6_cours

Seed Papilionaceae / Cupuliferous / Cruciferous / Chenopodiaceae / Solanaceae

Nutrition course
2nd year
UNIV, Medea
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MCA 2025-2026

_ Seed Papilionaceae

Genus Pisum/Cicer/Viscia/Lathyrus/
Ervum/Phaseolus/Trigonella/Wisteria/Arachis

—Fagaceae or Cupuliferae
Genre :Castanea/ Quercus

— Cruciferous (brassicaceae)

Genus Brassica/ Sinapus/ Raphanus

_ Chenopodiaceae

—Solanaceae

Genre: Solanum/Atropa/Datura/Hyoscyanus/ Nicotina

1_ Seed papilionaceae

- Papilionaceae, also known as Fabaceae or legumes, are a large family of plants whose edible seeds are an important source of nutrients. The term "papilionaceae" refers to the shape of their flower, which resembles a butterfly.
- Pulses (mature seeds)
- These are legumes whose seeds are harvested at maturity and then dried. They are appreciated for their high protein, fiber and mineral content.
- Dried beans: There are many varieties, such as kidney beans, white beans (ingots) and flageolet beans.
- Lentils: They are rich in iron, fiber, and vitamins. There are different colours, such as green lentils, red lentils or black lentils.
- Chickpeas: These seeds are a staple ingredient in many cuisines

Butterfly/papilionaceae flowers

- Broad beans: They can be eaten fresh or dried.
- Dried peas and split peas: Split peas are a dried pea seed, without the husk.
- Lupines: Lupines are legumes, with spectacular flowers and their food and ornamental use. The seeds are high in protein and fiber, and can be eaten after being processed to remove their bitter alkaloids, some wild species are toxic. Lupins improve agricultural soils with nitrogen and phosphorus
- Fresh seeds and whole pods: Some papilionaceae are eaten as fresh seeds or whole pods before maturity.
- Pea: The seeds are eaten fresh before they harden.
- Green beans: These tender pods are harvested before maturity to be eaten entirely.

Pods eaten fresh:
(broad beans, green beans)

- Sprouting seeds
- Papilionaceae seeds can be germinated to obtain nutrient-rich shoots.
- Sprouting lentils: Lentil sprouts are rich in vitamins and minerals and have a bittersweet flavor.
- Sprouting chickpeas: They are eaten with a short germ and can be cooked or added to salads.
- Oilseeds
- Some papilionaceae produce oil-rich seeds.
- Peanut (peanut): Although technically a legume, peanut is often classified as an oilseed due to its high oil content.
- Soybeans: Soybeans are grown for their protein and oil.

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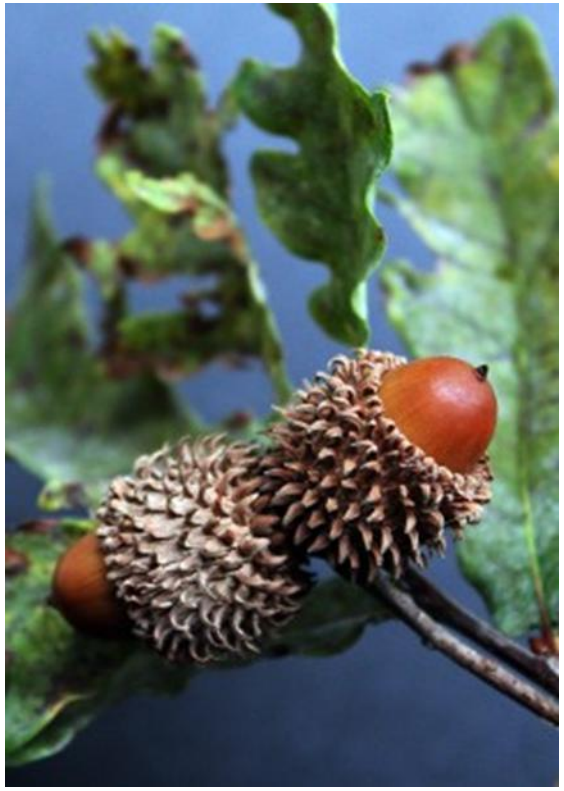
2_ **fagaceous or cupiliferous**

