

# Hemlock

## POISON!

**Botanical: *Conium maculatum* (LINN.)**

**Family: N.O. Umbelliferae**

### Synonyms

Herb Bennet. Spotted Corobane. Musquash Root. Beaver Poison. Poison Hemlock. Poison Parsley. Spotted Hemlock. Kex. Kecksies.

### Parts Used

Leaves, fruit, seeds.

### Habitat

It is by no means an uncommon plant in this country, found on hedgebanks, in neglected meadows, on waste ground and by the borders of streams in most parts of England, occurring in similar places throughout Europe (except the extreme north) and also in temperate Asia and North Africa. It has been introduced into North and South America.

The Hemlock is a member of the great order Umbelliferae, the same family of plants to which the parsley, fennel, parsnip and carrot belong.

Many of the umbelliferous plants abound in an acrid, watery juice, which is more or less narcotic in its effects on the animal frame, and which, therefore, when properly administered in minute doses, is a valuable medicine. Among these the most important is *Conium*, or Hemlock. Every part of this plant, especially the fresh leaves and fruit, contains a volatile, oily alkaloid, which is so poisonous that a few drops prove fatal to a small animal.

### History

The Ancients were familiar with the plant, which is mentioned in early Greek literature, and fully recognized its poisonous nature. The juice of hemlock was frequently administered to criminals, and this was the fatal poison which Socrates was condemned to drink.

The old Roman name of *Conium* was *Cicuta*, which prevails in the mediaeval Latin literature, but was applied about 1541 by Gesner and others to another umbelliferous plant, *Cicuta virosa*, the Water Hemlock, which does not grow in Greece and southern Europe. To avoid the confusion arising from the same name for these quite dissimilar plants, Linnaeus, in 1737, restored the classical Greek name and called the Hemlock (*Conium maculatum*), the generic name being derived from the Greek word *Konas*, meaning to whirl about, because the plant, when eaten, causes vertigo and death. The

specific name is the Latin word, meaning 'spotted,' and refers to the stem-markings. According to an old English legend, these purple streaks on the stem represent the brand put on Cain's brow after he had committed murder.

Hemlock was used in Anglo-Saxon medicine, and is mentioned as early as the tenth century. The name Hemlock is derived from the Anglo-Saxon words *hem* (border, shore) and *leác* (leek or plant). Another authority derives the British name 'hemlock' from the Anglo-Saxon word *healm* (straw), from which the word 'hulm' is derived.

The use of Hemlock in modern medicine is due chiefly to the recommendation of Storch, of Vienna, since when (1760) the plant has been much employed, though it has lost some of its reputation owing to the uncertain action of the preparations made from it.

### **Description**

Hemlock is a tall, much branched and gracefully growing plant, with elegantly-cut foliage and white flowers. Country people very generally call by the name of Hemlock many species of umbelliferous plants, but the real Hemlock may be distinguished by its slender growth, perfectly smooth stem which is marked with red, and its finely-divided leaves which are also smooth.

It is a biennial plant, usually growing from 2 to 4 feet high, but in sheltered situations sometimes attaining nearly double that height. The *root* is long, forked, pale yellow and 1/2 to 3/4 inch in diameter. The erect, smooth *stem*, stout below, much branched above and hollow, is bright green, but (as already stated) is distinctively mottled with small irregular stains or spots of a port-wine colour and also covered with a white 'bloom' which is very easily rubbed off.

The *leaves* are numerous, those of the first year and the lower ones very large, even reaching 2 feet in length, alternate, longstalked, tripinnate (divided along the midrib into opposite pairs of leaflets and these again divided and subdivided in similar manner). The upper leaves are much smaller, nearly stalkless, with the short footstalk dilated and stem-clasping, often opposite or three together, more oblong in outline, dipinnate or pinnate, quite smooth, uniform dull green, segments toothed, each tooth being tipped with a minute, sharp white point.

The *umbels* are rather small, 1 1/4 to 2 inches broad, numerous, terminal, on rather short flower stalks, with 12 to 16 rays to the umbel. At the base of the main umbel there are 4 to 8 lance-shaped, deflexed bracts; at the base of the small umbels there are three or four spreading bractlets. The flowers are small, their petals white with an inflexed point, the stamens a little longer than the petals, with white anthers.

The *fruit* is small, about 1/8 inch long broad, ridged, compressed laterally and smooth. Both flowers and fruit bear a resemblance to caraway, but the prominent crenate (wavy) ridges and absence of *vittae* (oil cells between the ridges) are important characters for distinguishing this fruit from others of the same natural order of plants.

The entire plant has a bitter taste and possesses a disagreeable mousy odour, which is especially noticeable when bruised. When dry, the odour is still disagreeable, but not

so pronounced as in the fresh plant. The seeds or fruits have very marked odour or taste, but when rubbed with a solution of potassium bi-oxide, the same disagreeable mouse-like odour is produced.

The poisonous property occurs in all parts of the plant, though it is stated to be less strong in the root. Poisoning has occurred from eating the leaves for parsley, the roots for parsnips and the seeds in mistake for anise seeds. Many children, too, have suffered by using whistles made from the hollow stems of the Hemlock, which should be extirpated from meadows and pastures since many domestic animals have been killed by eating it, though goats are said to eat it with impunity.

