POISONOUS PLANTS OF TURKEY
Week 6

TOXIC PLANT COMPOUNDS

POISONS ARE EXAMINED UNDER 3 GROUPS:

1-Mineral Poisons

2-Animal Poisons

3-PLANT POISONS*

SECONDARY METABOLITES

-Alkaloids
-Amines
-Syanogenetic glycosides
-Glycosinolate
-Alkamides
-Terpens
-Coumarins
-Flavonoids
-Tannins…..

Wirbeltierforschung in der Kulturlandschaft

Mode of action and toxicology of plant toxins and poisonous plants

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-A plant may contains toxic component/s of one or more different chemical groups.

-Although most of these toxic compounds have been identified, some have not yet been identified.

- Although the taxonomic relations between plants give an idea of the toxicity of a plant, quantitative differences can be seen even among the same species of plants.

The toxic compounds can be found in different amounts in different organs of plant.

Toxic compounds can be concentrated

- not in the leaf but in the seed,
- not in the ripe fruit but in the raw fruit,
- or just at the roots….

As in the oleander plant (***Nerium oleander***), all parts of the plant may contain toxic compounds.

FOR A POISONOUS PLANT,

-Geographical position,
-Vegetation period,
-Conditions of development

…can affect the amount and distribution of toxic compounds in plants.

TOXIC COMPOUNDS in PLANTS:

ALKALOIDS:

-Nitrogen-containing complexes, even in very small amounts they are physiologically active, bitter, and usually water-insoluble organic compounds.

-Names usually ends with -in suffix

Plant families: Apocynaceae, Berberidaceae, Solanaceae, Fabaceae, Papaveraceae, Ranunculaceae, Rubiaceae

PLANTS CONTAINING ALKALOID,

-all parts… *Datura* sp.

-bark….. *Cinchona sp.*

-seed… *Styrichnos nux vomica*

-roots….*Aconitum* sp.

-fruits…. *Piper nigrum*

-leaves….*Nicotiana tabacum*

-latex …. *Papaver somniferum*

Glycosides:

Glycosides contain sugar (glycol) and generally non-sugar toxic compounds (aglycones).

Glycosides are generally colorless, bitter and crystalline compounds.

CLASSIFICATION OF GLYCOSIDS

-Saponin Glycosides
-Cardiac Glycosides
    * Cardenolides
    * Bufadienolides
-Cyanogenic glycosides
- Isothiocyanate Glycosides
-Phenolic glycosides
    * Simple Phenolic
    * Anthraquinone
    * Coumarin
    * Flavones / Flavonoids
    * Anthocyanidins

ELEMENTS ve NITRATES

Depends on the location where the plant grows, minerals accumulated in the plant structure may cause toxic properties in the plant. In this respect, especially molybdenum, selenium, lead, copper, arsenic are important.

In the families of **Asteraceae, Cruciferae and Fabaceae**, plants species with the ability to accumulate such chemicals are found intensively.

OXALATES

Soluble oxalates (sodium and potassium oxalates) in *Rumex* sp., *Oxalis* sp. also has a high rate.

The group that has a greater importance in poisoning is calcium oxalate crystals that are insoluble and irritating in the gastrointestinal tract when taken orally.

COMPOUNDS CAUSED PHOTOSENSITIVITY

They are compounds that cause sensitivity to light in the body when came into contact or when taken orally.

The best known example of this group is the psoralenes from furanocumarin.

phytophotodermatitis **Heracleum sp.**

TOXIC PROTEINS

In organism, they inhibit protein synthesis by acting on ribosomes.

They exhibit cytotoxic activity.

Example: Risin is one of the most toxic natural constituents in the world.

It is found in the seeds of *Ricinus communis*.