Herbals and Supplements

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Emergency
Directions: Take 4 to 6 drops in a small glass of water. Repeat when necessary. Can also place 4 drops directly under the tongue.

Supplement Facts
Serving Size: 4 drops
Servings Per Container: 45

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount Per % Daily Serving Value</th>
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<tbody>
<tr>
<td>Formula of Flower Essences</td>
<td>*</td>
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<tr>
<td>Star of Bethlehem</td>
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<tr>
<td>Clematis</td>
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<tr>
<td>Cherry Plum</td>
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<td>Impatiens</td>
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*Daily Value not established

Other Ingredients: In a base of alcohol.
Topics

• History and Regulations
• Name the top selling herbs
• State what reasons people use Complimentary & Alternative Medicine (CAM)
• The most dangerous herbs
• The most important drug interactions
The Concept

Natural organics for you & your baby

Herbal Life is Healthy Life

Planetary Formulas

One Person at a Time
Coca Leaves and Cocaines

Centruroides exilicauda

Castor Bean (Ricin)

Brown Recluse
Did you know...?

Allopaths
• Do **double blind** studies on pts...means 50% of the sick get sugar pills, with **no regard** for helping them if the medicine works!
• Very **expensive**. Emphasis on licenses, professional personnel, special government regulated facilities, controlled prices, expensive patents, making much money.

http://www.herbalhealer.com/allopaths.html

Naturopaths
• **Never do testing** on animals or people. Always strive...heal each person.

• **Economical**. **Natural** foods & herbs can not be patented nor monopolized. Much can be **do-it-yourself**. No expensive facilities. Most cases...Naturopaths desire to heal is much greater than the desire for money.
The Other Trend on Herbal Sites…
Herbal & Dietary Supplements

• **Dietary Supplements**
  – Botanicals (plants/herbs), vitamins, amino acids, food additives (or any combination of)
  – *Supplements* diet
  – 20,000-30,000 on the market

• **Herb**
  – Certain leafy plants without woody stems
  – Preparations often include “nonherb” plant materials (and even animal and mineral products)
  – “Supplement” - reflects their classification as “nutrients” with nondrug status
Herbal & Dietary Supplements

• Commonly used
  – WHO estimates up to 80% of world population
  – Series: Used ≥ 1 during the preceding week (14%) and the past 12-months (19%)

• Factors for the upswing
  – Lower cost
  – Ease of purchase
  – Consumer empowerment
  – Dissatisfaction with conventional therapies
  – Perception that herbals are better and safer
Herbal & Dietary Supplements
Top Sellers

- Ginkgo biloba
- St. John’s wort
- Ginseng
- Garlic
- Echinacea
- Glucosamine/Chondroitin

- Kava kava
- Saw palmetto (for BPH)
- Evening primrose
- Goldenseal
- Cranberry
- Valerian
- Grape seed extract
10 Most Common Natural Products Among Adults* - 2007

- Fish Oil/Omega 3: 37.4%
- Glucosamine: 19.9%
- Echinacea: 19.8%
- Flaxseed Oil/Pills: 15.9%
- Ginseng: 14.1%
- Combination Herb Pills: 13.0%
- Ginkgo Biloba: 11.3%
- Chondroitin: 11.2%
- Garlic Supplements: 11.0%
- Coenzyme Q-10: 8.7%

*Percentages among adults who used natural products in the last 30 days.

Herbal & Dietary Supplements

- **DSHEA** *(Dietary Supplement Health and Education Act of 1994)*
  - Manufacturers can do “claims”
    - “Stimulates CV health”, “Enhances sex drive”
  - **NOT** “Cures atherosclerosis”, “Cures impotence”
- **FDA** dietary supplement (include vitamins, minerals, herbals, amino acids, and any product that had been sold as a "supplement" before October 15, 1994)
- Any new supplement ingredient, after Oct 1994, must notify the FDA 75 days before marketing
  - FDA must review - expected to be safe?
  - Most supplement ingredients were in use prior to 1994
Herbal & Dietary Supplements

- After marketing, if agent is felt to be unsafe, the FDA can:
  - warn the public
  - suggest changes to make it safer
  - urge the manufacturer to recall the product
  - Recall or ban the product

