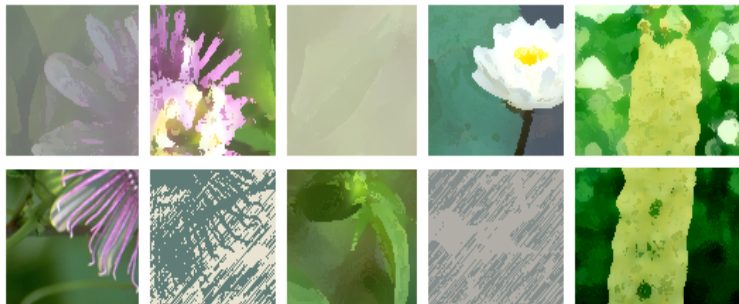


Aviva Ramm

Integrative Medicine for
Women and Children



Plant Profile: Uva Ursi

Common name: Uva ursi

Botanical name: *Arctostaphylos uva ursi*

Family: *Ericaceae*

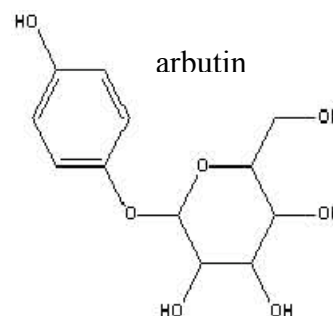
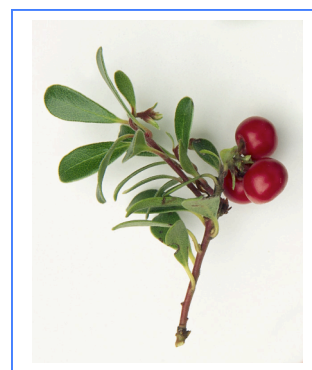
Part used: dried leaf

Major chemical constituents: The primary medicinally active constituents are the phenolic glycoside arbutin (which generates hydroquinone as a result of glycolysis), tannins, and flavonoids..

A small amount of free hydroquinone is also found in the leaves.

P-coumaric acid and caffeic acid, compounds with known antibacterial properties, and salicylic acid, a known bacteriostatic and anti-inflammatory agent, may also be of significance. ^{1, 2}

Uva ursi contains the flavonoid quercetin and the triterpenes ursolic acid. ³



Principal actions: Urinary tract antiseptic and bacteriostatic, anti-inflammatory, astringent. The mechanisms of action of uva ursi are not fully elucidated. It appears, however, that arbutin, and its aglycone, hydroquinone—a urinary disinfectant-- are primarily responsible for the herb's antimicrobial activity. Hydroquinones are primarily hydrolyzed in the kidney because tannins prevent enzymatic activity that would normally lead to its conversion in the gut; it also appears that arbutin might be hydrolyzed in the urinary tract as a result of β -glucosidase activity stimulated by pathogenic infection. ^{4, 5} Arbutin is rapidly absorbed after consumption of tea and extract preparations, with urinary excretion of metabolites within a few hours and up to 24 hours. ^{6, 7} Antibacterial actions may be most prominent in an alkaline (pH 8) urinary environment, however, activity is not necessarily dependent on elevated urinary pH.

Traditional and Historical use: Uva ursi was used by over 12 Native North American (US and Canada) tribes as a diuretic or for treatment of inflammation of the genitourinary tract.^{8,9} Uva ursi is one of the most commonly used urinary tract disinfectants in modern herbal medicine.² New Mexicans of Hispanic descent used an oral decoction as a treatment for bladder infection and in sitz baths for vaginitis, amongst other conditions.⁸ It appears to have been introduced into European medical practice in the 13th century as an effective treatment for conditions of the bladder and kidney, and as such has remained in use since.⁸ Goethe is reported to have been prescribed and successfully treated for kidney stones with this herb.¹⁰ Early American medical botanists reported on its usefulness in the treatment of genitourinary disorders and by the late 19th century it was widely used by Eclectic physicians as an astringent tonic for chronic diarrhea, dysentery, and menorrhagia, as well as for genitourinary disorders and diabetes. It has had an official entry in pharmacopoeias of numerous western nations since the 18th century, including *London Pharmacopoeia*, the *British Pharmaceutical Codex*, the *British Herbal Pharmacopoeia*, the *National Formulary* and the *United States Dispensatory*.^{2,8} It continues to be considered an important agent in genitourinary formulas and can be found in the pharmacopoeias of numerous countries including Austria, Czechoslovakia, Egypt, France, Germany, Hungary, Japan, Russia, Switzerland, and others.⁸

Clinical indications: Uva ursi leaves are primarily used as an antiseptic in urinary tract infections.⁸ The herb is approved by the German Commission E for the treatment of inflammatory conditions of the urinary tract.¹¹ It is widely used in the treatment of uncomplicated acute and recurrent urinary tract infection, based on its astringent and antibacterial actions, and when antibiotics are not deemed essential.³ Midwives include the herb as an astringent anti-inflammatory in sitz baths and perineal rinses for postnatal perineal healing and as part of treatment of vaginitis and urethritis. Unfortunately, there are few clinical trials and pharmacodynamic studies of uva ursi. In vitro studies using crude leaf preparations and extracts of uva ursi leaf have demonstrated mild antimicrobial activity against known UTI causing organisms including *C. albicans*, *E. coli*, *S. aureus*, and *Proteus vulgaris*, and others.⁴ Several studies have also demonstrated anti-inflammatory activity of the herb, particularly enhanced when extracts are used in combination with anti-inflammatory pharmaceutical drugs, for example, prednisolone, indomethacin, or dexamethazone.^{12 13} One double-blind, placebo-controlled, randomized study of 57 women utilized a combination extract of hydroalcoholic extract of uva ursi leaves, standardized to an unknown amount of arbutin and methylarbutin uva ursi with dandelion leaf (*Taraxacum officinalis*) to evaluate the efficacy of this combination for the prevention of recurrent urinary tract infection. Inclusion in the study required that the otherwise healthy individuals had suffered at least three episodes of cystitis in the last year and at least one episode in the last 6 months prior to this study. Patients were received either the extract (n = 30) or placebo (n = 27) 3 tablets 3 times daily for 1 month and were then followed for 12 months. At the end of the 12-month monitoring

period, significantly more women in the placebo group (n = 5) experienced recurrent cystitis compared to the treatment group (n = 0) ($P < 0.05$). No adverse effects were reported.^{2, 14}

