture Basis (ZMB)

**LECITHIN:** Soybeans may contain 15,000-25,000 ppm lecithin, but brazilnuts may contain as much as 100,000 ppm (10%). Even dandelion flowers contain nearly 3% on a dry weight basis, poppyseed 2.8 %, mungbean 1.6%. According to the Chemical Marketing Reporter (August 12, 1991), lecithin has been banned as a weight-control drug.

**LEUCINE:** In the CRC Handbook of Phytochemical Constituents, sunflower tops the charts at 3.6% leucine, followed by watercress at 3.3, blackbeans, jute and soy at 3.2, taro leaves and winged beans at 2.7, sheat and spinach at 2.6, velvetbean at 2.5, tepary at 2.4, and butternut, fababeans, lentil, pea, pigweed, and sesame, at 2.3, and lablab, lambsquarter, and pumpkin seed at 2.2%, on a calculated dry weight basis, well rounded. Zello et al (1995) suggest a requirement of 14 mg/kg/day leucine for adults, based on nitrogen-balance studies, but they maintain that such estimates are too low, by ca 1/2.

**LIMONENE:** Best sources of limonene, surprisingly, are not citrus , but caraway, at 3% on a dry weight basis, celery seed at 2.5%, orange at 1%, cardamom, fennel and tangerine at 0.9%, lime, spearmint, nutmeg, at 0.6%, and star-anise and thyme at 0.5%, zero-moisture basis.

**LINALOOL:** Highs for linalool, at least in my published database, include linaloe (to 8.4%), mountain mint (to 3.9%), ho leaf (to 2.3%), coriander (to 1.7%), winter savory (to 1.4%), flexuose mountain mint (to 1.1%), oswego tea (to 0.96%) spearmint (to 0.93%) and cardamom (to 0.25%) on a zero moisture basis.

**ALPHA-LINOLENIC-ACID (ALA):** Average daily intake in the US figures at ca 1 g/day or 0.5% of energy intake (Cunnane, 1995). I think Cunnane's table make reflect a pro-flax bias, but I list here his higher ALA sources flax 45-60%, perilla 50-60 (see p.145, Cunnane did not cite the 60%), beans 30-57; pumpkins 24-45; lemons 13-42; lime 13-42; potato 10-28; orange 6-21; banana 14-20; peas 17; carrot 17; english walnut 17; lentils 16; butternut 16; canola 8-15; soybean 5-7; barley 4-7; peanuts 3; brazilnuts 1-3; cashewnuts 1-3; macadamianuts 1-3; pecans 1-3; pistachio nuts 1-3; brown rice 1-2; and oats 1-2%.

### **GAMMA-LINOLENIC-ACID (GLA)**

**LYCOPENE:** Good sources of lycopene, according to NAPRALERT (courtesy of N. R. Farnsworth) and my database include balsampear (to 231 ppm), carrot (80-140), pot marigold (to 3,360 ppm), rosehips (43-111 ppm),. tomato (16-663 ppms), watermelon (45-900 ppm). Confession is good for the soul. This is all the quantitative data I found for lycopene (except for 260 ppms in seed of *Connarus macrocarpa* and 0.6 ppm in *Aronia melanocarpa*) in both databases as of Feb. 10, 1996, deriving about half from each database.)

**LYSINE:** In the CRC Handbook of Phytochemical Constituents, watercress and soy lead for lysine, at 2.7%, followed by blackbean sprouts and carob at 2.6, lentil sprouts at 2.4, lambsquarter and wingedbean seed at 2.3, lentil and white lupine as 2.2, spinach and velvetbean at 2.1, pea and pumpkinseed at 2.0, and asparagus, butterbean, chinese cabbage, fababean, fenugreek, parsley, and tepary bean at 1.9%, on a calculated and rounded dry weight basis. Zello et al (1995) suggest a requirement of 12 mg/kg/day lysine for adults, based on nitrogen-balance studies, but they maintain that such estimates are too low, by ca 1/3.

**MAGNESIUM:** Purslane {highest at nearly 2% on a dry weight basis}, greenbean 1.8%, poppyseed 1.6%, cowpea 1.4%, spinach 1.1%, snakegourd 1.0%, licorice 1.0% with lettuce and nettle coming in at 0.9%, on a dry weight basis, were the best dietary sources of magnesium in my database). On a fresh-weight (as-purchased) basis licorice was outstanding at nearly 1%, with poppyseed at 0.3%.

**MANGANESE:** USDA scientists report (Nielsen, 1993) that unrefined cereals, nuts leafy vegetables, and tea are rich in Mn; refined grains, meats and dairy products low. Tea and cloves were highest in my

database, at 1200 ppms, followed by fennelseed at 700 ppms, buchu at 675, spinach at 485, red clover at 465, parsley and catnip at 375, bilberry at 370, ginger at 350, cardamom at 280, cowberry at 250, lettuce at 240 and cowpea at 240 (on zero-mositure basis).

## MELATONIN:

CROP MELATONIN MELATONIN	<i>LYCOPERSICUM ESCULENTUM</i> 32.0-506.0
pg/g ppm (for FNF)	0.000506
<i>AVENA SATIVA</i> 1,796.1 0.001796	<i>MUSA PARADISIACA</i> 466.0 0.000466
<i>ZEA MAYS</i> 1,366.1 0.001366	<i>CHRYSANthemum CORONARIUM</i> 416.8
<i>ORYZA SATIVA</i> 1,006.0 0.001006	0.000417
<i>RAPHANUS SATIVUS</i> 657.2 0.000657	<i>HORDEUM SATIVUM</i> 378.1 0.000378
<i>ANGELICA KEISKEI</i> 623.9 0.000624	<i>BRASSICA CAMPESTRIS</i> 112.5 0.000112
<i>ZINGIBER OFFICINALE</i> 583.7 0.000584	<i>LYCOPERSICUM PIMPINELLIFOLIUM</i> 112.0
	0.000112
	<i>BRASSICA OLERACEA</i> 107.4 0.000107

The only foods I have seen reported to contain more than 100 picograms melatonin per gram are oats (1,796), corn (1,366). rice (1,006), radish (657), angelica (623), ginger (584) tomato (to 506), banana (466), chrysanthemum (417), barley (378), mustardgreens (112) and cabbage (107). Think small. Those units are in parts per trillion. Only the oats, rice, and corn attain the parts per billion level, 1.7, 1.4 and 1.0 ppb respectively. Effective doses of melatonin may start at 0.3 mg for a 100 kg person like me. To get 0.3 mg melatonin from rice with only 0.001 mg per kilo, I'd have to eat 300 kg rice; three times my body weight in rice. Think I'll go with the capsules!

**METHIONINE:** Best sources of methionine on a dry weight basis in the published FNF database are sunflower to 2.0%, black cumin, 1.7%, brazilnut 1.0, sesame 0.9, butternut, evening primrose, pumpkinseed, spinach, swamp cabbage, taro leaves and watermelon seed 0.6, and bean sprouts, jute, mustard seed, poppyseed, and soy, at ca 0.5% ZMB. Zello et al (1995) suggest a requirement of 13 mg/kg/day methinone plus cystine for adults, based on nitrogen-balance studies, but they maintain that such estimates are too low.

**MENTHOL:** Cornmint topped the highs in the published FNF for mentholat 2.4% (ZMB), cf 0.75% for muticous mountain mint, 0.67% for peppermint, 0.38% for european pennyroyal, 0.36% for watermint; 0.3% for virginia mountain mint, and 0.18% for scented geraniums.

**MENTHONE:** Cornmint also topped the highs in the published FNF for menthone, at 2.4% (ZMB), followed by typical mountain mint 2.0, pilose and virginia mountain mint 1.5, european pennyroyal 0.6, whorl mountain mint 0.5, peppermint 0.3, white mountain mint, douglas savory, and biblical mint 0.2 with spearmint closer to 0.1%, on a calculated dry weight basis.

**MUFA:** (now recommended for NIDDM). If FNF and its sources are correct, avocado fruits can contain up to 69% MUFA's or oleic-acid, macadamia nuts up to 59% MUFA, hazelnuts 57%, the much maligned oil palm fruit 43%, marula nuts 42%, pistachio 34%, olives 33, cashews 30, peanuts 26%, brazilnuts 24%, chocolate 22; coriander seed 17, pumpkin 15%, fennelseed and butternut 11%. My proposed

MUFamous MUFA-nut butter would embrace the better of these, spiced up with a little coriander and fennel.

**MYRCENE:** This antinociceptive compound is highest (at least in FNF) in leaves of the bayrum tree (up to 2.4% on a calculated dry weight basis), nutmeg (0.59), rosemary (0.56), cardamom (0.3), cornmint (0.25), wild bergamot (0.19), juniper (0.19), parsley seed (0.17), caraway seed (0.16), spearmint (0.14), lime (0.1), tarragon ((0.1) and dill seed (0.09% on a dry weight basis)

**MYRISTIC-ACID:** Mace is incredibly high in myristic acid, upwards of 30% on a calculated dry weight basis, followed by coconut at 13.3, filbert at 1.4, brazilnut at 1.3, karaya at 1.2, safflower as 0.9, cantaloupe at 0.9, cottonseed at 0.7, Indian almond and macadamia at 0.6, pawpaw at 0.5, cashew at 0.4, almond at 0.3, emblic, ginger, okra seed, oregano, sesame and thyme at 0.2, pumpkin flowers, spinach and sunflowerseeds at 0.1% on a calculated ry weight basis.

**NIACIN:** Regrettably, FNF is almost useless for niacin. It's the same old unreliable source that I find has fouled up many FNF entries<sup>6</sup>. It's so bad, that I must caution anyone using FNF to disregard all numbers followed by the citation PED. Somehow, I must teach my computer to back up and remove all PED entries and redo them. Big job.

**NICKEL:** In general vegetarians are less likely than omnivores to be nickel-deficient. Best source of nickle in Nielsen's table (1993) was instant tea (15.5 ppm), cacao powder, 9.8 ppms, tea leaves 5.3, cashew 5.1, soy protein, 4.3, walnut 3.6, filbert and peanut 1.6, almond 1.3, wheat germ 1, pistacio 0.8, rice 0.4. These calculations are for fresh weight basis, where reasonably dry nuts and grain always score well. Fruits amy be 95% water, vegetables 90%. Peach was the best fruits source in Nielsen's Table at 0.16 ppms, apples the lowest at 0.03. String beans were the highest vegetable at 0.26 ppms, tomato lowest at 0.08 ppms. Roughly these fruit and vegetable figures would be 10 times higher if you magically dried them somehow. Important mineral component of urease which hydrolyses the antiseptic diuretic urea to ammonium carbonate. The best source of urease is the sword- or jackbean, *Canavalia ensiformis*.

**OLEIC-ACID:** If FNF and its sources are correct, avocado fruits can contain up to 69% MUFA's or oleic-acid, macadamia nuts up to 59% MUFA, hazelnuts 57%, the much maligned oil palm fruit 43%, marula nuts 42%, pistachio 34%, olives 33, cashews 30, peanuts 26%, brazilnuts 24%, chocolate 22; coriander seed 17, pumpkin 15%, fennelseed and butternut 11%. Some 'Naked Seeded' pumpkins may have 30%. My proposed MUFamous MUFA-nut butter would embrace the better of these, spiced up with a little coriander and fennel.

**OPC's** (Oligomeric Procyanadins): In an article by Schwitters, himself, the author of OPC in Practice, we find a quoitte that supports what I have been saying for years "OPC is not only found together with the red pigments. It is found in all plants, vegetables and fruits, such as oranges and lemons." Since data on OPC's have rarely been tabulated, I cannot quantify who's the best among them. Since they often co-occur with water-soluble tannins (polymers) and catechins (monomers), one might search for good sources of these and presume that, under certain circumstances, these same sources might be good sources of OPC's. I currently prefer the peanuts hulls and the red wines and grape juices to pine bark. A single flavan-3-ol molecule (monomer) is **catechin**; the pairs and triples (dimers and trimers) are **OPC**; quadruples (tetramers) and higher polymeric procyanidins are **tannin**. The whole group is identified as **bioflavanols or flavanols**. (Schwitters, B. 1995. "OPC in Practice" Special Advertising Section. NFM NSN, October, 1995)

**OXALATES:** Highs for oxalic-acid in FNF are lambsquarter to 30% oxalic acid on a dry weight basis, buckwheat leaves,<sup>11</sup> starfruit, 9.6%, black-pepper 3.4%, purslane 1.7%, poppyseed 1.6%, rhubarb 1.3%, and tea, to 1.0% oxalic acid on a dry weight basis. Oxalates, e.g. in black tea, may lead to stone

formation. Checking 14 kinds of national herb teas (including camomile, orange-spice and peppermint), scientists at Memorial University of Newfoundland (J. Amer. Diet. Assoc. Mar 1985), found that herb teas had 1/7th to 1/32th the oxalate of regular tea (Prevention, Sept. 1995. p. 46).

**PANTOTHENIC ACID:** The Merck Index (11th ed.) says that this vitamin occurs everywhere in plant and animal tissue. The richest common source is liver but royal jelly (queen bee jelly) contains 6 times as much. Rice bran and molasses are other good sources. If it occurs in all plant tissues, one needs quantitative data to impact. In my database the richest sources, on a dry weight basis, are endive (to 145 ppm), pea (to 74 ppm), broccoli (to 63), cucumber (to 63), watercress (to 62), tomato (to 61), New Zealand spinach (to 50), broad bean (to 50), green gram (to 48), oats (to 45), strawberry (to 40) and avocado (to 38 ppm).

**PECTIN:** Pectin in fruits might be indicated for anginal and diabetic patients, maybe even colon-cancer candidates like myself. and the fast sugars contraindicated. Fruits with pectin contents above 1% are expected to make good gels. Nwanekezi et al, (1994) checked several fruits for pectin contents, and reported the following from their studies: mango, 1.8-14.1%; papaya, 1.6-12.5%; orange, 1.35-14.1%; cashew apple 1.3-16.7%; guava, 1.3-7.9%; banana 1.1-9.5%; lime 1-8%; and others like avocado (0.7-4.3%, eggplant 0.9-4.5%, irvingia 0.7-3.8%, star apple 0.6- 2.4%, and tomato 0.5-2.5% . I assume that the low values are on a fresh weight basis and have converted them to dry weight basis. Since moisture varies so widely, I prefer to compare calculated dry weight values (ZMB=zero-moisture basis). The highest pectin figures in FNF ZMB are marshmallow root (to 35%), pumpkin seed (to 30%, Bisset, 1994), white-flowered gourd (to 21%), carrot (to 18%), wood-apple (to 16%), rosehip (to 11%), flaxseed (10%), ambarella (10%) with the revered apple weighing in at only 6.7% and fig at 5%.

Up to 30% (ZMB) of the albedo of the orange may be pectin and grapefruit peel may be 3.5% pectin (fresh weight basis). Concentrations in juices are quite low 0.01-0.13% in orange juice, and the grapefruit juice sacs 0.3% (Fellers, 1991).

**PHENYLALANINE:** Highest in my database on a zero-moisture basis is sunflower seed (4.8%), watercress and bean sprouts at 2.3%, soybean at 2.2%, pigeonpea at 2.1%

chaya at 1.9%, breadnuts at 1.8%, jute greens, watermelon seed, and swamp cabbage at 1.7%, lupine, pigweed greens, green gram, peanuts, asparagus pea, lentil, yardlong bean at 1.6%, and spinach, carob, and butternut, at 1.5%, zero-moisture basis. Zello et al (1995) suggest a requirement of 14 mg/kg/day phenylalanine plus tyrosine for adults, based on nitrogen-balance studies, but they maintain that such estimates are too low, by about 1/2.

**PHYLLQUINONE:** Highs in the FNF database, largely derived from Shearer et al (1996) are kale (6.18 ppm), parsley 5.48, spinach (3.80), cabbage (green) (3.39), watercress (3.15), broccoli (1.79), soybean oil (1.73), brussels sprouts (1.47), lettuce (1.29), rapeseed oil ((1.29 ppm), and mustard greens (0.88 ppms). The green outer leaves of cabbage can have 3-6 times more than inner whitish leaves. Red cabbage has only 0.190 ppms. Ironically, but as expected, the bioavailability is lowest from the richest source, green leafy vegetables, presumably because of the tight association of the vitamin with the photosynthetic apparatus. Requirements (based on coagulation requirements, not bone studies, are 1 ug/kg/day). In my case that translates to 110 ug/day, which could be provided by a little more than a half cup of mustard greens, less than a half cup of the other items listed above. (Shearer et al, 1996)

Shearer, M. J., Bach, A. and Kohlmeier, M. 1996. Chemistry, nutritional sources, tissue distribution and metabolism of vitamin K with special reference to bone health. J. Nutrition 126(4s): 1181S-1186S.

**PHOSPHORUS:** Highest for phosphorus in my database on a zero-moisture basis is beet, at 4.6%, followed by malanga leaves at 3.8%, lamb's quarter at 3.7, tomatillo at 3.0, flaxseed at 2.0, cowpeas at

1.6, watermelon seed at 1.5, sesame lettuce and stringbeans at 1.4, cucumber and pumpkinseed at 1.3, swamp cabbage and watercress at 1.2, and asparagus, Indian almond, oats, peanut, pumpkin flowers, and radish, at 1.0%, on a calculated dry weight basis, well rounded.

**PHYTOSTEROLS:** Highest phytosterol foods in my database based on dry weight values calculated from USDA Ag Handbook 8 et seq. are sesame at 8,100 ppm, lettuce as 6,330, sunflower seed at 5,640, black cumin at 5,100, hazelnut at 5,000, cucumber at 3,540, asparagus at 3,095, okra at 2,400 (and contains the male contraceptive gossypol), cauliflower at 2,325 ppm, buckwheat at 2,270, oregano at 2,185, beet at 1,970, spinach at 1,800, crucifer leaves at 1,700, cashew nuts at 1,700, onions at 1,455, pumpkin or squash at 1,425, radishes at 1,355, tomatoes at 1,155, celery at 1,120, basil at 1,060 at etc. One could easily use such data to construct hypocholesterolemic salads and soups to replace the hypercholesterolemic modern meat and potatoes. A high phytosterol fruit salad would include figs (1,485 ppm), strawberries (1,425), apricots (1,320) with a little hypercholesterolemic ginger (910). Since the phytosterols hang with the oils, one might seek an inexpensive sesame or sunflower oil with even more vinegar for the salad dressing. Examining Spiller's phytosterol table (p.213 et seq.), one sees that sprouts are unusually rich in sterols.

Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.

**PINENE(alpha-):** Highest food sources of alpha-pinene from FNF are parsley seed (to 31,080 ppm, ZMB; coriander seed 13,780, juniper berries 9,200,, sweet annie 3,760, cardamom 3,000, cubeb 2,200, sassafras 2,000, horsemint 2,000, ginger 1,950, sage and angelica 1,500, and boldo, dill, tarragon and yarrow at up to 1,000 ppm, on a calculated dry weight basis.

**PINENE(beta-):** Highest food sources of beta-pinene from FNF are parsley seed (to 26,450 ppm, calculated ZMB), cumin 6,600; hyssop 4,580; cornsilk 3,000; angelica 2,400; bayleaf 2,080; sage (greek) 1,590; cornmint 1,445; lime 1,190 biblical mint 1,160, and cardamom (to 1,095 ppm, on a calculated ZMB).

**POTASSIUM:** If upping your potassium can prevent stroke as Heinerman says (1994), you might want to up your intake of lettuce (up to 12% potassium on a calculated dry weight basis), endive (9.5%), mungbean (9%), lambsquarter leaves (8.7%), radish (8.9), chinese cabbage (8.2%), purslane (8.1%), parsley (to 7.9%), chrysanthemum buds (7.7%), dandelion roots (7.5%), or amaranth leaves (7.4%), cucumber (7.2%) or spinach (6.9%) potassium on a calculated dry weight basis. (Duke, CRC Handbook of Phytochemical Constituents) (See allergy).

**PROLINE:** What a surprise to find cabbage on top for proline, at 3.2%, then chives and soy at 2.3, asparagus, white mustard and winged beans at 2.1, jute, velvetbeans and wheat at 2.0, carob and watercress at 1.9, bean sprouts and fenugreek at 1.8, chickpea and pumpkin at 1.7, lupine at 1.6, and okra, peanut and pigweed at 1.5, and cowpea, lambsquarter and sesame at 1.4%, on a calculated dry weight basis.

**PUFA:** The butternut, *Juglans cinerea*, is high for polyunsaturates, at 44.2%, sunflower coming in second at 34.6%, brazilnut third at 25.0%, pumpkinseed fourth at 22.5%, peanut fifth at 18.4%, followed by soybean at 12.3%, cashew at 8.4%, pistachio and avocado fruits at 7.6% and breadfruit seeds at 6.8%, on a zero-moisture basis.

**QUERCETIN:** Washinton State Scientists (Patil and Pike, 1995) studied the distribution of quercetin in different rings of various coloured onion (*Allium cepa* L.) cultivars. The skins were extracted with alcohol to obtain bound quercetin glycosides that were then hydrolyzed to free quercetin. Unfortunately for food "farmacists", quercetin decreased from the outer dry skin to the inner more palatable rings. The highest concentration was in the outer dry skin of 'Red Bone' onion (30,600 ppms; including 20,640

ppms free quercetin) while 'Contessa' had only 94 ppm. The outer rings (not the dry skin) of 'Kadavan' were highest at 345 ppms fresh weight. That means you'd have to eat a kilo of these Kadavan outer rings to get 345 mg quercetin. Onion skins are still my best source of quercetin. French fried onion skins, anyone? "An onion a day may be a better prescription than an apple a day." (Brown, 1996). A recent Dutch study concluded that food quercetin was better absorbed than "silver bullet" quercetin. From onions, the ileostomy volunteers absorbed 52% of quercetin, cf. 17% for quercetin rutinoides and 24% for quercetin aglycone. Brown (1996) counters that after oral administration of 4 grams quercetin ("silver bullet"), serum levels never exceed 1 ug/ml.

Hollman, P.C.H. et al. 1995. Absorption of dietary quercetin glycosides and quercetin in healthy ileostomy volunteers. Am. J. Clin. Nutr. 62: 1276-82.

Patil, B.S. and Pike, L.M. 1995. Distribution of quercetin content in different rings of various coloured onion (*Allium cepa* L.) cultivars. J. Hort. Sci. 70(4): 643-50.

Reichert, R. 1996. Quercetin Absorption. QRNM(Spring): 15-6.

**RIBOFLAVIN:** It would take more than 10 pounds of dry lambsquarter (100 pounds of fresh lambsquarter containing 90% water), richest source in my database to provide the 400 mg a day shown to reduce severity of migraine 70%. Lambsquarter leaves contain 76 mg/kg or 76 ppm, ZMB; thyme has 53; jutegreens 44; poke shoots 39; peppermint 39; asparagus 36; taro leaves 35, mallow leaves 35; celery stalks 34 and roselle 31 mg/kg or part per million, on a zero moisture basis.

**ROSMARINIC-ACID:** One could get physiologically significant doses of the antioxidant antithyrotropic rosmarinic acid by consuming teas composed of some of the following, mostly pleasant tea-making herbs, shall we call it Rosmarinade:

basil 1,000-19,000 ppm rosmarinic-acid	Pagoda Tree Flowers 13-30% (LAF)
beebalm 18,000	EUCALYPTUS RHYNCHOPHYLLA 10-24% (LAF)
bugle 37,000	Violet Flowers 10-23% (FNF)
lemonbalm 37,000	Eucalyptus Leaf 7-10% (FNF)
oregano 1,000-55,000	Mulberry Leaves 2-6 (FNF)
peppermint 1,000-30,000	Buckwheat(but not seed) 1-6.4(LAF)
rosemary 3,000-39,000	Pagoda Tree Leaves 0-4
sage 2,000-30,000	Rue ( <b>POISON</b> ) 2
savory 12,000-26,000	Citrus Leaf 0.6
selfheal 61,000	Rhubarb 0.6
spearmint 6,000-43,000	Sheep Sorrel 0.5
thyme 5,000-26,000 ppm	Coca 0.5

**RUTIN rutin (%)**

**SAPONINS:** Highs in my database (URL = <http://www.ars-grin.gov/duke/>) for saponins include the inedible horse chestnut (to 26%), licorice (to 14%), unedible seneca snakeroot and soapbark (to 10%), rose leaves (to 8.5%), gotu kola (to 8%), ginseng (to 7%), inedible blackbean and edible desert date (to 7%), beets and chickpea (to 6%) air potato (to 5.7%), soybean and mungbean( to 5.5%) spinach (at 5%), cornsilk (to 3%), epazote and violet (to 2.5%), and alfalfa, sarsaparilla and velvetbean (to 2%). Alfalfa sprouts may attain 8%. The saponins, e.g. in licorice, are such that they can emulsify active ingredients in other herbs, increasing their availability an order of magnitude or two.

**SERINE:** Beansprouts lead off for serine at 2.4%, followed by carob and soy at 2.3, lupine at 2.1, butternut at 1.7, butterbean, chives, swamp cabbage and velvetbean at 1.5, asparagus, jute, lablab, lentil, peanut, at 1.4, pistachio and sesame and watermelon seed at 1.4, and black bean, cauliflower, faba bean, fenugreek, green gram, and pigweed at 1.3%, on a calculated dry weight basis.

**SEROTONIN:** Mix to taste ground seeds of the following (serotonin levels in ppms): butternut (398 ppm); black walnut (304), shagbark hickory (143) english walnut (87), mockernut (67), pecan (29), pignut (25). LRNP (Sep. 1993) mentions that kiwi fruits have twice the serotonin of tomatoes and 1/3 that of bananas, enough to interfere with urinalysis for serotonin metabolites.

**SILICA:** Lanning has reported 6.5% in seeds of rarely eaten weed, *Fimbristylis*: 3.2 % in rice, 2.6% in johnson grass; 1.4% in oats; 0.8% in wild rice, 0.7% in barley, 0.05% in millet, 0.03% in sorghum, 0.01% in rye; 0.01% in wheat (though the bran is 14 times higher), and 0.01% in triticale. Walker (1970) produced data that I have yet to computerize with only five food plants attaining more than 0.1% SiO<sub>2</sub>: horseradish 0.22%, spinach 0.18%, parsnips 0.17%, dandelion 0.13%, and savoy cabbage 0.10%. My database had shown before these documents: barley, to 0.90%; hempseed 0.84%; nettle 0.65%; chickweed 0.48%; brazilnut 0.18%; butternut 0.14%; walnut 0.14%; pistachio 0.14%; parsley 0.14%; cashew 0.13%; stringbean 0.12%; turnip 0.12% and cucumber, to 0.10%, on a zero-moisture basis.

**STEARIC-ACID:** Of edible seeds, cashew tops my stearic-acid list, at 10.2%, followed by java olive at 7.5, brazilnut at 7.3, cucumber seeds 7.0, watermelon seeds 6.6, Indian almond at 4.1, cantaloupe seed at 3.5, sesame at 3.3, pumpkin-seed at 3.0,, sunflower and macadamia at 2.8, walnut at 2.1, and cardamom qt 1.8% on a calculated dry weight basis. Strangely I have no quantitative data for chocolate, basis for an industry which keeps bragging about chocolate being useful in weight reduction, rather than fattening. But there may be bad news breaking. Under the title Unusual Fats Lose Heart-friendly Image, Science News (Raloff, 1996) reports a British Study from the August American Journal of Clinical Nutrition, suggesting that lamb and dairy products correlated most closely with worsening atherosclerosis. Stearic acid, found in meat and cocoa butter, is unique among saturated fatty acids in failing to elevate blood cholesterol. And not so surprisingly, trans-fatty acids, common in margarines, shortening and animal products, were fingered. Thomas A. Pearson, Mary Imogene Bassett Research Institute, Cooperstown NY, and editor of a monograph on stearic acid, had concluded that it lacked the deleterious effects of other saturated fats. He did admit that animal tests suggested it might induce blood clots - elevating risk for heart attack or stroke- thought there was as yet no evidence for this in humans. He reiterates that the new study doesn't yet "support a conclusion that stearic acid causes heart disease." Taking the other side, W. E. Connor, Oregon Health Sciences University in Portland, a blood clot researcher, says "I was always inclined to view stearic acid as not benign. This study now confirms that." (Raloff, J. 1996. Unusual fats lose heart-friendly image. Sci. News 150: p. 87)

#### **TANNIN:**

HERB % TANNIN

Black tea 11.5-33%

Rhatany >20% (VET)

Bearberry 16.7-22.0 (to 40%, acc to LRNP)



Persimmon 20.0 (Crellin & Philpott)	Hawthorn 5.9
Woodavens 12-28 (Bisset)	Raspberry Leaf 5.6
Betony (Stachys offic.) 15 (Honest Herbal)	Peppermint 5.0-5.5 (6-12%, BIS)
Hamamelis Capsules 11.0	Rooibus 4.4-5.4
Eucalyptus Capsules 11.0	Bilberry Capsules 5.3
Redroot 10.0 (Crellin & Philpott)	Artichoke Capsules 4.3
St. John's-wort 10.0 (LRNP Aug 1989)	Nettle 3.2
Sage Capsules 8.6	Lemon Verbena 2.3
Sage Tea 3-7 (VET)	Camomile 1.8-2.3
Maté 8.4-8.5	Comfrey 2.3
Maté 7-14 (LRNP Apr 1988)	Fennel 0.6

Honeysuckle contains at least two antiviral compounds over and beyond the antiviral tannin. You can imagine my surprise when I asked the computer what was the best source of tannin. The computer said honeysuckle plants, at 800,000 ppms (that's 80%). Garbage in. Garbage out. In the CRC Handbook of Phytochemicals, the number for the honeysuckle entry, before computerization, had an extra 0, reading 80,0000 where it should have read 80,000 or 8%. Users on the internet next month will find the right number 80,000 there, putting honeysuckle way back on page two of also rans in the tannin hit parade on the NetScape. Embarrassing; privet the number two entry had the same mistake, 70,0000 instead of 70,000. (My computer sometimes adds an extra digit due to my southern drawl at the keyboard.) That's why I always have to verify exceptional highs in our database. But we get closer to the truth, eliminating typos as we verify exciting results. Cainagre was a valid entry at a high of 35%, fruits of Acacia came in second and third at 32-34%; pomegranate rind at 33.6%, guava bark at 30%, emblic fruit and geranium root at 28%; tea leaves at 27%; sumach leaves at at 27%, rose flowers and Mexican bamboo at 24%, peruvian pepperbark at 23%, sorrel root at 22.6%, bearberry at 20. Yes honeysuckle at her true 8% and privet at 7%. Even St. John's-wort flowers have 16%.

Polyphenols seem to exert three major medical influences (1)complexation ("chelation") with metals, like aluminum, calcium, copper, iron, manganese, vanadium etc.(2) complexation with other molecules like proteins and polysaccharides, and (3) antioxidant and radical scavenging activities. (Haslam, 1996) . Reactive oxidant species have been implicated in aging, arthritis, atherosclerosis, autoimmune diseases, cancer, inflammation (technically and strictly theoretically making them useful in any ...-itis), multiple sclerosis, parkinson's disease and senile dementia; tannins and polyphenols, wide ranging in plants, are less consumed by meatarians than vegetarians. Haslam (1996) tabulates some radical scavenger's IC50s.

COMPOUND HYDROXYL SINGLET SUPERPEROXIDE HO O2-	Gallic Acid 78.0 69.8 1.01
Ascorbic Acid 18.8 120.4 23.3	Hamamelitannin 5.46 45.5 1.31
	Propyl Gallate 86.5 66.7 1.41

Haslam, E. 1996. Natural polyphenols (vegetable tannins) as drugs: Possible modes of action. J. Nat. Prod. 59(2):205-215.

**\*TANNIN:** Anthelminthic JNP59:205; Anticariogenic JNP59:205; Antidiarrheic; Antidysenteric; Antihepatotoxic JNP59:205; AntiHIV JNP59:205; Antihypertensive JNP59:205; Antilipolytic JNP59:205; Antimutagenic; Antiophidic EMP5:363; Antioxidant IC50=1.44  $\mu$ g/ml CPB38:1051; Antiradicular 500 mg/kg/day orl mus CPB38:1049; Antirenitic CPB38:1049; Antitumor JNP59:205; Antiulcer JNP59:205; Antiviral JNP59:205; Bactericide JE26:74; Cancer-Preventive HG22:14; Chelator JNP59:205; Cyclooxygenase-Inhibitor JNP59:205; Glucosyl-Transferase-Inhibitor JNP59:205; Hepatoprotective; Immunosuppressant RWG29; Lipoygenase-Inhibitor JNP59:205; MAO-Inhibitor JNP59:205; Ornithine-Decarboxylase-Inhibitor JNP59:205; Psychotropic CPB38:1049; Viricide JE26:74; Xanthine-Oxidase-Inhibitor JNP59:205

**THIAMIN:** My high value for thiamin traces back to the reference coded PED which I no longer trust in all cases. Gentian root was there reported at 48 ppms. The 1.8% (18,000 ppms) reported for wood of *Picrasmia excelsa* (Leung and Foster, 1995) is more than 100 times higher than the incredible figure given for gentian. (Interesting that both the incredibly high thiamin herbs are also incredibly bitter. Following these incredible inedibles, various bean sprouts look credibly good, with blackbean highest at 40 ppm, then asparagus at 26, sunflower seed at 24, shepherd's purse at 21, okra and other mallows at 20, buchu and sowthistle at 19, watercress at 18, peanut, soy sprouts and taro leaves at 17, coriander leaves at 16, bell pepper, chaya and snowpeas at 15, beet greens, chicory, chrystanthemum, endive, fenugreek, peas, and water lotus at 14 ppms, on a calculated dry weight basis.

**THREONINE:** Highs for threonine, at least in my published database, include watercress (to 2.66%), blackbean sprouts (to 1.89%), swamp canbbae (*Ipomoea aquatica*) (to 1.86%), soybeans (to 1.73%), watermelon seed (to 1.53%), white lupine (to 1.49%), spinach (to 1.45%), chives (to 1.39%), jew's mallowchives (to 1.34%), winged bean (to 1.29%) and sesame (to 1.24%) on a ZMB. Zello et al (1995) suggest a requirement of 7 mg/kg/day threonine for adults, based on nitrogen-balance studies, but they maintain that such estimates are too low, by about 1/2.

**THYMOL:** Highs for thymol, at least in my published database, include ajwan (to 3.3%), horsemint (to 2.8%), thyme (to 2.4%), nude mountain mint (to 2.3%), wild bergamot (to 2.1%), winter savory (to 1.4%), mountain dittany (to 1.1%), lemon mint (to 0.83%), basil (to 0.14%), and california bay (to 0.13%), on a calculated zero moisture basis. (Under Altitude Sickness)

**TOCOPHEROL:** Highs for tocopherol, at least in my published database, include purslane (to 0.23%, ZMB), wheat grains (0.19), corn (0.10), swamp cabbage (*Ipomoea*) (0.12), cottonseed oil (0.09), rose seed (0.07), chickweed (0.04) pansy flowers (0.03), asparagus (0.03), sesame (0.02) and poppyseed (0.02% on a calculated dry weight basis). Oil palm oil is said to be the best source of tocotrienol. Liu and Huang (1995) showed that tissue alpha-tocopherol retention in male rats is compromised by feeding diets containing oxidized frying oil. (This could be reversed by tocopherol supplementation.) Liu, J. F. and Huang, C. J. 1995. Tissue alpha-tocopherol retention in male rats is compromised by feeding diets containing oxidized frying oil. J. Nutr. 125(12): 3071-9. On an as-purchased basis, "nuts contain more vitamin E than any other source except vegetable oils". Almonds and hazlenuts are rich in alpha-tocopherol (240 ppms) while pecans and walnuts are rich in gamma-tocopherol (180 ppms) (Sabate et al, 1996). Sabate, J. Bell, H. E. T. and Fraser, G.E. 1996. Nut Consumption and Coronary Heart Disease. pp. 145-151 in Spiller, G. A. Ed. 1996. CRC Handbook of Lipids in Human Nutrition. CRC Press. Boca Raton, FL. 233 pp.

**TRYPTOPHAN:** Mix to taste ground seeds of the following (highest reported tryptophan levels in rounded ppms): evening primrose (9,000 ppm), winged bean (8,000), white mustard (5,000), pumpkin

(4,500), sunflower (4,000), lablab (4,000), sesame (3,500), chickpea (3,500). The best green source is watercress (6,000), bean sprouts and spinach (4,500), asparagus, chives, jute, mustard green, mungbean and vine spinach (Basella) sprouts at 4,000, cauliflower, chicory, cornsalad, pigweed, purslane, and taro leaves at 3,500 ppms on a calculated dry weight basis. Zello et al (1995) suggest a requirement of 3.5 mg/kg/day tryptophan for adults, based on nitrogen-balance studies, but they maintain that such estimates are too low.

**TYROSINE:** My old red neck mustard greens tyrannically top the tyrosine charts at 1.9% on a ZMB, followed by velvetbean seeds at 1.7, carob and winged bean at 1.6, bean sprouts, lupine and soy at 1.5, oats at 1.4, lablab, peanut, spinach and watercress at 1.3, and jute greens, sesame, taro leaves and tepary beans at 1.2, and butternut, chaya, chives, fababean, lambsquarter, pigweed, pumpkinseed, snowpea, swamp cabbage, and watermelon seeds at closer to 1.0% on a dry weight basis.

#### URSOLIC ACID:

<i>ACINOS THYMOIDES</i> 14,000 SH NAP	<i>LAVANDULA LATIFOLIA</i> 10,000-19,000 LF FNF
<i>BURSERIA DELPECHIANA</i> 33,333 RE NAP	<i>LEPECHINIA MEYENI</i> 13,635 SH NAP
<i>CALAMINTHA ASHEI</i> 52,000 LF NAP	<i>NEPETA CATARIA</i> 10,300 SH NAP
<i>CLINOPODIUM VULGARE</i> 14,000 SH NAP	<i>NERIUM OLEANDER</i> 43,000 PL FNF
<i>CLINOPODIUM VULGARE</i> 16,000 LF NAP	<i>PRUNUS AFRICANA</i> 28,900 BK NAP
<i>EUCALYPTUS ALBA</i> 15,000 LF NAP	<i>ROSMARINUS OFFICINALIS</i> 28,000-48,000 FNF (-192,000) LF NAP (Ref K1505)
<i>EUCALYPTUS MICROTHECA</i> 25,000 LF NAP	<i>SALVIA TRILOBA</i> 74,500 PL FNF
<i>EUCALYPTUS TERETICORNIS</i> 12,000 LF NAP	<i>SATUREJA MONTANA</i> 16,000 LF NAP "FNF"
<i>EUCALYPTUS TESSELLARIS</i> 13,000 LF NAP	<i>SHOREA ROBUSTA</i> 350,000 RE NAP
<i>FORSYTHIA SUSPensa</i> 13,000 LF NAP	<i>THYMUS KARAMARIANICUS</i> 25,100 SH NAP T14283
<i>FRAXINUS ORNUS</i> 11,000 LF FNF	<i>THYMUS KOTSCHYANUS</i> 11,700 SH NAP
<i>HELICHRYSUM DIOSMAEFOLIUM</i> 16,000 LF NAP	<i>THYMUS VULGARIS</i> 15,000-18,800 SH FNF
<i>HELICHRYSUM STOECHAS</i> 29,475 SH NAP	<i>VACCINIUM OXYCOCCOS</i> 8,000-11,000 FR NAP
<i>HYPTIS CAPITATA</i> 51,460 SH NAP	<i>VINCA MINOR</i> 1,400-37,000 LF FNF
<i>ILEX AQUIFOLIUM</i> 22,500-33,400 LF NAP	

Strange how FNF and NAPRALERT databases (the latter courtesy of Norman Farnsworth) complement each other. There's a synergy in these databases just like there is in the chemicals. Re ursolic acid, NAPRALERT had 24 entries over 10,000 ppm, two shared with FNF; FNF had 7, making NAPRALERT nearly 3.5 times better than FNF. But there's synergy between the databases, bringing the total to 29 species with more than 1% ursolic acid. Mints were outstanding for ursolic and maslinic acid, from *Coleus* and *Salvia*, as well as drops of EO of cloves. After compiling all this, I'd mix up a pleasing tea, if I had HIV, and indulge the potential synergies of the natural protease inhibitors, ursolic acid from *Acinos*,

Hyptis, Rosmarinus and Thymus; maslinic acid. The only quantitative data I had for maslinic acid was for *Salvia officinalis*. Conversely, Napralert didn't have my high value for the chicoric acid in Echinacea, while FNF didn't have the rather smaller number for chicory.

**VALINE:** Sunflowers smile at the summit of the valine charts, with 5.0%, followed by snowpeas and watercress at 2.7%, beansprouts at 2.3, carob and pumpkinseed at 2.1, jute gren (mulakiya) and soy at 2.0, spinach at 1.9, swamp cabbage, taro and velvetbean at 1.8, lupine, tepary and winged bean at 1.7, butternut, chives, lentil, pigweed and sesame at 1.6, and asparagus, chaya, fababean, and pistachio at 1.5. Zello et al (1995) suggest a requirement of 10 mg/kg/day valine for adults, based on nitrogen-balance studies, but they maintain that such estimates are too low.

**VIT-B6:** Higher entries for B6 (RDA=2 mg/day) in FNF include edible jute (*Corchorus olitorus*) at 50 ppm (ZMB), cauliflower at 30, watercress at 26, spinach at 24, garden cress at 23, banana at 23, okra at 22, onion, broccoli and squash at 18, kale and kohlrabi at 17, brussels sprouts and peas at 16, and radish at 15 ppm's, on a calculated zero moisture basis. Acc to CRH7:p. 63, 1995, on a fresh weight basis, one avocado will provide 43% of the RDA of 2,000 micrograms of vit B6, or 860 micrograms (ug); one baked potato with skin 700, one slice watermelon 700, one banana 660, 1/2 cup sunflower seeds 280, 1/2 cup wheat bran, one sweet potato 280, 6 dried figs 260, one tablespoon rice bran 220, 1/2 cup spinach 220, and 1/2 cup peanuts 10% of the RDA or 200 ug, on an as purchased basis.

**ZINC:** If my database is correct, good sources of zinc include: spinach (to 185 ppms, dry weight basis), parsley (to 165), collards (to 155), brussel sprouts (to 155), cucumbers (to 155), stringbeans (to 150) endive (to 145) cowpea (to 145) prunes (to 130) and asparagus (to 125 ppms, dry weight basis). Maybe that's why popeye and olive and spinach got along so well. "Zinc plays an essential role in the synthesis and secretion of luteinizing hormone (LH) and follicle-stimulating hormone (FSH), gonadal differentiation, action of the Mullerian inhibiting factor, testicular growth and development of seminiferous tubules, spermatogenesis, testicular steroidogenesis, androgen metabolism and interaction with steroid receptors...In zinc deficiency, testicular cells are able to take up cholesterol and neutral lipids which are precursors of sex steroids, but are incapable of converting them into sex steroids, leading to the arrest of spermatogenesis and the impairment of fertilization." Following the prostate and kidney, liver has highest amounts of zinc. Liver, kidney, neuroendocrine structures and male accessory reproductive organs metabolize testosterone into 5 alpha-androstan-17-beta-ol-3alpha-one of DHT (dihydrotestosterone) with the enzyme 5 alpha-reductase. Testosterone is also converted to estradiol by aromatase in the liver, testis, skin, adipose and neural tissues. (Hepatic aromatization of androgens to estrogens is enhanced by castration, alcohol ingestion, and cocaine administration.) (Om and Chung, 1996.). Zinc deficiency lowered the hepatic conversion of testosterone to DHT but increased conversion of testosterone to estradiol. Increased maternal need for zinc must be met thru increased dietary intake or homeostatic mechanisms which could compensate for the secretion of zinc into milk. Such mechanisms may involve (1) increased absorption (2) reduced excretion (urine and faecal endogenous losses) and (3) use of maternal pools of zinc, like bone (ca 30% of total body zinc, or 660 mg zinc associated with bone in a 60 kg woman). All three homeostatic mechanisms have been postulated and demonstrated. (Moser-Veillon, 1995). Matter of fact, the homeostatic mechanisms are so strong as that pharmacological intakes of zinc did not alter milk zinc contents. I'm rather inclined to believe that evolution would favor conservational mechanisms like this for most, if not all, essential vitamins and minerals, if not nutraceuticals yet to be proved essential. {Moser-Veillon, P.B. 1995. Zinc needs and homeostasis during lactation. *Analyst* 120 (Mar. 1995): 895-7.}

**GENERAL REFERENCES:** *CRC Handbook of Proximate Analysis Tables of Higher Plants* (1986) *CRC Handbook (and database) of Phytochemical Constituents of GRAS Herbs and Other Economic Plants*, 654 pp., 1992; *CRC Handbook (and Database) of Biological Activities of Phytochemicals* (1992), *CRC Handbook of Medicinal Mints (Aromathematics)* (1996).

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Om, A.S. and Chung, K.W. 1996. Dietary zinc deficiency alters 5-alpha-reduction and aromatization of testosterone and androgen and estrogen receptors in rat liver. J. Nutr. 126(4):842-8.

Zello, G.A., Wykes, L.J., Ball, R.O. and Pencharz, P.B. 1995. Recent advances in methods of assessing dietary amino acid requirements for adult humans. J. Nutr. 125(12): 2907-2915.

## Module 3: POLYHERBAL FORMULATIONS

### A. Interactions (Intraspecific and Interspecific)

1. Antagonism
2. Additivity
3. Synergy

### B. Sample Formulae:

1. Mixes of related phytochemicals from the same plant species.
2. Mixes of foods rich in specified phytochemicals.
3. Mixes of related species with related phytochemicals.
4. Mixes of unrelated species with related or unrelated phytochemicals.

Handouts will include dozens of the authors published and unpublished recipes or formulae, to be rationalized in class.

REFERENCES: *CRC Handbook (and database) of Phytochemical Constituents of GRAS Herbs and Other Economic Plants* (1992) *CRC Handbook (and Database) of Biological Activities of Phytochemicals* (1992), *CRC Handbook of Medicinal Mints (Aromathematics)* (1996). Rodale's *Green Pharmacy* (1997)

### 4-F Formulae (for Fun)

#### From Father Nature's Pharmacy

It's easy on a long weekend to come up with 100 4-f formulae (**Four-For-Fun-Formulae**). Chinese tend to gravitate toward 7, 9 or some such number. But that's more than I like. The 4-F formulae will include four logical ingredients, not necessarily tasty nor proven as a combo, but safe and proven to contain ingredients effective for the malady in question. I've striven to use ingredients you will be able to find, but stress that since there is no proof, that the dropping of one ingredient, or the addition of a favorite won't necessarily hurt.

The logo is, perhaps all too obviously, patterned after the good-luck four-leaf clover, which by the way will show up in several of the formulae, including one that will probably be better at preventing breast and prostate cancer and tastier than soybeans.

#### ABDOMINAL PAIN (ENTERALGIA)(STOMACHACHE)

1. HERB GARDEN tea: 4 CAMOMILE: 4 LEMONGRASS: 4 PEPPERMINT:2 YARROW
2. HERB GARDEN tea: 2 ANISE: 4 HYSSOP: 2 TARRAGON: 2 THYME
3. SPICE RACK tea: 2 ANISEED:2 CORIANDER SEED:2 CLOVE:4 CINNAMON
4. SPICE RACK tea: 1 GINGER: 1 CLOVE :4 PEPPERMINT :4 CINNAMON

## ACNE

1.ACNADE: Make a tea boiling vigorously one part fresh or dried nettle and one part fresh or dried sage to 2-4 parts water respectively.(Careful with that fresh nettle. It'll cause a temporary acne). Then add 2-5 drops teatree oil and 5-10 drops rosemary oil. Wash face with lotion, and leave dry without toweling. (RD)

ACNE LOTION: Steep 4 parts calendula, 4 parts camomile, 2 parts rosemary, amd 2 parts rosemary, in enough vodka to cover twice; strain, and apply topically as a facial lotion (Drink the same facial lotion it if it fails to help your acne, adding lemon lemonbalm to improve the flavor) (RD)

ALOEHA ACNE: Take half cup of fresh aloe juice and mix in 2 tsp calendula tincture (flowers), breaking a capsule of vitamin E into the mix, applying tpoically to affected areas, or generally as an overnight facial cream. (RD)

SAY AHA! TO ACNE: Squeeze the juice of one papaya and one pineapple (both contain AHA, alpha-hydroxy-acid) of about the same size, with a couple of figs, with some thick-skinned grapes. Drink the juice al gusto. Take the pulp and apply to the face as a mud-bath, no more than a half hour on the first pass.. (RD)

## ANXIETY

AROMATIC miss STRESS: Dab a few drops each of oils of basil, camomile, lavender, lemonbalm, on a handkerchief, sniffing lightly when you feel your fur rising.

CHAMELOT: Steep a lot ( a small handful) of chamomile flowers in a two cups of boiling water, with a few leaves each of lavender, lemonbalm, and a couple cones of hops. Keep warm in a thermous. Sip when you feel the stress mounting.

LACKLUSTRE-LICKING-POT-LIKKER: Gently simmer 2 handsfull water cress, and 1 handful spinach, with a dozen or so diced chive leaves, and 2-4 diced asparagus spears and drink the potliker when stress mounts, enjoying the solids for lunch.

SEEDS OF TRYPTOFANTASY: Nibble on a homemade mix of seeds of evening primrose, pumpkin, sesame and sunflower, all good sources of tryptophan. Dietary

## ARTHRITIS

1. AROMARTHRADE: Aromatherapeutic approaches to arthritis include camphor, cinnamon, clove, eucalyptus, lemon, marjoram, oregano, mint (menthol), and thyme, some of which are incorporated effectively in commercial Tiger Balm. A drop or two of several of these in the bath, in the vaporizer, or in a cheap vodka may improve your outlook, if not your arthritis.(RD)

2. ARTHRALGETUM: A homemade arthraid pomade, made crudely by grinding or juicing up equal parts ginger, hotpepper, peppermint, turmeric (RD)

3. BILBERRY BUST: Spice up one cup blended bilberries (substituting blueberries OK) with ca 10 g each ground ginger, oregano and turmeric. Believe it or not, I'd both ingest it, cut with lemonade, or apply it topically (RD)

4. FENUGREEK GODDESS: Well endowed with the same steroid precursors as wild yam, fenugreek is cheaper, and can be ground into a paste in your blender, one cup fenugreek, with a hot pepper, oregano and peppermint. The resultant pomade will contain the presteroid disogenin, capsaicin, menthol, and two sources of salicylates, all common ingredients in OTC topicals for arthritis. (RD)

## ASTHMA

Aromasthmatea: Aniseed; Coriander (seed); Fennel (seed) Parsley (Seed). 1 tsp each steep in a uqartd of simmering water; sweeten with licorice root.

Asthma-Heat: Mix as hot as you can stand it, in a tea, or ground up as a relish to eat on bread, ginger; horse-radish; hot pepper; turmeric

Cosmic Caffeinator (my formula, on sale by Jeanne Rose) Mix to taste, chocolate powder,, ground, coffee, ground cola nuts, guarana, guatusa, and mate; all contain at least one of the three antiasthmatic alkaloids, caffeine, theobromine and theophylline. Sweeten with by steeping a licorice root in the "coffee", if you can stand it. Arab might like to add cardamom,

Potherb: Cook up \* lb fresh nettle leaves, bringing only to a simmer; add five cloves garlic and one whole onion, peel and all; serve like spinach, with vinegar in which hot pepper have marinated.

Spice Rack: Equal mix of Ginger, Turmeric, flavored with a handful of peppermint, and 2-4 small licorice roots.

## ATHLETE'S FOOT

Here's where I go with the monoherbal approach, topically, while loading up on garlic internally.

1. Garlic Foot Bath: Dice 10 garlic clove into a wash basin of warm water with a little lemon juice. Steep feet for ca 15 minutes. Dry feet carefully. Go to the beach barefooted. Soak your feet in the ocean several; time, then dry them in the sun.(If you go with the **Four-For-Fun-Formulae**; add a dash of ginger and licorice, each of which have a wide array of fungicidal compounds; (garlic contains at least 5 antidermatitic compounds in my database (URL=<http://www.ars-grin.gov/duke/>), as well as 13 bactericidal and and 8 fungicidal compounds. Venugopal and Venugopal (1995) tested aqueous garlic extracts (100 g garlic in 50 ml distilled water) against 88 isolates from clinical cases of tinea capitis, corporis and cruris).

2. Add 10-20 drops teatree oil to a warm basin of water; steep feet therein. Dry feet carefully. Go to the beach barefooted. Soak your feet in the ocean several; time, then dry them in the sun.

3. Aero-mata-mal-de-pies: Mix equal parts of oil of garlic, lavender, thyme and teatree; apply sparingly, moistening afflicted areas with a cotton applicator.

4. Backyard Bonanza: Steep overnight 10-20 whole walnuts (hulls intact), four handfulls crushed jewelweed (heavy with the red prop roots), 2 handfulls mulberry leaves, and one handful crushed wild garlic in a bucket; remove the goodies and soak your feet 15-30 minutes; if the grey hairs on your legs turn auburn or black, give me royalties on this "Greasian" Formula.

## BACK PAIN

If the back pain is due to muscular spasms, I think you should bathe in one grandiose herbal tea, massage with it, and drink it (dilute) too. There are many transdermal spasmolytic compounds; compounds viewed as spasmolytic: alpha-bisabolol, borneol at 8 ppm's; bornyl-acetate at 90 ppms, camphor at 75 ppms; carvacrol; caryophyllene; limonene at 197 ppm's; linalyl-acetate at 210 ppms, menthol at 10 ppm's, menthone at 44 ppm's, myrcene and thymol). Cineole, itself aromatic and transdermally absorbed, can speed up transdermal absorption of other compounds, sometimes 100 fold. Growing my own herbs as I do, I could afford to sacrifice the culls to the herbal bath. Four rational formulas for beverages follow. Put the teabags, and any excess herbage in your bath. And have that special someone massage your aching back with the essential oils, a few drops in almond oil.



ANALGESITEA: Two tsp fennel, four tsp oregano, two tsp tarragon, one tsp thyme in a quart of simmering water. Use lemongrass instead of lemon for flavoring

ANES-THEA: Thea used to be the scientific name of tea, *Camellia sinensis*. Drink tea, heavy with three l's, lemongrass, licorice, and lovage, all well endowed with anesthetic compounds. Add left overs to your bath.

BORNEALGESIA (Rich in borneol) Cardamom, expensive as it is, tops the list for borneol, followed by sage, rosemary, and mountain mint (weed at my place) Use lemongrass instead of lemon for flavoring.

LEMONGRASS LINIMENT: Add a concentrated lemongrass, oregano, rosemary and thyme tea, one part herb to two parts water, simmered slowly. Let stand overnight. Bring to a boil again. Strain and add the tea to olive oil as a carrier for a massage oil. Throw the spent leaves in your bath.

### **BAD BREATH**

BIBLICAL BOUNTY: Biblical plants folklorically used for halitosis include cinnamon, coriander, dill, and ginger. Make a tea of one tsp cinnamon, 1 tsp crushed coriander seed, 1 tsp dill (herb or seed), and 2 tsp ginger, in a quart of water. Chew parsley before and after drinking the tea, and swishing it between your teeth.

FARSI FOUR: Persians often indulge clusters of fresh herbs, coriander, parsley, spearmint, and tarragon, all with chlorophyll's breath freshening magic.

FOUR C's: Cardamom (four seeds); 2 quills cinnamon, cloves (8), and ten coriander (1 tsp). Chew individually or mixed, or make a strong tea for a mouth wash/gargle, swirling it thru the teth.

SCAMBORO FARE: Parsley, sage, rosemary and thyme, as concentrated tea, a/o mouthwash; I tend to chew the whole herbs on the sly when faced with an unexpected unexpectedly close encounter. The rough leaves of sage are good for massaging the gums.

### **BED SORES**

FFFF: Four C's: Calendula, Camomile, Centella, Comfrey

FFFF Four G's: Garlic (cloves), Ginger (buds), Ginkgo (leaves), Gotu Kola (leaves, or capsules)

M-4: Make a salve of six parts pulverized comfrey leaves with one part each pulverized calendula flowers, horsechestnut leaves, and plantain leaves.

V-4: Thoroughly juice the following veggies and apply topically after washing and massage around the sore; as a poultice, to leave on 15-30 minutes:

One Part Alfalfa Sprouts: Four parts comfrey leaf (two if you're inclined to eat the slurry or drink the juice, too): Two Parts Kohlrabi: One Part Plantain (covered with water in the blender.

### **BED WETTING**

Corny Anti-Pee Tea: Cornsilk (1 part), fennel (1 part seed), hypericum (2 parts); melissa (2 parts)

Dehydroalo: Take 1 dash of aloe gel, with two spoons honey, with one drop each of oil of bergamot and oil of thyme.

ENURETEA: Herbs rich in antidiuretic carvacrol: bergamot (*Monarda fistulosa*), dittany (*Cunila*), savory (*Satureja*) and thyme. Sweeten with licorice, which also contains an antidiuretic.

HomeOhome Remedy: Barberry, dandelion, fennel and horsetail, in a very dilute tea. Drink the tea at least two hours before bedtime. (Barberry and horsetail, though frequently used by herbalists are not bona-fide food pharmacy, and might be too strong for children.)

(X LETHAL X): Flying Ointment: The old witches balms contained herbs like belladonna, henbane, jimsonweed, and mandrake, all of which contain the antisialogogue alkaloids, atropine and scopolamine. (Peruvian baby sitters just put leaves of plants like this under the pillow of a child to make them sleep through the night. We warn you not to try this one, including it only for historical interest.

### **BELCHING**

RECIPES: Here are a four untested 4-F antifatulent formulae proposed for belching research to a major publisher here in the US. Until they have been proven safe and efficacious, no one should use them.

CARMINATEA # 4: Aniseed, camomile, cinnamon, clove; ca 1 tsp @ per cup simmering water. Add extra cloves for extra potency.

EPazoTEA: Although potentially dangerous in very large doses, the Mexican wormseed known as epazote is a classical carminative. I personally do not fear it in small doses, and have eaten many bean dishes garnished with epazote. Sweet annie has been listed in some GRAS tabulations, including my own. Hence I fear not my 4-F epazotea; a teaspoon (dry) or three tsp (fresh) each of epazote, peppermint, savory and sweet annie. Spicing it up by adding a few cloves could improve efficacy. Add turmeric for its curcumin which inhibits gas formation by E. Coli. Curcumin, bound to iron in the medium, causes inhibition of the formation of formic dehydrogenase which in turn inhibits gas formation.

MINT TEASE # 4: Oregano, peppermint, sage and savory; ca 1 tsp @ per cup simmering water; adding a dash or two of cloves and turmeric could improve efficacy.

SAGaciTEA: Sage; savory; spearmint; and rosemary; ca 1 tsp @ per cup simmering water; adding a dash or two of cloves and turmeric could improve efficacy.

### **BITES**

RECIPES: Here are a four untested 4-F formulae proposed for research to a major publisher here in the US. Until they have been proven safe and efficacious, no one should use them.

### **BLADDER PROBLEMS**

RECIPES: Here are a four untested herpes 4-F formulae proposed for research to a major publisher here in the US. Until they have been proven safe and efficacious, no one should be sure that they are safe a/o efficacious. I suspect they are about as safe and efficacious as some of the hard core pharmaceuticals our physicians might prescribe.

### **HERPES**

RECIPES: Here are a four untested herpes 4-F formulae proposed for research to a major publisher here in the US. Until they have been proven safe and efficacious, no one should be sure that they are safe a/o efficacious. I suspect they are about as safe and efficacious as some of the hard core pharmaceuticals our physicians might prescribe.

1. 3 parts calendula flowers (H), 3 parts echinacea root (H), 1 part garlic (F) steeped 15 minutes in 10 parts hot water (with or without some alcohol) (with unhappy face; not fun to drink). Strain (I squeeze out the goodies as I strain) 1-4 cups a day spiced up for taste.

2. 2 parts cloves (S), 2 parts hyssop (H); 8 parts lemon balm (H), 1 part licorice (S), 1 pa

3. 4 part honeysuckle flowers (M); 4 part forsythia fruits (M), 1 part licorice root (S), 1 part lemon juice (F), in 20 parts water (With straight face, not yucky, not great)

4. 5 parts hypericum (flowering shoots) (M), 1 part licorice root (S), tinctured in 50 per cent alcohol. Take up to 30 drops in cup of warm water, 1-4 times a day. (With yucky face)

5. 1 part kava-kava, 1 part licorice; ten parts water; take one-cup warm at bedtime (yucky)

### FOOD FARMACY FORMULAE

James A. Duke

**WARNING:** These are for my personal use only, and not to be recommended or prescribed to anyone else. All herbs, fruits and vegetables contain natural pesticides. (And allergens and anti-allergens, carcinogens and anticarcinogens, inflammatory and anti-inflammatory, mutagens and anti-mutagens, and pro-oxidants and antioxidants, etc.) .

### FIRST DRAFT

Jim Duke **FOR DISCUSSION ONLY**

**ADRENERGITEA:** Equal parts, as available, of echinacea, eleuthero, ginseng, huanchi, (astragalus); sweeten with the controversial licorice, a proven adrenal stimulant.

**AIDS-ADE:** To the usual antioxidant (which see) mint tea, add such proven antiviral mints as all-heal, hyssop, and skullcap. Gollapudi et al (1995) isolated from hyssop tea (aqueous extract) a polysaccharide MAR-10 which dose-dependently inhibited HIV-I. They concluded that the hyssop compound might be useful in treating HIV-I patients. **Add echinacea and chicory for the anti-integrase compound cichoric acid.**

**ALL-SAINT'S TEA:** Mix all-heal, *Prunella vulgaris* (in clinical trials for AIDS), with shoots of various species of flowering Hypericum, especially St. John's-wort, *Hypericum perforatum*, and St. Peter's-wort, *Hypericum hypericoides*, with proven antiretroviral activity. The patient him or herself should collect the plants on St. John's Day, June 24, and extract them in an hydroalcoholic tincture. Additionally the patient should extract the flowers of Hypericum by steeping in evening primrose oil until the oil turns blood-colored. (NOTE: *Prunella* is a well recognized antioxidant food plant, used in teas and as a potherb, or added to salads, soups and stews., Of the Hypericums, only *Hypericum perforatum* is GRAF; Facciola says of it: The herb and fruit are sometimes used as a tea. Flowers can be used for making mead."

**ALTITUDE ADJUSTMENT CASUALTEA:** Steep cloves (*Syzigium aromaticum*, alias *Eugenia caryophyllata*) in your coca tea (if legal and available), adding allspice, bayleaf, cinnamon and marjoram as available to taste. Mix in, as available, those mints that smell rich in thymol: balm, basil (also rich in eugenol), dittany, savory, and thyme. To accommodate your Japanese mountain climbing friends, add peppermint because they believe in peppermint oil for soroche. (Believing is the bigger half of medicine) I believe more in the thymol and eugenol after surveying the literature. Therefore, the peppermint would be superfluous with me.

**ALZHEIMARETTO:** This is a drink I make only for myself and cannot recommend to anyone else, except perhaps as a bath ingredient. The drink is made by steeping those herbs richest in compounds that prevent the breakdown of choline or acetylcholine, at least in test tubes. Mint compounds which are known to prevent the breakdown of acetyl choline and/or choline include carvacrol, carvone, cineole, fenchone, limonene, limonene oxide, pulegone and pulegone-oxide, and thymol. Rosemary contains at

least five of these, the italicized five. Many if not all of these compounds are dermally absorbed and some can cross the blood brain barrier. Thus rosemary shampoo could have acetylcholine saving activity comparable to tacrine. As mentioned in Organic Gardening (Jul/Aug 1995), horsebalm is my best mint for carvacrol and thymol, spearmint is my best mint source of cineole, mountain mint my best mint source of limonene and pulegone. Add oregano, rosemary and self-heal for their marvelous antioxidant properties, and/or high contents of rosmarinic acid, which has different activities showing promise in Alzheimeran research. Caraway, dill and fennel top it off.

**AMAZONIAN ACEER HEARTWISE SALAD:** Wash and dice your purslane (*Portulaca oleracea*), best source of several antioxidants, e.g. ascorbic acid, beta-carotene, tocopherol and glutathione, and well endowed with omega-three fatty acids. For your dressing, mix equal parts palm oil (*Elaeis guineensis*) best source of tocotrienol and great source of carotene; mix with mil pesos oil (*Jessenia batatau*; better than olive oil for MUFAs); and camu-camu juice, (*Myrciaris dubia*) best known source of vitamin C. Add diced brazilnuts (*Bertholletia excelsa*) and cashew nuts (*Anacardium occidentale*), best and good source of selenium respectively. (Don't use more than 10 brazilnuts a day.)

**AMAZONIAN SALVE:** Naturopathic Doctor, Steve and I cooked up something that might be a great antiviral, maybe even better than Shaman's Virend for herpes, over an open wood fire in an Amazonian kitchen with no electricity, Nov. 3, 1995. We amalgamated components of a reportedly antiviral pair from the rainforest, cat's claw (*Uncaria tomentosa*) and fer-de-lance (*Dracontium loretanum*), with the dragon's blood (*Croton lechleri*), five parts equally mixed, into a mix of 1 part beeswax and 4 parts olive oil. We called it the Amazonian Salve. I'll carry it around on my next lecture swing, thinking of it as the poor man's Virend. But if AIDS were my target, I might use evening primrose oil instead of olive oil, and I'd add a lot of turmeric, thereby incorporating, with the proven antiviral dragons' blood, most of the supposed anti-AIDS plants in some Peruvian and Ugandan clinical trials. It might not help. But neither are the more expensive immune-smashing hardcore pharmaceuticals that are further debilitating our AIDS patients.

**AMENI-TEA: Amen!** My database (URL=<http://www.ars-grin.gov/duke/>) lists scores of emmenagogue herbs, among which I think the following are the most likely to be effective yet pleasantly scented. I would not hesitate to suggest Ameno-Tea to my daughter, if she wanted to bring on her period. Add dashes of whichever you have on hand to boiling water. Steep 15 minutes: agrimony, angelica, calaminths, caraway, carrotseed, catnip, coriander, culantro, cumin, dill, dongquai, epazote, fennel, feverfew, ginger, horehound, hyssop, juniper, lavender, lemonbalm, lovage, marigold, marjoram, motherwort, nutsedge, oregano, parsely, pennyroyal, roselle, rosemary, rue, saffron, tansy, tarragon, thyme, turmeric, wild chervil, wintergreen, yarrow, ylang-ylang. I note also that fruits and roots with proteolytic enzymes, like figs, ginger, papaya, pineapple, are also folkloric emmenagogues. I'm a strong believer that millenia of empirical experimentation and/or observation by our ancestral women have selected the more effective of these, so much so that their use in pregnancy is often counterindicated, feverfew, pennyroyal, parsley, rue and tansy. I've known herbalists who intentionally brought on their periods early with these in anticipation of the timing of trips or special visits from lovers.

**AMYGDELIGHT** (Laetrile Sauce). Scoop off the thick top that rises in your blender after you let your laetrilology settle. Crush a few almonds and closely related apricot pits (which may contain 8% amygdalin, and maybe a few other members of the rose family, like blackberries, cherries, peach, plums, raspberries and strawberries, which have, in general, more water and less laetrile in the delicious fruits than in the semi-edible seeds. Caution: Too much amygdalin, benzaldehyde, cyanide a/or water can kill a human.

**ANALGESITEA:** I'd combine my more flavorful herbs from ANALGETEA and ANESTHEA with better local sources of salicylates, capsicum, queen-of-the-meadow, loosestrife, willow, and mostly wintergreen (for

both flavor and methyl salicylate). Add as available a dash of dill, fennel, ginger, oregano, pennyroyal, spearmint, thyme.

**ANALGETEA:** When seeing why "lemon coke" might lead one to feel no pain, I did an FNF run for plants with the greatest number a/o quantity of analgesic compounds. That run would suggest to me the following components. fennel and tarragon with 10 analgesic compounds each, capsicum with 9, carrot with 8, currant and rosemary with, dill, ginger, grapefruit, hops, oregano, poppy (illegal!) and thyme with 7 each. Camphor leaf, though it had only 4 analgesic compounds was highest of these quantitatively with 22% analgesic compounds, on a zero-moisture basis. Bayrum, celeryseed, coffee, clove, and licorice ranged from 4.4% to 18% analgesic compounds, on a dry weight basis.

