PIPSISSEWA

Chimaphila umbellata (L.) W. Bart.
Pyrolaceae
(also placed in Ericaceae)

***Common Names in English**:*
Prince's Pine. Umbellate Wintergreen, Wintergreen, Ground Holly, Bitter Wintergreen, Love in Winter, King's Cure, Rheumatism Weed.

Other species and subspecies:
Chimaphila menziesii
Chimaphila maculate

A number of subspecies exist.

Other taxonomic names in literature:
Pyrola umbellata L.

Description of Plant

Pipsissewa is a dwarf evergreen native shrub. It grows up to 35cm tall with whorls of leathery evergreen leaves that are 3-7cm long. The leaves are shiny, narrow and sharply toothed above the middle.
The flowers are nodding, waxy, whitish–pink to rosy, saucer shaped. There are 3–15 flowers in a small loose cluster and they are 5-7mm long. They have a faint perfume. Pipsissewa blooms from June to August throughout its range and is a long-lived perennial with rhizomatous growth. It most commonly occurs in mixed woods and coniferous forests on dry, well-drained, rocky or sandy soils up to 3,500m. Pipsissewa also occurs in moist or imperfectly-drained situations throughout its range.[1]

Range

Pipsissewa is widely distributed in the northern latitudes of the northern hemisphere. It is found from Newfoundland to Alaska south to California and Mexico, and east to New Mexico, Colorado, and South Dakota. It is also found in the eastern United States from Maine south in the mountains to Georgia and west to Minnesota.[2]

Chimaphila umbellata

Common Misidentification Errors

Many of the plants in the Wintergreen (Pyrolaceae) family have similar flowers to pipsissewa so care must be taken to properly identify the plant because the other members of the family cannot be substituted for Pipsissewa medicinally.

The name wintergreen is most commonly used for *Gaultheria procumbens*.
Gaultheria procumbens cannot be substituted for pipsissewa medicinally. The plant should be identified carefully using the Latin name.

Chimaphila maculata is endangered in Ontario and Quebec so great care should be taken not to harvest it by mistake.

APPENDIX 2

➢ *Part of the Plant Used Medicinally*

Leaves	Bartram 1995
Leaves and roots	Blankenship 1905
Roots	Bolyard 1981
Leaves	Gladstar 2000
Leaves	Grieve 1975
Leaves	Hebda 1996
Whole Plant	Hutchens 1973
Leaves	Jellin et al 2000
Leaves	Kings American Dispensatory 1898
Leaves	Kloss 1988
Leaves	Lust 1974
Leaves	Miller 1985
Leaves and roots	Millspaugh 1974
Leaves	Moore 1979, 1993
Leaves	Tilford 1993
Leaves	Turner 1971
Leaves and roots	Willard 1996
Leaves	Wren 1988
Leaves	Youngken 1948

The leaves, not the roots, are currently used in natural health products. The roots have been used traditionally as a medicine but the plant regenerates too slowly for commercial wildcrafting of the roots. The roots have also been used as a flavouring in root beer.

➢ *Harvest Times*

Pipsissewa can be harvested at any time of year, but the best time to harvest is in the Fall once the seeds have fallen to aid reproduction[3].

➢ *Harvest Area*

It is important to ensure that the harvest area is not contaminated with heavy metals, industrial pollutants, pesticides or herbicides, or oil run off from roads, or run off from mines.
The harvest area should not be within the fall out area for industrial pollutants as the plants can absorb pollutants through their leaves even if the pollutants are not found in significant amounts in the soil[4]. If

the history of the harvest site or any adjacent waterway is not known a soil sample should be tested for the above pollutants.
Harvesting should not take place within 50metres of main roads[5]. Check to make sure that the area has not been sprayed with herbicides or pesticides prior to harvesting.

➢ *Harvesting Methods*

The plant should be identified using "Good Practices for Plant Identification for the Herbal Industry"[6]. If there is any doubt about the identity of the plant seek an experienced person to confirm identity.

