

## Poisonous Plants

### Lecture (7)

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#### • Euphorbiaceae - Spurge Family

##### *Euphorbia* spp. - Spurge

**Description:** Herbaceous perennial or annual with milky juice. Leaves alternate, opposite, or whorled. Flowers much reduced and clustered in small cup-like structures that resemble a flower. Fruit a 3-lobed capsule on a long stalk protruding from the cup-like involucre. Many species are difficult for anyone but a specialist to identify. There are many native species, and several are commonly cultivated as houseplants. It is the houseplants, of course, that are most dangerous to pets.

**Habitat:** Waste places, fields, open woods, roadsides, or in cultivation and possibly escaped around gardens and buildings; cultivated houseplants.

**Distribution:** Some of the species in Iraq are :

- *Euphorbia helioscopia* L. **ام الحبيب، سعدة، رمادة**

**Distribution:** Baghdad, Tuz, Kifri, Amadia, Mendal, Dohukm, Zaafraniya, Zawita. Time of bloom (February- April).

**Animals/Human Poisoning:** Humans, Sheep.

**Toxic parts:** latex

**Toxic plant chemicals:** 12-deoxyphorbol

**Known Hazards** The sap contains a latex which is toxic on ingestion and highly irritant externally, causing photosensitive skin reactions and severe inflammation, especially on contact with eyes or open cuts. The toxicity can remain high even in dried plant material. Prolonged and regular contact with the sap is inadvisable because of its carcinogenic nature.

**General symptoms of poisoning:** Abdominal Pains, Coma, Death, Diarrhea, Lungs, Congestion of Mouth, Irritation of Salivation, Vomiting

**Notes on poisoning:** In Britain, sheep that had ingested sun spurge experienced severe swelling and inflammation of the mouth, diarrhea, and salivation. The animals recovered fully when moved to new pasture that did not contain this plant (Cooper and Johnson 1984). One of two children died after sucking the juice of sun spurge. Symptoms included burning of the mouth, esophagus, and stomach, salivation, vomiting, narrowing of the pupils, and lung edema. One child went into a coma before death (Cooper and Johnson 1984).



• ***Euphorbia peplus L.*** لبينة، خناق الدجاج، ام الحليب

**Distribution:** Baghdad, Time of bloom (February- March).

**Toxic parts:** latex.

**Notes on Toxic plant chemicals:** Petty spurge contains a toxic diterpene, 5-deoxyingenol, as well as ingenol (Frohne and Pfander 1983.)

**Toxic plant chemicals:** 5-deoxyingenol

**Animals/Human Poisoning:** Cattle, Humans

**General symptoms of poisoning:** Salivation

**Notes on poisoning:** Experimental feeding of petty spurge caused blood-stained feces and excessive salivation in a calf (Kingsbury 1964.)

**General symptoms of poisoning :** Discharge of Eye, Irritation of Mouth.

**Notes on poisoning:** Skin and mucous membrane irritation result from contact with the latex. Severe eye irritation also occurs .



***Euphorbia tinctoris* L.** شيرمار

**Distribution:** common on the foothills and on the slopes of north mountains up to altitude 2000m its found in Khanzad, Dohuk, Mandali, Sulaimania, Haj Omran.. etc Time of bloom ( April- Augst).

**All these plant share the following :**

**Poisonous principle:** selerium, euphorbin, saponin, euphorbin.

**Animals poisoned:** toxic to human and animals

**Symptoms: Symptoms:** Irritant, emetic, purgative. Swells eyes, mouth and throat, abdomen pain, fainting spells. Cattle became weak, collapse, have excessive scours and finally die.

- ***E. tirucalli* L. - Milkbush, Pencil-tree.** قرن الغزال، شجيرة الاقلام، شجيرة الحليب، نبات النفط

**Distribution:** Baghdad,

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

**Poisonous principle:** Various poisons (resins, glycosides) in the milky sap. Diterpenoid substances phorbol and ingenol have been isolated from some plants.

**Parts of plant:** Juice of leaves, stems, flowers, and fruit; green or dry.

**Animals poisoned:** Cattle, horses, dogs, cats, and birds.

**Symptoms:** Vomiting, abdominal pains, diarrhea; cattle feeding for some time on hay containing spurges become weak, collapse in a coma, and finally die. Conjunctivitis, keratitis, rarely dermatitis, stomatitis, and gastroenteritis in pets.