Genus :Castanea/ Quercus,

- The Fagaceae or the Cupuliferae refer to one and the same family of plants. The term Fagaceae is the botanical name, while Cupuliferae (common) refers to a key feature of this family. Distinguishing Feature: The Cup
- The name "cupuliferous" comes from the cupule (from the Latin cupula, small cup).
- It is a woody, scaly or thorny envelope, which partially or totally surrounds the fruit (acorn, chestnut). It is this common structure that gave its name to the family's former designation.
- The Fagaceae are a family of trees and shrubs from the temperate regions of the Northern Hemisphere, comprising about 1,000 species divided into 8 main genera



- caractéristiques communes
- Leaves are alternate, often deciduous (fall in autumn), some species of oak leaves are evergreen.
- Unisexual flowers (male and female flowers separated on the same tree - monoecious), with the male flowers usually grouped in pendulous catkins and the female flowers in small groups or spikes.
- Fruits rich in tannins, usually acorns, chestnuts, protected by the famous cupule.
- Main genres
- Fagus (Beech trees)
- Castanea (Chestnut trees)
- Quercus (oaks)

- Hêtre:

- Châtaignier

3_Cruciferous or brassicaceae

- Genre Brassica/ Sinapus/ Raphanus

- Cruciferous vegetables, whose name has been officially changed to Brassicaceae, are a family of plants encompassing vegetables such as cabbage, broccoli, cauliflower, radish and arugula. Their original name, "cruciferous", comes from the cross-shaped shape of their flowers, with four petals. This family includes many species cultivated for their food (vegetables, oilseeds) or ornamental interest, such as rapeseed, mustard or wallflowers.

wild mustard Black mustard , white mustard

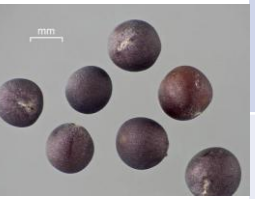
- Origin of the name: The name "cruciferous" comes from the arrangement of their flowers (petals in a cross), scientific name: "Brassicaceae",
- Species: This family is diverse, including common cabbage (Brassica, oleracea) and its varieties (red cabbage, kale), rapeseed (Brassica napus), radish (Raphanus sativus), watercress (Nasturtium, officinale) and arugula (Eruca, sativa).
- Flowers: The flowers are usually white or yellow and are typically tetramerous, (four petals and four sepals).
- Fruit: is a capsule called silique (elongated) or silicle (short).

- Used in food:
- grown as vegetables (broccoli, Brussels sprouts, cauliflower) or for their oilseeds (rapeseed).
- Seasoning: Some genera such as horseradish (Armoracia rusticana) are used as condiments.
- Ornamental plants: Some species such as wallflowers and aubrietes; decorative interest.
- Essential nutrients: Brassicas are rich in vitamins, minerals and fibre.
- Phytochemicals: They contain compounds that are beneficial to health, such as anti-inflammatory and anti-cancer properties.
- Sulphur compounds: The presence of myrosin cells gives them a pungent odour and taste, often linked to sulphur glycosides,
- scientific research: the plant Arabidopsis thaliana, used as a model for study in genetics, (+++ many discoveries).

Sinapis et Raphanus

- are two genera of flowering plants that both belong to the large family of Brassicaceae (formerly Cruciferae). Although they share many similarities as members of this family (flowers with four petals arranged in a cross, production of siliques), they have distinct botanical and ecological differences.
- Here are the main distinctions:
- Common Features
- Family: Brassicaceae.
- Flowers: Generally yellow (sometimes white or purplish for Raphanus), grouped in clusters.
- Annuals/biennials: The most common species are annual herbaceous plants.

