



Ethnobotanical Leaflets



Mayapple

By Brian T. Fondren

Podophyllum peltatum is most commonly known as the mayapple, but in various regions it is also known as Devil's apple, hog apple, Indian apple, umbrella plant, wild lemon, and American mandrake (though it should not be confused with true mandrake, *Mandragora officinarum*, an unrelated Old World plant whose roots have been used throughout history for medicines and potions). The plant gets its generic name from the Greek words *podos* and *phyllon*, meaning foot shaped leaves. *Peltatum* means shield-like.

Mayapple is a well know rhizomatous herb that grows in gregarious groups in the oak-hickory forests all over the eastern United States and Southern Canada. The root is composed of many thick tubers, fastened together by fleshy fibres which spreads greatly underground, sending out many small fibers at the joints, which strike downward. The stems are solitary mostly branched, one to two feet high, crowned with two large, smooth leaves, stalked, peltate in the center like an umbrella the size of a human hand. It is sometimes called "umbrella plant" because the first sign of it in early spring is a short looking like a closed "umbrella". It's composed of five to seven wedge shaped divisions some what lobed and toothed at the apex. It has a whitish nodding flowers with parts in whorls of three between palmately dissected peltated leaves, about two inches across. The plant flowers from March to May, and fruits ripen from May to August. When it falls off, the fruit then develops, swells to the size and shape of the common rosehip, being one to two inches long. It is yellow in color and is sweet, though slightly acidic. The leaves and roots are poisonous. The foliage and stems have been used as a pot-herb.

The Mayapple loves company and can be found growing in warm, sheltered spots, such as partially shaded borders, woods, and marshes, liking a light, loamy soil. It requires no other culture than to be kept clear of weeds, and is so hardy as to be seldom injured by frost. Mayapple is an easy-to-grow perennial and can quickly crowd out weaker plants. Large colonies develop from long, creeping rhizomes.

The mayapple is perennial plant in the barberry family (Berberidaceae). The plants long, thin rhizome is the most poisonous part, but also the most useful (since the 1820's the plant has been recognized as

being of medicinal value in the official U.S.A Pharmacopoeia) because it contains high concentrations of the compounds podophyllotoxin and alpha and beta peltatin, all of which have anti-cancer properties. During the last twenty or thirty years, attention has been drawn by pharmacologists and medical researchers to the fact that *Podophyllum* contains chemical agents responsible for anti-cancer activity. Some preparations are used for treatment of venereal wart (*Condyloma acuminatum*) and skin Cancers.

It was said the five percent of the dried rhizome and root consist of a resin called podophyllin that was used as purgative by Native North American tribes. The resin was prepared by percolation of the fresh root in alcohol, which is then evaporated until it turns syrupy. The tribes then added cold water with agitation and allowed it to stand for twenty-four hours to precipitate the resin. The mixture is decanted and the precipitate is collected by straining and then dried at 80 degrees F. Its approximated yield is around eighty-four pounds of resin per ton of root.

The plant was first introduced to the settlers of the New World by the Indians. In New England the root was used to stimulate glands and for gastrointestinal disorders. The root was also used as a tonic for liver, lung, and stomach ailments. A decoction was made by boiling the roots in water and was used to treat rheumatism. This was also used on chickens who had diarrhea. Years ago it was used as a poison for eliminating chipmunks. The various uses of the plant were considered to be similar to that of the Jalap (a plant of the Mexican origin).

Historical uses by Native Americans are varied. It's uncertain how the Indians first discovered the various uses of mandrake, but most believed that it was found by trial and error or by accidental use. The Indians harvested the plant by drying the rhizomes in the shade and making a powder out of them. Many tribes consume or drink brew from the powder as a laxative or to treat intestinal worms. Penobscot Indians used mayapple in poultice form for external use of wart tumors on the skin. It was also used for committing suicide by the Hurons and Iroquois. Cherokee Indians used the plant for an anti-rheumatic, cathartic, dermatological aid, ear medicine, insecticide, and laxative. Other Cherokee used the root as a purgative, vermifuge, for the treatment of warts and as an anthelmintic.

The rhizome and root of the Mayapple have been utilized for their pharmacological properties. The rhizome is poisonous by contact. You can get severe dermatitis from exposure of this part of the plant including conjunctivitis, erythema, and keratitis. Constituents of podophyllin resin obtained from the rhizome and root of *Podophyllum peltatum* have been analyzed. When purified, picropodophyllin (C₁₅H₁₀O₆) has a bitter taste, and forms a silky, colorless crystal that is insoluble in water but soluble in strong alcohol, ether, and chloroform. A related compound, picropodophyllinic acid, is noted for keeping the crystalline picropodophyllin in solution, forming granules that can be dissolved in alcohol and other organic solvents.

From all this, it appears that Mayapple is a very valuable medicinal plant. It is still being collected in the wild and supplies are being bought by Abbott Laboratories in North Chicago, where about 300,000 pounds are needed annually. Abbott Laboratory research scientists believed that it would be desirable to cultivate Mayapple on a commercial scale. Now in closing it is apparent that *Podophyllum* is a medicine

of most extensive service; its greatest power lies in its action upon the liver and bowels. It is a gastro-intestinal irritant, a powerful hepatic and intestinal stimulant. *Podophyllum* is a powerful medicine exercising an influence on every part of the system, stimulating the glands to healthy action. It is highly valuable in dropsy, biliousness, dyspepsia, liver and other medical conditions. Its most beneficial actions is obtained by the use of small doses frequently given. Mayapple acts admirably upon all the secretion, removing obstructions, and producing a healthy condition of all the organs in the system. Mayapple may be given by infusion, tincture, decoction, substance, or tincture but it must never be given warm.

Characteristics

Family: Berberidaceae

Plant Description: Perennial herb; stem unbranched, with one - two large, rounded umbrella like, deeply five - nine lobed leaves; flower solitary, nodding, in axial between two leaves, six - nine parted, white; fruit apple - like, yellow when its ripe.

Origin: Found: In forest or natural areas in the USA in rich woods and fields, pastures.

Mode: ingestion

Poisonous Part: Unripe fruit, leaves, root

Symptoms: Salivation, vomiting, diarrhea, excitement, headache, fever, coma, and other symptoms may vary pending of amount ingested.

Toxic Principle: Podophyllin

Severity: Highly toxic, may be fatal if eaten!!!

Edibility: Ripe (yellow and soft) fruit is edible raw, but in limited quantity. The roots and leaves are poisonous. DO NOT EAT!! Only collect fruits from areas you know have NOT been treated with pesticides.

SAFE HANDLING PROCEDURE: Wash fruit thoroughly in warm water. Don't use detergent or any type of sanitizer, which can leave a residue. The fruit has a lemon-like flavor and is used for jams, jellies and marmalade.

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