**Treatment:** Demulcents, intestinal astringents, gastric sedatives, nervous and circulatory stimulants.



***Chrozophora tinctoria* L.** Ghobbeira, Zeraj, Neel, English: Dyer's-croton الزريج، صباغ روحو، نيل

**Describe:** It is an herb or undershrub, monoecious, indumentums consisting of very dense, sessile and peduncle stellate or lepidote hairs, next to simple hairs. Stipules narrowly triangular, scars very indistinct.

Leaves spirally arranged and simple. Flowers actinomorphic, staminate flowers usually 2 per node, pistillate flowers usually single and fruits, slightly lobed capsules, triangular in transverse section, dehiscent usually septically and partly loculicidally into 3 bivalved parts, outside densely stellate, inside glabrous, thin-walled; column slender, with frayed remnants of the septa, apically triangular; septa single veined. Seeds 3 per fruit, obovate, angular; covered by a thin, incomplete sarcotesta; the latter carunculate apically, embryo flat; endosperm copious.

**Distribution:** Western Desert, North Island, Kirkuk, Eastern Sedimentary Plain, Sulaymaniyah Rawanduz.

**Hazardous Plant Parts:**

**Active principle:** in aerial parts : rutin, chrozophorin, dolabellane diterpene glucosides. saponins (leaves, stems and roots), anthraquinones (leaves, stems and roots), terpenoids (leaves), flavonoids, flavones (leaves and roots), tannins (leaves and roots) and cardiac glycosides (stems).

**Toxicity class:**

**Symptoms:** Although the rats fed 10% / diet had the lowest growth rate, bouts of soft faeces and entero-hepato-nephropathy, no death occurred among the rats. These changes were accompanied by increases in serum GGT and AST activities, urea and cholesterol concentrations, decreases in total protein and albumin levels, macrocytic hypochromic anaemia and leucopenia



***Ricinus communis* L. - Castorbean, Castor-oil-plant خروج**

**Description:** A stout and robust annual herb, shrub-like to 12 ft tall, with reddish or purplish stems. Leaves large, alternate, and blades deeply and palmately 6-11 lobed, nearly round in outline with the petiole near the middle. Flowers small, in panicles. Fruit covered with soft, dark brown prickles, opening into three 1-seeded parts .

**Habitat:** Cultivated as an ornamental and occasionally escaped into various habitats.

**Distribution:** in all the country (field, garden, as ornamental plant. Blooming time (June- September).

**Group number:** 5. (Dangerous, but generally unavailable).

**Poisonous principle:** Ricin,( Ricin may comprise up to 3% of the seed weight), The highly toxic glycoprotein ricin is responsible for poisoning. This phytotoxin, a composite of various amino acids, consists of a neutral alpha-chain capable of inhibiting protein synthesis and an acidic beta-chain, which functions as a carrier and moiety that binds the toxin to cell surface. Phytotoxins may act as antigens eliciting an antibody response.

A phytotoxalbumin, plus ricinine (alkaloid), HCN, allergins, and unknown substances. ricinolic acid (fatty acid).

**Parts of plant:** All parts of the plants re toxic, but the most toxic are the seeds. Seeds, and to a lesser extent foliage, are toxic; 1-3 seeds may be fatal to a child, 2-4, to an adult. Toxicity is seen most often in spring and summer.

**Animals poisoned:** human, Horses, cattle, sheep, pigs, poultry, and dogs.

**Clinical Findings and Symptoms:** Ingested seeds that remain intact as they pass through the gastrointestinal tract generally do not release toxin or cause toxicity. However, if the seeds are chewed, pulverized, or digested (i.e., if passage through the gastrointestinal tract is delayed), then the toxin is absorbed by intestinal cells causing mild to severe gastrointestinal toxicity. Effects depend upon the amount of toxin exposure and include nausea, vomiting, abdominal cramping, diarrhea, and dehydration. Variations in the severity of toxicity may be related to the degree to which the seeds are ground or chewed before ingestion. Parenteral administration (such as by injection or inhalation), or perhaps a large ingestion, may produce life-threatening systemic findings, including multisystem organ failure, even with small exposures.

**Immediate or delayed:** nausea, vomiting, signs of gastric pains, bloody diarrhea, depression, excessive thirst, trembling, sweating, dullness of vision, convulsions, coma, and death if eaten in large quantity (0.01% weight of horses; 0.2% weight of cattle, sheep, or hogs; 1.4% weight of poultry).

