

ECOTOXICITY OF PLANT IN GORJ

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Abstract: *Toxic plants, the content of alkaloids, glucozizi, saponins, essential oils and other compounds, are able to cause severe disease in animals. Is influenced by dose toxicity, solubility toxic, health, immunological and physiological status, age, gender, body weight, hereditary resistance species.*

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1. GENERAL ASPECTS OF TOXICITY

Toxicology is the science that deals with the study of toxic substances, their mode of action and means of preventing and combating poisoning induced by them. Explore toxic substances, their origin, physical, chemical, biological, modalities and mechanism of action, isolation, identification, dosing and measures to combat their harmful actions.

The toxin is an organic substance, most commonly of protein with toxic action, caused by animal or plant organisms and which is capable of inducing phenomena of intoxication. Thus, many bacteria, fungi, helminths etc. produce toxins capable of causing serious illness. Only part of these toxins interested in toxicology. Toxin protein structure are organic substances produced by plant or animal organisms, which cause phenomena of intoxication.

Poisonings in natural conditions occur with toxic are commonly in nature, such as toxins minerals in drinking water (fluorides, nitrates, iron) or accumulated in plants (molybdenum, selenium, cadmium), plants toxic (especially in drought conditions, early grazing young animals), poisonous insects (bumblebees, wasps, spiders) and poisonous snakes. Poisonings occur under natural conditions by the action of toxic substances that are commonly in nature without man may have contributed to their spread. Among them we can mention natural mineral poisoning with toxic plants and animal venoms.

Toxic plants, the content of alkaloids, glucozizi, saponins, essential oils and other compounds, are able to cause severe disease in animals. The incidence of poisoning with toxic plants is higher in young animals, early grazing and droughts.

In toxins plant toxicity is influenced by plant parts are consumed (usually toxic concentrated in the roots, seed), the state of the vegetation (principles toxic are found in greater amounts in certain stages of vegetation, for example, glycosides cianogenetici in maize in phase milk wax), the pedoclimatic factors and weather (the drought conditions in the steppe regions in *Glyceria aquatica* - hand water, concentrated glycosides cianogenetici; Flores dinner contains higher amounts of Santonin in May and small in August).

2. TOXIC PLANTS IN GORJ

Gorj County is located in south-western Romania, in northern Oltenia and has a relief richness and variety of mountain, hill, plain and a temperate continental climate with Mediterranean influences.

Is influenced by dose toxicity, solubility toxic, health, immunological and physiological status, age, gender, body weight, hereditary resistance species.

Factors influencing the severity of intoxication are:

- Individual constitution
- age
- character inherited (hereditary inclination)

The list of toxic plants the whole plant, or parts of them are toxic, the main toxic components and effects of intoxication is shown in Table 1. The plants are established sources of pharmaceutical compounds, aromatic and industrial civilization is inextricably linked to the plant world, they for millennia constituted the major source of obtaining bio-products essential to the survival of the entire animal kingdom. True factories biochemical operated solar plants synthesize not only the parent compounds necessary for their survival in the category of carbohydrates, proteins and lipids, but also a wide range of organic substances that can be extracted in sufficient quantities to present significant importance as raw materials with various applications in science, technology and trade.

Vegetable continues to be the main supplier of phytochemical compounds used in various industries such as the pharmaceutical products, food, cosmetics, agrochemicals. Plants considered irreplaceable sources for industrial oils (volatile and fixed), flavorings, perfumes, resins, hydrocolloid gums, saponins and other surfactants, dyes, pesticides, natural rubber, drugs and many other special compounds.

