

## Poisonous Plants

### Lecture (5)

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#### Ranunculaceae family

*Adonis aestivalis* L. عين الديك، زخرك، ككك

**Describe:** These small herbaceous perennial plants have feathery leaves, thick roots, and conspicuous yellow or crimson spring flowers that are 2 to 3 inches across on short stems.

**Distribution:** upper plains and foothills, blooming time (March-may)

**Hazardous Plant Parts:** all parts

**Active principle:** Young leaves contain Adonidin, adonitoxin and other cardiac glycosides (cardenolides), Cardioactive steroids resembling digitalis

**Toxicity class:** Ib, CT, HP, GI, MP

**Mode of action, Symptoms:** cardiac glycosides inhibit Na<sup>+</sup>,K<sup>+</sup> ATPase, symptoms of cardiac glycoside poisoning, diuresis, irritation of GI tract with strong diarrhea, cardiac arrest

**Clinical Findings:** There are no adequately documented human poisonings, and clinical descriptions are derived primarily from animal reports. Substantial ingestion may lead to toxicity. Poisoning would be expected to produce clinical findings typical of cardioactive steroids. Toxicity has a variable latent period that depends on the quantity ingested. Dysrhythmias are usually expressed as sinus bradycardia, premature ventricular contractions, atrioventricular conduction defects, or ventricular tachydysrhythmias. Hyperkalemia, if present, may be an indicator of toxicity.



#### Ranunculaceae family

*Anemone coronaria* L. / Ranunculaceae family/ شقائق النعمان ، كول اذار

**Description:** These perennial herbs are often used in rock gardens because they are usually no more than 1 foot high. The divided flowers appear singly on

the stem and may be showy yellow, red, white, or purple. Anemone is also sold as a cut flower.

**Distribution:** its found on altitudes of 200-1500 m in Arbil, Shaqlawah, Amadia, Tuz Khormatu , Kiruk, (march- April)

**HAZARDOUS PLANT PARTS:** all parts

**ACTIVE PRINCIPLE:** ranunculin is converted enzymatically to protoanemonin, anamonic acid and animonin in leaves and flower.

**TOXICITY CLASS:** II, CT, NT, IN, GI, AP

**MODE OF ACTION:** protoanemonin can bind to various proteins,.

**Clinical Findings, SYMPTOMS:** symptoms include nausea and disturbance of GI tract and kidneys, mutagenic, blistering, ulceration and inflammation of skin.

Intense pain and inflammation of the mouth with blistering, ulceration, and profuse salivation can occur. Bloody emesis and diarrhea develop in association with severe abdominal cramps. Central nervous system involvement is manifested by dizziness, syncope, and seizures.



- **Papaveraceae - Poppy Family**

***Papaver somniferum* L. - Common poppy, Opium poppy** خشخاش أسود، أبو النوم

**Description:** Erect, annual, glaucous herb with milky juice; stem to 3 ft tall. Leaves alternate, sessile and clasping, not spiny; margin wavy, lobed, or toothed. Flowers large, bluish white to red with a purple center, petals 4-12. Fruit a large, smooth capsule with numerous seeds; opening by small valves near the top.

**Habitat:** Around gardens .

**Distribution:** In the meddle and north of Iraq.

**Severity:** HIGHLY TOXIC, MAY BE FATAL IF EATEN

**Poisonous principle:** Opium alkaloids, 25 different alkaloids: the important one is morphine , narcotine, papaverine, codine, thebaine, narceine, and other less effect compound: xanthine, landanine, landanosine.

**Poison Part:** Dried milky sap from all parts, but mainly fruits.

**Animals poisoned:** human, Cattle, but only rarely.

**SYMPTOMS:** Stupor, coma, shallow and slow breathing, respiratory and circulatory



***P. rhoeas L.*** خشخاش منثور

**Describe:** An annual herb growing up to 60 cm tall, with white latex and slender roots . Leaves: Once or twice pinnately lobed, cut or toothed and stiffly hairy. The basal leaves are stalked, but the upper leaves are sessile (attached to the stem without a stalk). Flowers: The showy scarlet flowers are 7-10 cm in diameter and are supported on long hairy stalks. The two free sepals fall as the flower opens. Each flower bears four rounded, overlapping, papery petals, which are normally vibrant blood red, though occasionally pink or white, and often have a dark blotch at the base. The petals are crumpled when in bud. The stamens (male parts) are numerous and the anthers (pollen-bearing parts) are bluish-black, and borne on slender black filaments. The stigma (female part that receives the pollen) is a disk with 8-12 rays . Fruit: A smooth, hairless capsule 1-2 cm long, which is almost globose and no more than twice as long as wide . Seeds: The small seeds are released through pores that open at the top of the capsule. They can remain dormant in the soil for 80 years or more.