**Necropsy:** Swelling and edema of the liver and kidneys; inflammation and punctiform hemorrhage of the mucosal lining of the digestive tract. Pulmonary edema

**Treatment:** Intestinal astringents and nerve sedatives; antihistamines.



• **Meliaceae - Mahogany Family**

***Melia azederach* L. - Chinaberry, China-ball tree** سبج

**Description:** Deciduous tree, 20-40 ft tall, with alternate, twice-pinnately divided leaves 1-3 ft long; leaflets 1-2 in. long and toothed on the margins. Flowers in large terminal panicles, lilac-colored. Fruit a small drupe, 1/2 in. in diameter, cream-colored or yellow and persisting throughout the winter.

**Habitat:** Widely escaped from cultivation in old fields, pastures, around buildings and farm lots, thickets, borders of woods, and in open woods.

**Distribution:** in middle and south of Iraq.

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

**Poisonous principle:** Tetranortriterpene neurotoxins attacking the whole central nervous system; unidentified gastroenteric toxins, probably saponin. Tazetine alkaloid in bark and fruit.

**Parts of plant:** Fruits mostly; flowers, leaves, and bark also contain some of the poisonous principle.

**Animals poisoned:** human, Pigs and sheep are most susceptible (0.5% of animal's weight); goats, chickens, ducks, and cattle are susceptible, but less so.

**Clinical Findings and symptom:** There are no adequately documented human poisonings, and clinical descriptions are derived primarily from animal reports. There may be a prolonged latent period following ingestion. Nausea, vomiting, and diarrhea may occur as may weakness, ataxia, and tremor.

Immediate or extended latent period. Nausea, vomiting, bloody diarrhea, excitement or depression, weak heart, partial to complete paralysis, difficult breathing. In severe cases, animals die from respiratory failure within 24 hours of eating the plant.

**Treatment:** Spontaneous recovery possible. Laxatives and gastrointestinal protectants suggested.

**Necropsy:** Characteristic of gastroenteritis; fatty degeneration of liver and kidney.



• **Araliaceae - Ginseng Family**

***Hedera helix* L. - English Ivy, Ivy**

**Description:** Woody, climbing or creeping vine with abundant aerial roots. Leaves evergreen, leathery, alternate, petioled, the blade palmately veined and variously shaped (in different horticultural varieties and juvenile versus mature leaves). Flowers small and greenish; fruit a small, 3- or 5-seeded black berry.

**Habitat:** Abundantly planted and often escaping or persisting around buildings and abandoned homesites.

**Group number:** 5. (Dangerous, but generally unavailable)

**Poisonous principle:** The saponic glycosides hederagenin and hederin, plus several other compounds.

**Parts of plant:** Leaves and berries. Keep berries away from cats and dogs.

**Animals poisoned:** Cattle and horses browsing vines or clippings. the plant still should be suspected .

**Symptoms:** Salivation, intense thirst, emesis, diarrhea.

**Treatment:** Symptomatic (gastroenteritis and fluid replacement

**Clinical Findings:** There are no adequately documented human poisonings, and clinical descriptions are based on the nature of the toxin. Most ingestions should cause little to no toxicity. The saponins are poorly absorbed, but with large exposures, gastrointestinal symptoms of nausea, vomiting, abdominal cramping, and diarrhea may occur. Allergic sensitization to this plant is common and can cause severe allergic reactions, particularly contact dermatitis.



• **Apiaceae - Parsley Family**  
***Conium maculatum* L. - Poison-hemlock** شوكران، بسبس بري



**Description:** A biennial herb with a smooth, purple-spotted or -lined, hollow stem, to 8 ft tall by the second season. The taproot is solid and parsnip-like. Leaves large, 3-4 compound, the leaflets very small. Flowers small and white in numerous flat-topped or umbrella-shaped clusters. The fruit is similar to that of *Cicuta*.

**Habitat:** Wastelands, marshy areas, and various localities where the soil is fairly moist.

**Distribution:** Sulaimania.

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

**Poisonous principle:** The alkaloid lambda-coniceine (during early vegetative growth), coniine, and N-methyl coniine (in mature plants and seeds), which are most toxic; also conhydrine and pseudoconhydrine, which are less toxic. Coniine and coniceine are teratogenic. Toxic levels for cattle are between 0.1 and 0.5% (green-weight basis) of the animal's weight (1–5 lb for a 1,000-lb animal). Reported levels for sheep are similar

**Parts of plant:** Leaves and unripe fruits.

**Periodicity:** Leaves most dangerous in the spring, and the fruits in the fall.

**Animals poisoned:** All classes are susceptible, including humans.

**Clinical Findings and Symptoms:** Variable, but usually involve gastrointestinal irritation, salivation, abdominal pain, nervousness, trembling, ataxia, bradycardia, dilated pupils, respiratory difficulties, paralysis, and coma. The teratogenic effect in pigs (exposure during gestation days 50-75) is arthrogryposis.