- To “ban” a supplement:
  - the FDA must prove that the product is unsafe
  - April 2004 - "banned" all sales of ephedra (the 1st ban of any supplement since 1994)

- Food products - Quality control & Production are set by the Current Good Manufacturing Practices regulations
Types of Toxicity

All substances are poisons; there is none which is not a poison. The right dose differentiates a poison…." Paracelsus (1493-1541)

Minimal problem
Low concentration

Inherent toxicity
Misuse
Misidentification
Misrepresentation
Contamination
Drug interaction

Heavy-metal poisonings from lead, cadmium, mercury, copper, zinc, and arsenic

Use precludes some from seeking allopathic /osteopathic care
Alkaloids

• Heterogenous group of organic(carbons) & nitrogenous compounds
• CNS stimulation/depression, hepatotoxicity
• Groundel (Senecio longilobus), comfrey (Symphytum officinale): hepatic veno-occlusive disease
• Aconitum (Aconitum napellus), Goldenseal (Hydrastis canadensis), Jimson weed (Datura stramonium)
**Glycosides**

**Glycoside** is any molecule in which

- Esters that contain a sugar (glycol) and non-sugar (aglycone) which yields one or more sugars with hydrolysis

- Examples
  - Anthroquinones (senna and aloe)
  - Saponins (licorice [Glycyrrhiza lepida](#)
  - Ginseng [Panax ginseng](#)
  - Lactone glycosides
Glycoside Example - Digoxin

Glycone

Anomeric Carbon (Bound to two oxygens) (The stereocenter)

Non-Sugar Aglycone Genin
Is a steroid for "Digoxin"
Essential Oils

- A concentrated hydrophobic liquid containing volatile aroma compounds from plants.
- Also known as **volatile oils**, **ethereal oils** or **aetherolea**, or simply as the "oil of" the plant from which they were extracted, such as **oil of clove**.
- An oil is "essential" in the sense that it carries a distinctive scent, or essence, of the plant.
- Essential oils do not form a distinctive category for any medical, pharmacological, or culinary purpose.

- Sweet orange
- Cedarwood
- Peppermint
- Cedarwood
- Lemon
- *Eucalyptus globulus*
- Clove (leaf)
- Spearmint
- Pennyroyal Oil
The considerate plumber plants a herb garden for his customers.
Common Flavors
Ginkgo biloba

- Maidenhair tree
- Ginkgolides

**Uses**
- **Antioxidant (?)**
- **PVD**
  - Platelet aggregation
  - Circulation
- **Alzheimer disease**

**Adverse Effects**
- **Bleeding (?)** in pts on antiplatelet agents or anticoagulants
- **GI distress**
- **HA**

Major study (JAMA 2002;288:835) No help in cognition in healthy elderly subjects without cognitive impairment.
Common Flavors
St John’s Wort (*Hypericum perforatum*)

- **Uses:** Depression, Anxiety, gastritis, insomnia, AIDS
- **Components**
  - Hyperfoin
  - Hypericin
  - Flavonoids
  - Tannins
- **Adverse Events**
  - MAOI-A and B inhibition (Mild)
  - ? Agonism GABA / adenosine
  - ? Reuptake (DA, NE, GABA)

Major study
Ineffective in treating depression.
*JAMA* 2002;287:1807-1814
Common Flavors
St John’s Wort
Toxicity

- Photosensitization
- Serotonin Syndrome
- Drug interactions (CYP 3A4)
  - Indinavir
  - Oral contraceptives
  - Cycloserine
Bacon Strips Bandages

Ouch! That smart! Treat your minor cuts, scrapes and scratches with the incredible healing power of a designer bandage from Accoutrements. And if a fancy bandage isn't enough to dry up your tears, how about a FREE TOY! Each comes in a 3-3/4" tall metal pocket tin and contains a small plastic trinket to help make even the ouchiest owies feel all better in no time. The 3" x 1" Bacon Strips are cut to look like small slabs of bacon. Fifteen per tin.