**ANESTHEA:** When seeing why "lemon coke" might lead one to feel no pain, I did an FNF run for plants with the greatest number a/o quantity of anesthetic compounds. Licorice contained 9 anesthetic, tea and black pepper 8, lovage and kava-kava 7, rosemary, shrubby basil and spearmint 6, cinnamon, fennel, mace, oregano, peppermint, pennyroyal, winter savory, and ylang-ylang.

**ANGELADE (for the heart):** Celery is close kin to the herb angelica (Harmala et al. 1992) which contains 15 calcium-antagonistic compounds. Celery has three of these: bergapten 1-520 ppm's; isopimpinellin 4-122 ppm's; and xanthotoxin 6-183 ppm's. Parsnip and parsley are even better endowed with the coumarin calcium-blockers. I'm not about to suggest ingestion of coumarins in foods as calcium-antagonists, just here to ask of our federal health watchers: would

ANGELADE (consisting of juiced angelica, carrot, celery, fennel, parsley, parsnip juice) be as safe and efficacious and cheap as verapamil as a calcium blocker? Might that thereby partially explain the lower incidence of cardiopathy in vegetarians? So celery contains hypotensive, hypocholesterolemic, and calcium-blocker phytochemicals. How about antiarrhythmic compounds? There's apigenin, apiin, magnesium, and potassium. Is heart of celery better for the heart than what your physician suggests? Would **ANGELADE**, with a wider variety of 6 vegetables be better? Methinks yes! But I'll probably never know. I'd bet however it would do more good than verapamil.

**ANTIAGGREGANT SALAD:** When I asked FNF for the plants with the greatest variety of antiaggregant compounds, the printout read like a tofu salad: garlic with 9 different antiaggfregants, tomato, dill and fennel with 7, onion, hot pepper and soybean with 6; and celery, carrot and parsley, each with 5 different antiaggregant compounds. I left out a few front runners that might have detracted from the salad. Consult the FNF database if you really want to know. The more you add, the less the likelihood of altitude sickness and stroke.

**ANTIINLAMMATEA:** A very good antitoinflammatory tea can be fashioned from backyard herbs, as available, like birchbark, caraway, CELERY, chamomile, feverfew, oregano, peppermint, rosemary, wintergreen, thyme, and yarrow , spiced up with analgesic antiinflammatory eugenol from clove; curcumin, galangin, and zingibain from ginger and turmeric; and thymoquinone from black cumin; sweetened with licorice (for those like me not bothered with hypertension or hypokalemia) and pineapple (for its bromelain)

**ANTIOCH'S TEA:** Mix as available those high antioxidant mints, as tabulated in Organic Gardening (Jul/Aug, p. 45. 1995). Of 15 mints, their relative antioxidant potency follow, from highest to lower (many more are tabulated elsewhere): oregano 2.9; self-heal 2.4; spearmint 1.7; rosemary 1.5; bugle 1.5; lemonbalm 1.5; clary 1.4; marjoram 1.3; applemint 1.3; peppermint 1.2; sage, 1.2; cornmint 1.1, watermint 1.1, savory 1.0, and thyme 1.0. This means the oregano has nearly three times the antioxidant acivity as the savory and thyme. But I like to mix as many as I have on hand, stressing the high antioxidant ones. I think this approach complements the ACESe (beta-carotene, ascorbic acid,

tocopherol, selenium) nutrient approach, but prefer the whole food sources to the supplement, i.e. purslane, camu-camu, purslane, brazilnut, better than Vitamin A, Vitamin C, Vitamin E, and selenium, respectively.

**ANTIULCER CELERY SOUP:** 1 cup celery, 2 cups cabbage, 1 cup diced potato, 1/2 cup okra, 1/2 cup onion, 1/2 cup green pepper, spiced with cayenne, garlic, ginger, black pepper.

**ANTIULCER FRUIT COCKTAIL:** Apple (pectin), Banana, Blueberries (anthocyanosides), Cinnamon (cinnamaldehyde), Cloves (eugenol), Ginger (shogaol), Pineapple (bromelain). A flavonoid-rich diet might help in allergic ulcer patients. In one study, 1,000 mg catechin, 5 times a day, reduced histamine levels in both normal and patients with gastric and duodenal ulcers and gastritis (Pizzorno and Murray, 1985). Others swear by bananas (*Musa*) and plantains (both *Musa* and *Plantago*). For example, Dunjic et al (1993) argue that bananas and plantains "strengthen mucosal resistance and promote healing of ulcers because of water soluble polysaccharides in unripe bananas and surface active phospholipids in ripe sweet bananas." They gave some hard drinking rats absolute alcohol, chased 45 minutes later by banana suspension or lecithin a/o pectin. Reichert (1995) in review, queries why not just employ lecithin or choline since they showed greater statistical significance, and hence greater anti-ulcer effectiveness, than banana pulp alone. Suggesting synergistic interactions between such phytochemicals as phosphatidylcholine, phosphatidylinositol, and phosphatidylethanolamine Reichert says: "Bananas may in fact be another useful addition to such well established anti-ulcer foods as raw cabbage, green tea, garlic and legumes." (Reichert, 1995)

**ANTIYEAST SOUP** 4 cloves garlic; 2 onions; sage, thyme, clove, salt and pepper to taste; top with acidophilus yogurt.

**ANTIYEAST YOGURT:** Steep some of the tea herbs in acidophilous yogurt, but only briefly. The candidicidal compounds can probably, at least in some cases, damage the acidophilous as well. The caprylic acid in coconut might make a useful addition. If the yeast is in the mouth (thrush) you might consider topical application..

**ANTIYEAST TEA:** mix to taste those easily available to you: allspice, basil, bergamot, camomile, caraway, cinnamon, clove, eucalyptus, ginger, lavender, lemonbalm, lemongrass, licorice, mace, orange rosemary, sage, spicebush (GRAF, not GRAS), tea-tree (not exactly GRAS, consult the FDA, if you like the Washington Merry-Go-Round), thyme. Sweeten with licorice or stevia instead of sugar. ( Sweetflag, a relatively dangerous herb, has impressive levels of antiseptic eugenol, isoeugenol and methylisoeugenol).

**ARTHRITIC BROTH:** For an herbal broth (consomme or bouillon), I'd try burdock, cayenne, celeryseed, dandelion, epazote, garlic-mustard, horseradish, juniper, lambsquarter, lemongrass, oregano, parsley, sarsaparilla, thyme, turmeric, valerian, watercress and willowbark. I salt and pepper my broths, but herbal seasonings are probably better for you. Black pepper and white mustard belong in this one, with ginger and turmeric.

#### **ARTHRITIC SOUP:**

MAJOR INGREDIENTS MINOR INGREDIENTS SPICES

(Cups) (Cups) (Dashes)

Cabbage (2) Garlic (1/8) Capsicum (2)

String Beans (1) Chicory (1/4) Black Pepper (2)

Nettle Leaves (1) Turmeric (1/8) White Mustard (2)

Celery (1) Eggplant (1/4) Flax Seed (2)

Dandelion Leaves (1/2) Licorice (1/8) Lemon Juice (2)

Dandelion Roots (1/2) Evening Primrose Sarsaparilla (1)

Carrots (1/2) Seed (Whole) (1/8) Fenugreek (2)

Asparagus (1/2) Spinach (1/4)

You don't need all of these, nor in these proportions. But all ingredients have a folk reputation for arthritis. In my experience, 25% (Amerindian) to 50% (Chinese) batting averages have been attributed to the folklore, i.e., 1/4 to 1/2 of them, if carefully examined will prove to have a compound scientifically demonstrated to have an appropriate biological activity. And if you believe in the soup more than the fizzle, the soup will do more good.

**ARTHRITIC-TEA:** For an herb tea (I sweeten my teas with Stevia and add lemon or lemonbalm), I'd include camomile, cassia, cinnamon, ginger, ginseng (only if cheap), groundivy, hyssop, lavender, lemongrass, licorice, oregano, sarsaparilla, sassafras (without safrole if the FDA is around; they outlawed the old sassafras root beer even though it is less carcinogenic than today's ethanolic beer), thyme, turmeric, and wintergreen. The brave might experiment by adding hot sauce, so that the capsaicin might generate endorphin release. Several OTC products containing capsaicin are used to control the pain of arthritis and rheumatism (ABC, 1994). Bromelain from pineapple might be added; Murray suggests 400-500 mg bromelain, three times a day, on an empty stomach, to increase the absorption of curcumin, the active ingredient in turmeric. Turmeric is close kin to ginger which also shows promise.

**ARTHITI-TEA (DISFLAMMITEA):** Duwiejua and Zeitlin (1993) prepared a nice summary on plants as sources of antiinflammatory compounds. They generalize that flavonoids, as a class, are potent inhibitors of arachidonic-acid metabolism. Many inhibit cyclooxygenase, which itself leads to conversion of arachidonic acid to prostacyclin (PGI<sub>2</sub>), thromboxane A<sub>2</sub>, and the largely proinflammatory stable prostaglandins, PGE<sub>2</sub>, PGF<sub>2</sub>, and PGD<sub>2</sub>. Galangin from turmeric and other members of the ginger family inhibits cyclooxygenase with IC<sub>50</sub>=5.5 uM. Activity of 5-lipoxygenase (5-LO) leads to proleukotrienes. Aesculetin, baicalein and quercetin inhibit 5-LO at IC<sub>50</sub> 0.1-5 uM. Among the terpenoids, triterpenes and sesquiterpenes are most promising. They enumerate several triterpenes with significant antiinflammatory., one from licorice equalling in intensity alpha,beta-boswellic-acid (from *Boswellia serrata*) which completely inhibits the complement pathway 100% at only 0.1 uM. Moreover the glycyrrhetic acid even mimic corticosteroid activity. Several other compounds, less potent, inhibit carrageenan activity at 40 mg, ipr, but I don't think that's of consequence to the herbal community, unless the activity can be demonstrated for oral preparations. At 40 mg/kg ipr, the inhibitions are nimbin (24.8%), beta-amyrin (26.9%), oleanolic-acid (36.5%), filicine (40.3%), and alpha-amyrin (43.1%) (Duwiejua and Zeitlin, 1993). Antiedemic activity (against carrageenan-induced paw-edema in rodents), but ipr, has also been reported for many sesquiterpenes; aromaticin (IC<sub>35</sub>=2.5 mg/kg ipr); deoxyelephantopin (IC<sub>57</sub>=2.5 mg/kg ipr); eupaformosin (IC<sub>31</sub>=2.5 mg/kg ipr); eupahyssopin (IC<sub>57</sub>=2.5 mg/kg ipr); eupatolide (IC<sub>30</sub>=2.5 mg/kg ipr); helenalin (IC<sub>70</sub>=2.5 mg/kg ipr); molephantin (IC<sub>33</sub>=2.5 mg/kg ipr); tenulin (IC<sub>16</sub>=2.5 mg/kg ipr). While I'm not overexcited about any of these, the reference drug, indomethacin, is not much more exciting (IC<sub>88</sub>=10 mg/kg ipr). Against adjuvant-induced arthritis, the sesquiterpenes were even better, administered daily for three weeks, on average) helenalin (IC<sub>77</sub>=2.5 mg/kg ipr); tenulin (IC<sub>53</sub>=2.5 mg/kg ipr); eupahyssopin (IC<sub>66</sub>=2.5 mg/kg ipr); eupatolide (IC<sub>30</sub>=2.5 mg/kg ipr); molephantin (IC<sub>60</sub>=2.5 mg/kg ipr); most were better than the reference drug, indomethacin, (IC<sub>45</sub>=10 mg/kg ipr). Other important antiinflammatory compounds in the daisy family include parthenolide from

feverfew, bisabolol from chamomile, and atractylenolide frp, *Atractylis japonica*. Salicylates are the best known of the phenol carboxylic acids, occurring in such antiarthritic plants as birches, poplars, primroses, willows, violets and wintergreen. Simple phenols like carvacrol, eugenol and thymol also have IC50 values comparable to indomethacin (IC50=1.2 uM) in the cyclooxygenase system. **Reading this paragraph conjures up in my mind a very good antinflammatory tea from my backyard herbs, like birchbark, caraway, chamomile, feverfew, wintergreen, thyme, and yarrow , spiced up with analgesic antiinflammatory *eugenol from clove, curcumin from ginger and galangin from turmeric*.** Curcumin, a relatively non-toxic nutraceutical, is as antiinflammatory as cortisone or phenylbutazone in acute models, but only half as effective in chronic models. I think we should at least try the tea and exercise before resorting to cortisols.



## Module 4: AROMATHEMATICS

### INTRODUCTION

Since the publication of Duke's first phytochemical works (Duke 1992a, 1992b), we have almost doubled the phytochemicals, biological activities and species in our database. With this new contribution, we include much new data in the aromatic mint family, Lamiaceae. Data on the mint family are presented here in much the same format and with many of the same caveats and interpretations as before.

#### Aggregated vs. Non-Aggregated Entries

This volume differs from earlier volumes in that we maintain the integrity of many entries, publishing the phytochemical quantitative data for a given analysis, rather than strictly aggregating the data. Over the years it has become clear to us that the aggregated data, which report the highs and lows for a given phytochemical in parts per million (ppm), are most useful for showing the range of variation of these individual phytochemicals, which can be quite striking. For some species of thyme, this variation can be as much as 13,900-fold.

One common mistaken interpretation of the aggregated data is that a species might appear to be high in two closely related compounds, for example thymol and carvacrol. However, the non-aggregated analyses show that, rather than positive correlations between levels of closely related compounds, there is often compensation - when one compound is raised in quantity, another is lowered.

#### Synergy

We have learned in the last five years, that most species have many phytochemicals with many biological activities and that many of the phytochemicals we use for medicines, especially the antibiotics (anthelmintics, bactericides, fungicides, viricides, vermifuges, etc.), serve as natural pesticides for the species containing them. As we would expect, evolution seems to favor a synergy among such pesticides, which often carries over into their medical potential.

By examining the non-aggregated entries, one can, through various computational techniques, ask which of the mint analyses cited in this volume have the greatest reported variety or total concentration of phytochemicals with a specific activity (for instance which mints have the greatest number of antispasmodic compounds and which have the greatest total reported concentration of one or all of these spasmolytic compounds). A number of tools have been developed by the authors to allow these types of queries to be made for the entire phytochemical database (including the mints) on the Internet (Beckstrom-Sternberg and Duke) at the following URL: <http://www.ars-grin.gov/duke/>.

#### Properties of Aromatic Compounds

Because of the unique properties of aromatic compounds, which are important for both herbal medicine and aromatherapy, there's more to aromatherapy than meets the nose. It has been clearly demonstrated that many of the aromatic compounds are biologically active whether inhaled, ingested, or applied topically. Cineole for example, via its CNS activities, can improve a rodent's ability to work its way through a maze, whether ingested or inhaled. Likewise, cineole, as well as other aromatic compounds, can speed up and increase the transdermal absorption of other compounds, sometimes by as much as 100-fold. The implications of this are inspiring as well as sobering. The increased absorption allows smaller amounts of an active compound to be used, and puts it directly into the bloodstream

rather than passing through the gut, where it could be altered or inactivated. On the down side, too much of a good thing could be fatal, pointing to the need for standardization of topically applied compounds and their carriers, especially in light of the huge variation in the concentrations of plant chemical constituents.

## Ecotypes

One interesting speculation to us is that rosemary, the herb of remembrance, may in fact be preventively active, perhaps even transdermally, against Alzheimer's disease. Rosmarinic acid, namesake of rosemary, has three different activities that might be useful in Alzheimer's disease: anticomplement activity, antioxidant activity, and choline sparing activity. There are over a dozen antioxidants in rosemary and more than five anticholinesterase compounds. By analyzing the non-aggregated, individual assay data we can see which ecotype or variety is best endowed with these biologically active compounds. This ecotypic variation could form the basis of an industry dedicated to cultivating specialized ecotypes of the same species for different medicinal applications.

## Food and Drug Administration (FDA)

With the new labeling laws signed by President Clinton on October 15, 1994, it seems legal and possible for herbalists to say that rosemary contains these compounds, but not to say that rosemary will prevent or decelerate Alzheimer's. We believe that rosemary, the herb of remembrance, can be proved useful in Alzheimer's, and that it may be more useful than some FDA-approved drugs for Alzheimer's. However, we doubt that anyone will invest the required 500 million to prove that rosemary is safe and efficacious for Alzheimer's. So for economic reasons, we may not be getting the best medicine for Alzheimer's. It would be difficult to secure a patent for rosemary for Alzheimer's. Strangely though, one could analyze different varieties of rosemary to find which one was richest in the anticholinesterase compounds and patent that variety as unique phytochemically, to be clonally reproduced, under ecological conditions that increase the quantities of the anticholinesterase compounds.

## Aromathematics

Of course, as new data accumulates, other edible and non-edible mints may prove even richer in antialzheimeran phytochemicals. Mints other than lavender and melissa may prove richer in sedative compounds. Mints other than peppermint and spearmint may prove richer in carminative compounds and antipruritic phytochemicals. Mints other than perilla may prove richer in breast-cancer preventive phytochemicals like carvone, limonene, and perillyl-alcohol. That's what's so exciting about this new field we call aromathematics (so as not to offend long-term advocates of aromatherapy), which is here defined as the study of aromatic compounds and their biological activities; with each new detailed analysis published, a new candidate may emerge for several diseases.

## Standardized Extracts vs. the Silver Bullet

We feel that in many cases, standardized extracts of these potent mints, may be safer and just as efficacious as many of the more expensive synthetic options. Consider the following example. If your physician has diagnosed you correctly (with Lyme disease, the physician is wrong nearly half the time), and if you do not have any co-morbid factors (most of us do), and if you are not deficient in some mineral, vitamin, or vital phytochemical that has not yet proven vital (and most of us are deficient in at least one), then the physician's silver bullet may help. But if all three conditions are not satisfied, then the safe herbs may have more to offer. The homeostatic human body is good at sequestering from an herb tea those phytochemicals that it needs and rejecting things it doesn't need. Thus the menu of thousands of phytochemicals in an herb tea may give the human body opportunity to select those that it needs, rejecting those that might be harmful.

## The Asthma Challenge

"Three months of 5-lipoxygenase inhibition produced a significant improvement in asthma control" (JAMA#275(12):931.1996). This tells us that the American Medical Association believes that 5-lipoxygenase inhibition can help with asthma. So we pose to you, the reader, the question, which of the mints mentioned herein has the greatest variety and/or quantity of lipoxygenase inhibitors reported? Would that be worth taking for asthma in a desperate situation: no physician, no medicine? The above cited paper in the Journal of the American Medical Association states that inhibition of 5-lipoxygenase is associated with improved asthma control as evidenced by reduced asthma exacerbations, objective measures of lung function, quality of life, and medication use. We suspect that antileukotrienic activity in many of our mints could likewise be channeled into antiasthmatic utility.

Further, we suspect that, on average, through synergy, lower doses of total mixed LO-inhibitors will be more effective than an equal dose of a single LO-inhibitor, and possibly less likely to have serious side effects, especially from mints that are GRAF (Generally Recognized As Food).

With fewer and fewer Americans able to afford the synthetic silver bullets offered us by the Pharmaceutical Industry, we anticipate that North Americans will be clamoring for a program like the TRAMIL program in the Caribbean countries. Experts in the fields of botany, chemistry, medicine, and pharmacy review the folk medicines available and select the safer and/or more effective among these herbs. We believe that data like those presented in this book will help select the best and safest medicinal mints for those of us who prefer herbal alternatives for economic, medicinal or mystical reasons.

## Caveats, Details and Abbreviations

In order to make this book as useful as possible, it has been divided into two distinct parts. Part 1 lists the chemicals found in each plant, with quantities listed in parts per million (ppm), unless otherwise stated. Part 2 is a list of some reported biological activities of those chemicals. The astute reader may notice that a number of rather common chemicals are missing from these pages; this is done by design. Chemicals which the authors deemed ubiquitous, or common to all or most plants, are omitted when there is no quantitative data, since they communicate little of real value when quantitative data are lacking. The quantitative data for many of the minerals are often more a mirror of the soil's mineral content rather than an indication that the plant is specially endowed, since few plants are true accumulators.

The list of non-quantitative ubiquitous chemicals excluded from this work is found below:

## Non-Quantitative Ubiquitous Chemicals Excluded from the Analysis

ACETALDEHYDE	CAPROIC-ACID	GALACTOSE	MUFA
ACETONE	CARBOHYDRATES	GLUCOSE	MYRISTIC-ACID
ALANINE	CELLULOSE	GLUTAMIC-ACID	NIACIN
ALPHA- TOCOPHEROL	CHLORINE	GLUTAMINE	NICKEL
ALUMINUM	CHLOROPHYLL	GLYCINE	NITROGEN
AMMONIA(NH3)	CHOLESTEROL	GOLD	OCTADECATETRAEN OIC-ACID
ANTHOCYANINS	CHOLINE	HISTIDINE	OLEIC-ACID
ARACHIDIC-ACID	CHROMIUM	INDOLE-ACETIC- ACID	PALMITIC-ACID
ARACHIDONIC-ACID	CITRIC-ACID	IODINE	PALMITOLEIC-ACID
ARGININE	COBALT	IRON	PANTOTHENIC-ACID
ARSENIC	COPPER	ISOLEUCINE	PECTIN
ASCORBIC-ACID	CYSTEINE	KILOCALORIES	PEROXIDASE
ASH	CYSTINE	LAURIC-ACID	PHENYLALANINE
ASPARTIC-ACID	DOCOSAHEXAENOIC -ACID	LEAD	PHOSPHORUS
BARIUM	DOCOSAPENTAENOI C-ACID	LECITHIN	POTASSIUM
BEHENIC-ACID	EICOSAPENTAENOIC -ACID	LEUCINE	PROLINE
BETA-CAROTENE	EO	LIGNOCERIC-ACID	PROTEIN
BETA-SITOSTEROL	ERUCIC-ACID	LINOLEIC-ACID	PUFA
BETA-SITOSTEROL- GLYCOSIDE	ETHANOL	LINOLENIC-ACID	RESIN
BETA-TOCOPHEROL	FAT	LITHIUM	RHAMNOSE
BORON	FIBER	LYSINE	RIBOFLAVIN
BROMINE	FLUORINE	MAGNESIUM	RIBONUCLEASE
BUTYRIC-ACID	FOLACIN	MANGANESE	RUBIDIUM
CADMIUM	FRUCTOSE	MERCURY	SELENIUM
CALCIUM	GADOLEIC-ACID	METHIONINE	SERINE
		MOLYBDENUM	SFA

SHIKIMIC-ACID	SUCROSE	TOCOPHEROL	VIT-D
SILICON	SULFUR	TOCOTRIENOL	VIT-E
SITOSTEROL	SYRINGIC-ACID	TRYPTOPHAN	WATER
SODIUM	TANNIN	TYROSINE	XANTHOPHYLLS
STARCH	TARTARIC-ACID	URONIC-ACID	XYLOSE
STEARIC-ACID	THIAMIN	VALINE	ZINC
STIGMASTEROL	THREONINE	VANADIUM	ZIRCONIUM
STRONTIUM	TIN	VIT-B12	
SUCCINIC-ACID	TITANIUM	VIT-B6	

(See Appendix 1: Deck of Cards)

## Module 5: HERBALISTS' DESK REFERENCE (HDR)

Jim Duke

(Text for a lecture Oct. 11. *Herbal Therapies (Botanical, Herbal, or Phytochemical Alternatives)*  
Continuing Education for Toledo Physicians. Contact Nancy Merriam 419-471-4649.)

First I summarize for you the herbs that are selling most in the US, according to figures published in the September 23 issue of Chemical and Engineering News. Echinacea leads herbal medicine sales in the US, commanding 9.9% of the American herbal sales (costing \$24-42 a pound wholesale for the roots, 4.40 for the leaves), followed by garlic, 9.8% (\$2.60 per pound), goldenseal, 7.0% (\$50.00), ginseng, 5.9% (\$28-219) ginkgo 4.5 (\$5.50); saw palmetto 4.4 (\$22), aloe 4.3 (\$10.50), ephedra 3.5 (\$4.50), siberian ginseng 3.1 (\$7.50), and cranberry 3.0%. Therefore I include all these in my discussion. Originally I had agreed to introduce you to some 30 of the most frequently used herbs.

Other top sellers listed by Peggy Brevort in Herbalgram include:

Scientific Name Common Name \$ Per Lb. (Wholesale)

<i>Capsicum</i> spp Cayenne 3.20	<i>Rhamnus purshiana</i> Cascara sagrada OTC
<i>Cassia senna</i> Senna OTC	<i>Salix alba</i> White Willow 2.70
<i>Centella asiatica</i> Gotu Kola 3.50	<i>Silybum marianum</i> Milk Thistle 8.00
<i>Crataegus oxyacantha</i> Hawthorn 3.60	<i>Tabebuia impetiginosa</i> Pau d'arco 4.25
<i>Glycyrrhiza glabra</i> Licorice 5.25	<i>Tanacetum parthenium</i> Feverfew 9.75
<i>Hamamelis virginiana</i> Witch Hazel OTC	<i>Trifolium pratense</i> Red Clover 14.00
<i>Humulus lupulus</i> Hops 6.00	<i>Ulmus fulva</i> Slippery Elm OTC
<i>Matricaria recutita</i> Camomile 4.70	<i>Uncaria tomentosa</i> Cat's Claw
<i>Mentha piperita</i> Peppermint 2.95	<i>Valeriana officinalis</i> Valerian 2.90
<i>Plantago ovata</i> Psyllium OTC	

The tops among Chinese herbs are:

Scientific Name Common Name \$ Per Lb. (Wholesale)

<i>Angelica sinensis</i> Dong Quai 8.75	<i>Ephedra sinica</i> Ma Huang 4.50
<i>Astragalus sinensis</i> Huang Qi 7.50	<i>Ginkgo biloba</i> Ginkgo 5.50
<i>Eleutherococcus senticosus</i> Tsu Wujia 7.50	<i>Glycyrrhiza uralensis</i> Licorice 3.25

*Paeonia obovata* Peony 4.00

*Schizandra chinensis* Schizandra 7.89

*Panax ginseng* Ren Shen 79.00

*Zingiber officinale* Ginger 3.75

*Polygonum multiflorum* Fo Ti 6.58

*Ziziphus jujube* Jujube 4.00

*Rehmannia glutinosa* Rehmannia 5.92

## MOST FREQUENTLY SOLD CHINESE DRUGS

(MODIFIED FROM BREVOORT, HERBALGRAM, 1996)

Here I list what I view as the major physiological activities, which herbalists may think they can legally label, the most promising indications, which they still cannot label, but ones for which I candidly think there are valid claims. Then, hyperconservatively, I have gone thru rather alarmist a/o very conservative views of potential side effects and/or caveats (SE) applicable to these herbs. I am, in most cases, rather convinced of the efficacy, and less convinced of the alleged side effects and caveats that I have included, as promised in my syllabus for this CE course. Look at the ads for pharmaceuticals in a pop journal or in JAMA and you'll see that much more verbiage is dedicated to side effects than to indications, with 10-1,000 times more words addressing caveats, counterindications, and side effects. Remember that as you address the side effects of these herbal concoctions.

I like the albeit arbitrary safety scoring I gave herbs in my CRC Handbook of Medicinal Plants (1985), no pluses if I feared for my daughter to drink a single cup of tea therefrom, 1 + as more dangerous than coffee ( meaning I'd not fear her drinking one cup but discourage more), 2 ++ about as safe (ca in the toxicity range) of coffee, two cups of which I think are OK (except maybe if you're pregnant), and 3 +++ as safer than coffee ( I would not be alarmed at my daughter's ingesting three cups). I did not consult that CRC book when developing the scores I report here. These scores are gut feeling scores a dozen years later with much holy water over the dam. In the following table ACT=Activities; IND=Indications; POS = Posology, and SEC=Side effects and caveats, mostly from the literature. OTC = Over the Counter or approved for sale in Europe. STX=Standardized Extract; TCM=Traditional Chinese Medicine; PNC=Potter's New Cyclopaedia (Williamson & Evans, 1988); SF=Steven Foster NH=personal communication, Barbara Grant, Natures Herbs. Most data in the posology columns were derived from these sources, and they do not necessarily correspond to OTC doses. To avoid clutter on these slides, these sources are not always cited on the busier slides.

### ALFALFA (*Medicago sativa*) +

ACT: Aperitif; Bactericide; Cardiotonic; Diuretic; Estrogenic; Stomachic; Tonic

IND: Arthritis; Cancer; Coughs; Dysuria; Gravel Fever; Halitosis; Peptic Ulcers

POS: 1-2 500-mg Capsules/Day; 3-4 375-mg capsules 3x/day

SEC: Abortion; Diarrhea; Dyspepsia; Hemolysis; Lupus, Pancytopenia Seeds a/o sprouts may contain 13,000 ppm canavanine which may be implicated in hypocomplementenemia, lupus, and pancytopenia. Stachydrine and I-homostachydrine in the seeds may be emmenagogue and lactogenic. One patient died from listeriosis after ingesting contaminated alfalfa tablets. (LRNP, Mar. 1991) May cause stomach upset and diarrhea. Believed by some herbalists to be helpful in delaying absorption of cholesterol and dissolving plaque deposits on arterial walls. (TMA, 1996)

### ALOE (*Aloe vera*) ( Gel) ++ OTC

ACT: Anesthetic; Antiinflammatory; Antiseptic; Moisturizer; Tissue restorative

IND: Abrasions; Alcoholic Ulcers; Bugbites; Burns; Dermatitis

POS: Apply Topically; or 1 Tsp juice after meals; 25 mg in 1,185 mg soybean oil

3-6 capsules daily (Not an OTC dosage)

SEC: Dermatitis; Diarrhea; Intestinal Cramps; Ulcers

#### ALOE (*Aloe vera*) (Inner leaf) + OTC

ACT: Anthelmintic; Cathartic; Laxative

IND: Constipation

POS: 1 Tsp juice after meals; 1 250 mg capsule at bedtime

SEC: Dermatitis; Diarrhea; Intestinal Cramps; Ulcers; Commission E reports counter indications, adverse effects, and interactions of anthranoid laxatives. (AEHD). Naturopaths Yarnell and Meserole (1996) state that people allergic to aloe may develop a severe rash following its application.

#### ASHWAGANDHA (*Withania somniferum*) +

ACT: Adaptogenic; ?Aphrodisiac?; Hypotensive; Sedative; Spasmolytic

IND: Cramps; High Blood Pressure; Immune Dysfunction; Impotence; Insomnia

POS: Two 300 mg capsules/day

SEC: Gastritis; Intestinal Cramps; While many herbalists praise this, even attributing ginseng like magic to it, I think of it as a poorly known nightshade relative with a few toxic medicinal compounds.

#### BEARBERRY (*Arctostaphylos uva-ursi*) + OTC

ACT: Astringent; Urinary Antiseptic

IND: Cystitis; Urethritis

POS: 10 g dry leaf in one quart cold water; 1-3 500 mg capsules/3x/day

SEC: Hepatitis; Nausea; Nephrosis; Stomachache; Vomiting. Use no more than one week, unless otherwise directed by physician. Not recommended for children, pregnant or nephritic patients;

#### BILBERRY (*Vaccinium myrtillus*) +++ OTC

ACT: Antiaggregant; Antiinflammatory; Antioxidant; Antiseptic; Astringent; Capillary-strengthenener; Circulatory-stimulant



IND: Cataracts; Diabetic Retinopathy; Diarrhea; Fragile Capillaries; Impaired Vision (esp. at night); Maculitis; Sore Throat; Varicose Veins

POS: 20-60 g dry fruit/day; 240-480 mg STX/day; 2 500 mg capsules 2x/day

SEC: Fresh berries may cause diarrhea. Leaves can be poisonous consumed over a long period of time. (TMA, 1996) Commission E reports leaf not permitted for therapeutic use; higher doses or prolonged use can produce chronic poisoning; chronic administration of 1.5 g/kg/day is lethal in animals. (AEHD)

#### BLACK COHOSH (*Cimicifuga racemosa*) +

ACT: Analgesic; Antiinflammatory; Antirheumatic; Diuretic; Emmenagogue; Expectorant; Nervine; Sedative

IND: Arthritis, Dysmenorrhea; High Blood Pressure; Menopause; Menstrual Problems; PMS; Whooping Cough

POS: 300-2,000 mg dry root; 40 mg herb in 40-60% ethanol; one 550 mg capsule 3x/day

SEC: I got a nasty letter from some Germans apparently with an economic interest in cohosh, asking where I got the cautionary remarks from by 1985 CRC book. They must really be irritated by what follows Commission E reports occasional gastric complaints. Not to be used for more than 6 months. (AEHD) With prolonged use, may irritate the uterus, cause dizziness, diarrhea, nausea, vomiting, abdominal pain, headaches, joint pains, and lowered heart rate. Can contribute to abnormal blood clotting and liver problems. Can encourage breast tumors. Should not be used by anyone with any type of heart disease or by anyone advised not to take oral contraceptives. Can cause premature labor. Should be used only under medical supervision. (TMA, 1996)

#### BOSWELLIA (*Boswellia commiphora*) ++

ACT: Analgesic; Antiinflammatory; Antirheumatic

IND: Arthritis; Inflammation; Rheumatism; Sports Injuries

POS: Three 195 mg capsules boswellin/day

SEC: This johnny-come-lately hasn't been among us occidentals long enough to accumulate much negative or positive folklore.

#### BURDOCK (*Arctium lappa*) +++ OTC

ACT: Antipyretic; Antitumor; Diaphoretic; Hypoglycemic; Immunomodulator

IND: Arthritis; Degenerative Diseases; Diabetes (NIDM); Lymphoma; Urethritis

POS: Liquid Root Extract 2-8 ml; Liquid Seed Extract 0.5-2 ml; three 475 mg capsules 3x/day

SEC: Physicians in Burgos Spain report 3 1995 cases of contact dermatitis caused by burdock root poultices. Herbs for Health (Nov./Dec.). p. 68., reviewing Rodriguez, P. et al. 1995. Allergic contact

dermatitis due to burdock. Contact Dermatitis 33(2): 134-5.

CALENDULA (*Calendula officinalis*) +++ OTC

ACT: Antiinflammatory; Antiseptic; Antiviral; Carminative; Immunostimulant; Vulnerary

IND: Abrasions; Burns; Indigestion; Menstrual Distress; Stomach Distress

POS: 1-5 g herb per cup tea, 3 x daily; 5-40 drops tincture 3 x/day

SEC: I think it safer than coffee, discounting a report of anaphylactic shock in one Russian who gargled with the infusion (it's kin to ragweed) (LRNP, Aug. 1992)

CASCARA SAGRADA (*Rhamnus purshiana*) OTC +

ACT: Diuretic; Emetic; Fungicide; Laxative; Peristaltic; Purgative

IND: Constipation; Hemorrhoids; Ringworm

POS: 1 ml (ca 10 drops) STX (fluid); two 450 capsules/bedtime

SEC: While widely used, anthranoid-containing laxatives can be habit-forming; some contain compounds suspected of being cytotoxic, genotoxic, mutagenic and even tumorigenic; epidemiological studies in Germany reveal that abusers of anthranoid laxatives have three times higher rate of colon carcinoma

CAT'S CLAW (*Uncaria tomentosa*) ++

ACT: Antiinflammatory; Antiviral; Immunostimulant

IND: Arthritis; Gout; Immune Dysfunction; Indigestion; Inflammation;

POS: 20-60 mg STX; 1 Tsp Decoction; 1-2 500 mg capsules 3x/day; two 505 mg STX capsules/day

SEC: Too new to have much toxicity data, I think it as innocuous as coffee. But only time will tell. Foster cautions that, like other immunostimulants, including his favorite echinacea, cat's calw should be avoided in such immune disorders as HIV, multiple sclerosis, and tuberculosis. Not shown safe in children and lactating or pregnant women.

CAYENNE (*Capsicum* spp.) ++ OTC

ACT: Analgesic; Carminative; Circulatory Stimulant; Diaphoretic; Spasmolytic

IND: Arthritis (Pain); Herpes Zoster; Indigestion; Pain; Tennis Elbow; Varicose Veins

POS: Topical STX usually contain 0.25-0.75% capsaicin; 0.5-1 tsp dry fruit/cup water; 2-3 155 mg capsules 3x/day; 1 STX 450 mg capsule 3x/day

SEC: Commission E reports counter indications of damaged skin, hypersensitivity and adverse effects of irritant properties; rarely allergic reactions. Not to be used for more than 2 days.

#### CHAMOMILE (*Matricaria recutita*) +++ OTC

ACT: Antiinflammatory; Antispasmodic; Carminative; Diuretic; Expectorant; Sedative

IND: Dermatitis; Eczema; GI Distress; Gingivitis; Indigestion; Insomnia; Ulcers; Varicose Veins

POS: 2-3 g per cup, 3-4x/day; 10-40 drops tincture 3 x/day; 2-3 355mg capsules 3 x/day

SEC: Some people advise, perhaps over advise, that sensitive people may have an allergic reaction to this. I don't take camomile daily but almost daily I ingest a whole lot of peanuts, which are more dangerous, anaphylactically killing two people a year in the US.

#### CHASTEBERRY (*Vitex agnus-castus*) ++

ACT: Emmenagogue; Stimulant; Vulnerary

IND: Acne; Breast Pain; Cramps; Irregular Cycles; Menopause; Menstrual Distress; PMS

POS: 30-40 mg dry fruit/day; 40 drops STX tincture; two 565 mg capsules 2x/day

SEC: Commission E reports no counter indications or interactions for the fruit. Adverse effects: skin reactions.

#### CRANBERRY (*Vaccinium macrocarpum*) +++ OTC

ACT: Antiseptic; Bactericide

IND: Bladder & Kidney Infections; Cystitis; Gout; Urethritis

POS: 5-20 oz/day; 800 mg capsules; 2-4 505 mg capsules 3x/day; 2-3 505 mg capsules STX w meals

SEC: Ingestion of ridiculous amounts (3-4 liters a day may cause diarrhea and other GI disorders.

#### DAMIANA (*Turnera diffusa*) ++

ACT: Antidepressant; ?Aphrodisiac?; Diuretic; Stimulant; Tonic (aphrodisiaca)

IND: Anxiety; Depression; Frigidity; Impotence

POS: 2-4 ml Liquid Extract; Damiana Extract BPC 0.3-0.6g PNC

SEC: "No significant adverse effects . . . Persons claiming to experience damiana-induced hallucinations should be monitored closely."

DANDELION (*Taraxacum officinale*) +++ OTC

ACT: Antiinflammatory; Aperitif; Bitter; Cholagogue; Diuretic; Natriuretic

IND: Cirrhosis; Improper Bile Secretion; Hepatitis; Indigestion; Jaundice

POS: 4-10 g dry lf 3x/day; 1-2 tsp root/cup/ AM & PM; three 515 mg capsules 3x/day

SEC: Commission E reports counter indications: biliary obstruction, empyema of gall-bladder, ileus; adverse effects: gastric complaints. Other counter indications reported: biliary inflammation.

DONG QUAI (*Angelica sinensis*) +

ACT: Analgesic; Antiallergic; Antiinflammatory; Antiseptic; Antispasmodic; Female Tonic; Hypotensive

IND: Dysmenorrhea; Hot Flashes; Menstrual Pain; Muscular Cramps; PMS

POS: 1-3 tsp root/day; 5.5-12 g root/day; three 535 mg capsules 3x/day; two 630 mg STX capsules 2 x daily

SEC: Psoralens can be phototoxic and carcinogenic. The aqueous extract inhibits experimentally induced IgE titers, suggesting immunosuppressive potential. "Its use cannot be recommended." Pregnant and nursing women, or patients with diarrhea, should not take except under a doctor's instruction.

ECHINACEA (*Echinacea* spp.) +++

ACT: Antibacterial; Antiviral; Immunostimulant

IND: Bronchitis; Cold; Earache; Eczema; Flu; Immune Dysfunction; Infections; Wounds

POS: 60 drops root tincture 3x/day; 2-3 425 mg capsules 2-3x/day; two 505 mg STX capsules 2-3x/day

SEC: I don't worry about levels of PA's as low as 60 ppms; isotussilagine and tussilagine have been reported at levels of up to 60 ppms in pallid and purple coneflower (These PA's are unlikely to cause any liver damage. Commission E reports counter indications: progressive systemic diseases (e.g., tuberculosis, multiple sclerosis). Should not be used for more than 6 weeks. Other sources report counter indications: inclination to hypersensitivity, pregnancy; adverse effects: metabolic worsening in diabetic patients; dose-dependent chills, fever, nausea, vomiting; acute allergic reactions. Not to be used for more than 3 weeks. According to Parnham (1996) doses 1,000 times greater than normally used may be immunosuppressive.

ELDERBERRY (*Sambucus canadensis*) +++ OTC

ACT: Antiviral

IND: Bronchitis; Cold; Cough; Fever; Flu; Sorethroat

POS: 2-4 g dry flower PNC; 2-10 g dry fruit; 2-3 485 mg capsules 2-3x/day; one 485 mg STX capsule, 3x/day

SEC: Parts of the plant may contain dangerous levels of HCN. Several cases of severe poisoning from several glasses of juice involved dizziness, nausea, numbness, stupor, vomiting and weakness.

#### EPHEDRA (*Ephedra* spp.) + OTC

ACT: Anorexic; Antiinflammatory; CNS-Stimulant; Diuretic

IND: Asthma; Lethargy; Nasal Congestion; Obesity; Sinusitis

POS: 1.5-6 g/cup/day

SEC: The herb and/or its ephedrine can cause dizziness, flushing, hypertension, palpitations and utero contraction (Green Farmacy). Commission E reports counter indications, adverse effects, and interactions of the major alkaloid, ephedrine. Not to be used for prolonged period. Not to be taken with MAOI's.

#### EVENING PRIMROSE (*Oenothera biennis*) +++ OTC

ACT: Antiaggregant; Antiinflammatory; Nutritive (Essential Oil Deficiencies)

IND: Arthritis; Dermatitis; Eczema; Hyperactivity; Mastalgia; Menstrual Distress; PMS

POS: 3-12 500-mg capsules EPO/day; two 1300 mg capsules/day

SEC: The literature looks clean. I've heard from two separate personal cases of women taking it satisfactorily for PMS that it caused migraine-like headaches which they did not experience before taking EPO. Anecdotal but credible. As my best source of tryptophan which leads to cerebral serotonin, it can alter brain levels of serotonin which is involved in some migraine cases. Enteralgia, headache, and nausea may occur in a small percentage of subjects.

#### FENUGREEK (*Trigonella foenum-graecum*) +++ OTC

ACT: Antiinflammatory; Estrogenic, Hypcholesterolemic, Hypoglycemic; Steroid Precursor;

IND: Arthritis; Diabetes (NIDM), High Blood Pressure, High Cholesterol; Indigestion; Sore Throat

POS: 50-100 g/day; one 625 mg capsule 2-3 x/day

SEC: Commission E reports no counter indications or interactions for oral use of the seed. Adverse effects: skin reactions to repeated external use. An idiosyncratic gastroenteritis was fingered on fenugreek in LRNP (July, 1987). One micromastic female complained of mastogenic activity following ingestion of fenugreek sprouts.

#### FEVERFEW (*Tanacetum parthenium*) ++ OTC

ACT: Analgesic; Antiinflammatory; Emmenagogue; Serotonin-Reuptake-Inhibitor

IND: Arthritis; Cluster Headache; Fever; Menstrual Pain; Migraine

POS: 125 mg dry lf/day with at least 0.2% parthenolide; two 400 mg capsules, 3 x/day

SEC: Oral feverfew may cause mouth ulcers in ca 10% of patients. Should not be taken by pregnant women as the leaves have emmenagogue activity. No serious side effects have been noticed in those taking feverfew over years as a preventive. Ulcerations of the mouth, sore tongue, inflammation of the oral mucosa and tongue, swelling of the lips, unpleasant taste, loss of taste, urinary problems, headache, diarrhea, flatulence, nausea, and vomiting are side effects (most were apparent only in the first week) reported by those using feverfew. Cases of contact dermatitis are rare. Mild tranquillizing and sedative effects have been reported. Chewing the leaves for extended periods may lead to abdominal pains and indigestion. Has shown abortifacient effects. Sesquiterpene lactones (SL), are aromatic compounds widely distributed in certain plant families, with highest concentrations generally found in leaves and flowers. Sheep and cattle poisonings due to SL-containing species have been reported. Cases of allergic contact dermatitis in humans have also been reported.

#### FLAX (*Linum usitatissimum*) +++ OTC

ACT: Demulcent; Laxative

IND: Colitis, Constipation; Diverticulitis; Enteritis; Gastritis

POS: 1 tsp ( 5-6 g alpha-linolenic-acid)/day; one 300 mg STX softgel

SEC: Under pessimal conditions, 100 g linseed can liberate up to 50 mg HCN, enough to bring about symptoms of poisoning. But these conditions rarely if ever maintain. Most HCN is metabolized via the enzyme rhodanase which can convert 30-60 mg HCN per hour into the relatively toxic thiocyanate. Even doses of 300 g ground linseed evoked no symptoms of poisoning in volunteer. Single doses of 100 g to not cause significant rise in blood hydrocyanic acid and thiocyanate levels. Taking 15 g linseed thrice daily for 3 to 4 weeks raised thiocyanate levels in blood and urine. May adversely affect absorption of drugs (as with any mucilaginous preparation).

#### FO-TI (*Polygonum multiflorum*) +++

ACT: Antiatherosclerotic; Antioxidant; Hypocholesterolemic; Immunostimulant; Laxative

IND: Bronchitis; Cardiopathy; High Cholesterol

POS: 6-15 g dry root; 2-3 575 mg capsules; 3 x/day

SEC: May cause diarrhea, enteralgia, nausea; numbness of the extremities; skin rashes.

#### GARLIC (*Allium sativum*) +++ OTC

ACT: Antiaggregant; Antioxidant; Antiseptic; Diaphoretic; Hypocholesterolemic; Hypotensive

IND: Cold; Flu; High Bloodpressure; High Cholesterol; Infections; Yeast

POS: 4 g garlic or one average clove; 5,000 ug allicin/day; one 400 mg STX/day; 3-4 550 mg capsule 3 x/day

SEC: Some thiol-bearing compounds in garlic and onion and their relatives can cause acantholysis in vitro and possibly pemphigus in vivo. "More than 5 cloves a day may induce flatulence and heartburn (Castleman, 1996) and "thin blood" (people taking blood thinners may over thin their blood thereby. Some people (including a long-term director of the Missouri Botanical Garden) are very allergic to garlic. Commission E reports foul breath, rare GI-disturbances, and allergic reactions.

#### GINGER (*Zingiber officinale*) +++ OTC

ACT: Antiemetic; Antiinflammatory; Carminative; Spasmolytic

IND: Arthritis; Cramps; Dizziness; Indigestion; Morning & Motion Sickness; Nausea

POS: 3-10 g fresh ginger; or 2-4 g dry ginger/day; three 550 mg capsules 3 x day (NH); one 480mg STX 2x/day

SEC: Perhaps erring on the side of caution, Reichert cautions that ginger may raise the bloodpressure, may amplify blood-thinning drug's activities, and might be counter indicated in pregnancy. The Lawrence Review says overdoses may cause cardiac arrhythmias and CNS-depression. Due to ginger's strong antiaggregant activity, "experts recommend it not be used by people with blood-clotting disorders. Many ... chemotherapy patients experience periods when their blood platelet counts drop dramatically....Doctors will warn patients to avoid aspirin when their platelet counts are low ... We feel that patients should also avoid ginger when their platelet count drops, while continuing use of ginger for patients with normal platelet counts." (Block, 1996) Less conservatively, Commission E reports rhizome should not be used for vomiting in pregnancy.

#### GINKGO (*Ginkgo biloba*) ++ OTC

ACT: Antioxidant; Cerebral-Stimulant; Circulatory-Stimulant; Peripheral-Stimulant; Vasodilator

IND: Alzheimer's; Impotence; Intermittent Claudication; Maculitis; Poor Circulation; Raynaud's Syndrome; Senile Dementia; Tinnitus

POS: 40-80 mg STX 3x/day; three 400 mg capsules/day

SEC: Though regarded by many as a poisonous plant, ginkgo, selling at 500 million a year in Europe, has not accumulated much data in the alarmists journals. According to (LRNP Feb '94) mild adverse effects include GI upset and headache. Bilobin and ginkgolic acid are similar to poison ivy's allergen (LRNP Feb '88). In my CRC Handbook of Nuts, I don't discuss the leaves (extracts of which are sold as medicine). Fruits are allergenic (and disgustingly malodorous) and too many of the edible seeds can cause serious problems, even death.

#### GINSENG (Oriental) (*Panax ginseng*) +++ OTC

ACT: Adaptogenic; Hypoglycemic; Stimulant; Tonic

IND: Cold; Diabetes; Fatigue; Immune Dysfunction; Impotence; Slow Thinking

POS: 0.33-0.66 g root 3x/day; 1-9 g; 100 mg STX (4-7% ginsenosides) 1-2x/day; three 550 mg capsules 3x/day (Korean); one 535 mg STX 2x/day (Korean)

SEC: The worst and most erroneous studies of ginseng were reported in JAMA, which accepted no corrections from the herbal industry, trying to get the reports straight. I regard as erroneous these studies. "Most commonly reported side effects of ginseng are nervousness and excitation, which usually diminish" (LRNP Sep '90) Foster (1996) reports GI distress; overstimulation; breast tenderness; dysmenorrhea. Avoid if hypertensive or pregnant.

#### GOLDENSEAL (*Hydrastis canadensis*) +

ACT: Antiinflammatory; Antiseptic; Astringent; Digestive

IND: Dermatitis; Earache; Eczema; Gastritis; Gingivitis; Laryngitis; Ringworm; Sore Throat

POS: 2-4 ml (20-40 drops) tincture; 150-350 mg root 3x/day; 1-2 540 mg capsules 3x/day; one 470 mg STX 2x/day

SEC: "goldenseal should not be taken for long periods of time" (Barney, 1996). The LRNP (June '87) is a bit stronger. Large doses of the plant may irritate the mouth and throat, and cause diarrhea, nausea, parathesia, and vomiting. "CNS stimulation and respiratory failure induced by the plant can be fatal." In higher doses hydrastine can cause convulsions, exaggerated reflexes, hypertension, and death from respiratory failure. (LRNP, but quoting an old old book). "No recent reports of toxicity...in the literature" (SF). May alter intestinal flora.

#### GOTU KOLA (*Centella asiatica*) +++

ACT: Antiedemic; Antiinflammatory; Diuretic; Sedative; Tonic; Vulnerary

IND: Burns; Edema; Failing Memory; Phlebitis; Psoriasis; Varicose Veins; Wounds

POS: 1 tsp dry herb/cup; 600 mg powdered leaf/day

SEC: LRNP (Dec '88) says that, despite claims of non-allergenicity, dermatitis has been reported in some patients taking the gotu kola. Reading their account, I'd not be any more afraid of gotu kola than wild lettuce.

#### HAWTHORN (*Crataegus monogyna*) +++ OTC

ACT: Antianginal; Antiarrhythmic; Cardiotonic; Coronary Vasodilator; Preventative

IND: Angina; Arrhythmia; Cardiovascular Insufficiency;; High Blood Pressure

POS: 4-5 g fruit/cup; 80-160 mg STX 3x/day; 2-3 550 mg capsules 2-3 x/day; one 500 mg STX 2-3x/day

SEC: LRNP (Jan '94), admitting that low doses, are usually devoid of adverse effects, says that high doses may induce hypotension (that can be good in hypertensives) and sedation (which can be good in insomniacs). Acute parenteral LD50's range from 18-34 ml/kg while LD50's of individual components range from 50-2,600 mg/kg. Acute oral toxicity reportedly ranges from 18.5-33.8 ml/kg.



HONEYSUCKLE (*Lonicera japonica*) ++

ACT: Antiinflammatory; Antiseptic, Antiviral

IND: Cavities, Cold, Conjunctivitis; Flu; Infection

POS: 10 g flower/cup water

SEC: Though flowers are reported as foods in the orient, I think of it as more medicine than food, but damn good antibiotic medicine (JAD).

HOPS (*Humulus lupulus*) +++ OTC

ACT: Estrogenic; Sedative; Tranquilizer

IND: Anxiety; Depression; Insomnia; Unrest

POS: 500 mg/day (SF)

SEC: Mild Allergies or Dermatitis may result from contact.

HORSE CHESTNUT (*Aesculus hippocastanum*) ++ OTC

ACT: Astringent

IND: Diarrhea; Hemorrhoids; Varicosities

POS: 0.5-1.2 ml Liquid Fruit Extract; 2-4 ml Liquid Bark Extract

SEC: Commission E reports rare GI-disturbances. Aesculin has caused contact dermatitis.

HORSETAIL (*Equisetum arvense*) +

ACT: Astringent; Siliceous

IND: Arthritis; Poor Bone Development; Poor Hair; Poor Skin

POS: 2-4 ml Liquid Extract; three 355 mg capsules 3 x day; one 505 mg STX 2 x day

SEC: Despite reported benefits of silicon, it seems prudent that infants, young children and pregnant women not ingest horsetail for extended periods, unless its thiaminase enzyme has been deactivated. Said to induce seborrheic dermatitis.

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HUANG QI (*Astragalus membranaceus*) ++

ACT: Antibacterial, Antiinflammatory; Antipyretic; Antiviral; Diuretic; Immunostimulant; Tonic

IND: Cancer; Cold; Fatigue; Flu; HIV; Other Infections; Immune Dysfunction

POS: 9-15 g sliced root; six 500- mg capsules/day; two 400 mg capsules 3 x day

SEC: No side effects reported but "pregnant women should check with their practitioners before using." No botanist knows all the species of *Astragalus*, and some very toxic ones look pretty much like the innocuous ones.

KAVA (*Piper methysticum*) ++

ACT: Analgesic, Anticonvulsant; Antidepressant; Antirheumatic; Antiseptic; Muscle Relaxant; Sedative

IND: Anxiety; Depression; Headache; Insomnia; Menstrual Cramps; Prostatitis; Stress

POS: 1 tsp cup/nite; 35 mg STX (70% kavalactone) 3x/day; 1-2 455 mg capsules 2-3x/day; 1-2 530 mg STX capsules 1-2 x/day

SEC: Commission E reports counter indications: esophageal and gastrointestinal stenoses; adverse effects: allergic reactions (rarely). Other sources report counter indications: intestinal obstruction. Many reports suggest a yellowing of the skin in chronic users. "Chronic ingestion may lead to 'kawism' characterized by dry, flaking, discolored skin and reddened eyes." Persistent rumors suggest that overdoses can cause intoxication.. Commission E warns against the concomitant use of kava with barbituates, antidepressant medications, and CNS agents. Lactating or pregnant women should not use kava.

LEMONBALM (*Melissa officinalis*) +++ OCT

ACT: Antiherpetic, Antispasmodic; Antiviral; Sedative

IND: Enterospasms; Gastrosperm; Herpes, Insomnia

POS: 1.5-4.5 g/cup

SEC: Safer than coffee in my book.

#### LICORICE (*Glycyrrhiza glabra*) ++ OTC

ACT: Adrenal-Stimulant; Antiasthmatic; Antiinflammatory; Antitussive; Antiviral; Demulcent; Diuretic; Expectorant

IND: Adrenal Insufficiency; Asthma; Bronchitis; Cough; Herpes; Indigestion; Ulcers; Virus

POS: 5-15 g root/day; 200-600 mg glycyrrhizin/day

SEC: Too much (>50 g/day) can raise the blood pressure, cause sodium and water retention, and lower potassium levels to far. May result in pseudoaldosterianism. Adverse effects reported in M30 (amenorrhea, cardiac arrest, congestive heart failure, headache, hyperprolactinemia, hypertension, hypokalemia, muscle weakness, myoglobinuria, myopathy, and paralysis, Commission E reports counter indications: cholestatic liver diseases, liver cirrhosis, hypertension, hypokalaemia, severe renal insufficiency, pregnancy. As prolonged use/higher doses may give mineralocorticoid adverse effects/interactions, the root should not be used for more than 4-6 weeks without consulting physician. The use to correct taste in doses providing maximum 100 mg of glycyrrhizin per day is also allowed. Cantelli-Forti et al (1994) note that "serious side effects related to glycyrrhizin ingestion, including headaches, edema, body weight increase, and disturbances in body-electrolyte balance were observed either after daily high LE personal consumption or in clinical use." "Continuous consumption of licorice root extract in daily use as food or for therapeutic purposes is safer than the use of glycyrrhizin alone (or when the latter is added to man-made products {chewing gums, drinks, drugs, sweets etc.}). I would extend that into a generality for whole herbal extracts rather than silver bullets: "Continuous consumption of whole plants or plant extracts is safer than the use of their major active ingredient alone (or purified and added to drugs)"

#### MARSHMALLOW (*Althaea officinalis*) +++OTC

ACT: Demulcent, Emollient; Hypoglycemic; Immune-Stimulant; Vulnerary

IND: Asthma; Bronchitis; Cough; Diabetes; Sore Throat; Stomatitis

POS: 5-15 g root/day; 200-600 mg glycyrrhizin/day

SEC: Safer than coffee in my book. Remote chance of gossypol. High pectin/mucilage content may interfere with uptake of other pharmaceuticals.

#### MELATONIN (+)-N.A.

ACT: Antiaging; Antidepressant; Antioxidant; Synchronizer

IND: Insomnia; Jetlag; Seasonal Affective Disorder

POS: 0.5-3 mg melatonin at bedtime

SEC: Doses < 8 mg have reportedly induced heavy head, headache, and transient depression. May aggravate depression in psychiatric patients. JAMA cautions that "some studies suggest melatonin may deepen depression in those who have it or induce it in those susceptible to it. Melatonin in physiological doses caused vasoconstriction. Melatonin also constricts cerebral arteries." (in rats). Melatonin has no LD50...Additional possible adverse effects mentioned in the NIH workshop included inhibition of fertility, suppression of male sexual drive, hypothermia, and retinal and retinal damage. " (Possibilities of gynaecomastia and low sperm count disappeared in one man when he discontinued melatonin.) Some people taking as little as 3 mg tell me it's too much and gets them wired, reporting better insomnia protection with smaller doses.

#### MILK THISTLE (*Silybum marianum*) +++ OTC

ACT: Antidotal; Antioxidant; Antitoxic; Cholagogue; Hepatoprotective

IND: Cirrhosis; Hepatitis; Indigestion; Intoxication; Mushroom Poisoning; Psoriasis

POS: 12-15 g whole or powdered seed; STX 420 mg silymarin day; 1-2 540 mg capsules 3 x/day

SEC: Commission E reports no counter indications or interactions for the fruit. Occasional mild laxative effects are reported. "The long term safety and the advisability of the use of these extracts in pregnant or women of potential childbearing remain to be established.

#### NETTLE (*Urtica dioica*) +++ OTC

ACT: Antiasthmatic; Astringent; CNS-Depressant; Diuretic; Histaminic; Hypotensive; Nutritive; Tonic

IND: Arthritis; Asthma; Diarrhea; Hayfever; Nephrosis; Osteoporosis; Prostatitis; Rheumatism

POS: 8-10 g dry herb/day; 4-6 g root/day; 1-2 480 mg capsules 2-3x/day; 1-2 480 STX capsules 1-2 x/day

SEC: Occasional mild GI-complaints after root ingestion. The urtication can be painful and long-lasting, in some inducing a black-and-blue reaction. No fatalities are reported in the US.

#### PASSION FLOWER (*Passiflora incarnata*) ++ OTC

ACT: Analgesic; Antispasmodic; Monoamine-Oxidase Inhibitor; Sedative; Tranquilizer

IND: Addiction; Anxiety; Depression; Hyperactivity; Insomnia

POS: 1-3 g herb 3x/day

SEC: Large doses may result in CNS depression (LRNP, May 1989). The same precautions suggested for MAO inhibitors might be indicated here.

#### PAU D'ARCO (*Tabebuia* spp.) +++

ACT: Antibacterial; Antiinflammatory; Antifungal; Antitumor; Candidicide

IND: Immune Dysfunction; Fungal Infections; Yeast Infections

POS: 15-20 g inner bark/pint/day; three 505 mg capsules 3 x/day

SEC: Side effect may include GI distress and nausea. Guiraud et al (1994) note that lapachol and beta-lapachone, though active against *Candida*, could be harmful). Multiple doses of oral lapachol at 500 mg/kg caused death with severe histopathological changes. In clinical trials, oral lapachol induced anticoagulant effects, nausea and vomiting. After 6 doses at 9 mg/kg. Beta-lapachone caused death, following anorexia, diarrhea and weight loss.

#### PEPPERMINT (*Mentha piperita*) +++ OTC

ACT: Analgesic; Antipruritic; Antispasmodic; Carminative

IND: Colitis; Diverticulitis; Gingivitis; Heartburn; Indigestion; Irritable Bowel Syndrome; Itch; Menstrual Cramps

POS: 1-2 g leaf/cup 3x/day; 1-2 enteric coated peppermint oil pills 3 x daily

SEC: Not to be used in patients with achlorhydria, biliary or gall-bladder obstruction. Menthol-containing ointments applied to an infant's nostrils have produced immediate collapse. Rats receiving 100mg/day peppermint oil develop dose-related brain lesions. Because of its ability to relax GI smooth muscles, peppermint oil may sometimes worsen symptoms of hiatal hernia. "Peppermint tea should not be given to infants of very young children because the pungent fragrance can cause gagging." (Castleman, 1996) Coated pills opening too soon (in stomach) may cause gastralgia and heartburn.

#### PSYLLIUM (*Plantago psyllium*) +++ OTC

ACT: Demulcent; Laxative; Pectiniferous

IND: Colitis; Constipation; Diarrhea; Hemorrhoids; Ulcers; Stress

POS: 10-20 g powdered seed; 4-20 g husks; 3-4 565 mg capsules 3 x/day

SEC: Physicians and other health care professionals are developing increasingly allergic reactions to psyllium powder. Hulbert et al (1995) report a fatal bronchospasm after oral ingestion of isphagula, identical with or closely related to psyllium. Commission E reports counter indications for seed and seed-shell: GI-obstruction (ileus), diabetes which is hard to control (as insulin need may be reduced); adverse effects: allergic reactions; interactions: absorption of other drugs taken simultaneously. Other counter indications: intestinal obstruction.

#### RED CLOVER (*Trifolium pratense*) +++

ACT: Antiangiogenic; Antiinflammatory; Diuretic; Estrogenic; Expectorant

IND: Asthma; Bronchitis; Cancer Prevention; Indigestion; Menopause; Whooping Cough

POS: 3-6 g dry flowers; three 355mg capsules 3x/day

SEC: Safe at levels normally consumed by humans, clovers have so much estrogenic activity that when pregnant animals graze heavily on them, they may suffer miscarriage. Apparently healthy clovers may be fungally infected with much higher levels of estrogens, rarely even slaframine, a toxic fungal metabolite.

#### ROSEMARY (*Rosmarinus officinalis*) +++ OTC

ACT: Anticholinesterase, Antioxidant, Antiseptic; Antispasmodic; CNS-Stimulant

IND: Alzheimer's; Arthritis; Drowsiness; Lethargy; Myalgia; Neuralgia; Rheumatism;

POS: 3-1.2 ml Rosemary Spirit (?tincture?)

SEC: Like any essential oil, that of rosemary can be toxic in large quantities, causing irritations to the intestines, kidneys, skin and stomach. Michael Castleman is apparently talking about the herb, not the more dangerous essential oil, when he says, "Like most other herbs, rosemary should be used in large amount only in consultation with your health care provider. If you are pregnant, you should avoid such amounts because they can cause uterine contractions." (Castleman, 1996)

#### SARSAPARILLA (*Smilax aristolochiifolia*) +++

ACT: Antiinflammatory; Antirheumatic; Diuretic; Steroid-Precursor Starter material for progesterone, testosterone and other steroids

IND: Psoriasis; Steroids used for arthritis, dysmenorrhea, menopause PMS

POS: 1-4 g powdered root; two 455mg capsules 2-3x/day. I'd feel safe with 10-30 g dry root in 3 cups tea or sarsaparilla per day.

SEC: Commission E reports for the root that gastric and renal toxicity as well as drug interactions are possible.

#### SAW PALMETTO (*Serenoa repens*) +++ OTC

ACT: Antiinflammatory; Diuretic

IND: Impotence; Inflamed Prostate; Male Pattern Baldness; Polyuria

POS: One 320 mg softgel STX/day; 1-2 g dry fruit; 2-3 600 mg capsules 3x/day

SEC: Commission E reports no counter indications or interactions for the fruit. Adverse effects: gastric complaints (rarely). As improvement is symptomatic without eliminating prostatic hypertrophy, a physician should be consulted regularly.

#### SENNA (*Cassia senna*) + OTC

ACT: Cathartic; Fungicide; Laxative

IND: Constipation; Ringworm

POS: 0.5-2 g dry leaf; two 25 mg capsules/day

SEC: Anthranoid-containing laxatives can be habit-forming; some contain compounds suspected of being cytotoxic, genotoxic, mutagenic and even tumorigenic; epidemiological studies in Germany reveal that abusers of anthranoid laxatives have three times higher rate of colon carcinoma. One woman developed clubbing of her digits and hypertrophic osteoarthropathy after taking at least 3 senna tablets daily for 3 years for weight loss. She also experienced several months of secondary amenorrhea.

#### SIBERIAN GINSENG (*Eleutherococcus senticosus*) +++

ACT: Adaptogenic; Antistress; Immune-Stimulant; Tonic

IND: Cold; Depression; Fatigue; Flu; Mental and Physical Dysfunction; Stress

POS: 2-16 ml STX 1-3x/day for 1-2 mos.; two 500 mg capsules 3x/day; 2-3 400 mg capsules 3x/day; two 400 mg STX capsules 2-3x/day

SEC: Commission E reports counter indications for hypertension. (AEHD) Though generally regarded as safe by non-FDA types, use is not recommended "for patients in febrile states, hypertonic crisis or myocardial infarction."

#### SKULLCAP (*Scutellaria laterifolia*) ++

ACT: Antispasmodic; Astringent; Bitter; Demulcent; Hypotensive; Nervine; Sedative; Tonic

IND: Headache; Insomnia; Nervous Tension; Stress

POS: 3-9 g root

SEC: "There is no evidence to indicate the *Scutellaria* is toxic when ingested at normal doses." The FDA has suggested that overdose of the tincture causes confusion, convulsions, giddiness, pulsar irregularities, and twitching. Reported fatality in Norway possibly *Scutellaria*; possibly *Teucrium*, a frequent adulterant.

#### SLIPPERY ELM (*Ulmus rubra*) +++ OTC

ACT: Demulcent; Emollient

IND: Cough; Cuts; Gastritis; Sore Throat; Stomach Distress

POS: 0.5-2 g powdered bark/cup, 2-3x/day; two 340 mg capsules as needed

SEC: While I consider slippery elm safer than coffee, LRNP (Mar, 1991) says "preparations of slippery elm had been used as abortifacients." Oleoresins from several elm species can cause dermatitis. Pollen is

allergenic.

### ST. JOHN'S-WORT (*Hypericum perforatum*) +++ OTC

ACT: Antidepressant, Antiinflammatory, Antiviral; Monoamine-Oxidase-Inhibitor; Tranquilizer

IND: Burns; Depression, HIV; Insomnia, Stress

POS: 2-4 g dry herb (0.2-1 mg hypericin)/day; 300 mg STX (0.3% hypericin) 3x/day ; one 425 mg STX 2x/day

SEC: active ingredients may be photoactive, especially in fair-skinned people. Reichert takes it even more seriously. Although hypericum is not as strong as synthetic MAO inhibitors, patients should still avoid the things usually avoided when taking MAO's: high tyramine foods (smoked or pickled), alcoholic beverages; amphetamines, cold and hay fever remedies, narcotics, tryptophan, tyrosine. Do not take during pregnancy or intense sun exposure. Foster (1996) is moderate. St. John's-wort should not be mixed with synthetic antidepressants. Because it may inhibit MAO, taking it with selective serotonin reuptake inhibitors such as Prozac could cause serious health damage... Although side effects have not been reported in clinical studies, range animals eating the plant and then standing in bright sunlight have experienced sunburn or blindness from photosensitization. . .This treatment option should be discussed with your health-care provider.