Preparations used clinically: cold water infusion, hot water infusion decoction, tincture.

Dosage: 3g dried leaves to 150 mL water as a cold infusion steeped for 2 hours or as a hot infusion steeped 30 minutes, and taken up to 4 times daily.^{11 15} Doses should provide the equivalent of 400-840 mg arbutin daily, divider over 2-4 doses.^{1, 11} Uva ursi shows greater antibacterial activity in an alkaline environment, therefore some authors suggest giving it along with sodium bicarbonate or substantially increasing fresh fruit and vegetable intake to alkalinize the urine, while others suggest avoiding the use of acidifying agents during treatment.^{3, 8, 11, 15, 16} Tincture dose is 2-4 mL 3 to 4 times daily of a 1:5 preparation.² Alkalization of the urine seems not to be a prerequisite to improve the antiseptic properties of hydroquinone released from arbutin.⁷ Some amount of disagreement can be found in the literature regarding the requirement of an alkaline pH environment for the efficacy of this herb. Some authors postulate that a reduced urinary pH inhibits the efficacy of the herb, others argue that increasing the alkalinity of the urinary environment enhances the efficacy of the herb, while still others state that activity is not dependent on urinary pH. Given the reliability of this herb generally, it is prudent to conclude that if uva-ursi does not seem to be working, the addition of 4 “00” capsules of the equivalent of 1 tablespoon sodium or potassium bicarbonate may be taken once or twice daily, divided between uva ursi doses, to alkalinize the urine in such situations before making a final determination about efficacy.¹⁷ Some authors recommend discontinuation of the use of the herb after 7 days, however, the European Scientific Cooperative on Phytotherapy (ESCOP) recommends treatment be continued until complete disappearance of symptoms, up to a maximum of 2 weeks.³

Use in pregnancy and lactation: The *Botanical Safety Handbook* gives this herb a Class 2b and 2d rating: Not to be used in pregnancy, a caution which is reiterated by most authorities.^{1, 2, 11, 18} However, the reasons for contraindication are variable and not well-supported, ranging from alleged uterotonic and oxytocic activity to “theoretical fetotoxicity.”^{1, 2} Low Dog states that the herb has potentially fetotoxicity due to its hydroquinone content. Studies using pure hydroquinone have produced microtubulin dysfunction in bone marrow, and exposure of human lymphocytes and cell lines to hydroquinone has been shown to cause genetic damage.¹⁹ While Tyler et. al state that mutagenicity may be associated with this herb, other researchers report on low potential for mutagenicity and negative Ames test.² In animals administered 100 and 400 mg/kg sc per day of arbutin, no signs of fetal toxicity were observed.² Uva ursi has been used by midwives as a primary treatment of acute symptomatic cystitis in pregnancy for over 2 decades, with no adverse reports associated with its use. The transference to infants of arbutin/hydroquinone from uva ursi use during lactation has not been researched and therefore is not recommended by German authorities, however, the risk remains speculative.¹¹ McKenna et al recommend using only the lowest doses during

lactation, observing the infant for side effects, and using under the guidance of a knowledgeable lactation consultant.⁸

Safety information: (herb drug interactions, toxicity, and contraindications)

Used as per directed dose and duration, uva ursi appears to have a good safety profile. Few contraindications exist for the herb with the exception of avoiding use in kidney disorders, children under 12, and pregnancy (controversy over the latter discussed above).^{3, 8, 18} No justification is given for the caution against use in children.¹ Due to the high tannin content and bitter taste, this herb may cause nausea and vomiting in some patients.^{3, 15} High tannin levels may interfere with iron absorption in the gut and may aggravate highly inflamed or ulcerated GI conditions.¹ According to a number of authorities, arbutin containing preparations should not be taken for longer than a consecutive week, nor should they be taken more than 5 times annually without medical consultation.¹¹ No explanation for this recommendation is given though it is likely due to concern regarding hydroquinone consumption.² Contrary to this, the European Scientific Cooperative on Phytotherapy (ESCOP) recommends treatment be continued until complete disappearance of symptoms, up to a maximum of 2 weeks.³ Uva ursi is a known inhibitor of melanin synthesis. An observational case report was made of a 56-year-old woman who ingested uva ursi for 3 years noted a decrease in visual acuity within the past year. Ocular examination including fluorescent angiography revealed a typical bull's-eye maculopathy bilaterally, suggesting the need for further research into possible retinal toxicity from use of this herb.²⁰ There is no data regarding the direct toxicity of uva ursi preparations. Used acutely according to general dosing recommendations, this herb is expected to have very low carcinogenicity, though carcinogenicity has been observed in mouse and rat models given pure hydroquinone.² Excessive ingestion of arbutin may cause tinnitus, delirium, convulsions, collapse, and death.⁸ The only expected drug interaction is possible potentiation of prednisolone and related anti-inflammatory drugs by 50% methanolic extract.⁸

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