Pipsissewa is very sensitive to harvesting and great care must be taken not to damage the plant colonies or surrounding area. Pipsissewa is slow growing and does not tolerate trampling[7] so care must be taken not to compact the soil around the plants in the act of harvesting.
Although there is traditional use of the roots they should not be commercially harvested due to the very poor regeneration of the plant colony after root harvesting[8].
There are insufficient studies to show reliable data on sustainable harvesting methods, but the studies that have been carried out demonstrate some methods that are definitely not sustainable.
Removal of entire stems and foliage is not sustainable [9] and results in a large percentage of the plants dying completely.
Removal of roots is not sustainable.
Only plants with more than two whorls of leaves should be harvested with the bottom two whorls of leaves being left on the plant[10]. (A whorl means three or more leaves radiating from one point on the stem.) Pipsissewa responds to harvesting by sprouting new growth in the year following harvest, but may take up to ten years to reach pre-harvest levels[11].
Leaves should not be wet with rain or dew when harvesting.

The stem, above the bottom two whorls of leaves, should be cut using sharp cutters rather than a knife to avoid the roots being pulled.

The following practices should be avoided as they will cause the plant to sweat and quality will deteriorate DO NOT: harvest into plastic bags, pack a large amount of plant into a harvesting container, leave the plant piled up for any period of time prior to drying, bruise the plant during harvesting, or harvest on a hot day.
Do not delay transporting plant to drying facility.
Harvested plant material should be collected in clean containers and contact with the ground should be avoided. Harvesting containers or tarps must be cleaned between harvest batches.
In order to ensure that the harvesting is not negatively impacting the stands you are collecting from you must monitor and record the sustainability of your harvesting operations on an on-going basis.

- always make sure there are enough mature plants left after harvesting to maintain habitats that other wildlife depend on;
- avoid damage to neighbouring species, especially rare or threatened species;
- take particular care with species that have symbiotic relationships or otherwise depend on each other;
- avoid harvesting operations that lead to erosion or damage to sensitive habitat, and
- take and keep samples of each batch harvested[12].

Harvester must have clean hands and be free of any disease that is transmittable through food.

Tools must be cleaned between harvest batches.

Plant with more than two whorls of leaves. (Photo A.Howe)

➢ *Regeneration*

Regeneration is slow. The plant produces seed but this is not the primary method of spread. It spreads mainly by its rhizomes and this growth is slow[13]. Insufficient studies have been carried out to ascertain regeneration rates post harvest but the studies do show that regeneration is slow[14], [15], and may take up to ten years to reach pre harvest levels. Regeneration and sustainable harvest rates will be site specific so permanent sample plots must be set up to monitor and assess sustainability and harvest impact. This will almost certainly be required should organic certification become available in the future.

➢ *Harvest Records*

The harvester must keep records of each harvest batch, these should include identification of the plant, name of plant in Latin, common name, harvest date, harvest location (using map reference or indicated on a map), part harvested, quantity harvested, sustainable harvest rate for area, harvest rate for this harvest, quality of material collected, unusual weather during the growing season that might influence plant constituents, delays in getting the plant to drying stage which would affect quality. Each harvest batch must be given a batch code that will correspond with the record for the harvest batch and with the batch sample and this code will follow the batch through drying, processing and storage or to whatever point the material is sold. Record sale details including name and contact details of buyer. Records should be kept for two years. CHSNC[16] is in the process of developing templates for GAP records that can be used for wildcrafting. The “Good Practices for Plant Identification for the Herbal Industry”[17] can be used to document plant identity.

➢ *Preparation for Drying*

As the leaves are spread on racks for drying ensure that no other plants have been included in the harvest. The leaves must not be washed prior to drying.

➢ *Drying*

The leaves should be spread out on racks and dried between 30C to 45C out of direct light, in a drying shed. A good airflow around the drying racks is essential. Drying outside, or with no heat will tend to result in browning[18]. The leaves should be crisp, but not brittle when dry.

Drying racks should be labeled individually with the name of the drying herb and the code applied at harvesting. Any problems associated with drying must be recorded with the corresponding batch records.
Drying, processing and storage facilities should provide protection of the plant-material against pests, rodents, insects, birds, and pets and other domestic animals[19].
Drying racks must be cleaned between harvest batches.

