THERAPEUTIC BOTANICALS
ROOTS, LEAVES, FLOWERS, FRUIT & SEEDS

Jill Madison MS RD/N CLC
ALL DISEASE BEGINS IN THE GUT.

- Hippocrates

"People are fed by the food industry, which pays no attention to health... And are treated by the health industry, which pays no attention to food."

-Wendell Berry
Are the health benefits from consuming foods naturally high in fiber, due to the fiber (and its positive impact on the microbiome), or the phytochemicals & nutrients that accompany high fiber foods?
Spice MyPlate: Nutrition Education Focusing Upon Spices and Herbs Improved Diet Quality and Attitudes Among Urban High School Students

- Marion Nestle

Culinary Medicine: Patient Education for Therapeutic Lifestyle Changes

- Michael Pollan
OBJECTIVES

Distinguish

- Medicines: Traditional, Ethnobotanical, Integrative, Functional, Herbal & Culinary
- vs. Therapeutic botanicals

Illuminate

- Specific botanical therapeutics that shine in food / beverages
- Recipes

Know

- Evidence based practice
- Relevant law
- Professional referrals, books & resources
GLOBAL TRADITIONAL MEDICINES

WESTERN HERBALISM

TRADITIONAL CHINESE MEDICINE

AYURVED
Western Herbalism

- Long history: Sumerian to Greco, Roman, Egyptian and other European folk traditions
- Temperature, moisture, action, therapeutic use
- “What does this plant make the body do?”

Ayurved

- Oldest (?) complete medical tradition i.e. 2700 bce
- Historically based on empirical science, now becoming more evidence based with trials using herbal remedies
- Energetics, 6 tastes, 3 doshas, individualized health maintenance / balance (i.e. prevention/wellness)

Trad. Chinese Med.

- Systems based medicine, along with qualities such as elements, movements, 5 tastes, temperatures
- Foods/herbs have therapeutic/tx use via their energetics and impact on certain body systems i.e. “moves stagnant liver qi”, but also used in prevention/wellness
Restore overall balance and strengthen the functioning of the body as a whole - maintain a healthy immune system, broad-spectrum normalizing influence on unbalanced physiological processes / modulates stress, innocuous.

**HERBAL ACTIONS**

- Adaptogen
- Alternative
- Aromatic
- Astringent
- Bitters
- Carminative
- Demulcent
- Diaphoretic
- Diuretic
- Emollient
- Expectorant
- Nervine
- Nutritive
- Tonic

Stimulate appetite and digestion by encouraging the production of gastric fluids and peristalsis.

Reduce or prevent excess gas.

Mucilaginous - coats, soothes, and protects mucus membranes - triggering a reflex that helps promote natural moistening secretions.

Provides excellent macro/micronutrition.
BOTANICAL THERAPEUTICS MODEL

BIODIVERSITY → RESILIENCE

SUPPORT, NOT CONTROL/FIX
Biodiversity →

- Which ‘ecosystem’ needs added pesticides/fertilizer?
- Which is more productive? (and for whom?)
- Which is more resilient?
Where/how do botanical therapeutics thrive?

- Support overall nourishment (!)
- Immunity (?)
- Digestion (?)
- Breastfeeding (?)
Macro & micronutrients are essential for life

Is there more to physical nourishment?

What about phytochemicals?

- Anti-oxidants, Flavonoids i.e. Anthocyanins?
- Polyphenols i.e. Curcuminoids?
- Terpenes i.e. Sesquiterpenes?
- Glucosinolates?
- Carotenoids i.e. Lycopene?
- Chlorophyll?
- Polysaccharides i.e. Pectin & Lignan & Beta-glucans?
WHOLE PLANTS ARE DIFFICULT TO STUDY

• Majority of studies done are not on herbs as a whole, but the individual chemicals that stimulate a desired response in the body.

• When a particular plant chemical causes a particular reaction, that chemical is then extracted from the plant.

• We know how specific vitamins/minerals and when intake is low, we supplement - however the individual vitamin/mineral supplements often don’t benefit health the same way a whole food will. Milk vs. Ca/D supplements.

• Systems biology is complicated.

  Digestion → different metabolites with different bioactive ingredients from parental compounds → unclear which are the bioactive ingredients or metabolites responsible of the effect and their relevance in humans and whether they function isolated or in symphony.
**BOTANICAL SELECTIONS**

- Excellent historical ethnobotanical use & EBP
  - Good **human safety** data, often with unknown direct mechanism.
  - Food-based herbs generally regarded as safe for all with no reports of toxicity

- Not too pricey or endangered

- Relevant to pediatrics
  - NOT adult diseases/conditions like cvd/htn/weightloss/etc.