Table 1. Vegetable toxic, toxic components and the effects of intoxication

Vegetable	Part toxic	The main ingredient substances	The effects of intoxication
<i>(Cyclamen sp.)</i>	leaf and bulb	Ciclamină (Saponină)	cramps, dizziness, circulatory disorders
<i>(Hyoscyamus niger)</i>	whole plant	Atropină (Alcaloid)	heart disorders, hallucinations
<i>(Strychnos nux-vomica)</i>	whole plant, mai ales semințele	Stricnină (Alcaloid)	death
<i>(Helleborus niger)</i>	whole plant	Hellebrigenină	heart disorders
<i>(Hedera helix)</i>	only parts	alpha-Hederină (Saponină)	medicinal effect in low concentration, high doses tulle. gastric fever

<i>(Taxus baccata)</i>	sâmburele din boabă, frunze, scoarță, lemnul	Taxină (Alcaloid)	dizziness, circulatory collapse, respiratory paralysis
<i>(Brugmansia)</i>	whole plant	Scopolamină, Hiosciamină	loss of consciousness, fainting, death by heart failure
<i>(Aconitum napellus)</i>	whole plant	Aconitină	(Hypothermia), paralysis movement / breath, cramps, exitus (death)
<i>(Digitalis purpurea)</i>	Leaves	(Digitalis)	cardiac disorders (arrhythmias, cardiac fibrillation)
<i>(Wisteria sinensis)</i>	seeds and legumes	Wisteria-	digestive / circulatory
<i>(Conium maculatum)</i>	whole plant, especially seeds	Coniină	paralysis, respiratory arrest until
<i>(Laburnum anagyroides)</i>	whole plant, especially seeds	Citisină	paralysis, respiratory arrest until
<i>(Ranunculus sp.)</i>	whole plant	Protoanemonină	digestive disorders
<i>(Colchicum autumnale)</i>	whole plant, especially seeds	Colchicină	retching, exitus (death) by paralysis of the respiratory center dose (20-40 mg)
<i>(Sambucus sp.)</i>	shoots, bark, Leaves	Sambunigrină (Glicozidă cianogenă)	vomiting
<i>(Aethusa cynapium)</i>	whole plant	Aetusină (Poliină)	death
<i>(Hyacinthus orientalis)</i>	the bulb	Acid oxalic	vomiting
<i>(Iris sp.)</i>	underground stem	16Hidroxiiridal (Diterpenă)	digestive disorders
<i>(Prunus laurocerasus)</i>	Leaves, pips	Amigdalină (Glicozidă cianogenă)	stomach pain, vomiting
<i>(Convallaria majalis)</i>	Leaves, flowers	Convallatoxină (Cardenolidă)	abnormal heart rhythm
<i>(Urtica ferox)</i>	whole plant	(Cardenolidă)	reaching the leaves appear serious intoxication!
<i>(Nerium oleander)</i>	Leaves, branches	Oleandrină (Cardenolidă)	digestive disorders
<i>(Rheum rhabarbarum)</i>	Leaves	Oxalat de calciu	cramps, kidney problems

<i>(Rhododendron sp.)</i>	whole plant	Andromedotoxină (Diterpenă)	etching, vomiting, diarrhea, cramps
<i>(Heracleum mantegazzianum)</i>	juice plant	Furanocumarine	burns, bronchitis
<i>(Delphinium elatum)</i>	whole plant	Elatină	digestive disorders
<i>(Thevetia peruviana)</i>	whole plant	Tevetină	skin irritation, loss of consciousness
<i>(Daphne mezereum)</i>	beans	Mezerină (Ortoester)	vomiting sensation, vomiting, cardiac / circulatory
<i>(Datura stramonium)</i>	whole plant	Atropină, Scopolamină	fever, loss of consciousness, hallucinations
<i>(Chaerophyllum temulum)</i>	Green parties, are toxic and dry	Falcarinol	paralysis
<i>(Atropa belladonna)</i>	the entire plant, especially fruit	Atropină	hallucinations, dementia, chills
<i>(Cicuta virosa)</i>	whole plant	Cicutoxină	vomiting sensation, vomiting, cardiac / circulatory
<i>(Ricinus communis)</i>	seed	Ricină	vomiting, fever, abnormal heart rhythm
<i>(Pterodium aquilum)</i>	whole plant	Tiaminază, pterozide	paralysis

Phytochemicals include chemicals most popular vegetable:

- drugs (morphine and codeine analgesics -alcaloizi latex derived from *Papaver somniferum*, cocaine - local anesthetic alkaloid derived from the leaves of the coca, quinine antimalarial -alcaloid derived from *Cinchona* bark, and digitalina cleaning) (Fig. 1.)
- perfume, fragrances (rose oil and Jasmin)
- industrial raw materials (fatty acids, pine oil and natural rubber)
- pesticides (pyrethrins and nicotine)



Papaver somniferum



Cinchona

Fig. 1. Plant alkaloids are extracted for the preparation of medicaments

Also speed the process of extinction of species and the narrowing of the genetic base of plant resources in the world has stimulated both reorganizing the vital importance of genetic resources and interest in obtaining metabolites of interest by unconventional methods.

