Epazote Herb Profile

Also known as

Chenopodium ambrosioides, Jesuits Tea, Pigweed, Mexican Tea, Wormseed

Introduction

Epazote is a perennial green herb that grows to about three feet. It is native of Southern Mexico, Central and South America. It has been known as an invasive weed, but is more commonly used as a medicinal herb or spice for traditional Mexican dishes. Epazote has a quite a pungent taste, and its fragrance is quite strong, but difficult to describe. The smell has been compared to a great diversity of scents, which range from citrus to gasoline, and mint to a vague perfume like smell. The Aztecs had a long history of using the herb as a culinary additive, but the word that they used for it translated as "smelly animal". It is most commonly added to black beans for flavor and to help avoid the gastric discomfort that sometimes occurs after eating beans.

Parts Used

The whole leaf or stem.

Typical Preparations

Added to any dish as a spice, or used as a tea.

Summary

The Aztecs used Epazote both as a spice as well as medicinally. It is said to prevent flatulence caused by eating beans, but also in the treatment of amenorrhea, dysmenorrheal, malaria, hysteria, and asthma. Oil of Chenopodium is derived from Epazote. The oil is an antihelminthic that is known to kill intestinal worms. The nickname wormseed is derived from this application because it is said to prevent worms in animals. A great many sources say that it is poisonous in large quantities, but no one can quite define what amount "large" constitutes. Epazote is also known to have insecticidal properties.

Precautions

None known

Botanical: Chenopodium anthelminticum (BERT.)
Family: N.O. Chenopodiaceae

- Description

---Synonyms---Chenopodium Ambrosioides (Linn.). Mexican Tea. Jesuit's Tea. Herba Sancti Mariae.
---Part Used---Seeds.
---Habitat---Indigenous to Mexico and South America, Missouri, New England, and eastern United States.

The American Wormseed plant (*Chenopodium ambrosioides*, Linn.), and still more a variety of it, *C. ambrosioides*, var. *anthelminticum* (Bert), furnishes the important drug Chenopodium.

It is indigenous to Mexico and South America, but has become thoroughly naturalized as far north as Missouri and New England, where it grows about dwellings and in manured soils. It is now found in almost all parts of the eastern United States, a coarse, perennial weed of the roadside and waste places, smoothish, more or less viscidglandular, the stout, erect, angular and grooved stem growing to a height of about 2 feet.

---Description---The leaves are slightly petioled, oblong-lanceolate, toothed, the upper ones entire and tapering at both ends. The small, very numerous flowers are yellowish-green in colour and occur in numerous small clusters, or globular spikes, arranged in the axils of slender, lateral, leafy branches. The calyx is five-cleft, the lobes ovate, pointed. Stamens five, ovary covered on the top with small, oblong, stalked glands; styles, two to three. The fruit is perfectly enclosed in the calyx, obtusely angled, the seed smooth and shining, the embryo forming about three-quarters of a ring around the mealy albumen.

The drug consists of these small, irregular, globular fruits, not larger than the head of a pin. They are very light and of a greenishyellow or brown colour. On rubbing the fruit, the membraneous pericarp is removed and the single, small, brownish-black seed is exposed.

The odour of the fruit is strong, resembling somewhat that of eucalyptus; the taste, pungent and bitter.

The fruit of *C. ambrosioides*, var. *anthelminticum* is even more aromatic.

Both varieties of the plant flower from July to September and the fruits ripen successively through the autumn and are collected in October.

The whole herb has a strong, peculiar, somewhat aromatic odour, which is due to the presence of a volatile oil and is retained on drying. The leaves have been used in place of tea in Mexico.

The American aborigines used the whole herb in decoction in painful menstruation, but its principal use has been - both leaves and seeds - as a vermifuge, and it is to-day considered one of the best expellents of lumbricoids.

Though all parts of the plant possess anthelmintic properties, the fruits and the oil extracted from them are alone employed, being official in the United States Pharmacopoeia. It was long customary for the seeds to be administered in the form of a powder, or an electuary, but although the activity of the seed is unquestioned, it has now been entirely displaced in America by the volatile oil obtained by distillation from the crushed fruits, to which the medicinal importance of the fruit is due.

The oil was first isolated in 1895 by a German pharmacist who lived in Brazil, where the seeds had long been used as a vermifuge.

Most of this oil is distilled in Maryland, and since Baltimore is the commercial centre of that state, this

oil is commonly known as Baltimore oil, in distinction from Western Missouri oil, which has at times played a role in the market. The plant is now cultivated in large quantities near Baltimore.

[Top]

---Constituents of the Oil---American Worm seed oil, known as Chenopodium oil, is colourless or yellowish, when freshly distilled, becoming deeper yellow and even brownish by use. It has a peculiar, penetrating, somewhat camphoraceous odour (the peculiar odour of the plant), and a pungent, bitter taste.

The yield of oil from the crushed fruits is 0.6 to 1.0 per cent.

Its chief constituent is Ascaridole, to the high percentage of 60 to 70 per cent, an unstable substance, allied to cineal, readily decomposed on heating, with the production of a hydrocarbon. It also contains *p*-cymene, *a*-perpinene, probably dihydro-*p*-cymene and possibly sylvestrene. Betzine and choline have also been reported.

According to the researches of De Langen, Flue and Welhuizen, of the Dutch-Indian Medical Service, in 1919, the oil contains Glycol and Safrol, and these authors ascribe the powerful effect of the oil to the combination of Ascaridole and Safrol.