**Distribution:** in field, dry stony hillside wados on the upper plain and foothills. Found in Khanzad vallys, Sinjar, Mosul, Haditha, Qaranjar, Mindily (March-April)

**Hazardous Plant Parts:** all parts, especially latex

**Active principle:** rhoeadine, protopin, berberine and other isoquinoline alkaloids

**Toxicity class:** II, CT, NT, GI, AP

**Mode of action, Symptoms:** alkaloids modulate neuroreceptors, vomit-ing, spasms, abdominal pain, in animals, central excitation, gastroenteritis, unrest, epileptiform spasms, unconsciousness



- **Cannabaceae - Hemp Family**

***Cannabis sativa* L. - Marijuana, Hemp, Indian Hemp قنب**

**Description:** A coarse, rough-stemmed annual to 12 ft. tall; palmately divided leaves with 3-7 leaflets which are narrow and coarsely toothed; leaves opposite below and alternate in the upper portion of the plant; flowers small and green, the sexes separate.

**Habitat:** Escaped cultivation in waste places or old fields.

**Distribution:** north of Iraq

**Group number:** 3. Dangerous but uncommon

**Poisonous principle:** The resin tetrahydrocannabinol and related compounds, cannabitol, cannibol, cannabidiol,

**Parts of plant:** Leaves but highest concentration in flower stalks.

**Periodicity:** Most dangerous in summer during hot weather.

**Animals poisoned:** human, Cattle and horses.

**Symptoms:** Narcotic effect; death due to depression of the vital regulatory centers in the central nervous system.

**Treatment:** Remove from source. Respiratory and cardiac stimulants with supportive therapy.

**Necropsy:** Congestion and ecchymotic hemorrhages of various organs.



- **Juglandaceae - Walnut Family**

***Juglans spp.* - Butternut, White Walnut, Black Walnut**

**Description:** Deciduous trees; twigs with dark, chambered pith. Leaves alternate, pinnately divided into 7-23 leaflets, each nearly sessile, lanceolate or oblong-lanceolate, margin serrate, apex pointed; petioles, rachis, and leaflets glandular pubescent and aromatic. Pollen flowers in long, drooping catkins; female flowers in small clusters. Fruit a large nut, the shell thick and hard with a sharply ridged surface, enclosed in an indehiscent husk.

**In Iraq there is *Juglans regia* L. جوز**

**Describe:** The common walnut (*Juglans regia* L.) is a large, deciduous tree, reaching a height up to 25-35 m and exceptionally a maximum trunk diameter up to 2 m. It is long-lived: normally 100-200 years, but some specimens may reach 1 000 years old. It has a deep root system, with a substantial tap root starting from the juvenile stage. The bark is silver-grey and smooth between deep, wide fissures. The leaves are 20-45 cm long, with 5 to 9 leaflets, the ones from the apex being larger compared with those from the base of the leaf. Crushed leaves have a scent like shoe-polish. The crown diameter of the common walnut is larger in relation to its stem diameter than any other broadleaf tree species used in Europe. The fruit ripens during hot summers and is a large rounded nut of 4-5 cm and weighing up to 18 g. It may be propagated both by seeds and also vegetatively. It can hybridise and it has been found that the hybrids between common walnut and black walnut (*Juglans nigra*) have good vigour and form.

**Hazardous Plant Parts:** Leaves; wood shavings as bedding in horse stalls.

**Group number:** 2. (Dangerous, but rarely eaten).

**Active principle:** juglandin (nucin), hydrojuglon, juglon, juglandin, tannic acid, in leaves

**Animals poisoned:** Horses.

**Symptoms:** Symptoms can be brought on by exposure in stalls containing more than 20% black walnut shavings; within 24 hours of exposure, animals experience reluctance to move, depression; increased temperature, pulse, and respiration; abdominal sounds; digital pulse; digital limb edema; severe lameness-laminitis; nonfatal.

**Treatment:** Remove shavings promptly. Treat limb edema.

**Necropsy:** Laminitis and edema of lower limb.



- **Fagaceae - Beech Family**

- ***Quercus spp.* - Oaks**

**Group number:** 4. (Of minor importance).

**Poisonous principle:** Large amounts of gallotannins, and possibly other compounds identified as quercitrin and quercetin.

**Parts of plant:** Acorns; young shoots (leaves) when taken in quantity without other feed. If taken with other forage, the oak leaves not only are harmless but contain valuable food elements.

**Periodicity:** Usually in the spring when other food is scarce and the young oak leaves are tender and palatable; or tender sprouts from cut trunks.

**Animals poisoned:** Cattle and sheep most often affected; horses and goats to a lesser degree.

**Symptoms:** Gastrointestinal and renal dysfunction; constipation and later bloody diarrhea, loss of appetite, rough coat, dry muzzle, excessive thirst and urination, pulse weak and rapid. Depression, emaciation, rumen stasis.