- ‘Edible’ with culinary applications
  - Using WHOLE plant or certain parts - not reductive compounds.
  - Not a plant packaged into a pill / supplement, nor a traditional yet topical remedy like aloe.
• Understand the many ways to prepare & use herbs culinarily
  – Leaves, Flowers, Seeds: use less DRY than FRESH, add directly into your recipes matching flavors
  – Culinary additions: syrups, vinegars, oils, salts, pesto/salsas/sauces, ice cubes

• What is the most consumed beverage in the world? (after water)

• Tea
  – Leaves, Flowers, Seeds: HOT INFUSION
    • Dry: ~1 tablespoon herb/flower/seed: 1 quart water, add just boiled water and steep for 15-60 minutes
    • Fresh: ~1 oz wt or 1 cup fresh herb/flower: 1 quart water, add just boiled water and steep for 15-60 minutes
  – Mucilaginous Roots, Flowers: COLD INFUSION
    • Soak ½ oz wt: 1 quart cold/room temp water for 8-12 hours
  – Roots or dry/woody/hard mushrooms: DECOCTION
    • ~2 tablespoons herb: 1 quart water, simmer together in a covered pot for 15-60 minutes
Use your RD skills...

• Are the nutrients you want water or fat soluble?

• Know which part of each specific plant has the nutrition you want

• Know multiple factors affect chemical composition of plants (variety, genotype, climate, soil, vegetative stage, harvest time, storage, processing and treatment)

• Food-based herbs/spices vs. dosing
  
  – All botanicals in this ppt are food based, you can add to taste.

  – Dosing? Not as important as when using ‘culinarily’ but common in herbal medicine resources: take the child’s weight in pounds, divided by 150, then multiplied by the adult dose.

Chamomile

Adult dose of flower head: average daily dose 2-8g, 3 times a day; of fluid extract 1:1 in 45% ethanol: dose 1-4ml, 3 times a day.

Child dose of flower head: 2g, 3 times daily; of fluid extract (ethanol 45-60%): single dose 0.6-2ml.

Should not be used by children under 3 years old.
<table>
<thead>
<tr>
<th>ROOTS</th>
<th>LEAVES</th>
<th>FLOWERS</th>
<th>FRUIT</th>
<th>SEEDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astralagus</td>
<td>Anise</td>
<td>Calendula</td>
<td>Amla</td>
<td>Anise</td>
</tr>
<tr>
<td>Burdock</td>
<td>Dandelion</td>
<td>Cannabis</td>
<td>Elder</td>
<td>Cacao</td>
</tr>
<tr>
<td>Chicory</td>
<td>Gotu Kola</td>
<td>Chamomile</td>
<td>Goji</td>
<td>Caraway</td>
</tr>
<tr>
<td>Garlic</td>
<td>Holy Basil</td>
<td>Elder</td>
<td>Hawthorne</td>
<td>Fennel</td>
</tr>
<tr>
<td>Ginger</td>
<td>Kombu</td>
<td>Hibiscus</td>
<td>Lemon/Lime</td>
<td>Fenugreek</td>
</tr>
<tr>
<td>Gingko</td>
<td>Lemon Balm</td>
<td>Lavender</td>
<td>Rosehip</td>
<td>Flax</td>
</tr>
<tr>
<td>Ginseng</td>
<td>Mint(s)</td>
<td>Passionflower</td>
<td>Ume</td>
<td>Hemp</td>
</tr>
<tr>
<td>Kudzu</td>
<td>Oat Straw</td>
<td>Rose</td>
<td>Schisandra</td>
<td>Kalanji</td>
</tr>
<tr>
<td>Marshmallow</td>
<td>Nettle</td>
<td>Saffron</td>
<td><em>Enoki</em></td>
<td>Milky Oat</td>
</tr>
<tr>
<td>Turmeric</td>
<td>Oregano</td>
<td>Violet</td>
<td><em>Reishi</em></td>
<td>Nutmeg</td>
</tr>
<tr>
<td></td>
<td>Rosemary</td>
<td></td>
<td><em>Shitake</em></td>
<td>Oat</td>
</tr>
<tr>
<td></td>
<td>Sage</td>
<td></td>
<td><em>Turkey Tail</em></td>
<td>Pepper</td>
</tr>
</tbody>
</table>
2 ADAPTOGENS
<table>
<thead>
<tr>
<th><strong>NAMES</strong> (BOTANICAL, FAMILY, COMMON)</th>
<th><em>Astralagus membranaceus</em>, Leguminosae/Fabaceae, Milk vetch, 黃芪</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PARTS USED</strong></td>
<td>Root (rhizome)</td>
</tr>
<tr>
<td><strong>HERBAL ACTION</strong></td>
<td><strong>Adaptogen</strong> (helps the body adapt to stress and to exert a normalizing effect upon bodily processes), <strong>Tonic</strong> (helps build immune resistance, inflamm. and parasympathetic response), Anti-inflammatory, <strong>Taste/temp/energy</strong>: sweetish, warming/moistening/ascending.</td>
</tr>
<tr>
<td><strong>HISTORIC USES</strong></td>
<td>As food or extract; immunoregulatory, antioxidant, anti-inflammatory, cardiotonic / improving endurance, antihyperglycemic.</td>
</tr>
<tr>
<td><strong>PHYTO-CHEMICALS</strong></td>
<td>224+ known bioactive polysaccharides, flavonoids, and triterpene saponins. Also rich in Ca, Mg, Fe, Cu, Zn.</td>
</tr>
<tr>
<td><strong>CLINICAL USE</strong></td>
<td>In vitro &amp; in vivo investigations have confirmed that Astragalus enhances the immune system (stimulates macrophage, NK cells, helps to activate T cells and IgA/M response) however relationship betw chemical constituents and activity unclear.</td>
</tr>
<tr>
<td><strong>CULINARY NOTES</strong></td>
<td>Typically purchase root as dry slices or chunks, great for broths (esp. in a pressure cooker/crock/instapot), or into liquid base when cooking whole grains. ‘Decoct’ or simmer for ~2-4 hrs for best extraction. Try adding astragalus to a homemade chai recipe! Mild, sweetish flavor easily blends into recipes. Food or tea. Remove root pieces prior to serving.</td>
</tr>
</tbody>
</table>
### HOLY BASIL / TULSI

