The Longwood Herbal Task Force

(http://www.mcp.edu/herbal/default.htm) and

The Center for Holistic Pediatric Education and Research

Burdock (*Arctium lappa)*

Kathi J. Kemper, MD, MPH

Overview

Burdock has been used in numerous countries throughout history to treat problems ranging from arthritis and baldness to cancer. It is one of the key herbal ingredients in the 20th century cancer remedies, Essiac and the Hoxsey formula, and is also under investigation as an anti-HIV agent. There is little clinical evidence evaluating these uses. Burdock appears safe (it is eaten as a vegetable in Japan), except for occasional contact dermatitis and the risk of misidentification with toxic herbs such as belladonna. Animal studies suggest caution in using burdock in diabetic patients. It is not traditionally used during pregnancy, lactation or early childhood; insufficient data exist to make recommendations for use during these periods or for use with other herbs or medications.

Historical and Popular Uses

In medieval Germany, Hildegard of Bingen used burdock to treat cancerous tumors; its use in treating cancer soon spread to China. The Chinese also used burdock to treat upper respiratory infections and pneumonia arising from a "hot wind"[1]. In 14th century Europe, a combination of burdock and wine was used to treat leprosy. Later European herbalists used burdock for fevers, a variety of dermatologic conditions (baldness, scrapes, and burns), syphilis and gonorrhea. American herbalists used burdock as a diuretic and to treat arthritis, urinary tract problems, lice, ringworm, and eczema. Native Americans included the root in herbal preparations used by women in labor[2].

Burdock is traditionally used as a liver tonic, diaphoretic and diuretic, blood purifier, laxative, antipyretic, and antimicrobial. In the 1930's Harry Hoxsey included burdock in his herbal cancer treatment. Burdock has also been incorporated into the Canadian cancer remedy, Essiac[3]. In Ayurvedic medicine, burdock is used for upper respiratory infections and pneumonia.

Nowadays, burdock is used to treat skin problems, canker sores, arthritis, cancer, premenstrual syndrome, seborrhea, urinary tract infections, and HIV[4]. It is also used to treat renal stones[5], gout and rheumatic complaints. It is applied topically to treat eczema, seborrhea, warts, baldness and poorly healing wounds. In Britain, it is a component of several herbal compounds: Seven Seas Rheumatic Pain Tablets, Potter's Rheumatic Pain Tablets, Tabritis Tablets, Catarrh Mixture, Skin Eruptions Mixture, Potter's GB Tablets and Gerard House Blue Flag Root Compound Tablets[6]. Burdock roots and leaves are eaten as a vegetable in Japan and sold in specialty groceries in the United States.

Botany

Medicinal species: *Arctium lappa*, *Arctium minus*, *Lappa major* or *Bardanae radix.* The formal name is derived from the Greek, *arktos* or "bear" and *lappa* meaning "to seize"[7].

Common names: akujitsu, arctii, bardana, beggar's buttons, burdock root, great burdock, burr, burr seed, chin, clot-burr, cocklebuttons, cockleburr, daiki kishi, gobo, grosse klette, hardock, hare burr, hurrburr, kletterwurzel, lampaza, lappa, lappola, thorny burr, niu bang zi, woo-bang-ja[8].

Botanical Family: Compositae/Asteraceae (daisy)

Plant description: Burdock's stem has multiple branches, each of which is topped by many crimson-violet flowerheads that produce the famous "burrs" that give burdock its name. The biennial grows to three to nine feet in height. The root (the part used medicinally) has a very hard, horny, brown, longitudinally wrinkled bark and a white interior. The plant is readily grown from seed in moist, rich soil and full sun. Roots can be harvested the fall of the first year of growth or the spring of the second year[3]. Confusion with similar-appearing roots of *Atropa belladonna* is possible.

Where it's grown: Burdock is native to Europe and northern Asia, and naturalized in North America. It is frequently grown for medicinal use in Bulgaria, Yugoslavia, Poland and Hungary where limited quality control may increase possibility of contamination with *Atropa belladonna*.

Biochemistry

Burdock: Active Chemical Constituents

- Sulfur-containing polyacetylenes (00.1% - 0.002%)[9,10]
- Polysaccharides/mucilages: xyloglucan[11]
- Dilignans and lignans: arctigenin
- Other: organic acids (acetic, butyric, caffeic, chlorogenic, gamma-guanidino-n-butyric, isovaleric, linoleic, linolenic, myristic, oleic, palmitic, proprionic, stearic, tiglic); aldehydes; carbohydrates (up to 50% inulin); sesquiterpene lactones, phytosterols[12,13]

Arctigenin appears to have antimutagenic effects and inhibits tumor growth *in vitro*[14,15,1]. Several lignans are now under investigations as antiviral (particularly anti-HIV) and anticancer agents[16-18].

