



SHORT COMMUNICATION

Some Medicinal Plants of Interest for their Content in Alkaloids II

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Abstract: The use of medicinal plants with alkaloids, such as *Chelidonium*, *Ciconium*, must be closely controlled by medicine, they can only be used under medical-pharmacological control; Currently, only a few countries legislate the use of toxic botanical species, so broader legislation is advisable to prevent poisoning and death.

Keywords: Alkaloids; Drugs; Medicine; Cultivation

INTRODUCTION

In previous works we have highlighted the high amount of alkaloids, and their importance in health throughout civilization [1], as well as the toxic nature of some, which can even cause death [2-4]. , such is the case of the species *Papaver somniferum* and *Atropa belladonna*, however certain chemical compounds such as opium, morphine are used in medicine for their analgesic-narcotic character [5], in the case of terminal illnesses.

There are some plants with a high toxicity, not existing a great difference between the therapeutic dose and the fatal one. For this reason, it is vitally important to consume them under medical or pharmaceutical control, respecting the appropriate doses recommended by the specialist, and may suffer all kinds of injuries or even death, due to intoxication with certain plants. One of these plants is the hemlock *Conium maculatum* with alkaloids such as coniine, which inhibits the functioning of the central nervous system, causing death. Or the jimson weed *Datura stramonium* that has neurotoxic factors that can produce a state of irreversible madness, or death by poisoning [5-10].

Chelidonium majus, also known as celandine, greater celandine, swallow grass, is a herbaceous plant of the genus *Chelidonium*, which belongs to the *Papaveraceae* family.

It is a perennial, annual, perennial, erect herb that can reach 1m in height. Its stem is branched and leafy from the base, more or less pubescent. Leaves strongly divided, alternate, pinnatisect, with 5-7 pairs of ovate to oblong segments, each segment in turn divided into rounded, unequal and irregular hairy lobes. The basal leaves are petiolate and the cauline leaves are sometimes sessile. The flowers are grouped from 2 to 6 flowers, in unequal, terminal umbelliform inflorescences, which all start from the same point, with 3-8cm pedicels. The calyx is formed by two yellow-greenish obovate sepals, generally with apical and deciduous trichomes. Corolla 8mm in diameter, formed by four petals in cross, obovate, unguiculate, and of an intense yellow. Androecium formed by a large number of stamens with yellow anthers and filiform staminal filaments. Bicarpelar gynoecium with superior ovary. The fruit is an elongated capsule, 3-5mm long, glabrous, with dents and valve dehiscence (2 valves) from the base. Small, blackseeds with a white aril.

The flowering of the celandine will depend above all on the geographical area in which it is found, beginning in some locations to bloom at the end of winter or at the beginning of spring, while in others it can last until the end of summer. Experts recommend picking the plant before it blooms or at the beginning of flowering and waiting for the root until autumn, when it has a higher concentration of active ingredients.

The whole plant is important, since alkaloids have been found mainly in the root, latex, leaves and stem, alkaloids that are combined with various organic acids such as chelidonic, malic, citric, succinic acids.

In the root are the largest amount of alkaloids such as chelidone, chelerythrine, α , β , and γ -homochelidone, protoberberine, sanguinarine. The latex of this plant is orange in color, stained by chelidoxanthin, which is believed to be identical to berberine. Chelerythrine is much more abundant in the fruit. In the leaves and stem there is another alkaloid called chelysine, we also find large amounts of calcium phosphate and ammonium-magnesium phosphate. Oil abounds in the seeds, constituting 60% of their weight.

The main properties attributed to celandine are: Mild sedative and anti-asthmatic action, due to the alkaloids of the root. Hypoglycemic action on the blood and cardiac properties, such as increased blood pressure and dilation of the coronary arteries. It exerts a relaxation effect against bronchial muscle spasm (antitussive and antispasmodic). Relaxation of the muscles of the small intestine and contraction of the womb. Cholagogue, facilitating the expulsion of bile from the gallbladder.

The sedative action is mainly due to the alkaloids chelidone (desensitizes nerve endings), α -homochelidone and β -homo chelidone (powerful local anesthetic).

When the stem is cut, an orange juice flows out, latex, which can be toxic in contact with the epidermis or the eyes. This toxicity is attributed to chelerythrine.