**Names**: *Ocimum sanctum*, Lamiaceae, Tulsi, Holy Basil (with different varieties; vana, rama, krishna)

**Parts Used**: Aerial parts, leaves, stems, seeds

**Herbal Action**: Adaptogen, Anti-inflammatory, Immunomodulation, Carminative, Tonic, Nervine (more distantly). *Taste/temp/energy*: warming and cooling with a sweet, spicy, pungent taste.

**Historic Uses**: As tea, juice or supplement/extract; adaptogenic, immune stimulant (antimicrobial, anti-inflammatory, immunomodulatory), neurocognitive effects - calming & grounding, cardioprotective, dispelling of gas.


**Clinical Use**: In vitro, animal and human studies attest multiple therapeutic actions, esp NK, IL & T cell response. Also inhibits COX 2, anti-inflammatory. Review of 24 human studies showed positive/safe impact although much variation on use, dose, and lack of clarity on mechanism of action.

**Culinary Notes**: Teas and infusions. Great hot or iced, alone or mixed. “Spicy” - floral, clove-ish, peppery, lemony. Because of its high volatile oil content it is steeped for 5-10 minutes covered. You can start with 1 tsp of the leaf and increase as desired.
2 BITTERS
EARLY SPRING
Edible basal rosette

LATE SPRING
In flower

FALL
Edible crown
Edible branching tap root
Root cross section with milky sap
Roots edible all year; sweetest late fall–late winter; most bitter mid summer

Leaf margins deeply lobed, pointing back toward plant center
Leafless, hollow flower stalk ( scape ) with milky sap
Edible, deeply cut, lance-shaped leaves