**Treatment:** Oil-type laxative; ruminotorics, parenteral fluid; nutrient therapy, and glucocorticoids. Feeding 10% calcium hydroxide may prevent symptoms. Transplantation of ruminal microflora. If illness has progressed to the point of advanced renal dysfunction, it is rare for animals to recover.

**Necropsy:** Gastritis and enteritis, with a bloody false membrane forming in the intestine; increased peritoneal and plural fluids and petechiation on the subserous tissue, kidney, and heart; necrosis of the proximal tubules, numerous hyaline casts in the kidney, and necrosis of the liver as seen microscopically. Perirenal edema.

In Iraq there is ***Quercus indicus***. بلوط، مازو، مازي، جلو، مشة اغاتي





Oak Gall (oak leaves)

- **Polygonaceae - Buckwheat Family**

Because of their high oxalate content, a number of plants in this family (*Fagopyrum*, *Persicaria*, *Polygonum*, *Rumex*, *Rheum*) deserve brief mention as possible sources of poisoning, although none is considered very important.

***Fagopyrum esculentum* Moench. - Buckwheat**

**Description:**

Erect, annual herb with hollow stems; leaves alternate, simple, arrow-shaped; flowers small, white, fragrant, in terminal or axillary clusters; fruit a 3-sided nutlet

**Poison Part:** Fruits

**Poison Delivery Mode:** Phytophotodermatitis and ingestion

**Edibility:** EDIBLE PARTS: Flour made from dried fruits

**Toxic Principle:** Fagopyrin.

**Animal poisoning :** in humans, sheep, cattle, goats, pigs, and horses.

**Severity:** SKIN IRRITATION MINOR OR LASTING ONLY FOR A FEW MINUTES.

**Symptoms:** It produces a primary photosensitization in direct sunlight 24 hours after being eaten. Skin rash following ingestion and exposure to sunlight, in susceptible individuals. It contains compounds which can cause irritating skin disorders ('**fagopyrism**') mainly in sheep and pigs and occasionally in humans, especially in cases where there is heavy consumption and also exposure to sunlight. Fagopyrism has also been observed in humans after consumption of buckwheat honey. It may also affect cattle when fed pure buckwheat silage. The plant has caused photosensitivity in some people, only the dehusked grain is considered to be safe





***Polygonum persicaria* L. Smartweeds, Knotweeds** عصى الراعي، حشيشة القرعان

**Describe:** *Persicaria maculosa* is an annual herb up to 80 cm (31 in) tall, with an erect rather floppy stem with swollen joints. The leaves are alternate and almost stalkless. The leaf blades often have a brown or black spot in the centre and are narrowly ovate and have entire margins. Each leaf base has stipules which are fused into a stem-enclosing sheath that is loose and fringed with long hairs at the upper end. The inflorescence is a dense spike. The perianth of each tiny pink flower consists of four or five lobes, fused near the base. There are six stamens, two fused carpels and two styles.

**Distribution:** Basrah, Amara districts, flowering time: (September-October)

**Active principle:** in roots there are oxymethyle-anthraquinonis.

**Mode of action, Symptoms:** the poison produce inflammation to bladder and digestive tract in pig, sheep, horses, swine. Irritation and smarting dermatitis.



***Rumex crispus* L. Sorrel, Dock حميض**

**Describe:** The plant produces an inflorescence or flower stalk that grows to about 1 m high. It has smooth **leaves** shooting off from a large **basal rosette**, with distinctive waved or curled edges. On the stalk flowers and seeds are produced in clusters on branched stems, with the largest cluster being found at the apex. The seeds are shiny, brown and encased in the **calyx** of the flower that produced them. This casing enables the seeds to float on water and get caught in wool and animal fur, and this helps the seeds to spread to new locations.<sup>[3]</sup> The root-structure is a large, yellow, forking **taproot**.

**Distribution:** found in Kurdistan in ditches near Sari Hassan Beg on altitude 2000m. Blooming time (June- September).

**Hazardous Plant Parts:** leaves.

**Active principle:** leaves contain oxalic acid and potassium oxalate, tartaric acid. Roots: Rumicin, lapathin, tannin, gum, anthroquinone glycosides

**Mode of action, Symptoms:** it caused dermatitis. this plant should only be consumed in moderation as it can irritate the urinary tract and increase the risk of developing **kidney stones**. It should be used with care during lactation, as it may cause a laxative effect in the infant.



Q1: Give the following data of Leguminosae family (*Anagyris foetide* L., *Lathyrus sativus* L., *Lotus corniculatus* L.) and give it as homework:

Describe:

Distribution:

Hazardous Plant Parts:

Active principle:

Toxicity class:

Mode of action, Symptoms