Applied internally, it can produce a certain narcotic action, paralysis of the nerve endings and slow breathing. It is convenient to give it mixed with other plants, due to its high toxicity and not to administer it at high doses continuously over a long period of time.

Celandine is mainly used externally, extracting the juice of the plant, to cauterize warts, thanks to its caustic and irritating properties (sometimes surpassing salicylic acid and nitric acid), in calluses and tumors.

Plant native to Europe and the Mediterranean basin. Currently distributed over a wide area that includes Europe, Asia, Africa and North America. Practically throughout the Peninsula (mainly in the northern half) and the Balearic Islands, except the arid SE [11].

It is a ruderal species, which is usually found in grasslands, fissures, in shady and cool places, especially in walls, dumps and old walls, avoiding places that are too sunny and dry.

Conium maculatum, commonly known as hemlock or azecuta, is a herbaceous plant included in the genus *Conium*, which belongs to the family *Umbelliferae*.

It is a herbaceous plant that can reach between 30-200 cm in height and is characterized by the fact that it gives off an unpleasant odour. Its complete development takes place in two years, in the first it forms the root and the leaves, and in the second it develops the stem. It is hollow, fistulous, striated at the bottom, furrowed at the top, and purple-spotted at the base. Leaves are very large, triangular in outline, 2-4 pinnatisect, glabrous, with last order divisions of 10 to 20mm and petioles of up to 60 cm in the lower leaves. The superior ones have shorter petioles and the leaves are smaller, although similar. The flowers are grouped in umbels of eight to twenty rays of unequal length, they are terminal umbels with hermaphroditic flowers, the lateral ones also with male flowers. Each umbel has 3-5 small bracteoles, widened and arranged like a necklace, in addition to the 5-6 bracts, narrowly triangular and reflexed, that form the involucre of the umbels. The flowers are small and white. The fruit is small from 3 to 4mm, rounded, but laterally compressed, and grayish-black in color. The two halves that form it, show five raised ribs, and normally wavy.

It blooms from the month of May, and ripens its fruits in summer.

The most important active ingredients of hemlock are its 5 alkaloids, mainly γ -conicein and d-coniine (or α -propylpiperidine), also known as coniine or cicutoxin, a neurotoxin that inhibits the functioning of the central nervous system, so it hemlock is a highly toxic plant. Both are liquid and can be carried away by water vapour, so they lose part of their properties if an infusion is made with the plant. Two other of its alkaloids, conhydrin and pseudoconhydrin, are solid and crystalline.

The concentration of alkaloids varies according to the stage of maturation and climatic conditions, being found mainly in unripe fruits, with about 2% of them, especially coniine. In contrast, the leaves contain four times less, and the roots an even smaller amount.

In hemlock we can also find other substances such as glycosides, flavonoids, camarinics and piperidine.

Hemlock has been used for its antispasmodic properties and as a sedative or anesthetic, to combat asthma and whooping cough, calm persistent and intractable pain, such as those caused by cancer and neuralgia. But conicein and coniin are not only effective when administered orally, but they are also capable of passing through the skin, applying it externally in the form of an ointment (hemlock extract or coniin), calming neuralgia.

Already in ancient times, Arab and Greek doctors used it for various ailments, and it is currently used as one of the most powerful and safest analgesics, although care must be taken to respect the dosages, since the difference between a therapeutic or toxic dose is very small.

In ancient Greece, one of the uses of hemlock was to take the lives of those sentenced to death. And according to Plato it was also used to end the life of the philosopher Socrates [12].

A hemlock poisoning initially produces dryness and burning in the mouth, difficulty swallowing, nausea, diarrhea; pupil dilation; difficulty articulating words due to loss of control of the tongue; dizziness follows, coldness of the extremities, muscular paralysis; convulsions, respiratory arrest and suffocation, due to the paralysis of the respiratory nervous center, causing death three or four hours after ingesting the drug [13-14].

It is also being used in homeopathy, appearing in the most recent studies as one of the great anticarcinogenic medications.

We can find hemlock throughout Europe, North Africa and temperate Asia. It is distributed throughout most of the Peninsula and the Balearic Islands.

It is ruderal, inhabiting humid and cool places, such as the banks of rivers and uncultivated areas [15].

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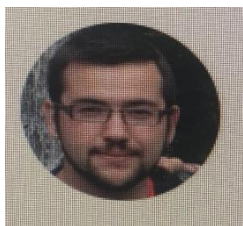
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