Petal with single flower
Parallel edged petal

Single seed
50+ seed heads
<table>
<thead>
<tr>
<th><strong>NAMES</strong></th>
<th><em>Taraxacum officinale</em>, Asteraceae, Dandelion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PARTS USED</strong></td>
<td>All parts - roots (nutritive, esp. inulin only in unroasted root) - leaves (bitter &amp; nutritive), flowers</td>
</tr>
<tr>
<td><strong>HERBAL ACTION</strong></td>
<td>Both root &amp; leaves are bitter (cholagogue), nutritive, very gentle laxative. Leaves a diuretic (bp lowering); tonic. <strong>Taste/temp/energy:</strong> bitter, slightly stimulating, cooling and draining.</td>
</tr>
<tr>
<td><strong>HISTORIC USES</strong></td>
<td>Leaves as food, root as tea (decoction), broth, juice or tincture. Nutritive, antioxidant and anti-inflammatory.</td>
</tr>
<tr>
<td><strong>PHYTOCHEMICALS</strong></td>
<td><strong>Leaves:</strong> higher levels of Fe, vit B2 &amp; E than any of our cultivated greens (spinach, collards, kale), also high in fiber, sesquiterpenes, taraxacin, polyphenols, polysaccharides, vit A &amp; C, B3, Ca, K, Cu, Zn, Mg. <strong>Root:</strong> unusually high amt of inulin (fall is best). <strong>Flowers:</strong> high in lutein (eye health).</td>
</tr>
<tr>
<td><strong>CLINICAL USE</strong></td>
<td>Long history as a folk remedy - now an increasing scientific data and gaining evidence-based credibility! in vitro and in vivo anti-inflammatory activity in IBD (down reg of cytokines), polysaccharides in root (inulin) excellent prebiotic w/ immunomodulatory and antioxidant activity.</td>
</tr>
<tr>
<td><strong>CULINARY NOTES</strong></td>
<td>Root: tea (decoct - simmer 1-4hrs). Leaves raw or sautéed mixed with other greens, pesto soup/stews, etc., flowers raw in salads, baking.</td>
</tr>
</tbody>
</table>
Table 7. Nutritional tests of wet plant tissue (performed by SCS Global Services in Emeryville, CA) collected by Berkeley Open Source Food in West Oakland, CA, and USDA National Nutrient Database values for raw kale.

<table>
<thead>
<tr>
<th></th>
<th>chickweed <em>Stellaria media</em></th>
<th>dandelion <em>Taraxacum officinale</em></th>
<th>dock <em>Rumex crispus</em></th>
<th>mallow <em>Malva sylvestris</em></th>
<th>nasturtium <em>Tropaeolum majus</em></th>
<th>oxalis <em>Oxalis pes-caprae</em></th>
<th>kale <em>Brassica oleracea</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>serving (g)</td>
<td>101</td>
<td>70</td>
<td>98</td>
<td>68</td>
<td>72</td>
<td>84</td>
<td>21</td>
</tr>
<tr>
<td>cal (Kcal)</td>
<td>29.51</td>
<td>24.40</td>
<td>32.85</td>
<td>35.36</td>
<td>33.78</td>
<td>23.21</td>
<td>7.0</td>
</tr>
<tr>
<td>fat cal (Kcal)</td>
<td>2.43</td>
<td>2.43</td>
<td>2.43</td>
<td>2.43</td>
<td>4.60</td>
<td>2.13</td>
<td>2.79</td>
</tr>
<tr>
<td>fat (g)</td>
<td>0.27</td>
<td>0.27</td>
<td>0.27</td>
<td>0.27</td>
<td>0.51</td>
<td>0.24</td>
<td>0.31</td>
</tr>
<tr>
<td>saturated fat (g)</td>
<td>0.01</td>
<td>0.01</td>
<td>0.02</td>
<td>0.01</td>
<td>0.03</td>
<td>0.01</td>
<td>0.04</td>
</tr>
<tr>
<td>TFA (g)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>cholesterol (mg)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>carbohydrates (g)</td>
<td>5.27</td>
<td>3.88</td>
<td>4.72</td>
<td>5.30</td>
<td>4.97</td>
<td>4.45</td>
<td>0.93*</td>
</tr>
<tr>
<td>dietary fiber (g)</td>
<td>3.69</td>
<td>3.68</td>
<td>3.34</td>
<td>4.88</td>
<td>2.23</td>
<td>2.52</td>
<td>0.90</td>
</tr>
<tr>
<td>total sugars (g)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.27</td>
<td>0</td>
<td>0.21</td>
</tr>
<tr>
<td>protein (g)</td>
<td>1.45</td>
<td>1.59</td>
<td>2.59</td>
<td>2.78</td>
<td>2.33</td>
<td>0.83</td>
<td>0.61</td>
</tr>
<tr>
<td>Vitamin A (IU)</td>
<td>2315.32</td>
<td>4603.9</td>
<td>5311.82</td>
<td>3168.76</td>
<td>5891.04</td>
<td>1998.25</td>
<td>1011.0</td>
</tr>
<tr>
<td>Vitamin C (mg)</td>
<td>10.82</td>
<td>3.14</td>
<td>35.63</td>
<td>5.87</td>
<td>1.07</td>
<td>7.93</td>
<td>19.6</td>
</tr>
<tr>
<td>Na (mg)</td>
<td>45.83</td>
<td>36.64</td>
<td>99.46</td>
<td>29.07</td>
<td>28.78</td>
<td>24.33</td>
<td>11.0</td>
</tr>
<tr>
<td>Ca (mg)</td>
<td>66.92</td>
<td>67.13</td>
<td>67.40</td>
<td>185.39</td>
<td>106.89</td>
<td>41.07</td>
<td>53.0</td>
</tr>
<tr>
<td>Fe (mg)</td>
<td>1.56</td>
<td>1.91</td>
<td>1.29</td>
<td>2.27</td>
<td>0.85</td>
<td>1.58</td>
<td>0.34</td>
</tr>
<tr>
<td>K (mg)</td>
<td>446.24</td>
<td>308.06</td>
<td>305.40</td>
<td>242.14</td>
<td>214.54</td>
<td>108.21</td>
<td>73.0</td>
</tr>
</tbody>
</table>