### TEATREE OIL (*Melaleuca* spp.) ++ OTC

ACT: Antiseptic; Fungicide

IND: Candidiasis; Fungi; Infections; Onychiosis

POS: Topical as directed STX (>30% terpinen-4-ol; <15% cineole); 0.05-0.2 ml Cajuput Oil

SEC: Topical and vaginal irritation have been reported, but the "topical use of the oil has not generally been associated with toxicity." Still, "the topical use...cannot be recommended at this time" (LRNP-Jan 91) As with most essential oils, this one may induce dermatitis in sensitive individuals.

### TURMERIC (*Curcuma longa*) +++ OTC

ACT: Antiinflammatory; Antilymphomic; Antitumor

IND: Arthritis, Lymph Gland Dysfunction; Rheumatism

POS: 1,200 mg curcumin; one 445 mg STX capsule 2-3 x/day

SEC: While in moderate doses, turmeric is said to inhibit cancers, lymphomas and ulcers, overdoses of curcuminoids may possibly be cytotoxic and ulcerogenic and may lead to diminution of red and white corpuscles. Still Comm. E approves 1.5-3 g/day, not nearly enough to provide 1,200 mg curcumin. Commission E also reports counterindications: biliary obstruction, adverse effects: GI-irritation from continued use.



VALERIAN (*Valeriana officinalis*) +++

ACT: Antispasmodic; Carminative; Nervine; Sedative; Stomachic; Tranquilizer

IND: Anxiety; Insomnia; Menstrual Cramps; Nervous Tension; Stress

POS: 2-3 g/day; 300-400 mg STX (0.5% essential oil)/day; three 475 mg capsules 3 x/day; 3-6 475 mg/capsules ½ hr before bed

SEC: No counter indications, adverse effects, or interactions except for the effect of the tincture on driving ability.

WHITE WILLOW (*Salix alba*) ++OTC

ACT: Analgesic; Antitoinflammatory; Antipyretic; Astringent

IND: Arthritis; Fever; Gout; Headache; Pain; Rheumatism; Toothache

POS: 1-2 g bark (20-40 mg salicin), 1-3x/day; 2-3 380 mg/capsules every 3 hrs

SEC: Commission E reports for oral use of bark, counter indications, adverse effects, and interactions: on theoretical grounds similar to those of the salicylates.

WILD YAM (*Dioscorea villosa*) +++

ACT: Antiinflammatory; Starter material for progesterone, testosterone and other steroids

IND: Steroids used for arthritis, dysmenorrhea, menopause, PMS

POS: 2-4 ml Liquid Extract; two 505 mg capsules/day; one 505 mg STX capsule/day

SEC: While the medicinal yams are so rich in saponins as to be distasteful, over consumption is not to be recommended. Reichert (1996) reports GI distress in volunteers taking high doses of wild yam, after saying that the investigators (Araghiniknam et al, 1996) he was reviewing "noted no adverse effects".

WITCH HAZEL (*Hamamelis virginiana*) ++ OTC

ACT: Astringent

IND: Bruises; Dermatitis; Diarrhea; Gingivitis; Hemorrhoids; Varicose Veins

POS: Topical

SEC: "It is not recommended that these extracts be taken internally because the toxicity of the tannins has not been well defined ... Doses of 1 g of witch hazel will cause nausea, vomiting or constipation." (LRNP, Sep, 1990)

YUCCA (*Yucca elata*) +++

ACT: Antiinflammatory; Starter Material for Steroids

IND: Steroids used for arthritis, dysmenorrhea, menopause, PMS

POS: Three 490 mg capsules 3x/day

SEC: Though large doses of saponins can be hemolytic and problematic, "little is known about the toxicity of yucca saponins." (LRNP, Mar, 1994)

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Herbal Alternative Indication Physician's

### "Farmaceutical" Pharmaceutical

Aloe Burns Silvadene cream

Aloe Ulcers Abx (Antibiotics)

Bearberry Cystitis Bactrim; Pyridium

Bilberry Diarrhea Imodium, Lomotil; Kaopectate

Bilberry Nyctalopia Vitamin A derivatives (NH)

Bilberry Retinopathy

Bilberry Varicosities ASA, Motrin; Dcleral Therapy

Bugleweed Graves Disease Iodine, PTU, Beta-Blocker

Calendula Acne Retin-A; Tetracycline

Calendula Sprain NSAIDS

Camomile Allergy Corticosteroids; Antihistamines

Camomile Dyspepsia Pepcid; Antacids; Reglan

Camomile Eczema Hydrocortisone cream

Camomile IBS Librax, Donnogel-PG; Donnatal

Capsicum Arthritic Pain Tylenol, NSAIDS

Capsicum Myalgia NSAIDS, Cyclobenzabrene

Capsicum Shingles Acyclovir; Famcyclovir

Celery Seed Arthritis NSAIDS

Celery Seed Hyperuricemia Allopurinol

Chaste Tree Mastodynia NSAIDS

Chaste Tree PMS NSAIDS: SSRI; diuretics; analgesics

Clove Toothache Ibuprofen; Aspirin

Clover Cancer Taxol; Chemotherapy

Coca Leaves Altitude Sickness O2; Diamox

Comfrey Decubitis Proshield

Comfrey Diabetic Ulcers Antibiotics, if infected

Cranberry Cystitis Bactrim; Antibiotics

Echinacea Adenoids See Allergy Treatment

Echinacea Bronchitis Abx; Atropine, Codeine; Dextromethorphan

Echinacea Cold Decongestants; OTCs; Tylenol

Echinacea Earache Abx, Decongestants

Echinacea Flu Tylenol, OTCs

Echinacea HIV Indinavir: Ritonavir; Lamuvidine

Echinacea Rhinitis Cromalyn; Vancenase; Phenylpropanolamine

Eggplant/Willow B-Cell Carcinoma Chemotx

Ephedra Narcolepsy Modafinil; Tricyclics

Evening Primrose Alcoholism Antabuse, Prozac

Evening Primrose Atopic eczema Steroids

Evening Primrose Att. Def. Disorder Ritalin; Some antidepressants

Evening Primrose Insomnia Halcion; Valium

Evening Primrose Mastodynia Ambien; NSAIDS; Progesterone

Evening Primrose Obesity Fen/Phen; Prozac; Redux

Evening Primrose PMS NSAIDS, Diuretics ; Analgesics

Faba Bean Parkinsonianism Amantadine; L-Dopa; Sinemet

Faba Beans Tardive dyskinesia Sinemet, Amantadine; Cosentrin

Fennel Gas Mylanta/Gaviscon; Simethicone

Fennel Oligolactea Prolactin

Fenugreek Hypercholesterolemia Mevacor, Niacin; Zocar

Fenugreek Micromastia Silicon

Feverfew Migraine Cafergot; Sumatriptan, Verapamil

Garlic Arteriosclerosis (Vasodilators) Hydralazine

Garlic/beans Diabetes II Diabeta, Metformin; Sulfuryurea

Garlic Encephalitis Interferon; Vidarabine

Garlic/beans Hypertension HCTE, Beta blockers, ACE-inhibitor

Garlic Yeast Lotrimin, Nystatin

Ginger Arthritis Tylenol, NSAIDS; Steroids

Ginger Dyspepsia Pepsid, antacids (NH)

Ginger Morning Sickness Vit. B6, Ginger, OTCs

Ginger Motion Sickness Scopolamine, Dramamine

Ginger Vertigo Mclizine, Antihistam.; Antiemetics

Ginkgo Alzheimer's Tacrine (Cognex)

Ginkgo Cerebral Circ. None

Ginkgo Interm. Claudication Trental

Ginkgo Tinnitus Steroids (rarely work)

Ginkgo Vertigo Meclizine, Antihist;Benzquidamide

Gobo/Tumeric Lymphoma Cortisone; Prednisone

Goldenseal Cankers Ambesol

Goldenseal Giardia Flagyl, Chloroquine

Goldenseal Gingivitis Abx; Peridex

Goldenseal Tonsillitis Abx

Goldenseal Vaginitis Clindamycin; Flagyl

Goldenseal Yeast Clotrimazole; Femstat; Monostat

Hawthorn Angina Beta-blocker; Nitroglycerin

Hawthorn Cardiomyopathy (Prev.) ACE-Inhib.; Vasodilators

Honeysuckle/Forsythia Incipient Flu No equivalent treatment

Hops Anxiety Ativan, Xanax, Klonopin, Paxil

Hops Insomnia Ativan, Halcion, Klonopin, Paxil

Horsebalm Alzheimer's Cognex (Tacrine)

Horse Chestnut Varicosities Heat/ASA

Horse Chestnut Ulcus cruris (Decubitus)

Hypericum Depression Prozac, Elavil, Trazadone, Zoloft

Jewelweed Poison Ivy Hydrocortisone cream

Jewelweed Urticaria Benadryl/Atarax; Antihist.

Kava/kava Anxiety Ativan, Klonopin; Paxil; Xanax

Kava/kava Dysmenorrhea Naprosyn

Kava/kava Stress Diazepam

Kudzu Alcoholism Antabuse

Lemonbalm Herpes Acyclovir, Zovirax

Lemonbalm Insomnia Ativan; Halcion;Klonopin; Paxil;

Licorice Ulcers Abx; Antacids; Beta-Block;Zantac

Marijuana Glaucoma Pilocarpine, Betoptic, Timoptic

Milk Thistle Hepatitis (Prev.) Interferon

Milk Thistle Cirrhosis No Effective Treatment

Milk Thistle Mushroom Intoxication No Effective Treatment

Mountain Mint Tick Repellent Deet

Passionflower Anxiety Adapin; Librium; Valium

Pectin Hypercholesterolemia Mevacor, Niacin; Zocar;

Peppermint Colitis Sulfasalazine

Peppermint Diverticulitis Abx

Peppermint IBS Librax, Donnogel-PG; Donnatal Prickly Ash Toothache NSAIDS; Analgesics

Quinidine Arrhythmia Beta-Block; Digoxin; Procainamide;

Raspberry Diarrhea Imodium

Raspberry Dysmenorrhea NSAIDS

Rosemary Alzheimer's Cognex (Tacrine)

Rutin Telangectasia Laser

Saw Palmetto BPH Hytrin, Proscar

Saw Palmetto Male Pattern Baldness Rogaine

Senna Irregularity Metamucil

Stinging Nettle Hayfever Antihist.; Decong.; Pseudoephedrine

Stinging Nettle Osteoporosis Calciferrin, ERT, Fosomax

Stinging Nettle Prostatic Dysuria Abx; Hytrin; Proscar

Sweet Annie Malaria Chloroquine; Daraprim; Lariam;

Sweet Annie Virus Acyclovir, Zovirax

Sweet Annie Yeast Clotrimazole; Femstat; Monostat Teatree Athlete's Foot Griseofulvin

Teatree Boils Erythromycin; Other Abx

Teatree Infection Erythromycin; Other Abx

Teatree Onychyosis Sporonox; Ketoconazole

Thymol/Carvacrol Low Back Pain NSAIDS, Analgesics; Myorelax

Turmeric Arthritis Analgesics; NSAIDS; Tylenol

Turmeric Lymphoma Chemotherapy

Valerian Anxiety Xanax, Valium Adapin ; Librium

Valerian Insomnia Xanax, Seconal

Willow Angina Nitroglycerin

Willow Arthritis NSAIDS, Tylenol, Analgesics

Willow Toothache Ibuprofen; Aspirin

Wintergreen Myalgia NSAIDS, Cyclobenzabrene

Yohimbe Impotence Yohimbine; Testosterone

Yohimbe Narcolepsy Modafinil; Tricyclics



## Module 6: NORTH AMERICAN MEDICINAL PLANTS

(Texts: Duke, 1986; Moerman, 1986)

### OUTLINE

#### A. American Herbs with European a/o Asian Success Stories

1. Bayberry (*Myrica cerifera*)
2. Bearberry (Uva Ursi) (*Arctostaphylos uva-ursi*)
3. Bilberry (*Vaccinium myrtillus*)
4. Black Cohosh (*Cimicifuga racemosa*)
5. Black Walnut (*Juglans nigra*)
6. Bloodroot (*Sanguinaria canadensis*)
7. Cascara sagrada (*Rhamnus purshianus*)
8. Coneflower (*Echinacea* spp.)
9. Cranberry (*Vaccinium macrocarpum*)
10. Evening Primrose (*Oenothera biennis*)
11. Ginseng (*Panax quinquefolius*)
12. Goldenseal (*Hydrastis canadensis*)
13. Mayapple (*Podophyllum peltatum*)
14. Passionflower (*Passiflora incarnata*)
15. Saw Palmetto (*Serenoa repens*)
16. Skullcap (*Scutellaria* sp.)
17. Slippery Elm (*Ulmus fulva*)

18. St. John's-wort (*Hypericum punctatum*)

19. White Pine (*Pinus strobus*)

20. White Oak (*Quercus alba*)

21. Wild Cherry (*Prunus serotina*)

22. Wild Yam (*Dioscorea villosa*)

23. Witchhazel (*Hamamelis occidentalis*)

24. Yew (*Taxus* spp.)

B. More localized (or introduced and weedy) here in America

1. Birchbark (*Betula lenta*)

2. California Poppy (*Eschscholtzia californica*)

3. Eyebright (*Euphrasia* sp.)

4. Horsebalm (*Monarda punctata*)

5. Horsetail (*Equisetum arvense*)

6. Ladyslipper (*Cypripedium* sp.)

7. Licorice (*Glycyrrhiza echinata*)

8. Lobelia (*Lobelia inflata*)

9. Pennyroyal (American) (*Hedeoma pulegiodes*)

10. Pilewort (*Collinsonia canadensis*)

11. Pokeweed (*Phytolacca americana*)

12. Sassafras (*Sassafras albidum*)

13. Willow (American species) (*Salix* sp.)

14. Wintergreen (*Gaultheria procumbens*)

1. Burdock (*Arctium lappa*) (?Introduced Weed)

2. Chickweed (*Stellaria media*) (Introduced weed)

3. Dandelion (*Taraxacum officinale*) (Introduced weed)

4. Dock (*Rumex obtusifolia*) (?Introduced Weed)
5. Honeysuckle (*Lonicera japonica*) (Introduced weed)
6. Kudzu (*Pueraria lobata*) (Introduced weed)
7. Red Clover (*Trifolium pratense*) (Introduced weed)
8. Sheep Sorrel (*Rumex acetosella*) (?Introduced Weed)
9. Stinging Nettle (*Urtica dioica*) (Introduced weed)
10. Valerian (*Valeriana officinalis*) (Introduced weed)

REFERENCES: Duke's *Handbook of Northeastern Indian Medicinal Plants* (1986); Moerman's *Medicinal Plants of Native America* (1986)

## THE TOP TEN

(GREEN IS GOOD)

1. *Echinacea* sp. Coneflower 9.9% 158,400,000
2. *Allium sativum* Garlic 9.8 156,800,000
3. *Hydrastis canadensis* Goldenseal 7.0 112,000,000
4. *Panax* spp. Ginseng 5.9 94,000,000
5. *Ginkgo biloba* Ginkgo 4.5 72,000,000
6. *Serenoa repens* Saw Palmetto 4.4 70,400,000
7. *Aloe* Aloe vera 4.3 68,800,000
8. *Ephedra* sp. Ma Huang 3.5 56,000,000
9. *Eleutherococcus senticosus* Siberian ginseng 3.1 49,600,000
10. *Vaccinium* spp. Cranberry 3.0 48,000,000

Echinacea's tops with you,

Can prevent the cold and flu;

N'you can run the flu away

With some garlic pills today.

It's sure that you can really heal

With a touch of goldenseal,

While the real ginseng is really cool;

Puts some power in your tool.

(Drink some ginseng with your lunch

Put some power in your punch)

If your memories fadin' way

Ginkgo pills will help it stay

You can keep your prostate well

With a saw palmetto pill

From the Bible you can learn;

'Bout Aloe, good for burns

China's known it all along,

'bout the magic of ma huang.

You can eliminate some stress

With eleuthero's caress

(Siberian ginseng, yes

Helps relieve you of your stress)

Urinary germs cut loose

With cranberries' healthy juice

QUAKER'S DOZEN

Keep depression on the run

With the magic of Saint John

Escape the sour grapes of wrath  
On the evening primrose path.

I wonder what's to be  
What will come of you and me  
We can't just pop a pill  
We depend on chlorophyll.

Take a moment if you will  
And give thanks to chlorophyll  
Think about it, you'll recall  
That it's green that feeds us all

The plants you will recall  
Make the food that feeds us all  
And the medicines they give  
Help the Herbal Village live

Not to mention all the flowers  
Help bring smiles to all our hours  
And there's more to all those blooms;  
They are loaded with perfumes.

Yes the flower in its grace  
Puts a smile on frowning face  
And I think that we all should  
Think about it if we would

GREEN is GOOD

Ladyslipper's scarce

And the goldenseal is rare

And the ginseng just ain't there

Beware

#### AMERINDIAN MEDICINAL PLANTS

The Indian branches of my family tree

Lay long concealed, moot mystery;

But my mother lately confided in me

My great aunt Extra was Cherokee!

Uncle Roland married quietly

Another Indian decorating my tree,

But the Cherokee side of my family tree

Leads elsewhere but not to me,

The trail of tears, but a memory;

Adopted into the family tree;

So I'm as caucasian as I can be,

And don't even think like the Cherokee

I thought was part of me (1986)

All that was written a decade ago

But now there's news you need to know

Irony has struck the family tree

My son John married Cherokee

His John, Kara and Sara make three

## Cherokee's back in the family tree (1996)

(First published in Duke's Handbook of Northeastern Indian Medicinal Plants, Quarterman Publications, 1986. Now only available, like several of Duke's books, from the American Botanical Council, P.O. Box 201660. Austin, TX 78720-1660)

I've seen published estimates of the Amerindian arrival on this continent ranging from 12,000 to 100,000 years ago. Virtually all non-headline hunting anthropologists will side with the shorter time span. I'll be generous and speculate that AmerIndians have had some 20 millennia to evolve an empirical relationship with the native American plants. Many of those "virtually all" anthropologists will speculate that man (*Homo*, sensu lato), not necessarily Chinese man has been in current China and probably also Java and India for at least a million years. Does that mean that the Ayurvedic, Chinese (TCM) and Jamu (Indonesian) traditional medicines are better because mankind (*Homos*, sensu lato) has coevolved with plantkind there for 1,000,000 years (1000 millennia). And that African *Homo*, for more than 2,000,000 years (2,000 millennia), has had even more time to coevolve with the African flora and fauna.

### Traditional Med Coevolution Millennia Generations

(Years)

EUROAMERICAN 500 0.5 25

AMERINDIAN ~20,000 20 1,000

AYURVEDIC ~1,000,000 1,000 50,000

CHINESE ~1,000,000 1,000 50,000

JAMU ~1,000,000 1,000 50,000

AFRICAN ~2,000,000 2,000 100,000

### Coevolution of Man with Traditional Medicine Systems

If we accept the very broad rounded numbers I have tabulated, then we see that the Asian traditions have coevolved with man for 50 times longer than the Amerindian, while in Africa, the cradle of mankind, man has coexisted and coevolved with the African Flora 100 times longer than the Amerindian has coevolved with the American Flora and Fauna, natural foods and medicines. Yet Eurocaucasians like myself are using more Amerindian medicinal plants than African medicinal plants.

Recent press suggests strongly the power or religion in medicine. While the Bible and Koran did not stress medicinal plants as much as faith in healing, both are full of references to medicinal plants. At the cross roads of the African and Eurasian world, the Holy Land Bridge marks the most likely "exodus" route for wander lusting early man leaving the African continent for the first time, to radiate out in various directions. The geographical crossroads was also an ecological crossroads, where rainforest and desert Africans funneled in to meet Mediterranean Africans. And evolved Africans and Caucasians would meet again and again in this narrows we call the Holy Land.

This leads to a deeper appreciation of early Arabic, Biblical, Coptic, and Moslem medicinal wisdom, which has roots several orders of magnitude earlier than our adventurous AmerIndians who crossed a colder, more cruel land bridge, another meeting of continents and life epochs. And the emigrating->immigrating bridge crossing first Americans brought with them genetic and mental recollections of many of the Russo/Sino/Tibetan foods and medicines, many of which have cognates here in North America. Perhaps some of the eurosiberian weeds, bitter herbs of the Bible, traveled with them, intentionally in their survival (food and medicine) kits or hitchhiking as homophilic weedy waifs, long associated with non-agricultural humans near human dwellings.

Perhaps the healthiest recommendation in the Bible is to "eat with bitter herbs", anticipating by a couple millennia the NIH appeal to eat your leafy veggies. The bitter herbs of the Bible have variously been interpreted to include chicory, dandelion, endive, lettuce, sheep sorrel, and watercress. Zohary (1982) adds dwarf chicory and poppy-leaved *Reichardia*, and by close juxtaposition, rocket. I find it more bitter than the endive, lettuce, and watercress. All of these bitter herbs contain many important nutraceuticals which primitive and modern agriculture tends to select against as seeds of more palatable variants are saved, more bitter ones discarded; or modern agriculture selectively breeds to diminish the bitter nutraceuticals. I suspect that a half cup a day each of five of these bitter herbs would lower the incidence of many diseases of modern man.

But the AmerIndians, like Caucasian Americans, have adopted many of these bitter herbs into their pharmacopoeia. Alphabetically first is the chicory, which the Cherokee and Houma used as a tonic for the nerves. Iroquois used the root as a wash and poultice for chancres and fever sores. This may even foreshadow the great antiviral news for chicory and its namesake cichoric acid. This news suggests that cichoric acid, perhaps in many of our bitter herbs, especially in dandelion and chicory, and the Amerindian coneflower, may have antiHIV activity.

Perhaps none of the Biblical bitter herbs are native to America, but all are represented among our weeds. Alphabetically second, dandelion, if alien, has nonetheless entered the pharmacopoeia, of the Aleuts, the Bella Coola, Cherokee, Chippewa, Delaware, Fox, Iroquois, Kiowa, Mohegan, Ojibwa, Papago, Potawatomi, Rappahannock, and Shinnecok, e.g. (Moerman, 1986). Modern Homo sprays his dandelion with pesticides, killing many less weedy plants, and perhaps himself, slowly, and then goes to the dugstore to buy a lecithin/selenium pill. The dandelion is one of the best sources of lecithin, according to my database. And all plants apparently contain selenium. The bitter compounds, mostly important phytonutrients for us, discourage herbivory and diseases of these bitter herbs, actually increasing their weediness. The meek shall inherit the earth. Where once the green trees were kissed by the sunrise There's a highrise 'tween the sunrise and the smog in your eye. All the other flow'rs got twisted by the herbicide squirt The last dandelions laughing, man's bitter dessert.

Before we go to the individual disease accounts, let me name the many important Amerindian medicinal plants that have made their way into world commerce, one, echinacea, being the biggest seller in herbal North American, and it was probably the most important Amerindian medicinal plant before the caucasian arrived.. Five others in the top ten US sellers are Amerindian herbs, cranberry (No. 10, a standby for cystitis), ginseng (No 4; for debility, stress, and some say impotence), goldenseal (No. 3, for most germ-induced diseases), saw palmetto (No.6, outselling the pharmaceuticals in Germany for BPH). Four also may be attributed to TCM, ephedra, ginkgo, ginseng, siberian ginseng The Chinese ephedra is clearly outselling the Amerindian ephedras, which contain less ephedrine a/o pseudoephedrine. Siberian Ginseng comes to us both from China and Russia, and it grows as a weed here at the Herbal Village. Who knows whence came number 2, garlic, but it was mentioned even in the Bible, and figures in all major pharmacopoeia. Only one of the top ten is African, aloe, also mentioned in the Bible. Two other that are gaining importance in the world market are evening primrose for acne, alcoholism and PMS, and passionflower, for insomnia and stress. Strangely capsicum, with its capsaicin, clearly an Amerindian,



food, spice and medicine, though it is one of the most widely advertised herbal medicines, from A to Z (Axsaine to Zostrix).

Too often we are provincial and only talk about North American herbs. But South America has produced several of the world's most important medicines, like quinine and ipecac, and food pharmaceuticals, like avocado; one of the best sources of MUFAs and the best plant source of vitamin D; brazilnut, world's best source of selenium; cacao, guarana and mate, important sources of xanthine alkaloids, like caffeine, theobromine and possibly theophylline; camu-camu, world's best source of vitamin C; capsicum, mentioned above as the unique source of capsaicin; mil-peso oil, a better source of MUFAs than olive oil; oil palm, one of the best sources of tocotrienols; papaya, unique source of papain and chymopapain; pineapple, unique source of bromelain.

#### GAIAN DISTRIBUTION OF PHYTOCHEMICALS

Once Gary Null asked me to discuss Amerindian medicinal plants for the following ailments. I could come up with a few fabulous, some good and more mediocre remedies, here at the Herbal Village. My herbal village concept came up many years ago after hearing David Hoffman talk about Gaia and about synergy, two very important concepts in my herbal philosophy. I talked about the Gaian distribution of important phytochemicals. There's e.g. a licorice in most pharmacopoeias, Amerindian, Ayurvedic, Chinese, European, etc. Though the species may be different, the chemical glycyrrhizin, and its medicinal attributes is common to all. Of the seven species of *Hypericum* I submitted to the NCI, all, including some strictly American species, contained hypericin a/o pseudohypericin, and one American species, *Hypericum hypericoides* contain more and showed more antiviral activity and would probably exhibit more antidepressant activity, than the more widely used *Hypericum perforatum*. Ramps and other wild onions share many chemicals and biological activities with the more famous garlic. The isoflavones antidipsomantic daidzein and antiangiogenic estrogenic genistein occur in most, if not all clovers, not just Chinese kudzu and Chinese soybean. I much prefer American black beans, butter beans and pinto beans to soybeans anyhow. They come out a little lower than some soy varieties, but I eat ten times as many, thereby getting more genistein from palatable amerindian beans than from oriental soybeans.

Analyses being published any day now by Peter Kaufmann, John Boik and myself, rank some 80 legumes as to genistein content. *Psoralea*, Indians black dotted bean was first at 2,150 pps, followed by kudzu root at a distant 315 ppms., then came fermented soybean ( I suspect that other beans that are fermented will have more genistein (one USDA study showed that fungal invasion increases genistein content 100-fold), then Baptisia at 350, Japanese pagoda tree at 180,, upine at 100, hog peanut at 85, with one soy at 70, anotehr at 40, tied with the more palatable tepary bean from out west. You mentioned alcoholism, and kudzu's daidzein is indicated for that. The faba-bean was by far our highest source of that. But as for total daidzein + genistein, it was *Psoralea*, 2250 ppms, kudzu root at 1265. Faba bean at 1,125 (and you can but a pound of them in a can for \$1.25 getting significant quantities of l-dopa in the process, which also might be useful in alcoholism), then fermented miso at 755, the Baptisia at 395, clover at 185, pagoda tree at 180 (also our best source of rutin, along with buckwheat and Native American polygonums), lupine at 125, hospheanuit at 115, vegetable soybean at 105, oreintal varieties of soybean and tepary bean at 75.

On every continent, some nettle, with its urticating acetylcholine a/o choline a/o formic acid a/o histamine a/o serotonin, has been used in primitive pharmacopoeia in self flagellation for arthritis and rheumatism. Most continents have endemic sources of the antiseptic alkaloid berberine, goldenseal and coptis in America, oregon grape in western America, yellow root in Appalachia, coptis et al in China, and members of the citrus family in Asia and Africa. The pycnogenols are in the American grapes as well as the normal source, European grapes. American and Chinese ginsengs share many of the same ginsenosides, folklore and hype. GLA not only occurs in our American evening primrose but also in

borage, currants and cannabis. Taxol has been found in every species of yew yet examined. And senna-like cassias on every warm continent contain the synergistic sennosides. The lignans, peltatin and podophyllotoxin, are not restricted to the American and Ayurvedic mayapple, but rather occur in many unrelated species, some widely distributed, some narrowly endemic, bush mints (hyptis), chervil, flax, junipers, e.g. Sitosterol from the saw palmetto has been praised for its antiprostatic activity, but sitosterol occurs in every continent, perhaps in every plant, along with campesterol, cholesterol and stigmasterol. The resveratrol is not restricted to the American, or the Chinese, or the European grapes, but probably occurs in many, if not all, astringent fruits.

And don't tell me that plant X will cure disease Y because it contains ascorbic acid, beta-carotene, glutathione, selenium, tocopherol. Probably all green leaves of all plant species contain these and thousands of other phytochemicals, many common to all living plants, somewhat fewer common to all life, and many rather but not totally ubiquitous in green plants, and perhaps fewer unique to that individual species. Our 100,000 genes, directing the thousands of homeostatic equilibrating chemical reactions between thousands of biochemicals and zoochemicals in our bodies, have been coevolving with perhaps as many biochemicals and phytochemicals, within the many culinary, food, and medicinal plants, some still extant, that our ancestors have ingested for millions of years. We ignore this empirical wisdom derived from this coevolution at our own risk. The empirical truths of the hundreds of existing forest-dwelling ethnic groups are dying with the wise old elders, just as the forest-dwelling species and their medicines for today's and tomorrow's diseases, will disappear. Our centennial synthetic pharmaceuticals, while sometimes quicker in action, are much more liable to upset our chemical equilibria, than are the millennial natural foods and medicines with which our ancestors coevolved. Though our own black walnut, resembling the brain, is the best source of that brainfood serotonin, most walnuts, hickories and pecans also contain high levels of serotonin. Natural salicylates probably occur in all willows, poplars, meadowsweets, and at lower levels in all plants. Rosmarinic acid, the famous antioxidant, is not restricted to rosemary. It occurs in most mints, including American bugle and self-heal, and many borage and verbena relatives.

## MEDICAL PROBLEMS AND AMERINDIAN SOLUTIONS

(Parenthetical more folkloric, or not yet proven)

Acne: Echinacea, Evening Primrose, Pineapple (AHA, proteolysis), (Goldenseal, Selfheal, Yarrow)

Alcoholism: Echinacea, Evening Primrose, (Hops)

Allergies: Nettles, Wild Onion

Alzheimer's: Horse Balm (Hound's Tongue)

Amenorrhea: Bugle, Mountain Mint, Pennyroyal, Spice Bush, Sweet Flag

Anemia: Grapes, Nettles Hematinic

Angina: Angelade, Hawthorns, Ramps, Wild Onions (Arbor Vitae)

Anxiety: Passionflower (Damiana, Hops, Hypericum)

Arrhythmia: Angelade, Hawthorns, Quinine

Arthritis: Cat's Claw, Cayenne, Chaparral, Cohosh, Dragon's Blood, EPO, Licorice, Meadowsweet, Nettle, Pineapple/Papaya, Willow, Wild Yam, Yucca

Atherosclerosis: Blueberry, Brazilnut, Hawthorn, Willow

Athlete's Foot: compounds in teatree (>30% terpinen-4-ol; <15% cineole)

Att.Def. Disorder: Evening Primrose, (kava polynesian; valerian a weed in Maine)

Boils: 50 herbs indexed

Bronchitis: Capsaicin and other hots, Echinacea, Garlic, Goldenseal, Osha burdock, goldenseal, ramps

Burns: Hypericum in EPO

Bursitis: Nettle, Papaya/Pineapple and CICs

Cancer: Mayapple, Yew, Pau D'arco, Cat's claw, Walnut

Preventives: Bugle, Burdock, Echinacea, Garlic, Selfheal

Candidiasis: Echinacea, Goldenseal, Wild Garlic

Cataracts: Bugle (rosmarinic-acid)

Colds & Flu: Cayenne, Dragon's Blood, Echinacea, Goldenseal, Slippery Elm; Walnut, Wild Onion, Willow

Constipation: Paleolithic Diet and then Cascara Sagrada, Senna

Cystitis: Bearberry, Cranberry

Depressions: Hypericum (Damiana)

Diabetes: Burdock, Legumes and the Desert Indians

Diarrhea: Bilberry and Blueberry

Diverticulitis: Paleolithic Diet

Dysmenorrhea: Cohosh, Evening Primrose

Ear Infections: Mullein and Goldenseal

Eczema: Evening Primrose

Flatulence: Any old mint, American or otherwise

Headaches: Angel's Trumpet, Walnut, Willow, Wintergreen

Hepatitis: American thistles and dandelions

Hypertension: wild garlics

Hypoglycemia:

Insects: Dittany, Horsebalm, Mountain Mint, Pennyroyal, Walnut

Menstrual Pain: American angelicas, EPO

Parasites: Barberry, Goldenseal, Ipecac, Quinine, Senna, Walnut

Pregnancy: Pennyroyal most mints

PMS: Cohosh, Evening Primrose

Prostate Conditions: Prosnut Butter: Saw Palmetto (all plants contain sitosterol), Pumpkin, Brazilnut, Licorice

Psoriasis: Barberry, Dragon's Blood, Goldenseal, Sarsaparilla

Ulcers: Licorice, Cayenne, Pumpkin (plus bactericides)

UTIs: Barberry, Bearberry, Burdock, Cranberry, Goldenseal, Wild Garlics.

Whiplash:

## Module 7: MICMAC MEDICINE MANUAL

"Human knowledge about foods and about medicines constitute two of the great epistemological treasures of our species." (Moerman, 1996)

In his brilliant analysis of the food and drug plants of native North America, Moerman (1996) updates his previously published totals. noting Native American medicinal uses for 2,564 species from a total flora of 21,615 spp indicating that Native Americans used more than 10% of their flora as medicine. It is of interest to us, in discussing the Micmac Medicines to note the top ten medicinal families, from Moerman's selective point of view (highest percentage of plants used medicinally).

Asteraceae 14.8% (397 of 2688) Pinaceae 50.0% (37 of 74)

Apiaceae 21.4% (85 of 397) Salicaceae 33.9% (38 of 112)

Ericaceae 29.6% (63 of 213) Caprifoliaceae 37.5% (30 of 80)

Rosaceae 15.9% (133 of 836) . Lamiaceae 15.4% (72 of 469)

Ranunculaceae 23.2% (74 of 319) Fagaceae 30.0% (28 of 94)

In the following table, I have gone thru one Micmac Book, accepting the scientific nomenclature as correct, although I am highly suspicious of those scientific names indicated by a ????. These data, after nomenclatorial scrutiny, will be entered into the ethnobotany portion of the USDA database I created, with the able assistance of Stephen Beckstrom-Sternberg. Its WWW address:

URL=<http://www.ars-grin.gov/duke/>

Finally we will merge this with Micmac data from Duke and Wain (1981) and those data provided by Dr. Moerman from his superb database to make a skeletal Micmac database, preparatory to field work in Maine and adjacent Canada.

*Abies balsamea* "Balsam Fir" "Fir" Asthma, Cold, Colic, Cough, Congestion, Cuts, Flu, Sores, Sore Throat, Tuberculosis, Ulcer

*Acer* sp. "White Maple" "Striped Maple" Cold, Congestion, Conjunctivitis, Swelling

*Achillea millefolium* "Yarrow" Bruises, Cold, Fever, Sprain, Swelling

*Acorus calamus* "Sweet Flag" "Flagroot" "Muskrat Root" Colic, Cholera, Cough, Belching, Cramps, Preventive, Stomach Cramps, Gastrosis, Preventive

*Alnus crispa* "Alder" Cathartic, Cramps, Depurative, Diptheria, Fever, Gastrosis, Lameness, Nephrosis, Neuralgia, Pain, Rheumatism, Wounds

*Anaphalis intercedens* "Everlasting" Fumitory

*Antennaria neodioica* "Everlasting" Fumitory

*Apocynum cannabinum* "Indian Hemp" "Worm Root" Vermifuge, Worms

*Aralia nudicaulis* "Sarsaparilla" Cold, Cough, Flu, Wounds

*Arctium minus* "Burdock" Depurative, Dermatosis, Tonic

*Arctostaphylos uva-ursi* "Kinnikinnick" "Bearberry" Fumitory, Urinary Antiseptic

*Arisaema trifolia* "Segabun" "Indian Turnip" Cold, Gastrosis, Tuberculosis

*Armoracia rusticiana* "Eptekeway" "Horse Radish" "Hot Root" Digestive, Inappetance, Stomach

*Asclepias syriaca* "Milkweed" Poison Ivy

*Betula alleghenensis* "Yellow Birch" Cramps, Diarrhea, Dyspepsia, Gastrosis, Cramps, Cramps, Rheumatism

*Chimaphila umbellata* "Prince's Pine" Tuberculosis

*Chrysanthemum* sp.?? "Field Daisy" Conjunctivitis

*Comptonia peregrina* "Sweet Fern" Boils, Dermatosis, Poison Ivy, Rheumatism, Sore, Tonic

*Coptis trifolia* "Goldthread" Chafing, Diabetes, Diarrhea, Inappetence, Stomatosis, Stomach Cancer, Tonic

*Cornus canadensis* "Bunchberry" Enuresis, Gastrosis, Hemorrhage, Nephrosis, Wound

*Cornus* sp. "Dogwood" Fumitory

*Cypripedium acaule* "Ladyslipper" "Moccasin Flower" Nervine, Tuberculosis

*Eupatorium perfoliatum* "Boneset" Arthritis, Cold, Insomnia, Gastric ulcers, Pain, Tonic

*Fagus grandifolia* "Beech" Antiseptic, Appetite, Enteritis, Hepatosis, Nephrosis, Rheumatism, Tonic, Tuberculosis

*Fragaria virginiana* "Strawberry" Cramps, Depurative, Dysentery, Gastrosis, Gingivitis, Tonic, Urinantiseptic

*Gaultheria procumbens* "Teaberry" Cardiopathy (Heart attack), Preventive (Heart attack), Stroke

*Hamamelis virginiana* "Witch Hazel" Aphrodisiac, Dermatosis, Headache, Rash, Swelling, Tea

*Heracleum lanatum* "Cow Parsnip" "Wabegpagosi" "Pagosi" Cold, Flu, Tuberculosis

*Iris versicolor* "Beaver Root" "Blue Flag" Antidote, Emetic

*Juniperus communis* "Juniper" Burns, Colds, Cuts, Flu, Gastrosis, Nephrosis, Rheumatism, Sore, Sprain, Tonic, Dysuria

*Kalmia angustifolia* "Lambkill" Poison, Rheumatism, Sore limbs, Swelling

*Larix laricina* "Hackmatack" Cold, Flu, Infections, Tuberculosis, Wounds

*Ledum groenlandicum* "Labrador Tea" Nephrosis, Tea, Tonic

*Lobelia inflata* "Indian tobacco" Asthma, Earache, Fumitory

*Mitchella repens* "Partridgeberry" "Squaw Vine" Parturition, Pregnancy

*Myrica pensylvanica* "Bayberry" Arthritis, Mouthwash, Pain, Rheumatism, Stomatitis

*Nicotiana tabacum* "Tobacco" Drowning, Earache

*Nuphar variegatum* "Big One Side" "Cow Lily" Swelling

*Nymphaea odorata* "Water Lily" Preventive, Swelling

*Panicum capillare* "Witch Grass" Tonic

*Picea* spp. "Cat Spruce" "White Spruce" "Black Spruce" "Spruce" Tuberculosis, Infections, Cold, Tonic, Laryngitis, Scurvy, Warts

*Pinus strobus* "White Pine" Cold, Hemorrhage, Nephrosis

*Plantago major* "Plantain" Gastrosis, Sore, Infection, Sore, Ulcer, Wound, Infection, Sore, Wound

*Populus* spp. "Bitterwood" Cold, Flu, Worms

*Prunus cerasus*, "Red Cherry" Cold, Cough, Hypertension

*Prunus serotina* "Black Cherry" Cold, Cough, Depurative, Flu, Tonic

*Prunus virginiana* "Bitterberry" "Chokecherry" Cough, Diarrhea

*Quercus* sp. "Oak" Hemorrhage, Piles

*Ranunculus acris* "Buttercup" Cancer, Headache, Phobia

*Rhexia virginica* "Meadow Beauty" Throat

*Rhinanthus crista-galli* "Yellow Rattle" Epilepsy, Fits

*Rhus typhina* "Staghorn Sumach" Cough, Earache, Sorethroat

*Rubus alleghenensis* "Blackberry" Canker, Diarrhea, Sorethroat, Stomach, Stomatosis

*Rubus idaeus* "Raspberry" Canker, Diarrhea, Sorethroat, Stomach, Stomatosis

*Salix discolor* "Pussy Willow" Bruises, Cancer, Cold, Nephrosis

*Salix* sp. "Red Willow" Fumitory

*Sambucus canadensis* "Elderberry" Cathartic, Emetic

*Sambucus pubens* "Elderberry" Emetic

*Sanguinaria canadensis* "Bloodroot" Hemorrhage, Rheumatism, Tuberculosis

*Sarracenia purpurea* "Indian Cut Root" "Pitcher Plant" Dyspepsia, Nephrosis, Tuberculosis

*Sorbus americana* "Mountain Ash" Stomachache, Witchcraft

*Symphoricarpus albus* "Waxberry" Headache, Tonic

*Symplocarpus foetidus* "Skunk Cabbage" Diabetes, Toothache, Tuberculosis

*Thuja occidentalis* "Cedar" Swelling

*Tilia* sp. "Basswood" Infection, Sore, Wound

*Trifolium* sp. "Clover" Fever, Stings

*Trifolium pratense* "Red Clover" Tonic

*Tsuga canadensis* "Hemlock" Cold

*Vaccinium macrocarpon* "Cranberry" Tonic

*Vaccinium myrtilloides*??? "Blueberry" Rheumatism, Tonic

*Verbasum thapsus* "Mullein" Asthma

*Viburnum trilobum* "Highbush Cranberry" Adenopathy, Swellings

*Viola arvensis*??? "Pansy" Conjunctivitis

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## Module 8: AMAZONIAN (IBEROAMERICAN)

*Abuta grandifolia* (Mart.) Sandwith. Menispermaceae. "Abuta", "Motelo sanango", "Trompetero sachá". The decoction of the stems and roots mixed with wild bee honey is used to treat sterile women. Root decoction used for post-menstrual hemorrhages.

*Ananas comosus* L. Bromeliaceae. "Piña", "Piña negra", "Huacamayo piña", "Gebero piña", "Garrafón piña", "Lagarto piña", "Jambo piña", "**Pineapple**". A refreshing drink is made from the pericarp decoction, which is also added to "chicha" to improve its taste. Preserves made with the fruit. The juice is astringent and anthelmintic. In the Philippines the fiber yields a very fine white thread (SOU). "Tikunas" grate the green fruits in water and take in the first or second month of pregnancy as abortifacient. Amazonian Brazilians take the fruit for dyspeptic flatulence (SAR). In Piura, practicing food "farmacy", the fruit is ingested for blenorrhagia, kidney stones, rheumatism, and worms.

*Annona cherimolia* Mill. Annonaceae. "Chirimolia", "**Custard apple**". Fruit edible. Chopped leaves applied to the nape of the neck for headache; leaf decoction drunk for dysentery; crushed seeds used to kill parasites (FEO).

*Annona muricata* L. Annonaceae. "Guanábana", "Chirimoya", "Chirimoya brasileira", "**Soursop**". Cultivated. Fruit edible fresh or in ice creams. Leaf decoction used for catarrh in Piura; crushed seed to kill parasites (FEO). Colonists from Risaralda use the plant for rachitic children. Bark, roots and leaves are used in teas for diabetes; also used as a sedative and antispasmodic (RVM). "Créoles" use the decoction of the leaves and bark as a sedative, yet heart tonic. They use *A. montana* the same way (GMJ). Tapajos natives use the leaf tea for the liver (BDS). Elsewhere used for chills, colds, diarrhea, dysentery, dyspepsia, fever, flu, gallbladder attacks, hypertension, insomnia, kidneys, nervousness, palpitations, pediculosis, ringworm, sores and internal ulcers (DAW).

*Annona squamosa* L. Annonaceae. "Anona", "**Sweetsop**". Cultivated. Fruit edible (RVM). Elsewhere used for abortion, bruises, carbuncles, chancre, cold, diarrhea, dyspepsia, fever, puerperium, rheumatism, spasm, syphilis, tumors, ulcers and venereal disease; considered astringent, insecticide, pectoral, pediculicide, purgative, soporific, tonic and vermifuge (DAW). Brazilians use the leaves in cough syrup (BDS). Like so many Annonaceae with seeds used to control insects and lice, this contains pesticidal acetogenins (JAD).

*Arrabidaea chica* (HBK) Verlot. Bignoniaceae. "Puca panga". Fresh leaves used in decoction alone or mixed with the fruits of *Renealmia alpinia* to dye fibers of *Astrocaryum chambira* or to make tattoos. This dye is also used to treat skin infections and herpes (RAR). Leaves also used as anti-inflammatory. "Chami" from Risaralda extract the red tint to dye baskets (RVM). "Tikuna" use leaf infusion for conjunctivitis (SAR). Acha' "Jivaros" chew the leaves with clay to blacken the teeth (SAR). Tapajos residents use leaf tea for anemia, blood disorders, inflammation.

*Banisteriopsis caapi* (Spruce ex Griseb.) Morton. Malpighiaceae. "Ayahuasca", "**Soul vine**", "**Spirit vine**", "Yagé". In some cases semicultivated by witches, shamans and ayahuasqueros. Stems used by native farmers and city folk as a purge. The "ayahuasca" is an hallucinogenic drink, much used in the old days in rituals. Now it is used for medicinal purposes and divination. It is said not only to cure all kinds of sickness, but to help in diagnosis, divination, and telepathy. It is also laxative and emetic. To prepare the "purge" it is recommended that the stem collector (the brujo) abstain from sex for at least a week before cutting the stems, and in the day of the gathering he should go without eating. This should be done either Tuesdays or Fridays in the morning. They have to cut and grind the stems and boil them until the liquid becomes dark; then pass through a sieve; once cool, it is ready to be taken. They generally use one species, sometimes mixed with other species of *Banisteriopsis*, as *B. longialata*, and

occasionally with other plants, such as: *Psychotria viridis*, *P. carthaginensis*, *Nicotiana tabacum*, *Brugmansia suaveolens*, *Malouetia tamarquina*, etc. *Tabernaemontana* sp., *Brunfelsia*, sp., *Datura suaveolens*, *Lochroma fuchsioides*, *Juanulloa*, cactus, ferns, etc. Contains alkaloids such as harmaline, tetrahydroharmine, harmol, harminic-acid methyl-ester, harminic acid, acetyl-norharmine, N-norharmine, N-oxyharmine, harmalinic acid, ketotetrahydronorharmine (RVM).

*Bauhinia guianensis* Aubl. Fabaceae. "Escalera de mono", "**Monkey ladder**". Used as an ornamental and for handicrafts (RVM). Amazonian "Tukuna" use stem for kidney diseases (SAR). "Taiwanos" consider the seed diuretic (SAR). The root is boiled with "sarabatuco" to treat ameba in Amazonian Brazil (BDS). Considered ichthyotoxic (RAR).

*Bixa orellana* L. Bixaceae. "Achote", "Achiote amarillo". Cultivated. Natives mainly use it for food coloring and to decorate their bodies. There are experimental plots for the extraction of bixin. In Piura, the shoot decoction is considered antidysenteric, antiseptic, antivenereal, aphrodisiac, astringent, and febrifugal (FEO). The foliage is used to treat skin problems and hepatitis; also used as aphrodisiac, antidysenteric, and antipyretic. Considered good for the digestive system, and for treatment of liver disease. Very effective as a gargle for tonsillitis (RVM). "Chinatecas" poultice leaves on cuts to avoid scars (RVM). People from Cojedes use the flower infusion as purge and to avoid phlegm in newborn babies. "Kayapo" massage stomachs of women in labor with the leaves. "Waunana" use to dye demijohns and baskets. Bark yields a gum similar to gum arabic. Fiber used as cordage. "Kayapo" use to tint to the body (RVM). Dye said to be an antidote for HCN (SAR). Seeds believed to be expectorant, the roots, digestive (SAR), antitussive (BDS). Around Explorama, fresh leaf stalks, devoid of blades, are inserted into a glass of water; the mucilage that forms is applied in conjunctivitis. (Fig. 36)

*Brugmansia aurea* Lagerheim. Solanaceae. "Toé", "Maricahua", "Floripondio", "**Angels trumpet**". Cultivated. Ornamental used as an hallucinogen, for telepathy and divinations. Some people smoke the leaves and the flowers in small quantities, as a substitute for marijuana. Brujos make a purge for dogs to make them good hunting dogs (EXP). Leaf decoction externally used for dermatitis and orchitis; chopped leaves antispasmodic, decongestant (FEO). The main alkaloid in *Brugmansia* is scopolamine, also found are: norscopolamine, atropine, meteloidine, noratropine, 3alpha,6beta-ditigloyloxytropine-7beta-ol, tropine, 3alpha-tigloyloxytropine RVM.

*Brunfelsia chiricaspis* Plowman. Solanaceae. "Chiricaspis", "Chiric sanango". Used as an additive in the preparation of hallucinogenic beverages (RVM). The hallucination has serious side effects, among them: chills, cold sweats, heavy tongue, itchiness, nausea, stomachache, temporary insanity, tingling, and vomiting (SAR). Used by the Indians for fever (SAR).

*Calycophyllum spruceanum* (Benth.) Hook. Rubiaceae. "Capirona". The wood, used for construction, is a favorite for firewood and charcoal. Natives boil 1 kg of bark in 10 liters of water to obtain 4 liters of medicine from which they drink 150 ml 3 times a day for 3 consecutive months for diabetes (RVM). Peruvians use the bark against "sarna negra", an arachnid that lives under the skin. Powdered bark is applied to mycoses (SAR). Considered contraceptive, emollient, vulnerary.

*Capsicum annuum* L. Solanaceae. "Pimiento", "Pucunucho", "**Sweet pepper**". Cultivated. Natives believe that to become a good blowgun shooter, one must chew and eat slowly a half dozen fruit before breakfast for 8 days. Studies report that this species is hallucinogenic, but they don't use it for this purpose. Curanderos use it in a maceration mixed with aguardiente to give as a purge for dogs to make them good hunting dogs. This species and *C. frutescens* are present in this maceration and also *Nicotiana tabacum*, *Brunfelsia grandiflora* ssp. *schultesii* and *Brugmansia* spp. (RVM). "Jivaro" apply the fruit directly to toothache (SAR). In Piura, the fruit infusion is considered antipyretic, tonic, and

vasoregulatory; the decoction used as a gargle for sore throat or pharyngitis; the tincture is applied to bugbites, mange, hemorrhoids, and rheumatism (FEO).

*Capsicum conicum* Mey. Solanaceae. "Carolito", \* "Coralito"\*. Cultivated. Considered one of the strongest chillies.

*Carapa guianensis* Aubl. Meliaceae. "Andiroba", "Requia", "**Brazilian mahogany**". An excellent wood for carpentry, comparable with the wood from *Cedrela odorata* and *Swietenia macrophylla*. The bitter bark infusion is believed febrifuge and vermifuge (SAR), also a tonic. Perhaps useful in herpes (RAR). Infusion used to wash dermatoses and sores (SAR). Seeds yield an oil, with the consistency of lard, used to coat wood to protect it from insects (SOU). Brazilians sell seed oil as antiinflammatory and antiarthritic (RVM). Also used in the soap industry. Fruit oil ingested for cough in Brazil (BDS). The "Wayãpi", the "Palikur", and the "Créoles" use it to remove ticks from their heads, also for *Schongastia guianensis*, which gets in the skin. Native Americans trust the oil as an emollient and antiinflammatory for skin rash (GMJ).

*Carica papaya* L. Caricaceae. "**Papaya**", "**Pawpaw**". Cultivated. Green fruit eaten cooked; ripe, eaten fresh or in juices. A dozen seed are swallowed as a vermifuge. For constipation, eat half a papaya. Rutter mentions use of papaya for acarosis, enteritis, and tachycardia (RAR). "Chocó" mix the latex with honey as vermifuge. Leaf infusion cardiotonic. "Cuna" use cooked roots for indigestion. Tikuna eat grated immature fruit with 2-6 aspirin, inducing abortion in about two days (SAR). In Piura, the leaf tea is considered digestive and hypotensive; chopped fruits are used as antiseptic (FEO). Brazilians make flower tea for heart and liver (BDS). Knowing that meat tenderizer (based on papaya's papain) had been used for sea nettle stings, JAD applied papaya juice to the rash Don Segundo induced by flagellating the wrist with stinging nettle. JAD had a reaction. Chymopapain has been used to dissolve herniated disks, but 1 in 4,000 people exposed to this treatment die of anaphylactic shock. Recent news has suggested that too much papaya might induce prostate cancer (JAD).

*Cassia reticulata* Willd. Fabaceae. "Retama". Sometimes planted as an ornamental. Flower infusion used for liver diseases, acid indigestion, upset stomach and kidney inflammation. Leaves and flowers contain antibiotics such as rhein (cassic acid), which is antibacterial against gram-positive and acid-resistant bacteria. The antibiotics reduce swellings of hepatic and renal sickness. Also used to treat venereal and skin diseases (LAE, RVM). Leaves used in baths for gastritis and ulcers (VDF). Used around Explorama for ringworm (JAD). "Boras" burn the leaves to repel sandfly *Lutzomyia* sp. "Manta blanca", vector of leishmaniasis. Used as a purge by the "Chocó". The Piria "Cuna" in the town of Piria (Panama) use it for stomachaches. Infusion of leaves and flowers used by the "Waunana" for stomachaches (RVM). "Witotos" use the roots in a febrifugal tea (SAR). "Tukanos" use leaves as insect repellents in clothes and hammocks (SAR). "Achuanos" value for fungal infections (SAR). Sometimes used for cardiac edema (NIC).

*Ceiba pentandra* (L.) Gaertn. Bombacaceae. "Ceiba", "**Kapok**", "Lupuna", "Lupuna blanca". Wood mainly used for plywood exports. Because it grows along the rivers with easy access, it has been overexploited to the point that it is disappearing. In the old days, trees served as guideposts for river navigators. "Wayãpi" associate this tree with jungle spirits. Bark decoction used in baths for fever (GMJ). Branch decoction diuretic and emetic (FEO). The cotton is used with blowguns (JAD).

*Cephaelis ipecacuanha* (Brot.) A.Rich. Rubiaceae. "Ipecac" Colombians chew the root as an insect repellent and amebicide. Crude extracts still find their way into millions of prescriptions a year in the US. Found in many US medicine chests to cause vomiting in children who have swallowed poison. Poison control centers should be consulted, though, as vomiting is counterindicated with some poisons. Emetine has elsewhere proved out against ameba, bilharzia, cancer, and guinea worms (JAD).

*Chondrodendron tomentosum* R.&P. Menispermaceae. "Ampihuasca", "**Curaré**". Some natives, crush and cook the roots and stems, adding other plants and venomous animals, mixing until it becomes a light syrup; they call this decoction "ampi", or "curaré", which they use on the tip of their arrows and darts. The active ingredient in "curaré" is D-tubocurarine, actually used in medicine. Brazilians consider the root diuretic, emmenagogue, and febrifuge (SAR), using it internally for madness and dropsy, externally for bruises. Used for edema, fever, kidney stones, and orchitis (RAR).

*Cissampelos pareira* L. Menispermaceae. "Imchich masha", "Barbasco". "Palikur" use the leaf poultice as an analgesic (GMJ). Seeds used for snakebite; diuretic, expectorant, febrifuge, piscicide, POISON, for venereal disease (RAR). Contains tetrandrine, which is analgesic, antiinflammatory, and febrifuge.

*Copaifera reticulata* Ducke. Fabaceae. "Copaiba", "**Copal**". On Rio Solimoes, resin used as a cicatrizant, for gonorrhea, psoriasis, and sores (SAR); in Piura used for catarrh, syphilis, and urinary incontinence (FEO). Plotkin (1993) notes that the resin (copal) is used to coat tubules exposed by the dentist drill. Once employed in the US as disinfectant, diuretic, laxative, and stimulant, as well as in cosmetics and soaps (MJP).

*Costus guanaiensis* Rusby var. *guanaiensis*. Costaceae. "Caña agria" "Cañagre". Used to reduce internal fever, cough, bronchitis, laryngitis, pharyngitis, stomatitis and tonsillitis; "Cuna" use the leaf decoction for stomachache (RVM). Maxwell chewed the cane when she had a cough (NIC).

*Croton lechleri* Muell.-Arg. Euphorbiaceae. "Sangre de drago", "Sangre de grado", "**Dragon's blood**". The latex is used to heal wounds, and for vaginal baths before childbirth. It is also recommended for intestinal and stomach ulcers (RVM). It yields the hemostatic sap that accelerates wound healing (NIC). For leucorrhea, fractures, and piles (RAR).

*Curarea tecunarium* Barneby & Krukoff. Menispermaceae. "Sacha ampihuasca", "**Wild curaré**". Sometimes used in preparation of "curaré". Used as a male contraceptive. Tests in rats show a decrease in testosterone levels (RVM). Ecuadorean "Waorani" use it for dermatoses and fungal infections.

*Curcuma longa* L. Zingiberaceae. "Guisador", "Azafran", "Palillo", "**Turmeric**". Cultivated. Rhizome frequently used as spice. Used for hepatitis. Rhizomes are crushed fresh and mixed with water. This juice is taken one spoon for children and 1 to 2 for adults, once a day for 10 to 15 consecutive days for hepatitis. Some people bathe in this extract. "Créoles" use it to treat injuries. Crushed rhizome, mixed with the leaves of *Siparuna guianensis* and of *Justicia pectoralis*, salt and rum, is poulticed on bruises on their backs. (Decoction of the three plants, taken 3 times a day, adding to this 3 drops of arnica tincture, and some sugar) (GMJ). The root contains at least 3 antiinflammatory compounds, curcumin, feruloyl, 4-hydroxy-cinnamoyl methane, and bis-14-hydroxy-cinnamoyl methane, dose dependent up to 30 mg/kg (Indian J. Mod. Res. 75:574. 1982).

*Cyclanthera pedata* (L.) Schrad. Cucurbitaceae. "Caigua". Cultivated. Fruit edible. It has various medicinal usages. The tea of the seeds is well known for controlling high blood pressure (RVM). De Feo suggests that the decoction of the epicarpis is also antidiabetic (FEO).

*Datura stramonium* L. Solanaceae. "Chamico", "**Jimsonweed**". Chopped leaves are applied to dermatitis, the decoction used as an antiseptic in vaginitis (FEO).

*Desmodium adscendens* (Sw.) DC. Fabaceae. "Amor seco", "**Beggar-lice**", "Margarita". The plant infusion is given to people who suffer from nervousness. It is also used in baths to treat vaginal infections. Because they believe this plant has magic powers, it is given to the lover who has lost interest in his mate, to make him/her come back. It is also used as a contraceptive (RVM). Rio Pastaza natives wash the breast of dry mothers with the leaf tea (SAR).

*Dioscorea bulbifera* L. Dioscoreaceae. "Ñati papa", "huayra papa", "**Air potato**". Cultivated. The tubers are edible. The crushed raw pulp is poulticed onto boils (RVM). Tubers considered alexeteric, antidotal, antiinflammatory, diuretic (RVM), hemostatic, even POISONOUS, and used for cancer, dysentery, fever, goiter, hernia, piles, sores, syphilis and tumors (DAW).

*Dipteryx odorata* Aubl. Fabaceae. "Charapilla del murciélago", "Shihuahuaco". The wood is used for bridges, dormers, posts, etc. (RVM). Seeds soaked in rum are used by the "Créoles" for snakebite, shampoos, contusions and rheumatism. The "Wayãpi" use the bark decoction as antipyretic baths, and the "Palikur" use it as fortifying baths for infants and small children (GMJ). Brazilians make a cough pill by balling up the crushed seed (BDS). Elsewhere used as anticoagulant, antidyspeptic, antitussive, cardiotonic, diaphoretic, febrifuge, fumigant, narcotic, stimulant and stomachic DAW. The coumarin explains its anticoagulant activity (JAD).

*Dracontium lorentense* Krause. Araceae. "Hierba del jergon", "Jergón sachá", "**Fer-de-lance**". Tuber believed to help snakebites perhaps on account of the snakeskin like mottling of the petiole. Some people whip their feet and legs with the branches to repel snakes. The corms are used to control and steady the hands. The roots are reported to be edible (DAT).

*Duroia hirsuta* (Poepp. & Engl.) Schum. Rubiaceae. "Huitillo del supay". These shrubs, associated with ants, grow in small homogeneous stands called "Supay chacra" (Devil's fields). Other plant species with ant symbioses: *Cecropia* spp., *Cordia nodosa*, *Tococa* spp., and *Triplaris* spp. The soil around *Duroia* is usually free of weeds, possibly because of the ants. Gentry and Blaney (pers. comm.) think it may be due to secretions or micro-organisms associated with the ants that prevent the growing of weeds and other plants. The forked stakes are occasionally used in construction. Rural people, superstitious about the "Supay chacra", avoid walking nearby. Some rural Colombians chew the fruits to prevent dental caries (RVM). "Waoranis" rub the ant pheromones inside their cheeks for oral aphthae (SAR). Putumayo natives bind a bark strip on the arm, both staining and scarring the area (SAR).

*Duroia paraensis* Ducke. Rubiaceae. "Pampa remo caspi". Wood for beams and decks (RVM).

*Eclipta alba* (L.) Hassk. Asteraceae. "Huanguilla", "Naparo cimarron", "Shobi isa sheta", "Naparo cimarron". Around Pucallpa, leaf maceration used for headache (VDF). In Brazil the plant is used as an antiasthmatic and as a depurative. "Créoles" rub the leaf decoction on children for skin blemishes. It is also used for albuminuria (GMJ). Folk remedy elsewhere for catarrh, copremia, cough, dyspepsia, elephantiasis, enterorrhagia, headache, hemorrhage, hepatitis, jaundice, lumbago, marasmus, pertussis, splenitis, toothache, and vertigo. Also considered estrogenic and insecticidal (DAW). Being seriously studied as a remedy for snakebite (JAD). The active ingredient wedelolactone is antiinflammatory and inhibits hemorrhage and the liberation of creatinine kinase induced by snake venom (Mem. Inst. Oswaldo Cruz 86 {Suppl.II}:203-5).

*Erythrina fusca* Lour. Fabaceae. "Amasisa", "Gallito", "**Swamp immortelle**". Semicultivated. Soil conservation species, adding nitrogen to the soil, used as ornamental and living fence. Bark decoction used to wash infected wounds to treat fungal dermatoses. Effective in a skin infection called "arco". Créoles use the root decoction as a sudorific to reduce fever caused by colds and malaria. Flowers in decoction regarded as antitussive. "Palikur" use bark of trunk and roots mixed with the bark of *Parkia pendula* to purify waters. Trunk bark put in hot water and poulticed onto migraine headaches (GMJ). Hartwell mentions its use for cancer (DAW).

*Erythroxylum coca* var. *ipadu* Plowman. Erythroxylaceae. "Ipadú". Cultivated, especially by the Amazonian ethnic groups of Peru, Brazil and Colombia. Cultivated by the "Boras" along the Rio Yaguasyacu; the "chacchado" or "chaw" is enjoyed during parties, work or spare time. To prepare leaves

for chewing, they roast them slowly in a clay pot; they fill their mouths with these leaves, occasionally adding ashes from *Cecropia* leaves and other plants to give a strong and better flavor. Chewing gives the sensation of increased energy and strength, leaving behind fatigue and hunger; also leads to euphoria and good disposition. Leaf infusion taken for gastrointestinal problems like diarrhea and indigestion. Coca is common in the religious and social life of Amazonian Peru (RVM). It is used in diarrhea and to help the mother get rid of unwanted blood after childbirth (RVM).

*Ficus insipida* Willd. var. *insipida* Moraceae. "Ojé", "Doctor ojé". Locals take latex as vermifuge, drinking one cup fresh mixed with orange juice, or with sugar cane juice. Those who take this purge must avoid greasy and salty foods for a week; they can not receive direct sun, and must avoid being seen by strangers to the family. Those not following this diet become "overo" (with white skin pigmentation) (RVM). Pucallpa residents rub the latex onto rheumatic inflammations (VDF). "Cuna" mix some latex with a liter of water, and drink some of this mixture every other day to get rid of intestinal parasites. In Piura, the leaf decoction is used for anemia and tertian fever. Contains phyllosanthine, beta-amyrin or lupeol; lavandulol, phyllanthol, and eloxanthine (AYA).

*Genipa americana* L. Rubiaceae. "Huito", "Huitol", "Jagua", "**Genipap**". Fresh fruit eaten for bronchitis; also used to make spiritous drinks. Cooking with brown sugar and aguardiente makes a nice dessert. Green fruit used to dye clothes, also used to paint and decorate their faces. Wood used in carpentry. Some people affirm that the fruit decoction is abortifacient. Don Antonio Montero claims that the strained fruit juice is good for cancer of the uterus. "Achuales" from Pastaza use the green pericarp to extract decayed teeth. "Achuales" and peasants near Iquitos cook the fruit and seeds; this decoction is use on baths for female genital inflammations. It also reduces swelling of the respiratory mucous membranes. "Kayapo" eat the fruit and use it to decorate their bodies. "Créoles" prepare a cathartic and antidiarrheic decoction; the same decoction is used in poultice to treat ulcers (GMJ). Haitians use for anemia, aphrodisia, blenorragia, diarrhea, gonorrhea, hepatoses, and tumors (DAW). Brazilians express the fruit juice, let stand overnight, and drink a small cup each day for 2 or 3 days for jaundice (BDC). Contains: genipin, mannitol, tannin, methyl-ethers, caterine, hydantoin, and tannic acid (RVM).

*Gossypium barbadense* L. Malvaceae. "Algodón", "**Cotton**", "Algodonero". Cultivated in small amounts. Ashes from dried buds used for diaper rash, and infected wounds. Leaf decoction used as oxytotic. Flower decoction used for hepatitis (RVM). Flower buds are used by the "Wayãpi" for earache. Leaves used for parasites, to eliminate filaria (GMJ).

*Guazuma ulmifolia* Lam. Sterculiaceae. "Bolaina", "Atadijo", "**West Indian elm**". Wood and bark for construction and ropes. Ripe fruits have a strong honey scent. Some people even chew the fruit to extract the sweet juice, spitting out the remainder. The macerated fruit mixed with aguardiente is used to scent the "siricaípe" or "mapacho". In Jamaica the bark is used to feed silkworms. Leaf decoction used for baldness, the bark decoction for dysentery (SOU). Elsewhere regarded as astringent, depurative, diaphoretic, emollient, pectoral, refrigerant, stomachic, styptic, and sudorific; used for alopecia, asthma, bronchitis, dermatosis, diarrhea, dysentery, elephantiasis, fever, hepatitis, leprosy, malaria, nephritis, pulmonosis, and syphilis (DAW, RAR).

*Heliotropium indicum* L. Boraginaceae. "Alacransillo", "Ihuin rao", "Ucullucui sacha". Around Pucallapa, used for scorpion stings and rheumatism (VDF). Elsewhere regarded as abortifacient (and ironically antiabortive), anodyne, astringent, diuretic, emmenagogue, emollient, pectoral, stomachic, and vulnerary; used for aftosa, asthma, boils, bugbites, calculus, cough, dermatoses, eczema, erysipelas, fever, furuncle, hyperuricemia, inflammation, itch, kidney stones, laziness, leprosy, myalgia, nephritis, ophthalmia, pharyngitis, rheumatism, scabies, sores, tumors, and warts (DAW). Folk remedy for cancer that contains an antitumor compound, indicine-N-oxide (JAD).

*Hibiscus sabdariffa* L. Malvaceae. "Rosella", **Roselle**". Brazilians poultice the leaves, mashed in salt and alcohol, onto wounds, especially streptococcus-infected wounds (erysipelas), which they call "isipla" on the Rio Tapajos (BDS). (They also apply the red-spotted tree frog to such wounds.)