The characters of the oil are:

Specific gravity, 0.950 to 0.990.
Optical rotation, - 5 degrees to 10 degrees.
Refraction index, 1.4723 to 1.4726.
Saponification number, 246 to 280.
Soluble in three volumes of 70 per cent alcohol.

Adulteration with American turpentine oil causes lowering of the specific gravity and insolubility in alcohol.

The fresh plant yields the alkaloid Chenopodine, a white tasteless and odourless crystalline powder, soluble in 11 parts of cold water, 3 of boiling water and 20 per cent of alcohol.

[Top]

---Medicinal Action and Uses---Chenopodium, being a very active anthelmintic, is frequently used for the expulsion of lumbricoid (round) worms, especially in children. Because of its efficacy, ease of administration and low toxicity, it is perhaps the most valuable of all the vermifuge remedies.

The bruised fruit may be given in doses of 20 grains, in the form of an electuary.

A fluid extract is prepared, of which the dose is 1/2 to 1 drachm.

The expressed juice of the fresh plant is also employed, in tablespoonful doses. A decoction made by boiling 1 OZ. of the fresh plant with 1 pint of milk or water has sometimes been given in doses of a wineglassful.

The volatile oil is now much used, the dose of which, for a child, is from 5 to 10 mimims.

The drug should be given in one full dose, fasting, and then be followed, in about two hours, by an active purgative, such as castor oil. When the purge has acted, the patient can take food. The treatment should be repeated ten days later. In view of the uncertain ascaridole contents of some samples, small doses should be given at first.

Toxic symptoms are transient dizziness and vomiting.

The oil has been recommended in the treatment of malaria, chorea, hysteria and other nervous diseases.

The plant has been employed, under the name of *Herba Sancti Mariae*, in pectoral complaints, as an expectorant, in catarrh and asthma.

Although oil of Chenopodium has been official in the United States Pharmacopoeia for many years, it does not appear to have received official recognition elsewhere. It owes its modern popularity to the investigations of Brüning, who repeatedly drew attention to it (see *Zeitschrift für exot. Path*., 1906).

In 1912 two Dutch physicians, both working in Delhi (Dutch East Indies), stated that this essential oil is the most effective remedy against *ankylostomiasis*, the Hookworm disease. Originally, this disease was exclusively a tropical and subtropical one, but about thirty years ago, it appeared in mineworkers in Europe north of the Alps.

The Hookworm, which causes the disease, is called *Ankylostos duodenale*, the male of which attains a length of 10 mm., the female 14 mm. The living hookworm is fleshcoloured, the dead one has a grey or white colour. At the foot of the hook-formed teeth, glands, each consisting of a single cell, pour their contents into the wounds which the worm makes in the mucous membrane of the intestinal canal and into the blood-vessels by means of the teeth. It is supposed that the phenomena of the disease must be attributed to the mechanical changes brought about by the hookworm, as well as to a poisonous substance secreted by the worm. The worm deposits its eggs in the intestinal canal of its host. Together with the faeces, these eggs leave the body of the host. At a temperature of 25 degrees to 30 degrees C., the larva develops, and after two changes of skin, enters into the body of the new host by means of vegetables, drinking-water, or through the skin.

Several medicaments have been tried against the hookworm; thymol had appeared to be the only remedy that had been used with some success, but it is much surpassed by Chenopodium oil, which gives better results than eucalyptus, betanaphthol, or thymol.

The use of this oil commenced when thymol was not available during the early days of the Great War. It proved to be satisfactory in every way and is the drug commonly used in Ceylon since 1917. Statistics indicate that in three treatments, about 95 per cent of the worms are removed from the body. It has also been used in Fiji and has proved an anthelmintic of great potency. It is said there that over 80 per cent. of the worms are expelled after a single dose.

The maximum individual dose would appear to be 1 c.c., but it is best given in three cacheta of 0.5 c.c. each, at two-hourly intervals, followed three hours later by a saline purge of 1 OZ. of magnesium sulphate.

The observances of the two Dutch physicians Schuffner and Vervoort have been confirmed by other medical men, and at present, Chenopodium oil has become the specific remedy against the Hookworrn disease.

It is, however, a dangerous remedy in the hands of the layman on account of its activity, for unfortunately, the oil as it appears in commerce contains markedly varying quantities of the active principle Ascaridole, and the amount lessens with keeping, making it desirable that dealers should always mention the Ascaridole percentage of the oil they are selling and the date of distillation. The freshly-distilled oil in cases of overdoses has been known to cause symptoms of poisoning. Ascaridole, extracted and administered in place of the whole oil, is effective, and the use of it eliminates uncertainty of the strength of a dose of the oil, but it is relatively costly.

Carbon tetrachloride, recently introduced as a remedy for Hookworm, has proved most efficient. It is the cheapest of all advocated treatments, but the dose of 3 mils., at present given, sometimes proves dangerous and would appear to require reduction. A combination of this drug with Ascaridole is being now tested.

Chenopodium oil has also been shown to be of great service against the tapeworm and is employed in veterinary practice in a worm mixture for dogs, combined with oil of turpentine, oil of aniseed, castor oil and olive oil.

Since this oil has proved so important, steps have been taken to cultivate the plant in the Dutch East Indies, and these endeavours have met with great success, and manufacture of the oil in Netherlands India is now being extensively carried on.

[Top]

---Other Species---

From *C. glaucum* (Linn.), the Oak-leaved Goosefoot of the United States, a medicinal tincture is made, which is used for expelling round-worms. There exists some doubt as to whether the properties of the tincture are not also due in part to the aphis that infests the plant.

This species is also a native of Great Britain.

The European and Asiatic *C. Botrys*, Jerusalem Oak, or Feather Geranium, is considered an expectorant in France.