- Uses: Some species are grown as green manures (CIPAN), for their seeds (mustard), or as vegetables (radishes).
- Weed status: Sinapis arvensis (wild mustard or sanve) and Raphanus raphanistrum (wild radish or ravenelle) are common weeds (weeds) in cultivated fields, especially rapeseed.
- Botanical Differences



Feature	Sinapis (Mustard)	Raphanus (Radis)
Fruit (silique)	The pods are bumpy, smooth or slightly bristly, with clearly ribbed valves (3 to 5 veins). The spout is conical and usually shorter than the valves.	The pods are often thicker, spongy and without marked constrictions. The fruit often fractures into transverse articles when ripe (it is not classically dehiscent).
seeds	Generally smooth and globose	Often contained in sections of the fruit that become disjointed.
The leaves	The lower leaves are pinnate (finely indented), and the upper leaves are often sessile, oval or oblong, with sinuate-toothed edges.	The leaves are often lyreate (cut into broad lobes, with a large terminal lobe), especially the lower ones.
Preferential housing Flower Colors	Often prefers fertile, calcareous or basic soils. Mostly bright yellow	Prefers non-calcareous, sandy or loamy soils, often acidic Usually pale yellow or white, sometimes with purplish veins.
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4_Chenopodiaceae

- The Chenopodiaceae family includes many common edible vegetables such as spinach, beets, Swiss chard (or perry), and less common plants such as arroche, lamb's-quarters (also known as cabbage) and glasswort. Some species such as quinoa are also important food sources.

Common vegetables from the Chenopodiaceae

- Spinach: Grown for their edible leaves.
- Beets and chard: Either the root (beetroot) or the leaves and their thick chard (Swiss chard) are eaten.
- Swiss chard: Some varieties are called "perry" and are eaten such as spinach or chard.
- as well as other vegetables and edible plants, Arroche, Lamb's-quarters, Salicornia .....;
- The different species of lamb's-quarters contain oxalic acid.

Chénopodiacées/les bettes à carde (ou poirées)

Happy Panier
La bette, la blette, la carde ou poirée...

Jaime-jardiner.com - Ouest-France
Blettes | Jaime-jardiner.com

Gamm vert
Quand et comment planter des côte...

Hortisologne
POIREE VERTE A CAR...

PasseportSanté
Bette à carde : valeurs nutritives, bienfai...

Jardiner Malin
Blette, bette : culture, entret...

Gamm vert
Quelles sont les maladies des blette...

L'Express
Tout ce qu'il faut savoir sur la b...

Détente jardin
Comment cultiver la poirée, blette ou bet...

enGraineToi.com
Graines Poirée Verte à ...

Bio en ligne.com
Blette, bette ou poirée: culture, pl...

Les Papilles Estomaquées...
Bettes, Blettes, Poirées : Que faire a...

Gerbeaud
Semez et cultivez les bettes (ou ...

Graines Paysannes
Poirée à Cardes ro...

Veir Magazine
Culture de la blette...

Maison Catros-Gérand
Poirée verte à carde bla...

Binette & Jardin - Ouest-France
Planter la poirée ou bette : quand et co...

MonJardinBio.com
Du potager à l'assiette : la blette - cultur...

Wikipédia
Bette (plante) — Wikip...

5_Les nightshades

- Genus:

Solanum/Atropa/Datura/Hyoscyanus/ Nicotina

Les Solanacées/ Solanaceae

- Belongs to the broadleaf leaf
- herbaceous plants, shrubs, trees, lianas with alternate leaves, simple and without stipules.
- hundred genera/ 2,700 species,
- occupies a great diversity of habitat, morphology and ecology.
- present especially in the 2 Americas, (the greatest number of species).
- includes food species of great economic importance (potatoes, tomatoes, eggplants and peppers).
- Many ornamental plants,
- Some species, rich in alkaloids, are known for their medicinal uses, their psychotropic effects or for their toxicity: belladonna, nightshade, brugmansia, datura, mandrake, tobacco.