Serving sizes for chickweed, dandelion, dock, and kale were 1c; serving sizes for mallow, nasturtium, and oxalis were 1/2c. Masses are listed. “cal” and “Kcal” stand for kilocalories (dietary calories) and “TFA” stands for trans fatty acids. See Table 6 for sample sites. (“This number is suspiciously low—and values listed on other websites are generally 4–6g—but it is the value the USDA lists.)
3 CARMINATIVES
### GINGER

<table>
<thead>
<tr>
<th><strong>Names</strong></th>
<th><em>Zingiber officinale</em>, <em>Zingiberaceae</em>, Ginger</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parts Used</strong></td>
<td>Root (rhizome)</td>
</tr>
<tr>
<td><strong>Historic Uses</strong></td>
<td>Dyspepsia and a variety of GI issues, appetite stimulant, anti-inflammatory both internally and externally, antimicrobial used in common colds.</td>
</tr>
<tr>
<td><strong>Phytochemicals</strong></td>
<td>Over 400 documented - Polyphenols, Sesquiterpene Lactones (lipophilic) <em>zingiberene</em>, <em>curcumene</em>, <em>sesquiphellandrene</em>, <em>bisabolene</em>, monoterpenes, amino acids, raw fiber, protein, phytosterols, vitamins (B3, vitamin A), minerals (esp Calcium).</td>
</tr>
<tr>
<td><strong>Clinical Use</strong></td>
<td>Uses well supported by clinical data: prophylaxis of nausea/vomiting with motion sickness, postoperative nausea, pernicious vomiting in pregnancy, seasickness, promotes GI motility, reduces bloating, promotes secretion of bile secretion &amp; gastric fluids, inhibits platelet aggregation (caution if on blood thinners). Vaso-dilator.</td>
</tr>
<tr>
<td><strong>Culinary Notes</strong></td>
<td>Flavor combines well in sweet/savory dishes, bakery items to soups/broths, pickles, decoct for tea or blend/grate fresh juice.</td>
</tr>
</tbody>
</table>
# Chamomile

<table>
<thead>
<tr>
<th><strong>Names</strong></th>
<th>Matricaria recutita, Asteraceae, Chamomile, Manzanilla</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parts Used</strong></td>
<td>Flowering heads</td>
</tr>
<tr>
<td><strong>Historic Uses</strong></td>
<td>Teas / infusions, extract, tincture; gentle sedative (relaxant, restorative), anti-spasmodic, analgesic, anti-inflammatory, anticarcinogenic, antipyretic, antiseptic, anti-diarrheal, anti-emetic, carminative, antimicrobial.</td>
</tr>
<tr>
<td><strong>Phytochemicals</strong></td>
<td>Over 120 chemical compounds - sesquiterpenes incl. chamazulene, α-bisabolol, flavonoids incl. apigenin, quercetin, rutin, coumarins.</td>
</tr>
<tr>
<td><strong>Clinical Use</strong></td>
<td>Excellent invitro evidence showing spec. compounds such as α-bisabolol/chamazulene as antimicrobial. Well supported by human clinical trial data: symptomatic treatment of GI ailments: dyspepsia, epigastric bloating, impaired digestion, and flatulence. Treatment of restlessness/mild insomnia due to nervous disorders.</td>
</tr>
<tr>
<td><strong>Culinary Notes</strong></td>
<td>Tea/infusion, add flowers to salads, baking, popsicles. Consider using fat to capture lipophilic compounds.</td>
</tr>
</tbody>
</table>
3 DEMULCENTS
# Marshmallow