*Hyptis capitata* Jacq. Coll. Lamiaceae. "Cadillo cabeza". Used in Ecuador for fungal infections (in Taiwan for asthma, colds, fever), the aerial parts contain the antioxidant rosmarinic acid, oleanolic-acid, and ursolic acid, stigmasterol, 10-epi-olguine, and 2,3-di(3',4'-methylenedioxybenzyl)-2-buten-4-olide, a lignan, and apigenin-4',7'-dimethyl-ether. No alkaloids. Crude extracts showed little fungicidal or insecticidal activity. (PC 30(8):2753-6. 1991).

*Ilex guayusa* Loes. Aquifoliaceae. "Guayusa". Cultivated. In Piura the leaf decoction, considered antipyretic, antirheumatic, antiseptic, and cholagogue, is used to treat venereal diseases and female sterility (FEO). Leaf infusion used by the "Achuales" as an emetic. Women get up early in the morning and prepare the infusion in the biggest pot available; then everyone, including the children, drinks as much as they can, and minutes later they all start vomiting. They do this to clean body and spirit; bad things they have consumed the day before are eliminated, to start a new day with clean body and renewed spirit (RVM). Amazonian Ecuadorians drink guayusa to settle nerves and to prevent the ayahuasca hangover. Also believed useful in aphrodisia, dysmenorrhea, fever, hepatosis, malaria, pregnancy, stomach problems, syphilis, and perhaps other venereal diseases (SAR).

*Iryanthera paraensis* Huber. Myristicaceae. "Cumala colorada". The fruit has edible arils (RVM). "Waorani" rub the inner bark and/or resin onto fungal infections and mites (SAR).

*Jacaranda copaia* Aubl. ssp. *spectabilis* A. Gentry. Bignoniaceae. "Asphingo", "Chichicara caspi", "Huamanzamana", "Ishtapi", "**Jacaranda**", "Mami rao", "Meneco", "Paravisco", "Soliman". Wood for light construction; to make furniture, pulp for paper, beams and decks (RVM). Pucallpa natives use the leaf decoction for bronchitis, fever, rheumatism (VDF). "Andoke" use crushed leaves as a cicatrizant on wounds (SAR). Rio Vaupes natives use shredded bark in teas for colds and pneumonia, the sap for skin infections (SAR). Elsewhere considered cathartic and emetic (DAW). Brazilians believe burning the leaves and bark will keep illness and mosquitoes away. Also used for sores, syphilis, and toothache (dental abscesses) (RAR). "Créoles" and "Maroons" use it for leishmaniasis (MJP).

*Jatropha gossypifolia* L. Euphorbiaceae. "Piñón negro", "**Black physic nut**". Cultivated. Latex used as a cicatrizant for infected wounds and erysipelas (BDS). Seeds contain oil and have purgative and emetic properties. The leaf decoction is used for venereal diseases as blood purifier, and as an emetic for stomachache. The roots are used as antidote to *Hippomane mancinella* and *Guarea guara*. The latex is used for hemorrhoids and burns. The leaves are poulticed onto swellings (PEA, SOU). Leaf tea used in baths for flu in Brazil (BDS). Mashed leaves poulticed onto headache (RAR). "Créoles" use seed oil and leaf decoction as a purge; "Palikur" and "Wayãpi" use against witchcraft (GMJ). Another example of a reputedly POISONOUS folk cancer remedy containing compounds with antitumor activity, e.g. jatrophone (CRC).

*Laportea aestuans* (L.) Chew. Urticaceae. "Ishanga blanca", "**White nettle**". Commonly used to relieve rheumatic pains, and to whip children when they misbehave. Used by the "Créoles" as a diuretic (GMJ). Elsewhere used for burns, constipation, dysentery, rickets, and wounds (DAW).

*Lonchocarpus nicou* (Aubl.) DC. Fabaceae. "Barbasco", "Cubé", "**Rotenone**". Semicultivated. Even though fishing with barbasco or other ichthyotoxics is forbidden, this plant is still being used in places (RVM). Brazil's "Timbo", at 3 ppm, eliminates piranha and their eggs in 15 minutes (MJB). "Ketchwa" and "Shuar" use in arrow POISONS (SAR). Brazilians use *L. urucu* to kill leaf cutters (SAR).



*Luffa operculata* (L.) Cogn. Cucurbitaceae. "Espongilla", "**Sponge gourd**". Dry fruit "skeleton", with a sponge consistency, used for cellulitis, etc. Fruit mixed with *Jatropha curcas* for sinusitis (RVM). Brazilians use the purgative fruit pulp for dropsy (SAR), massaging rheumatism with bits of fruit in andiroba oil. Fruit tea somewhat POISONOUS, ingested for rheumatism (BDS). Considered abortifacient (RAR). Contains luffanine (SAR).

*Maclura tinctoria* (L.) Gaud. Moraceae. "Insira", "Insira amarilla". Fruits edible. Wood occasionally used in carpentry. Cotton soaked in the latex is used to relieve toothaches. An olive green dye is derived from the plant. Because it contains phloroglucin and gallic acid, it is probably antiseptic and astringent. Moringin is also antiseptic (AYA). This species also works as diuretic and anti-venereal. Highly recommended for urinary infections like blennorrhea. Colombians soak latex in 'cotton' of *Ochroma pyramidale* or *Ceiba samauma*, using it as a filling. Latex removes teeth, whether carious or healthy, without pain and bleeding (NIC). Used by the "Chami" for lumber. Considered analgesic, diuretic, purgative; used for cough, gout, pharyngitis, rheumatism, sore throat, syphilis (RAR).

*Mammea americana* L. Clusiaceae. "Mamey", "**Mamee apple**". Fruit edible (JAD). In Amazonian Brazil, latex, bark and/or fruit pulp are used for bugbites and parasitic infections (SAR). Seeds considered antieczemic, febrifuge, insecticide, parasiticide, vermifuge (RAR).

*Manihot esculenta* Crantz. Euphorbiaceae. "Cassava", "Mandioca", "Yuca". Cultivated. Many cultivars are morphologically different, and vary in cyanide content. Some are quite POISONOUS (JAD)! The edible roots yield farina, tapioca, and starch. Roots are used cooked, fried, roasted, and in other culinary applications. Also used to make the popular alcoholic refreshments, "mazatto", and "beshu", as well as a gelatinous beverage. Only "cassaba brava", is used to make farina. A poultice of cassava mixed with aguardiente, is used for chills and fever (RVM). "Créoles" apply to a child's body a mixture of starch and rum to relieve cutaneous eruptions. "Wayãpi" use leaves as a "remedy against the arrow", also in hemostatic poultice. They use root juice in ritual baths to treat sterility in women. The "Palikur" use the starch in poultice soaked in oil of *Carapa* sp. for tender muscles (GMJ). "Makuna" use the yuca water to treat scabies (SAR). "Witoto" used the leachings from cyanidiferous yuca as a fish POISON (SAR). A cupful of sweet squeezings is given for diarrhea (SAR).

*Mansoa alliacea* (Lam.) A.Gentry. Bignoniaceae. "Ajo sacha", "Boens", "Nia boens", "**Wild garlic**". Alcoholic maceration of the stem and roots used for rheumatism; leaf infusion used in baths to relieve "manchiari" (a nervous state caused by terror or sudden shock), especially in children. Also used as cleansing baths for bad luck. "Achuales" use the roots as antirheumatic (RVM). "Créoles" use the stem decoction in baths, to relieve fatigue and small needle-like cramps. "Palikur" use it to protect themselves against the bad spirits (shades of Dracula?). "Wayãpi" use the decoction of leaves and stems as antipyretic baths (GMJ), Tapajos natives for body aches, flu (BDS). Contains alline, allicin, allyl-disulfoxide, diallyl sulfide, dimethyl sulfide, divinyl sulfide, propylallyl disulfide (AYA), and two cytotoxic naphthoquinones, 9-methoxy- $\alpha$ -lapachone and 4-hydroxy-9-methoxy- $\alpha$ -lapachone (Phytochemistry 31(3):1061. 1992).

*Maytenus macrocarpa* (R.&P.) Briq. Celastraceae. "Chuchuasi", "Chuchasha", "Chuchuhuasi". Bark maceration considered antidiarrheic, antiarthritic, used to regulate menstrual periods, for upset stomach. Its main use is in a cordial! Bark decoction used for dysentery. The wood is used for lumber (RVM). A shot of chuchuhuasi with aguardiente and honey was given many ecotourists on departure from the Iquitos airport in 1991 (JAD). Aril of a Brazilian species contained 8,500 ppm caffeine (SAR). "Siona" boil stems in water for arthritis and rheumatism (SAR, under *M. laevis*). Under the name *M. ebenifolia*, Maxwell mentions the "chuchuhuasi" as an effective insect repellent. "Chuchuhuasi" is "probably the best known of all jungle remedies, in Colombia as well as Peru. Aphrodisiac...best of all antirheumatic medicines" (NIC).

*Momordica charantia* L. Cucurbitaceae. "Papailla", "**Balsam pear**". Fruit edible cooked. Plant decoction used for colic, and worms; infusion of fruit and flowers used for hepatitis. Seed pulp mixed with lard as a suppurative (SOU). Considered vermicide, stomachic, emmenagogue, and very effective in the expulsion of *Trichocephalos*. Fruit decoction used as febrifuge and emetic (PEA). Leaf decoction used by the "Cuna" for measles (RVM), by Brazilians for fever, itch, and sores (BDS). Seeds and pericarp contain saponin glycosides which produce elaterin and alkaloids, which causes vomiting and diarrhea (LAE). Leaf infusion a common folk remedy for diabetes around Iquitos (AYA). TRAMIL cites it as relatively POISONOUS (TRA). On the patent for Compound Q for AIDS, as a source of momocharin. Also contains rosmarinic acid, with antiviral activity and calceolarioside and verbascoside.

*Mucuna pruriens* (L.) DC. Fabaceae. "Nescafé", "Nescao". Cultivated. Toasted ground seeds are used as a coffee substitute (RVM). Elsewhere regarded as anodyne, antidotal, aphrodisiac, diuretic, nervine, resolvent, rubefacient, and vermifuge; used for anasarca, asthma, cancer, cholera, cough, diarrhea, dogbite, dropsy, dysuria, insanity, mumps, pleuritis, ringworm, snakebite, sores, syphilis, tumors, and worms (DAW). Interesting that this reputedly aphrodisiac plant should contain l-dopa, side effects of which include priapism (JAD).

*Myroxylon balsamum* (L.) Harms. Fabaceae. "Balsamo", "Estoraque", "**Balsam of Peru**". For parquets, dormers, posts, jam poles, handicrafts, keel plates for boats. Resin from trunks believed antipyretic and cicatrizant. Resin used for colds, lung ailments (SAR), abscesses, asthma, bronchitis, catarrh, headache, rheumatism, sores, sprains, tuberculosis, venereal diseases, and wounds (DAW, RAR). Powdered bark used as incense (SOU).

*Nicotiana tabacum* L. Solanaceae. "Tabaco", "**Tobacco**". Cultivated. The black tobacco "mapacho or siricaípe", is smoked during the ayahuasca, witchcraft, healing, and cleansing rituals; the pitch left from the smoke is picked up on a piece of paper and applied on the skin to kill worms. Powdered tobacco is mixed with aguardiente and given to dogs to make them better hunters. "Créoles" mixed the dried leaves with *Scoparia dulcis* leaves, while the "Wayãpi" use the pitch, to suffocate the larvae of the worm "macaco", *Dermatobia hominis* (Euterebrites), parasites which live in the skin of humans and dogs. "Palikur" poultice it onto migraine headaches; it is also used as a cholagogue to treat liver diseases. One drop of tobacco juice makes a strong collyrium (GMJ). "Bora" and "Witoto" poultice fresh leaves onto boils and infected wounds (SAR). "Jivaro" take tobacco juice for chills, indisposition and snakebite (SAR). "Tukanoan" rub the leaf decoction onto bruise and sprains (SAR). Many Indian groups used it for lung ailments (SAR). In Piura the leaf decoction is applied externally for parasites and rheumatism.

*Ocimum micranthum* Willd. Lamiaceae. "Albaca", "Iroro", "Pichana albaca", "Pichana blanca", "**Wild basil**". Used for fever and headache around Pucallpa (VDF). Said to be hallucinogenic (RVM). "Créoles" prepare a collyrium from the flowers; with the decoction they make a tea to treat flu. The maceration is used by the "Wayãpi" in antipyretic baths, and in massage to relieve colic (GMJ). Leaves are used to relieve gastric pains (RVM). "Tikuna" wash the head with leaf macerations for fever (SAR). Leaf juice dropped into eyes for conjunctivitis (SAR). Sometimes used as spice and perfume (SAR). Tapajos residents use the plant on bugbites and stings.

*Passiflora quadrangularis* L. Passifloraceae. "Tumbo", "**Giant granadilla**". Cultivated. Fruits edible; stems are considered POISON; the leaves, roots and flowers abortifacient. "Chami" make an infusion to treat fractures and bruises (RVM). Elsewhere considered calmant, CNS-depressant, cardiodepressant, decongestant, depurative, emollient, narcotic, sedative; used for arthritis, diabetes, hoarseness, hypertension, inflammation, liver ailments, neuralgia, sorethroat, and uvulitis (DAW). Contains noradrenalin (JBH).

*Paullinia cupana* HBK. Sapindaceae. "Guaraná", "**Cupana**". Cultivated. Seed decoction an astringent, bitter, nervine tonic (FEO). From the seeds is prepared commercial guarana. Considered a preventive for arteriosclerosis, and an effective cardiovascular drug; also used to treat chronic diarrhea. Considered analgesic (MJB), aphrodisiac, astringent, febrifuge, intoxicant, piscicide, stimulant, and tonic; used for diarrhea, dysentery, hypertension, migraine, neuralgia (DAW, RAR). Seeds contains >5% caffeine, cf tea with 2.2%, and toasted coffee with 0.8%, green coffee with 2.2% , and cacao with 1.1% (RVM). Traces of theobromine and theophylline also occur (Int. J. Pharmacogn. 31(3):174. 1993).

*Persea americana* Mill. Lauraceae. "Palta", "Huirapalta", "**Avocado**". Cultivated fruit tree. Fruit juice considered aphrodisiac, used against dandruff and alopecia (FEO). Leaves well known as stomachic, emmenagogue, and resolvent. Seed decoction is an antidiarrheic, also used as an abortive. Used to treat amebic dysentery, diabetes, and snakebite (SOU). Also well known as antidiabetic (RVM). It eliminates uric acid, is a reconstituent tonic, antianemic, diuretic, antiinflammatory for the liver, for renal calculus, to strengthen weak muscles, for dysentery, and it is a mild aphrodisiac (RVM). "Tikuna" drink a cup of avocado leaf tea before meals to clean the liver (SAR). "Ketchwa" crush seed with *Brownea* wood and *Rudgea* leaves and make a decoction, said to stop menstruation for 3-6 months (SAR). As contraceptive, the seed decoction is taken each month during menses (SAR). "Siona-Secoya" also use as contraceptive (SAR). Ecuadorian "Shuar" take crushed seed in aguardiente for snakebite (SAR). Monounsaturates like oleic-acid are the health food rage now; avocado proved highest among 1,200 species (JAD).

*Petiveria alliacea* L. Phytolaccaceae. "Chanviro", "Micura", "Mocosa", "Mucura", "Sacha ajo". Reportedly abortive, antispasmodic, antirheumatic, antipyretic, diuretic, emmenagogue, sudorific; mostly used in magic rituals call "limpias" ("cleansing"). The curanderos bathe the patients in the liquid left from the infusion to cleanse them from the "salt" (bad luck); other people bathe with it on the first hour of the new year. Colombians chew the plant in order to coat their teeth and protect them from cavities (GAB). Also used in ritual amulets. Preclinical tests show depressive effects on the central nervous system (CNS), with anticonvulsive effects (RVM). "Créoles" use it to get rid of bad spirits; the roots are antispasmodic and antipyretic; the leaf decoction, sudorific and cough suppressant. "Palikur" use to protect their children against bad luck, and in baths for the vitamin deficiency called "coqueluche" (GMJ). "Tikuna" bathe feverish patients in the leaf infusion and wash headache with the decoction. For bronchitis and pneumonia, a drop of kerosene and lemon juice is added to a teaspoon of macerated leaves (SAR). Rutter mentions beriberi, cramps, nerves, paralysis, rheumatism, scabies, scorpion sting, spider bites, toothache, venereal diseases, and vision, calling the herb abortifacient, analgesic, contraceptive, diuretic, emmenagogue, vermifuge, and insecticide (RAR). Independently, two different sources, one Venezuelan, one Colombian, related anecdotes about "curing" pancreatic cancer with *Petiveria* (JAD). Tramitall but endorses inhalation of the aroma for migraine and sinusitis, and using as a mouthwash for toothache (TRA).

*Phyllanthus niruri* L. Euphorbiaceae. "Chanca piedra", "Sacha foster", "**Stone-breaker**". Like other species, quite effective in eliminating kidney- and gallstones (NIC). Considered anodyne, aperitif, carminative, digestive, diuretic, emmenagogue, laxative, stomachic, tonic and vermifuge, used elsewhere for blennorrhagia, colic, diabetes, dropsy, dysentery, dyspepsia, fever, flu, gonorrhea, itch, jaundice, kidney ailments, malaria, proctitis, stomachache, tenesmus, tumors and vaginitis (DAW). Plant has proven antihepatotoxic, antispasmodic, antiviral, bactericidal, diuretic, febrifugal, and hypoglycemic activity (TRA).

*Physalis peruviana* L. Solanaceae. "Aguaymanto". "**Cape gooseberry**". Fruit edible. Fruit juice for pharyngitis and stomatitis, the infusion as an ocular decongestant, the diuretic leaf infusion for cough and jaundice (FEO).

*Piper angustifolium* R.&P. Piperaceae. "Cordoncillo", "Matico". Leaves applied externally as antiseptic vulnerary; the tea consumed for bronchitis, dysentery, gonorrhea, inflammation, and malaria (FEO, RAR). Infusion washed onto rheumatic areas around Pucallpa (VDF).

*Piper peltatum* L. Piperaceae. "Santa María". Leaves used as table cloths, to wrap food (RVM), and rubbed on the body as a tick repellent (DAW). Leaf decoction used as a diuretic, antipyretic, and emetic. The leaves passed over fire are applied directly on the head to relieve and reduce the swelling caused by trauma and hernias. Leaf poulticed onto sores (DAT). Believed anodyne, antibleorrhagic, antiinflammatory, diuretic, lenitive, pediculicidal, piscicidal, resolvent, sudorific, vermifuge (JAD, RVM). "Créoles" use it as an antineuralgic, the leaf infusion as a sudorific (GMJ). Elsewhere used for abscesses, burns, colds, erysipelas, headache, hepatitis, leishmaniasis, swellings, toothache and urethritis (DAW).

*Portulaca oleracea* L. Portulacaceae. "Verdolaga", "**Purslane**". Crushed plant used for fever, stings, and swellings. Containing noradenaline, purslane might logically be rubbed onto beestings and/or placed under the tongue, especially of allergic people (JAD). "Créoles" prepare an antidiabetic, digestive, and emollient tea. Used by the Palikur as a hypotensive (GMJ) (but contains hypertensive compounds JAD). Elsewhere considered alexeritic, alterative, aperient, astringent, bactericidal, cardi tonic, demulcent, detergent, diuretic, emmolient, fungicidal, hemostat, refrigerant, sedative, vermifugal and viricidal; used folklorically for anthrax, bladder ailments, blenorrhagia, boils, bugbites, burns, colds, colic, dermatitis, diarrhea, dysentery, dyspepsia, earache, eczema, edema, enterorrhagia, erysipeals, fever, gonorrhea, gravel, hematuria, hepatitis, herpes, hyperglycemia, hypotension, inflammation, insomnia, leucorrhea, nausea, nephritis, palpitations, piles, pleuritis, pruritis, snakebite, sores, splentitis, strangury, swellings, toothache, tumors,, warts and wounds DAW. A rather promising chemopreventive (= "cancer-preventive") herb, loaded with antioxidants (JAD). Seeds of *P. peruviana* I.M. Johnston are considered emmenagogue and vermifuge. The shoot decoction, considered diuretic and cholagogue, is used for headache. Shoots are chopped and applied in pork fat to hemorrhoids (FEO).

*Pourouma cecropiaefolia* Mart. Moraceae. "Baacohe", "Ubilla", "**Grape tree**". Cultivated. Fruit edible, produced ca 3 years after planting (MJB). Wood used for paper pulp, and the toasted seeds as a substitute for coffee (RVM). Leaf ashes sometimes substituted for *Cecropia* as a coca additive. "Bara-Maku" use root scrapings to induce permanent sterility (SAR). "Cubeo" use as a masticatory, elsewhere considered intoxicant (DAW).

*Psidium guayaba* L. Myrtaceae. "Guayabo", "Guayabo blanco", "**Guava**". Cultivated. Fruit is edible. Wood used to for tool handles, and for the "tramojo" (an implement put on pigs so they cannot walk easily). The infusion of foliar buds is used for diarrhea (especially that caused by bacteria, AYA). Also used for sanitary napkins; for dentition, and swellings of gout (VAM). "Exumas" use the leaves and roots for diarrhea. Natives of Cojeles (Venezuela) use the bark decoction for diarrhea, the floral infusion to regulate menstrual periods (FOR). "Créoles" and "Wayãpi" use decoction of bark, leaves, and shoots for diarrhea (GMJ). Tramil recommends the leaves for diarrhea, emotional shock, vertigo, and vomiting (TRA).

*Quassia amara* L. Simaroubaceae. "Amargo", "Cuasia", "**Bitterwood**". Insecticidal, tonic, for fever and hepatitis (RAR). Brazilians use the leaf tea in bathing for measles (BDS), a remedy that sounds a bit better than tea of ashes of dry white dog dung. Brazilians also wash the mouth with leaf tea after tooth extraction. Surinamese "Maroons" use the bark for fever and parasites (MJP). Potent aphidicide (MJP).

*Rauwolfia tetraphylla* L. Apocynaceae. "Misho runto", "Pelilla", "Sanango", "Turcassa", "**Amazonian snakeroot**". Around Pucallpa, the leaf decoction is used for toothache (VDF). "Shipibos", "Yaguas", and "Achuales" use the roots as arrow POISON (AYA). Reserpine, tetraphylline, and tetraphyllicine are obtained from this species and from *R. sprucei* (LAE).

*Renealmia alpina* (Rottb.) Maas. Zingiberaceae. "Mishquipanga". Fruits yield a red-purple dye used for cloth and handicraft. Don Segundo suggests this plant as an ephemeral mosquito repellent; it seems to work, albeit briefly, on some of us.

*Ryania speciosa* Vahl var. *tomentosa* (Miq.) Monach. Flacourtiaceae. "Esponja huayo", "Espuma huayo". Highly toxic species used by the "Paumari" as fish POISON; used for making insecticides (RVM). On Rio Negro, they used the roots for rat POISON (SAR) "Maku" said to use the plant for euthanasia, homicide and suicide (DAW).

*Scoparia dulcis* L. Scrophulariaceae. "Bati matsoti", "Escobilla", "Ñucñu-pichana", "Piqui pichana". Leaf infusion used for bronchitis, cough, diarrhea, fevers, kidney diseases, and hemorrhoids (RVM, VDF). Leaf infusion antidiarrheic and emetic (CAA). Antiseptic leaf decoction used for wounds; and fever. "Créoles" use the leaf decoction mixed with maternal milk as an antiemetic for infants. Dried leaves used by as a marihuana substitute. "Palikur" use the leaf decoction in antipyretic baths and in poultices for migraine headaches (GMJ). Ecuadorians take the tea for pain and swelling (SAR). "Tikuna" drink the tea, with or without "paico", three days during the menses as an abortifacient or contraceptive (SAR). Four to five plants tied together make the typical river-dweller's broom (RVM). Brazilians add the root to the bath when "cleaning their blood" (BDS). They apply strained leaf juice for eye ailments; and to infected wounds (erysipelas) (BDS).

*Sida rhombifolia* L. Malvaceae. "Ancusacha", "Pichana", "Varilla". Considered analgesic, aphrodisiac, demulcent, diuretic, emmenagogue, emollient, lactagogue, and sedative; used for alopecia, antibiotic, bilious conditions, bladder ailments, boils, burns, conjunctivitis, dermatosis, diarrhea, dyspepsia, dyspnea, gastrosis, gonorrhea, impetigo, leucorrhea, lupus, piles, rheumatism, snakebite, sores, thrush, tuberculosis, tumors, ulcers, urethritis, and wounds (DAW, TRA, RAR).

*Simarouba amara* Aubl. Simaroubaceae. "Marupá". Wood for lumber, interior decorations, furniture, plywood veneer, paper pulp. Bark decoction for fever. "Créoles" mix macerated bark with rum as a tonic for malaria and dysentery (GMJ). Emetic, hemostat, purgative, tonic (RAR).

*Siparuna guianensis* Aubl. Monimiaceae. "Isula huayo", "Picho huayo", "Asna huayo". Fruit used in fiestas, the leaf infusion believed aphrodisiac. Leaf decoction used in baths for mycosis. "Créoles" use the leaf tea as an abortive, oxytocic, and antipyretic; the alcoholic leaf maceration as vulnerary, and the salty leaf decoction as hypotensive. "Wayãpi" use the decoction of leaves and bark as a refreshment and antipyretic (GMJ). The tea of the leaves and flowers is used as a carminative, in dyspepsia, and painful spasms (RVM). Don Segundo informed one class that the aroma of this plant, applied to the skin to prevent hunted animals from smelling the hunter (by masking his body odor), was not only effective, but rendered the hunter all but irresistible to females. One of my taxonomic associates claims to have confirmed this empirically (JAD). "Tikuna" eat the fruits for dyspepsia (SAR). Elsewhere considered anodyne, insecticidal and stomachic; used folklorically for colds, colic, cramps, dermatosis, fever, headache, mange, rheumatism, snakebite and wounds (DAW). Tapajos natives make solar tea from the leaves for bathing headache (BDS).

*Solanum mammosum* L. Solanaceae. "Vaca chucho", "Tinctona", "**Breast berry**". Used as an ornamental; fruit said to be POISONOUS. "Boras" use it to treat the sores of leishmaniasis, a worm infection (DAT). "Chocó" (JAD) and the "Chami" use the fruit to kill cockroaches (CAA). "Cuna" use fruit macerated in hot water for growths on the breast (doctrine of signatures?). In Tolima and Santander seeds are used as insecticides (FOR). Guatemalans use fruits as medicine and ornament during pilgrimages. In Costa Rica, the leaf decoction is used for kidney and bladder infections. The decoction of the fruit with all its juice is used for asthma; plant also used for sinusitis, arthritis and rheumatism (POV). "Kofán" use as a pacifier for small children (SAR).

*Solanum sessiliflorum* Dun. Solanaceae. "Cocona", "Topiro". Cultivated. Fruit edible and makes good juice, often served at Explorama. Juice used as a scabicide; also recommended after snakebite (RVM). "Waorani" rub juice on scalp to cleanse and gloss the hair (SAR). Boiled plant rubbed on spiderbites to heal necrotic tissue (SAR). Following scorpion sting, juice is drunk to prevent vomiting (SAR).

*Spilanthes acmella* L. Asteraceae. "Botoncillo". Brazilians boil the flowering tops for the lungs, specifically tuberculosis (BDS).

*Spondias mombin* L. Anacardiaceae. "Ciruela", "Hubo", "Ubos", "Ushun", "**Hog Plum**". Fruit edible. Wood for lumber and veneer. Root decoction used for diarrhea, and for mothers after giving birth, taking small doses for two consecutive months. Itaya residents use it for tuberculosis, as an adjuvant with antibiotics. Decoction used for vaginal baths to treat infections and hemorrhoids (AYA). "Campas" use it to lure tapirs (RVM). "Créoles" use the bark for diarrhea and upset stomach (GMJ). "Tikuna" use bark decoction as anodyne and hemostat in diarrhea, metrorrhagia and stomachache (SAR). A single cup, given each day during the menses, is believed contraceptive; drunk one day after delivery, it is believed to lead to permanent sterility (SAR). Tramil mentions antiviral, myorelaxant and uterotonic activities (TRA). In Brazil, used in ice creams and liqueurs (MJP).

*Stachytarpheta cayennensis* (Rich). Vahl. Verbenaceae. "Ocollucuy sachá", "Sacha verbena". The stems and leaves are soaked in some water, squeezed and mixed, the greenish extract drunk, one glass a day, for three consecutive months for diabetes (AYA). UHV natives use the plant in medicine for their dogs (RAF). "Créoles" use the leaf tea as a cholagogue purgative for dysentery. "Wayãpi" and "Palikur" use the plant decoction in baths to relieve colds and headaches (GMJ). Venezuelans have used it for tumors, Dominicans as a panacea, and Trinidadians as a collyrium and depurative in chest colds, dysentery, fever, heart attacks, ophthalmia and worms (DAW).

*Strychnos guianensis* (Aubl.) Mart. Loganiaceae. "Comida del venado", "Anzuelo casha". Stems used to make "curaré"; recommended as an aphrodisiac. Mixed with *Uncaria guianensis*, the decoction is used in genital baths for venereal diseases (RVM). Contains brucine, eritocurarine, guaiaicurarines, guaiaicurine, c-guaianine, and strychnine (JAD).

*Symphonia globulifera* L.f. Clusiaceae. "Azufre caspi", "Navidad caspi", "Chullachaqui", "**Buckwax**". Wood used for house construction, canoes, paddles, keel plates, flooring, carpentry, tool handles, etc. It is good quality for construction, carpentry, and firewood (RVM). Latex used to caulk boats (RVM). "Créoles" use the latex for dermatosis, and to reinforce the binding of the arrows (RVM). Indians apply the bark ash to wounds and indolent ulcers (SAR). Brazilians use the seed oil for dermatoses (SAR).

*Tabebuia chrysanta* (Jacq.) Nichols. Bignoniaceae. "Tahuarí negro", "Paliperro". Wood for lumber, posts, poles, handicrafts, parquets. "Yaguas" use the trunk to make jungle drums. Over-exported to the US as "tahebo" or "pao-d'arco", bark tea marketed for candidiasis, cancer, and malignant tumors (JAD).

*Tabernaemontana sananho* R.&P. Apocynaceae. "Sanango", "Lobo sanango", "Toomecocoriú". Much as *T. rimulosa*. The leaves, softened by fire, are applied to relieve rheumatic pains (RVM). In Pastaza, taken one week after delivery. "Pulp is used as a gargle for sore throat and colds" (SAR). "Tikuna" mix the latex with water for eye wounds (SAR). "Jivaro" apply the bark juice to toothache (SAR). Considered sudorific, tonic, used for colds, obesity, rheumatism, syphilis (RAR).

*Tecoma stans* (L.) Juss. Bignoniaceae. "Campanilla amarilla", "**Yellowbells**". Cultivated ornamental. In *SOME MEDICINAL FOREST PLANTS OF AFRICA AND LATIN AMERICA*, FAO (1986), note that the alkaloids tecomine and tecostanine lower the blood sugar in experimental animals. Leaf infusions lower the blood sugar in humans. In Mexico, its roots have shown antisiphilitic, diuretic and tonic properties (FAO).

*Theobroma cacao* L. Sterculiaceae. "Cacao", "**Chocolate**". Cultivated. The pulp of fruit edible. Food uses of chocolate, made from the seed, are well known (RVM). Not so well known is the fact that much cocoa butter ends up in suppositories. Leaf infusion widely used as cardi tonic and diuretic in Colombia (SAR). "Karijona" use toasted seed with manihot squeezings for a scalp condition like eczema. "Ingano" use the bark decoction as a wash for sarna (SAR). Theobromine and theophylline, like caffeine, all found in this plant, used in modern medicine as antiasthmatic (JAD). We are cooperating with one entrepreneur seeking a "lean green cacao bean" for renewable "organic low-fat rainforest chocolate".

*Theobroma subincanum* Mart. Sterculiaceae. "Cacahuillo", "Cacao macambillo", "Macambillo", "Macambo sacha". Fruit pulp edible. Powdered inner bark (of pod) mixed with tobacco as an hallucinogen. "Tirio" value the bark as tinder for starting fires (MJP).

*Tynnanthus panurensis* (Bur.) Sandw. Bignoniaceae. "Clavo huasca", "Inejkeu", "**Clove vine**". The pieces of roots and stems are macerated in aguardiente to make a stimulant liqueur, good for rheumatism (RVM). Resin used for fevers (DAT). Some explorama visitors have used it, effectively, for toothache, being as effective as, and probably chemically similar to clove oil (JAD). Some visitors believe, others disbelieve, that the rays of the cross, steeped in aguardiente, are aphrodisiac, some for females, some for males, some for both. We have no incontrovertible empirical evidence, one way or the other.

*Uncaria guianensis* (Aubl.) Gmel. Rubiaceae. "Uña de gato", "**Cat's claw**", "Paraguay", "Garabato", "Uña de gavián", "**Hawk's claw**". In Piura, the bark decoction, considered antiinflammatory, antirheumatic, and contraceptive, is used in treating gastric ulcers and tumors (FEO). Considered a remedy for cancer of the female's urinary tract; also used for gastritis, rheumatism and cirrhosis. The "Boras" use it for gonorrhea (RVM). Colombian and Guianan Indians use it for dysentery (SAR). Nicole Maxwell culminates her latest edition with an illustrated anecdote about this plant, now exported by the tons to Europe, for various cancers. Nicole even states that it turns grey hair black, including some of her own (NIC). See following entry.

*Uncaria tomentosa* (Aubl.) Gmel. Rubiaceae. "Uña de gato", "**Cat's claw**", "Paraguay", "Garabato", "Uña de gavián", "**Hawk's claw**". Widely used in Peru for antiinflammatory, contraceptive, and cytostatic activities, the plant has yielded an antiinflammatory antiedemic glycoside (JNP54{2}:453. 1991). In Piura, the bark decoction, considered antiinflammatory, antirheumatic, and contraceptive, is used in treating gastric ulcers and tumors (FEO). In her latest edition, Nicole Maxwell (1990) has added much information which may reflect the potential of the cat's claw. She informs us that Sidney McDaniel submitted samples to the NIH cancer screen.

*Unonopsis veneficiorum* (Mart.) R.E. Fries. Annonaceae. "Icoja". Bark used like *U. floribunda* (RVM), also in curaré (SAR). "Maku" use in antifertility potions (SAR).

*Urera baccifera* (L.) Gaud. Urticaceae. "Ishanga Moe", "Mara mara", "**Stinging nettle**". The stinging hairs on the leaves are used to relieve rheumatic pains. "Chami" cook and eat the leaves and stems after removing the thorns (CAA). Around Pucallpa, applied to the body for persistent fever (VDF). Elsewhere considered diuretic, rubefacient and vesicant; used for amenorrhea, arthritis, chills, fever, gonorrhea, leucorrhea, malaria, rheumatism and venereal diseases (DAW). One M.D. speculated that the acetylcholine, choline and histamine injected with the stings, would stimulate the production of mast cells which might in turn result in antiinflammatory (and antiarthritic) activity, away from the sting.

*Virola calophylla* Warb. Myristicaceae. "Cumala blanca". Wood for lumber. Some natives (e.g. "Bora" and "Huitoto"), use *Virola* as a powerful hallucinogen, taking it orally and nasally. They grate, dry, and toast the inner bark slowly until it becomes powder so they can inhale it. They also grate the cambium, boil it in water, mixing continuously until it forms a thick syrup; after it dries, they make pills and swallow

them. The alkaloids found are mostly derivatives of tryptamine: DMT, MMT, 5-MeO-DMT, 5-MeO-MMT, and the derivatives of beta-carboline: 6-MeO-DMTHC; the percentage of such compounds vary according to the species, as well as their environment (RVM). Widely used for fungal diseases and scabies (SAR). Amazonian Peruvians use for bladder and stomach ailments (SAR). "Maku" use the bark tea for malaria (SAR).

*Virola surinamensis* (Rol.) Warb. Myristicaceae. "Cumala blanca hoja parda". Wood for lumber, plywood. "Bora" and "Huitoto" use the cambium as a hallucinogen. The decoction of the aerial rootlets that appear on the base of the trunk is used for cough. "Palikur" prepare a bark emollient used for swellings and erysipelas; used as an oral antiseptic to treat canker sores and abscesses. For swelling, it is mixed with bark of *Humiria balsamifera*, the decoction used for external baths (GMJ). Tea of leaves, sap, and bark, mixed with *Physalis angulata*, is used for upset stomach, intestinal colic, erysipelas, and inflammations (RVM). Leaves contain the antitubercular compound galbacin, the antiaggregant veraguensin, and the antischistosomal surinamensis (JBH).

*Vismia angusta* Miq. Hypericaceae. "Pichirina hoja grande". The wood is used for rural construction; the decoction of the latex from the buds, mixed with the latex of *Euphorbia cotinifolia*, is used to treat ringworm or "caracha" (dermatosis caused by fungus) (RVM). Amazonian Colombians use the latex for infected sores and wounds. "Tikuna" use to treat herpes and mycoses (SAR). The latex of one *Vismia* is slated for studies by a California pharmaceutical company; preliminary tests suggest it to be effective (MJP). Both Segundo and JAD suffered long-lasting rashes as a result of the latex (JAD).

*Zingiber officinale* Roscoe. Zingiberaceae. "Jengibre", "Ki6n". Cultivated. Macerated rhizomes in aguardiente for arthritis and rheumatism; believed to invigorate males. Rhizome decoction used for diarrhea, and, with a pinch of cinnamon, stomachaches. Also used as an antifatulent and spice. "Palikur" poultice the rhizomes onto migraine headaches (GMJ). Used also for bronchitis and rheumatic pains (RVM). Tramil reports that oral doses of 50-100 mg/kg of the alcoholic extract have antiinflammatory activity comparable to aspirin, and not so promising analgesic activity. The extract is active against gram negative and positive bacteria. Gingerol and shogoal show molluscicidal activity (TRA). Furanogermenone, at oral doses of 500 mg/kg helps prevent gastric ulcer. Shogoal is intensely antitussive, compared to dihydrocodeine (TRA). One gram of powdered ginger can prevent seasickness (JAD). Tramil all but recommends it for colds, coughs, flu, stomachache and vomiting (TRA). Rio Tapajos women drink the tea while in labor, giving the "baby the strength to come out" (BDS). They also take the tea for colic, menstrual cramps, sore throat.

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## Module 9: AFRICAN

Jim Duke

When you go to the tropics in your temperate winter climate, it's like going to your backyard in summer; many of the same cultivated annual food, herbal, medicinal and ornamental plants you know back home are also cultivated here. And if you've been to the tropics elsewhere, you'll see many of the same tropical perennial food, medicinal and ornamental species in Africa you saw in Latin America, or Hawaii, e.g. papaya, angel's trumpet, and African tulip tree (*Spathodea*) respectively. Here then, is just a partial listing of some of the medicinal plants of Kenya, East Africa, Africa, and the world, that you are liable to see on a Pharmacy from the Rainforest ecotour to Kenya, Tanzania and/or Uganda.

### A. African Medicinal Plants in World Trade

*Aloe* "Aloe" (LILY FAMILY) Aloe among the top selling medicinal herbs in the US

*Aspalathus* spp. "Bush Tea" (LEGUME FAMILY)

*Cassia acutifolia* "Senna" (LEGUME FAMILY) Senna the laxative synergic SENNOSIDES

*Catharanthus roseus* "Madagascar Periwinkle" (DOGBANE FAMILY)

*Centella asiatica* "Gotu Kola" (CARROT FAMILY)

*Dioscorea* spp. "African Yams" (YAM FAMILY) Steroids, DIOSGENIN; SITOSTEROL

*Harpagophytum* "Devil's Claw" (SESAME FAMILY) GI and rheumatic ailments

*Pausinystalia yohimbe* "Yohimbe" (FAMILY) Aphrodisiac alkaloid YOHIMBINE

*Phystostigma venenosum* "Ordeal Bean" (LEGUME FAMILY) Antiglaucomic PHYSOSTIGMINE

*Pygeum africanum* "Pygeum" (ROSE FAMILY) OTC prostate remedy (ENDANGERED)

*Rauvolfia vomitoria* "African snakeroot" (DOGBANE FAMILY) RESERPINE, YOHIMBINE

*Strophanthus* spp. "Kombe" (DOGBANE FAMILY) STROPHANTIDIN (cardiac glycosides)

*Strychnos icaja* "Strychnine" (STRYCHNINE FAMILY) GI problems, hernia, malaria

*Tabernanthe iboga* "Iboga" (DOGBANE FAMILY) Hallucinogen IBOGAINE

*Tamarindus indica* "Tamarind" (LEGUME FAMILY) HYDROXYCITRIC ACID

*Trigonella foenum-graecum* "Fenugreek" (LEGUME FAMILY) DIOSGENIN

*Warburgia ugandensis* "Pepper-Bark" (CANELLA FAMILY) POLYGODIAL antifeedant, antiyeast

*Withania somnifera* "Ashwagandha (POTATO FAMILY) WITHAFERIN; WITHANOLIDES

## B. Pan African Medicinal Plants and Some Uses

*Alchornea cordifolia* "Christmas Bush" (SPURGE FAMILY) GI, respiratory and urinary ailments

*Alstonia boonei* "Emien" (DOGBANE FAMILY): Bark antimalarial ECHITAMINE; VOACANGINE

*Anthocleista nobilis* "Cabbage Tree"(STRYCHNINE FAMILY): Bk. anti-diabetic, - fertility,-venereal

*Bersama abyssinica* (MELIANTHACEAE): Bark anthelminthic, aphrodisiac

*Bridelia feruginea* (SPURGE FAMILY) Leaves eaten

*Butyrospermum paradoxum* (CHICLE FAMILY): Shea butter (seed fat) used for boils and rheumatism; bark for labor and parturition; leaves for collyrium and

*Carapa procera* (MAHOGANY FAMILY): Seed fat for burns, fungi, lice

*Catha edulis* "Khat" (BITTERSWEET FAMILY): Anorectic CNS stimulant

*Chasmantya dependens* (MOONSEED FAMILY) Toot antivenereal; leaves for bruise, fractures

*Chlorophora excelsa* "African Oak (MULBERRY FAMILY) Latex for tooth extraction

*Chrysophyllum albidum* "White Star Apple (CHICLE FAM.) Bark for malaria, yellow fever

*Cocculus pendulus* (MOONSEED FAMILY) Hypertension

*Combretum micranthum* (COMBRETACEAE) For guinea worms

*Costus afer* (GINGER FAMILY) Cough; hypertension

*Cryptolepis sanguinolenta* (PERIPLOCACEAE): Fever; inflammation, yeast

*Dichrostachys cinerea* (LEGUME FAMILY): Bark for leprosy, venereal disease

*Elaeis guineensis* "Oil Palm (PALM FAMILY) Roots for bronchitis, gonorrhea, metrorrhagia

*Garcinia kola* "Bitter Kola" (ST. JOHN'S-WORT FAMILY)

*Khaya senegalensis* "African mahogany" (MAHOGANY FAM): Ameba; malaria

*Lonchocarpus sericeus* "Senegal Lilac" (LEGUME FAMILY): ROTENONE (2-6%)

*Moringa oleifera* "Horseradish Tree" (HORSERADISH TREE FAMILY) Water purification

*Nauclea latifolia* "African Peach" (COFFEE FAMILY): Leishmanniasis

*Sclerocarya birrea* "African Hog Plum" (CASHEW FAMILY) Diabetes; dysentery; malaria

*Trema guineensis* "African Elm" (ELM FAMILY); Bark for asthma, bronchitis, cough

*Uvaria* sp. "Finger Root" (PAWPAW FAMILY) Jaundice; malaria

*Vernonia amygdalina* "Bitter leaf" (ASTER FAMILY) VERNON cardiotonic, hypotensive

*Voacanga africana* (DOGBANE FAMILY): For mental disorders VOACANGINE analgesic

#### C. Major Local Kenyan and Tanzanian Medicinal Plants

*Acokanthera schimperi* "Arrow poison" Contains ouabain

*Clutia abyssinica* (SPURGE FAMILY) Convulsions, flu, hepatitis, malaria

*Commiphora molmol* (INCENSE FAMILY) Cult. In Kenya for the resin, an oral antiseptic

*Embelia schimperi* (MYRSINACEAE) Fruit for worms; stem bark for cramps

*Entada abyssinica* (LEGUME FAM.) Root for arthritis; roasted seed for conjunctivitis

*Erythrina senegalensis* "Coral Flower" (LEGUME FAMILY) Root for toothache, venereal diseases

*Holarrhena floribunda* (DOGBANE FAMILY) Bark for dysentery; fever; snakebite

*Kigelia africana* "Sausage Tree" (BIGNONIACEAE) Parturition; splenitis

*Jateorrhiza palmata* "Calumba" (MOONSEED FAMILY) Bronchitis, hypertension, impotence

*Mallotus oppositifolius* "Kamala" (SPURGE FAMILY) Dysentery, worms

*Manniophytum flavum* (SPURGE FAMILY) Dermatitis, yaws

*Maytenus buchananii* (BITTERSWEET FAMILY) Bark for boils, mouth sores, etc. MAYTINSINE

*Mitragyna ciliata* "Liberian Poplar" (COFFEE FAMILY) MITRAGYNINE as analgesic as codeine

*Morinda citrifolia* "Brimstone Tree" (COFFEE FAMILY) Dysentery; hypertension

*Picralima nitida* "Akuamma Seed" (DOGBANE FAMILY) Fever, hypertension, jaundice, malaria

*Quassia africana* (SIMAROUBACEAE) Bronchitis; dysmenorrhea; fever; pneumonia

*Rauwolfia caffra* "Quinine Tree" (DOGBANE FAMILY) AJMALINE; RESERPINE; YOHIMBINE

*Salvadora persica* "Toothbrush Tree" (TOOTHBRUSH TREE FAM.) Ancylostomiasis

*Sansevieria liberica* "Bowstring Hemp" (AGAVE FAMILY) Conjunctivitis, convulsions; hemorrhoids

*Stephania dinklagei* (MOONSEED FAMILY) CORYDINE (sedative) STEPHANINE

*Tinospora caffra* (MOONSEED FAMILY): Fever; tonic

*Trichilia emetica* "Barf Bark" (MAHOGANY FAMILY) Bark antidermatitis, antiinflammatory, emetic

*Zanthoxylum zanthoxyloides* "Toothache Bark" (CITRUS FAMILY); BERBERINE CHELERYTHRINE antisick cell

#### D. Cosmopolitan Weedy Medicinal Species Expected in Kenya/Tanzania

*Abrus precatorius* "Crab-s Eye" Colic, constipation, cough POISONOUS

*Achyranthes aspera* (PIGWEEED FAMILY): Hemostatic; BETAINE; ECDYSTERONE; SAPONINS

*Ageratum conyzoides* (ASTER FAMILY)

*Artemisia afra* (ASTER FAMILY) Leaves for cold, constipation, cough, gout THUJONE

*Borreria verticillata* (COFFEE FAMILY) Stem juice antidermatitic; ess. oil inhibit *E. coli* and staph

*Boscia senegalensis* (CAPER FAMILY) for fungus, jaundice, malaria, venereal disease

*Calotropis procera* "Giant Milkweed" (MILKWEED FAMILY) CARDIAC GLYCOSIDES

*Datura metel* (SOLANACEAE; POTATO FAMILY) atropine; scopolamine

*Datura stramonium* "Jimsonweed" (SOLANACEAE; POTATO FAMILY) atropine; scopolamine

*Emilia sonchifolia* (ASTER FAMILY) Leaves febrifuge; juice for conjunctivitis

*Eupatorium odoratum* (ASTER FAMILY) Cough, malaria

*Euphorbia hirta* (SPURGE FAMILY) Dysentery, enteritis;

*Heliotropium indicum* (BORAGE FAMILY) Pyrrolizidine alkaloids

*Hillieria latifolia* (POKEWEED FAMILY) Jaundice; guinea worms; urethritis

*Hoslundia opposita* (MINT FAMILY) Antimalarial

*Jatropha curcas* "Physic nut" (SPURGE FAMILY) POISONOUS purgative

*Ocimum gratissimum* "Fever Plant" (MINT FAMILY) EUGENOL, THYMOL

*Portulaca oleracea* "Purslane" (PURSLANE FAMILY): Extracts antidiabetic, myorelaxant

*Solanum incanum* "Bitter Apple" (POTATO FAMILY) SOLANINE

*Solanum nigrum* "Black nightshade" (POTATO FAMILY) SOLANINE, SOLASODINE

*Spigelia anthelmia* "Wormseed" (STRYCHNINE FAMILY) DANGEROUS Anthelminthic

#### E. Local Food Farmacy

1. *Fromamomum melegueta* (GINGER FAMILY): Fruit considered aphrodisiac. Seeds contain gingerol and shogaol, the same acrive ingredients in ginger (MMI)

2. *Piper guineense* Ashanti Pepper (PEPPER FAMILY) Leaves for dysmenorrhea, infertility
3. *Pycnanthus kombo* "African Nutmeg" (NUTMEG FAMILY) Edible seeds for dermatitis, thrush
4. *Sesamum indicum* "Sesame Seed" (SESAME FAMILY); Sesamim synergic with pyrethrum
5. *Xylopia aethiopica* "Ethiopian Pepper" (PAWPAW FAMILY): Promote fertility, lactation; CARENE; CINEOLE; LIMONENE

F. Pantropical Food "Farmacy" Species: Following are a list of some pantropical food species with parenthetical inclusion of some of the nutraceuticals found in significant quantities in the plant); Avocado (MUFAs); balsam pear (compound Q, momocharin), beans and other legumes (biochanin, daidzein, formononetin, genistein, or estrogenic isoflavones); cassava (HCN); chocolate (theobromine, theophylline), citrus (limonene, limonoids); coconut (aluric acid) coffee (caffeine, chlorogenic acid, theobromine, theophylline);, cola (caffeine, theobromine, theophylline); cowpea (folic acid); fenugreek (diosgenin); garlic (allicin), grape (pycnogenol, resveratrol); jujube (betulinic acid); oil palm (tocotrienol); okra (gossypol); onion (ajoene, allicin, quercetin), papaya (chymopapain, papain), peanut (isoflavones, pycnogenol) pineapple (bromelain); pumpkinseed (alanine, glycine, glutamic acid, pectin, tryptophan); soybean and other legumes (biochanin, daidzein, formononetin, genistein); sweet potato (carotenoids); tea (caffeine, theobromine, theophylline) tomato (GABA, lycopene); velvet-bean (l-dopa); yam (diosgenin)

G. Medicinal Spice Rack: chile (capsaicin, salicylates); cloves (eugenol); ginger (gingerol, shogaol, zingibain), lemongrass (citral, citronellal, citronellol); nutmeg (myristicin); sesame (sesamin); turmeric (curcumin).

#### PROBLEMS TO SOLVE

Food for thought: If man evolved in Africa and radiated out, only last reaching Latin America, why are most of our modern food plants species that originated, not in Africa, but in the Middle East and Latin America.

Coffee is native to Africa but more coffee is now produced for world market in Brazil and Colombia today. Conversely, chocolate and vanilla, though native American, are now more produced in Africa. Why?

What food and medicinal crops, now widely distributed in tropical Africa, would not have been there before Columbus discovered America.

If evolutionary diet is important for health, as the Paleolithic Prescription (Boyd Eaton) argues very effectively, and evolution proceeded from Africa to the Middle East, then the Far East and Europe, with what foods in today's markets have our genes been longest associated?

If evolutionary diet is important for health, why not evolutionary medicines. But there again, more of our herbal medicines and phytomedicinal drugs are based on European/Near Eastern species than on the longer-associated African/Far Eastern species.

#### Traditional Med Coevolution Millenia Generations

(Years)

EUROAMERICAN 500 0.5 25

AMERINDIAN ~20,000 20 1,000

AYURVEDIC ~1,000,000 1,000 50,000

CHINESE ~1,000,000 1,000 50,000

JAMU ~1,000,000 1,000 50,000

AFRICAN ~2,000,000 2,000 100,000

#### Coevolution of Man with Traditional Medicine Systems

##### AFRICAN MINTS

*Achyrosermum oblongifolium* Bak. (W)

*Acollanthus pubescens* Benth. (W)

*Acrotome inflata* Benth. (E)

*Aeolanthus canescens* Guerke (E)

*Aeolanthus gamwelliae* G Tayl. (E)

*Aeollanthus suaveolens* Mart. (W)

*Ajuga ophrydis* Burch. (E)

*Alvesia rosmarinifolia* Welw. (E)

*Anisomeles indica* (Linn.) O Ktze. (W)

*Ballota africana* Benth. (E)

*Basilicum polystachyon* (Linn.) Moench (W)

*Becium knyanum* G Tayl. (E)

*Becium obovatum* NE Br. (E)



*Becium obovatum* (E Mey.) NE Br. (W)

*Becium obovatum* NE Br. var. *hians* NE Br. (E)

*Coleus barbatus* Benth. (E)

*Coleus esculentus* G Tayl. (E)

*Coleus* sp. (E)

*Endostemon tereticaulis* (Poir.) M Ashby (W)

*Englerastrum schweinfurthii* Briq. (W)

*Fuerstia africana* Th. CE Fries. (E)

*Haumaniastrum buettneri* (Gürke) Mort. (W)

*Haumaniastrum caeruleum* (Oliv.) JK Morton (W)

*Haumaniastrum lilacinum* (Oliv.) JK Morton (W)

*Hemizygia bracteosa* (Benth.) Briq. (W)

*Hemizygia welwitschii* (Rolfe) M Ashby (W)

*Holostylon baumii* G Tayl. (E)

*Hoslundia opposita* Vahl. (E,W)

*Hoslundia opposita* Vahl. var. *verticillata* Bak. (E)

*Hyptis atrorubens* Poit. (W)

*Hyptis lanceolata* Poir. (W)

*Hyptis pectinata* (Linn.) Poit. (E,W)

*Hyptis spicigera* Lam. (W)

*Hyptis suaveolens* Poit. (W)

*Iboza riparia* NE Br. (E)

*Isodictyophorus reticulatus* (A Chev.) JK Morton (W)

*Lasiocorys capensis* Benth. (E)

*Lavandula coronipifolia* Poir. (W)

*Lavendula officinalis* Chaix (E)

*Leocus africanus* (Bak.) JK Morton (W)

*Leocus lyratus* A Chev. (W)

*Leonotis africana* Briq. (E)

*Leonotis dysophylla* Benth. (E)

*Leonotis leonotis* R Br. (E)

*Leonotis leonurus* Ait. f. (E)

*Leonotis microphylla* Skan. (E)

*Leonotis mollis* Benth. (E)

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## Module 10: ARABIC

*Abrus precatorius* L. (FABACEAE) (LEGUME FAMILY) "Jequirity bean" "Haab e shoush" Abortifacient, antifertility agent, emetic, ophthalmic, purgative.

*Acacia ehrenbergiana* Hayne (MIMOSACEAE) (LEGUME FAMILY) "Salam" Paralysis.

*Acacia gerrardii* Benth. (MIMOSACEAE) (LEGUME FAMILY) "Karat" "Qarat" Burns, fever, sore gums, loose teeth, toothache.

*Acacia negrii* Pic.-Sermolli (MIMOSACEAE) (LEGUME FAMILY) "Salam" Ophthalmia.

*Acacia nilotica* (L.) Willd. (MIMOSACEAE) (LEGUME FAMILY) "Babul" "Karat" "qarat" "tulh" Demulcent. Boils, cataracts, colds, diabetes, diarrhea, swellings, toothache.

*Acacia senegal* (L.) Willd. (MIMOSACEAE) (LEGUME FAMILY) "Gum arabic" "Temmar" Antiseptic, tonic. Chest pains, hemoptysis, menorrhagia, whooping cough, wounds.

*Acalypha fruticosa* Forsskal (EUPHORBIACEAE) (SPURGE FAMILY) "Anama" Bee stings.

*Achillea biebersteinii* Afan. (ASTERACEAE) (ASTER FAMILY) "Thafra'a" Eyewash conjunctivitis. Also for itch and toothache.

*Achyranthes aspera* L. (AMARANTHACEAE) (AMARANTH FAMILY) "Chaff Flower" "Mahoot" "na'eem" "no'eim" "wazer" Scorpion bites.

*Acridocarpus orientalis* A. Juss. (MALPHIGIACEAE) (ACEROLA FAMILY) "Qafas" Chronic headaches, myalgia, paralysis, tendonitis.

*Adenium obesum* (Forsskal) Roem. & Schult. (APOCYNACEAE) (DOGBANE FAMILY) "Desert rose" "'Adan" "'adana" "seyfid" Dislocations, rheumatism, sprains, paralysis, swellings, wounds, skin infections.

*Aerva javanica* (Burm. f.) Juss. ex J.A. Schultes (AMARANTHACEAE) (AMARANTH FAMILY) "Kapok bush" "Ra" "turfa" "tuwain" "alre'en" "alra" "erwa" "irwa" "turf" Hemostatic. Wounds as dressing and to stop bleeding, eye disease in cattle.

*Alcea rosea* L. (MALVACEAE) (MALLOW FAMILY) "Hollyhock" "Binafsa" Cough.

*Alhagi maurorum* Medik. (FABACEAE) (LEGUME FAMILY) "Camelthorn" "Caspian manna" "'Aqul" "Al heej" "kag" "'igol" "'aqul" Analgesic, aphrodisiac, hepatic. Cataracts, jaundice, migraine, rheumatism.

*Alkanna orientalis* (L.) Boiss. (BORAGINACEAE) (BORAGE FAMILY) "Libbeid" "lebbd" "'anzurn" "'uzz waran" Sore throat.

*Allium cepa* L. (LILIACEAE) (LILY FAMILY) "Onion" "Basl" Cough, deafness, ear infection, malarial fever, phlegm, skin problems, stomach cramps, improve vision.

*Allium sativum* L. (LILIACEAE) (LILY FAMILY) "Garlic" "Thm" Abdominal pain and colic, colds, cough, dandruff, diabetes, diarrhea, eye infections, flatulence, kidney problems, memory, tuberculosis, removing thorns, snakebites, treating wounds.

*Allophylus rubifolius* (Hoschst. Ex A. Rich.) Engl. (SAPINDACEAE) (GUARANA FAMILY) "Zerkm" Boils, skin ulcers.

*Aloe dhufarensis* Lavranos (LILIACEAE) (LILY FAMILY) "Subr" "tuf" Disinfectant; headache, arthritis, dermatitis, diabetes, constipation, cough, colds.

*Aloe tomentosa* Defl. (LILIACEAE) (LILY FAMILY) "Hir" "sabbar" Dermatitis, inflamed eyes, broken bones.

*Aloe vera* L. (LILIACEAE) (LILY FAMILY) "Bitter Aloes" "Sabar" "saqal" Febrifuge, abortifacient, anodyne, purgative; fever, headache, inflamed eyes, constipation, amenorrhea, alopecia.

*Amaranthus blitoides* S. Watson (AMARANTHACEAE) (AMARANTH FAMILY) "Prostrate pigweed" "Dadh" "qutaif" "shegra al santeen" "shaeb" "sinder" Emollient. Scorpion stings, snakebites, dermatitis.

*Ambrosia maritima* L. (ASTERACEAE) (ASTER FAMILY) "Ambrosia" Antispasmodic, diuretic. Bronchial asthma, spasms, increase urination.

*Anagallis arvensis* L. (PRIMULACEAE) (PRIMEROSE FAMILY) "Scarlet pimpernel" "Ayn al gat" "farfkh" "zraig al 'ain" Antifungal, antiviral. Epilepsy, skin rash, snakebite, thirst, ulcers.

*Anastatica hierochuntica* L. (BRASSICACEAE) (MUSTARD FAMILY) "True rose-of-Jericho" "Kaff al 'adhra" "kaff e Maryam" "shagret Maryam" Childbirth.

*Andrachne aspera* Spreng. (EUPHORBIACEAE) (SPURGE FAMILY) "Iqlt al-'ayn" Ophthalmia.

*Anethum graveolens* L. (APIACEAE) (CELERY FAMILY) "Dill" "Hulwa" "spinet" "shibith" "sadhb al barr" "shabt" Carminative. Abdominal colic.

*Argemone mexicana* L. (PAPAVERACEAE) (POPPY FAMILY) "Mexican pricklepoppy" "Tashmezg" Demulcent, diuretic, ophthalmic, hepatic, laxative, narcotic. Constipation, dysentery, jaundice, skin rash, sore eyes, ulcers.

*Aristolochia bracteolata* Lam. (ARISTOLOCHIACEAE) (BIRTHWORT FAMILY) "Ghghae" "ghka" "iqlt" "loiya" "laaya" Skin problems, snake and scorpion bites.

*Arnebia hispidissima* (Lehm.) DC. (BORAGINACEAE) (BORAGE FAMILY) "Funn" "lisn al thour" Febrifuge. Fever, including malarial fever.

*Artemisia sieberi* Besser (A. *Herba-alba* Asso) (ASTERACEAE) (ASTER FAMILY) "Shih" Anthelmintic. Intestinal worms.

*Asparagus africanus* Lam. (LILIACEAE) (LILY FAMILY) "Khurus theeb" Breathing problems.

*Asphodelus fistulosus* L. (LILIACEAE) (LILY FAMILY) "Onionweed" "Baroog" "bayrq" "busayl" "barwaq" Diuretic, laxative. Constipation, ulcers.

*Atriplex halimus* L. (CHENOPODIACEAE) (LAMBSQUARTER FAMILY) "Sea orach" "Mediterranean saltbush" "Rughl" Emetic.

*Astragalus atropilosus* (Hochst.) Bunge (FABACEAE) (LEGUME FAMILY) "Sanabil" Backache.

*Avicennia marina* (Forsskal) Vierh. (VERBENACEAE) (VERBENA FAMILY) "Girm" "qurm" Astringent, aphrodisiac.

*Azadirachta indica* A. Juss. (MELIACEAE) (MAHOGANY FAMILY) "Neem" "Shereesh" "sherish" Febrifuge. Abdominal pain, colic, fever.

*Becium dhafarense* Sebald (LAMIACEAE) (MINT FAMILY) "Hodem" Abrasions, dry skin, insect bites, itching, sore eyes, sores.

*Blepharis ciliaris* (L.) BL Burt (ACANTHACEAE) (ACANTHUS FAMILY) "Shawk al dab" Disinfectant, hemostatic, anti-inflammatory, diuretic, aphrodisiac; hemorrhoids.

*Boswellia sacra* Flueck. (BURSERACEAE) (COPAL FAMILY) "Frankincense" "olibanum tree" "Lubn" "bakhor" Diuretic, purgative. Mastitis, emotional and psychological problems in pregnancy, sore eyes, strengthen teeth.

*Caesalpinia pulcherima* (L.) Sw. (CAESALPINIACEAE) (LEGUME FAMILY) "Pride of Barbados" "Paradise flower" "Hmar" Laxative. Constipation, dysmenorrhea.

*Calotropis procera* (Ait.) Ait. (ASCLEPIADACEAE) (MILKWEED FAMILY) "Giant-milkweed" "Sodom-apple" "swallow-wort" "Ashkar" "oshar" "oshur" "ushar" Analgesic, diaphoretic, emetic. Difficult breathing, pain, paralysis, scorpion stings, wounds.

*Cadaba farinosa* Forsskal (CAPPARACEAE) (CAPER FAMILY) "Simar" "azan al arnab" Antiinflammatory. Colic, conjunctivitis, snakebite, stomachache.

*Calligonum comosum* L'Herit (POLYGONACEAE) (BUCKWHEAT FAMILY) "Abl" "art" Toothache.

*Capparis cartilaginea* Decne. (CAPPARACEAE) (CAPER FAMILY) "Lusef" "aslub" "albelib (fruit) Antiseptic. Arthritis, bruises, childbirth, deafness, earache, headache, myalgia, paralysis, skin rash, snakebite, swellings.

*Capparis decidua* (Forsskal) Edgew. (CAPPARACEAE) (CAPER FAMILY) "Kabra" Anthelmintic, laxative, nervine. Asthma, constipation, coughs, hysteria and other psychological problems, worms.

*Capparis spinosa* L. (CAPPARACEAE) (CAPER FAMILY) "Caper" "Lasafa" "fakouha" "shafallah"  
Anthelmintic, diuretic, expectorant, stimulant, tonic. Coughs, diabetes, earache, worms.

*Caralluma aucheriana* (Decne.) N.E. Br. (ASCLEPIADACEAE) (MILKWEED FAMILY) "Dij" Emollient, hepatic.  
Burns, sunburn, itchy skin, liver problems.

*Carica papaya* L. (CARICACEAE) (PAPAYA FAMILY) "Papaya" "Ffayf" "fifaiy" "faifai" "paw-paw"  
Anthelmintic, coolant. Diarrhea, worms.

*Carissa edulis* (Forsskal) Vahl. (ANACARDIACEAE) (DOGBANE FAMILY) "Egyptian carissa" "Folk" Colic,  
constipation, gastroenteritis, menstrual pain, toothache.

*Carthamus tinctorius* L. (ASTERACEAE) (ASTER FAMILY) "Safflower" "Shawrina" "zafaran" "usfur"  
Aphrodisiac. Conjunctivitis and ophthalmia.

*Cassia fistula* L. (CAESALPINIACEAE) (LEGUME FAMILY) "Indian-laburnum" "purging cassia" "Hiyr  
sambar" Laxative. Constipation, gastritis, piles, stomach ulcers.

*Catha edulis* Forsskal (CELASTRACEAE) (BITTERSWEET FAMILY) "Khat" "kat" "gad" "tschat" "qat"  
Stimulant. Depression, fatigue, (alleviate) hunger, melancholia.

*Ceratonia siliqua* L. (CAESALPINIACEAE) (LEGUME FAMILY) "St. John's-bread" "Qarmatt" Diarrhea.

*Chamaecrista absus* (L.) Irwin & Barneby (*Cassia absus* L.) (CAESALPINIACEAE) (LEGUME FAMILY)  
"Tussum" Ophthalmia.

*Chicorium intybus* L. (ASTERACEAE) (ASTER FAMILY) "Hindiba" "hendiban" Analgesic, demulcent,  
febrifuge, hepatic, tonic. Dyspepsia, fever, headache, jaundice.

*Cinnamomum camphora* (L.) Presl. (LAURACEAE) (LAUREL FAMILY) "Camphor tree" "Kafoor" Anti-  
convulsant, anthelmintic, carminative, insecticide, sedative. Toothache.

*Cissus rotundifolia* L. (VITACEAE) (GRAPE FAMILY) "Ghalaf" "halqa" Anodyne. Backache.

*Cistanche tubulosa* (Schrenk.) Wight (SCROPHULARIACEAE) (FIGWORT FAMILY) "Dhnn" "basl" "thanoon"  
Diarrhea, skin sores.

*Citrullus colocynthis* (L.) Schrad. (CUCURBITACEAE) (GOURD FAMILY) "Colocynth" "Handal" "murrah"  
"sri" "hedeg" "shry" Analgesic, laxative, purgative. Dog, insect, and snakebites, colic, constipation,

rheumatism.

*Citrullus lanatus* (Thunb.) Mats. & Makai (CUCURBITACEAE) (GOURD FAMILY) "Watermelon" "Bateekh" "joh" Coolant, diuretic, laxative. Constipation, heat stroke, kidney stones.

*Citrus aurantifolia* (L.) Swingle (RUTACEAE) (CITRUS FAMILY) "Lime" "Loomi" Cataracts, colds, fever, chest pains, earache, insect bites, jaundice, removing thorns, snakebites, stomachache, toothache.

*Clematis sinensis* Fresen. (RANUNCULACEAE) (BUTTERCUP FAMILY) "Haya'a" Anodyne. Rheumatism.

*Cleome droserifolia* Delile (CAPPARACEAE) (CAPER FAMILY) "Za'af" Ophthalmia.

*Cleome rupicola* Vicary (CAPPARACEAE) (CAPER FAMILY) "Muqabil al shams" Cataracts.

*Coccinia grandis* (L.) J.O. Voigt (CUCURBITACEAE) (GOURD FAMILY) "Ivy gourd" "Bakhra'a" Bronchial catarrh, diabetes, earache, skin diseases, throat pains.

*Cocculus hirsutus* (L.) Diels "Hamr al majnn" Demulcent, digestive, emetic, febrifuge, purgative. Dermatitis, fever, rheumatism, venereal disease.