Solanaceae

Among the Solanaceae there are important species for human and animal food: potato (Solanum tuberosum), tomato (Solanum lycopersicum),

Sweet and spicy pepper (Capsicum annuum) and

eggplant (Solanum melongena), tobacco (Nicotiana tabacum).

Economic importance

- Many Solanaceae are important weeds.
- can be hosts of crop pests and diseases,
- Like what:
- Browalia arborescens and Acnistus americana can be hosts for various Thysanoptera that damage the intercrop.
- some species of Datura, hosts for the different types of viruses that are then transmitted to cultured Solanaceae.

- Several species of Solanaceae trees and shrubs are cultivated as ornamental plants:
- Brugmansia: cultivated for its large, pendulous, trumpet-shaped flowers;
- Brunfelsia latifolia, whose very fragrant flowers change from purple to white in a period of three days.
- Other shrub species grown for their attractive flowers, marketed as ornamental plants.

- Many other species, especially those that produce alkaloids, are used in pharmacology
- Nicotiana,
- Hyoscyamus, and
- Datura.

5-1_Datura stramonium

Datura stramonium is a widespread annual plant, known by several vernacular names such as stramoine, boobie, or thorny apple. Native to the Americas, it has naturalized in many parts of the world and is considered a highly toxic plant.

Description of the Datura

- Appearance: It is a tall, erect, branching grass, up to 1.5 metres tall, with a foul smell when crushed.
- Leaves: The leaves are large (up to 20 cm), oval, with coarsely serrated and sinuate edges.
- Flowers: The flowers are large, erect trumpet-shaped, usually white to cream, sometimes purple, and have a pleasant fragrance, often opening in the evening.
- Fruits: The fruit is a spiny, ovoid capsule that opens at maturity into four valves to release many black seeds.

Toxicity of Datura

- Datura poisoning, also known as "devil's weed" or "angel trumpet", is a medical emergency caused by the tropane alkaloids (atropine, scopolamine, hyoscyamine) present throughout the plant, especially in the seeds. Smoke is toxic
- Symptoms are severe and can be fatal.
- Signs appear within an hour of ingestion (humans)
- are part of the anticholinergic syndrome.
- "Hot as a hare, blind as a bat, dry as a bone, red as a beetroot and crazy as a hatter."
- Dryness of the mucous membranes (mouth, throat) and intense thirst.
- Extreme and persistent dilation of the pupils (mydriasis),
- resulting in blurred vision and sensitivity to light (photophobia).
- Dry, hot, red skin (skin erythrosis).

Belladonna (Atropa belladonna**)**

Description:

Atropa belongs to the Solanaceae family, of which the best known and most important species is Atropa belladonna. A perennial, bushy herbaceous plant that grows up to 1.5 metres tall, has an unpleasant smell when crushed, with bell-shaped flowers of purple colour.

Toxicity:

All parts of the plant (leaves, flowers, berries, roots) are poisonous, especially the black, shiny berries

Active ingredients:

The plant contains tropane alkaloids, hyoscyamine, which converts to atropine upon extraction or preservation. These substances have anticholinergic properties.

- Medicine and pharmacology:
- Atropine is a powerful spasmolytic, an antidote to certain neurotoxic cases. used in ophthalmology to dilate the pupils.
- Poisoning by organochlorines and organophosphates (antiparasitics, phytoparasitics) and other poisonings

Toxicity

- All parts of the plant (leaves, flowers, seeds, fruits) are extremely toxic. They contain tropane alkaloids (such as atropine and scopolamine) that act violently on the central nervous system.
- Ingestion, even in small quantities, can cause serious poisoning, sometimes fatal. Symptoms include:
- Dryness of the skin and mucous membranes.
- Dilation of the pupils (mydriasis).
- Rapid heart rate (tachycardia) and high fever.
- Neurological disorders: confusion, disorientation, loss of awareness of time and place.
- Hallucinations (visual and auditory), psychosis, extreme agitation.
- Inappropriate behaviour, sometimes dangerous to oneself (self-harm).
- The effects can be terrifying and persist for several days or even weeks.