➢ *Extraction Techniques*

Tincture, Fluid Extract, Encapsulation, Infusion and Decoction[20] are all used.

➢ *Storage*

Pipsissewa must be stored in dry conditions out of direct light. The storage area should be heated to avoid damp and mould, but not at high temperatures as degradation of the product will occur. Dry material should be stored in new polypropylene sacks. Each harvest batch must be labeled appropriately with the name of the plant, quantity and the code applied at harvesting. Details of any problems that occurred during storage (eg. Loss of heat, overheating, insect infestation in building etc.) must be recorded with the corresponding batch records.
Drying, processing and storage facilities should provide protection of the plant-material against pests, rodents, insects, birds, pets, and other domestic animals[21].

➢ *Toxicity or Health and Safety Cautions for Harvesters and Processors*

Pipsissewa leaves contain chimaphilin which is a skin sensitizer[22]. Pipsissewa is traditionally used as a counter-irritant to irritate or blister the skin over rheumatic joints, so caution should be exercised when handling this plant.

➢ *Identification of Commercial Product*

Pharmaceutical Name: *Herba Chimaphilae umbell*.
Entire leaves and a few stems, olive green in appearance. Leaves 2.5 to 7 cm in length and from 8 to 20mm in breadth, the distal portion coarsely and sharply serrate, acute or somewhat obtuse, the proximal wedge shaped and nearly entire; leathery, smooth shiny. Veins prominent.
Powdered herb: Moderate yellowish brown to light olive. Microscopical: Fragments of epidermis composed of cells with clear unevenly thickened, porous and wavy vertical wealls. Thos from the lower epidermis showing bradly elliptical stomata up to 40 um in length; fragments of mesophyll, some of the cells of which contain choroplastids, others tannin; fragments of parenchyma containing a reddish brown to ellowish orange amorphous substance; fragments of the epidermis of the stems, the cells of which contain a purplish pigment that is coloured yellowish red with acids and green with alkalies; calcium oxalate in rosette aggregates up to 65um in diamter; starch grains few, simple, spheroidal, up to 16um in diameter or 2 to 4 compound; fragments of sclerenchyma fibers; trachea with spiral or annular thickenings; elongated, thick walled, lignified cells showing minute reticulations.[23]
Odor: slight
Taste: Astringent, bitter.

➢ *Official Monographs*

No current English language monographs.
See "*Classic Herbal Texts"* for historical monographs. Available online at: http://www.henriettesherbal.com/eclectic/index.html

➢ *Organic certification*

Standards for organic certification of wildcrafted plants has not yet been formalised in Canada[24]. The Soil Association (organic certifying body in the UK) have standards for Wild Harvesting. These standards are recognized in the EU. The standards address endangered species, harvesting areas, requirements for sustainable harvest management plans, processing, personnel training, batch tracking, samples and record keeping. The full Wild Harvesting Standards can be ordered from the Soil Association[25].

➢ *Land Access for Harvesting*

Private Land: Written permission to harvest must be obtained from the land owner.
Crown Land: No permission or license is required however harvesting must be carried out within provincial Ministry guidelines. In BC such harvesting is subject to the Forest and Range Practices Act.[26]
First Nations Reserve Land: Permission must be obtained from the Band with details of exactly what you wish to harvest. For many First Nations harvesting of medicinal plants is a spiritual practice with strict rules about how the harvest is carried out. Knowledge of and respect for these practices should be a part of any request for permission to harvest.
National or Provincial Parks: It is illegal to harvest in National or Provincial Parks.

➢ *Points of Concern*

Chimaphila umbellata is endangered or threatened in some US states[27] and in Ontario and Quebec in Canada. The local status should be checked and no harvesting should take place if the plant is on endangered or threatened lists.
It is on the United Plant Savers "To Watch" list.
Although it is reported as common in some provinces in Canada it is vulnerable in several provinces due to various factors including declining habitat[28].
Its slow growth rate, the increasing demand and lack of agriculturally grown product could have a negative impact on already sensitive wild populations.
Claims for safety and efficacy based on First Nations knowledge must be accompanied with details of benefit sharing as per the Convention on Biological Diversity.

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Researched and compiled by Amanda Howe MSc. MNIMH