*Commiphora gileadensis* (L.) C. Chr. (BURSERACEAE) (COPAL FAMILY) "Mecca myrrh" "balm-of-Gilead" "Sukof" Dog bites, deodorant.

*Commiphora habessinica* (Berg.) Engl. in A. DC. (BURSERACEAE) (COPAL FAMILY) "Abyssinian myrrh" "Yemen myrrh" "Arabian myrrh" "Medigh" "'okor" "mrr" Anthelmintic, disinfectant. Chest colds, coughs, dyspepsia, dyspnea, diarrhea, swollen glands.

*Commiphora myrrha* (Nees) Engl. (BURSERACEAE) (COPAL FAMILY) "Myrrh" "Murr" "subr" Aphrodisiac, febrifuge. Colds, digestion, fever, fractures, hemorrhoids, snakebites, toothache, wounds.

*Convolvulus arvensis* (CONVOLVULACEAE) (MORNING GLORY FAMILY) "Field bindweed" "maddaid" "fadkh" "'ollaig" "ollaig" Anti-hemorrhagic. Cuts, wounds.

*Conyza incana* Willd. (ASTERACEAE) (ASTER FAMILY) "Arfaj" Anodyne. Arthritis, myalgia.

*Cordia myxa* L. (BORAGINACEAE) (BORAGE FAMILY) "Bambar" "kao" Anthelmintic, diuretic, demulcent. Diarrhea, gastroenteritis, worms, wounds.

*Cordia perrottettii* Wight (BORAGINACEAE) (BORAGE FAMILY) "Abalt" "'ubteh" "'abateet" "'ubteh" "soxid" "soxir" Cataracts, ophthalmia, trachoma.

*Coriandrum sativum* L. (APIACEAE) (CELERY FAMILY) "Coriander" "Cobzra" "kabzara" "khabzara" Carminative, digestive, tonic. Abdominal colic, cloudy eyes, dyspepsia, flatulence, nausea, swellings.

*Cornulaca monacantha* Del. (CHENOPODIACEAE) (LAMBSQUARTER FAMILY) "Thallg" Hepatic. Jaundice.

*Cressa cretica* L. (CONVOLVULACEAE) (MORNING GLORY FAMILY) "Nedewah" "shuwwayl" Aphrodisiac, expectorant, tonic.

*Crepis rueppellii* Sch. Bip. (ASTERACEAE) (ASTER FAMILY) "Mirr" Hepatic. Jaundice, liver pains.

*Croton confertus* Baker (EUPHORBIACEAE) (SPURGE FAMILY) "Hr" Analgesic, laxative, tonic. Blood purifier, constipation, coughs, pain, stomach ache, swellings.

*Cucumis sativus* L. (CUCURBITACEAE) (GOURD FAMILY) "Cucumber" "Kheyar" "haswey" Emetic, emulcent, diuretic, purgative, vermifuge. Bowel and urinary infections, tapeworm.

*Cucurbita maxima* Duch. ex Lam. (CUCURBITACEAE) (GOURD FAMILY) "Pumpkin" "Qar" Vermifuge. Head lice, worms.

*Cuminum cyminum* L. (APIACEAE) (CELERY FAMILY) "Cumin" "Kimoona" "sanoot" Abdominal colic, diarrhea, nosebleeds.

*Curcuma longa* L. (ZINGIBERACEAE) (GINGER FAMILY) "Turmeric" "Kurcum" "curcum" "gezo" "kurkum" "hurid" Bronchitis, bruises, coughs, eye infections, skin infections, sprains, wounds.

*Cynodon dactylon* (L.) Pers. (POACEAE) (GRASS FAMILY) "Bermuda grass" "Najm" "thayyl" "najl" "naim" Astringent. Piles, venereal diseases, wounds.

*Cynomorium coccineum* L. (BALANOPHORACEAE) "Tarthoorth" "tarthth" Laxative. Constipation.

*Cyperus laevigatus* L. (CYPERACEAE) (SEDGE FAMILY) "Hasir" "hasal" Toothache.

*Cyperus rotundus* L. (CYPERACEAE) (SEDGE FAMILY) "Purple nutsedge" "Sa'ad" "hasir" "si'd" Anthelmintic, diuretic, febrifuge, galactagogue. Earache, bee stings, bites, dysmenorrhea.



*Cyphostemma ternatum* (Forsskal) Descoings (VITACEAE) (GRAPE FAMILY) "Km" Infection.

*Datura metel* L. (SOLANACEAE) (POTATO FAMILY) "Downy thorn-apple" "Hindu datura" "Benj" "murhn" "mang" Analgesic, sedative. Asthma, epilepsy.

*Daucus carota* L. (APIACEAE) (CELERY FAMILY) "Carrot" "Gizr" Aphrodisiac.

*Delonix elata* (L.) Gamble (CAESALPINIACEAE) (LEGUME FAMILY) "Eyrir" Parturition.

*Dianthus deserti* Kotschy (CARYOPHYLLACEAE) (PINK FAMILY) "d al-hilba" Sprains.

*Dodonaea viscosa* (L.) Jacq. (SAPINDACEAE) (GUARANA FAMILY) "Hopshrub" "Shhs" Toothache.

*Dorstenia foetida* (Forsskal) Schweinf. (MORACEAE) (MULBERRY FAMILY) "Kartib" "kertib" Flatulence, gastrosis, indigestion.

*Dracena serrulata* Baker (AGAVACEAE) (AGAVE FAMILY) "'Ariyeb" "'ayrob" Anodyne; hemorrhage, dermatosis.

*Dyerophytum indicum* (Gibs. ex Wight) Kuntze (PLUMBAGINACEAE) (LEADWORT FAMILY) "Mellh" Asthma, chest infections, dyspnea.

*Ecbolium viride* (Forsskal) Alston (ACANTHACEAE) (ACANTHUS FAMILY) "Sayah" Diuretic; acne.

*Echium angustifolium* Miller (BORAGINACEAE) (BORAGE FAMILY) "Lisn al-thaur" Hepatitis, herpes, jaundice, kidney, kidney stones, skin problems.

*Emex spinosa* (L.) Campd. (POLYGONACEAE) (BUCKWHEAT FAMILY) "Lesser Jack" "Devil's-thorn" "'Ambasis" "hamzibn" "hameedh" "himbazah" "humbayz" "hanzab" "rukbah" Diuretic, dyspepsia, purgative. Indigestion.

*Epilobium hirsutum* L. (ONAGRACEAE) (EVENING PRIMROSE FAMILY) "Sq al-gurb" Epilepsy, mental disorders.

*Euclea schimperi* (A. DC.) Dandy (EBENACEAE) (PERSIMMON FAMILY) "Kilit" Antiseptic, analgesic, tonic. Blood purifier, to cleanse teeth and refresh mouth, colic, diarrhea, indigestion, inflammation, pain.

*Eulophia petersii* (Rchb. f.) Rchb. f. (ORCHIDACEAE) (ORCHID FAMILY) "Miseb" "iseb" Eczema, ringworm, skin rashes, sores.

*Euphorbia amak* Schweinf. (EUPHORBIACEAE) (SPURGE FAMILY) "Amk sabur" Analgesic, laxative. Constipation, rheumatism.

*Euphorbia balsamifera* ssp. *adenensis* (Defl.) Bally (EUPHORBIACEAE) (SPURGE FAMILY) "Tikedoha" Depilatory.

*Euphorbia cactus* Baker (EUPHORBIACEAE) (SPURGE FAMILY) "Zuger" Anesthetic. Skin ulcers, sores, ringworm, toothache.

*Euphorbia hadramautica* Baker (EUPHORBIACEAE) (SPURGE FAMILY) "Kertib" "kertib a'adob" "kertib 'adonab" Abortifacient, digestive, emetic, purgative. Colic, eczema, flatulence, indigestion, skin rash and sores.

*Euphorbia larica* Boiss. (EUPHORBIACEAE) (SPURGE FAMILY) "Mt" Depilatory. Skin problems.

*Euphorbia peplus* L. (EUPHORBIACEAE) (SPURGE FAMILY) "Petty spurge" "khunaiz" Hepatic. Liver disorders.

*Euphorbia schimperiana* Scheele (EUPHORBIACEAE) (SPURGE FAMILY) "Lubbna" "rummd" Laxative, vermifuge. Constipation, worms.

*Euryops arabicus* Steud. (ASTERACEAE) (ASTER FAMILY) "Hanqalan" "hayqalan" "ybar" "jbar" Wounds on the feet.

*Fagonia indica* Burm. f. (ZYGOPHYLLACEAE) (CALTROPS FAMILY) "Sheka'a" Abdominal colic, dyspepsia, eye problems, fever, kidney stones, liver pain, malaria, spleen pain, venereal diseases.

*Fagonia schweinfurthii* (Hadidi) Hadidi (ZYGOPHYLLACEAE) (CALTROPS FAMILY) "Otot" "derma" "lekob" Ear infections, infections, venereal diseases.

*Ferula assa-foetida* L. (APIACEAE) (CELERY FAMILY) "Asafetida" "Haltt" "haltda" Antispasmodic, expectorant, sedative. Colic.

*Ficus carica* L. (MORACEAE) (MULBERRY FAMILY) "Fig" "Teen" "balas 'arabi" Emetic, diuretic, laxative, nervine, poultice. Blisters, bruised fingers and toes, cough, depression, freckles, kidney stones, laxative, leprosy, nervous tension, remove thorns, warts.

*Ficus cordata* ssp. *salicifolia* (Vahl) C.C. Berg (MORACEAE) (MULBERRY FAMILY) "Lithab" Bruised fingers and toes, indigestion, warts.

*Foeniculum vulgare* Mill. (APIACEAE) (CELERY FAMILY) "Fennel" "Sheeh" "samr" Carminative, diuretic, nephritis. Abdominal colic, coughs, kidney pain.

*Fumaria parviflora* Lam. (FUMARIACEAE) (FUMITORY FAMILY) "Hamed" "Humaid" "humaida" "shahatarag" "shtrag" "sagar" Anthelmintic, laxative. Constipation, dyspepsia, skin disorders.

*Geranium trilophum* Boiss. (GERANIACEAE) (GERANIUM FAMILY) "Zahra'a" Analgesic. Backache.

*Glycyrrhiza glabra* L. (FABACEAE) (LEGUME FAMILY) "Licorice" "Irk al hilou" "irk al hiel" "ud al ss" Analgesic, digestive, expectorant, purgative. Cough, indigestion, myalgia.

*Gnidia somalensis* (Franch.) Gilg. (THYMELAEACEAE) (MEZERUM FAMILY) "Barha" Emetic, purgative. Stomach cleanser, tuberculosis.

*Haloxylon salicornicum* (Moq.) Bunge (CHENOPODIACEAE) (LAMBSQUARTER FAMILY) "Gatha" "remth" "rimth" Hypoglycemia.

*Haplophyllum tuberculatum* (Forsskal) Fiori (RUTACEAE) (CITRUS FAMILY) "Tafer al tays" "kirkhan" "shajarat al baud" Abortifacient, analgesic, sedative, stimulant. Chest pains, dysmenorrhea, flatulence, gastrosis, hysteria, puerperium, rheumatism.

*Heliotropium crispum* Desf. (BORAGINACEAE) (BORAGE FAMILY) "Ramrm" "rumrm" Mouth blisters, snakebites, swellings, ulcers.

*Heliotropium europaeum* L. (BORAGINACEAE) (BORAGE FAMILY) "Heliotrope" "Karee" "ramrm" Emetic, hepatic. Liver ailments, liver pain.

*Heliotropium fartakense* O. Schwartz (BORAGINACEAE) (BORAGE FAMILY) "Remrm" Burns, colic, dislocated joints, eczema, indigestion, swollen eyes, skin problems, snakebites, sprains, ulcers, wounds.

*Heliotropium longiflorum* (Hochst. & Steud. ex A. DC.) Jaub. & Spach (BORAGINACEAE) (BORAGE FAMILY) "Habg" "hbk" "ramrm" "rumrm" Swollen eyes, facial sores, skin infections, sores.

*Holarrhena pubescens* (Buch.-Ham.) G. Don. f. (*H. antidysenterica*) (ANACARDIACEAE) (DOGBANE FAMILY) "Tellicherry bark" "Alsan al teer" "kurchi" Febrifuge, vermifuge. Diarrhea, insomnia, restlessness, rheumatism.

*Impatiens balsamina* L. (BALSAMINACEAE) (FORGET-ME-NOT FAMILY) "Rose balsam" "Garden balsam" "Sefr" Conjunctivitis, dermatitis.

*Imperata cylindrica* (L.) P. Beauv. (POACEAE) (GRASS FAMILY) "Cogongrass" "Halfa" Rheumatism.

*Indigofera articulata* Gouan (FABACEAE) (LEGUME FAMILY) "Khedaish" Toothache.

*Indigofera oblongifolia* Forsskal (FABACEAE) (LEGUME FAMILY) "Hasr" Analgesic, anti-inflammatory. Insect stings, snakebites, swellings.

*Ipomoea nil* (L.) Roth. (CONVOLVULACEAE) (MORNING GLORY FAMILY) "Kemerot" Anodyne, purgative. Asthma, cleansing agent, headlice, ophthalmia, pain, to improve vision.

*Ipomoea pes-caprae* (L.) R. Br. (CONVOLVULACEAE) (MORNING GLORY FAMILY) "Beach morning-glory" "Railroadvine" "Derg" Purgative. Colic, rheumatism, poisonous jellyfish stings.

*Jasminum grandiflorum* L. (OLEACEAE) (OLIVE FAMILY) "Royal jasmine" "Yasmn" "anbr" Digestive, emollient. Abdominal pain, burns, colic, dysentery.

*Jatropha dhofarica* Radcliffe-Smith (EUPHORBIACEAE) (SPURGE FAMILY) "Zabrt" "zeberwot" "zebrt" Antiseptic, deodorant, hemostatic, laxative, vermifuge. Constipation, skin sores, worms, wounds.

*Juglans regia* L. (JUGLANDACEAE) (WALNUT FAMILY) "English walnut" "Joz" "naksh" Nervine. Eczema, nervous problems.

*Juniperus excelsa* M. Bieb. ssp. *polycarpus* (C. Koch) (CUPRESSACEAE) (CYPRESS FAMILY) "Al'allan" "ktrn" Analgesic. Myalgia, paralysis.

*Kanahia laniflora* (Forsskal) R. Br. (ASCLEPIADACEAE) (MILKWEED FAMILY) "Sibbi'a" Abscesses, swellings, ulcers.

*Kleinia odora* (Forsskal) DC. (ASTERACEAE) (ASTER FAMILY) "Egsib" "ga'adin" Anodyne, diuretic. Painful, stiff limbs; paralysis.

*Kleinia saginata* P. Halliday (ASTERACEAE) (ASTER FAMILY) "Hubberdi" Hemostatic, emulcent. Wounds, ophthalmia.

*Lablab purpureus* (L.) Sweet (FABACEAE) (LEGUME FAMILY) "Dolichos lablab" "Lablab" Aphrodisiac, laxative, diuretic, dysmenorrhea.

*Lantana petitiiana* A. Rich (VERBENACEAE) (VERBENA FAMILY) "Sa'af" Abdominal colic.

*Launea nudicaulis* (L.) Hook. f. (ASTERACEAE) (ASTER FAMILY) "Hwwa" "huwah" "howwah" Febrifuge. Fever, excessive bleeding after childbirth.

*Lavandula* spp. (LAMIACEAE) (MINT FAMILY) "Oustah kodous" "dhurm" "fx" "fahya" Analgesic, carminative. Abdominal colic, headache, rheumatism, gastrosis.

*Lavandula dhofarensis* A.G. Miller (LAMIACEAE) (MINT FAMILY) "Heryem" ekulun" "hilbn" Nervine, vermifuge. Kidney problems, stomachache, worms.

*Lawsonia inermis* L. (LYTHRACEAE) (LOOSESTRIFE FAMILY) "Henna" "hinna" "hina" Anti-inflammatory, febrifuge, local anesthetic. Dandruff, fever, headaches, skin rash, mouth ulcers.

*Lepidium sativum* L. (BRASSICACEAE) (MUSTARD FAMILY) "Garden cress" "Rashd" "rishd" "thuffa" "hilf" Aches and pains, backache, bronchial problems, colic, coughs, cramps, measles, skin rash.

*Leptadenia pyrotechnica* (Forsskal) Decne. (ASCLEPIADACEAE) (MILKWEED FAMILY) "Markh" Diuretic.

*Limonium axillare* Forsskal (PLUMBAGINACEAE) (LEADWORT FAMILY) "Qataf" "gataf" Astringent. Diarrhea.

*Linum usitatissimum* L. (LINACEAE) (FLAX FAMILY) "Flax" "Hab e kattn" "sib muma" Analgesic, laxative. Arthritis, constipation, urinary disorders, venereal diseases, wounds.

*Lycium shawii* Roem. et Schult (SOLANACEAE) (POTATO FAMILY) "'Awsaj" "'awshaj" "qasad" Diuretic, hepatic, laxative, tonic. Colic, jaundice, improve vision.

*Lycopersicon esculentum* Miller (SOLANACEAE) (POTATO FAMILY) "Tomato" "Tamatum" Bleeding gums, nosebleeds.

*Maerua crassifolia* Forsskal (CAPPARACEAE) (CAPER FAMILY) "Maeru" "Sarh" Laxative. Abdominal colic, constipation, pain from bone fracture.

*Malva parviflora* L. (MALVACEAE) (MALLOW FAMILY) "Little mallow" "Khubaiza" "khubbayz" Demulcent. Fever, ulcers.

*Mangifera indica* L. (ANACARDIACEAE) (CASHEW FAMILY) "Mango" "Amba" Diabetes, flu, jaundice.

*Matricaria aurea* (Loefl.) Sch.-Bip. (ASTERACEAE) (ASTER FAMILY) "Bbnag" "bbnaj" Colic, cramps, stomachaches.

*Marrubium vulgare* L. (LAMIACEAE) (MINT FAMILY) "Horehound" "Rehn" "zaqoom" Expectorant, tonic. Coughs.

*Medicago sativa* L. (FABACEAE) (LEGUME FAMILY) "Alfalfa" "Qat" "jat" "qadb" Aphrodisiac. Bruises, fractures, to stop nosebleeds.

*Melilotus alba* Medic. (FABACEAE) (LEGUME FAMILY) "White sweetclover" "Otrah" "raimn" Analgesic, astringent, narcotic. Rheumatism.

*Melilotus indicus* (L.) All. (FABACEAE) (LEGUME FAMILY) "Sour clover" "Handagg" "handaqg" Emollient. Skin rash.

*Mentha longifolia* (L.) Hudson (LAMIACEAE) (MINT FAMILY) "Horsemint" "Na'ana" "gha'gha" "habak" Dyspnea, chills, cough, fever, gastrosis.

*Moringa peregrina* (Forsskal) Fiori (MORINGACEAE) (HORSE RADISH TREE FAMILY) "Shu" Analgesic, febrifuge, laxative. Abdominal pain, back pain, bone fractures, burns, constipation, fever, headache, lacerations, myalgia, parturition.

*Morus nigra* L. (MORACEAE) (MULBERRY FAMILY) "Black mulberry" "Ud al-tt" "tt" Tonic. Dysmenorrhea.

*Myristica fragrans* Houtt. (MYRISTICACEAE) (NUTMEG FAMILY) "Mace" "Nutmeg" "Joz e Qu'wa" "qoust" "Bisbasa" Carminative, digestive, narcotic (in high doses), tonic. Digestion, stomach cramps.

*Myrtus communis* L. (MYRTACEAE) (MYRTLE FAMILY) "Myrtle" "Ys" "hads" Astringent, antiseptic, stimulant. Blisters, abdominal colic, coughs, diarrhea, fevers, headache, insecticide, nosebleeds, stings, ulcers.

*Nepeta deflersiana* Schweinf. (LAMIACEAE) (MINT FAMILY) "Dharah" "hamida" Emollient. Burns, gastrosis.

*Nerium oleander* L. (ANACARDIACEAE) (DOGBANE FAMILY) "Oleander" "Habn" Bronchitis, cough, sinus problems.

*Nigella sativa* L. (RANUNCULACEAE) (BUTTERCUP FAMILY) "Black cumin" "Habba sood" "qahta saud" Asthma, congestion, flatulence, hemorrhoids, polio.

*Ochradenus baccatus* Del. (RESEDACEAE) (RESEDA FAMILY) "Gurdee" "qirdi" "qurdi" Stomach ache, stomach pains.

*Ocimum basilicum* L. (LAMIACEAE) (MINT FAMILY) "Basil" "Rehn" Hemostatic. Cataracts, colds, diarrhea, enteralgia, wounds.

*Olea europaea* L. (OLEACEAE) (OLIVE FAMILY) "Olive" "Itm" "mitn" Laxative. Blisters, bone fractures, cataracts, constipation, skin rashes, ulcers.

*Opuntia ficus-indica* Mill. (CACTACEAE) (CACTUS FAMILY) "Indianfig pricklypear" "Balas turk" Diarrhea.

*Paeonia officinalis* Retz. (PAEONIACEAE) (PAEONY FAMILY) "'Ud al-salb" Aphrodisiac, nervine, tonic. Neuroses.

*Pandanus tectorius* Sol. ex Parkinson (PANDANACEAE) (SCREW PINE) "Kd" Coolant. Chicken pox, measles.

*Papaver somniferum* Schl. (PAPAVERACEAE) (POPPY FAMILY) "Opium poppy" "Afyn" "hishas" Cough, insomnia, nervous tension.

*Peganum harmala* L. (ZYGOPHYLLACEAE) (CALTROPS FAMILY) "African rue" "Harmal" "khiyys" Analgesic, anthelmintic, narcotic. Gastrosis, kidney stones, rheumatism, worms.

*Pergularia tomentosa* L. (ASCLEPIADACEAE) (MILKWEED FAMILY) "Geygeh" "ghalaqah" "shajarat al jald" Anthelmintic, dermatosis, expectorant, laxative, purgative.

*Periploca aphylla* Decne. (ASCLEPIADACEAE) (MILKWEED FAMILY) "Handabb" "sowas" Anodyne. Dermatoses, tumors, swellings.

*Petroselinum crispum* (Miller) A.W. Hill (APIACEAE) (CELERY FAMILY) "Parsley" "Hawah" "zamoutah" Digestive, stimulant. Diarrhea, stomachache.

*Phoenix dactylifera* L. (ARECACEAE) (PALM FAMILY) "Date Palm" "Nakhel" "nakhl" "tammar" "tamr" (fruit) Aphrodisiac, tonic. Bruises, headache .

*Phragmites australis* (Cav.) Trin ex Steud. (POACEAE) (GRASS FAMILY) "Common reed" "Aqraban" "hajna" Anti-emetic, coolant.

*Physorhynchus chamaerapistrum* (Boiss.) Boiss. (BRASSICACEAE) (MUSTARD FAMILY) "Khophaje" Earache, warts.

*Pimpinella anisum* L. (APIACEAE) (CELERY FAMILY) "Anise" "Anasn" "Yanish" Analgesic, digestive, lactagogue. Indigestion, lactation, post-partum pain.

*Piper nigrum* L. (PIPERACEAE) (PEPPER FAMILY) "Black pepper" "Filfil" "filfil aswad" Aphrodisiac, stimulant, tonic. Appetite, childbirth, deafness, earache, flatulence, jaundice, phlegm, ringworm, vision.

*Pistacia lentiscus* L. (ANACARDIACEAE) (CASHEW FAMILY) "Mistakah" "mustiva" "mustaka sultani" Appetite, dermatosis, fever, bad breath, chest pains.

*Plantago coronopus* L. (PLANTAGINACEAE) (PLANTAIN FAMILY) "Rebla" "wideina" Laxative. Constipation, wounds.

*Plantago major* L. (PLANTAGINACEAE) (PLANTAIN FAMILY) "Common plantain" "Warak sabun masasah" "lisan al kalb" "barhanj" Febrifuge. Abscess, diarrhea, dysentery, fever, tonic, ulcers.

*Plantago ovata* Forsskal (PLANTAGINACEAE) (PLANTAIN FAMILY) "Blond psyllium" "Hab zargah" "qurayta" "rebla" "bidr qtn" Astringent, demulcent, diuretic. Boils, chronic constipation, diarrhea, ulcers, venereal diseases.

*Pluchea arabica* (boiss.) Qaiser & Lack (ASTERACEAE) (ASTER FAMILY) "Godot" Deodorant. Boils, ear infections, skin sores, swellings.

*Plumbago zeylanica* L. (PLUMBAGINACEAE) (LEADWORT FAMILY) "Enki'in" "ensain" "kefil d otin" Abortifacient, appetite depressant, vermifuge. Cough, dyspepsia, leprosy, skin problems, swellings, worms.

*Polycarpaea repens* (Forsskal) Aschers. et Schweinf. (CARYOPHYLLACEAE) (PINK FAMILY) "La'la'ah" "makr" "ruqayyiqah" Antidote for snakebite.



*Portulaca oleraceae* L. (PORTULACACEAE) (PURSLANE FAMILY) "Purslane" "Al khalqa" "barbir" "farfena" "humdeh" Astringent, blood cleanser, demulcent, diuretic, emollient, hepatic, laxative. Constipation, hepatitis, nephrosis.

*Portulaca quadrifida* L. (PORTULACACEAE) (PURSLANE FAMILY) "Farfena" "arnubah" "martah" Diuretic. Swellings, wounds.

*Prosopis cineraria* (L.) Druce (MIMOSACEAE) (LEGUME FAMILY) "Ghf" Analgesic, antiseptic. Cataracts, dyspepsia, earache, rheumatism, scorpion stings, toothache, pain in bone fractures, wounds.

*Prunus dulcis* (Miller) D. Webb (ROSACEAE) (ROSE FAMILY) "Almond" "Loz" "lauz" Vermifuge. Cough, dyspnea, herpes, worms.

*Psiadia punctulata* Dsyatke (*P. arabica* Jaub. et Spach) (ASTERACEAE) (ASTER FAMILY) "Tubbak" "fatah" Anodyne. Broken bones, myalgia.

*Psoralea corylifolia* L. (= *Cullen corylifolia* (L.) Medikus [per GRIN]) (FABACEAE) (LEGUME FAMILY) "Mahleb shari" "mahleb aswad" Aphrodisiac, cooling, deodorant. Dyspnea, fever, mastitis, painful swellings.

*Pteropryum scoparium* Jaub. & Spach. (POLYGONACEAE) (BUCKWHEAT FAMILY) "Sidf" Dyspepsia. Indigestion.

*Pulicaria jaubertii* Gamal-Eldin (ASTERACEAE) (ASTER FAMILY) "Ansif" "munsf" Tonic. Digestion (stimulant), dysmenorrhea, epilepsy, lactagogue, vermifuge.

*Punica granatum* L. (PUNICACEAE) (POMEGRANATE FAMILY) "Pomegranate" "Rumn" Anthelmintic, hemostatic, hepatic, ophthalmic. Bleeding, burns, diarrhea, jaundice, skin rashes, vision, ulcers, weak stomach, worms.

*Raphanus sativus* L. (BRASSICACEAE) (MUSTARD FAMILY) "Radish" "Fejel" "figl" "qusm" Aphrodisiac, lactagogue, nervine. Baldness, complexion, deafness, freckles, kidney pain, spleen.

*Reichardia tingitana* (L.) Roth. (ASTERACEAE) (ASTER FAMILY) "Halawla" "huwwa" "maknn" "murr" Laxative. Colic, constipation, conjunctivitis, ophthalmia.

*Rhus somalensis* Engl. (ANACARDIACEAE) (CASHEW FAMILY) "Derfit" Antiseptic, astringent, hemostatic, diuretic, febrifuge. Appetite, general tonic.

*Rhazya stricta* Decaisne (ANACARDIACEAE) (DOGBANE FAMILY) "Harmal" "adfr" Anthelmintic, febrifuge, lactagogue, vermicide. Abdominal pain, bad breath, chest pain, colic, conjunctivitis, constipation,

diabetes, fever, lactation, skin rash, sore throat, worms.

*Ricinus communis* L. (EUPHORBIACEAE) (SPURGE FAMILY) "Castorbean" "'arash" "kharwa" "khirwa" "Khurwa'a" "zait" Analgesic, laxative, purgative. Blisters, constipation, halitosis, ophthalmia, toothache, ulcers.

*Rosa* sp. (ROSACEAE) (ROSE FAMILY) "Rose" "Ward" Cardiotonic, febrifuge, nervine, tonic. Cough, fever, mouth ulcers, skin disorders, throat pain.

*Rubia tinctorum* L. (RUBIACEAE) (COFFEE FAMILY) "Madder" "Fauwa" Dysmenorrhea, puerperium.

*Rumex vesicarius* L. (POLYGONACEAE) (BUCKWHEAT FAMILY) "Hamid" "Humaid" "humayd" Antidote, vermifuge. Diarrhea, scorpion stings.

*Ruta chalepensis* L. (RUTACEAE) (CITRUS FAMILY) "Sadab" "sadhb" "shadhab" "shathb" Analgesic, antirheumatic, aphrodisiac. Abdominal colic, headache, mental problems, rheumatism, snakebite, stomachache, wounds.

*Saccharum officinarum* L. (POACEAE) (GRASS FAMILY) "Sugarcane" "Qasab al sukkar" Diuretic, ophthalmic. Cough, eye problems.

*Salvadora persica* Garc. (SALVADORACEAE) (SALVADORA FAMILY) "Rak" "arak" "barr (fruit)" "miswak (twigs)" Laxative. Blisters, constipation, dysmenorrhea, scorpion stings, swellings, ulcers.

*Salvia aegyptiaca* L. (LAMIACEAE) (MINT FAMILY) "Ra'al" "noaim" "shajarat al ghazal" Demulcent. Diarrhea, piles.

*Sansevieria ehrenbergii* Schweinf. ex Baker (AGAVACEAE) (AVAVE FAMILY) "Seyteh" "sbteh" Dermatitis.

*Sarcostemma viminalis* R. Br. (ASCLEPIADACEAE) (MILKWEED FAMILY) "Bdol" General tonic and cleanser of the digestive system.

*Securinega phyllanthoides* Muell.-Arg. ssp. *phyllanthoides* Webster (EUPHORBIACEAE) (SPURGE FAMILY) "Hinna gaml" Chest pains.

*Senecio asirensis* Boulos et J.R.I. Wood (ASTERACEAE) (ASTER FAMILY) "Henna" Febrifuge. Fever.

*Senna alexandrina* Miller (CAESALPINIACEAE) (LEGUME FAMILY) "Alexandrian senna" "San" "sann" "makk" "sen" "senna makk" Anthelmintic, antiseptic, cathartic, laxative. Constipation, purgative,

rheumatism, skin diseases, stomach cramps.

*Senna holosericea* (Fresen.) Greuter (CAESALPINIACEAE) (LEGUME FAMILY) "Sennmukk" "ferrot"  
Laxative, nervine. Constipation, nervous problems.

*Senna italica* Miller (CAESALPINIACEAE) (LEGUME FAMILY) "Italian senna" "Ashriq" "ishriq" "shajarat ad dabb"  
Laxative, purgative. Chronic constipation, stomach cramps.

*Sesamum indicum* L. (PEDALIACEAE) (SESAME FAMILY) "Sesame" "Zait simsim" "saltt gilgiln"  
Aphrodisiac. Colds, dysentery, urinary problems.

*Sesbania sesban* (L.) Merrill (FABACEAE) (LEGUME FAMILY) "Sesban" "Nowm" Anthelmintic, astringent.  
Diarrhea, dysmenorrhea, itching, skin rash, wounds.

*Sisymbrium irio* L. (BRASSICACEAE) (MUSTARD FAMILY) "Shiltt" Expectorant, febrifuge. Fever.

*Solanum incanum* L. (SOLANACEAE) (POTATO FAMILY) "Ain al baqar" "arsam" "arsan" "hadaq" "mazg"  
"mazj" "helkem" "nuqum" Bruised fingers, dyspepsia, earache, flatulence, hemorrhoids, toothache,  
ulcers, weeping wounds.

*Solanum melongena* L. (SOLANACEAE) (POTATO FAMILY) "Eggplant" "Batangen" "batangan" Cholesterol,  
nausea.

*Solanum nigrum* L. (SOLANACEAE) (POTATO FAMILY) "Black nightshade" "Anab al deeb" "mejaje" "enab  
el deeb" "anamnam" Expectorant. Bruised fingers, burns, cholecystitis, fever, gonorrhea, nephrosis,  
stomachache, skin ulcers.

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## Module 11: AYURVEDIC

*Achyranthes aspera* L. "Chaff Plant" "Apamarga" (AMARANTH FAMILY) ANASARCA Bronchitis; Dropsy;  
Leprosy; Dysentery; FUNCTIONAL CLAIMS: Antiperiodic; Diuretic; Purgative

*Aconitum ferox* Wall ex Ser. "Indian Asconoit" "Vatsanaba" (BUTTERCUP FAMILY) Erythema; Gout; Neuralgia; Rheumatism; Tonsillitis; FUNCTIONAL CLAIMS: Anodyne; Antidiabetic; Antiinflammatory; Antipyretic; Diaphoretic; Diuretic; Narcotic; Nervine; Sedative

*Aegle marmelos* (L.) Corr. ex Roxb. "Bael" "Bilva-Shriphala" (CITRUS FAMILY) Arrhythmia; Asthma; Dysentery; Fever; Malaria; FUNCTIONAL CLAIMS: Carminative; Expectorant; Febrifuge; Laxative

*Alpinia galanga* Willd. "Java Galangal" "Malayavach" (GINGER FAMILY) Bronchitis; Dermatitis; Dyspepsia; Rheumatism; FUNCTIONAL CLAIMS: Carminative; Febrifuge

*Alstonia scholaris* (L.) R. Br. "Dita Bark"; "Saptaparna" (DOGBANE FAMILY) Debility; DYSENTERY; Hepatitis; MALARIA; FUNCTIONAL CLAIMS: Anthelmintic; Aphrodisiac; Carminative; Emmenagogue; Expectorant; Febrifuge; Lactagogue

*Amomum subulatum* Roxb. "Greater Cardamom" ""Elabari" (GINGER FAMILY) Gingivitis; Gonorrhea; Hepatitis; Neuralgia; Ophthalmia; FUNCTIONAL CLAIMS: Cardiotonic; Carminative; Diuretic; Expectorant

*Andrographis paniculata* (Burm. F.) Nees "King of Bitters" "Kirta" (ACANTHUS FAMILY)

Debility; Dysentery; Dyspepsia; Fever; Inappetence; Neuralgia; FUNCTIONAL CLAIMS: Anthelmintic; Carminative; Cholagogue; Febrifuge

*Apium graveolens* L. "Celery" "Ajmoda" (CELERY FAMILY) ARTHRITIS; Asthma; Bronchitis; COLIC; GOUT; Hepatitis; RHEUMATISM; FUNCTIONAL CLAIMS: Anticonvulsant; Antiinflammatory; Aphrodisiac; Carminative; Diuretic; Emmenagogue; Sedative; Tranquilizer

*Argyrea speciosa* Sweet "Elephant Creeper" "Vridha Daraka" (MORNING GLORY FAMILY)

Arthritis; Elephantiasis; Obesity; Otitis; Rheumatism FUNCTIONAL CLAIMS: Antiinflammatory; Antiseptic; Aphrodisiac; Emollient; Vermifuge

*Azadirachta indica* A. Juss. "Neem" "Arishta" (MAHOGANY FAMILY) Fever; LEPROSY; Malaria; Ophthalmia; Tuberculosis; FUNCTIONAL CLAIMS: Anthelmintic; Antifeedant; Antiseptic; Diuretic; Emmenagogue; Febrifuge; Insecticide

*Bacopa monniera* (L.) Wettst. "Brahmi" "Water Hyssop" (FIGWORT FAMILY) ANURIA; Bronchitis; Cough; Epilepsy; Hysteria; Neuroses; FUNCTIONAL CLAIMS: Cardiotonic; Diuretic; Nervine; Vasoconstrictor

*Balanites aegyptiaca* (L.) Delile "Desert Date", "Ingudi Vraksha" (DESERT DATE FAMILY) ANTISEPTIC; Burns; Colic; Cough; Herpes; HYPERTENSION; Malaria; Rheumatism; Syphilis; FUNCTIONAL CLAIMS: Anthelmintic; Hypotensive; Piscicide; Purgative

*Bauhinia variegata* L. "Orchid Tree" "Kanchanara" (LEGUME FAMILY) Cough; Dermatitis; Menorrhagia; Obesity; Sore Throat; FUNCTIONAL CLAIMS: Carminative; Laxative

*Berberis aristata* DC. "Himalayan Barberry" "Tree Turmeric" "Daruharidra" (BARBERRY FAMILY) CHOLERA; MALARIA; PSORIASIS; FUNCTIONAL CLAIMS: Antimalarial; Antipyretic; **Hypoglycemic**; Purgative; Stomachic

*Boswellia serrata* Roxb. "Indian Olibanum" "Shallaki" (COPAL FAMILY) Bronchitis; DIABETES; Gonorrhea; Hepatitis; FUNCTIONAL CLAIMS: **Analgesic**; **Anticarcinomic**;

**CNS-Depressant**; **Hypoglycemic**; **Sedative**

*Butea monosperma* (La.) Kuntze "Bastard Teak" "Palasa" (LEGUME FAMILY) DIABETES; Heartburn; Piles; Tuberculosis; WORMS; FUNCTIONAL CLAIMS: **Anthelminthic**; **Antifertility**; **Hypoglycemic**

*Caesalpinia crista* L. "Bonduc Nut" "Nickernut" "Latakaranja" (LEGUME FAMILY): Asthma; Colic; CONVULSIONS; Fever; HEPATOSIS; Malaria; Neuroses; FUNCTIONAL CLAIMS: **Antidiarrheic**; **Antiestrogenic**; **Antifertility**; **Anthelminthic**; **Antiperiodic**; **Febrifuge**

*Calophyllum inophyllum* L. "Alexandrian Laurel" "Punnaga" (St.JOHN'SWORT FAMILY):

Migraine; Orchitis; Pain; Vertigo; Ulcers; FUNCTIONAL CLAIMS: **Antiaggregant**; **Antipyretic**; **Bradycardic**

*Calotropis gigantea* (L.) R. Br. "Giant Milkweed" "Alarka" (MILKWEED FAMILY): Bronchitis; Dysentery; Leprosy; Splenitis; FUNCTIONAL CLAIMS: **Anticarcinomic**; **Digitalic**; **Emetic**; **Expectorant**; **Purgative**

*Cannabis sativa* L. "Marijuana" "Bhangra" (NETTLE FAMILY): Delirium; Dermatitis; Dysmenorrhea; GLAUCOMA; Malaria; MULTIPLE SCLEROSIS; Pertussis; FUNCTIONAL CLAIMS: **Analgesic**; **Antiglaucomic**; **Antispasmodic**; **Sedative**; **Serotonergic**

*Cassia angustifolia* Wahl. "Indian Senna"; "Markandika" (LEGUME FAMILY): Biliousness; CONSTIPATION; Dermatitis; Gout; FUNCTIONAL CLAIMS: **Purgative**

*Centella asiatica* L. "Gotu Kola" "Indian Pennywort" "Mandukaparni" (CELERY FAMILY): Dermatitis; Eczema; Insanity; Leprosy; Psoriasis; Retardation; Rheumatism; FUNCTIONAL CLAIMS: Antiseptic; Diuretic; Sedative

*Cichorium intybus* L. "Chicory", "Kasni" (ASTER FAMILY): Asthma; Cancer; Dysmenorrhea; Impotence; INSOMNIA; Splenitis; Tachycardia; FUNCTIONAL CLAIMS: **Alexiteric**; **Digestive**; **Emmenagogue**; **Stomachic**

*Cinnamomum verum* S. Presl. "Ceylon Cinnamon" "Twak" (LAUREL FAMILY): **DIABETES**; Dysmenorrhea; DYSPEPSIA; PAIN; FEVER; Rheumatism; TUBERCULOSIS; FUNCTIONAL CLAIMS: **Amtiseptic; Carminative; Digestive; Emmenagogue; Stomachic; Uterotonic**

*Cissampelos pareira* L. "Velvet Leaf" "Laghu Patha" (MOONSEED FAMILY): Dermatitis;

Diarrhea; Dyspepsia; Syphilis; FUNCTIONAL CLAIMS: **Antilithic; Diuretic; Myorelaxant;**

*Citrullus colocynthis* (L.) Schrad. "Bitter Apple", "Indravaruni" (GOURD FAMILY) CANCER; **CONSTIPATION**; Fever; Neuralgia, Rheumatism; Sciatica; Splenomegaly; WORMS; Wounds;

FUNCTIONAL CLAIMS: **Cathartic; Diuretic; Emetic; Expectorant**

*Coccinia indica* Wight & Arn. "Scarlet Gourd", "Bimbai" (GOURD FAMILY): Adenopathy; AMEBIASIS; Bronchitis; Dermatitis; DIABETES; FUNCTIONAL CLAIMS: Antispasmodic; Cathartic; Expectorant; Hypoglycemic; Protisticide

*Coleus forskohlii* (MINT FAMILY)

*Commiphora mukul* "Gugal Gum" "Goggulu" (COPAL FAMILY): ARTHRITIS; Dysmenorrhea; Dyspepsia; Endometritis; HYPERCHOLESTEROLEMIA; HYPERTENSION; Impotence; ISCHEMIC; FUNCTIONAL CLAIMS: **Antiinflammatory**; Antispasmodic; Carminative; Emmenagogue; Hypoglycemic; Protisticide

*Coptis teeta* Wall. "Indian Goldthread" "Mishmamitika" (BUTTERCUP FAMILY): CONJUNCTIVITIS; Dyspepsia; Inappetence; Jaundice; FUNCTIONAL CLAIMS: Antiseptic; Carminative; Febrifuge

*Coriandrum sativum* L. "Coriander" "Dhanyaka" (CELERY FAMILY): DYSPEPSIA; HALITOSIS; Impotence; Neuralgia; Rheumatism; Toothache; FUNCTIONAL CLAIMS: Antibilious; Antiseptic; Aphrodisiac; Carminative

*Crocus sativus* L. "Saffron" "Kumkuma" (IRIS FAMILY) CANCER; Chickenpox; Dysmenorrhea; Fever; Measles; Mumps; Pertussis; FUNCTIONAL CLAIMS: **Anodyne; Antispasmodic**; Aphrodisiac; Carminative; Diuretic; Sedative

*Croton tiglium* L. "Purging Croton" "Jayapala" (SPURGE FAMILY): Apoplexy; Asthma; Calculus; Colic; CONSTIPATION; Gout; Laryngitis; Neuralgia; Rheumatism; Tympanitis; FUNCTIONAL CLAIMS: Diaphoretic; Diuretic; Emetic; Rubefacient;

*Cuminum cyminum* L. "Cumin" "Jeeraka" (CELERY FAMILY) "...for ye pay tithe of mint and anise and cummin..." Matthew 23. Asthma; Dermatitis; Dysentery; Gonorrhea; Impotence; Syncope; Tachycardia; FUNCTIONAL CLAIMS: Carminative; Stomachic

*Curcuma longa* L. "Turmeric" "Haridra" (GINGER FAMILY): ARTHRITIS; BRONCHITIS; DYSPEPSIA; HYPERTENSION; Jaundice; LARYNGITIS; LYMPHOMA; Malaria; RHEUMATISM; ULCERS; FUNCTIONAL CLAIMS: Anthelmintic; Antiinflammatory; Antiperiodic; Carminative; Diuretic; Expectorant; Stomachic

*Curcuma zedoaria* Roscoe "Zedoary" "Shati" (GINGER FAMILY): BRONCHITIS; COLD; COUGH; DYSPEPSIA; LARYNGITIS; LYMPHOMA; SPRAINS; FUNCTIONAL CLAIMS: Antiinflammatory; Carminative; Diuretic; Expectorant; Stomachic

*Datura metel* L. "Indian Thornapple" "Datura" (POTATO FAMILY): Arthritis; ASTHMA; CRAMPS; DYSMENORRHEA; Lumbago; Rheumatism; Sciatica; WORMS; FUNCTIONAL CLAIMS: **Anodyne;** **Anthelmintic;** Antispasmodic; Narcotic

*Dioscorea bulbifera* L. "Air Potato" "Wild Yam" "Barahi" (YAM FAMILY) Dysentery; Piles; Sores; Syphilis; Ulcers; FUNCTIONAL CLAIMS: Antifeedant

*Elephantopus scaber* L. "Elephant Ear" "Gojihiva" (ASTER FAMILY): Dermatitis; Diarrhea; Dysuria; Snakebite; Toothache; Ulcers; FUNCTIONAL CLAIMS: Cardiotonic; Febrifuge

*Elettaria cardamomum* Maton "Cardamom" "Ela Chhoti" (GINGER FAMILY): ASTHMA; BRONCHITIS, Cholecystitis; Hemorrhoids; Strangury; FUNCTIONAL CLAIMS: Aphrodisiac; Cardiotonic; Carminative; Diuretic; Laxative; Stomachic

*Ferula assa-foetida* L. "Asafoetida" "Hingu" (CELERY FAMILY): Bronchitis; Cramps; Dysmenorrhea; Dyspepsia; Pertussis; Pneumonia; FUNCTIONAL CLAIMS: Anthelmintic; Antiseptic; Antispasmodic; Aphrodisiac; Diuretic; Emmenagogue; Expectorant

*Garcinia cambogia* (ST.JOHN'SWORT FAMILY)

*Garcinia indica* (Thouars) Choisy "Kokum" "Red Mango" "Brikshamla" (ST.JOHN'SWORT FAMILY): Dermatitis; Diarrhea; Dysentery; Sores; Urticaria; FUNCTIONAL CLAIMS: Cholagogue; Demulcent; Emollient

*Gloriosa superba* L. "Gloriosa Lily" "Langalika" (LILY FAMILY) Colic; Gonorrhea; Leprosy; NEURALGIA; PEDICULOSIS; RHEUMATISM: FUNCTIONAL CLAIMS: Anthelmintic; Antiperiodic; Antiseptic; Pediculicide; Purgative;libacterial; Antiviral

*Gymnema sylvestre* R. Br. "Indian Milkweed Vine" "Meshasringi" (MILKWEED FAMILY):

Adenopathy; Cough; DIABETES; Fever; Snakebite: FUNCTIONAL CLAIMS: Diuretic; Hypoglycemic

*Hemidesmus indicus* (L.) Schult. "Indian sarsaparilla" " Sariva" (PERIPLOCA FAMILY) Dermatitis; Dyspepsia; Cough; Fever; Inappetence; Rheumatism; FUNCTIONAL CLAIMS: Demulcent; Diaphoretic;

Diuretic

*Holarrhena antidysenterica* (L.) Wall. "Conessi Tree" "Kutaja" (DOGBANE FLOWER): Dysentery; Fever; Hemorrhoids; WORMS; FUNCTIONAL CLAIMS: Anthelmintic; Antiamebic; Antidysenteric; Antipyretic; Carminative

*Hydnocarpus laurifolia* (Dennst.) Sleumer "Chalmoogra Almond" "Tugaraka" (FLACOURTIA FAMILY): Dermatitis; LEPROSY; FUNCTIONAL CLAIMS: Antibacterial

*Phyllanthus amarus* ?

*Justicia adhatoda* L. "Malabar Nut" "Vasaka" (ACANTHUS FAMILY): Asthma; Bronchitis; Cough; Diphtheria; Fever; Gonorrhea; Jaundice; Malaria; Tuberculosis; FUNCTIONAL CLAIMS: Antispasmodic; Bronchodilator; Diuretic; Expectorant

*Linum usitatissimum* L. "Flax", "Linen" "Uma" (FLAX FAMILY): Arthritis; Bronchitis; CANCER; CARDIOPATHY; Cold; **DERMATITIS**; INFLAMMATION; Rheumatism;

FUNCTIONAL CLAIMS: Demulcent; Diuretic; Emollient

*Luffa aegyptiaca* Miller "Sponge Gourd" "Dharmagava" (GOURD FAMILY) Dermatositis;

Inappetence; FUNCTIONAL CLAIMS: Cathartic; Diuretic; Emetic

*Madhuca longifolia* (L.) Macbride "Mahua" "Madhuka" (CHICLE FAMILY): Bronchitis; Dermatitis; Diabetes; Hemorrhoids; Pharyngitis; Rheumatism; Tonsillitis; FUNCTIONAL CLAIMS: Antiseptic; Demulcent; Expectorant

*Melia azedarach* L. "Chinaberry" "Persian Lilac" (MAHOGANY FAMILY) Dermatositis; Malaria; Nausea; WORMS; FUNCTIONAL CLAIMS: Anthelmintic; Antiperiodic; Antiseptic : Emollient; Purgative

*Mesua ferrea* L. "Cobra Saffron" "Nagkeshara" (ST.JOHN'SWORT FAMILY): ASTHMA; Bronchitis; Dysentery; Rheumatism; Scabies; Sores; FUNCTIONAL CLAIMS: Anthelmintic; Antiasthmatic; Antiedemic; Antiinflammatory; Sudorific

*Michellia champac* L. "Champac" "Champaca" (MAGNOLIA FAMILY): Gastritis; Gout; Headache; Rheumatism; Sores; Vertigo FUNCTIONAL CLAIMS: ANTISEPTIC; Carminative; Demulcent; Deobstruent; Diuretic; Emmenagogue; Expectorant; Hypoglycemic

*Mimusops elengi* L. "Spanish Cherry" "Bakula" (CHICLE FAMILY) Cardiopathy; Fever; Gingivitis; Infertility; Leukoderma; Urethritis; FUNCTIONAL CLAIMS: Antipyretic; Antiseptic; Antispasmodic; Cardiotonic;



## Hypotensive

*Moringa oleifera* Lam. "Horseradish Tree" "Sigru" (HORSERADISH TREE FAMILY): Asthma; Cough; Epilepsy; Gout; Headache; Hepatitis; Malaria; Rheumatism; FUNCTIONAL CLAIMS: Analgesic; Anthelmintic; Antiinflammatory; Antiseptic; Antispasmodic; Diuretic; Emmenagogue; Expectorant

*Mucuna pruriens* (L.) DC. "Cowitch" "Kapikachchha" (LEGUME FAMILY) Elephantiasis; Nephrosis; Neurosis; PARKINSONISM; FUNCTIONAL CLAIMS: Anthelmintic; Antiparkinsonian; Aphrodisiac; Hypotensive

*Nardostachys jatamansi* DC. "Spikenard" "Jatamansi" (VALERIAN FAMILY): ARRHYTHMIA; CARDIOPATHY; Chorea; CRAMPS; DYSMENORRHEA; Epilepsy; Headache; INSOMNIA; Leprosy; FUNCTIONAL CLAIMS: Antispasmodic; Carminative; Diuretic; Emmenagogue; Hypotensive; Hypothermic; Sedative; Tranquilizer

*Nelumbo nucifera* Gaertn. "Water Lotus" "Kamal" (WATERLILY FAMILY): Dermatitis; Diarrhea; Dysmenorrhea; Fever; Hemorrhoids; Leprosy; Strangury; FUNCTIONAL CLAIMS: Cholagogue; CNS-Depressant; Demulcent; Diuretic; Expectorant

*Nigella sativa* L. "Black Cumin", "Upakunchika" (BUTTERCUP FAMILY): **ARTHRITIS**; ASTHMA, BRONCHITIS; Colic; Cough; Dermatitis; DYSMENORRHEA; Orchitis; **RHEUMATISM**; FUNCTIONAL CLAIMS: Anthelmintic; Antibilious; Antiseptic; Carminative; Diaphoretic; Diuretic; Emmenagogue; Lactagogue

*Nyctanthes arbor-tristis* L. "Night Jasmine" "Parijata" (OLIVE FAMILY): Dermatitis; Fever; Rheumatism; Sciatica; FUNCTIONAL CLAIMS: Anthelmintic; Antihistamine; Antiinflammatory; Antipyretic; CNS-Depressant; Hypotensive; Tranquilizer

*Ocimum sanctum* L. "Holy Basil" "Tulsi" (MINT FAMILY): Bronchitis; Cough; DERMATOSIS; DYSPEPSIA; Dysentery; Fever; Gastrosis; Malaria; FUNCTIONAL CLAIMS: Antiperiodic; Antiseptic; Antispasmodic; Carminative; Demulcent; Diuretic; Expectorant; Hypoglycemic

*Paederia foetida* L. "Stinking Coffee" "Prasarini" (COFFEE FLOWER): Anuria; ARTHRITIS; Diarrhea; Hemorrhoids; Myalgia; Rheumatism; Splenosis; FUNCTIONAL CLAIMS: Anthelmintic; Antiinflammatory; Antispasmodic; Diuretic

*Papaver somniferum* L. "Opium Poppy", "Ahiphenam" (POPPY FAMILY): CANCER; **COUGH**; Dysentery; **INSOMNIA**; Impotence; PAIN; TOOTHACHE; FUNCTIONAL CLAIMS: Analgesic; Hypnotic; Narcotic

*Peganum harmala* L. "Syrian Rue" "Harmal" (CALTROPS FAMILY): Asthma; Colic; Dysmenorrhea; Fever; Jaundice; Laryngitis; Lumbago; MALARIA; WORMS; FUNCTIONAL CLAIMS: Abortifacient; Analgesic; Antiperiodic; Emmenagogue

*Phyllanthus emblica* L. "Emblic" "Amalik" (SPURGE FAMILY): Asthma; Bronchitis; Diarrhea; Dysentery; Gonorrhea; FUNCTIONAL CLAIMS: Antibacterial; Antiviral; Aperient; CNS-depressant; Diuretic; Spasmolytic

*Phyllanthus fraternus* Webster "Stone Breaker" "Bhumyaamlaki" (SPURGE FAMILY) Constipation; Dermatitis; Dyspepsia; Dysuria; HEPATITIS; JAUNDICE; Ophthalmia;

FUNCTIONAL CLAIMS: Analgesic; Diuretic; Fungicide; Hypoglycemic; Laxative

*Picrorrhiza kurroa* Royle "Kuru" "Picroliv" (Trade Name) "Katula" (FIGWORT FAMILY): Anemia; Asthma; Bronchitis; Dyspepsia; Elephantiasis; Fever; Jaundice; Hepatitis; FUNCTIONAL CLAIMS: Antiaggregant; Antiperiodic; Cathartic; Cholagogue; Laxative

*Piper longum* L. "Long Pepper" "Pipali" (PEPPER FAMILY) Asthma; Bronchitis; Colic; Dyspepsia; Gout; Lumbago; Rheumatism; Splenitis; TUBERCULOSIS; FUNCTIONAL CLAIMS: Antiseptic; Aphrodisiac; Cardiotonic; Carminative; Diuretic; Emmenagogue; Vermifuge

*Piper nigrum* L. "Black Pepper" "Maricha" (PEPPER FAMILY): Cholera; Diarrhea; Dyspepsia; Dysuria; Headache; Rheumatism; Toothache; FUNCTIONAL CLAIMS: Antiperiodic; Antiseptic; Carminative; Fungicide; Taenicide

*Plantago ovata* Forsk. "Ispaghula" "Ashwagolam" (PLANTAIN FAMILY) Adenopathy; Blenorrhea; Bronchitis; Diarrhea; Dysentery; Gonorrhea; Gout; Rheumatism; Urethritis; FUNCTIONAL CLAIMS: Demulcent; Diuretic; Emollient; Hypocholesterolemic; Laxative

*Plumbago zeylanica* L. "Leadwort" "Chitraka" (LEADWORT FAMILY) Adenopathy; Dermatitis; Leukoderma; Paralysis; Rheumatism; FUNCTIONAL CLAIMS: Antiseptic; Aphrodisiac; Cardiotonic; Carminative; FUNCTIONAL CLAIMS: Abortifacient; Antifertility; Antiseptic

*Prunus dulcis* (Mill.) D.A. Webb "Almond" "Badama" (ROSE FAMILY) Acne; Asthma; CANCER; Cough; Dermatitis; Laryngitis; Neuralgia; FUNCTIONAL CLAIMS: Anodyne; Demulcent; Emollient; Laxative; Nervine

*Psoralea corylifolia* L. "Black Dot" "Vakuchi" (LEGUME FAMILY): Leprosy; **LEUKODERMA**; FUNCTIONAL CLAIMS: Anthelmintic; Antiinflammatory; Diaphoretic; Diuretic; Myorelaxant; Sedative; Tranquilizer

*Pterocarpus marsupium* Roxb. "Malabar Kino" "Pitasala" (LEGUME FAMILY): Dermatitis; DIABETES; Diarrhea; Sores; Toothache; FUNCTIONAL CLAIMS: Hypocholesterolemic; Hypoglycemia

*Pterocarpus santalinus* L.f. "Red Saunders" "Rakta Chandana" (LEGUME FAMILY): Dermatitis; DYSENTERY; Fever; Headache; Inflammation; Malaria; Ophthalmia; Toothache;

FUNCTIONAL CLAIMS: Antipyretic; Antispasmodic; Aphrodisiac; Diaphoretic; Hypoglycemic; Vermifuge

*Punica granatum* L. "Pomegranate", "Dadima" (POMEGRANATE FAMILY): Bronchitis; CANCER; Conjunctivitis; **DYSENTERY; DYSMENORRHEA**; HEMORRHOIDS; INFERTILITY; SORE THROAT; STOMATITIS; WORMS; FUNCTIONAL CLAIMS: Anthelmintic; Antiseptic; Estrogenic; Taenifuge

*Rauwolfia serpentina* (L.) Benth. Ex Kurz "Indian Snakeroot" "Sarpagandha" (DOGBANE FAMILY): DYSENTERY; HYPERTENSION; Hypochondria; INSOMNIA; FUNCTIONAL CLAIMS: Antipyretic; CNS-Depressant; Hypotensive; Sedative

*Rheum emodi* Wall. "Indian Rhubarb" "Amlavetasa" (BUCKWHEAT FAMILY): Asthma; Bronchitis; Colitis; Coryza; DERMATITIS; Dysentery; Fever; Hemorrhoids; Jaundice; Lumbago; FUNCTIONAL CLAIMS: Cathartic; Diuretic; Emmenagogue; Purgative

*Ricinus communis* L. "Castorbean", "Erandat" (SPURGE FAMILY): Abscess; Bunion; CANCER; Conjunctivitis; DERMATITIS; Gout; Headache; Lumbago; Rheumatism; Sciatica;

FUNCTIONAL CLAIMS: Cathartic; Emetic; Emmenagogue; Lactagogue; Purgative

*Ruta graveolens* L. "Rue", "Sadapaha" (CITRUS FAMILY): POISONOUS; Colic; CRAMPS; Dyspepsia; Epilepsy; Hysteria; Rheumatism; VITILIGO; FUNCTIONAL CLAIMS: Abortifacient; Anthelmintic; Antiseptic; Antispasmodic; Diuretic; Emmenagogue; Expectorant; Vermicide

*Santalum album* L. "Sandalwood: "Chandanam" (SANDALWOOD FAMILY): Bronchitis; Cystitis; Dermatitis; Dysentery; Erysipelas; Gonorrhea; Scabies; Urethritis; FUNCTIONAL CLAIMS: Antiseptic; Diuretic; Expectorant

*Saussurea lappa* (Decaisne) C.B. Clarke "Indian Orris", "Kustha" (ASTER FAMILY): **ASTHMA; BRONCHITIS; CHOLERA; COUGH**; Dermatitis; Dyspepsia; Smallpox; Stomachache; Tuberculosis; FUNCTIONAL CLAIMS: Anthelmintic; Antiseptic; Antispasmodic; Aphrodisiac; Cardiotonic; Carminative; Diuretic; Expectorant; Sedative

*Sesamum indicum* L. "Sesame" "Tila" (SESAME FAMILY): Burns; Cholera; Diarrhea; Dysentery; Dysmenorrhea; Migraine; Vertigo; FUNCTIONAL CLAIMS: Demulcent; Diuretic; Emmenagogue; Emollient; Lactagogue; Laxative

*Sida cordifolia* L. "Country Mallow" "Bala" (MALLOW FAMILY): Asthma; Cystitis; Dysentery; Elephantiasis; Fever; Gonorrhea; Hemorrhoids; Rheumatism; Spermatorrhea; FUNCTIONAL CLAIMS: Cardiotonic; Demulcent; Diuretic; Emollient; Febrifuge; Sympathomimetic

*Solanum indicum* L. "Indian Nightshade" "BrahatiVanavrinktaki" (POTATO FAMILY): Asthma; Colic; Cough; Dermatitis; Dropsy; Dysuria; Worms; FUNCTIONAL CLAIMS: Aphrodisiac; Cardiotonic;

Carminative; Diaphoretic; Expectorant

*Strychnos nux-vomica* L. "Strychnine" "Kupilu" (STRYCHNINE FAMILY): CHOLERA; Dysentery; Dyspepsia; Epilepsy; Gout; IMPOTENCE; Incontinence; Neuralgia; Rheumatism; FUNCTIONAL CLAIMS: POISONOUS; Aphrodisiac; Cardiotonic; Nervine; Stomachic

*Swertia chirata* Buch.Ham "Chireta" "Kirata Tikta" (GENTIAN FAMILY): Asthma; Dermatitis; Gout; MALARIA; WORMS; FUNCTIONAL CLAIMS: Anthelminthic; Carminative; Febrifuge; Laxative

*Syzygium cumini* (L.) Skeels (Syn: *Eugenia jambolana* Lam.) "Java Plum" "Jambu" (MYRTLE FAMILY) DIABETES; Diarrhea; Dysentery; Dysmenorrhea FUNCTIONAL CLAIMS: Diuretic; Hypoglycemic

*Tamarindus indica* L. "Tamarind" "Amlika" (LEGUME FAMILY): Conjunctivitis; Gonorrhea; Hemorrhoids; Inflammation; Vaginitis; FUNCTIONAL CLAIMS: Antibilious; Carminative

*Terminalia arjuna* Wight & Arn. "Arjuna Myrobalan" "Arjuna" (COMBRETUM FAMILY): Angina; Cardiopathy; Diarrhea; Dysentery; Hypertension; Sprue; FUNCTIONAL CLAIMS: Antidotal; Cardiotonic; Diuretic; Hypotensive; Lithontripti

*Terminalia bellirica* (Gaertn.) Roxb. "Belleric Myrobalan" "Vibhitaka" (COMBRETUM FAMILY): Cough; Diarrhea; Dropsy; Enterosis; Gastrosis; Hemorrhoids; Hepatitis; Ophthalmia; Rheumatism; FUNCTIONAL CLAIMS: Expectorant; Laxative

*Terminalia chebula* Retz.. "Chebulic Myrobalan" "Haritaki" (COMBRETUM FAMILY): Asthma; Cough; Diarrhea; Dysentery; Fever; GINGIVITIS; Hemorrhoids; Hepatosis; Splenosis; Stomatitis; FUNCTIONAL CLAIMS: Purgative

*Tinospora cordifolia* (Willd.) Miers "Indian Quinine" "Guduchi" (MOONSEED FAMILY): Bronchitis; Cough; Diarrhea; Dysentery; Dyspepsia; Dysuria; Fever; Gonorrhea; Impotence; Rheumatism; FUNCTIONAL CLAIMS: Aphrodisiac; Diuretic

*Trachyspermum ammi* (L.) Sprague ex Turrill "Ajowan" "Yamani" (CELERY FAMILY)

Cholera; Cramps; DYSPEPSIA; DYSENTERY; Hysteria; WORMS FUNCTIONAL CLAIMS: **Antispasmodic; Antiseptic; Carminative; Vermifuge**

*Tribulus terrestris* L. "Caltrops" "Gokshura" (CALTROPS FAMILY): Cystitis; Dysuria; Gonorrhea; Gout; Gravel; Nephrosis; Spermatorrhea; Urethritis; FUNCTIONAL CLAIMS: Aphrodisiac; Demulcent; Diuretic

*Trigonella foenum-graecum* L. "Fenugreek" "Medhika" (LEGUME FAMILY): Alopecia; **DIABETES; DYSLACTEA;** Dyspepsia; **HYPERCHOLESTEROLEMIA;** Leukorrhea; MICROMASTIA; Pain; **RHEUMATISM;**

Swelling; FUNCTIONAL CLAIMS: Aphrodisiac; Carminative; Demulcent; Diuretic; Emmenagogue; Lactagogue

*Tylophora asthmatica* Weight & Arn.. "Asthmatics Swallowwort" "Antamul" (MILKWEED FAMILY): Asthma; Bronchitis; Catarrh; Dysentery; Gastrosis; FUNCTIONAL CLAIMS: Cathartic; Diaphoretic; Emetic; Expectorant

*Tylophora indica* (Burm. f.) Merr. "Indian Ipecac" "Antamul" (MILKWEED FAMILY): Asthma; Bronchitis; Dysentery; Rheumatism; FUNCTIONAL CLAIMS: Cathartic; Diaphoretic; Emetic

*Urginea indica* Kunth. "Indian Squill" "Vana Palandam" (LILY FAMILY): Asthma; Bronchitis; Cardiopathy; Croup; Dermatitis; Emphysema; Nephrosis; Rheumatism; FUNCTIONAL CLAIMS: Cardiotonic; Cathartic; Deobstruent; Diuretic; Emetic; Emmenagogue; Expectorant

*Valeriana jatamansi* Jones "Indian Valerian" "Tagara" (VALERIAN FAMILY): Chorea; Cramps; Dysmenorrhea; Epilepsy; Gastrosis; Nervousness; FUNCTIONAL CLAIMS: Carminative; Sedative

*Vernonia anthelmintica* (L.) Willd. "Indian Wormweed" "Aranyajira" (ASTER FAMILY): Dermatitis; WORMS; FUNCTIONAL CLAIMS: **Anthelmintic; Diuretic' Stomachic**

*Vernonia cinerea* Less. "Ashy Fleabane" "Sahadevi" (ASTER FAMILY): Conjunctivitis; Dermatitis; Dropsy; Hemorrhoids; Leprosy; Strangury; WORMS; FUNCTIONAL CLAIMS: Alexipharmic; Anthelmintic; Antispasmodic; Diaphoretic

*Withania somnifera* "Winter Cherry" "Ashwagandha" (POTATO FAMILY): Alcoholism; Debility; Dysphonia; Emphysema; Impotence; Neurosis; Ophthalmia; Rheumatism; Spermatorrhea; Tuberculosis; Ulcers; FUNCTIONAL CLAIMS: Aphrodisiac; Deobstruent; Diuretic; Lactagogue; Nervine; Sedative

*Zanthoxylum alatum* Roxb. "Winged Prickly Ash" "Tejpal" (CITRUS FAMILY): Cholera; Dyspepsia; Fever; Toothache; FUNCTIONAL CLAIMS: Carminative; Stomachic

*Zingiber officinale* Rosc. "Ginger" "Ardhrakam" (GINGER FAMILY): Asthma; Cholera; Cough; DYSPEPSIA; Gout; Headache; NAUSEA; RHEUMATISM; Toothache; VERTIGO; FUNCTIONAL CLAIMS: Carminative; Rubefacient; Sialogogue

*Ziziphus mauritiana* Lamk.. "Indian Jujube", "Badri" (BUCKTHORN FAMILY): Asthma; Colic; Diarrhea; Dysentery; Dysuria; Gingivitis; Gonorrhea; Hepatitis; Rheumatism; Tuberculosis FUNCTIONAL CLAIMS: Antiseptic; Carminative

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## Module 12: BIBLICAL BOTANY

Jim Duke

The Biblical World, bridging Africa via Egypt thru Israel and Palestine to Europe and the Middle East, is at the crossroads of the African and the European Continent. While few of these species are native to Tropical Africa, many if not most, still flourish today in Egypt and Israel, on both sides of the Suez Canal. I have had the pleasure of seeing both sides of the Suez Canal and Mount Sinai, on the day when it reverted from Israel to Egypt. Herewith I present some old, some, new, some borrowed, some blue observations, on Biblical Botany, especially medicinals, since so much has happened since the 1983 publication of my *Medicinal Plants of the Bible*, now out of print. I now seek new medicinal information on these old Biblical species. Why? Because more Americans are going to Alternative Practitioners, including religious and herbal advocates, than to Convention Physicians. And many of these Biblical species have proven biological activities which could prove synergistic with the New Age patient's faith in religion, and with the proven placebo effect.