Given its resemblance to wild carrot, misidentification accounts for most poisonings. Initial gastrointestinal effects may be followed by those typical of nicotine poisoning; these include hypertension, large pupils, sweating, and perhaps seizures. Severe poisoning produces coma, weakness, and paralysis that may result in death from respiratory failure.

**Necropsy:** Not characteristic. Animals may show widespread congestion of lungs and liver.

**Conditions of Poisoning:** Livestock poisoning is most common in spring when the tender, succulent, highly toxic new leaves appear. Poison hemlock leaves have a nauseating taste. Livestock seldom eat it, and usually do so only when forced by lack of preferred forage. Acute intoxications may be alleviated by administering stimulants and activated charcoal, which can effectively absorb the toxic alkaloids.

**Treatment:** Use an emetic to empty stomach, then give purgative and stimulants, if indicated. Tannic acid neutralized the alkaloid.



**Ammi majus L. زند العروس ، خلة شيطانية**

**Describe:** The plant has white lace-like flower clusters at the end of a 1 to 2 foot stem

**Distribution:** Makatu near Mandali. Azizyea, Rustam, Baghdad Kut Sinjar. Time of bloom: October- May.

**Hazardous Plant Parts:** All parts of the plant, but especially the seeds.

**Animals:** Toxic To Dogs , Toxic To Cats , Toxic To Horses, cattle, sheep, fowl, and humans

**Active principle:** Furanocoumarins (5 and 8-Methoxypsoralen (bergapten and xanthotoxin respectively)), Nitrates

**Mode of action and Symptoms:** Photosensitization (subacute ulcerative and exudative dermatitis of the skin of ears, muzzle, and vulva), Blindness, cloudy cornea, Conjunctivokeratitis, Photophobia, as a result of ingestion or skin contact with the plant and subsequent exposure to sunlight.

Photosensitization is a clinical condition in which areas exposed to light and lacking significant protective hair, wool, or pigmentation become hyperreactive to sunlight due to the presence of photodynamic agents. When animals ingest the plant their body is unable to fully metabolize it. This allows photoreactive compounds to be deposited throughout the

tissues of the body. When exposed to the UV radiation of sunlight, the now photoreactive tissue reacts by becoming energized. This reaction yields free radicals that literally “burn” the tissue. The affected tissue will become wrinkled, blistered, or split apart creating open wounds, and the surface may eventually slough away. It may take weeks to recover and obvious scarring may remain forever. Additionally the tissue damage may be so severe that it completely debilitates the animal or allows necrosis and secondary infections that kill the animal. Even more damaging than how it affects the skin is how it affects the eyes, in that animals may experience cloudy corneas, conjunctivokeratitis and permanent scarring of the eyes that leaves the animal blind.



• **Apocynaceae - Dogbane Family**

***Apocynum spp.* - Dogbane** سم الكلب

**Description:** Perennial herb, 1-4 ft tall with milky juice. Leaves opposite, simple, entire, and glabrous or nearly so. Flowers in clusters on the main axis or on axillary branches; fruit of two long and slender follicles; seeds with a tuft of long silky hairs at the apex. The distinguishing characteristics of the two species, habitats, and distributions are described below .

***Apocynum venetum:*** سم الكلب

**Distribution:** found in Atrush district on altitude of 900 m. time of bloom (June – July).

**Habitats :** Swamps, wet places and maritime sands

**Hazardous Plant Parts:** All parts of the plant are poisonous.

**Active principle:** Rhizome and roots contain cimaritin glycoside. Apocynins A–D are four new phenylpropanoidsubstituted flavan-3-ols isolated from *Apocynum venetum* leaves, and apocynosides I and II are two new ionone glucosides purified from processed leaves of *Apocynum venetum*. Ionone glucosides, Kaempferol, Vanillic acid, Baimaside, Daucosterol, Rutin, D-catechin, Quercetin .

**Toxicity class:** medium.

**Mode of action, Symptoms:** Apocynum venetum potentially has therapeutic potential in the prevention and treatment for the cardiovascular and neurological diseases, especially for high blood pressure, high cholesterol, neurasthenia, depression and anxiety. But it should be careful of overdose. The median lethal dose (LD50) of acute oral toxicity of concentrated tea of Apocynum venetum leaves is more than 10 g/kg (Yu et al., 2006).