Experimental Studies

Burdock: Research on Potential Clinical Benefits
1. Cardiovascular: none
2. Pulmonary: Upper respiratory infections, pneumonia
3. Renal and electrolyte balance: Diuretic; renal stones
4. Gastrointestinal/hepatic: Liver tonic
5. Neuro/psychiatric: none
6. Endocrin: Hyper/hypoglycemic effects
7. Hematologic: none
8. Rheumatologic: none
9. Reproductive: Uterine stimulant
10. Immune modulation: Anti-inflammatory
11. Antimicrobial: Antibacterial, antiviral
12. Antineoplastic: Antimutagenic, antitumor
13. Antioxidant: none
14. Skin and mucus membranes: Eczema, psoriasis, baldness, warts
15. Other/miscellaneous: none

1. **Cardiovascular**: none
2. **Pulmonary**: Traditionally used to treat upper respiratory infections and pneumonia, but no studies have evaluated these uses.
3. **Renal and electrolyte balance**: Traditionally used as a mild diuretic and to treat renal stones[4], but no studies have evaluated these uses.
4. **Gastrointestinal/hepatic**: Traditionally used as a liver tonic[4], but no studies have evaluated this use.
5. **Neuro/psychiatric**: none
6. **Endocrine**: Hyper/hypoglycemic effects. Burdock is traditionally used as a hypoglycemic agent[19].
   i. *In vitro data*: none

ii. *Animal data*:: Streptozotocin-induced diabetic mice given burdock experienced aggravation of hyperglycemia[20]. However, studies in non-diabetic rats indicate some hypoglycemic effects[21].

iii. *Human data*: Reports from the 1930's stated that as the amount of burdock in the diet of diabetics increased, blood sugar levels and insulin requirements decreased[22].

7. **Hematologic**: none
8. **Rheumatologic**: none
9. **Reproductive**: Traditionally believed to be a uterine stimulant and therefore contraindicated during pregnancy except to induce or strengthen labor contractions[19]; no scientific studies have evaluated this claim.
10. **Immune modulation**: Anti-inflammatory

    i. *In vitro data*: Hot water extracts of burdock root and lignans from the root antagonized platelet activating factor (PAF) in rabbit platelets[23].

    ii. *Animal data*: Burdock decreased edema in the rat-paw model of carageenan-induced inflammation[24].

    iii. *Human data*: none
11. **Antimicrobial**: Antibacterial, antiviral

    a. Antibacterial[10]

        i. *In vitro data*: Burdock root has demonstrated activity *in vitro* against several gram negative bacteria: *E. coli, Shigella flexneri, Shigella sonnei*[25].

        ii. *Animal data*: none

        iii. *Human data*: none

    b. Antiviral[26]

        i. *In vitro data*: Burdock is active against HIV *in vitro*[4, 17, 27, 28].

        ii. *Animal data*: none

        iii. *Human data*: none

12. **Antineoplastic**: Antimutagenic, antitumor
    a. Antimutagenic
        i. *In vitro data*: Fresh burdock juice inhibited mutagenicity of 4-NO2-1,2 –DAB, ethidium bromide and other mutagens[29]; fresh juice also inhibited DMBA-induced chromosomal aberrations[14,30, 31].
        ii. *Animal data*: none
        iii. *Human data*: none
    b. Antitumor
        i. *In vitro data*: Like other crude plant extracts, burdock exhibited some cytostatic activity against certain cancer cell lines and inhibited tumor-promoting activity of Epstein Barr virus[32-34].
        ii. *Animal data*: none
        iii. *Human data*: none
13. **Antioxidant**: none
14. **Skin and mucus membranes**: Traditionally used topically for eczema, psoriasis, baldness and warts, but there are no studies evaluating these effects[35].
15. **Other/miscellaneous**: none

Toxicity and Contraindications

All herbal products carry the potential for contamination with other herbal products, pesticides, herbicides, heavy metals and pharmaceuticals. This is particularly concerning with imports from developing countries.

Allergic reactions can occur to any natural product in sensitive persons.

Allergies: Contact dermatitis to burdock has been reported[36].

Potentially toxic compounds in burdock: Tannins

Acute toxicity: Acute atropine-like poisoning occurred in a woman who drank a strong decoction of burdock tea. Presumably the burdock preparation used had been contaminated with belladonna[37]. Other acute anticholinergic-type poisonings have also been reported[38,39,40].

Chronic toxicity: Unknown; a toxicity study in rats showed no toxicity or carcinogenicity over four months when fed a diet containing 33% burdock[41].

Limitations during other illnesses or in patients with specific organ dysfunction: Streptozotocin-induced diabetic mice given burdock experienced aggravation of hyperglycemia[20]. This raises concerns about potential toxicity or side effects in diabetic patients taking burdock.

Interactions with other herbs or pharmaceuticals: Use caution for patients on hypoglycemic therapy.

Safety during pregnancy and/or childhood: Burdock is traditionally avoided during pregnancy (based on its putative effects as a uterine stimulant) and lactation and in children less than two years old[3]. There are insufficient data to evaluate these recommendations.

Typical dosages

Provision of dosage information dose not constitute a recommendation or endorsement, but rather indicates the range of doses commonly used in herbal practice.

Doses are given for single herb use and must be adjusted when using herbs in combinations.

Doses may also vary according to the type and severity of the condition treated and individual patient conditions.

Typical adult doses::

Root: Up to 2-6 grams of pure dried root daily[12]; this amount can be prepared as a decoction.

Tea: One teaspoon of dried root boiled in 3 cups of water for 30 minutes; drink up to 3 cups daily[3].

Decoction (1:20): 500 mL daily[12]

Tincture (1:10 in 45% alcohol): ¼ - 1 teaspoon (1 –5 ml) up to TID.

Liquid extract (1:1 in 25% alcohol): 2 – 8 ml TID[12].

Proprietary name: Anthraxivore

Multi-ingredient herbal preparations containing burdock root: Arbum, Cascade, Depuratif Panrel, Essiac, Hoxsey formula, Kleer, Rheumatic Pain Remedy, Skin Eruptions Mixture, Trifolium complex, Water Relief Tablets

Availability of standardized preparations: None

Dosages used in herbal combinations: Variable

Pediatric dosages: Unknown; usually avoided for children less than 2 years old

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