Black nightshade (Solanum nigrum)

- Black nightshade (Solanum nigrum) is a common wild plant in the nightshade family.
- Appearance: annual herbaceous plant with stems with large, more or less lobed and alternating leaves.
- Flowers: are small, with white star-shaped petals, and yellow anthers arranged in a column.
- Fruits: are small berries that look like mini-tomatoes. They are green at first, then turn black and shiny when ripe.
- Habitat: It is found in rubble, crops and wastelands, on soils rich in humus and nitrogen.

Toxicity

- Nightshade (Solanum nigrum) poisoning in ruminants primarily affects the digestive and nervous systems.
- Symptoms can vary depending on how much is ingested and what part of the plant is consumed (green berries and leaves are the most toxic, while ripe berries are generally less dangerous).
- The main symptoms observed include:
- Digestive disorders
- Hypersalivation (excessive drooling)
- Loss of appetite (anorexia)
- Abdominal pain (colic)
- Diarrhea, sometimes severe
- Nausea and vomiting (although ruminants rarely vomit)
- Bloat (swelling due to gas buildup) in severe cases

- Neurological disorders
- Apathy and drowsiness (depression)
- General weakness
- Muscle tremors
- Motor incoordination and unsteady gait
- Dilated pupils
- Agitation or confusion, and in severe cases, seizures
- Other symptoms, (bradycardia), (dyspnea)
- (sign of anemia) or (jaundice/jaundice) in chronic or severe forms
- In extreme cases, poisoning can lead to paralysis, coma and death of the animal.
- Poisoning circumstance: Ingestion of the plant in maize silage

Tobacco Plant

- Tobacco (Nicotiana tabacum) is an annual herbaceous plant (sometimes short-lived perennial) of the Solanaceae family, native to America. It is mainly grown for its large leaves, which are harvested and processed for human consumption.

Botanical description

- Appearance The plant usually reaches 1 to 3 meters in height, with a cylindrical, sturdy, hairy stem.
- Leaves It has large, simple, alternate, oval and entire leaves, often sessile or slightly petiolate, bright green and sticky to the touch due to glandular hairs.
- Flowers The flowers, pink to pinkish-white or sometimes yellowish, are grouped in terminal panicles. They are shaped like a long tube that flares into a funnel.
- Fruits The fruits are oval-oblong capsules that open through two valves when ripe, containing a large number of tiny seeds.

Cultivation and uses

- Tobacco is grown in many countries.
- prefers rich, light, well-drained soils
- a sunny exposure.
- Cultivation often involves specific steps such as topping (cutting the flower stalk) to concentrate energy in the leaves, followed by drying (curing) the harvested leaves.
- Main uses is the production of smoking tobacco (cigarettes, cigars, etc.).
- Other uses Historically and traditionally, tobacco has been used as a natural insecticide (tobacco manure) to control mange, aphids and other pests in the garden. Cade oil is a form of nicotine that is used nowadays by individuals and in champoin
- Legal status
- Growing tobacco for personal consumption is generally allowed in many places, but its manufacture and sale for profit is strictly regulated.

Composition and toxicity

- The whole plant is poisonous. Its best-known active ingredient is nicotine, a neurotoxic alkaloid that acts on the central nervous system and is responsible for tobacco addiction in humans. Nicotine is a violent poison.

Clinical cliniques

- Signs of poisoning appear within an hour of ingestion, and can last up to 24 hours in severe cases.
- Symptoms
- Gastrointestinal signs: excessive salivation, vomiting (less common in adult ruminants), diarrhea, abdominal pain, and sometimes constipation in high doses.
- Nervous signs: agitation, excitement, muscle tremors, twitching of the ears and facial muscles, ataxia (difficulty walking), confusion, and in severe cases, seizures and loss of consciousness.
- Cardiovascular and respiratory signs: rapid heart rate (tachycardia), rapid and difficult breathing