<table>
<thead>
<tr>
<th>NAMES</th>
<th><em>Althaea officinalis</em>, Malvaceae, Marshmallow</th>
</tr>
</thead>
<tbody>
<tr>
<td>PARTS USED</td>
<td>Root (rhizome), leaves also although less effective</td>
</tr>
<tr>
<td>HERBAL ACTION</td>
<td>Demulcent, Nutritive, Gentle Laxative (more bulking), Diuretic (quite distantly). <strong>Taste/temp/energy:</strong> sweet-ish, cooling, moistening.</td>
</tr>
<tr>
<td>HISTORIC USES</td>
<td>Inflammation - mucilaginous soluble fibers soothe mucus membranes, GI tract, lungs (esp dry cough), kidneys, and overall nutrition.</td>
</tr>
<tr>
<td>PHYTOCHEMICALS Root</td>
<td>polysaccharides &amp; mucilage (soluble fibers)- galactomannan, arabinans, pectins, glucans, and arabinogalactans. Flavonoids- kaempferol and quercetin; caffeic, chlorogenic, ferulic, and syringic phenolic acids; chlorophyll, and calcium. Also Coumarins &amp; Tannins.</td>
</tr>
<tr>
<td>CLINICAL USE</td>
<td>Germany’s Commission E reported that it alleviates local irritation, inhibits mucociliary activity, and stimulates phagocytosis: marshmallow root and leaf are both licensed as standard medicinal teas. Good human safety data, although minimal human clinical trials showing effect. As with all fiber, may slow absorption of Rx.</td>
</tr>
<tr>
<td>CULINARY NOTES</td>
<td>Solubilizes only in water infusions - cold best although could stir into a warm cereal or blend with smoothies. Slippery gel swells in water Sweetish with bland taste.</td>
</tr>
</tbody>
</table>
Soluble fiber is well studied with established positive health impacts!

Most mucilage is not broken down for absorption by digestive system within the bowel.

Major effects of mucilage-rich foods:

- Lower bowel transit time by absorbing water in the colon and creating stool a bulking & softening effect
- Reduce absorption of cholesterol
- Protect against gastric acidity
- Regulate intestinal flora and support microbiome
- Relaxes and soothes via the endodermal lining of the gut

HUGE market - expected to surpass 5.5 Billion USD by 2024
5 NUTRITIVES
**NETTLE (STINGING)**

<table>
<thead>
<tr>
<th><strong>NAMES</strong></th>
<th><em>Urtica dioica</em>, Urticaceae, Stinging Nettle</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PARTS USED</strong></td>
<td>Leaves most commonly, also seeds and roots</td>
</tr>
<tr>
<td><strong>HERBAL ACTION</strong></td>
<td>Nutritive (esp “blood builder”, Anti-inflammatory, Tonic, Astringent. <strong>Taste/temp/energy</strong>: salty, cooling, drying.</td>
</tr>
<tr>
<td><strong>HISTORIC USES</strong></td>
<td>Arthritis, eczema, to incre, hypothyroid, weak hair/teeth/bones, fatigue, build blood, seasonal allergies, urinary tract infections, asthma, menstrual cramps.</td>
</tr>
<tr>
<td><strong>PHYTO-CHEMICALS</strong></td>
<td>Leaves: chlorophyll, indoles (histamine &amp; serotonin), acetylcholine, flavonoids (quercetin, etc.), tannins, lignans, carotenoids, B vits &amp; C, minerals (esp Ca &amp; Fe, K, Mg), protein, fiber.</td>
</tr>
<tr>
<td><strong>CLINICAL USE</strong></td>
<td>In vitro antimicrobial activity against Gram-positive and Gram-negative bacteria and hypoglycemic effect. Human studies show anti-inflammatory/analgesic effect, reduction in postoperative blood loss and purulent inflammation following adenomectomy. Antioxidant activity towards iron-promoted oxidation of phospholipids, linoleic acid and deoxyribose.</td>
</tr>
<tr>
<td><strong>CULINARY NOTES</strong></td>
<td>Leaves are tastiest/most tender spring, rest of the year better cooked as you may any leafy green, added to soup, frittata, meatballs, pesto. Tea as infusion is most common method of ingestion if you can’t find fresh/wild.</td>
</tr>
</tbody>
</table>
Several food sources of iron are listed in Table 2. Some plant-based foods that are good sources of iron, such as spinach, have low iron bioavailability because they contain iron-absorption inhibitors, such as polyphenols [15,16].