Some even say that the pyramids owe their existence to the fortitude of the laborers, fortified with garlic and onion, that Cicero's passion may have been in part due to the l-dopa in the faba bean, that Leah was turned on by the atropine and scopolamine in the roots of the mandrake, and, incredibly, that the apple of the Bible may have in fact been the pomegranate, now reportedly the best plant source of the estrogen called estrone. There's even the suggestion that Solomon treated boils with fig juice. The proteolytic latex of figs is widely used in the third world, even today, as an antiseptic.

And now for some ABC's! We here in the New World are often jarred to find that in the Biblical Old World, they mean something differently than we do when they say apple, bean, and corn. The Biblical Apple may have been what we today call apple, or it may have been apricot or pomegranate (depending

on which scholar you believe), the Bean is what we call the faba bean, and Corn is what we call wheat.

Perhaps the healthiest recommendation in the Bible is to "eat with bitter herbs", anticipating a couple millennia the NIH appeal to eat your leafy veggies. The bitter herbs of the Bible have variously been interpreted to include chicory, dandelion, endive, lettuce, sheep sorrel, and watercress. Zohary (1982) adds dwarf chicory and poppy-leaved *Reichardia*, and by close juxtaposition, rocket. I find it more bitter than the endive, lettuce, and watercress.

It's clear that believing is part of the healing process. NBC News presented Dr. Herbert Benson, author of *Timless Healing*, who said that 95% of Americans believed in God, and that 99% of family physicians believed that faith can help heal. Dr. Benson spoke of healing as a three-legged stool, (1) Self (including beliefs, exercise, relaxation, and nutrition, wherein we'll fit our Biblical foods and spices) (2) Drugs (wherein we'll fit drugs like L-dopa from faba bean, morphine from the opium poppy, and many medicinal herbs) and (3) Surgery.

Israeli Botanical Scholar, Michael Zohary (1982), states rather expressly: "Although healing by plants is not explicitly mentioned in the Bible, herbal remedies were numerous and specific... The ultimate healer was God, and prayer was therefore the remedy most often prescribed." Because mentioning medicinal uses of plant would defy "the belief in God's exclusive healing power, they were not mentioned in the scripture". If we can add the real medicinal potential of the biologically active compounds in many of these medicinal plants, to the placebo effect, and to the real belief in God and the Bible, it augurs well for these Medicinal Plants of the Bible.

I've sprinkled the following tabulation of the medicinal plants of the bible with what I assess as purely folk medicinal indications (lower case), healing indications (in CAPITAL LETTERS indicating that the plant clearly contains phytochemicals that could help and even more positive indications (in CAPSs and **BOLD FONT**, indicating that the plant has been proven useful for the indications). I believe that my enumerating these indications (and I have enumerated less than half of the folk indications), I can strengthen the faith systems of some readers, and thereby help them heal themselves. In no way, however, am I recommending self diagnosis and/or self medication. I am enumerating those plants that one or another scholarly authority has considered to be a Biblical Plant, and tabulating a few of the real and folk indications for those herbs. Only your health practitioner can advise you as to whether or not you should use these herbs in your healing. I do.

Except for those species preceded by an asterisk \*, all of these entries were included in the out-of-print *Medicinal Plants of the Bible* (Duke and Duke, 1983), illustrated in part by my wife Peggy. Zohary (1982), for example, added 35 species to my published account of 142 species, including some important medicinal species like *Aloe vera*, *Calotropis procera*, *Commiphora abyssinica*, *Curcuma longa*, *Cymbopogon martinii*, *Hyoscyamus muticus*, *Lagenaria siceraria*, and *Liquidambar orientalis*. I have indicated such new inclusions from Zohary with the asterisk\*.

Zohary's book embarrassed me with a student I had been ill-advising that the apple in the Bible was either apricot or pomegranate. For her, with apologies for my relying, too staunchly, on my earlier sources, I quote: "The cultivated flora consisted of plants domesticated in loco or in nearby countries, like wheat, barley, lentil, pea, (I did not have pea in my earlier book either), fig, olive, carob, date palm, sycamore, and plants introduced from fairly remote countries, like the pomegranate, walnut, vine,

apple, mulberry, and pistachio. Quite a number of plants have never grown in the Land, but were imported as drugs or spices - like nard, myrrh, galbanum, cinnamon, saunders and the like... The Bible mentions lentils, broad beans, and chick-peas (I missed that one), but bitter vetch and garden peas as well as fenugreek were probably grown too." (Zohary, 1982)

Israeli authors like Zohary, more familiar with the Israeli Flora and the Bible than am I, should be better equipped to speculate as to which herbs were really meant in some elusive passages. I'm both pleased and displeased to note that Zohary, too, leaves a few problems unresolved, including one involving two major medicinal plants, saffron and turmeric, and one minor medicinal, safflower, all sources of yellow dyes. All three can be grown in warmer regions of Israel, but the turmeric would be difficult. Saffron and safflower would both be easy. Here are points which Zohary makes! "Saffron (in Hebrew, *karkom*) is mentioned only once in the Bible" Some commentators identify it with turmeric which "was never grown" in this country, others with saffron, which was probably grown only in post-biblical times. There is linguistic support for both possibilities. "There is no doubt that the sown *karkom* fields mentioned in the Mishnah (of the Talmud) refer to *Crocus sativus*". More data he presents point "to the identification of biblical *karkom* as turmeric and not as *crocus*. . . But doubt arises when one considers another widely cultivated annual yielding numerous heads of orange flowers." (safflower, *Carthamus tinctorius*). Where does this leave me? Should I include just one or all three of the candidates for the one mention of saffron in the Bible? From the medicinal point of view, turmeric seems even more important than saffron, which appears even more important than safflower. Ditto from the likelihood point of view, based on the views of Zohary.

Zohary's account of the Thorns & Thistles reiterates the problems with identifying modern botanical species in historical scriptures written by non-botanists. "More than seventy species of spiny plants grow among the flora of Israel and more than twenty are mentioned in the Scripture. No other group of plant names in the Bible is so frequently misidentified and arbitrarily translated. . . No thorn name in any version of the Bible is reliably translated."

\*ABIES CILICICA (Ant. & Ky.) Carr. "Cilician Fir" "Berosh (Biblical)" "They made all your planks of fir trees from Senir." Ezekiel 27:3-5.

ACACIA NILOTICA (L.) Dcl. "Babul" "Egyptian Mimosa" "Thorn" "Bush" (LEGUME FAMILY) "... The Lord appeared unto him in a flame of fire out of the midst of a bush..." Exodus 3. Cough; DIABETES; Fever, Hemorrhage, Hemorrhoids; Sclerosis; Smallpox.

\*ACACIA RADDIANA Savi "Common Acacia" "And you shall make upright frames for the tabernacle of acacia wood." Exodus 26: 15.

ACACIA SEYAL Del. "White Whistling Wood" "Shittim Wood" (LEGUME FAMILY) "...I will plant in the wilderness... the Shittah tree..." Isaiah 41. Bronchitis; Rheumatism.

ACACIA TORTILIS (Forsk.) Hayne "Umbrella Thorn" "Seyal" "Shittim Wood" (LEGUME FAMILY) "...And I made an ark of Shittim wood.." Deuteronomy 10. Dermatitis; Worms



ACANTHUS SYRIACUS Boiss. "Nettles" (Biblical) (ACANTHUS FAMILY) "...Among the bushes they brayed; under the nettles they were gathered together..." Job 30. Astringent; Diuretic.

AGROSTEMMA GITHAGO L. "Corn Cockle" "Cockle" (PINK FAMILY) "...If my land cry against me...Let thistles grow instead of wheat and cockle instead of barley..." Job 31. Cancer; Dropsy; Jaundice.

\*ALCEA ROSEA L. (Syn.;ALCEA SETOSA (Boiss.) Alef.) "Hollyhock" "Purslane (Biblical)" "Can that which is tasteless be eaten without salt, or is there any taste in the slime of the purslane?" Job 6:6-7 Cold; COUGH; Cramps; Edema; SORE THROAT; ULCERS.

ALHAGI CAMELORUM Fisch. "Camelthorn" "Manna" (Biblical) (LEGUME FAMILY) "...we have sent you money to buy burnt-offerings, and sin offerings, and incense, and prepare ye manna..." Baruch 1. Asthma; Anuria; Bronchitis; Impotence; Leprosy; Obesity; Piles; Smallpox.

ALLIUM CEPA L. "Onion" (LILY FAMILY) "...We remember the fish, which we did eat in Egypt...the leeks, and the onions..." Numbers 11. ANGINA, CANCER, DIABETES, HYPERTENSION.

\*ALLIUM PORRUM L. "Leek" (LILY FAMILY) "...We remember the fish, which we did eat in Egypt...the leeks, and the onions..." Numbers 11. ANGINA, CANCER, DIABETES, HYPERTENSION.

ALLIUM SATIVUM L. "Garlic" (LILY FAMILY) "...We remember the fish... and the garlick..." Numbers 11. **ANGINA; CANCER, COLDS; DIABETES; FLU; HYPERTENSION, INFECTIONS.**

ALOE PERRYI Baker "Socotrine Aloe" "Aloes" (ALOE FAMILY) "...and brought a mixture of myrrh and aloes..." John 19. **BURNS; CANCER; CONSTIPATION.**

\*ALOE VERA (L.) Burm. f. "Barbados Aloe" "Aloes" (ALOE FAMILY) "Nicodemus also, who had at first come to him by night, came bring a mixture of myrrh and aloes about a hundreds pound weight. They took the body of Jesus, and bound it in linen cloths with the spices, as is the burial custom of the Jews.." John 19: 39-40. **BURNS; CANCER; CONSTIPATION.**

\*ANABASIS ARTICULATA (Forssk.) Moq. "Jointed Anabasis" "Shuni (Biblical)" (LAMBSQUARTER FAMILY). "The sons of Gad: Ziphion, Haggi, Shuni..." Genesis 46: 16. Edema; Headache; Scabies; Sores; Warts; Wounds.

ANASTATICA HIEROCHUNTICA L. "Jericho Rose", "Mary's Flower", "Palestinian Tumbleweed", "Wheel" (Biblical) (MUSTARD FAMILY) "... O my God, make them like a wheel; as the stubble before the wind. . ." Psalms 83. Cold; epilepsy; parturition.

ANEMONE CORONARIA L. "Windflower", "Anemone," "Lily of the Field", "Poppy Anemone", "Garden Anemone" (Biblical) (BUTTERCUP FAMILY) "...Consider the lilies of the field, how the grow; they toil not,

neither do they spin: And yet I say unto you, that even Solomon in all his glory was not arrayed like one of these..." Matthew 6. Leprosy; malaria; tuberculosis; tumors.

ANETHUM GRAVEOLENS L. "Dill", " Dill Seed", "Garden Dill", "Anise" (Biblical) (CELERY FAMILY) "...Woe unto you, scribes and Pharisees, hypocrites! for ye pay tithe of mint and anise and cummin..." Matthew 23. Cancer, COLIC, **DYSPEPSIA**; ESTROGENIC.

\*MATRICARIA AUREA (Loefl.) Sch. Bip (Syn.ANTHEMIS SP sensu Zohary). "Dog Chamomile" (ASTER FAMILY) "All flesh is grass, and all its glory like the flower of the grass.The grass withers, and the flower falls; but the word of the Lord abides forever." I Peter 1:24. Cold; Conjunctivitis; Cough; Debility; Diabetes; ENTERALGIA; Fever; Gingivosis; Headache; Myalgia; Neuralgia; Neurosis; Toothache; Wounds.

AQUILLARIA AGALLOCHA Roxb. "Eaglewood" "Aloes" (Biblical Old Testament) (EAGLEWOOD FAMILY) "...All thy garments smell of myrrh, and aloes..." Psalm 45. Asthma; CANCER; Dermatitis; Fever; Gout; Hepatitis; Malaria; Rheumatism.

ARTEMISIA HERBA-ALBA Asso. "White Wormwood" "Wormwood" (Biblical) (ASTER FAMILY) "...But her end is bitter as wormwood, sharp as a two-edged sword..."Proverbs 5. Bronchitis; COLD; Cough; Fever; Toothache; WORMS.

ARUNDO DONAX L. "Giant Reed", "Spanish Cane", "Reed" (Biblical) (GRASS FAMILY) "...A reed shaken with the wind..."Matthew 11. Cancer; Dropsy; Dyslactea; Hypertension.

\*ASTRAGALUS BETHLEHEMITICUS Boiss. "BethlehemTragacanth" "Gum"(Biblical) (LEGUME FAMILY) "A little balm and a little honey, gum, myrrh, pistachio nuts, and almonds." Genesis 43: 11. BURNS; CANCER; COUGH; Diarrhea.

ASTRAGALUS GUMMIFER Labill "Tragacanth" "Gum" (Biblical) "Spice" (Biblical) (LEGUME FAMILY) "A little balm and a little honey, gum, myrrh, piustachio nuts, and almonds." Genesis 43: 11. "...I have gathered my myrrh with my spice..." Song of Solomon 5. BURNS; CANCER; COUGH; Diarrhea.

ATRIPLEX HALIMUS L. "Sea Purslane", "Mallow" (Biblical) "Shrubby Orach" (LAMB'SQUARTER FAMILY) "...Who cuts up mallows by the bushes, and juniper roots for their meat..." Job 30. Dermatitis; Hyperacidity; Sores; Ulcers.

BALANITES AEGYPTIACA (L.) Delil "Desert Date", "Jericho Balsam" "Balm" (Biblical) (DESERT DATE FAMILY) "...Is there no balm in Gilead, is there no physician there?..." Jeremiah 8. ANTISEPTIC; Burns; Cough; Herpes; Colic; Malaria; Rheumatism; Syphilis.

BOSWELLIA CARTERI Birdwell "Olibanum" "Frankincense" (Biblical) (COPAL FAMILY) "...Spikenard and saffron; calamus and cinnamon, with all trees of frankincense, myrrhh and aloes, with all the chief

spices..." Song of Solomon 4. Bilharzia: Dysentery; Fever; Gonorrhea; Polyps.

\*BOSWELLIA SACRA Flueckiger "Frankincense" (COPAL FAMILY) Take sweet spices, stacte, and onycha, and galbanum, sweet spices with pourre frankincense. . . and make an incense blended as by the perfumer, seasoned with salt, pure and holy." Exodus 30: 34-5.

BRASSICA NIGRA (L.) Koch "Black Mustard" (MUSTARD FAMILY) "...The kingdom of heaven is like to a grain of mustard seed, which a man took, and sowed in his field: Which indeed is the least of all seeds: but when it is grown, it is the greatest among herbs..." Matthew 13. Arthritis; BRONCHITIS; CANCER; COLDS; Pluerisy; Pneumonia; Rheumatism.

BUXUS LONGIFOLIA Boiss. "Boxwood" "Box (Biblical) (BOXWOOD FAMILY)"...I will set in the desert the fir tree, and the pine, and the box tree together... " Isaiah 41. Cancer; Leprosy, Malaria; Rheumatism; Syphilis; Worms.

\*CALOTROPIS PROCERA (Ait.) Ait.f. "Giant Milkweed" "Apple of Sodom" "Mudar" "Osher"(Arabic) "...(I) in consequence of which there are still the remainders of that divine fire, and the traces or shadows of the five cities are still to be seen, as well as the ashes growing in their fruits, which fruits have a color as if they were fit to be eaten, but if you pluck them with your hands they dissolve into smoke and ashes." Josephus, Jewish Wars Book IV 8:4. Astma; Cardiopathy; Cough; Dysentery; Elephantiasis; Scabies; Sunstroke; Ulcers.

CAPPARIS SPINOSA L. "Caper", "Caper-Bush", "Alcaparro", " Desire (Biblical)" (CAPER FAMILY) "...fears shall be in the way, and the almond tree shall flourish, and the grasshopper shall be a burden, and desire shall fail: because man goeth to his long home..." Ecclesiastes 12. Arthritis; Cancer; Dysentery; Fractures; Malaria; Ophthalmia; Sciatica.

\*=SENNA ALEXANDRINA Miller (Syn. CASSIA SENNA L).

CEDRUS LIBANI Barr "Cedar of Lebanon" (CEDAR FAMILY) "...let fire come out of the bramble, and devour the cedars of Lebannon..." Judges 9. ...Behold...a cedar in Lebanon with fair branches...Ezekiel 31. Asthma; Bronchitis; Burns; Cancer; Dermatitis; Tuberculosis William Cullen Bryant beautifully praised the cedars, clearly predicting my sentiments:

"The groves were God's first temples,

Ere man learned

To hew the shaft..."

CENTAUREA CALCITRAPA L. "Star-Thistle" (ASTER FAMILY) "...Thorns also and thistles shall it bring forth to thee..." Genesis 3. Cancer; Gravel; Headache; Jaundice' Malaria; Ophthalmia.

\*CENTAUREA IBERICA Spreng.. "Spanish-Thistle" (ASTER FAMILY) "...Thorn and thistles shall grow up on their altars." Hosea 10:8.

\*CEPHALARIA SYRIACA (L.) Schrad. "Syrian Scabious" "Weeds" (TEASEL FAMILY) "The kingdom of heaven may be compared to a man who sowed good seed in his field.; but while men were sleeping, his enemy came and sowed weeds among the wheat, and went away." Matthew 13: 24-5.

CERATONIA SILIQUA L. "Carob", "Algarrobo", " Carob Bean", " Locust (Biblical)", " John's Bread", "St. John's Bread" (LEGUME FAMILY) "...John had his raiment of camel's hair, and a leathern girdle about his loins; and his meat was locusts and wild honey..." Matthew 3. Asthma; CANCER; Cough; Hoarseness; HYPERCHOLESTEROLEMIA.

CERCIS SILIQUASTRUM L. "Judas Tree" "Redbud" (LEGUME FAMILY) "...And he cast down the pieces of silver in the temple, and departed, and went and hanged himself..." Matthew 27. Catarrh; Headache.

\*CHRYSANTHEMUM CORONARIUM L. "Crown Daisy" "Garland" (ASTER FAMILY) "Let the lowly brother boast in his exaltation, and the rich in his humiliation, because like the flower of the grass he will pass away. James I: 9-10. AIDS; DYSPEPSIA; Gonorrhea; Itch; MELANOMA; Worms.

\*CICER ARIETINUM L. "Chick Pea" "Provender (Biblical) "And the oxen and the asses that till the ground will eat salted provender, which has been winnowed with shovel and fork." Isaiah 30: 24. CANCER: Constipation ; Dermatitis; Dyspepsia; Itch; Leprosy; Smallpox; Sunstroke.

CICHORIUM ENDIVIA L. "Endive" (ASTER FAMILY) "...eat it with unleavened bread and bitter herbs..." Numbers 9. Dyspepsia; Fever; Gout, Headache; Jaundice; Splenosis; Tumor.

CICHORIUM INTYBUS L. "Chicory", "Succory", "Witloof Chicory", "Radichetta", "Asparagus Chicory" (ASTER FAMILY) "...And they shall eat the flesh in that night, roast with fire, and unleavened breads; and with bitter herbs they shall eat it..." Exodus 12. AIDS; Asthma; CANCER; DIABETES; Dysmenorrhea; Impotence; INSOMNIA; Splenitis; Tachycardia.

\*CICHORIUM PUMILUM Jacq.. "Dwarf Chicory" "Bitter Herb" (Biblical) (ASTER FAMILY) "...with unleavened bread and bitter herbs they shall eat it." Exodus 12:8. AIDS; Cancer; Dropsy; Gout; Warts.

CINNAMOMUM CASSIA Blume "Saigon Cinnamon", "Cassia Bark", " Cassia (Biblical) " (LAUREL FAMILY) "...the Lord spoke unto Moses, saying, Take thou also unto thee principal spices...of cassia five hundred shekels..." Exodus 30. **DIABETES**; Dysmenorrhea; DYSPEPSIA; PAIN; FEVER; Rheumatism; Vaginitis.

CINNAMOMUM VERUM J.S. Presl. "Ceylon Cinnamon" (LAUREL FAMILY) "...And the merchants of the earth shall weep and mourn over her; for no man buyeth their...cinnamon, and odours, and ointments..." Revelation 18. "...Take thou also unto thee principal spices...of sweet cinnamon...Exodus

30. **DIABETES**; Dysmenorrhea; **DYSPEPSIA**; **PAIN**; **FEVER**; Rheumatism; **TUBERCULOSIS**.

**CISTUS CRETICUS** L. "European Rock Rose", "Ladanum" "Myrrh (Biblical) (**ROCKROSE FAMILY**) "...A company of Ishmaelites came from Gilead with their camels, bearing spicery and balm and myrrh..." Genesis 37. Asthma; Catarrh; Dysentery; Dysmenorrhea; Dyspnea.

**CITRULLUS COLOCYNTHIS** (L.) Schrad. "Colocynth", "Bitter Apple", "Wild Gourd (Biblical)", "Gall (Biblical)" (**GOURD FAMILY**) "...Behold, I will feed them, even this people, with wormwood, and give them water of gall to drink..." Jeremiah 9. **CANCER**; **CONSTIPATION**; Fever; Neuralgia, Rheumatism; Sciatica; Splenomegaly; **WORMS**; Wounds.

**CITRULLUS LANATUS** (Thunb.) Matusmara et Nakai "Watermelon", "Sandia", "Patilla" (**GOURD FAMILY**) "...We remember the fish, which we did eat in Egypt freely; the cucumbers, and the melons..." Numbers 11. Cystitis; Dyspepsia; Gonorrhea; Fever; **PROSTATITIS**.

\***CITRUS MEDICA** L. "Citron" "Etz hadar=goodly trees"(Biblical) "Ethrog" (**CITRUS FAMILY**) "And you shall take on the first day the fruit of goodly trees" Leviticus 23: 40. Bronchosis; Dyspepsia; Enterosis; Lumbago; Seasickness.

\***COMMIPHORA ABYSSINICA** (Berg.) Engl. "Myrrh" (**COPAL FAMILY**) "Your robes are all fragrant with myrrh and aloes and cassia." Psalms 45:8.

**COMMIPHORA AFRICANA** Engl. "African Myrrh" "Bdellium" (**COPAL FAMILY**) "...out of the ground made the Lord God to grow every tree that is pleasant to the sight, and good for food; ...there is bdellium..." Genesis 2. Cramps; Dyspepsia; Fever; Hepatitis; Ophthalmia.

**COMMIPHORA MYRRHA** (Nees) Engl. "Myrrh" (**COPAL FAMILY**) "...six months with oil of myrrh, and six months with sweet odours, and with other things for the purifying of the women..." Esther 2. Bronchorrhea; **GINGIVITIS**; Leucorrhea; **SORE THROAT**; **STOMATITIS**; Worms; **WOUNDS**.

**COMMIPHORA GILEADENSIS** (L.) Engl. (Syn.: **COMMIPHORA OPOBALSAMUM** (L.) Engl). "Balsam", "Balsam of Gilead", "Balm (Biblical)" (**COPAL FAMILY**) "...they traded in thy market wheat of Minnith, and pannag, and honey, and oil, and balm..." Ezekiel 27. Cold; Dyspepsia; Flu; Infections; Wounds.

**CONIUM MACULATUM** L. "Hemlock" "Poison Hemlock" (**CELERY FAMILY**)...judgment springeth up as hemlock in the furrows of the field...Hosea 10 "...for you have turned judgment into gall, and the fruit of righteousness into hemlock..." Amos 6. Asthma; Bronchitis; Erysipelas; Insomnia; **POISON**.

**CORIANDRUM SATIVUM** L. "Coriander" (**CELERY FAMILY**) "...And the manna was as coriander seed..." Numbers 11. **DYSPEPSIA**; **HALITOSIS**; Impotence; Neuralgia; Rheumatism; Toothache.

CROCUS SATIVUS L. "Saffron Crocus" "Saffron" (IRIS FAMILY) "...Thy plants are an orchard of pomegranates, with pleasant fruits; camphire, with spikenard...and saffron; calamus and cinnamon..." Song of Solomon 4. CANCER; Chickenpox; Dysmenorrhea; Measles; Mumps; Pertussis.

CUCUMIS MELO L. "Muskmelon", "Cantaloup", "Honeydew", "Mango Melon" (GOURD FAMILY) "...We remember the fish, which we did eat in Egypt freely; the cucumbers, and the melons..." Numbers 11. Cancer; Dyspepsia; Eczema; Freckles; Menorrhagia.

CUCUMIS SATIVUS L. "Cucumber" (GOURD FAMILY) "...as a lodge in a garden of cucumbers, as a besieged city..." Isaiah 1. Acne; Burns; Cold; Herpes; Sunburn.

CUMINUM CYMINUM L. "Cumin" (CELERY FAMILY) "...for ye pay tithe of mint and anise and cummin..." Matthew 23. Asthma; Dermatitis; Dysentery; Impotence; Syncope; Tachycardia.

CUPRESSUS SEMPERVIRENS L. "Gopherwood" "Cypress" (CYPRESS FAMILY) "...He heweth him down cedars, and taketh the cypress and the oak..." Isaiah 44. Bronchitis; Dyspepsia; Hemorrhoids; Orchitis; Splenitis.

\*CURCUMA LONGA longa L. "Turmeric" "Saffron" (Biblical) (GINGER FAMILY) "...Thy plants are an orchard of pomegranates, with pleasant fruits; camphire, with spikenard...and saffron; calamus and cinnamon..." Song of Solomon 4. **ARTHRITIS**; BRONCHITIS; DYSPEPSIA; LARYNGITIS; **LYMPHOMA**; **RHEUMATISM**; FUNCTIONAL CLAIMS: Antiinflammatory; Carminative; Diuretic; Expectorant; Stomachic.

\*CYMBOPOGON MARTINII Stapf. "Ginger Grass" "Palmarosa" "Aromatic Cane" (Biblical) (GRASS FAMILY) "Take the finest spices: of liquid myrrh five hundred shekels, and of sweet-smelling cinnamon half as much, that is, two hundred and fifty, and of aromatic cane, two hundred and fifty." Exodus 30:23.

CYNOMORIUM COCCINEUM L. "Juniper (Biblical)" (CYNOMORIUM FAMILY) "...who cut up mallows by the bushes, and juniper roots for their meat..." Job 30. Colic; Constipation; Dysentery; Impotence; Nephrosis; Sterility.

CYPERUS PAPYRUS L. "Papyrus", "Bulrush", "Rush (Biblical)" (SEDGE FAMILY) "...Can the rush grow up without mire? can the flag grow without water?..." Job 8. Cancer; Fistula; Ophthalmia; Sores.

DIOSPYROS EBENUM Koerng "Date-Plum" "Ebony (Biblical)" (PERSIMMON FAMILY) "...They brought thee for a present horns of ivory and ebony..." Ezekiel 27. Cancer; Itch; Leprosy;

Ringworm; Stones.

DIOSPYROS MELANOXYLON Roxb. "Ebony Persimmon" (PERSIMMON FAMILY) "...They brought thee for a present horns of ivory and ebony..." Ezekiel 27. Dermatitis; Smallpox; Ulcers; Uterosis; Vaginitis.

\*ECHINOPS VISCOSUS DC. "Globe Thistle" "Brier" (ASTER FAMILY) "I will flail your flesh with the thorns of the wilderness and with briers" Judges 8:7.

ELAEAGNUS ANGUSTIFOLIA L. "Oleaster", "Russian Olive". "Olive (Biblical)" (RUSSIAN OLIVE FAMILY) "...Go forth unto the mount, and fetch olive branches, and pine..." Nehemiah 8. Bronchitis; Burns; Catarrh; Constipation; Fever; Neuralgia; Wounds.

\*ERUCA SATIVA L. "Garden Rocket" "Oroth (Biblical)" "Gargir (Arabic)" "One of them went out into the field to gather oroth (herbs), and found a wild vine and gathered from it his lap full of wild gourds, and came and cut them up into the pot of pottage, not knowing what they were. And they poured out for the men to eat." II Kings 4: 39-40.

FERULA GALBANIFLUA Boiss and Buhse "Galbanum" (CELERY FAMILY) "...Moses, take unto thee sweet spices, stacte, and onycha, and galbanum..." Exodus 30. Allergy; Bronchitis; Cancer' Caries; Colds; Dyspepsia; Inflammations.

\*FERULA GUMMOSA Boiss. "Galbanum" (CELERY FAMILY) "I grew tall ... like cassia and camel's thorn I gave forth the aroma of spices, and like choice myrrh I spread a pleasant odor, like galbanum, onycha and stacte, and like the fragrance of frankincense in the tabernacle." Ecclesiasticus 24: 14-5.

FICUS CARICA L. "Fig Tree" (MULBERRY FAMILY) "...And Isaiah said, take a lump of figs. And they took and laid it on the boil and he recovered..." II Kings 20. CANCER; LEUCODERMA; RINGWORM; Thrush; Wounds.

FICUS SYCOMORUS L. "Mulberry Fig", "Sycamore Fig", "Sycomore" (MULBERRY FAMILY) "...I was an herdsman, and a gatherer of sycamore fruit..." Amos 7. Burns; Cancer; Cirrhosis; Dermatitis; Dyslactea; Scrofula; Sore Throat.

FRAXINUS ORNUS L. Manna Ash (OLIVE FAMILY) "...Behold, we have sent you money to buy burnt offerings, and sin offerings, and incense, and prepare ye manna..." Baruch 1. CONSTIPATION; Fever; Gonorrhea; Malaria.

GOSSYPIUM HERBACEUM L. "Cotton" (MALLOW FAMILY) "...There were white cotton curtains and blue hangings caught up with cords of fine linen..." Ester 1. CANCER; **CONTRACEPTIVE**; Dermatitis; Dyslactea; Gout; Malaria.

\*GUNDELIA TOURNEFORTII L. "Tournefort's Gundelia" "Tumbleweed" (ASTER FAMILY) "O my God, make them like *whirling* dust, like chaff before the wind."

\*HALOXYLON PERSICUM Bge. "White Saxaul" "Adah" (Biblical) "Ada (Arabic)" "Lamech said to his wives 'Adah and Zilla, hear my voice'" Genesis 4: 23.

\*HAMMADA SALICORNICA (Moq.) Iljin "Hammada" "Lye"(Biblical) "Rimth" (Arabic) (LAMBSQUARTER FAMILY) "Though you wash yourself with lye and use much soap, the stain of your guilt is still before

me..." Jeremiah 2:22.

HEDERA HELIX L. "Ivy" (ARALIA FAMILY) "...they were compelled to go in procession to Baccus carrying ivy..." II Maccabees 6. Cancer; Corns; Impotence; Malaria; Rheumatism; Toothache.

HORDEUM VULGARE L. "Barley" (GRASS FAMILY) "...Let thistles grow instead of wheat and cockle instead of barley..." Job 31. DYSPEPSIA; Fractures; Orchitis; Parotitis; Sunstroke; Tuberculosis.

HYACINTHUS ORIENTALIS L. "Hyacinth", "Lily of the Valley (Biblical)" (LILY FAMILY) "...I am the rose of Sharon, and the lily of the valleys..." Song of Solomon 2. Dysuria; Jaundice;

Leucorrhea.

\*HYOSCYAMUS AUREUS L. "GoldenHenbane" "Shikkeron"(Biblical) (POTATO FAMILY) "The bundary goes out to the shoulder of the hill north of Ekron, then the boundary bends round to Shikkeron, and passes along to Mount Baalah, and goes out to Jabneel." Joshua 15: 11. NARCOTIC.

\*HYOSCYAMUS MUTICUS L. "Henbane" "Shikkeron"(Biblical) (POTATO FAMILY) "The bundary goes out to the shoulder of the hill north of Ekron, then the boundary bends round to Shikkeron, and passes along to Mount Baalah, and goes out to Jabneel." Joshua 15: 11. NARCOTIC.

IRIS PSEUDACORUS L. "Yellow Flag", "Lily (Biblical)" (IRIS FAMILY) "...he shall grow as the lily, and cast forth his roots as Lebanon..." Hosea 14. Bruises; Cholera; CONSTIPATION; Hepatosis; Rheumatism; Sciatica.

JUGLANS REGIA L. "Carpathian or Persian Walnut", "English Walnut", "Nuts (Biblical)"

(WALNUT FAMILY) "...I went down into the garden of nuts to see the fruits of the valley, and to see whether the vine flourished, and the pomegranates budded..." Song of Solomon 6. Alopecia; Cancer; Flu; Gingivitis; Halitosis; Headache.

JUNCUS EFFUSUS L. "Bog Rush", " Soft Rush", " Flag (Biblical)" (RUSH FAMILY) "...The seeds and the flags shall wither..." Isaiah 19> Anuria; Cough; Dropsy; Insomnia; Sore Throat; Stones.

JUNIPERUS EXCELSA Bieb. "Grecian Juniper", "Algum (Biblical)" (JUNIPER FAMILY) "...Send me also cedar trees, fir trees, and algum trees, out of Lebanon..." II Chronicles 2. Cough; Dyspepsia; Hepatosis; Rheumatism; Wounds.

JUNIPERUS OXYCEDRUS L. "Brown Juniper", "Cade", "Heath (Biblical)" "Prickly Juniper", "Cedar" (JUNIPER FAMILY) "...For he shall be like the heath in the desert..." Jeremiah 17. Alopecia; Cancer; Dermatitis; Eczema; Leprosy; Pruritis; Psoriasis.



\*JUNIPERUS PHOENICIA L. "Phoenician Juniper" "Aroer" (Biblical); Arar"(Arabic) "From Aroer, which is on the edge of the valley of the Arnon." Deuteronomy 2:36.

LACTUCA SATIVA L. "Lettuce" (ASTER FAMILY) "...eat it with unleavened bread and bitter herbs..." Numbers 9. Burns' Cough; Cancer; Impotence; INSOMNIA; Nymphomania.

\*LAGENARIA SICERARIA (Mol.) Standl. "Bottle Gourd" "Dilean" Zenan. Hadashah, Migdal-Gad, Dilean..." Joshua 15:37-8.

LAURUS NOBILIS L. "Bayleaf", "Sweet Bay", "Grecian Laurel", "Green Bay (Biblical)" (LAUREL FAMILY) "...I have seen the wicked in great power, and spreading himself like a green bay tree..." Psalm 37 **DIABETES**; Dyspepsia; Earache; Insomnia; MIGRAINE; PAIN.

LAWSONIA INERMIS L. "Henna", "Egyptian Privet", "Mignonette", "Camphire (Biblical)" (LOOSESTRIFE FAMILY) "...My beloved is unto me as a cluster of camphire in the vineyards..." Song of Solomon 1. CANCER; Dermatitis; Inflammation; SUNBURN; URTICARIA; Rheumatism.

LENS CULINARIS Medik. "Lentil" (LEGUME FAMILY) "...Then Jacob gave Esau bread and pottage of lentiles; and he did eat..." Genesis 25. FETAL ALCOHOL SYNDROME; SPINA BIFIDA.

LILIUM CANDIDUM L. "Madonna Lily" (LILY FAMILY) "...to feed in the gardens, and to gather lillies..." Song of Solomon 6. CANCER; Corns; Dermatitis; Dropsy; Epilepsy.

LINUM USITATISSIMUM L. "Flax", "Linen (Biblical)" (FLAX FAMILY) "...And he took it down, and wrapped it in Linen... "Luke 23. Arthritis; Bronchitis; CANCER; CARDIOPATHY; Cold; **DERMATITIS**; INFLAMMATION; Rheumatism.

\*LIQUIDAMBAR ORIENTALIS Miller "Storax" "Sweet Gum" "Balm" (Biblical) (STORAX FAMILY) "...Ishmaelites coming from Gilead, with their camels bearing gum, balm, and myrrh, on their way to carry it down to Egypt." Genesis 37: 25.

LOLIUM TEMULENTUM L. "Darnel", "Tares (Biblical)" (GRASS FAMILY) "...But while men slept, his enemy came and sowed tares among the wheat..." Matthew 13. Colic; Leprosy; MIGRAINE; Rheumatism; Toothache.

LYCIUM EUROPAEUM Linn. "European Box Thorn", " Desert Thorn", "Bramble (Biblical)" (POTATO FAMILY) "...let fire come out of the bramble, and devour the cedars of Lebanon..." Judges 9. Cramps; Hepatosis; INFLAMMATION; Splenosis; Tumors.

\*MALUS SYLVESTRIS Mill. "Apple" (ROSE FAMILY) "Sustain me with raisins, refresh me with apples; for I am sick with love." Song of Solomon 2:5. CONSTIPATION.

MALVA SYLVESTRIS L. "Blue Mallow" (MALLOW FAMILY) "...who cut up by mallows by the bushes..." Job 30. COLD, COUGH, Gravel; INFLAMMATION; Jaundice; SORE THROAT.

MANDRAGORA OFFICINARUM L. "Loveapple", "Mandrake" (POTATO FAMILY) "...The mandrakes gave a smell..." Song of Solomon 7. ASTHMA; INSOMNIA; COUGH; HAYFEVER; RHEUMATISM; **VERTIGO**.

\*MATRICARIA AUREA (Loefl.) Sch. Bip (Syn. ANTHEMIS SP sensu Zohary. "Dog Chamomile" (ASTER FAMILY) "All flesh is grass, and all its glory like the flower of the grass. The grass withers, and the flower falls; but the word of the Lord abides forever." I Peter 1:24. Cold; Conjunctivitis; Cough; Debility; Diabetes; ENTERALGIA; Fever; Gingivitis; Headache; Myalgia; Neuralgia; Neurosis; Toothache; Wounds.

MENTHA LONGIFOLIA (L.) Huds. "Biblical Mint" "Horsemint" "Mint" (MINT FAMILY)

"...for ye tithe mint and rue and all manner of herbs..." Luke II. COLD Dermatitis; DYSPEPSIA; HEADACHE; Impotence; PAIN; RHEUMATISM.

MORUS NIGRA L. "Black Mulberry", "Purple Mulberry", "Sycamore (Biblical)" (MULBERRY FAMILY) "...And to the end they might provoke the elephants to fight, they shewed them the blood of grapes and mulberries..." I Maccabees 6. Conjunctivitis; Dysmenorrhea; Fever; Sorethroat.

MYRTUS COMMUNIS L. "Myrtle" (MYRTLE FAMILY) "...I will plant in the wilderness the cedar, the shittah tree, and the myrtle, and the oil tree..." Isaiah 41. "...Go forth unto the mount and fetch olive branches, and pine branches, and myrtle branches, and palm branches..." Nehemiah 8. Asthma; bronchitis; Cancer; Hemorrhoids; Polyps; Smallpox; TUBERCULOSIS.

NARCISSUS TAZETTA L. "Narcissus", "Buttercup", "Rose (Biblical)" (AMARYLLIS FAMILY) "...The wilderness and the solitary place shall be glad for them; and the desert shall rejoice, and blossom as the rose..." Isaiah 35. CANCER; Epilepsy; Fever; Mastitis; Ophthalmia.

NARDOSTACHYS JATAMANSI DC. "Spikenard" (VALERIAN FAMILY) "...Thy plants are an orchard of pomegranates, with pleasant fruits: camphire with spikenard..." Song of Solomon 4. ARRHYTHMIA; CARDIOPATHY; Chorea; CRAMPS; DYSMENORRHEA; Epilepsy; Headache; INSOMNIA; Leprosy.

NASTURTIUM OFFICINALE R. Br. "Watercress" (MUSTARD FAMILY) "...Eat it with unleavened bread and bitter herbs..." Numbers 9. Asthma; CANCER; COLD; Dermatitis; Nephrosis; Tuberculosis.

NERIUM OLEANDER L. "Rose (Biblical)" (DOGBANE FAMILY) "...Hearken unto me, ye holy children, and bud forth as a rose growing by the brook of the field..." Ecclesiasticus 39. **POISONOUS**: Cancer; Cardiopathy; Dermatitis; Edema; Hypertension; Leprosy; Ringworm.

NIGELLA SATIVA L. "Black Cumin", "Fitch (Biblical)" (BUTTERCUP FAMILY) "...For the fitches are not thrashed with a threshing instrument. ..but the fitches are beaten out with a staff..." Isaiah 28.  
**ARTHRITIS; ASTHMA, BRONCHITIS; Colic; Cough; Dermatitis; DYSMENORRHEA; Orchitis; RHEUMATISM.**

\*NOTOBASIS SYRIACA (L.) Coss. "Syrian Thistle" "Thorn" (ASTER FAMILY) "I will flail your flesh with the thorns of the wilderness and with briers" Judges 8:7.

NYMPHAEA ALBA L. "Waterlily", "Lotus", "Lily (Biblical)" (WATERLILY FAMILY) "...And upon the top of the pillars was lily work..." I Kings 7. Cancer; Cramps; Diarrhea; Fever; INSOMNIA.

OLEA EUROPEA L. "Olive (Biblical)" (OLIVE FAMILY) "...His branches shall spread, and his beauty shall be as the olive tree..." Hosea 14. CANCER; **CARDIOPATHY;** Dermatitis; HYPERTENSION; Sore Throat; Sunburn.

ORIGANUM MARU L. "Egyptian Marjoram" "Hyssop (Biblical)" (MINT FAMILY) "...He spoke of trees, from the cedar that is in Lebanon to the hyssop that grows out of the wall. I Kings 4:33." **COLD; COLIC; Polyys;** RHEUMATISM; Sprain; Swelling.

\*ORIGANUM SYRIACUM L. "Syrian HYssop"" Hyssop (Biblical)" (MINT FAMILY) "...Purge me with hyssop and I shall be clean..." Psalms 51 **COLD; COLIC; Polyys;** RHEUMATISM; Sprain; Swelling.

ORNITHOGALUM UMBELLATUM L. "Star of Bethlehem", "Dove's Dung (Biblical)" (LILY FAMILY) "...and the fourth part of a cab of dove's dung for five pieces of silver. ..." II Kings 6. **POISONOUS** Adenopathy; Cachexia; Debility; Infections; Parotitis.

PALIURUS SPINA-CHRISTI Mill "Crown of Thorns (Biblical)" (BUCKTHORN FAMILY) "...And when they had platted a crown of thorns..." Matthew 27. Diarrhea; Dystonia; Dysuria.

\*PANCRATIUM MARITIMUM L. "Sea Daffodil" "Sea-Shore Lily" (AMARYLLIS FAMILY) "I will be as the dew to Israel; he shall blossom as the lily, he shall strike root as the poplar" Hosea 14: 5.

PANICUM MILIACEUM L. "Proso Millet", "Millet (Biblical)", "Pannag (Biblical)" (GRASS FAMILY) "...Take thou also unto thee wheat, and barley, and beans, and lentiles, and millet and fitches, and put them in one vessel, and make thee bread thereof..." Ezekiel 4. Abscesses; Cancer; Gonorrhea; Infection; Momordicism.

\*PAPAVR RHOEAS L. "Common Poppy", "Flanders Poppy", (POPPY FAMILY) "All flesh is grass, and all its beauty is like the flower of the field...The grass withers, the flower fades; but the word of our God will stand for ever." Isaiah 40: 6-8.

PAPAVER SOMNIFERUM L. "Opium Poppy", "Poppyseed Poppy", "Gall (Biblical)" (POPPY FAMILY) "...they gave him vinegar to drink mingled with gall: and when he had tasted thereof he would not drink..." Matthew 27. **CANCER; COUGH; Dysentery; INSOMNIA; Impotence; PAIN; TOOTHACHE.**

PHOENIX DACTYLIFERA L. "Date Palm" (PALM FAMILY) "...and brought them to Jericho, the city of palm trees..." II Chronicles 28. Asthma; Cough; Fever; Gonorrhea; Toothache; Tuberculosis.

PHRAGMITES AUSTRALIS (Cav.) Triri. ex Steud. "Common Reed" "Pen (Biblical)" (GRASS FAMILY) "...I will not with ink and pen write unto thee..." Ill John 13. Burns; Bronchitis; Cholera; Diabetes; Jaundice' Leukemia.

PINUS BRUTIA Tenore "Brutian Pine", "Thick Tree (Biblical)" (PINE FAMILY) "...Go forth unto the Mount, and fetch olive branches, and pine branches...and myrtle branches, and palm branches, and branches of thick trees to make booths..." Nehemiah 8. Catarrh; Cough; Gonorrhea; Hepatosis; Nephrosis; Rheumatism.

PINUS HALEPENSIS Mill. "Aleppo Pine", "Fir (Biblical)" (PINE FAMILY) "...as for the stork, the fir trees are her house..." Psalms 104. Catarrh; Cough; Gonorrhea; Hepatosis; Nephrosis; Rheumatism.

\*PINUS PINEA L. "Stone Pine" "Holm" (Biblical). "He cuts down cedars; of he chooses a holm tree or an oak and lets it grow strong among the trees of the forest; he plants a cedar and the rain nourishes it." Isaiah 44:14.

PISTACIA LENTISCUS L. "Mastic", "Mastick Tree (Biblical)" (CASHEW FAMILY) "...who answered, Under a mastick tree..." Susanna 51. Cancer; Cholecystitis; Cough; Diarrhea; Hepatosis; Itch; Rheumatism.

PISTACIA TEREBINTHUS L. "Cyprus Turpentine", "Teil Tree", "Turpentine Tree (Biblical)" (CASHEW FAMILY) "...As the turpentine tree I stretched out by branches..." Ecclesiasticus 24. Cancer; Cough; Diarrhea; Fever; Inflammation.

PISTACIA VERA L. "Pistacio-nut", "Nuts (Biblical)" (CASHEW FAMILY) "...carry down the man a present, a little balm, and a little honey, spices, and myrrh, nuts and almonds..." Genesis 43. Amenorrhea; Bruises; Cough; Dysentery; Impotence; Pruritus; Rheumatism.

\*PISUM SATIVUM

PLATANUS ORIENTALIS L. "Plane Tree", "Chestnut (Biblical)" (SYCAMORE FAMILY) "...And Jacob took him rods of green poplar, and of the hazel and chestnut tree..." Genesis 30. Cancer; Diarrhea; Dysentery; Inflammation; Ophthalmia; Rheumatism.

POPULUS ALBA L. "Poplar (Biblical)" (WILLOW FAMILY) "...and Jacob took him rods of green poplar..." Genesis 30. ARTHRITIS; Dermatitis; FEVER; Rheumatism; Snakebite; Strangury; TOOTHACHE.

POPULUS EUPHRATICA Oliv. "Euphrates Aspen", " Willow (Biblical)" (WILLOW FAMILY) "...We hanged our harps upon the willows in the midst thereof..." Psalms 137. ARTHRITIS; Dermatitis; FEVER; Rheumatism; Snakebite; Strangury; TOOTHACHE.

PRUNUS ARMENIACA L. "Apricot", " Chinese Almond", "Apple (Biblical)" (ROSE FAMILY) "...A word fitly spoken is like apples of gold in pictures of silver..." Proverbs 25 **POISONOUS SEED**; Asthma; CANCER; Cough; Laryngitis; Ophthalmia; Rheumatism.

PRUNUS DULCIS (Mill.) D.A. Webb "Almond" (ROSE FAMILY) "...and carry down the man a present, a little balm, a little honey, spices, and myrrh, nuts, and almonds..." Genesis 43. Acne; Asthma; CANCER; Cough; Dermatitis; Laryngitis; Neuralgia.

PTEROCARPUS SANTALINUS L. "Red Saunders", "Almug (Biblical)" (LEGUME FAMILY) "...brought in from Ophir great plenty of almug trees..." I Kings 10. Dermatoses; DYSENTERY; Fever; Headache; Inflammation; Malaria; Toothache.

PUNICA GRANATUM L. "Pomegranate", "Grenada" (POMEGRANATE FAMILY) "...I would cause thee to drink of spiced wine of the juice of my pomegranate..." Song of Solomon 8. Bronchitis; CANCER; Conjunctivitis; **DYSENTERY**; **DYSMENORRHEA**; **ESTROGENIC**; HEMORRHOIDS; INFERTILITY; SORE THROAT; STOMATITIS; **WORMS**.

QUERCUS AEGILOPS L. "Valonia Oak", " Dyer's Oak". "Oak (Biblical)" (OAK FAMILY) "...And as an oak, whose substance is in them, when the cast their leaves..." Isaiah 6. Burns; Cancer.

QUERCUS COCCIFERA L. "Kermes Oak" " Scarlet (Biblical)" (OAK FAMILY) "...And he shall take to cleanse the house two birds, and cedar wood, and scarlet, and hyssop..." Leviticus 14. Cancer; Fever; Sores; Wounds.

QUERCUS ILEX L. "Holly Oak", " Oak (Biblical)" (OAK FAMILY) "...and she was buried beneath Bethel under an oak..." Genesis 35. Cacoethes; Cancer; Fever; Hepatosis; Tumors.

\*REICHARDIA TINGITANA (L.) Roth. "Poppy-leaved Reichardia" "Bitter Herb" (Biblical) (ASTER FAMILY) "...with unleavened bread and bitter herbs they shall eat it." Exodus 12:8.

RETAMA RAETAM (Forsk.) Webb. & Berth. "White Broom", "Juniper (Biblical)" (LEGUME FAMILY) "...went a day's journey into the wilderness, and came and sat down under a juniper tree..." I Kings 19. Arthritis; Diarrhea; Fever; Ophthalmia; Pain; Sore.

RHAMNUS PALAESTINA Boiss "Palestine Buckthorn", "Hedge (Biblical)" (BUCKTHRON FAMILY) "...whoso breaketh an hedge, a serpent shall bite him..." Ecclesiastes 10. Cancer; Constipation.

RICINUS COMMUNIS L. "Castorbean", "Palma Christ", "Gourd (Biblical)" (SPURGE FAMILY) "...And the Lord God prepared a gourd, and made it to come up over Jonah, that it might be a shadow over his head...Jonah 4. Abscess; Bunion; CANCER; Conjunctivitis; DERMATITIS; Gout; Headache; Lumbago; Rheumatism; Sciatica.

ROSA PHONECIA Boiss. "Phoenician Rose" (ROSE FAMILY) "...whereup they grew roses and lilies..." 11 Esdras 2. **SCURVY**.

\*RUBIA TINCTORUM L. "Dyer's Madder" "Puah" (Biblical) (COFFEE FAMILY) "...There arose to deliver Israel Tola, the son of Puah, son of Dodo..." Judges 10: 1.

\*RUBUS SANGUINEUS Friv. "Bramble" "Thorn"(Biblical) (ROSE FAMILY) "Thorns and snares are in the way of the perverse; he who guards himself will keep far from them. Proverbs 22:5.

RUBUS SANCTUS Schreb. "Blackberry ", "Bramble (Biblical)" (ROSE FAMILY) "...nor of a bramble bush gather thy grapes..." Luke 6.

RUMEX ACETOSELLA Linn. "Sheep Sorrel" (BUCKWHEAT FAMILY) "...eat it with unleavened bread and bitter herbs..." Numbers 9. Cancer; Dyspepsia; Epithelioma; Fever; Jaundice.

RUSCUS ACULEATUS L. "Butchers Broom", "Knee Holly", "Brier (Biblical)" (BUTCHER'S BROOM FAMILY) "...And there shall be no more a pricking brier unto the house of Israel..." Ezekiel 28. Chilblains; Dyspnea; Dysuria; FEVER; Jaundice; Nephrosis.

RUTA GRAVEOLENS L. "Rue", "Garden Rue", "German Rue", "Herbygrass", "Herbe of Grace" (CITRUS FAMILY) "...But woe unto you, Pharisees! for ye tithe mint and rue and all manner of herbs..." Luke II. POISONOUS; Colic; CRAMPS; Dyspepsia; Epilepsy; Hysteria; Rheumatism; VITILIGO.

SACCHARUM OFFICINARUM L. "Sugarcane", "Sweet Cane (Biblical)" (GRASS FAMILY) "...Thou has bought me no sweet cane with money..." Isaiah 43. Cancer; Cold; Cough; Dysentery; Hemorrhoids; Laryngitis; Pertussis; Sore Throat.

SALICORNIA EUROPEA L. "Glasswort", "Sope (Biblical)" (LAMBSQUARTER FAMILY)

"...for he is like a refiner's fire, and like fuller's sope..." Malachi 3. Cancer; Tumors.

SALIX ALBA L. "Willow" (WILLOW FAMILY) "...And they shall spring up as among the grass, as willows by the water course..." Isaiah 44. **ARTHRITIS; COLD; FEVER; FLU; RHEUMATISM; TOOTHACHE.**

SALIX BABYLONICA L. "Weeping Willow", " Willow (Biblical)" (WILLOW FAMILY) "...We hanged our harps upon the willows in the midst thereof..." Psalms 137 **ARTHRITIS; COLD; FEVER; FLU; RHEUMATISM; TOOTHACHE.**

SALIX FRAGILIS Linn. "Crack Willow", "Red-Wood Willow ", "Kashmir Willow" (WILLOW FAMILY) "...the willows of the brook compass him about..." Job 40. **ARTHRITIS; COLD; FEVER; FLU; RHEUMATISM; TOOTHACHE.**

SALSOLA KALI L. "Glasswort", "Saltwort" (LAMBSQUARTER FAMILY) "...for though thou wash thee with nitre, and take thee much sope..." Jeremiah 2. Cancer; Dropsy; Dysmenorrhea; Infections; Worms.

SALVIA JUDAICA Boiss. "Judean Sage", "Candlestick (Biblical)" (MINT FAMILY) "...And he made the candlestick of pure gold..." Exodus 37.

\*SARCOPIUM SPINOSUM (L.) Spach. "Thorny Burnet" "Thorn" (Biblical) (ROSE FAMILY) "Therefore I will hedge up her way with thorns. . ." Hosea 2: 6.

SAUSSUREA LAPPACEA (Decaisne) C.B. Clarke "Indian Orris", " Kuth", "Costus Oil" "Cassia (Biblical)" (ASTER FAMILY) "...All thy garments smell of myrrh, and aloes, and cassia..." Psalms 45. **ASTHMA; BRONCHITIS; CHOLERA; COUGH;** Dermatitis; Dyspepsia; Smallpox; Stomachache; Tuberculosis.

\*SCOLYMUS HISPIDUS L. "Golden Thistle", "Thistles" (ASTERACEAE) "...Thorns shall grow over its strongholds, nettles and thistles in its fortresses." Isaiah 34: 13.

\*SCOLYMUS MACULATUS L. "Golden Thistle", "Brambles" (ASTERACEAE) "...As a lily among brambles, so is my love among maidens." Song of Solomon 2: 2.

\*SCIRPUS LACUSTRIS L. "Lake Rush" "Agmon (Hebrew) "Reed" (Biblical) "So the Lord cut off from Israel head and tail, palm branches and reed in one day.

\*SENNA ALEXANDRINA Miller (Syn. CASSIA SENNA L). "Alexandrian Senna" "Indian Senna" "Senna" "Burning Bush (Biblical) (LEGUME FAMILY) "And the angel of the Lord appeared to him in a flame of fire out of the midst of a bush; and he looked, and lo, the bush was burning. . ." Exodus 3:2. **CONSTIPATION;** Cramps; Gastrosis.

SILYBUM MARIANUM Gaertn. "Thistles", "Milk Thistle" (ASTERACEAE) "...Thorns also and thistles shall it bring forth to thee; and thou shalt eat the herb of the field..." Genesis 3. Asthma; Calculus; **CIRRHOSIS;**

Fever; **HEPATITIS; JAUNDICE;** Pluerisy; **PSORIASIS;** Splenitis.

SINAPIS ARVENSIS L. "Charlock", "Field Mustard" " Nettle (Biblical)" (MUSTARD FAMILY) "...it was all grown over with thorns and nettles had covered the face..." Proverbs 24. Arthritis; BRONCHITIS; CANCER; COLDS; Pluerisy; Pneumonia; Rheumatism.

SOLANUM INCANUM L. "Sodom Apple", "Palestine Nightshade", "Brier (Biblical)" "Jericho Potato" (POTATO FAMILY) "...and it shall burn and devour his thorns and briers in one day..." Isaiah 10. **POISONOUS: CANCER;** Dermatitis; **MELANOMA;** Pleurisy; Sore Throat; Toothache.

SOLANUM SODOMEUM L. "Vine of Sodom" (POTATO FAMILY) "...For their vine is of the vine of Sodom, and of the fields of Gomorrah..." Deuteronomy 32. **POISONOUS: CANCER;** Cystitis; Dermatitis; **MELANOMA;** Pleurisy; RINGWORM; Sore Throat; Toothache.

SORGHUM BICOLOR (L.) Moeiich "Sorghum", "Milo", "Broomcorn", "Hyssop (Biblical)" (GRASS FAMILY) "...they filled a sponge with vinegar, and put it upon hyssop, and put it to his mouth..." John 19. Burns; Cancer; Dysuria; Epilepsy; Flu; Measles; Nephrosis; Stomachache.

STYRAX BENZOIN Dryand "Onycha (Biblical)" (STORAX FAMILY) "...Take unto thee sweet spices, stacte and onycha..." Exodus 30. BRONCHITIS; Cancer; LARYNGITIS; Mastitis; Ringworm; Shingles.

STYRAX OFFICINALIS L "Stacte (storax)" (STORAX FAMILY) "...Take unto thee sweet spices, stacte, and onycha, and galbanum; these sweet spices with pure frankincense: of each shall there be a like weight: And thou shalt make it a perfume..." Exodus 30.(How's that for an early perfume recipe) Arthritis; BRONCHITIS; Cancer; Cold; Hysteria; Sores; Spermatorrhea.

\*SUEDA SPP "Sea Blite" "Shahor"=Black (Hebrew)" "Ashhur" (Biblical) " Ashhur, the father of Tekoa, had two wives." I Chronicles 4:5.

TAMARIX APHYLLA (L.) Karst "Tamarisk", " Grove (Biblical)" (TAMARISK FAMILY) "...And Abraham planted a grove in Beer-sheba. ..." Genesis 21. Eczema; Infertility; Impotence; Ophthalmia; Psoriasis; Splenitis; Syphilis.

TARAXACUM OFFICINALE Weber ex Wigg. "Dandelion" (ASTER FAMILY) "...eat it with unleavened bread and bitter herbs..." Numbers 9. CANCER; **DIABETES; HEPATITIS;** Rheumatism; Sciatica.

TETRACLINIS ARTICULATA (Vahl) Masters "Sandarac", " Thyine (Biblical)" (CYPRESS FAMILY) "...and all thyine wood, and all manner vessels of ivory..." Revelation 18. Dermatitis; Migraine; Neckache.

TRIGONELLA FOENUM-GRAECUM L. "Fenugreek" "Leek (Biblical)" (LEGUME FAMILY) "...We remember the fish...and the leeks..." Numbers 11.Alopecia; **DIABETES; DYSLACTEA;** Dyspepsia;



**HYPERCHOLESTEROLEMIA;** Leukorrhea; MICROMASTIA; Pain; **RHEUMATISM;** Swelling.

TRITICUM AESTIVUM L. "Wheat" "Corn (Biblical)" (GRASS FAMILY) "...And he slept and dreamed the second time: and, behold, seven ears of corn came up upon one stalk, rank and good..." Genesis 41. Diarrhea; Leprosy; Menorrhagia; Neurasthenia; Sunstroke; Syphilis; Tuberculosis.

TRITICUM SPELTA L. "Spelt" " Rie (Biblical)" (GRASS FAMILY) "...But the wheat and the rie were not smitten..." Exodus 9. Aegilops.

\*TULIPA MONTANA Lindl. "Mountain Tulip" (LILY FAMILY) "The flowers appear on the earth, the time of singing has come, and the voice of the turtledove is heard in our land." Song of Solomon 2: 12.

TYPHA AUSTRALIS Schum & Thonn. "Cattail", "Reed (Biblical)" (CATTAIL FAMILY) "...and they smote him on the head with a reed..." Mark 15. Epilepsy; Insanity; Tumors; Wounds.

\*ULMUS CANESCENS Melv. "Hairy Elm" "Neshem" (Arabic).

URTICA DIOICA L. "Stinging Nettle", "Common Nettle" , "Greater Nettle" (NETTLE FAMILY) "...and thorns shall come up in her palaces, nettles and brambles in the fortresses thereof..." Isaiah 34. **ALLERGY; ARTHRITIS; HAY FEVER; PROSTATITIS; RHEUMATISM.**

URTICA PILULIFERA L. "Roman Nettle", "Nettles (Biblical)" (NETTLE FAMILY) "...the pleasant places for their silver, nettles shall possess them..." Hosea 9. **ALLERGY; ARTHRITIS; HAY FEVER; PROSTATITIS; RHEUMATISM.**

VETIVERIA ZIZANIOIDES (L.) Nash "Vetiver", "Calamus (Biblical)" (GRASS FAMILY) "...bright iron, cassia and calamus, were in thy markets..." Ezekiel 22. Boils; Burns; Colic; Epilepsy; Fever; Flu; Hepatitis; Yellow Fever.

\*VIBURNUM TINUS L. "Viburnu," "Plane" (Biblical) "Murran (Arabic)" "I will set in the desert the cypress, the plane, and the pine, to beautify the place of my sanctuary..." Isaiah 60: 13.

VICIA FABA L. "Broadbean", " Fava Bean", " Horsebean" , "Windsorbean" , "Tickbeans (small types)" (LEGUME FAMILY) "...and flour, and parched corn, and beans..." II Samuel 17. **CANCER; DRUNKENESS; ESTROGENIC; IMPOTENCE; PARKINSONISM;** Pneumonia.

VITIS ORIENTALIS (Lam.) Boiss. "Wild Grape (Biblical)" (GRAPE FAMILY) "...and he looked that it should bring forth grapes, and it brought forth wild grapes..." Isaiah 5. Arthritis; **CARDIOPATHY; HERPES; HYPERTENSION;** Rheumatism; TUBERCULOSIS.

VITIS VINIFERA L. "Vine (grape)" (GRAPE FAMILY) "...But they shall sit every man under his vine and under his fig tree..." Micah 4. Arthritis; **CARDIOPATHY; HERPES; HYPERTENSION**; Rheumatism; TUBERCULOSIS.

XANTHIUM SPINOSUM L. "Clotbur", "Cocklebur", "Thorns (Biblical)" (ASTER FAMILY) "...and thorns shall come up in her palaces... Isaiah 34. Diarrhea; Dyspepsia; Osteosis; Rabies; Sores; Ulcers.

\*ZILLA SPINOSA (L.) Prantl "Spiny Zilla" "Silon=Thorn"(Bible) (MUSTARD FAMILY) "And for the house of Israel there shall be no more a brier to prick or a thorn to hurt them among all their neighbors who have treated them with contempt." Ezekiel 28: 24.

ZIZIPHUS SPINA-CHRISTI (L.) Willd. "Syrian Christ Thorn", "Thorns (Biblical)" (BUCKTHORN FAMILY) "...Do men gather grapes of thorns, or figs of thistles?..." Matthew 7. Arthritis; **CANCER**; Hepatosis; **MELANOMA**; Ophthalmia; Rheumatism; Toothache; Tumor.

ZOSTERA MARINA L. "Eelgrass", "Grass-Wrack", "Sea-Wrack", "Weeds (Biblical)"

(EELGRASS FAMILY) "...the depth closed me round about, the weeds were wrapped about my head..." Jonah 2. Diarrhea.

\*ZYGOPHYLLUM DUMOSUM Boiss. "Bean Caper" "Elim"(Biblical) "And they set out from Marah, and came to Elim; at Elim there were twelve springs of water and seventy palm trees..." Numbers 33: 9.

Source: Duke, J. A. 1983. Medicinal Plants of the Bible. (Illustrated by Peggy K. Duke) Out of print Tradomedic Books, Buffalo, NY. 233 pp.

\*Except species with asterisks, (after Zohary, 1982).

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## Module 13: CHINESE

Following are scientific names followed by the authority (botanist who originally named the species), English common names, Chinese names, plant family common names and a major indication for some of the most familiar Chinese herbs, often cited and more and more occasionally used here in the United

States. Phytochemical and pharmacological data are available on most of them in the Father Nature's Pharmacy database.