Bacon Strips Bandages
item 11476
Box of 15 $4.95

ADD TO CART

If you like this item, check out these related products:
Common Flavors
Ginseng (Panax ginseng)

- *P. ginseng* is from Far East. *P. quinquefolius* in North America
- Uses - Respiratory illnesses, GI disorders, impotence, fatigue, and stress ("adaptogenic effect")
- Complex - many *ginsenosides*
- Metabolic - Glucose, Cholesterol, Erythropoiesis, BP & HR, GI motility; and CNS stimulation
- Side Effect - may warfarin's anticoagulant effect
Common Flavors
Ginseng

• Long-term use
  – Ginseng Abuse Syndrome
    • HTN
    • Nervousness
    • Sleeplessness
    • AM diarrhea
Common Flavors
Garlic

- Uses
  - Antibacterial and antioxidant activity
  - Infections, hypertension, cancer prevention.
- Intact cells - odorless, sulfur-containing derivative alliin.
- Crushed, alliin → allicin
- Adverse Effects
  - Contact dermatitis, gastroenteritis, & N/V
  - Antiplatelet effects (?) → Bleeding)
Common Flavors Echinacea

- Uses – Immunostimulant - for cold and flu symptoms.
- Adverse Events – Rare allergic reactions
Valerian Root

- Uses: Sedation and anxiolysis
Dangerous Flavors
Aristolochic Acid (*Aristolochia clematitis*)

- **Birthwort, heartwort, fangii**
- **Ingredient (±) in Chinese herbal products labeled fang ji, mu tong, ma dou ling, and mu xiang**
- **Unlabeled substitute for other herbs**
- **Use:** Uterine stimulant
- **Aristolochic acid**
  - **Nephrotoxicity** (renal fibrosis)
    - 12-24 months
    - Failure, Hemodialysis, Transplantation need
  - **Carcinogen** (urothelial cancer)
- **FDA warning April 2001. Banned in 7 European countries and Egypt, Japan, and Venezuela.**
Pyrrolizidine Alkaloids

Comfrey (Symphytum officinale)
Heliotrope (Crotalaria specatabulis)
Gordolobo (Gnaphalium spp.)

- Likely converted to pyroles in liver (alkylating agents)
- Liver Venoocclusive disease (Sinusoidal hypertrophy & venous occlusion)
  - Liver function ↓, Irreversible ±; Deaths
  - Cirrhosis ?
- ? Association with hepatic CA
- Treatment: supportive, transplant
Dangerous Flavors
Chaparral (*Larrea divaricata*)

- Creosote bush, Hediondilla, jarilla, larreastat
- **Liver** - Abnormal function, often irreversible; deaths
- FDA warning to consumers in Dec 1992.
Dangerous Flavors
Germander (*Teucrium chamaedrys*)

- **Liver** - Abnormal function, often irreversible; deaths
- Banned in France and Germany.
Dangerous Flavors
Kava (Piper methysticum)

- Kavalactones - ??? Weak
- GABA-agonism, NE/serotonin reuptake blockade, Na channel blockade, MAOI-B inhibition

**Uses:**
- Sleeping aid
- Stress reliever
- Muscle relaxant
- Arthralgias
- HA
- Asthma
- Dysuria
Dangerous Flavors
Kava

• Adverse Events
  – CNS depression
  – Kava dermopathy or Kavaism
    • Chronic, high-dose
    • Flaky, dry, and yellowing of the skin, hair loss
    • Ataxia, Hearing, Appetite, and body weight reduction
    • Reversible.
  – Hepatotoxicity
    • 2002 - 70 cases hepatotoxicity, including 4 deaths
    • Sales restricted in many countries.
    • FDA issued a consumer advisory in March 2002.
Dangerous Flavors
Lobelia (Lobelia inflata)

• **Indian tobacco**
• **Uses:** Antispasmodic, respiratory stimulant, relaxant
• **Component = Pyridine-derived alkaloids (Lobeline)**
• **Nicotinic**
Lobelia & Its Nicotinic Friends

• **Betel Nut** (*Areca catechu*)
  – Chewed for euphoria (Stimulant)
  – **Arecholine** - Direct acting Nicotinic agonist
    • Bronchoconstrictor
  – **Methacholine**
    • Bronchospasm in asthmatic
  – Leaf = a phenolic volatile oil and an alkaloid
    • Sympathomimetic reactions
  – Long-term use = leukoplakia, SC CA of oral mucosa
Lobelia & Its Nicotinic Friends