**Table 2: Selected Food Sources of Iron [17]**

<table>
<thead>
<tr>
<th>Food</th>
<th>Milligrams per serving</th>
<th>Percent DV*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakfast cereals, fortified with 100% of the DV for iron, 1 serving</td>
<td>18</td>
<td>100</td>
</tr>
<tr>
<td>Oysters, eastern, cooked with moist heat, 3 ounces</td>
<td>8</td>
<td>44</td>
</tr>
<tr>
<td>White beans, canned, 1 cup</td>
<td>8</td>
<td>44</td>
</tr>
<tr>
<td>Chocolate, dark, 45%–69% cacao solids, 3 ounces</td>
<td>7</td>
<td>39</td>
</tr>
<tr>
<td>Beef liver, pan fried, 3 ounces</td>
<td>5</td>
<td>28</td>
</tr>
<tr>
<td>Lentils, boiled and drained, ½ cup</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>Spinach, boiled and drained, ½ cup</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>Tofu, firm, ½ cup</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>Kidney beans, canned, ½ cup</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Sardines, Atlantic, canned in oil, drained solids with bone, 3 ounces</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Chickpeas, boiled and drained, ½ cup</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Tomatoes, canned, stewed, ½ cup</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Beef, braised bottom round, trimmed to 1/8” fat, 3 ounces</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Potato, baked, flesh and skin, 1 medium potato</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Cashew nuts, oil roasted, 1 ounce (18 nuts)</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Green peas, boiled, ½ cup</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Chicken, roasted, meat and skin, 3 ounces</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Rice, white, long grain, enriched, parboiled, drained, ½ cup</td>
<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

**Vitamin A 100% • Vitamin C 1%**

**Calcium 50% • Iron 14%**

**Calcium 46% • Iron 10%**

**Calcium 43% • Iron 10%**

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.*

<table>
<thead>
<tr>
<th><strong>NAMES</strong></th>
<th><em>Hibiscus sabdariffa</em>, Malvaceae, Hibiscus, Roselle, Jamaica</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PARTS USED</strong></td>
<td>Calyx/sepal (base/below petals, forming a whorl that encloses the petals and protect flower in bud). Seeds, leaves, fruits and roots - less common.</td>
</tr>
<tr>
<td><strong>HERBAL ACTION</strong></td>
<td>Nutritive, Demulcent, Diaphoretic. Anti-oxidant, antimicrobial, modulates inflammation, lowering body temperature, hypotensive, cardiotonic. <strong>Taste/temp/energy:</strong> Cooling, moistening, tangy/tart/sour, sweet-ish.</td>
</tr>
<tr>
<td><strong>HISTORIC USES</strong></td>
<td>Foods and teas, colorant, medicine: break fever, hypercholesterolemia, hypertension, antispasmodic and antimicrobial.</td>
</tr>
<tr>
<td><strong>PHYTOCHEMICALS</strong></td>
<td>Sepals: polysaccharides (esp pectin), organic acids (citric acid, ascorbic acid, maleic acid, hibsic acid, oxalic acid, tartaric acid) and flavonoids (anthocyanins, delphinidin-3-sambubioside &amp; cyanidin-3-sambubioside - strong hydrophilic antioxidants). The organic acids together with bioactive components have free radical scavenging activity. Aqueous extraction works for all sepal compounds. Other parts of plants = other compounds.</td>
</tr>
<tr>
<td><strong>CLINICAL USE</strong></td>
<td>Invitro studies demon. anti-ox, anti-flam, anti-microbial activity &amp; attribute exact compounds/mechanism. Less human studies - esp. antihypertensive effect 2/2 angiotensin-converting enzyme, scientific basis for folk medicine’s hypotensive observation. Animal study demo. anti-inflammatory effect of a tea due to the inhibition of production of cytokine and COX2.</td>
</tr>
<tr>
<td><strong>CULINARY NOTES</strong></td>
<td>Use sepals for tea, vinegar, popsicles, powder in baking. Pectin serves well for jams, sauces, chutneys.</td>
</tr>
</tbody>
</table>
DECORATIVE, NUTRITIVE FLOWERS

- Anise hyssop
- Bee balm
- Borage
- Calendula
- Chamomile
- Chives
- Dandelion
- Daylily
- Dill
- Elder
- Fennel
- Flax
- Garlic chives
- Honeysuckle
- Johnny-jump-ups
- Lavender
- Mallow
- Nasturtium
- New England Aster
- Pansy
- Peppermint
- Pineapple guava
- Pineapple sage
- Purple basil
- Redbud
- Rose
- Rose of Sharon
- Rosemary
- Sage, garden
- Spearmint
- Squash
- Violet
The importance of assessing the biological availability of nutritional and functional food components cannot be underestimated. Bioavailability has critical relevance to both the proportional digestion and uptake of nutrients and functional food components, but also the degree of fermentation and nature of the host-microbial co-metabolism in the colon. While there exists a vast literature on the food content of microalgal and macroalgal foods and supplements, extrapolating these findings to assess their quantitative contribution to human health is more tenuous. -Wells et. al 2017
BOTANICAL THERAPEUTICS: APPLICATIONS
THE FIVE FOOD GROUPS?