*Albizia julibrissin* Durazz. "Silk Tree" "He Huan Pi" (LEGUME FAMILY) Insomnia

*Allium sativum* "Garlic" Da Suan" (GARLIC FAMILY) Cold Preventive

*Angelica sinensis* "Chinese Angelica"; "Dong Gui" "Dong Quai"(CELERY FAMILY) Dysmenorrhea

*Artemisia annua* L. "Sweet Annie" "Qing Hao" (ASTER FAMILY) Malaria

*Astragalus membranaceus* "Huang Qi" "Chinese Milk Vetch" (LEGUME FAMILY) Immunodepression

*Atractylodes lancea* (Thunb.) DC. "Cang Zhu" (ASTER FAMILY) Tonic

*Atractylodes macrocephala* Koidz. "Bai Zhu" (ASTER FAMILY) Tonic

*Belamcanda chinensis* (L.)DC "Leopard Lily" "She gan" (LILY FAMILY) Sore Throat

*Bletilla striata* (Thunb.) Reich. B fil. "Hardy Orchid" "Bai-ji" (ORCHID FAMILY) Bronchitis

*Celosia cristata* L. "Cockscomb" "Ji-guan-hua" (AMARANTH FAMILY) Conjunctivitis

*Chrysanthemum x morifolium* Ramat "Mum" "Ju Hua" (ASTER FAMILY) Cold

*Codonopsis pilosula* (Franch.) Nannf. "Bonnet Bellflower" "Dang-Shen" Dyspepsia

*Dianthus superbus* "Fringed Pink" "Qu Mai" (PINK FAMILY) Cancer

*Dictamnus dasycarpus* Turcz. "Dittany" Bai xianpi" (CITRUS FAMILY): Eczema

*Eleutherococcus senticosus* "Siberian ginseng" "Ci wu jia" "Wujia" (ARALIA FAMILY) Fatigue

*Ephedra sinica* "Chinese Ephedra" "Ma Huang" ( EPHEDRA FAMILY) Narcolepsy

*Eucommia ulmoides* Oliv. "Hardy Rubber Tree" "Du Zhong" (EUCOMMIACEAE) Hypertension

*Forsythia suspensa* (Thunb.) Vahl "Golden-bells" "Lian-qiao" (OLIVE FAMILY) Cold; Nephritis

*Gardenia jasminoides* Ellis "Cape jasmine" "Zhi Zi" (COFFEE FAMILY) Hepatitis

*Ginkgo biloba* L. "Ginkgo" "Bai Guo" (GINKGO FAMILY) Poor Circulation

*Glycyrrhiza uralensis* "Chinese Licorice" "Gan Cao" (LEGUME FAMILY) Ulcers

*Hemerocallis fulva* (L.) L. "Day Lily" "Xuan Cao" (LILY FAMILY) Hepatitis

*Hibiscus syriacus* L. "Rose of Sharon" "Mu Jin Hua" (MALLOW FAMILY) Dysentery

*Houttuynia cordata* Thunb. "Chameleon Plant" "Yu Xing Cao" (LIZARD'S-TAIL FAMILY) Bronchitis

*Leonurus heterophyllus* Sweet "Chinese Motherwort" "Yi Mu Cao" (MINT FAMILY) Dysmenorrhea

*Ligusticum chuanxiong* Hort.. "Sichuan Lovage" "Chuan Xiong" (CELERY FAMILY) Arthritis

*Ligusticum sinense* Oliv. "Gao Ben" (CELERY FAMILY) Arthritis

*Ligustrum lucidum* Ait. "Privet" "Chinese privet" "Nu Zhen Zi" (OLIVE FAMILY) Immunostimulant

*Lonicera japonica* Thunb. "Japanese Honeysuckle" "Jin yin hua" (HONEYSUCKLE FAMILY) Flu

*Lycium chinense* Mill. "Matrimony Vine" Wolfberry" "Gou Qi Zi" "Di Gi PI" (POTATO FAMILY)

*Morus alba* L. "White Mulberry" "Sang Ye" (MULBERRY FAMILY) Cold

*Nandina domestica* Thunb. "Heavenly Bamboo" "Nan-tian-zhu" (BARBERRY FLOWER) Cough

*Paeonia lactiflora* Pallas "Chinese Peony" "Bai Shao" (BUTTERCUP FAMILY) Headache

*Paeonia suffruticosa* Andr. "Tree Peony" "Mu Dan Pi" (BUTTERCUP FAMILY) Inflammation

*Panax ginseng* "Ginseng" "Ren Shen" (ARALIA FAMILY) Fatigue

*Perilla frutescens* (L.) Britt. "Beefsteak Plant" "Zi su" (MINT FAMILY) Cold

*Phellodendron amurense* Rupr. "Amur Corktree" "Huang Bai" (CITRUS FAMILY) Infections; Inflammation

*Platycodon grandiflorum* (Jacq.) A. DC. "Balloonflower" "Jie-geng" (BELLFLOWER FAMILY) Bronchitis

*Polygonum cuspidatum* Sieb. & Zucc. "Giant Knotweed" "Hu Zhang" (BUCKWHEAT FAMILY) Arthritis

*Polygonum multiflorum* "Nimble Will" "Fo Ti" (BUCKWHEAT FAMILY) Fatigue

*Prunus nune* (Sieb.) Sieb. & Zucc. "Mume Plum" "Wu Mei" (ROSE FAMILY) Cough

*Pueraria lobata* (Willd.) Ohwi "Kudzu" "Ge Gen" (LEGUME FAMILY) Alcoholism

*Rehmannia glutinosa* Gaertn. "Chinese Foxglove" "Di Huang" (FIGWORT FAMILY) Diabetes

*Rheum palmatum* L. "Medicinal Rhubarb" "Da Huang" (BUCKWHEAT FAMILY)

*Salvia miltiorrhiza* Bunge "Red Sage" "Dan Shen" (MINT FAMILY) Dysmenorrhea

*Schisandra chinensis* "Magnolia Vine" "Wu Wei Zi" (MAGNOLIA FAMILY) Hepatitis

*Scutellaria baicalensis* "Chinese Skullcap" "Huang Qin" (MINT FAMILY) Hepatitis

*Sophora japonica* L "Japanese Pagoda Tree" (LEGUME FAMILY) Varicose Veins

*Trichosanthes kirilowii* Maxim. "Chinese Cucumber" "Tian hua fen" (GOURD FAMILY) Abortion, AIDS (Compound Q)

*Tripterygium wilfordii* Hook. f. "Yellow Vine" (BITTERSWEET FAMILY) Immunosuppressant

*Vitex negundo* L. "Fiveleaf Chastetree" "Huang Jing Zi" (VERBENA FAMILY) Malaria

*Zingiber officinale* Roscoe "Ginger" "Gan-Jiang" (GINGER FAMILY) Vertigo

*Ziziphus jujuba* Mill. "Jujube" "Da Zao" (JUJUBE FAMILY) Insomnia

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Scientific Name Common \$ Per Lb. Indication

(Wholesale)

*Angelica sinensis* Dong Quai 8.75 Dysmenorrhea

*Astragalus* sp. Huang Qi 7.50 Immunodepression

*Eleutherococcus senticosus* Wujia 7.50 Fatigue

*Ephedra sinica* Ma Huang 4.50 Marcolepsy

*Ginkgo biloba* Ginkgo 5.50 Poor Circulation

*Glycyrrhiza uralensis* Licorice 3.25 Ulcers

*Paeonia* sp. Peony 4.00 Headache



*Panax ginseng* Ren Shen 79.00 Fatigue

*Polygonum multiflorum* Fo Ti 6.58 Fatigue

*Rehmannia glutinosa* Di Huang 5.92 Diabetes

*Schizandra chinensis* Magnolia Vine 7.89 Hepatitis

*Zingiber officinale* Ginger 3.75 Vertigo

*Ziziphus jujuba* Jujube 4.00 Insomnia

#### MOST FREQUENTLY SOLD CHINESE DRUGS

(MODIFIED FROM BREVOORT, HERBALGRAM, 1996)



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### Module 14: HAWAIIAN

*Abutilon* spp. "ko'olua"

*Acacia koa* Gray "Acacia" "Koa" (LEGUME FAMILY)

*Ageratum conyzoides* "Ageratum" "maile-honohono"

*Aleurites moluccana* "Candlenut tree" "Kokui" (SPURGE FAMILY)

*Alocasia macrorrhiza* "Elephant-ear plant" "'ape"

*Aloe vera* "Star cactus" "'aloe"

*Ananas* sp. "Pineapple" "hala-kea"

*Anthyrium* spp. "pohale"

*Arctium lappa* "Burdock" "gobo"

*Argemone glauca* "Prickly poppy" "pua-kala"

*Artemisia australis* "O'ahu wormwood" "'ahinahina"

*Artocarpus altilis* "Breadfruit" "'ulu"

*Asplenium* spp. "pi'ipi'i-lau-manamana"

*Asplenium nidus* "Bird's-nest fern" "'ekaha"

*Bambusa vulgaris* "Feathery bamboo" "ohe"

*Bidens* spp. "ko'oko'olau" (ASTER FAMILY)

*Bidens pilosa* "Beggar's Tick" "Ko'oko'olau" (ASTER FAMILY)

*Boerhavia diffusa* "Red spiderling" "alena"

*Broussaisia arguta* "kanawao"

*Broussonetia papyrifera* "Paper mulberry" "wauke"

*Caesalpinia bonduc* "Yellow nickers" "kakalaioa"

*Caesalpinia major* "Gray nickers" "kakalaioa"

*Canavalia galeata* "Sword bean" "'awikiwiki"

*Capparis sandwichiana* "Native caper" "maiapilo"

*Cardiospermum halicacabum* "Balloon vine" "poniu"

*Carica papaya* "Papaya" "mikana"

*Cassytha filiformis* "kauna'oa pehu"

*Cassytha filiformis* "kauna'oa-uka"

*Cenchrus agrimonioides* "Agrimony sandbur" "kamanomano"

*Chenopodium* spp. "Goosefoot; Pigweed" "'aheahea"

*Cibotium splendens* "Tree fern" "hapu'u-pulu"

*Coccinia grandis* "Ivy gourd" (GOURD FAMILY)

*Cocos nucifera* "Coconut" "niu"

*Colocasia esculenta* "Taro" "kalo"

*Coprosma ernodeoides* "Black-fruited coprosma" "kukae-nene"

*Cordyline terminalis* "Ti Plant" "Ki" (LILY FAMILY)

*Curcuma domestica* "Turmeric" "'olena" (GINGER FAMILY)

*Cuscuta sandwichiana* "Dodder" "kauna'oa"

*Cymbopogon citratus* "Lemongrass" "lukini"

*Cynodon dactylon* "Bermuda grass" "maniania"

*Cynodon dactylon* "Bermuda grass" "manienie"

*Cyperus ferax* "mau'u-pu'uka'a"

*Cyperus javanicus* "Marsh cypress" "'ahu'awa"

*Cyperus hypochlorus* "'ahu'awa"

*Digitaria pruriens* "Itchy crabgrass" "kukae-pua'a"

*Dioscorea alata* "uhi"

*Dioscorea bulbifera* "Bitter yam" "hoi"

*Diospyros* spp. "lama"

*Dodonaea* spp. "'a'ali'i"

*Dracaena* spp. "hala-pepe"

*Eucalyptus* spp. "Eucalyptus" "pale-piwa"

*Eugenia malaccensis* "Mountain apple" "'ohi'a-'ai"

*Euphorbia* spp. "'akoko" (SPURGE FAMILY)

*Freycinetia arborea* "'ie'ie"

*Gossypium sanvichensis* "Native Cotton; Hawaiian cotton" "ma'o" (MALLOW FAMILY)

*Heliotropium anomalum* var. *argenteum* "Heliotrope; turnsole" "hinahina"

*Heliotropium anomalum* var. *argenteum* "Heliotrope; turnsole" "hinahina ku-kahakai"

*Hibiscus* spp. "Hibiscus" "aloalo"

*Hibiscus tiliaceus* "Seaside Mahoe" "Hau" (MALLOW FAMILY)

*Hibiscus tiliaceus* "Seaside Mahoe" "hau-oheohe" (MALLOW FAMILY)

*Hibiscus youngianus* "Native pink hibiscus" "'akiohala" (MALLOW FAMILY)

*Hydrocotyle verticillata* "Marsh pennywort" "pohepohe"

*Ipomoea* spp. "koali"

*Ipomoea* spp. "Morning glory" "kowali"

*Ipomoea batatas* "Sweet potato" "'uala"

*Ipomoea batatas* "Sweet potato" "'uwala"

*Ipomoea brasiliensis* "Beach morning glory" "pohuehue"

*Jacquemontia sandwicensis* "pa'u-o-Hi'i-aka"

*Lagenaria siceraria* "Bottle gourd" "ipu"

*Lagenaria siceraria* "Bottle gourd" "ipu-'awa'awa"

*Lagenaria siceraria* "Bottle gourd" "pohue"

*Lipochaeta integrifolia* "nehe"

*Lycopodium cernuum* "Club moss" "wawae-'iole"

*Marattia douglassi* "pala"

*Metrosideros* spp. "'ohi'a-lehua"

*Metrosideros collina* "Lehua" (MYRTLE FAMILY)

*Momordica charantia* "Bitter Melon" (GOURD FAMILY)

*Morinda citrifolia* "Indian Mulberry" "Noni" (COFFEE FAMILY)

*Musa x paradisiaca* "Banana" "mai'a"

*Nasturtium microphyllum* "Watercress" "leko"

*Nasturtium sarmentosum* "pa'ihii"

*Osteomeles anthyllidifolia* "Hawaiian hawthorne" "ulei"

*Pandanus odoratissimus* "Pandanus; Screw-pine" "hala"

*Pelea anisata* "mokihana"

*Pelea hawaiiensis* "mokihana-kukae-moa"

*Peperomia* spp. "'ala'ala-wai-nui"

*Peperomia* spp. "'ala'ala-wai-nui-kane"

*Peperomia* spp. "'ala'ala-wai-nui-kupali'i"

*Peperomia* spp. "'ala'ala-wai-nui pehu"

*Peperomia* spp. "'ala'ala-wai pohina"

*Peperomia* spp. "kupa-li'i"

*Petroselinum crispum* "Parsley" "parsley"

*Peucedanum* spp. "maka'o"

*Piper methysticum* "Kava-Kava" "'Awa" (PEPPER FAMILY)

*Pipturus* spp. "mamake"

*Pipturus alba* "Mamaki" (NETTLE FAMILY) Most sold herb in Hawaii and we still don't know why. Fruits eaten as laxative; given children for thrush

*Plantago major* "Broad-leafed plantain" "lau-kahi"

*Portulaca sclerocarpa* "'ihi"

*Psidium guajava* "Guava" "kuawa" (MYRTLE FAMILY)

*Psilotum* spp. "moa"

*Saccharum officinarum* "Sugarcane" "ko"

*Sadleria* spp. "'ama'u"

*Santalum* spp. "Sandalwood" "'ili-ahi"

*Santalum ellipticum* "Coast sandalwood" "'ili-ahi-a-lo'e"

*Scaevola guadichaudiana* "Mountain naupaka" "naupaka-kuahiwi"

*Scaevola tascada* "Beach naupaka" "naupaka-kahakai"

*Sida* spp. "'ilima"

*Solanum nigrum* "Black nightshade" "popolo"

*Sophora chrysophylla* "mamane"

*Stictocardia tiliaefolia* "pili-kai"

*Styphelia tameiameia* "pukiawe"

*Tacca leontopetaloides* "Polynesian arrowroot" "pia"

*Tamarindus indica* "Tamarind" "wi"

*Tephrosia purpurea* "Hoary pea" "'auhuhu"

*Thelypteris cyatheoides* "kikawaio"

*Tribulus cistoides* "Large-flowered caltrop" "nohu"

*Vaccinium* spp. "'ohelo"

*Vigna marina* "Beach pea" "okole mihili"

*Zingiber officinalis* "Ginger" "'awapuhi-Pake" (GINGER FAMILY)

*Zingiber zerumbet* "Wild ginger" "'awapuhi-kuahiwi" (GINGER FAMILY)

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## Module 15: LAST AND LEAST ... DANGEROUS HERBS

The deadly dozen dubiously-salubrious denizens of the DA (Drug Administration)

Jim Duke

When the FDA outlawed supplements of tryptophan (essential to life), which probably occurs in all living and recently dead animals and plants, I interpreted that as suggesting that tryptophan must be a pretty promising nutritional supplement. Though environmental, health, and safety debates always have two sides, I am convinced that tryptophan was not the culprit, rather a technologically introduced contaminant, which killed more than 30 people. Tryptophan, though still on the FDA hit list and still illegal as a supplement, occurs in every plant and animal you consume. (Seed of evening primrose, busted at least 4 times by the FDA, is the best source of tryptophan in my database.) There's one strange conflicting connection; some US scientists, who will make more money if tryptophan and melatonin are moved from OTC to prescription-only availability, may have influenced the FDA campaigns against melatonin and/or evening primrose. One super scientist with financial ties to these chemicals or pharmaceuticals that share the same activities, has shown that dietary tryptophan contributes to cerebral serotonin, in that sense satisfying some of the same circuitry satisfied by Prozac. So Prozac is still legal, selling more than a billion dollars a year, while supplementary tryptophan is

illegal, and evening primrose, the best natural source of tryptophan has been busted. I have told herbal friends not to despair, that FDA disapproval of an herb or supplement often stimulates sales, so popular and credible is the belief that the FDA is in the pockets of the pharmaceutical propagandists. I suspect that many real scientists in the FDA, if they weighed the evidence, would rather their daughters took angelica than calcium blockers, celeryseed than allopurinol, evening primrose than Prozac, feverfew than sumatriptan, ma huang than amphetamine, rosemary than cognex, St. John's-wort than Prozac, soybean or other tastier estrogenic legumes than tamoxiphen.

Yes, the FDA has banned tryptophan, biotechnologically contaminated versions of which killed more than 30 people and caused perhaps hundreds of cases of EMS. But OTC and prescription pharmaceuticals, approved by the FDA, take thousands of lives each year. Now for an honest confession from an herbalist! Herbally-derived drugs of abuse probably kill more than a million Americans each year. And starting in 1995/6, Dr. Kessler, FDA Commissioner, finally took on the real herbal enemy, an Amerindian herb known as tobacco, *Nicotiana*. Though Amerindians historically used the herb ceremonially without becoming addicted, more than a quarter of Americas have smoked, and most of them became physiologically addicted, including yours truly. For more than two decades I smoked three packs a day, king-sized, unfiltered. Now I've switched from cancer sticks to carrot sticks, hoping that the mix of carotenoids, unlike isolated beta-carotene, will prevent the lung cancer I invited with all that smoke pouring through my lungs. This is the worst of the killer herbs, killing perhaps half a million Americans and more and more unAmericans every year. The next worse killer herbs are those used to make the often-abused alcohol. (Any sugar producing herb can be used to manufacture alcohol; among the most frequent, sugarcane, corn, potato, grapes, barley, hops, etc.) Though the poison ethanol kills many Americans, we don't ban the corn, our number two crop, nor the grapes, or potatoes. I frankly don't know which is the next worse killer, cocaine (From *Erythroxylum* spp.), heroin (from opium from *Papaver somniferum*, one of our Biblical herbs), or marihuana (*Cannabis sativa*) or its derivatives, hashish, or medicinal THC or marinol. I was once accurately quoted as saying I'd rather my kids smoked an occasional joint than chronically smoked tobacco. But I think that habitual smoking of equal amounts of marijuana as a substitute for smoking tobacco would be as bad as or worse than smoking tobacco. Coca, marijuana and opium poppy are banned for planting in the US. But all of these killers have legitimate uses. The FDA approves some medicinal uses of alcohol, codeine, cocaine, marinol, and morphine, e.g., and poppy's paverine is injected into more than one penis in the US, additional to its use in other areas. A few deaths attributed to jimsonweed and its generic relatives (*Datura* spp.) and ma huang (*Ephedra*), but solely or almost exclusively when used recreationally.

If more people are going to "quacks" (alternative practitioners), even when they have to pay out of pocket, than are going to allopathic physicians, more often covered by HMOs or insurance, as seems to be the case starting this decade, why is it that there are several orders of magnitude more fatalities associated with allopaths than with quacks?

#### Table of Fatalities

(Rounded no. of fatalities/no. people involved with procedure or medicine or herb)

Other estimates (food poisoning, murder, based on total population of 250 million.

Herbs 1/1,000,000 (JAD)

Supplements 1/1,000,000 (JAD based on tryptophan)



Mushroom Poisonings 1/100,000 (JAD)

Food Poisoning 1/25,000 (CSPI)

NSAIDS 1/10,000 (CMR)

Murders 1/10,000 (WTOP)

Surgery in Hospital 1/10,000 (JAMA)

Car Crashes 1/5,000 (JAD)

Improper Taking of Medication 1/2,000 (JAD)

Angiograms 1/1,000 (JAD)

Medicine (even in hospital) 1/1,000 (JAMA)

Alcohol 1/500 (JAD)

Cigarettes 1/500 (JAD)

Medical Mishaps 1/250 (AARP)

Iatrogenic hospital infections 1/80 (JAD)

Bypass Operations 1/20 (JAD)

Calculation of fatality ratios by me(=JAD):

27 died to tryptophan (assume 27,000,000 nutrient poppers=1 in a million).

Ca 2 herbal fatalities a year; assume conservatively only 2 million Americans(<1%; real figure could be closer to 25,000,000 {10% of Americans}) are taking herbs = 1 in a million

Mushroom Poisonings: Assumes twice as many among mushroom users as among herbal grazers, and assuming there are 5 times more of the latter. (JAD)

WTOP announced that there were more than 23,000 murders in 1992, which I rounded up to 25,000 over the population of 250,000,000

Center for Science in the Public Interest announced that 10,000 people died of food poisoning last year,  $10,000/250,000,000 = 1$  in 25,000

Assumes car fatalities will run 50,000 (The rate has gone down of late)  $50,000/250,000,000 = 5/25,000 = 1/5,000$

Cigarettes 100,000 out of 50,000,000 smokers = 1 in 500

Alcohol\* 100,000 out of 50,000,000 drinkers (25,000,000 problem drinkers) = 1 in 500

Angiograms 1,000-5,000/yr of 1,000,000 = 1 in 200 to 1 in 1,000

NSAIDS 10,000-20,000/yr assume 40% take = 1 in 10,000 to 1 in 5,000

Bypass Operations 14,000-28,000 1 in 10 to 1 in 20

AARP newsletter 1992 1 in 250 to medical mistakes

JAMA 1987 1 in 1,000 entering hospital will die of medication.

100,000 patients lost to hospital acquired infections. CMR May 13, 1985 Or 100,000 out of 8,000,000 = 1 in 80

Medical mistakes ca 200,000 per year assuming. 200,000,000 hospitalizations/year = 1 in 1,000 (Harvard's L. L. Leape) (Good Housekeeping, Oct. 1992, p. 124)

Improper Taking of Medication 125,000 per yr/ assume 250,000,000 = 1 in 2,000 (Approximately 125,000 Americans die each year from failure to take their medicine properly... Ca 30-50% of the 1.8 billion prescriptions dispensed annually are taken incorrectly by the patient.)

My first medicinal plant book that is still in print, the "CRC Handbook of Medicinal Herbs", was submitted to the publisher under the title of "Herbs of Dubious Salubrity". Why that title? Because the FDA had called me on most of those herbs, looking for bad things about them, a few days or weeks before the Herb Industry, looking for good things about them. In this syllabus, I may have erred on the good side of things, but I think I am being even handed. I do not, as a relatively respectable writer, want to be seen as advocating any dangerous herbs. And there are some dangerous herbs. Some of the most dangerous poisons in the world are natural compounds found in Mother Nature's benevolent plant kingdom.

Here I visualize two categories of poisonous plants, the most poisonous having been used and exploited, one way or another by the pharmaceutical industry and to a lesser degree by the herbalists, and the less poisonous having been used frequently by herbalists and less so by the pharmaceutical industry. There are hundreds that fall into each, admittedly poorly defined, category but for simplicity's sake, I have

limited our class discussion to a baker's dozen.

CAVEAT: No herb nor synthetic drug, is dangerous, if properly used. All herbs contain antiallergens and allergens, anticarcinogens and carcinogens, antimutagens and mutagens, antioxidants and prooxidant, antitoxins (antidotes) and toxins and thousands of other pro and con phytochemicals. There are probably safe, medicinal, toxic and lethal doses for all chemicals, natural and synthetic. Your genes may well have memory of natural toxins which challenged your ancestors. Your genes, though quick to learn, have no knowledge or memory of tomorrow's synthetic drugs and poisons.

## DANGEROUS HERBS

*Atropa belladonna* L. "Belladonna" (POTATO FAMILY)

*Conium maculatum* L. "Poison Hemlock" (CELERY FAMILY)

*Convallaria majalis* L. "Lily of the Valley" (LILY FAMILY)

*Datura stramonium* L. "Jimson Weed" (POTATO FAMILY)

*Euonymus atropurpureus* Jacq. "Wahoo" (BITTERSWEET FAMILY)

*Hyoscyamus niger* L. "Henbane" (POTATO FAMILY)

*Mandragora officinarum* L. "Mandrake" (POTATO FAMILY)

*Phoradendron flavescens* (Pursh.) Nutt "Mistletoe" (MISTLETOE FAMILY)

\**Physostigma venenosum* Balf. "Ordeal Bean" (LEGUME FAMILY)

\**Phytolacca americana* L "Pokeweed" (POKEWEED FAMILY)

*Podophyllum peltatum* L. "Mayapple" (BARBERRY FAMILY)

\**Ricinus communis* L. "Castorbean" (SPURGE FAMILY)

*Sanguinaria canadensis* L. "Bloodroot" (POPPY FAMILY)

*Solanum dulcamara* L. "Bittersweet Nightshade" (POTATO FAMILY)

\**Taxus* spp. "Yew" (YEW FAMILY)

*Vinca* spp. "Periwinkle" (DOGBANE FAMILY)

*Viscum album* L. "European Mistletoe" (MISTLETOE FAMILY)

## THE MEDIA'S "DANGEROUS" HERBS

*Acorus calamus* L. Calamus (AROID FAMILY)

*Aesculus hippocastanum* L. Horse Chestnut (HORSE CHESTNUT FAMILY)

*Arnica montana* L. "Wolfbane" (ASTER FAMILY)

*Artemisia absinthium* L. "Absinth" (ASTER FAMILY)

*Corynanthe yohimbe* Schum. "Yohimbe" (COFFEE FAMILY)

*Cytisus scoparius* (L.) Link. "Scotch Broom" (LEGUME FAMILY)

*Dipteryx odorata* (Aubl.) Willd. "Tonka Bean" (LEGUME FAMILY)

*Eupatorium rugosum* Houtt. "Snakeroot" (ASTER FAMILY)

\**Glycyrrhiza* spp. "Licorice" (LEGUME FAMILY)

\**Hedeoma pulegioides* (L.) Pers. (MINT FAMILY)

*Heliotropium europaeum* L. "Heliotrope" (BORAGE FAMILY)

*Hypericum perforatum* L. "St. John's-wort" (ST. JOHN'S-WORT FAMILY)

*Ipomoea jalapa* Nutt. "Jalap Root" (MORNING GLORY FAMILY)

*Ipomoea purpurea* (L.) Roth "Purple Morning Glory" (MORNING GLORY FAMILY)

\**Larrea tridentata* (Sesse & Moq. Ex DC.) J. M. Coult. (CALTROPS FAMILY)

*Lobelia inflata* L. "Lobelia" (LOBELIA FAMILY)

*Matricaria chamomilla* L. "Chamomile" (ASTER FAMILY)

\**Mentha pulegium* L. "European Pennyroyal" (MINT FAMILY)

\**Piper methysticum* Forst. "Kava-Kava" (BLACK PEPPER FAMILY) The campaign against this innocuous herb which I find to be a pleasant sedative, began in early 1997 with a media frenzy following intoxications at a New Year's Eve party

*Sassafras albidum* (Nutt.) Nees "Sassafras" (LAUREL FAMILY)

\**Senecio aureus* L. "Squaw Weed" (ASTER FAMILY)

*Symphytum* spp. "Comfrey" (BORAGE FAMILY)

\**Tanacetum vulgare* L. "Tansy" (ASTER FAMILY)

\**Teucrium chamaedrys* "Germander" (MINT FAMILY)

\**Tussilago farfara* L. "Colt's Foot" (ASTER FAMILY)

\* My additions from the popular press ( not included in FDA Directive 7117.05) FDA Directive 7117.05, Transmittal 77-21 (03/22/77) categorized 27 herbs as "unsafe" and I have assigned those, albeit arbitrarily, to the Really Dangerous and the Media Dangerous based on my personal evaluations of more than 20 years, during which times I have ingested more than half of them... "The Bureau of Foods will consider regulatory action against those herbs which fall within the unsafe category (see attachment) and which become adulterated foods by use in herbal teas or otherwise.. . .Formal statements on Calamus, Safrole and Coumarin (from tonka bean) are found in 21 CFR 121.106 and on Stramonium (Jimsonweed) in 21 CFR 250.12)

(See Appendix 2: Biting the Biocide Bullet)



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## EUROPEAN SYLLABUS

(COMMISSION E INDICATIONS and DOSAGES)

(Based on Bisset, 1994; as loosely interpreted by Duke)

Jim Duke, 1997

***Achillea millefolium* L. "Yarrow" (ASTER FAMILY)**

Cramps (4.5 g Leaf)

Dysmenorrhea (4.5 g Leaf)

Dyspepsia (4.5 g Leaf)

Enterosis (4.5 g Leaf)

Inappetence (4.5 g Leaf)

***Agathosma betulina* (Bergius) Pillans. "Buchu" (CITRUS FAMILY)**

Cholecocystosis (FL-NDI)

Nephrosis (FL-NDI)

Urethrosis (FL-NDI)

***Agrimonia eupatoria* L. "Agrimony" (ROSE FAMILY)**

Dermatitis (10% decoction)

Diarrhea (3-6 g)

Gargantitis (3-6 g)

Stomatitis (3-6 g)

***Alchemilla xanthochlora* Rothm. "Lady's mantle" (ROSE FAMILY)**

Diarrhea (5-10 g)

***Aloe barbadensis* Miller "Aloe" (ALOE FAMILY)**

Constipation (0.05-0.2 g powdered aloes)

Hemorrhoids (0.05-0.2 g powdered aloes)

***Alpinia officinarum* Hance "Galanga" (GINGER FAMILY)**

Dyspepsia (2-4 g Rhizome)

Inappetence (2-4 g Rhizome)

***Althaea officinalis* L. "Marshmallow" (MALLOW FAMILY)**

Cough (5 g leaf, 6 g root)

Gargantitis (5 g lf; 6 g root)

Gastitis (6 g root)

Stomatitis (5 g leaf; 6 g root)

***Ammi visnaga* (L.) Lam. "Bisnaga" (CELERY FAMILY)**

Angina (fruit equiv. 20 mg gamma-pyrone)

Respiratory Obstruction (fruit equiv. 20 mg gamma-pyrone)

Uroliths (fruit equiv. 20 mg gamma-pyrone; calc. as 20 mg khellin)

***Angelica archangelica* L. "Angelica" (CELERY FAMILY)**

Cramps (4.5 g root; 1.5 g tincture)

Dyspepsia (4.5 g root; 1.5 g tincture)

Flatulence (4.5 g root; 1.5 g tincture)

Gastrosis (4.5 g root; 1.5 g tincture)

Inappetence (4.5 g root; 1.5 g tincture)

***Arctium lappa* L. "Bardana" "Burdock" (ASTER FAMILY)**

Arthritis (FL-NDI)

Dermatosis (FL-NDI)

Enterosis (FL-NDI)

Gastrosis (FL-NDI)

Ichthyosis (FL-NDI)

Psoriasis (FL-NDI)

Rheumatism (FL-NDI)

***Arnica montana* L. "Wolfbane" (ASTER FAMILY)**

Bruise (2 g Flower/100 ml water)

Bugbite (2 g Flower/100 ml water)

Dislocation (2 g Flower/100 ml water)

Edema (2 g Flower/100 ml water)

Furuncles (2 g Flower/100 ml water)

Gargantitis (Tincture diluted 10 x)

Hematoma (2 g Flower/100 ml water)

Myalgia (2 g Flower/100 ml water)

Rheumatism (2 g Flower/100 ml water)

Phlebitis (2 g Flower/100 ml water)

Stomatitis (Tincture diluted 10 x)

***Artemisia absinthium* L. "Absinth" "Wormwood" (ASTER FAMILY)**

Biliary dyskinesia (2-3 g)

Dyspepsia (2-3 g)

Inappetence (2-3 g) etc. etc.

***Artemisia vulgaris* L. "Mugwort" (ASTER FAMILY)**

Colic (FL-NDI)

Constipation (FL-NDI)

Cramps (FL-NDI)

Diarrhea (FL-NDI)

Dysmenorrhea (FL-NDI)

Dyspepsia (FL-NDI)

Epilepsy (FL-NDI)

Hysteria (FL-NDI)

Insomnia (FL-NDI)

***Avena sativa* L. "Oats" (GRASS FAMILY)**

Anxiety (FL-NDI)

Cholecystitis (FL-NDI)

Dermatitis (FL-NDI)

Neurasthenia (FL-NDI)

***Betula pendula* Roth.. "Silver Birch" (BIRCH FAMILY)**



Gravel (2-3 g Leaf)

Nephrosis (2-3 g Leaf)

Rheumatism (2-3 g Leaf)

Urethritis (2-3 g Leaf)

***Calendula officinalis* L. "Pot Marigold" (ASTER FAMILY)**

Gargantitis (1-2 g Flower in 150 ml water)

Infection (2-5 g Flower in 100 g Ointment)

Stomatitis (1-2 g Flower in 150 ml water)

Ulcus Cruris (2-5 g Flower in 100 g Ointment)

Wound (2-5 g Flower in 100 g Ointment)

***Carum carvi* L. "Caraway" (CITRUS FAMILY)**

Colic (1.5-6 g Fruit)

Dyspepsia (1.5-6 g Fruit)

Enterosis (1.5-6 g Fruit)

Flatulence (1.5-6 g Fruit)

Gastrosis (1.5-6 g Fruit)

***Castanea sativa* Mill. "Sweet Chestnut" (OAK FAMILY)**

Bronchitis (FL-NDI)

Pertussis (FL-NDI)

***Centaureum erythraea* L. "Centaurry" (ASTER FAMILY)**

Dyspepsia (6 g Herb)

Inappetence (6 g Herb)

***Cetraria islandica* (L.) Ach. "Iceland Moss" (LICHEN FAMILY)**

Cough (4-8 g Herb)

Gargantitis (4-8 g Herb)

Inappetence (4-8 g Herb)

Stomatitis (4-8 g Herb)

***Chelidonium majus* L. "Celandine" (POPPY FAMILY)**

Biliary Cramps (2-5 g Herb or 12-30 mg alkaloid{chelidonine})

GI Cramps (2-5 g Herb or 12-30 mg alkaloid{chelidonine})

***Cinchona pubescens* Vahl. "Quinine" (COFFEE FAMILY)**

Dyspepsia (1-3 g Bark)

Flatulence (1-3 g Bark)

Inappetence (1-3 g Bark)

***Cinnamomum verum* J. Presl "Cinnamon" (LAUREL {BAYLEAF} FAMILY)**

Colic (2-4 g Bark)

Dyspepsia (2-4 g Bark)

Flatulence (2-4 g Bark)

Inappetence (2-4 g Bark)

***Citrus aurantium* L. "Bitter Orange" (CITRUS FAMILY)**

Dyspepsia (4-6 g Fruit Peel)

Inappetence (4-6 g Fruit Peel)

***Cnicus benedictus* L. "Holy Thistle" (ASTER FAMILY)**

Dyspepsia (4-6 g Bark)

Inappetence (4-6 g Bark)

***Commiphora molmol* Engl. "Myrrh" (COPAL FAMILY)**

Gargantitis (Topical Tincture)

Gingivitis (Topical Tincture)

Stomatitis (Topical Tincture)

***Coriandrum sativum* L. "Coriander" (CELERY FAMILY)**

Dyspepsia (3 g Fruit)

Inappetence (3 g Fruit)

***Crataegus laevigata* (Poiret) DC. "Hawthorn" (ROSE FAMILY)**

Bradyarrhythmia (5 mg OPCs, calc. As epicatechin)

Cardiac Insufficiency (5 mg OPCs, calc. As epicatechin)

***Crocus sativus* L. "SaffronHawthorn" (IRIS FAMILY)**

Asthma (FL-NDI)

Cramps (FL-NDI)

Nerves (FL-NDI)

***Cucurbita pepo* L. "Pumpkin" (GOURD FAMILY)**

BPH (10 g Seed)

Cholecystitis (10 g Seed)

Nocturia (10 g Seed)

Prostatitis (10 g Seed)

***Curcuma domestica* Valetton "Turmeric" (GINGER FAMILY)**

Dyspepsia (1.5-3 g Rhizome)

***Curcuma xanthorrhiza* Roxb. "Javanese Turmeric" (GINGER FAMILY)**

Dyspepsia (2 g Rhizome)

***Drosera ramentacea* Burch ex Harv. & Sond. "Sundew" (SUNDEW FAMILY)**

Cough (3 g Herb)

***Echinacea angustifolia* DC. "Narrow Leaf Cone Flower" (ASTER FAMILY)**

Abscess (FL-DNI)

Cold (FL-DNI)

Cold (FL-DNI)

Gargantitis (FL-DNI)

Herpes (FL-DNI)

Inflammation (FL-DNI)

Influenza (FL-DNI)

Rhinitis (FL-DNI)

Ulcus cruris (FL-DNI)

Wounds (FL-DNI)

***Echinacea pallida* DC. "Pale Cone Flower" (ASTER FAMILY)**

Infection (900 mg Root)

Influenza (900 mg Root)

***Elymus repens* (L.) Gould "Quack Grass" (GRASS FAMILY)**

Gravel (6-9 g Root)

Nephritis (6-9 g Root)

Urethritis (6-9 g Root)

***Equisetum arvense* L. "Field Horsetail" (HORSETAIL FAMILY)**

Cystitis (6 g Herb)

Edema (6 g Herb)

Gravel (6 g Herb)

Nephritis (6 g Herb)

Urethritis (6 g Herb)

***Eucalyptus globulus* L. "Blue Gum" (MYRTLE FAMILY)**

Bronchitis (4-6 g Leaf)

***Foeniculum vulgare* Mill. "Fennel" (CELERY FAMILY)**

Bronchitis (5-7 g Seed)

Dyspepsia (5-7 g Seed)

Enteritis (5-7 g Seed)

Flatulence (5-7 g Seed)

Gastritis (5-7 g Seed)

***Fragaria vesca* L.. "Wild Strawberry" (ROSE FAMILY)**

Anemias (FL-NDI)

Dermatitis (FL-NDI)

Diarrhea (FL-NDI)

Dysmenorrhea (FL-NDI)

Enteritis (FL-NDI)

Fever (FL-NDI)

Gastritis (FL-NDI)

Gout (FL-NDI)

Gravel (FL-NDI)

Hepatitis (FL-NDI)

Jaundice (FL-NDI)

Nephritis (FL-NDI)

Nervousness (FL-NDI)

Obesity (FL-NDI)

Rheumatism (FL-NDI)

***Frangula alnus* L. "Buckthorn" (BUCKTHORN FAMILY)**

Constipation (20-180 mg Hydroxyanthracene Derivatives)

Hemorrhoids (20-180 mg Hydroxyanthracene Derivatives)

***Fucus vesiculosus* L. "Bladderwrack" (ALGAE ALLIANCE)**

Arteriosclerosis (FL-NDI)

Dyspepsia (FL-NDI)

Obesity (FL-NDI)

Thyropathy (FL-NDI)

***Fumaria officinalis* L. "Fumitory" (FUMITORY FAMILY)**

Biliary Cramps (6 g Herb)

Cramps (6 g Herb)

Enterosis (6 g Herb)

Gastrosis (6 g Herb)

***Gentiana lutea* L. "Gentian" (GENTIAN FAMILY)**

Dyspepsia (2-4 g Herb)

Flatulence (2-4 g Herb)

Inappetence (2-4 g Herb)

***Glycyrrhiza glabra* L. "Licorice" (LEGUME FAMILY)**

Bronchitis (5-15 g Root equiv to 200-800 mg Glycyrrhizin)

Duodenal Ulcer (5-15 g Root equiv to 200-800 mg Glycyrrhizin)

Stomach Ulcer (5-15 g Root equiv to 200-800 mg Glycyrrhizin)

***Hamamelis virginiana* L. "Witch Hazel" (WITCH HAZEL FAMILY)**

Dermatitis (5-10 g Leaf/250 ml Water)

Diarrhea (2-3 g Bark)

Gingivitis (2-3 g Bark)

Hemorrhoids (5-10 g Leaf/250 ml Water)

Stomatitis (2-3 g Bark)

Varicosity (5-10 g Leaf/250 ml Water)

***Harpagophytum procumbens* DC. "Devil's Claw" (GENTIAN FAMILY)**

Dyspepsia (1.5 g Root)

Inappetence (1.5 g Root)

Rheumatism (4.5 g Root)

***Hedera helix* L. "Ivy" (ARALIA FAMILY)**

Bronchitis (0.3 g Leaf)

***Helichrysum arenarium* (L.) Moench. "Everlasting" (ASTER FAMILY)**

Dyspepsia (3 g Flower)

***Herniaria glabra* L. "Smooth Rupturewort" (PINK FAMILY)**

Arthritis (FL-NDI)

Bronchitis (FL-NDI)

Nephritis (FL-NDI)

Neuritis (FL-NDI)

Rheumatism (FL-NDI)

***Hibiscus sabdariffa* L. "Roselle" Red Sorrel" (MALLOW FAMILY)**

Bronchitis (FL-NDI)

Constipation (FL-NDI)

Gastritis (FL-NDI)

Inappetence (FL-NDI)

***Humulus lupulus* L. "Hops" (HOP FAMILY)**

Anxiety (0.5 g Hops)

Insomnia (0.5 g Hops)

Restlessness (0.5 g Hops)

***Hypericum perforatum* L. "St. John's-wort" (St. JOHN'S-WORT FAMILY)**

Anxiety (2-4 g Herb or 0.2- 1 mg Hypericin)

Burns (2-4 g Herb or 0.2- 1 mg Hypericin)

Depression (2-4 g Herb or 0.2- 1 mg Hypericin)

Dyspepsia (2-4 g Herb or 0.2- 1 mg Hypericin)

Myalgia (2-4 g Herb or 0.2- 1 mg Hypericin)

Nervousness (2-4 g Herb or 0.2- 1 mg Hypericin)

Wounds (2-4 g Herb or 0.2- 1 mg Hypericin)

***Ilex paraguariensis* A. St. Hil. "Mate" (HOLLY FAMILY)**

Mental Fatigue (3 g Leaf)

Physical Fatigue (3 g Leaf)

***Illicium verum* Hook. F. "Star Anise" (MAGNOLIA FAMILY)**

Bronchitis (3 g Fruit; 0.3 g Ess. Oil)

Dyspepsia (3 g Fruit; 0.3 g Ess. Oil)

***Inula helenium* L. "Elecampane" (ASTER FAMILY)**

Bronchitis (FL-NDI)

Enteritis (FL-NDI)

Gastritis (FL-NDI)

Nephritis (FL-NDI)



Urethritis (FL-NDI)

***Juglans regia* L. "Walnut" (WALNUT FAMILY)**

Antidiaphoretic (2-3 g Leaf/100 ml Water/topically)

Dermatitis (2-3 g Leaf/100 ml Water/topically)

Sweating (2-3 g Leaf/100 ml Water/topically)

***Juniperus communis* L. "Juniper" (JUNIPER FAMILY)**

Dyspepsia (2-10 g Fruit)

***Krameria triandra* Ruiz & Pav. "Peruvian Rhatany" (RHATANY FAMILY)**

Gargantitis (1 g Root)

Gingivitis (1 g Root)

Stomatitis (1 g Root)

***Lamium album* L. "White Deadnettle" (MINT FAMILY)**

Bronchitis (3 g Flower)

Dermatitis (3 g Flower)

Gargantitis (3 g Flower)

Leucorrhea (3 g Flower)

Stomatitis (3 g Flower)

***Lavandula angustifolia* Mill. "Lavender" (MINT FAMILY)**

Circulation (1-2 g Herb)

Enterosis (1-2 g Herb)

Gastrosis (1-2 g Herb)

Insomnia (1-2 g Herb)

Meteorism (1-2 g Herb)

Nervousness (1-2 g Herb)

Rochm-Held Syndrome (1-2 g Herb)

***Levisticum officinale* Koch "Lovage" (CELERY FAMILY)**

Cystitis (4-8 Root)

Gravel (4-8 Root)

Nephrosis (4-8 Root)

Urethritis (4-8 Root)

***Linum usitatissimum* L. "Flax" "Linseed" (FLAX FAMILY)**

Colitis (1 tbsp Whole Seed)

Constipation (1 tbsp Whole Seed)

Dermatitis (1 tbsp Whole Seed)

Diverticulitis (1 tbsp Whole Seed)

Enteritis (1 tbsp Whole Seed)

Gastritis (1 tbsp Whole Seed)

***Malva sylvestris* L. "Common Mallow" (MALLOW FAMILY)**

Cough (5 g Leaf or Flower)

Gargantitis (5 g Leaf or Flower)

Stomatitis (5 g Leaf or Flower)

***Marrubium vulgare* L. "Horehound" (MINT FAMILY)**

Bronchitis (4.6 g Herb)

Dyspepsia (4.6 g Herb)

Flatulence (4.6 g Herb)

Inappetence (4.6 g Herb)

***Marsdenia condurango* Teichb. Fil. "Condurango" (MILKWEED FAMILY)**

Inappetence (2-4 g Herb)

***Matricaria recutita* L. "German Camomile" (ASTER FAMILY)**

Bronchitis (3 g Flower)

Cramps (3 g Flower)

Dermatitis (3 g Flower)

Enteritis (3 g Flower)

Gastritis (3 g Flower)

Gingivitis (3 g Flower)

Proctitis (3 g Flower)

Stomatitis (3 g Flower)

Vaginitis (3 g Flower)

***Melilotus officinalis* (L.) Pall "Common Melilot" "Sweetlover" (LEGUME FAMILY)**

Bruises (1.5-3 g Herb equiv to 3-30 mg Coumarin)

Cramps (1.5-3 g Herb equiv to 3-30 mg Coumarin)

Hemorrhoids (1.5-3 g Herb equiv to 3-30 mg Coumarin)

Itching (1.5-3 g Herb equiv to 3-30 mg Coumarin)

Lymphatic Congestion (1.5-3 g Herb equiv to 3-30 mg Coumarin)

Phlebitis (1.5-3 g Herb equiv to 3-30 mg Coumarin)

Swelling (1.5-3 g Herb equiv to 3-30 mg Coumarin)

Thrombophlebitis (1.5-3 g Herb equiv to 3-30 mg Coumarin)

***Melissa officinalis* L "Lemonbalm" "Melissa" (MINT FAMILY)**

Enterosis (1.5-4.5 g Herb)

Gastrosis (1.5-4.5 g Herb)

Insomnia (1.5-4.5 g Herb)

***Mentha X piperita* L. "Peppermint" (MINT FAMILY)**

Biliary Cramps (3-6 g Leaf)

Cholecocystosis (3-6 g Leaf)

Cramps (3-6 g Leaf)

Enterosis (3-6 g Leaf)

Gastrosis (3-6 g Leaf)

***Menyanthes trifoliata* L. "Bogbean" (BOGBEAN FAMILY)**

Dyspepsia (1.5-3 g Leaf)

Inappetence (1.5-3 g Leaf)

***Nasturtium officinale* L. "Watercress" (MUSTARD FAMILY)**

Bronchitis (4-6 g Leaf{dry}; 20-30 g Leaf {fresh})

***Ononis spinosa* L. "Spiny Restharrow" (LEGUME FAMILY)**

Gravel (6-12 g Root)

Nephrosis (6-12 g Root)

Urethritis (6-12 g Root)

***Orthosiphon aristatus* (Blume) Miq. "Java Tea" (MINT FAMILY)**

Gravel (6-12 g Herb)

Nephrosis (6-12 g Herb)

Urethritis (6-12 g Herb)

***Paeonia officinalis* L. "Peony" (PEONY FAMILY)**

Allergy (FL-NDI)

Arthritis (FL-NDI)

Bronchosis (FL-NDI)

Cardiopathy (FL-NDI)

Cramps (FL-NDI)

Dermatosis (FL-NDI)

Gastritis (FL-NDI)

Hemorrhoids (FL-NDI)

Migraine (FL-NDI)

Neurasthenia (FL-NDI)

Neurosis (FL-NDI)

Rheumatism (FL-NDI)

***Panax ginseng* C.A. Meyer "Oriental Ginseng" (ARALIA FAMILY)**

Atony (1-2 g)

Convalescence (1-2 g)

Debility (1-2 g)

Lassitude (1-2 g)

***Papaver rhoeas* L. "Corn Poppy" (POPPY FAMILY)**

Bronchosis (FL-DNI; Flower)

Insomnia (FL-DNI; Flower)

Pain (FL-DNI; Flower)

***Passiflora incarnata* L. "Passionflower" (PASSIONFLOWER FAMILY)**

Nervousness (4-8 g Herb)

Restlessness (4-8 g Herb)

***Petasites hybridus* (L.) P. Gaertn. "Butterbur" (ASTER FAMILY)**

Colic (FL-NDI)

Headache (FL-NDI)

Inappetence (FL-NDI)

Nervousness (FL-NDI)

Pain (FL-NDI)

***Petroselinum crispum* Mill. "Parsley" (CELERY FAMILY)**

Enterosis (FL-NDI)

Gastrosis (FL-NDI)

Gravel (6 g Root)

Nephrosis (6 g Root)

Urethritis (6 g Root)

***Peumus boldus* Molina "Boldo" (MONIMIA FAMILY)**

Dyspepsia (3 g Leaf)

Enterosis (3 g Leaf)

Gastrosis (3 g Leaf)

***Phaseolus vulgaris* L. "Kidney Bean" (LEGUME FAMILY)**

Dysuria (5-15 g Husk)

***Pimpinella anisum* L. "Anise" (CELERY FAMILY)**

Bronchitis (3 g Fruit; 0.3 g Ess. Oil)

Dyspepsia (3 g Fruit; 0.3 g Ess. Oil)

***Pimpinella major* (L.) Huds. "Burnet Saxifrage" (CELERY FAMILY)**

Bronchitis (6-12 g Root)

***Plantago afra* L. "Psyllium" (PLANTAIN FAMILY)**

Colitis (10-30 g Seed)

Constipation (10-30 g Seed)

Hemorrhoids (10-30 g Seed)

Proctosis (10-30 g Seed)

***Plantago lanceolata* L. "Ribwort" (PLANTAIN FAMILY)**

Bronchitis (3-6 g Leaf)

Dermatitis (3-6 g Leaf)

Gargantitis (3-6 g Leaf)

Stomatitis (3-6 g Leaf)

***Plantago ovata* Forrsk. "Isphagula" "Blond Psyllium" (PLANTAIN FAMILY)**

Constipation (12-40 g Seed)

Hemorrhoids (12-40 g Seed)

Proctosis (12-40 g Seed)

***Polygala senega* L. "Senega Root" (MILKWORT FAMILY)**

Bronchitis (1.5-3 g Root)

***Polygonum aviculare* L. "Knotgrass" (BUCKWHEAT FAMILY)**

Bronchitis (4-6 g Herb)

Gargantitis (4-6 g Herb)

Gingivitis (4-6 g Herb)

Stomatitis (4-6 g Herb)

***Potentilla anserina* L. "Silverweed" (ROSE FAMILY)**

Diarrhea (4-6 g Herb)

Dysmenorrhea (4-6 g Herb)

Gargantitis (4-6 g Herb)

Stomatitis (4-6 g Herb)

***Primula veris* L.. "Primrose" (PRIMROSE FAMILY)**

Bronchitis (2-4 g Flower; 0.5-1.5 g Root)

***Prunus spinosa* L. "Blackthorn" (ROSE FAMILY)**

Cholecocystosis (FL-DNI; Flower)

Cold (FL-DNI; Flower)

Colic (FL-DNI; Flower)

Cramps (FL-DNI; Flower)

Dermatosis (FL-DNI; Flower)

Diarrhea (FL-DNI; Flower)

Dropsy (FL-DNI; Flower)

Enterosis (FL-DNI; Flower)

Exhaustion (FL-DNI; Flower)

Flatulence (FL-DNI; Flower)

Gastrosis (FL-DNI; Flower)

Nephrosis (FL-DNI; Flower)

***Pulmonaria officinalis* L. "Lungwort" (BORAGE FAMILY)**

Bronchosis (FL-DNI)

Enterosis (FL-DNI)

Gastrosis (FL-DNI)

Nephrosis (FL-DNI)

Urethrosis (FL-DNI)

Wounds (FL-DNI)

***Quercus robur* L. "Tanner's Oak" (OAK FAMILY)**

Dermatosis (20 g Bark/liter Water Topical)

Diarrhea (3 g Bark)

Gargantosis (20 g Bark/liter Water Topical)

Gingivosis (20 g Bark/liter Water Topical)



Proctosis (20 g Bark/liter Water Topical)

Stomatosis (20 g Bark/liter Water Topical)

Vaginitis (20 g Bark/liter Water Topical)

***Rhamnus catharticus* L. "Buckthorn" (BUCKTHORN FAMILY)**

Constipation (2-5 g Fruit=20-200 mg Hydroxyanthracene Derivatives)

Hemorrhoids (2-5 g Fruit=20-200 mg Hydroxyanthracene Derivatives)

Proctosis (2-5 g Fruit=20-200 mg Hydroxyanthracene Derivatives)

***Rhamnus purshianus* DC. "Cascara sagrada" (BUCKTHORN FAMILY)**

Constipation (2 g Bark=20-160 mg Hydroxyanthracene Derivatives)

Hemorrhoids (2 g Bark=20-160 mg Hydroxyanthracene Derivatives)

Proctosis (2 g Bark=20-160 mg Hydroxyanthracene Derivatives)

***Rheum palmatum* L. "Medicinal Rhubarb" (BUCKWHEAT FAMILY)**

Colitis (0.12-0.36 g Root=3-9 mg Hydroxyanthracene Derivatives)

Constipation (1.2-4.8 g Root=30-120 mg Hydroxyanthracene Derivatives)

Gastritis (0.12-0.36 g Root=3-9 mg Hydroxyanthracene Derivatives)

Hemorrhoids (1.2-4.8 g Root=30-120 mg Hydroxyanthracene Derivatives)

Proctosis (1.2-4.8 g Root=30-120 mg Hydroxyanthracene Derivatives)

Hemorrhoids (2-5 g Fruit=20-200 mg Hydroxyanthracene Derivatives)

Proctosis (2-5 g Fruit=20-200 mg Hydroxyanthracene Derivatives)

***Rosa canina* L "Dog Rose" (ROSE FAMILY)**

Arthritis (FL-NDI; Fruit)

Chills (FL-NDI; Fruit)

Cold (FL-NDI; Fruit)

Colic (FL-NDI; Fruit)

Dyspepsia (FL-NDI; Fruit)

Edema (FL-NDI; Fruit)

Fever (FL-NDI; Seed)

Flu (FL-NDI; Fruit)

Gallstones (FL-NDI; Fruit)

Nephrosis (FL-NDI; Fruit)

Rheumatism (FL-NDI; Fruit)

Sciatica (FL-NDI; Seed)

Urethrosis (FL-NDI; Fruit)

***Rosmarinus officinalis* L. "Rosemary" (MINT FAMILY)**

Arthritis (4-6 g Leaf)

Arthrosis (50 g Leaf in Bath)

Circulatory Disorders (50 g Leaf in Bath)

Dyspepsia (4-6 g Leaf)

Rheumatism (50 g Leaf in Bath)

***Rubus fruticosus* L. "Blackberry" (ROSE FAMILY)**

Diarrhea (4.5 g Leaf)

Gastritis (4.5 g Leaf)

Gingivitis (4.5 g Leaf)

Stomatitis (4.5 g Leaf)

***Rubus idaeus* L. "Raspberry" (ROSE FAMILY)**

Bronchosis (FL-NDI; Leaf)

Cardiopathy (FL-NDI; Leaf)

Dermatosis (FL-NDI; Leaf)

Diabetes (FL-NDI; Leaf)

Dysmenorrhea (FL-NDI; Leaf)

Enterosis (FL-NDI; Leaf)

Flu (FL-NDI; Leaf)

Fever (FL-NDI; Leaf)

Gargantosis (FL-NDI; Leaf)

Gastrosis (FL-NDI; Leaf)

Stomatosis (FL-NDI; Leaf)

***Silybum marianum* (L.) Gaertn. "Milk Thistle" (ASTERACEAE)**

Cirrhosis (12-15 g Seed; equiv.200-400 mg Silymarin)

Dyspepsia (12-15 g Seed; equiv.200-400 mg Silymarin)

Hepatitis (12-15 g Seed; equiv.200-400 mg Silymarin)

***Salix* spp. "Willow" (WILLOW FAMILY)**

Arthritis (2-3 g Bark or 60-120 mg Salicin)

Fever (2-3 g Bark or 60-120 mg Salicin)

Headache (2-3 g Bark or 60-120 mg Salicin)

Rheumatism (2-3 g Bark or 60-120 mg Salicin)

***Syzygium aromaticum* (L.) Merr. "Cloves" (MYRTLE FAMILY)**

Analgesic (Essential Oil)

Gargantitis (1-5% Essential Oil)

Stomatitis (1-5% Essential Oil)

***Trigonella foenum-graecum* L. "Fenugreek" (LEGUME FAMILY)**

Inappetence (6 g Seed)

Inflammation (50 g Seed Powder in 0.25 l Water)

***Tussilago farfara* L. "Coltsfoot" (ASTER FAMILY)**

Bronchitis (4.5-6 g Leaf)

Cough (4.5-6 g Leaf)

Gargantitis (4.5-6 g Leaf)

Hoarseness (4.5-6 g Leaf)

Stomatitis (4.5-6 g Leaf)

***Vaccinium myrtillus*** L. "Bilberry" (HEATHER FAMILY)

Arthritis (FL-NDI Leaf)

Dermatitis (FL-NDI Leaf)

Diabetes (FL-NDI Leaf)

Diarrhea (20-60 g Fruit)

Enterosis (FL-NDI Leaf)

Gargantitis (20-60 g Fruit)

Gastrosis (FL-NDI Leaf)

Gingivitis (20-60 g Fruit)

Hemorrhoids (FL-NDI Leaf)

Nephrosis (FL-NDI Leaf)

Rheumatism (FL-NDI Leaf)

Stomatitis (20-60 g Leaf)

Urethrosis (FL-NDI Leaf)

Note: I have rather consistently translated: lack of appetite to inappetence; mild inflammation of the mucus membranes of the mouth and throat to stomatitis and gargantitis; respiratory catarrh to bronchitis

(FL-NDI)= Folklore: No dosage indicated



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## Module 17: GREEN PHARMACY

### SUMMARY OF GREEN PHARMACY

#### AGING (SENESCENCE)

GINKGO (3)\*, ECHINACEA (2), GOTU KOLA (2)

GINSENG (2), EVENING PRIMROSE (2), MILK THISTLE (2)

#### ALLERGY

GARLIC (2), STINGING NETTLE (2), HORSERADISH (1)

GINKGO (2), CHAMOMILE (1), FEVERFEW (1)

#### ALTITUDE SICKNESS (SOROCHE)

CLOVE (2), HORSEBALM (2), GINKGO (1)

GARLIC (2), REISHI (2), THYME (0)

#### ALZHEIMER'S DISEASE (A/O SENILE DEMENTIA)

HORSEBALM (3), BRAZIL NUT (2), GINKGO (2)

ROSEMARY (3), DANDELION (2), SAGE (2)

#### AMENORRHEA

CHASTEBERRY (3), CELERY (1), MARSHMALLOW (1)

COHOSH (BLACK & BLUE) (2), DILL (1), ASSORTED HERBS (1)

#### ANGINA

ANGELICA (2), GARLIC & ONION (2), KUDZU (2)

BILBERRY (2), GINGER (2), WILLOW (2)

## **ANKYLOSING SPONDYLITIS**

GINGER (3), CORN (2), VEGETARIANISM (1)

PINEAPPLE (3), PIGWEED (2)

## **ARTHRITIS**

GINGER (3), RED PEPPER (3), CELERY SEED (2)

PINEAPPLE (3), STINGING NETTLE (3), TURMERIC (3)

## **ASTHMA**

COFFEE, TEA, ETC. (3), STINGING NETTLE (3), LICORICE (2), EPHEDRA (3), ANISE (2), GINKGO (1)

## **ATHLETE'S FOOT**

GARLIC (3), LICORICE (3), GOLDENSEAL (2)

GINGER (3), TEATREE (3), LEMONGRASS (2)

## **BACKACHE**

RED PEPPER (3), PEPPERMINT (3), WILLOW (3)

THYME (2), ASSORTED ESSENTIAL OILS (1)

## **BAD BREATH**

CARDAMOM (3), PARSLEY (3), CORIANDER (2)

EUCALYPTUS (3), PEPPERMINT (2), SAGE (2)

## **BALDNESS (ALOPECIA)**

SAW PALMETTO (3), ROSEMARY (2), SAFFLOWER (1)

LICORICE (2), HORSETAIL (1), SESAME (1)

## **BLADDER INFECTIONS (CYSTITIS)**

BLUEBERRY (3), PARSLEY (2), BEARBERRY (1)

YOGURT (3), BIRCH (1), COUCHGRASS (1)

## **BODY ODOR**

CORIANDER (3) , TURNIP JUICE (1), VINEGAR (1)

BAKING SODA/CORNSTARCH (1),

VEGETABLES CONTAINING ZINC (1)

### **BREAST ENLARGEMENT (MICROMASTIA)**

FENUGREEK (3), SAW PALMETTO (2), CUMIN (1)

FENNEL (2), WILD YAM (2)

### **BREAST-FEEDING PROBLEMS (DYSLACTEA)**

FENUGREEK (3), ANISE (2), FENNEL (2)

GARLIC (3), CHASTEBERRY (2), ECHINACEA (2)

### **BRONCHITIS**

EUCALYPTUS (2), MULLEIN (2), HOREHOUND (1)

GARLIC (2), STINGING NETTLE (2), MARSHMALLOW (1)

### **BRUISES**

ARNICA (2), PARSLEY (1), ST. JOHN'S-WORT (1)

COMFREY (1), POTATO (1), WITCH HAZEL (1)

### **BUNIONS**

CALENDULA (2), RED PEPPER (2), WILLOW (2)

PINEAPPLE (2), TURMERIC (2), GINGER (1)

### **BURNS**

ALOE (3), GARLIC (1), ST. JOHN'S-WORT (1)

ECHINACEA (1), GOTU KOLA (1), PLANTAIN (1)

### **BURSITIS AND TENDINITIS**

WILLOW (3), ECHINACEA (1), PINEAPPLE (1)

GINGER (2), LICORICE (1), TURMERIC (1)

### **CANCER PREVENTION**

CANCER PREVENTION HERBAL SALAD (3),

ANTIOXIDANTEA (2)

## **CANKER SORES**

MYRRH (2), CANKERROOT (1), LICORICE (1)

TEA (2), GOLDENSEAL (1), WILD GERANIUM (1)

## **CARDIAC ARRHYTHMIA**

ANGELICA (3), HAWTHORN (3), CANOLA (2)

CINCHONA (3), KHELLA (2), VALERIAN (1)

## **CARPAL TUNNEL SYNDROME**

WILLOW (3), PINEAPPLE (2), TURMERIC (2)

CAMOMILE (2), RED PEPPER (2) , CUMIN (1)

## **CATARACTS**

BILBERRY (3), ROSEMARY (3), CARROT (2)

CATNIP (3), BRAZIL NUT (2), CAPERS (1)

## **CHRONIC FATIGUE SYNDROME**

ANTIVIRAL HERBS (2), PURSLANE (1), MATE (1)

GINSENG (1), WHEATGRASS (1), SPINACH (1)

## **COLDS AND FLU**

ECHINACEA (3), GINGER (3), FORSYTHIA (2)

GARLIC (3), ELDERBERRY (2), MULLEIN (1)

## **CONSTIPATION**

FLAX (2), ALOE (ANTHRAQUINONES) (1),

PSYLLIUM (2), FENUGREEK (1), RHUBARB (1)

## **CORNS**

CELANDINE (1), WILLOW (1)

FIG (1), WINTERGREEN (1)

## **COUGHING**



ELDERBERRY (2), SLIPPERY ELM (2), MULLEIN (1)

GINGER (2), LICORICE (2), STINGING NETTLE (1)

### **CUTS, SCRAPES, ABSCESES**

TEATREE (3), COMFREY (2), HORSEBALM (2)

CALENDULA (2), GOLDENSEAL (2), GOTU KOLA (2)

### **DANDRUFF**

SOYBEAN (3), CELANDINE (1), GINGER/SESAME (1)

COMFREY (1), SCARBOROUGH SHAMPOO (1), LICORICE (1)

### **DEPRESSION**

LICORICE (3), GINGER (2), PURSLANE (2)

ST. JOHN'S-WORT (3), ROSEMARY (2), GINSENG (1)

### **DIABETES**

FENUGREEK (3), BEANS (2), PEANUT (2)

ONION (3), GARLIC (2), BITTER GOURD (2)

### **DIARRHEA**

APPLE (1), BLACKBERRY (1), CARROT (1)

CAROB (1), BILBERRY (1), TEA (1)

### **DIVERTICULITIS**

FLAX (3), WHEAT (3), WILD YAM (1)

PSYLLIUM (3), SLIPPERY ELM (2), CAMOMILE (1)

### **DIZZINESS (VERTIGO)**

GINGER (3), CELERY (1), ASSORTED HERBS (1)

GINKGO (2), PUMPKIN (1)

### **DRY MOUTH**

JABORANDI (3), ECHINACEA (1), MULTIFLORA ROSE (1)

YOHIMBE (1) , EVENING PRIMROSE (1), RED PEPPER (1)

## **EARACHE (OTALGIA)**

EPHEDRA (1), GOLDENSEAL (2), FORSYTHIA/GENTIAN/

GARLIC (2), ECHINACEA (1), HONEYSUCKLE (1)

## **EMPHYSEMA**

MULLEIN (3), CAMU-CAMU (2), LICORICE (2)

RED PEPPER (3), PEPPERMINT (2), EUCALYPTUS (2)

## **ENDOMETRIOSIS**

SOYBEAN (3), PEANUT (2), EVENING PRIMROSE (1)

FLAX (2), ALFALFA (1)

## **ERECTION PROBLEMS (IMPOTENCE)**

FAVA BEAN (3), VELVET BEAN (3), ANISE (2)

GINKGO (3), YOHIMBE (3), CARDAMOM (2)

## **FAINTING (SYNCOPE)**

BROOMWEED (2), COUNTRY MALLOW (2), EUCALYPTUS (2), CARDAMOM (2), COFFEE, TEA, ETC. (2), ROSEMARY (2)

## **FEVER**

WILLOW (3), ELDER (1), PEPPERMINT (1)

MEADOWSWEET (2), GINGER (1), RED PEPPER (1)

## **FLATULENCE (GAS)**

ASSORTED CARMINATIVE HERBS (3)

## **FUNGAL INFECTIONS (MYCOSES)**

GARLIC (3), TEATREE (3), PAU-D'ARCO (2)

LICORICE (3), BLACK WALNUT (3), LEMONGRASS (2)

## **GALLSTONES AND KIDNEY STONES**

BEGGAR-LICE (2), TURMERIC (2), CELANDINE (2)

PEPPERMINT (2), COUCHGRASS (2), GOLDENROD (1)

## **GENITAL HERPES AND COLD SORES**

LEMON BALM (3), MINTS (2), ST. JOHN'S-WORT (2) , TEA

ECHINACEA (2), RED PEPPER (2), GARLIC (1)

## **GINGIVITIS**

BLOODROOT (2), ECHINACEA (2), PURSLANE (2)

CAMOMILE (2), LICORICE (2), SAGE (2)

## **GLAUCOMA**

JABORANDI (3), OREGANO (2), BILBERRY (1)

KAFFIR POTATO (2), PANSY (2), FRUITS/VEG/VIT.C (2)

## **GOUT (PODAGRIA)**

CELERY (3), AVOCADO (1), DEVIL'S CLAW (1)

CHISO (2), TURMERIC (2), CAT'S CLAW (1)

## **GRAVES' DISEASE**

BUGLEWEED (3), SELF-HEAL (3), VERBENA (2)

LEMON BALM (3), KELP (2), BROCCOLI (1)

## **HANGOVER**

CINCHONA (1), KUDZU (1), FOLK HERBS (1)

GINKGO (1), WINTERGREEN (1), FRUCTOSE (1)

## **HEADACHE**

BAY (3), WILLOW (3), GINGER (2)

FEVERFEW (3), EVENING PRIMROSE (2), RED PEPPER (2)

## **HEARTBURN**

CAMOMILE (2), PEPPERMINT (2), FENNEL (1)

LICORICE (2), CARDAMOM/CINNAMON (1), DILL (1)

## **HEART DISEASE**

PIGWEEED (3), ANGELICA (2), HAWTHORN (2)

WILLOW (3), GRAPE (2), CHICORY (1)

### **HEMORRHOIDS**

COMFREY (2), WITCH HAZEL (2), HORSE CHESTNUT (1)

PSYLLIUM (2), PLANTAIN (2), BUTCHER'S BROOM (1)

### **HIGH BLOOD PRESSURE**

CELERY (3), HAWTHORN (2), TOMATO (2)

GARLIC (3), KUDZU (2), SAFFRON (1)

### **HIGH CHOLESTEROL**

AVOCADO (2), GARLIC (2), NUTS (1)

BEANS (2), CELERY (2), GINGER (2)

### **HIVES**

JEWELWEED (3), PARSLEY (2), GINGER (1)

STINGING NETTLE (3), AMARANTH (1)

### **HIV INFECTION**

LICORICE (3), ST. JOHN'S-WORT (3), ECHINACEA (2)

OREGANO (3), ASTRAGALUS (2), BURDOCK (2)

### **HYPOTHYROIDISM**

KELP (1), GENTIAN (1), WALNUT (1)

MUSTARD (1), RADISH (1), ST. JOHN'S-WORT (1)

### **INDIGESTION (DYSPEPSIA)**

CAMOMILE (3), GINGER (2), RED PEPPER (1)

PEPPERMINT (3), ANGELICA (2), CORIANDER (1)

### **INFERTILITY**

CAULIFLOWER (2), GINSENG (2), SPINACH (2)

GINGER (2), GUAVA (2), SUNFLOWER (2)

## **INFLAMMATORY BOWEL DISEASE (IBS)**

ONION (1), TEA (1), PSYLLIUM (1), VALERIAN (1)

## **INHIBITED SEXUAL DESIRE IN WOMEN (FRIGIDITY)**

CHINESE ANGELICA (2), QUEBRACHO (2), DAMIANA (2)

GINSENG (2), YOHIMBE (2), FENUGREEK (1)

## **INSECT BITES AND STINGS (BUGBITES)**

MOUNTAIN MINT (3), CITRONELLA (2), GARLIC (2)

BASIL (2), CALENDULA (2), PLANTAIN (2)

## **INSOMNIA**

LEMON BALM (3), LAVENDER (2), CAMOMILE (1)

VALERIAN (3), PASSIONFLOWER (2), HOPS (1)

## **INTERMITTENT CLAUDICATION**

GARLIC (3), GINGER (2), PURSLANE (2)

GINKGO (3), HAWTHORN (2)

## **INTESTINAL PARASITES**

CINCHONA (3), IPECAC (3), PAPAYA (2)

GOLDENSEAL (3), ELECAMPANE (2), CUBEB (1)

## **LARYNGITIS**

CARDAMOM (3), HOREHOUND (2), MULLEIN (2)

GINGER (2), MALLOWS (2), ELECAMPANE (1)

## **LICE**

NEEM (1), SWEETFLAG (1)

## **LIVER PROBLEMS (HEPATOSIS)**

CARROT (3), MILKTHISTLE (3), SCHISANDRA (3)

DANDELION (3), INDIAN ALMOND (3), LICORICE (2)

## **LYME DISEASE**

ECHINACEA (3), MOUNTAIN MINT (3)

GARLIC (3), LICORICE (2)

## **MACULAR DEGENERATION**

BILBERRY (3), GINKGO (2), CLOVE (1)

GREENS (2), PEANUT (2), WOLFBERRY (1)

## **MENOPAUSE**

BLACK COHOSH (2), ALFALFA (1), CHINESE ANGELICA (1)

LICORICE (2), CHASTEBERRY (1), RED CLOVER (1)

## **MENSTRUAL CRAMPS (DYSMENORRHEA)**

BLACK HAW (3), RASPBERRY (3), CHASTEBERRY (2)

CHINESE ANGELICA (3), BILBERRY (2), RED CLOVER (2)

## **MORNING SICKNESS**

GINGER (3), BLACK HOREHOUND (1), PEACH (1)

PEPPERMINT (2), CABBAGE (1), RASPBERRY (1)

## **MOTION SICKNESS**

GINGER (3), RASPBERRY (1)

## **MULTIPLE SCLEROSIS**

STINGING NETTLE (3), BLUEBERRY (2), PINEAPPLE (2)

BLACK CURRANT (2), EVENING PRIMROSE (2), PURSLANE (2)

## **NAUSEA**

GINGER (3), PEPPERMINT (1), CINNAMON (1)

## **OSTEOPOROSIS**

CABBAGE (3), PIGWEED (3), SOYBEAN (2)

DANDELION (3), AVOCADO (2), PARSLEY (1)

## **OVERWEIGHT (OBESITY)**

PLANTAIN (3), CHICKWEED (2), PINEAPPLE (2)

RED PEPPER (3), EVENING PRIMROSE (2), WALNUT (2)

## **PAIN**

CLOVE (3), WILLOW (3), GINGER (2), RED PEPPER (3), EVENING PRIMROSE (2), MOUNTAIN MINT (2)

## **PARKINSON'S DISEASE**

FAVA BEAN (3), EVENING PRIMROSE (2), PASSIONFLOWER (1), VELVET BEAN (3), GINKGO (1),

ST. JOHN'S-WORT (1)

## **PNEUMONIA**

ASTRAGALUS (2), DANDELION (2), GARLIC (2)

BAIKAL SKULLCAP (2), ECHINACEA (2), HONEYSUCKLE (2)

## **POISON IVY, POISON OAK, AND POISON SUMAC**

JEWELWEED (3), PLANTAIN (2), ALOE (2), SOAPWORT (2)

## **PREGNANCY AND DELIVERY**

PARTRIDGE BERRY (3), BLACK HAW (2), JUTE (2)

RASPBERRY (3), BLUE COHOSH (2), SPINACH (2)

## **PREMENSTRUAL SYNDROME (PMS)**

CHASTEBERRY (3), EVENING PRIMROSE (3), RASPBERRY (1), CHINESE ANGELICA (3), STINGING NETTLE (2), BURDOCK (1)

## **PROSTATE ENLARGEMENT (BPH) (PROSTATITIS)**

LICORICE (3), SAW PALMETTO (3), STINGING NETTLE (2)

PUMPKIN (3), PYGEUM (2), EVENING PRIMROSE (2)

## **PSORIASIS**

BISHOP'S WEED (3), AVOCADO (2), LICORICE (2)

RED PEPPER (3), BRAZIL NUT (2), PURSLANE (2)

## **RAYNAUD'S DISEASE**

EVENING PRIMROSE (3), GINKGO (3), MUSTARD (2)

GARLIC (3), BORAGE (2), RED PEPPER (2)

## **SCABIES**

EVENING PRIMROSE (3), ONION (3), MOUNTAIN MINT (2)

NEEM (3), AMERICAN PENNYROYAL (2), TEATREE OIL (2)

## **SCIATICA**

HAYSEED (3), WILLOW (3), COUNTRY MALLOW (2)

STINGING NETTLE (3), WINTERGREEN (3), MUSTARD (2)

## **SHINGLES**

LEMON BALM (3), CHINESE ANGELICA (2), LICORICE (2)

RED PEPPER (3), BAIKAL SKULLCAP (2), PASSIONFLOWER (2)

## **SINUSITIS**

GARLIC (3), EUCALYPTUS/PEPPERMINT (2), ECHINACEA (2), GOLDENSEAL (3), OREGANO (2),  
HORSERADISH (1)

## **SKIN PROBLEMS (DERMATOSES)**

ALOE (3), AVOCADO (2), CAMOMILE (2), EVENING PRIMROSE (3), CALENDULA (2), WITCH HAZEL (2)

## **SMOKING**

LICORICE (3), RED CLOVER (3)

## **SORES**

CALENDULA (3), DRAGON'S BLOOD (3), GINKGO (2)

COMFREY (3), TEATREE (2), GOTU KOLA (1)

## **SORE THROAT**

EUCALYPTUS (3), LICORICE (3), MARSH MALLOW (2)

HONEYSUCKLE (3), SLIPPERY ELM (3), BURNET- SAXIFRAGE (2)

## **STIES**

ECHINACEA (3), POTATO (3), CAMOMILE (1),

GOLDENSEAL (3), THYME (3), GARLIC (1)



## **STROKE**

GARLIC (3), PIGWEED (3), CARROT (2), GINKGO (3), WILLOW (3), EVENING PRIMROSE (1)

## **SUNBURN**

TEA (3), BLACK NIGHTSHADE (2), EGGPLANT (2)

ALOE (2), CALENDULA (2), PLANTAIN (2)

## **SWELLING**

GINGER (3), TURMERIC (2), ARNICA (1), PINEAPPLE (2), ALOE (1), CAT'S CLAW (1)

## **TINNITUS**

GINKGO (3), BLACK COHOSH (1), LESSER PERIWINKLE (1)

SESAME (2), GOLDENSEAL (1), SPINACH (1)

## **TONSILLITIS**

ECHINACEA (3), HONEYSUCKLE (2), CITRUS (VIT. C) (2)

GARLIC (2), SAGE (2), ELDERBERRY (1)

## **TOOTHACHE**

CLOVE (3), RED PEPPER (2), WILLOW (2), GINGER (2), TOOTHACHE TREE (2), SESAME (1)

## **TOOTH DECAY (CARIES)**

TEA (3), BLOODROOT (2), WILD BERGAMOT (2)

BAY (2), LICORICE (2), CHAPARRAL (1)

## **TUBERCULOSIS**

ECHINACEA (3), GARLIC (3), LICORICE (3)

FORSYTHIA (3), HONEYSUCKLE (3), EUCALYPTUS (2)

## **ULCERS**

GINGER (3), YELLOWROOT (3), CABBAGE (2)

LICORICE (3), BANANA (2), GARLIC (2)

## **VAGINITIS**

GARLIC (3), CARDAMOM (2), APPLE CIDER VINEGAR (1)

TEATREE (3), GOLDENSEAL (2), LAVENDER (1)

#### **VARICOSE VEINS**

HORSE CHESTNUT (3), WITCH HAZEL (3), GINKGO (2)

VIOLET (3), BUTCHER'S BROOM (2), GOTO KOLA (1)

#### **VIRAL INFECTIONS**

ECHINACEA (3), GOLDENSEAL (2), LICORICE (2)

GARLIC (2), DRAGON'S BLOOD (2), LEMON BALM (2)

#### **WARTS**

BIRCH (3), CASTOR (2), PINEAPPLE (2)

BLOODROOT (2), CELANDINE (2), BANANA (1)

#### **WORMS**

GINGER (3), WORMSEED (3), PAPAYA (2)

PUMPKIN (3), GARLIC (2), CLOVE (1)

#### **WRINKLES**

HORSE CHESTNUT (3), COCOA (2), SAGE (2)

CARROT (2), CUCUMBER (2), ROSEMARY (2)

#### **YEAST INFECTIONS**

ECHINACEA (3), CRANBERRY (2), PAU-D'ARCO (2)

GARLIC (3), GOLDENSEAL (2), PURSLANE (2) \*3 = 3 stars (best - for that indication); 2 = 2 stars (good - for that indication); 1 = one star (mediocre - for that indication)

### **SCORE FROM GREEN PHARMACY**

Scores derived by taking the top five or six herbs for all ailments, inverting the index, assigning scores to each according to the number of stars (leaves) it got in the Green Pharmacy, Total scores were then summed for each individual herb.