### **Parts Used, Harvesting and Drying**

The leaves and fruit. The fresh green Hemlock is employed in the preparation of Juice of Conium, Conium Ointment, and the green Extract of Conium.

The British pharmacopoeia directs that the leaves and young branches should be gathered from wild British plants when the flowers are fully matured, and the fruits are just beginning to form, as they then possess their greatest medicinal activity. This is about the end of June. The smaller leaves are selected and the larger stalks picked out and discarded.

The leaves separated from the branches and *dried* are also official.

The *dried ripe fruit* is official in the British Pharmacopoeia, and the Pharmacopoeia of India, but in the Pharmacopoeia of the United States the full-grown fruit, gathered before it turns from green to yellow and carefully dried, is directed to be used.

Hemlock fruits were introduced into British medicine in 1864 as a substitute for the dried leaf in making the tincture, but it has been shown that a tincture, whether of leaf or fruit, is far inferior to the preserved juice of the herb.

**---Constituents---**By far the most important constituent of hemlock leaves is the alkaloid Coniine, of which they may contain, when collected at the proper time, as much as 2.77 per cent the average being 1.65 per cent. When pure, Coniine is a volatile, colourless, oily liquid, strongly alkaline, with poisonous properties and having a bitter taste and a disagreeable, penetrating, mouse-like odour.

There are also present the alkaloids, Methyl-coniine, Conhydrine, Pseudoconhydrine, Ethyl piperidine, mucilage, a fixed oil and 12 per cent of ash.

Hemlock fruits have essentially the same active constituents, but yield a greater portion of Coniine than the leaves.

### **Medicinal Action and Uses**

As a medicine, Conium is sedative and antispasmodic, and in sufficient doses acts as a paralyser to the centres of motion. In its action it is, therefore, directly antagonistic to that of Strychnine, and hence it has been recommended as an antidote to Strychnine poisoning, and in other poisons of the same class, and in tetanus, hydrophobia, etc. (In

mediaeval days, Hemlock mixed with betony and fennel seed was considered a cure for the bite of a mad dog.)

On account of its peculiar sedative action on the motor centres, Hemlock juice (*Succus conii*) is prescribed as a remedy in cases of undue nervous motor excitability, such as teething in children, epilepsy from dentition. cramp, in the early stages of paralysis agitans, in spasms of the larynx and gullet, in acute mania, etc. As an inhalation it is said to relieve cough in bronchitis, whooping-cough, asthma, etc.

The drug has to be administered with care, as narcotic poisoning may result from internal use, and overdoses produce paralysis. In poisonous doses it produces complete paralysis with loss of speech, the respiratory function is at first depressed and ultimately ceases altogether and death results from asphyxia. The mind remains unaffected to the last. In the account of the death of Socrates, reference is made to loss of sensation as one of the prominent symptoms of his poisoning, but the dominant action is on the motor system. It is placed in Table II of the Poison Schedule.

Hemlock was formerly believed to exercise an alterative effect in scrofulous disorders. Both the Greek and Arabian physicians were in the practice of using it for the cure of indolent tumours, swellings and pains of the joints, as well as for affections of the skin. Among the moderns Baron Storch was the first to call the attention of medical men to its use, both externally and internally, for the cure of cancerous and other ulcers, and in the form of a poultice or ointment it has been found a very valuable application to relieve pain in these cases.

In the case of poisoning by Hemlock, the antidotes are tannic acid, stimulants and coffee, emetics of zinc, or mustard and castor oil, and, if necessary, artificial respiration. It is essential to keep up the temperature of the body.

Like many other poisonous plants, when cut and dried, Hemlock loses much of its poisonous properties, which are volatile and easily dissipated. Cooking destroys it.

Its disagreeable odour has prevented its fatal use as a vegetable in the raw state.

Larks and quails are said to eat Hemlock with impunity, but their flesh becomes so impregnated with the poison that they are poisonous as food. Thrushes eat the fruits with impunity, but ducks have been poisoned by them.

Coles' *Art of Simpling*:

'If Asses chance to feed much upon Hemlock, they will fall so fast asleep that they will seeme to be dead, in so much that some thinking them to be dead indeed have flayed off their skins, yet after the Hemlock had done operating they have stirred and wakened out of their sleep, to the grieffe and amazement of the owners.'

### **Adulteration**

Commercial Conium occasionally contains the leaves of other umbelliferous plants somewhat like it in appearance, or it may even be almost wholly composed of such plants. Anise has been used as an adulterant of the fruit.

Among umbelliferous plants most frequently mistaken for the true Hemlock *Anthriscus sylvestris* (Wild Chervil) and *Æthusa Cynapium* (Fool's Parsley) have similar general characteristics, but are readily distinguished. *A. sylvestris* has *hairy*, not smooth leaves, its fruit is *elongated*, not broad, and the bracts of the partial involucre (or involucels) are not directed outwards, as in the Hemlock. The stem also is *unspotted*.

### **Preparations and Dosages**

Powdered leaves 1 to 3 grains. Fluid extract of leaves, 5 to 10 drops. Fluid extract of seeds, 2 to 5 drops. Tincture seeds, B.P., 1/2 to 1 drachm. Juice of leaves, B.P., 1 to 2 drachms. Solid extract, 2 to 6 grains. Ointment, B.P.