3. CHEMICAL PLANTS CONTAINED

- **Pigments plant**

Are different by the color they give: chlorophyll-green, carotene, red-orange, Xanthophyll yellow and flavones-yellow, anthocyanins, pigments vacuolar ranging from red to blue, as the pH of acid or base of cellular juice.

Pelargonina is geranium flowers, cyanidin in the flowers of chicory and centauree (Fig. 2).



Fig.2. Chicory flowers and geranium, which contain anthocyanins and pelargonidina

- **Alkaloids**

Complex nitrogenous organic substances are produced only by plants, showing an alkaline reaction more or less important. End products are nitrogen metabolism. Know about 5000 different natural alkaloids.

The alkaloids can locate in leaves (tea, coca), seeds (coffee), roots and bark, spermoderm (crocus), "bark" fruit (mac) secreting channels, laticifere.

Alkaloids most important are: Coniine, nicotine, tropan, atropine, cocaine, quinine, papaverine, morphine, codeine, strychnine, caffeine (fig..3.).

- Strychnine extracted from the seeds and leaves of the plant called *Strychnos nux vomica* (cake wolf).— It is a powerful poison. In small amounts is toxic in large quantities is general and insecticide. Strychnine indole heterocycle containing in the molecule.
- caffeine is extracted from coffee beans.— It is a stimulant of the central nervous system. Caffeine containing the purine ring in the molecule.

Alkaloids are the end products of metabolism of nitrogen compounds and are means of protection and defense of the plants. The small quantities may be used as pharmaceutical substances in large quantities and act as insecticides and poisons.



Fig. 3. Quinine tree and cake wolf, quinine and strychnine containing alkaloids

• Oils, resins (resin) and oleoresins

Essential oils and resins are end products of plant metabolism. These substances are deposited in certain tissues of the plant, not to affect the metabolic processes. Thus, they can be found in the vacuole, intercellular bags, scales, under bark or tree bark surface. Resins and essential oils constitute defenses of plants against pests. Their pleasant smell can attract some insects favoring pollination.



Fig. 4. *Guaiacum officinalis* containing guaiac resin containing acid guajaritic

• Substances antibiotics

Antibiotics are substances with bacteriostatic (prevent the multiplication of microorganisms) or bactericidal (destroying microorganisms). After their origins differ microbial antibiotics and antibiotic vegetable. Antibiotics plant (fitoncide). Antibiotic properties are substances synthesized by plants. Some fitoncide presents insecticidal properties against many insects, worms, rodents known over 50 fitoncide extracted from various plants, of which the most important are:

- Allicin, dihidroallina, benzoic acid, allyl-senevolul etc.
- volatile Allicin is an antibiotic extracted from garlic to destroy the bacillus diphtheria, cholera, staphylococci) Dihidroaliina is an antibiotic extracted from onions (fig. 5)
- benzoic acid, p-hydroxy-benzoic acid, vanillic acid, caffeic acid, ferulic acid, are scattered in many higher plants (especially carrots), have bacteriostatic, bactericidal and antihormonal. They prevent the biosynthesis of gibberellins.
- allyl-senevolul, extracted from mustard, horseradish, radishes;



Figure 5. Garlic and onions, vegetable plants containing antibiotics

Insecticides plant

Some plants can synthesize higher insecticidal substances that exert a defense against insects, worms, rodents.

4. CONCLUSIONS

The plant kingdom continues to be the main supplier of phytochemical compounds used in various industries such as the pharmaceutical products, food, cosmetics, agrochemicals.

Factors influencing the severity of intoxication are: individual constitution, age, inherited characters.

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