- **Blue cohosh** (*Caulophyllum thalictroides*)
  - Traditionally = Abortifacient, menstrual d/o’s, antispasmodic
  - **Methylcytisine**
    - (1/40 as potent as nicotine)
• Genus *Ephedra* = erect evergreens (small shrubs)
• Ma-huang, “Herbal Ecstasy” Mormon tea, desert tea
• Uses - Stimulant, Rx Bronchospasm
• Alkaloids – Ephedrine & Pseudoephedrine
• Adverse Events
  – Dizzy, palpitations, flushing, anxiety, mania
  – Seizures, CVA, MI, Death
  – NV, HA
Dangerous Flavors
Yohimbe (*Pausinystalia yohimbe*)

- Uses - Bodybuilding, hallucinogen, aphrodisiac
- Alkaloid
  - Yohimbine (alkaloid) from bark
- Alpha-2 agonists
- Adverse Events
  - Hypotension
  - Weakness/paralysis
  - Abdominal pain
Dangerous Flavors
Pennyroyal Oil (*Mentha pulegium*)

- Volatile oil from leaves
- Uses - Abortifacient, regulate menstruation
  - Irritation and contraction of uterus
- Strong tea or oil ingested
- Hepatic failure (15 mL) (Direct)
  - *Pulegone* (depletes hepatic glutathione stores)
- N-acetylcysteine for treatment?
- Can also ... neurotoxicity, ARF
Hallucinogens

- Absinthe
- Nutmeg
- Khat
Dangerous Flavors
Wormwood (*Artemisia absinthium*)
(Absinthe)

- Wormwood extract
  - Main ingredient in toxic liquor
- Volatile oil (mixture)
  - Thujone (α-, & β-)
  - Common receptor binding as THC
- Chronic use
  - Psychosis, hallucinations, Sz, Intellectual decline
  - Vincent Van Gogh?
Nutmeg
Myristica fragrans

The brown seed is the Nutmeg (Contains the myristicin)

The red aril has the spice, Mace
Nutmeg
Myristica fragrans

- Uses: Oh so many
- Effects
  - Nausea
  - Skin flushing
  - Altered speed
  - Altered motor functions
  - Hallucinations

Myristicin (C_{11}H_{12}O_{3})
Image by Erowid, © 2001 Erowid.org
Khat (*Catha edulis*)

Khat is bundled in banana leaves to maintain moisture.

A small bag costs ~ $10 US per day and will provide a few hours of effects.

Leaves / stems are usually chewed; infrequently made into a tea.

Sold in small bundles of leaves.
Primary active ingredient

- Dried Leaves – Cathine (norpseudoephrine). This has 1/10 potency of D-amphetamine.
- Fresh leaves – Cathinone (benzylketoamphetamine). Is more potent psychoactive.
- As leaves age, cathinone degrades to cathine
- Khat leaves must be used within days to have optimal potency.
The Super Herbal...

DRUG INTERACTIONS
St Johns Wort

• With Indinavir a protease inhibitor
• Concomitant administration of St. John’s wort and indinavir big indinavir plasma concentrations
• ? Due to induction of the cytochrome P450 metabolic pathway.

Do ya’ know you are getting’?
What’s inside that stuff

- Herbal products PC SPES and SPES capsules
- Undeclared prescription drug ingredients
  - PC SPES contains warfarin
  - SPES contains alprazolam

Surprise!!!

"Prostate health"

“Strengthening the immune system”

Sep 20, 2002
FDA Medalert
http://www.fda.gov/medwatch/safety/2002/safety02.htm#spes
What’s inside that stuff

• FDA alert about Chinese weight-loss products
  – Deaths have occurred
  – Products of this type are often sold in small urban markets as alternatives to Western medicine.
  – Contained fenfluramine - removed from the market in 1997 after being associated with valvulopathy

• "Treasure of the East"
  – In 2001, FDA - nationwide alert on the recall
  – Aristolochic acid (Kidney damage)

August 13, 2002
Medalert
http://www.fda.gov/bbs/topics/NEWS/2002/NEW00826.html
CONGRATULATIONS!!1!1
YOU ARE THE 12,674,293th
VICTIM OF THIS POP-UP
CLICK HERE TO RECEIVE MORE FREE POP-UP ADVERTISEMENTS
and win abso-bloody-lutely nothing RIGHT NOW!