***Nerium oleander* L. - Oleander** دقلى ، وردة الحمار ، سم الحمار

**Description:** Woody shrub or small tree with narrow, evergreen and leathery leaves that are opposite or whorled, 3-10 in. long and with smooth margins. Flowers white, pink, red, or yellow. All parts with a gummy clear sap.

**Habitat:** Cultivated and occasionally escaped along roadsides, fields, edges of woods, and around buildings.

**Distribution:** wild plant in stony torrent bed or dry rocky valleys in foothills of Kurdistan up to altitude 800 m. Baghdad. Blooming ( March-December).

**Group number:** 1.

**Poisonous principle:** cardiac glycosides, oleandrin, neriin, nerioside and oleandroside; saponins and unknowns. Potentially deadly at 0.005-0.015% animal weight; 15-20 g of leaves are lethal for horses and cattle.

**Parts of plant** The whole plant is toxic.

**Animals poisoned:** human and all livestock and pets; usually when they have access to cuttings.

**Clinical Findings , Symptoms:** Depression, trembling, abdominal pain, vomiting, faster and irregular heart action, bloody diarrhea, respiratory paralysis, and death.

Poisoning has been reported from inhaling smoke from burning Nerium, use of the sticks to roast marshmallows, and drinking the water in which the flowers have been placed. Poisoning produces clinical findings typical of cardioactive steroid poisoning. Toxicity has a variable latent period that depends on the quantity ingested. Dysrhythmia is usually expressed as sinus bradycardia, premature ventricular contractions, atrioventricular conduction defects, or ventricular tachydysrhythmias. Hyperkalemia, if present, may be an indicator of toxicity.

**Management:** Gastrointestinal decontamination as appropriate, serial electrocardiograms, and serum potassium determinations should be performed. If serious cardioactive steroid toxicity is considered, digoxin-specific Fab should be administered. Consultation with a Poison Control Center should be strongly considered.

**Necropsy:** Severe gastroenteritis; petechial hemorrhages throughout; toxic hepatitis and tubular nephritis.



***Asclepias spp.* - Milkweeds** دقلة بلادي

**Description:** Erect or spreading herbs with milky juice, perennial from a thick root or deep rhizome. Leaves opposite or whorled, or occasionally, alternate; margins entire. Flowers in terminal or lateral clusters, white to

purple or orange. Fruit an elongated follicle containing many seeds bearing tufts of long silky hairs.

**Distribution:** in Iraq there is one species: *A. curassavica* L. مرجان، زهرة الدم

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

**Poisonous principle:** Cardiac glycosides and resinoids Cynafosides, a group of neurotoxic pregnane glycoside,.

**Parts of plant:** All parts, green or dried in hay. Toxicity decreases with maturity.

**Animals poisoned:** All classes of livestock, including birds, Sheep, cattle, horses, and poultry. Approximately 2% animal weight may be dangerous. Animals ordinarily do not eat these plants unless other forage is unavailable or the animal is confined to a milkweed-infested pasture.

**Poisonous Principle and Toxicity:** Cynafosides, are the most probable toxins in the neurologic poisoning of these milkweeds. Lethal levels for milkweed can be as little as 0.2% body weight of green plant material.

**Symptom:** Depression, muscular weakness, trembling, ataxia, disturbed equilibrium, increased salivation, bloating, difficult breathing, dilated pupils, rapid and weak pulse, and coma followed by death from respiratory failure. Signs appear within a few hours after ingestion of a toxic dose, and death generally follows within one to a few days.

**Conditions of Poisoning:** The two species discussed here have strong rhizomes and hence form dense populations, making consumption more likely. Both species have an affinity for irrigated hay fields. This makes livestock more likely to consume the plant when it is present in hay; this is a common occurrence in New Mexico. Milkweeds remain highly toxic even when dried. Preventing consumption is the only effective means to reduce animal losses.

**Treatment:** Fluids and nutrients; cathartic. For neurotoxic effects: sedative and laxatives. For cardiotoxic effects: atropine and/or diphenhydantoin.

**Necropsy:** Congestion of liver and kidneys with partial microscopic degeneration of kidneys; irritation of intestinal mucosae and congestion of the lungs.



Q1: Give the following data of **Caryophyllaceae** family (*Saponaria vaccaria* L.) and **Gramineae** family (*Stipa tortilis* ) and **Dioscoreaceae** family (*Tamus communis* L.) and give it as homework :

Describe:

Distribution:

Hazardous Plant Parts:

Active principle:

Toxicity class:

Mode of action, Symptoms