Garlic 65

Ginger 61

Licorice 54

Echinacea 37

Red Pepper 36

Willow 36

Ginkgo 33

Evening Primrose 27

Stinging Nettle 24

Goldenseal 22

Peppermint 19

Pineapple 19

Teatree 16

Camomile 15

Eucalyptus 15

Lemonbalm 14

Rosemary 14

Calendula 13

Purslane 13

Aloe 12

Bilberry 12

Cardamom 12

Honeysuckle 12

Plantain 12

St. John's-Wort 12

Chasteberry 11

Dongquai 11

Pigweed 11

Turmeric 11

Carrot 10

Celery 10

Dandelion 10

Mountain Mint 10

Sage 10

Tea 10

Angelica 9

Avocado 9

Comfrey 9

Hawthorn 9

Mullein 9

Oregano 9

Parsley 9

Raspberry 9

Clove 8

Fenugreek 8

Ginseng 8

Onion 8

Psyllium 8

Soybean 8

Witchhazel 8

Anise 7

Cinchona 7

Flax 7

Gotu Kola 7

Horse Chestnut 7

Pumpkin 7

Slippery Elm 7

Bloodroot 6

Brazilnut 6

Cabbage 6

Celandine 6

Coriander 6

Elderberry 6

Faba Bean 6

Forsythia 6

Jewelweed 6

Mallow 6

Peanut 6

Red Clover 6

Saw Palmetto 6

Spinach 6

Velvet Bean 6

Walnut 6

Yohimbe 6

Aloe 12

Angelica 9

Anise 7

Avocado 9

Bilberry 12

Bloodroot 6

Brazilnut 6

Cabbage 6

Calendula 13

Camomile 15

Cardamom 12

Carrot 10

Celandine 6

Celery 10

Chasteberry 11

Cinchona 7

Clove 8

Comfrey 9

Coriander 6

Dandelion 10

Dongquai 11

Echinacea 37

Elderberry 6

Eucalyptus 15

Evening Primrose 27

Faba Bean 6

Fenugreek 8

Flax 7

Forsythia 6

Garlic 65

Ginger 61

Ginkgo 33

Ginseng 8

Goldenseal 22

Gotu Kola 7

Hawthorn 9

Honeysuckle 12

Horse Chestnut 7

Jewelweed 6

Lemonbalm 14

Licorice 54

Mallow 6

Mountain Mint 10

Mullein 9

Onion 8

Oregano 9

Parsley 9

Peanut 6

Peppermint 19

Pigweed 11

Pineapple 19

Plantain 12

Psyllium 8

Pumpkin 7

Purslane 13

Raspberry 9

Red Pepper 36

Red Clover 6

Rosemary 14

Sage 10

Saw Palmetto 6

Slippery Elm 7

Soybean 8

Spinach 6

St. John's-Wort 12

Stinging Nettle 24

Tea 10

Teatree 16

Turmeric 11

Velvet Bean 6

Walnut 6

Willow 36

Witchhazel 8

Yohimbe 6

From *The Green Pharmacy*, Rodale Press, Emmaus, PA 18098-0099. 1997. 507 pp.



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## Module 18: MULTIPLE ACTIVITIES



## Bilberry - for arthritis

**Analgesic:** Caffeic-acid; chlorogenic-acid; ferulic-acid

**Antiarthritic:** Anthocyanins (120 mg/day); anthocyanosides (50-500 mg/kg orl day); catechin; copper; linoleic-acid; magnesium; pantothenic acid; ursolic-acid; zinc

**Antiedemic:** Anthocyanosides (50-500 mg/kg orl day); caffeic-acid; caryophyllene; catechin; oleanolic-acid (IC<sub>36</sub>=40 mg/kg ipr rat); quercitrin; ursolic-acid

**Antiinflammatory:** Anthocyanosides (50-500 mg/kg orl day); asperuloside; caffeic-acid; caryophyllene (IC<sub>50</sub>=100 M); catechin; chlorogenic-acid; copper; epicatechin; ferulic-acid; gallic-acid; hyperoside (1/4 indomethacin PM57:A131); linoleic-acid; magnesium; oleanolic-acid (40 mg/kg ipr rat); protocatechuic acid; quercetin (20-150 mg/kg); quercetin-3-galactoside; quercitrin; ursolic-acid (1/3 indomethacin IC<sub>24</sub>=500 mg/kg); vanillic-acid

**Antiosteotic:** Catechin (500 mg/3x/day PAM)

**Cyclooxygenase-Inhibitor:** gallic-acid; quercetin (IC<sub>50</sub>=16M)

**Inhibit collagenase:** Anthocyanins

**Inhibit elastase:** Anthocyanins

**Lipoxygenase-Inhibitor:** Caffeic-acid (IC<sub>27</sub>=5 mM); catechin (IC<sub>96</sub>=5 mM); chlorogenic-acid (IC<sub>23</sub>=5 mM); *p*-coumaric-acid; epigallocatechin (IC<sub>50</sub>=10 M ) quercetin (IC<sub>50</sub>=3.5 M); ursolic-acid (IC<sub>50</sub>=0.18 mM)

## Bilberry - for cystitis

**Analgesic:** Caffeic-acid; chlorogenic-acid; ferulic-acid

**Antiinflammatory:** Anthocyanosides (50-500 mg/kg orl day); asperuloside; caffeic-acid; caryophyllene (IC<sub>50</sub>=100 M); catechin; chlorogenic-acid; copper; epicatechin; ferulic-acid; gallic-acid; hyperoside (1/4 indomethacin PM57:A131); linoleic-acid; magnesium; oleanolic-acid (40 mg/kg ipr rat); protocatechuic acid; quercetin (20-150 mg/kg); quercetin-3-galactoside; quercitrin; ursolic-acid (1/3 indomethacin #IC<sub>24</sub>=500 mg/kg); vanillic-acid

**Antiseptic:** Arbutin (60-200 mg/man); benzoic acid; caffeic-acid; chlorogenic-acid; gallic-acid; hydroquinone; oleanolic-acid (MIC=625-1250 g/ml)

**Bactericide:** Arbutin (60-200 mg/man); benzoic-acid; caffeic-acid; caryophyllene; catechin (MIC=1,000 ppm); chlorogenic-acid; epicatechin (MIC=1,000 ppm); *o*-coumaric-acid; ferulic-acid; hydroquinone; hydroxybenzoic acid; *p*-hydroxybenzoic-acid; hyperoside (MIC=250-500 ppm); isoquercitrin; oleanolic-acid (MIC=625-1250 g/ml); protocatechuic-acid; quercetin; quercitrin; vanillic-acid (1.5-15 mg/ml)

**Cyclooxygenase-Inhibitor:** gallic-acid; quercetin (IC<sub>50</sub>=16M)

**Diuretic:** Arbutin (60-200 mg/man); caffeic-acid; chlorogenic-acid; hyperoside; isoquercitrin (10 ppm); oleanolic-acid; quercitrin; ursolic-acid

**Lipoxygenase-Inhibitor:** Caffeic-acid (IC<sub>27</sub>=5 mM); catechin (IC<sub>96</sub>=5 mM); chlorogenic-acid (IC<sub>23</sub>=5 mM); *p*-coumaric-acid; epigallocatechin (IC<sub>50</sub>=10 M ) quercetin (IC<sub>50</sub>=3.5 M); ursolic-acid (IC<sub>50</sub>=0.18mM)

**Uricosuric:** Benzoic acid

### **Brazilnut - for prostatitis**

**Alpha-reductase-inhibitor:** Phytosterols; delta-7-sterols (90 mg/day)

**Antiedemic:** Ascorbic acid; linolenic acid; magnesium

**Antiinflammatory:** ALA (IC<sub>50</sub>=42 M); Ascorbic-acid; copper; linoleic-acid; magnesium; phytosterols; salicylic-acid; selenium; beta-sitosterol; delta-7-sterols

**Antiprostaglandin:** Sitosterol (30 mg/day/12 weeks)

**Antiprostatic:** ALA; Alanine (200 mg/day); glutamic-acid (200 mg/day); glycine (200 mg/kg); linoleic-acid; selenium; beta-sitosterol (60 mg/day); tocopherol; zinc

### **Capsicum - for arthritis**

**Analgesic:** Ascorbic-acid; caffeic acid; camphor; capsaicin; chlorogenic acid; *p*-cymene; eugenol; myrcene; salicylates; scopoletin; selenium

**Antiarthritic:** Ascorbic acid; boron; glucosamine; selenium; tocopherol

**Antiinflammatory:** ALA (IC<sub>50</sub>=42 M); caffeic-acid; capsaicin; delta-3-carene; caryophyllene (IC<sub>50</sub>=100 M); chlorogenic acid; cinnamic-acid; cycloartenol; eugenol; hesperidin (IC<sub>63</sub>=100 mg/kg scu); alpha-pinene; quercetin (IC<sub>50</sub>=20-150 ppm); salicylic-acid; scopoletin; sitosterol; solasodine; stigmasterol

**Controls Substance P:** Capsaicin

**Cyclooxygenase-Inhibitor:** Capsaicin; quercetin (IC<sub>50</sub>=16 M)

**Lipoxygenase-Inhibitor:** Caffeic-acid (IC<sub>27</sub>=5 mM); capsaicin; catechin (IC<sub>96</sub>=5 mM); chlorogenic-acid (IC<sub>23</sub>=5 mM); *p*-coumaric-acid (IC<sub>11</sub>=5mM); epigallocatechin (IC<sub>50</sub>=10 M) quercetin (IC<sub>50</sub>=3.5 M)

**Stimulates Production of Internal Opiates (Endorphins):** Capsaicin

### **Celery - for arthritis**

**Analgesic:** Caffeic-acid; chlorogenic-acid; *p*-cymene; eugenol; falcarindiol; ferulic-acid; gentisic-acid; menthone; myrcene; scopoletin

**Antiedemic:** Caffeic-acid; coumarin; eugenol; rutin; scopoletin

**Antiinflammatory:** ALA (IC<sub>50</sub>=42 M); apigenin; ascorbic-acid; bergapten; butylidene-phthalide; caffeic-acid; chlorogenic-acid; cnidilide; copper; coumarin; eugenol (11M); ferulic-acid; gentisic-acid;

isopimpinellin (100 ppm); linoleic-acid; luteolin (=indomethacin); magnesium; mannitol; myristicin; alpha-pinene; protocatechuic-acid; quercetin-3-galactoside; rutin (20 ppm); scopoletin (1-20 g/ear); thymol; umbelliferone; xanthotoxin (20 mg/man/day)

**Lipoxygenase-Inhibitor:** Caffeic-acid (IC<sub>27</sub>=5 mM); chlorogenic-acid (IC<sub>23</sub>=5 mM); *p*-coumaric-acid (IC<sub>11</sub>=5mM); quercetin (IC<sub>50</sub>=3.5 M) rutin (IC<sub>50</sub>=2.5mM); umbelliferone

### **Celery - for heart problems**

**Antiarrhythmics:** Adenosine; apigenin; apiin; magnesium; potassium; protocatechuic-acid

**Calcium Blockers:** Apigenin; bergapten (1-520 ppm); isopimpinellin (4-122 ppm); psoralen (0.03-0.15 ppm); xanthotoxin (6-183 ppm)

**Diuretic:** Adenine; apigenin; apiole; asparagine; caffeic-acid; chlorogenic-acid; glycolic-acid; isopimpinellin (125 ppm); isoquercitrin; luteolin; mannitol; myristicin; terpinen-4-ol (0.1 ml/rat)

**Hypotensive:** ALA; apigenin; bergapten; 3-n-butyl-phthalide; isoquercitrin; myristicin; psoralen; rutin; scopoletin; valeric-acid

### **Echinacea - for colds & flu**

**Analgesic:** Borneol; caffeic-acid; chlorogenic acid; ferulic acid; myrcene

**Antiallergic:** Apigenin; kaempferol; quercetin (IC<sub>50</sub>=14 M)

**Antiflu:** Caffeic-acid; cichoric-acid; echinacoside; limonene; alpha-pinene; quercetin

**Antihistaminic:** Apigenin; chlorogenic-acid; echinacoside; kaempferol; rutin;

**Antiinflammatory:** Apigenin (=indomethacin); borneol IC<sub>50</sub>=100 M; caffeic-acid; caryophyllene (IC<sub>50</sub>=100 M); chlorogenic-acid; ferulic acid; kaempferol (20-200 mg/kg); luteolin (=indomethacin); luteolin-7-glucoside; quercetin (150 mg/kg); rutin (20 mg/kg); quercetin-3-galactoside; sitosterol; stigmasterol

**Antipharyngitic:** luteolin; quercetin

**Antiviral:** Apigenin; caffeic-acid; chlorogenic-acid; cichoric-acid IC<sub>50</sub>=125 g/ml; echinacoside; ferulic-acid; kaempferol; limonene; luteolin; luteolin-7-glucoside; alpha-pinene; quercetin (IC<sub>50</sub>=10 M); rutin; sitosterol; stigmasterol; vanillin

**Expectorant:** Bornyl-acetate; limonene; alpha-pinene

**Immunostimulant:** Arabinogalactan 3.7-500 g/ml; chlorogenic-acid; cichoric-acid 10-100 g/ml; ferulic acid; inulin

**Interferonogenic:** Arabinogalactan 3.7-500 g/ml; chlorogenic acid

**Mitogenic:** Arabinogalactan

**Phagocytotic:** Arabinogalactan; cichoric-acid 10-100 g/ml; ferulic-acid; heteroxylan  
**Spasmolytic:** Apigenin; borneol (ED50=8 g/ml); bornyl-acetate (ED50=90 g/ml); caffeic-acid (EC50=3-15 M); caryophyllene; ferulic acid; kaempferol; limonene (ED50=197 g/ml); luteolin; mycene; quercetin; rutin

### English Lavender - for Insomnia

**Analgesic:** borneol; camphor; luteolin; myrcene

**Anesthetic:** camphor 1,8-cineole

**Antiinsomniac:** valeric-acid (1.2-2.4 ppm)

**Antinociceptive:** myrcene 10-40 ppm

**CNS-Depressant:** ursolic-acid

**Sedative:** borneol; bornyl-acetate; 1,8-cineole; citronellol; coumarin; geraniol; limonene 1-32 mg/kg; linalol 1-32 mg/kg; linalyl-acetate; alpha-pinene; valeric-acid

**Tranquilizer:** alpha-pinene; valeric-acid

### Garlic - for altitude sickness

**Antiaggregant:** Adenosine; ajoene; allicin 0.1-1 M; alliin IC100=60 g/ml; caffeic-acid; diallyl-disulfide; ferulic-acid; kaempferol; quercetin IC50=55 M; 2-vinyl-4H-1,3-dithiin; vinyl-dithiin

**Respirastimulant:** Adenosine

### Garlic - for cancer

**Antioxidant:** Allin; s-allyl-cysteine-sulfoxide; caffeic-acid; chlorogenic-acid (IC53=200 ppm IC80=12 M); *p*-coumaric-acid IC24=30 ppm; ferulic-acid; 3,000 M IC51=200 ppm; glutathione; *p*-hydroxybenzoic-acid; kaempferol IC50=40 M; oleanolic-acid; quercetin IC96=300 ppm; rutin IC28=30 ppm; sinapic-acid IC27=30 ppm; taurine

**Antiperoxidant:** Caffeic-acid IC50=44 M; chlorogenic-acid (IC50=36 M)

**Antitumor:** Allicin; allixin; s-allyl-cysteine; allyl-methyl-disulfide; allyl-methyl-sulfide; caffeic-acid; chlorogenic acid; *p*-coumaric-acid; desgalactotigonin; diallyl-disulfide; diallyl-sulfide; diallyl-trisulfide; eruboside-B (IC40=50 g/ml); ferulic-acid; geraniol; quercetin; rutin

**Antitumor-Promoter:** Caffeic-acid IC42=10 M; chlorogenic acid IC25=10 M; ferulic-acid IC42=10 M; kaempferol; phloroglucinol; quercetin; rutin

### Garlic - for cardiopathy

**Antiaggregant:** Adenosine; ajoene; allicin 0.1-1 M; alliin IC100=60 g/ml; caffeic-acid; ferulic acid; kaempferol; quercetin IC50=55 M; rutin; 2-vinyl-4H-1,3-dithiin

**Antiarrhythmic:** Adenosine

**Antiatherogenic:** s-Allyl-cysteine-sulfoxide; rutin

**Antihypertensive:** Allicin; rutin; quercetin; tyrosinase

**Antithrombic:** Ajoene; alliin; rutin; 2-vinyl-4H-1,3-dithiin

**Arteriodilator:** Adenosine; ferulic acid

**Hypocholesterolemic:** Ajoene IC<sub>37-72</sub>=234 g/ml; allicin (IC<sub>37-72</sub>=162 g/ml); alliin; s-allyl-cysteine-sulfoxide; caffeic-acid; chlorogenic acid; diallyl sulfide; IC<sub>37-72</sub>=146 g/ml; diallyl trisulfide; nicotinic-acid (1-6 g/man/day); ornithine; rutin; taurine

**Hypotensive:** Allicin; kaempferol; rutin

**Vasodilator:** Adenosine; quercetin

### **Garlic - for colds**

**Analgesic:** Caffeic acid; chlorogenic-acid; ferulic-acid

**Antihistamine:** Citral; kaempferol; linalol; quercetin IC<sub>50</sub>=14 M; rutin

**Antiviral:** Caffeic-acid IC<sub>50</sub>=62.5 g/ml; chlorogenic acid; ferulic-acid; kaempferol; linalol; quercetin IC<sub>50</sub>=10 M; rutin

**Bronchorelaxant:** Citral; linalool

**Expectorant:** Citral; linalol; beta-phellandrene

### **Garlic - for diabetes**

**Antidiabetic:** Allicin; quercetin; rutin

**Hypoglycemic:** Adenosine; allicin (0.1 mg/kg); diallyl disulfide; diallyl trisulfide; nicotinic-acid; quercetin (100 mg/kg/orlrat)

**Insulinase-Inhibitor:** Nicotinic-acid

**Insulinic:** Adenosine; nicotinic-acid

**Insulin-Sparing:** Allicin (100 mg/kg)

### **Garlic - for high blood pressure**

**Antihypertensive:** Allicin; quercetin; rutin; tyrosinase

**Hypotensive:** Allicin; kaempferol; rutin

### **Garlic - for sepsis**

**Amebicide:** Allicin (30 g/ml)

**Antibiotic(Antiseptic):** Ajoene; allicin; alliin; allistatins; caffeic-acid; chlorogenic-acid; citral (5.2 x phenol); *p*-coumaric-acid; diallyl trisulfide; eruboside-B (MIC= 25 g/ml); geraniol (7 x phenol); *p*-hydroxybenzoic-acid; kaempferol 20 g/ml; linalol (5 x phenol); phloroglucinol; quercetin; rutin; sinapic-acid

**Bactericide:** Ajoene; alliin; allistatin-I; allistatin-II; chlorogenic-acid; citral; *p*-coumaric-acid; diallyl disulfide; ferulic-acid; geraniol MIC=400 g/ml; *p*-hydroxybenzoic-acid; kaempferol (20 g/ml); linalol MIC=1600 g/ml; quercetin; rutin; sinapic-acid

**Candidicide:** Allicin; eruboside-B (MIC=25 g/ml); ferulic acid; geraniol; linalol

**Fungicide:** Ajoene (IC100=100 g/ml); allicin; caffeic-acid MIC=400 g/ml; chlorogenic acid; citral; *p*-coumaric-acid; diallyl-disulfide; eruboside-B (MIC=25 g/ml); ferulic acid; geraniol IC93=2 mM; *p*-hydroxybenzoic acid; linalol; phloroglucinol; sinapic-acid

**Viricide:** Caffeic-acid IC50=62.5 g/ml; chlorogenic acid; ferulic-acid; kaempferol; linalol; quercetin; rutin

### **Ginger - for arthritis**

**Analgesic:** Caffeic-acid; camphor; chlorogenic-acid; *p*-cymene; ferulic-acid; 6-gingerol (150 mg/kg orl mus); myrcene; 6-shogaol

**Antiarthritic:** Copper; curcumin; linoleic-acid; magnesium; pantothenic acid; zinc

**Antiedemic:** Caffeic-acid; caryophyllene; curcumin; zingibain

**Antiinflammatory:** ALA; bornyl-acetate; caffeic-acid; caryophyllene (IC50=100 M); chlorogenic-acid; copper; alpha-curcumene; curcumin; ferulic-acid; kaempferol (20-200 mg/kg); linoleic-acid; magnesium; myricetin; alpha-pinene; quercetin (20-150 mg/kg); vanillic-acid; zingerone; zingibain

**Cyclooxygenase-Inhibitor:** Curcumin; 6-gingerol; kaempferol (IC50=20 M); quercetin (IC50=16 M); zingerone

**Lipoxygenase-Inhibitor:** Caffeic-acid (IC27=5 mM); chlorogenic-acid (IC23=5 mM); *p*-coumaric-acid (IC11=5 mM); curcumin; kaempferol; myricetin; quercetin IC50=3.5 M); zingerone

**Proteolytic:** Zingibain

### **Ginkgo - for Alzheimer's Disease and/or Dementia**

**Antiaggregant:** ALA; apigenin; ginkgolides; ginkgolide B IC50=0.6-0.8 mg/kg; kaempferol; quercetin IC50=55 M; thymol IC50=0.75

**Antiacetylcholinesterase:** Thymol

**Anticomplementary:** Apigenin

**Antiinflammatory:** ALA IC<sub>50</sub>=42 M; amentoflavone; apigenin (=indomethacin); ginkgolides; isorhamnetin; kaempferol 20-200 mg/kg; luteolin; protocatechuic-acid; quercetin (20-150 ppm); quercetin-3-rhamnoglycoside; rutin 20 mg/kg; thymol; vanillic-acid

**Antischemic:** bilobalide; ginkgolide-A (50-100 mg/kg mus); ginkgolide-B (50-100 mg/kg mus); protocatechuic-acid

**Antioxidant:** Amentoflavone IC<sub>50</sub>=38 M; apigenin; citric-acid; *p*-coumaric-acid IC<sub>24</sub>=30 ppm; *p*-hydroxybenzoic-acid; isoquercitrin; isorhamnetin; kaempferol IC<sub>50</sub>=40 M; luteolin; proanthocyanidins; protocatechuic-acid; quercetin IC<sub>96</sub>=300 ppm; rutin IC<sub>50</sub>=120 M; tannin C<sub>50</sub>=1.44 g/ml; thymol 100 mg; vanillic-acid

**Antiperoxidant:** Amentoflavone IC<sub>50</sub>=38 M; *p*-coumaric-acid IC<sub>50</sub>=100 M; quercetin

**Anxiolytic:** Apigenin 10 mg/kg; glutamic-acid

**Cyclooxygenase Inhibitor:** Kaempferol (IC<sub>50</sub> =20 M); quercetin(IC<sub>50</sub>=16 M; IC<sub>96</sub>=300 ppm)

**Neuroprotective:** Bilobalide 5 mg/kg scu mus; ginkgolide-A 50-100 mg/kg mus; ginkgolide-B 50-100 mg/kg mus

### **Lemonbalm - for Alzheimer's Disease**

**Antiacetylcholinesterase:** Limonene; thymol

**Anticomplementary:** Apigenin; rosmarinic-acid

**Antiinflammatory:** Caffeic-acid; caryophyllene-oxide; chlorogenic-acid; eugenyl-acetate; luteolin-7-glucoside; oleanolic-acid (40 mg/kg ipr); protocatechuic-acid; rosmarinic acid; thymol; ursolic acid

**Antioxidant:** Caffeic-acid (50 M IC<sub>57</sub>=30 ppm); chlorogenic-acid (IC<sub>80</sub>=12 M; IC<sub>53</sub>=200 ppm); methyl-eugenol EC<sub>50</sub>=100 l/l; myrcene; oleanolic-acid; protocatechuic-acid; rosmarinic-acid EC<sub>50</sub>=2.7 g/ml; thymol 100 ppm; ursolic-acid

**CNS-Stimulant:** Chlorogenic-acid (1/6 caffeine); cineole

**Estrogenic:** Anethole

### **Lemonbalm - for Backache**

**Analgesic:** Caffeic-acid; chlorogenic-acid; eugenol; myrcene

**Anesthetic:** Benzaldehyde; eugenol (200-400 ppm); thymol

**Antiinflammatory:** Caffeic-acid; caryophyllene-oxide; chlorogenic-acid; eugenyl-acetate; luteolin-7-glucoside; oleanolic-acid (40 mg/kg/ipr); protocatechuic-acid; rosmarinic acid; thymol; ursolic acid (1/3 indomethacin)

**Antinociceptive:** Myrcene (10-20 mg/kg ipr mus; 20-40 mg/kg scu mus)

**Antispasmodic:** Benzaldehyde; caffeic acid EC50=3-15 M; eugenol; eugenyl-acetate; geraniol; limonene EC50=197 g/ml; linalol; myrcene; protocatechuic-acid EC50=4-17 M; thymol

**Myorelaxant:** Apigenin; methyl-eugebol; thymol

**Sedative:** Apigenin 30-100 mg/kg; benzaldehyde; caffeic-acid 500 mg; citronellal (ED=1 ppm); citronellol; geraniol; limonene 1-32 mg/kg; linalool 1-32 mg/kg; methyl-eugenol; alpha-terpineol

### **Lemonbalm - for Herpes**

**Antitherpetic:** Apigenin; caffeic-acid 50 g/ml; chlorogenic-acid; luteolin-7-glycoside; polyphenols; protocatechuic-acid; rosmarinic-acid 50 g/ml; thymol

**Antiseptic:** Anethole; apigenin; benzaldehyde; caffeic-acid; chlorogenic-acid; citronellal (3.8 x phenol); eugenol; furfural; geraniol (7 x phenol); isoquercitrin; limonene; linalol (5 x phenol); luteolin-7-glucoside; neryl-acetate; polyphenols; protocatechuic-acid; rosmarinic-acid; thymol (20 x phenol) and more

**Antiviral:** Apigenin IC72=200 g/ml; caffeic-acid; chlorogenic acid; isoquercitrin; limonene; linalol; luteolin-7-glucoside; neryl-acetate; polyphenols; protocatechuic-acid; rosmarinic-acid; thymol

**Immunostimulant:** Anethole; chlorogenic-acid; protocatechuic-acid

### **Lemonbalm - for Insomnia**

**Analgesic:** Caffeic-acid; chlorogenic-acid; myrcene

**Anesthetic:** Benzaldehyde; methyl-eugenol; thymol

**Anxiolytic:** Apigenin 10 mg/kg

**CNS-Depressant:** Apigenin; eugenol; ursolic-acid

**Narcotic:** Benzaldehyde

**Sedative:** Apigenin 30-100 mg/kg; benzaldehyde; caffeic-acid 500 mg; citronellal (ED=1 ppm); citronellol; geraniol; limonene 1-32 mg/kg; linalool 1-32 mg/kg; methyl-eugenol; alpha-terpineol

### **Milk Thistle - for the Liver**

**Anticirrhotic:** Silymarin 450-600 mg/man/day

**Antifibrotic:** Silymarin



**Antihepatocarcinogenic:** Eriodictyol; fumaric-acid IC100=1% (diet)

**Antihepatotoxic (Hepatoprotective):** Betaine; 3-deoxysilychristin; luteolin; naringenin; quercetin; silandrin; silybin (75-100 mg/kg ivn mus); silychristin; silydianin; silymarin (50 mg/kg ivn mus); silymonin; taxifolin

**Antiinflammatory:** Apigenin (=indomethacin); cnicin; kaempferol 20 mg/kg; 200 mg/kg ipr rat; luteolin (=indomethacin); naringenin 20 ppm; quercetin 200 ppm; taxifolin

**Antinecrotic:** Silymarin

**Antioxidant:** Apigenin; eriodictyol; fumaric-acid; kaempferol IC50-40 M; luteolin; naringenin; quercetin (IC96=300ppm); silybin; silymarin

**Antiradicular:** Kaempferol; quercetin (IC50=4.6 M); silymarin

**Antitriglyceridridic:** Silymarin

**Antiviral (Viricide):** Apigenin; chrysoeriol; kaempferol; luteolin; naringenin; @quercetin (IC50=10 M); silymarin

**Choleretic:** Apigenin; kaempferol; naringenin

**Hepatotropic:** Silymarin

**Increase Glutathione (Glutathionigenic):** Silymarin

### **Nutmeg - for Insomnia**

**Anesthetic:** Cineole; eugenol; methyl eugenol; myristicin; safrole

**Antistress:** Elemecin; myristicin

**CNS-Depressant:** Eugenol; safrole

**Sedative:** Cineole (but also stimulant); dipentene; eugenol; geraniol; isoeugenol; limonene (ED=1-32 mg/kg); linalol (ED=1-32 mg/kg); methyleugenol; myristicin (300 mg/kg ipr); alpha-terpineol

### **Oregano - for Alzheimer's**

**Antiaggregant:** Apigenin; caffeic-acid; estragole (IC50=320 M); eugenol (IC50=0.3M); kaempferol; alpha-linolenic-acid; naringenin; quercetin (IC50=55M); thymol (IC50=0.75)

**Antialzheimeran:** carvacrol; limonene; thymol

**Anticholinesterase:** carvacrol; carvone; cineole; cymene; limonene; alpha-terpinene; gamma-terpinene; terpinen-4-ol; thymol

**Anticomplementary:** apigenin; rosmarinic-acid (1/2 aspirin)

**Antiinflammatory:** apigenin (=indomethacin); borneol; caffeic-acid; carvacrol (IC<sub>50</sub>=4 M); caryophyllene (IC<sub>50</sub>=100 M); caryophyllene-oxide; chlorogenic-acid; cinnamic-acid; delta-3-carene; eugenol 11 M; kaempferol (20 mg/kg, 200 mg/kg ipr rat); alpha-linolenic-acid (IC<sub>50</sub>=42 M); luteolin (=indomethacin); naringenin (20 ppm); naringin; oleanolic-acid (40 mg/kg ipr); orientin; alpha-pinene; protocatechuic-acid; quercetin (20-150 mg/kg; rosmarinic-acid; rutin (20 mg/kg); thymol; ursolic-acid (1/3x indomethacin); vanillic-acid; vitexin

**Antiischemic:** protocatechuic-acid

**Antioxidant:** apigenin; caffeic-acid (50 um, IC<sub>57</sub>=30 ppm); camphene; carvacrol; catechol; chlorogenic-acid (IC<sub>53</sub>=200 ppm, IC<sub>80</sub>=12 M); p-coumaric-acid (IC<sub>24</sub>=30 ppm) eriodictyol; eugenol (IC<sub>65</sub>=30 ppm); -hydroxybenzoic-acid; isovitexin (=tocopherol, BHA); kaempferol (IC<sub>50</sub>=40 M); luteolin; myrcene; naringenin; naringin; oleanolic-acid; protocatechuic-acid; quercetin (IC<sub>96</sub>=300 ppm); rosmarinic-acid EC<sub>50</sub>=2.7 ug/ml; rutin (IC<sub>28</sub>=30 ppm, IC<sub>50</sub>=120M); gamma-terpinene; thymol (100 ppm); ursolic-acid; vanillic-acid (IC<sub>21</sub>=30 ppm) **Antiperoxidant:** caffeic-acid (IC<sub>50</sub>=44 M); chlorogenic-acid (IC<sub>50</sub>=36 M); eriodictyol; naringenin; p-coumaric-acid (IC<sub>50</sub>=100 M); protocatechuic-acid (IC<sub>50</sub>=100 M); quercetin **Anxiolytic:** apigenin (10 mg/kg)

**CNS-Stimulant:** 1,8-cineole; camphor; carvone; chlorogenic-acid (1/6 caffeine) **Cyclooxygenase-Inhibitor:** kaempferol (IC<sub>50</sub> = 20 M) =20; quercetin (IC<sub>50</sub> =16 M)

### Papaya - for arthritis

**Analgesic:** Ascorbic acid; methyl salicylate; myrcene; thiamin; tryptophan

**Antiarthritic:** Ascorbic-acid; copper; linoleic-acid; magnesium; pantothenic acid; zinc

**Antiedemic:** Ascorbic-acid; caryophyllene; papain

**Antiinflammatory:** ALA (IC<sub>50</sub>=42 M); ascorbic acid; caryophyllene (IC<sub>50</sub>=100 M); copper; linoleic-acid; magnesium; methyl-salicylate; papain

**Lipoxygenase-Inhibitor:** p-Coumaric-acid

**Proteolytic:** Chymopapain; papain

### Passionflower - for Insomnia

**Analgesic:** scopoletin

**Anesthetic:**

**Antiinsomniac:**

**Antinociceptive:**

**Anxiolytic:** apigenin 10 ppm

**CNS-Depressant:** apigenin

**Sedative:** Apigenin 30-100 mg/kg

**Tranquilizer:** Harmane

### **Pineapple - for arthritis**

**Analgesic:** Ferulic acid

**Antiedemic:** Bromelain (ED50=50 mg/kg)

**Antiinflammatory:** ALA (IC50=42 M); bromelain (ED50=50 mg/kg); ferulic acid

**Lipoxygenase-Inhibitor:** *p*-Coumaric-acid (IC11=5 mM)

**Proteolytic:** Bromelain (400-600 mg 3 x daily)

### **Pumpkin - for prostatitis**

**Alpha-reductase-inhibitor:** Phytosterols; delta-7-sterols (90 mg/day)

**Antiedemic:** Ascorbic acid; caffeic-acid; lupeol;

**Antiinflammatory:** ALA (IC50=42 M); ascorbic-acid; caffeic-acid; copper; ferulic-acid; kaempferol (20-200 mg/kg); linoleic-acid; lupeol (1/3 indomethacin); magnesium; mannitol; phytosterols; quercetin (20-150 mg/kg); salicylic-acid; selenium; beta-sitosterol; delta-7-sterols

**Antiprostaglandin:** Sitosterol (30 mg/day/12 weeks)

**Antiprostatic:** ALA (alpha-linolenic-acid); alanine (200 mg/day); glutamic-acid (200 mg/day); glycine (200 mg/day); linoleic-acid; selenium; beta-sitosterol (60 mg/day); tocopherol; zinc

### **Rosemary - for Alzheimer's**

**Antiacetylcholinesterase:** Carvacrol; carvone; cineole; *p*-cymene; fenchone; isopulegol; limonene; alpha-terpinene; gamma-terpinene; terpinen-4-ol; thymol

**Anticomplementary:** Apigenin; apigenin-7-glucoside; rosmarinic-acid

**Antiinflammatory:** Apigenin; ascorbic-acid; betulin; betulinic acid; borneol (IC50=100 M); caffeic-acid; delta-3-carene; carvacrol (IC50=4 M); caryophyllene (IC50=100 M); caryophyllene-oxide; chlorogenic acid; copper; diosmin; eugenol; hesperidin (50-100 mg/kg); luteolin (=indomethacin); luteolin-7-glucoside; nepetrin; oleanolic-acid (40 mg/kg/ipr); alpha-pinene; rosmarinic-acid; thymol; ursolic-acid (1/3 indomethacin)

**Antioxidant:** Apigenin; ascorbic-acid; caffeic-acid (IC57=36M); camphene; carnosic acid; carnosol; carotenoids; carvacrol; chlorogenic acid (IC50=36 M); cirsimaritrin; genkwanin; hesperidin (IC50=8ppm); isorosmanol; labiatic-acid; luteolin; myrcene; oleanolic-acid; rosmadial; rosmanol; rosmaridiphenol; rosmarinic-acid (EC50=2.7 g/ml); rosmariquinone; gamma-terpinene; thymol (100 ppm); tocopherol; ursolic-acid

**Cyclooxygenase Inhibitor:** Carvacrol; eugenol and thymol

### **Sage - for Alzheimer's**

**Antiaggregant:** apigenin; caffeic-acid; ferulic-acid; hispidulin IC<sub>50</sub>=13 ug/ml; thymol IC<sub>50</sub>=0.75

**Antialzheimeran:** limonene; thymol

**Anticholinesterase:** cineole; cymene; limonene; alpha-terpinene; gamma-terpinene; terpinen-4-ol; thymol

**Anticomplementary:** apigenin; rosmarinic-acid (1/2 aspirin)

**Antiinflammatory:** alpha-pinene; apigenin (=indomethacin); betulin; borneol; caffeic-acid; carnosol; caryophyllene IC<sub>50</sub>=100 uM; caryophyllene-oxide; chlorogenic-acid; ferulic-acid; gallic-acid; luteolin (=indomethacin); luteolin-7-glucoside; maslinic-acid; oleanolic-acid 40 mg/kg ipr; rosmarinic-acid; salicylic-acid; thymol; ursolic-acid 1/3x indomethacin; vanillic-acid

**Antioxidant:** apigenin; caffeic-acid 50 um; IC<sub>57</sub>=30 ppm; camphene; carnosic-acid; carnosol; carnosolic-acid; catechin; chlorogenic-acid IC<sub>53</sub>=200 ppm; IC<sub>80</sub>=12 M; ferulic-acid 3,000 M; IC<sub>51</sub>=200 ppm; fumaric-acid; gallic-acid IC<sub>44</sub>=33 ppm; gamma-terpinene; labiatic-acid; luteolin; myrcene; oleanolic-acid; p-coumaric-acid IC<sub>24</sub>=30 ppm; rosmanol; rosmarinic-acid EC<sub>50</sub>=2.7 ug/ml; salicylic-acid; thymol 100 ppm; ursolic-acid; vanillic-acid IC<sub>21</sub>=30 ppm;

**Antiperoxidant:** caffeic-acid IC<sub>50</sub>=44 M; chlorogenic-acid IC<sub>50</sub>=36 M; gallic-acid IC<sub>50</sub>=69 M; p-coumaric-acid IC<sub>50</sub>=100 M

**Anxiolytic:** apigenin 10 mg/kg

**CNS-Stimulant:** 1,8-cineole; camphor; chlorogenic-acid (1/6 caffeine); beta-sitosterol-D-glucoside

**Cyclooxygenase-Inhibitor:** carnosol (IC<sub>50</sub>= 16 M) =16; gallic-acid

### **Saw Palmetto Extracts**

1. Inhibit alpha-reductase, thereby

1a. Inhibiting conversion of testosterone to dihydrotestosterone

(Leucine/Valine better than Valine/Valine)

2. Inhibit aromatase

3. Reduces the activity of estrogenic receptors in the prostate.

4. Inhibit phospholipase A2

5. Inhibit 5-lipoxygenase enzymes

5a. Thereby inhibiting arachidonic acid.

5b. Thereby reducing inflammation

6. Inhibit cyclooxygenase pathways

6a. Thereby inhibiting arachidonic acid.

6b. Thereby reducing inflammation

### **Saw Palmetto - for BPH**

**Antiedemic:** Ascorbic acid; caffeic-acid; linolenic-acid; magnesium; syringaldehyde

**Antiinflammatory:** Anthranilic acid; ascorbic-acid; ferulic acid; mannitol; phytosterols; salicylic-acid; selenium; beta-sitosterol; delta-7-sterols; syringaldehyde (ED=20 g/ear/mus); vanillic acid

**Antiprostaglandin:** Sitosterol (30 mg/day/12 weeks)

**Antiprostatitic:** ALA (alpha-linolenic-acid); alanine (200 mg/day); glutamic-acid (200 mg/day); glycine (200 mg/day); linoleic-acid; selenium; beta-sitosterol (60 mg/day); tocopherol; zinc

**Estrogenic (Weak):** Ferulic acid; itosterol

**Inhibit 5-alpha-reductase:** GLA; Phytosterols; delta-7-sterols (90 mg/day)

### **Soybeans - for Alzheimer's**

**Antiaggregant:** Adenosine; ALA; caffeic-acid; (+)-catechin; ferulic acid; genistein (1-10 g/ml); isoliquiritigenin; kaempferol; naringenin; phytic-acid; pyridoxine; quercetin IC50=55 M; tetramethylpyrazine

**Antialzheimeran:** Phosphatidyl-choline 25 g/day/orl

**Anticomplementary:** Arabinogalactan; (+)-catechin

**Antiinflammatory:** ALA IC50=42 M; allantoin; caffeic-acid; chlorogenic acid; cycloartenol; daidzein; ferulic-acid; gallic-acid; gentisic acid; kaempferol (20-200 g/ml); lupeol (1/3 indomethacin); naringenin 20 ppm; protocatechuic acid; rutin 20 mg/kg; quercetin (20-150 ppm); quercitrin; salicylic-acid; sitosterol; stigmasterol; vanillic-acid; vitexin

**Antiischemic:** Genistein; protocatechuic-acid

**Antioxidant:** Catalase; caffeic-acid (50 M; IC57=30 ppm); catechin; chlorogenic acid (IC53=200 ppm; IC80=12 M); *p*-coumaric-acid IC24=30 ppm; daidzein; daidzin; ferulic acid (3,000 M; IC51=200 ppm); fisetin; fumaric acid; gallic-acid (IC44=33 ppm); genistein; genistin; glutathione; glycitin; glyceollin; *p*-hydroxybenzoicacid; isoquercitrin; kaempferol IC50=40 M; lignin; lupeol 25 mg/kg/day; naringenin; OPCs; protocatechuic-acid; quercetin IC96=300 ppm; quercitrin (IC50=120 M); rutin (IC28=30; IC50=120 M); salicylic-acid; sinapic acid IC27=30; vanillic-acid IC21=30

**Antiperoxidant:** Catechin; caffeic-acid IC<sub>50</sub>=44 M; chlorogenic-acid IC<sub>50</sub>=36 M; *p*-coumaric acid IC<sub>50</sub>=100 M; gallic-acid IC<sub>50</sub>=69 M; lupeol 25 mg/kg/day; naringenin; protocatechuic-acid IC<sub>50</sub>=100 M; quercetin IC<sub>67</sub>=50

**Anxiolytic:** Apigenin 10 mg/kg; glutamic-Acid

**Cholinergic:** Choline; lecithin

**CNS-Stimulant:** Adenine; chlorogenic-acid (1/6 caffeine)

**Cyclooxygenase Inhibitor:** Fisetin IC<sub>50</sub>=80 M; gallic-acid; kaempferol IC<sub>50</sub>=20 M; quercetin (IC<sub>50</sub>=16 M; IC<sub>96</sub>=300 ppm); salicylic-acid

### Soybeans - for BPH

**Antiadenomic:** Sitosterol

**Antiinflammatory:** ALA IC<sub>50</sub>=42 M; allantoin; caffeic-acid; chlorogenic acid; cycloartenol; daidzein; ferulic-acid; gallic-acid; gentisic acid; kaempferol (20-200 g/ml); lupeol (1/3 indomethacin); naringenin 20 ppm; protocatechuic acid; quercetin (20-150 ppm); quercitrin; rutin 20 mg/kg; salicylic-acid; sitosterol; stigmasterol; vanillic-acid; vitexin

**Antiprostataadenomic:** Genistein 8-27 g/ml; sitosterol

**Antiprostatic:** ALA; daidzein; estrone; genistein; sitosterol 60 mg/day

**Cyclooxygenase Inhibitor:** Fisetin IC<sub>50</sub>=80 M; gallic-acid; kaempferol IC<sub>50</sub> =20 M; quercetin IC<sub>96</sub>=300 ppm; salicylic-acid

**Estrogenic:** Biochanin; coumestrol; daidzein; daidzin; formononetin; genistein; genistin; glyceollin-II; glycitein; sitosterol

### Soybeans - for Cancer

**Antimetastatic:** ALA; daidzein; genistein

**Antimutagenic:** Caffeic-acid; catechin; chlorogenic-acid; crocetin; daidzein; ferulic acid; fisetin; gallic-acid; genistein ID<sub>50</sub>=50-100 nM; *p*-hydroxybenzoic-acid; kaempferol ID<sub>50</sub>=10-40nM; naringenin ID<sub>50</sub>=50-100 nM; quercetin ID<sub>50</sub>=2-5 nM; rutin ID<sub>50</sub>=2-5 nM

**Antinitrosaminic:** Caffeic-acid; chlorogenic-acid; ferulic acid; gallic acid; lignin

**Antioxidant:** Catalase; caffeic-acid (50 M; IC<sub>57</sub>=30 ppm); catechin; chlorogenic acid (IC<sub>53</sub>=200 ppm IC<sub>80</sub>=12 M); *p*-coumaric-acid IC<sub>24</sub>=30 ppm; daidzein; daidzin; ferulic acid (3,000 M; IC<sub>51</sub>=200 ppm); fisetin; fumaric acid; gallic-acid(IC<sub>44</sub>=33 ppm); genistein; genistin; glutathione; glycitin; glyceollin; *p*-hydroxybenzoicacid; isoquercitrin; kaempferol IC<sub>50</sub>=40 M; lignin; lupeol 25 mg/kg/day; naringenin; OPCs; protocatechuic-acid; quercetin IC<sub>96</sub>=300 ppm; quercitrin (IC<sub>50</sub>=120 M); rutin (IC<sub>28</sub>=30; IC<sub>50</sub>=120 M); salicylic-acid; sinapic acid IC<sub>27</sub>=30; vanillic-acid IC<sub>21</sub>=30

**Antitumor:** Alpha-amyrin; anthocyanins; 120 mg/man; caffeic-acid; canavanine; chlorogenic-acid; *p*-coumaric-acid; daidzein; ferulic-acid; fumaric-acid; gallic-acid; genistein; lignin; lupeol; phytic-acid; phytosterols; protease-inhibitors; quercetin; quercitrin; rutin; salicylic-acid saponin ; sitosterol; squalene; stigmasterol; trigonelline

**Antitumor-Promoter:** Caffeic-acid IC<sub>42</sub>=10 M; chlorogenic-acid IC<sub>25</sub>=10 M; ferulic-acid IC<sub>25-46</sub>=10 M; kaempferol quercetin; rutin

**Apoptotic:** Quercetin

**Chemopreventive:** Ferulic acid; genistein; isoflavones; phytic acid; phytosterols; protease inhibitors; saponins

**Tyrosine-Kinase-Inhibitor:** Genistein; quercetin

### Soybeans - for Diabetes

**Antidiabetic:** Inositol; isoliquiritogenin; pinitol; pyridoxine; quercetin; quercitrin; rutin

**Antihyperglycemic:** Lupeol; trigonelline

**Hypoglycemic:** Adenosine; guanidine; indole-3-acetic-acid; quercetin (100 mg/kg/orl); quercitrin; salicylic-acid; trigonelline 500-3,000 mg/man/day

**Insulin-Sparing:** Adenosine; gallic-acid; pyroglutamic-acid

**Insulinase-Inhibitor:** Indole-3-acetic-acid

### Soybeans - for the Heart

**Antiaggregant:** Adenosine; ALA; caffeic-acid; (+)-catechin; ferulic acid; genistein (1-10 g/ml); isoliquiritogenin; kaempferol; naringenin; phytic-acid; pyridoxine; quercetin IC<sub>50</sub>=55 M; tetramethylpyrazine

**Antianginal:** Tetramethylpyrazine

**Antiatherogenic:** OPCs; rutin

**Anticoronary:** Lignin

**Antiischemic:** Genistein; protocatechuic-acid

**Antioxidant:** Catalase; caffeic-acid (50 M; IC<sub>57</sub>=30 ppm); catechin; chlorogenic acid (IC<sub>53</sub>=200 ppm IC<sub>80</sub>=12 M); *p*-coumaric-acid IC<sub>24</sub>=30 ppm; daidzein; daidzin; ferulic acid (3,000 M; IC<sub>51</sub>=200 ppm); fisetin; fumaric acid; gallic-acid (IC<sub>44</sub>=33 ppm); genistein; genistin; glutathione; glycitin; glyceollin; *p*-hydroxybenzoicacid; isoquercitrin; kaempferol IC<sub>50</sub>=40 M; lignin; lupeol 25 mg/kg/day; naringenin; OPCs; protocatechuic-acid; quercetin IC<sub>96</sub>=300 ppm; quercitrin (IC<sub>50</sub>=120 M); rutin (IC<sub>28</sub>=30; IC<sub>50</sub>=120 M); salicylic-acid; sinapic acid IC<sub>27</sub>=30; vanillic-acid IC<sub>21</sub>=30

**Arteriodilator:** Adenosine; ferulic-acid; tetramethylpyrazine

**Diuretic:** Adenine; aparagine; caffeic acid; chlorogenic-acid; glycolic acid; isoquercitrin (10 ppm); kaempferol; quercitrin; tetramethylpyrazine

**Hypocholesterolemic:** Crocetin; cycloartenol; glycolic-acid; inositol 2,000 mg/man/day; lignin; rutin; sitosterol; stigmasterol; trigonelline

**Hypotensive:** ALA; astragalin; daidzein; daidzin; isoquercitrin; kaempferol; lupeol; phylloquinone; quercitrin; rutin; tetramethylpyrazine 5-20 ppm; vitexin

### **Turmeric - for arthritis**

**Analgesic:** Borneol; caffeic-acid; curcumin; *p*-cymene; eugenol;

**Antidermatitic:** Guaiacol

**Antiedemic:** Borneol; caffeic-acid; caryophyllene; curcuminoids (tetrahydrocurcumin> curcumin>triethylcurcumin); eugenol

**Antiinflammatory:** Azulene; bis-(4-hydroxycinnamoyl)-methane; borneol; caffeic-acid; caryophyllene (IC<sub>50</sub>=100 M); cinnamic-acid; curcumin; eugenol (11 M); feruloyl-4-hydroxycinnamoylmethane; alpha-pinene; protocatechuic-acid; beta-sitosterol; vanillic-acid

**Inhibit Cyclooxygenase:** Curcumin; galangin (5.5 M)

**Inhibit Interleukin-1:** Curcumin (5 M)

**Inhibit Lipoxygenase:** Borneol; caffeic-acid (IC<sub>27</sub>=5 mM); cinnamic-acid; *p*-coumaric-acid (IC<sub>11</sub>=5 mM); curcumin; quercetin (IC<sub>50</sub> 0.1-5 M)

**Inhibit 12-Lipoxygenase:** Curcumin

**Inhibit Production of Tumor Necrosis Factor:** Curcumin

### **Valerian - for Insomnia**

**Analgesic:** Borneol; bornyl-formate; caffeic acid; chlorogenic-acid; *p*-cymene; myrcene; beta-pinene

**Anesthetic:** Carvacrol; 1,8-cineole; thymol

**Antiinsomniac:** GABA; valeric acid (1.2-2.4 ppm)

**Antinociceptive:** Myrcene 10-40 ppm;

**Anxiolytic:**

**CNS-Depressant:** Valepotriates; valerenone; valeric acid; valereinic-acid

**Sedative:** Baldrinal; borneol; bornyl-acetate; bornyl-formate 500 mg; caffeic-acid (500 mg); carvone; 1,8-cineole; dihydrovaltrate; geraniol; homobaldrinol (100 ppm); isovaleric acid; limonene 1-32 ppm; alpha-pinene; alpha-terpineol; valepotriates; valerenone; valeric acid; valerenic-acid



**Tranquilizer:** GABA; isovaleric acid; alpha-pinene; valeric acid



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YOUR INSTRUCTOR: Jim Duke ([James A. Duke](#))



Born in Birmingham, Alabama in 1929, James A. "Jim" Duke is a Phi Beta Kappa PhD (botany, 1961) graduate of the University of North Carolina. Jim, following military service, undertook postdoctoral activities at Washington University and Missouri Botanical Garden in St. Louis, Missouri. There he began studies of neotropical ethnobotany, his overriding interest to this day. From 1963 to 1965, Duke was ecologist with the USDA (Beltsville, Maryland), joining Battelle Columbus Laboratories (1965-71) for ecological and ethnobotanical studies in Panama and Colombia. During this formative period, Duke lived with various ethnic groups, closely observing their deep dependence on forest products. The first of some twenty books, his *Isthmian Ethnobotanical Dictionary* catalogs hundreds of Isthmian plants and their uses. Rejoining USDA in 1971, Duke had assignments relating to crop diversification, medicinal plants, and energy plant studies in developing countries. A popular lecturer on the subjects of ethnobotany, herbs, medicinal plants, and new crops and their ecology, he has taped dozens of TV and radio shows. There is a good biographic sketch in the Sep/Oct-1991 issue of EastWest magazine. The National Agriculture Library has a video history of Dr. Duke's career and development. Duke grows dozens of interesting plants on his six-acre farmette (Herbal Vineyard) with his wife and illustrator, Peggy. On Sept. 30, 1995, he retired after 30 years with the USDA. Before retiring, Dr. Duke brought his Father Nature's Pharmacy database online at USDA. It is now, in Duke's retirement, one of the most frequently consulted database with the Plant Genome Project at USDA. The URL address is:

<http://www.ars-grin.gov/duke>

Duke has already doubled the data content in the interactive database he maintains as Director, Duke's Herbal Vineyard, Inc. The database is especially useful for determining biological activities and healing potentials of food and herbs.

Fluent in Spanish, Duke has studied and/or lectured widely, concentrating on tropical ecology, medical botany, and crop diversification. Widely travelled, Duke "cut his tropical eye teeth" in Panama where he was resident from 1966-68. While working on an encyclopedia of economic plants, he has collaborated with the National Cancer Institute on both their AIDS and cancer-screening programs and their Designer Food Program (to prevent cancer). His data bases on the ecology, nutritional content, folk medicinal

uses and chemical constituents of economic plants are being widely utilized. Duke's major goal lately is to reverse the disdain for alternative medicines in the US, where, as in the Third World, a larger and larger percentage of the people can no longer afford first-world pharmaceuticals. Duke has a contagious interest in natural foods and nutritional approaches to preventive medicine. Between 1990-1992, Duke was advising the Designer Food Program of the NIH, then under the aegis of Dr. Herb Pierson. Lately Duke has been very active in ecotourism in Latin America and is teaching such themes as renewable rainforest products in the rainforests of Amazonian Peru. He has become an expert in the field of non-timber forest products.

With an aggregate of more than five years in Latin America, Duke has traversed parts of Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guadelupe, Guatemala, Honduras, Jamaica, Mexico, Panama, Peru, Puerto Rico, and Venezuela. In Asia, he has had lengthy visits in China, India, Indonesia, Pakistan, and quick looks at Burma, Japan, Laos and Vietnam. In the Middle East, he has worked in Iran, Israel, Kuwait, and Syria, with quick looks at the Mediterranean countries of Egypt, Greece, Italy, Portugal and Spain. His only tours in tropical Africa include Madagascar, Sao Tome, The Ivory Coast and Zambia. Recently he has been teaching field ethnobotany regularly in Amazonian Peru, Belize and Costa Rica (mostly in the winter) and in the Maine northwoods (in summer only). In 1997, similar tours are planned for Kenya and Uganda.

Jim belongs to the American Botanical Council (Trustee), American Herb Association (Life), American Society of Pharmacognosy, Association for Tropical Biology (Life), Council of Agricultural Science and Technology (Cornerstone Life Member), Herb Research Foundation (Advisor), International Association of Plant Taxonomists (Life), International Society for Tropical Root Crops (Life), International Weed Science Society (Life), Organization for Tropical Studies (Life), Oriental Healing Arts Society (Honorary), Phi Beta Kappa, Sigma Xi, Smithsonian Institution (Collaborator), Society for Conservation Biology (Life), Society for Economic Botany (Life), Southern Appalachian Botanical Club (Life), and the Washington Academy of Sciences (Life).

Dr. Duke serves as a Senior Scientific Adviser to Nature's Herbs and is on the board of trustees of the American Botanical Council, Director, Botanical Products International (Hakalau Hawaii) and Microbotanica, the Scientific Advisory Team of Shaman Pharmaceuticals (San Francisco), Medical Advisory Board of Herbalife (Los Angeles), and serves as Medicinal Plant Adviser to Reader's Digest and Time-Life. He also serves as an advisor or unpaid consultant to ACEER (Amazon Center for Environmental Education and Research), Alternative Medicine Digest, American Health, the Center for Alternative Medicine in Women's Health (NY), Center for Mind-Body Medicine, Center for Plant Conservation, Herb Research Foundation, International Expeditions, National College of Phytotherapy, Rodale Press, Rheumatology Unit (NIH); Supplements/ Dietary Advisory Board (NIH, Bethesda MD), Rosenthal Center for Alternative/Complementary Medicine, TRAMIL, and the World Health Organization (Traditional Medicine Program ). He is CEO of a newly formed consulting firm, Duke's Herbal Vineyard Inc, where he is writing the newsletter, *News from the Herbal Village*, and raising several specimen herbs for analysis and study. Routinely queried by editors and writers for several different popular and scientific health-oriented journals, and by producers of radio and television networks, both conservative and liberal, Duke recently has given accredited continuing education lectures on herbal medicine, pros and cons, to chiropractors, nurses, nurse practitioners, pharmacists, and physicians.

In addition to scores of popular and scientific articles, Duke has published several pertinent books: (1) *Handbook of Legumes of World Economic Importance*, Plenum Press, New York, 345 pp., 1981; (2) *Medicinal Plants of the Bible*, Trado-Medic Books, Buffalo, New York, 233 pp., 1981; (3) *CRC Handbook*

of *Medicinal Herbs*, CRC Press, Inc., Boca Raton, Florida, 704 pp., 1985; (4) *Culinary Herbs: A Potpourri*, Trado-Medic Books, Buffalo, New York, 195 pp., 1985; (5) *Medicinal Plants of China* (with E. Ayensu), Reference Publications, Algonac, Michigan, 2 vols., 705 pp., 1985; (6) *CRC Handbook of Proximate Analysis Tables of Higher Plants* (with A. Atchley), CRC Press, Inc., Boca Raton, Florida, 389 pp., 1986; (7) *Isthmian Ethnobotanical Dictionary*, 3rd edition, Scientific Publishers, Jodhpur, India, 205 pp., 1986; (8) *Handbook of Northeastern Indian Medicinal Plants*, Quarterman Press, Lincoln, Massachusetts, 212 pp., 1986; (9) *Living Liqueurs*, Quarterman Press, Lincoln, Massachusetts, 110 pp., 1987; (10) *CRC Handbook of Agricultural Energy Potential for Developing Countries* (with A. Atchley, K. Ackerson, and P. Duke), CRC Press, Inc., Boca Raton, Florida, 4 vols., 1063 pp., 1987; (11) *CRC Handbook of Nuts*, CRC Press, Inc., Boca Raton, Florida, 343 pp., 1989; (12) with Steven Foster, a *Peterson Field Guide to Medicinal Plants*, Houghton-Mifflin, Boston MA, 366 pp, 1990 (13) *Ginseng, a Concise Handbook*, Reference Publications, Algonac, Michigan, 273 pp., 1990, (14) *CRC Handbook of Edible Weeds*, CRC Press, Inc., Boca Raton, Florida, 1992 and (15) *CRC Handbook (and database) of Phytochemical Constituents of GRAS Herbs and Other Economic Plants*, 654 pp., 1992 and the *CRC Handbook (and Database) of Biological Activities of Phytochemicals* (1992), (16) *CRC Handbook of Alternative Cash Crops*, (J. A. Duke and J. L. duCellier), CRC Press, Inc., Boca Raton, Florida, 1993, 536 pp., (18) Duke and Vasquez's *Amazonian Ethnobotanical Dictionary* in 1994 and (19) Beckstrom-Sternberg and Duke (1996, *CRC Handbook of Aromathematics*) Number 20, his opus magnum, *Green Pharmacy*, Rodale Press, is due to be out July, 1997. Currently Dr. Duke, retired from the USDA Sept. 30, is working on three books, *Green Pharmacy* for Rodale Press, *Synergy in Phytomedicines*, under consideration by Synergetic Press, and finally, a second edition to the *CRC Handbook of Medicinal Herbs*. After he finishes these, Duke threatens to do more talking and less writing. In 1995 he presented more than 200 lectures and/or guided field trips or workshops. 1996 looks busier. Duke is a regular or occasional contributor or editorial adviser to such periodicals as *Alternative Medicine Digest*, *American Health*, *Business of Herbs*, *Complementary Medicine for the Physician*, *Diversity*, *Economic Botany*, *The Environmentarian*, *HerbalGram*, *Herbs for Health*, *The International Permaculture Species Yearbook*, *The Journal of Alternative & Complementary Medicine*, *Journal of Optimal Nutrition*, *Journal of Aromatherapy*, *Mind-Body Connection*, *Natural Health*, *Organic Gardening*, *News from the Herbal Village*, and *Wild Foods Forum*.



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