DAIRY

FRUIT

HERBS & SPICES

VEGETABLES

GRAINS

FAT

PROTEIN
FOOD: first write out the food(s)

F: FREQUENCY = how often the food, beverage, or meal to be eaten

O: OBJECTIVE = what it may do/support

O: OPTIONS = how much, and different methods to prepare, serve, shop for it, or grow it

D: DURATION = how many times per day, week, or month the prescription should be consumed

• Simple to follow
• Patterned after Rx advice which people are accustomed

Hibiscus mint & raspberry popsicles.

Have 1 popsicle 4 oz each (recipe provided) on hot summer days.

Recipe is cooling, calming, sugar free. Try different fruits to suit your choice!

Continue throughout summer or on hot days.
Organized by?

- **Medical condition**
- **Botanical properties**
- **Nutritional problem or condition**
- **Culinary best fit and action**
  1. **Begin: Stimulate Appetite & Digestion**
  2. **All Four Sides: Two Cool & Two Warm, for all Seasons**
  3. **Mains: Vegetarian or Omnivore**
  4. **Refreshments: Restorative, Reviving & Soothing**
  5. **Finishing: Carminative or Sweet: Closing the Meal**
  6. **Culinary Herbal Liquids & Extras: Broth(s), Oil, Vinegar, Honey, Sprinkles & Finishing Salt**
NOTE OF CAUTION & BENEFIT FOR PATIENTS & RDS
USING HERBS SAFELY

Choose the best quality you can find/access

The rule of “WHOLE”

Know/research herb-drug interactions

Potential side-effects and toxicity

Allergies? Research plant relatives/botany and titrate
• Know exact species, check references, use culinarily to strengthen/optimize, not as “medicine” to directly treat.

Attention California customers: To comply with California law, we have displayed warnings about one or more items in your order. Please acknowledge that you understand and wish to proceed with the order by clicking the Continue button. If you have any questions or concerns regarding these warnings, please contact our Customer Service Department by phone, chat, or email, and we’ll be happy to assist you.

WARNING:
Consuming this product can expose you to chemicals including lead, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov/food

Shatavari Root

Turmeric Root Powder

Milk Thistle Seed

Schisandra Berries

WARNING:
Consuming this product can expose you to chemicals including lead, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov/food
Where are the bok choy or the plantains? Why U.S. dietitians should be more culturally aware.
RESOURCES

BOOKS
- Alchemy of Herbs - Rosalee de la Foret
- Botanical Medicine - Dr. Marisa Marciano & Dr. Nikita Vizniak
- Foraging California: Finding, Identifying, And Preparing Edible Wild Foods In California - Christopher Nyerges
- Guide to Medicinal Herbs - Drs. Tieraona Low Dog, David Kiefer, Andrew Weil, Rebecca Johnson and Steven Foster
- Healing with Medicinal Plants of the West: Cultural and Scientific Basis for Their Use - Cecilia Garcia and James D. Adams Jr.
- Medical Herbalism - David Hoffman
- Modern Herbal Dispensatory - Thomas Easley & Steven Horne
- Naturally Healthy Babies and Children - Dr. Aviva Romm
- Stalking the Healthful Herbs - Euell Gibbons
- The Herbal Kitchen - Kami McBride
- The Herbal Kitchen - Jerry Traunfeld
- The Way of Herbs / The Way of Ayurvedic Herbs - Michael Tierra
- Vegetable Literacy - Deborah Madison

PRODUCT
- Your garden, your local farmer’s market, your grocery store
- Mountain Rose Herbs
- Starwest Botanicals
ONLINE: REFERENCE / ASSOCIATIONS / EDUCATION

• About Herbs app / Memorial Sloane Kettering - EBP, professional/consumer edu
• American Botanical Council - Professional referral & association
• American Herbalists Guild - Professional referral & association
• Chesnut School of Herbal Medicine - Professional / Consumer education
• Consumer Lab - Consumer education
• DSHEA (Law) - Federal regulations & lack of...
• East West School of Herbology - Professional / Consumer education
• Environmental Working Group - Consumer education
• Herb Walks with Lanny Kaufer (collection of local events from different sources) - Consumer education
• LactMed (NIH) - Professional resource re: herbs/meds/breastfeeding
• Linus Pauling Institute’s Micronutrient Information Center - Professional education
• National Center for Complementary and Alternative Medicine - EBP
• Natural Medicines Comprehensive Database - Professional education
• NSF Certification - Consumer education
• Ojai Herbal Symposium - Professional / Consumer education
• Up to Date - EBP
• Venice Family Clinic & Simms/Mann Health and Wellness Center, or other physician led integrative medicine practice - Professional referrals
• WHO Herbal Monograms - Professional resource


