



Information Sheet 15 Poison-Hemlock

Poison-Hemlock, *Conium maculatum*, is a tall (up to 2m) riparian herb found along the margins of watercourses in the UK. It is poisonous to humans and all livestock. There is a risk of fatalities to livestock once the plant has been cut as chemicals released by live plants which deter ingestion are no longer produced and animals are often attracted to the dead plant material as a source of 'hay'.

Identification

Conium maculatum is a member of the Umbelliferae family and has white flowers which resemble cow parsley. The definitive feature of this plant are the light green smooth stems and distinctive purple-red spots on the stem. Leaves can be up to 30 cm long and have coarsely toothed edges. The plant can grow very tall, up to 2.5 m in favourable places. It grows mainly in damp places along river margins but also on waste ground. It can often be seen along the hard shoulder and central reservations of motorways, especially near Heathrow airport. The stems have characteristic purple-red spots and are smooth (unlike cow-parsley). The leaves are much more finely dissected than cow-parsley.

Toxicity and poisoning

Cattle, goats, horses, pigs, sheep, rabbits, poultry, deer and humans have been poisoned after ingesting Poison-Hemlock. It also causes teratogenic (birth defects) effects called crooked calf disease in pigs and cattle caused by the alkaloid content. Animal species vary in their susceptibility to acute toxicity:



Toxic Parts: *Flowers, leaves, mature fruit, roots, seeds, stems, young shoots*

The following table gives information on the acute toxicity of hemlock to farm animals after ingestion:

Species	Acute Toxic Dose Rate (mg / kg body weight)	Time to death
Cows	3.3	1.5 - 2 hours
Horses	15.5	30-40 mins
Sheep	44.0	1.5 - 2 hours

The toxins in Hemlock are alkaloids. There are three main alkaloids which are responsible for the toxicity. All parts of the plant contain some level of the alkaloids, except for the sap in young plants. The most toxic chemical, gamma-coniceine, is abundant in leaves and flowers but less common in the fruits, where it is quickly converted to coniine and N-methylconiine. Gamma-coniceine is the precursor of the other alkaloids in Poison-Hemlock. This chemical is a partly unsaturated piperidine alkaloid. The other chemicals, including coniine and N-methylconiine, are

saturated. During the first year of growth, gamma-coniceine is the predominant chemical. During the second year of growth, the content of the other two alkaloids increase, especially in the leaves and fruits, with a decrease in the first chemical. Gamma-coniceine is considered to be 7 or 8 times more toxic than coniine, with N-methylconiine less toxic.

The following LD₅₀ (the concentration required to kill 50% of test organisms) in mice have been reported:

Alkaloid	Dose (mg / kg)	Mode of entry	Death time
gamma-coniceine	2.6	intravenous	30 sec
	12.0	subcutaneous	12 min
	12.0	oral	8 min
coniine	19.0	intravenous	30 sec
	80.0	subcutaneous	15 min
	100.0	oral	10 min
N-methylconiine	27.5	intravenous	30 sec
	150.5	subcutaneous	16 min
	204.5	oral	12 min

The symptoms of poisoning vary between species. The following table lists those which have been associated with hemlock poisoning for each type of animal.

Humans	Cattle	Sheep	Pigs
coma convulsions death by asphyxiation dizziness headache incoordination pupil dilation thirsty vomiting	arthrogryposis breathing, rapid carpal joint, flexure death depression diarrhoea elbow joint, flexure gait, unsteady incoordination limbs, lateral rotation muscle spasms salivation scoliosis teeth grinding torticolollis trembling urine, coffee coloured vomiting	ataxia carpal joint, flexure death defecation, frequent salivation tail, kinked trembling urination, frequent weakness	arthrogryposis articular rigidity ataxia blindness blindness, temporary breathing, laboured breathing, rapid carpal joint, flexure collapse death, death by asphyxiation fetlock joint, flexure gait, staggering gait, unsteady heart rate, elevated lacrimation, severe palatoschisis paralysis prostration pupil dilation scoliosis, syndactylism temperature, elevated trembling urination, frequent vision, impaired weakness

In most cases where ingestion has occurred, especially after the plant has been killed, the end result will be death in a very short time. Most of the symptoms listed above will occur if small amounts of live material have been ingested.

Management

Poison Hemlock can be cut, dug up or sprayed with a herbicide containing glyphosate.

Normally, these plants are avoided by grazing livestock but, after cutting or spraying, become palatable and retain the toxin within the dead plant tissue. Particular care should be taken to keep livestock away from treated river banks until the controlled plants have decomposed or been disposed of safely. Particular care should be taken that any poisonous plants are not dumped in reach of livestock.

DO NOT ALLOW ACCESS FOR LIVESTOCK UNTIL ALL THE PLANT MATERIAL HAS BEEN REMOVED

In situations where these plants are present there will be a risk to animals each time weed control operations take place. In these circumstances, it may be worth using a herbicide containing glyphosate to eradicate the plants so as to reduce the risks for future operations.

When a herbicide is used, it is important to fence the area to exclude livestock until **all the weed has died back completely**. If the weeds cannot be controlled by herbicide then, for each control operation, cut weed must be either transported to a safe disposal site or fenced off until all weed has decomposed or been destroyed by burning.

Care should be taken when cutting or digging up the plant as all parts are poisonous. Wear non-porous rubber gloves and a face shield for protection from cut ends of stems and contact with flowers and seeds. The poisonous roots should also be disposed of if the plant is dug up.

References

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The information contained in this information sheet was provided by the Canadian Poisonous Plants Information System, maintained by Agriculture Canada.