DESCRIPTION OF SOME IMPORTANT PLANT FAMILIES

Fabaceae

- The Fabaceae family, distributed globally, was previously referred to as Papilionoideae, a sub-family within the Leguminosae family.

Vegetative Characteristics:

- **Habit:** Varied, encompassing trees, shrubs, herbs, and climbers.
- **Root:** Characterized by a taproot system, often branched, and associated with root nodules housing nitrogen-fixing bacteria (Rhizobium).
- **Stem:** Can be either erect or climbing in nature.
- **Leaves:** Typically alternate, occasionally simple, predominantly pinnately compound, exhibiting stipules, and possessing pulvinate leaf bases. Venation is reticulate, and leaves or leaflets may be modified into tendrils.

Floral Characteristics:

- **Inflorescence:** Arranged in a racemose pattern.
- **Flower:** Exhibits bisexual traits with zygomorphic symmetry.
- **Calyx:** Comprises five sepals that are gamosepalous, showcasing either valvate or imbricate aestivation.
- **Corolla:** Composed of five petals, polypetalous in structure, and displaying papilionaceous form. The corolla consists of a posterior standard, two lateral wings, and two anterior petals forming a keel, demonstrating vexillary aestivation.
- **Androecium:** Consists of ten stamens arranged in a diadelphous fashion, and the anthers are dithecous.
- **Gynoecium:** Ovary is positioned superiorly, monocarpellary, and unilocular, housing numerous ovules. The style is singular, with ovules arranged in two alternate rows.
- **Fruit:** Develops into a legume.
- **Seed:** Ranges from one too many, and the seeds are non-endospermic.

Economic Significance:

- **Pulses:** Noteworthy pulses derived from this family include gram, arhar, SEM, moong, and soyabean, contributing significantly to the human diet.
- **Fodder:** Certain plants within this family, such as Trifolium and Sesbania, serve as valuable fodder resources for livestock.
- **Edible Oil:** Varieties like soyabean and groundnut are cultivated for the extraction of edible oils, playing a crucial role in culinary applications.
- **Dyes:** Indigofera, a member of this family, is employed in the production of dyes, particularly indigo dye.
- **Fibres:** Sunhemp, belonging to this family, is a source of fibres with diverse applications, contributing to the textile industry.
- **Ornamental Plants:** Lupin and sweet pea, recognized for their aesthetic appeal, are cultivated as ornamental plants.
- **Medicinal Uses:** Muliathi, found in this family, possesses medicinal properties, contributing to traditional medicinal practices and herbal remedies.

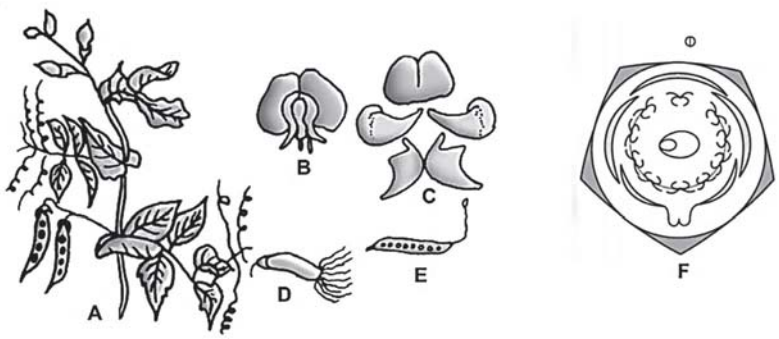

Fig. : *Pisum sativum* (pea) plant : **A.** Flowering twig, **B.** Flower, **C.** Petals, **D.** Reproductive parts, **E.** L.S. carpel, **F.** Floral diagram

Solanaceae

Solanaceae, often referred to as the 'potato family,' constitutes a substantial family of plants with a widespread distribution across tropical, sub-tropical, and temperate regions.

Vegetative Characteristics:

- **Habit:** The family encompasses a variety of growth habits, including herbs, shrubs, and small trees.
- **Root:** Plants within Solanaceae typically possess tap roots, anchoring them firmly in the soil.
- **Stem:** The stems exhibit herbaceous features, occasionally transitioning to woody forms. They are commonly aerial, erect, cylindrical, either solid or hollow, and may display a hairy or glabrous (smooth) texture. Notably, certain members, like the potato (Solanum tuberosum), feature underground stems.
- **Leaves:** Solanaceae plants exhibit alternate leaf arrangement. The leaves are primarily simple, with occasional instances of pinnately compound structures. Stipules are generally absent, and the leaves may display a hairy surface. The venation pattern is reticulate, contributing to the overall botanical characteristics of the family.

Floral Characteristics:

- **Inflorescence:** The arrangement of flowers in Solanaceae is often solitary, occurring either in the axils or forming cymose patterns, particularly observed in genera like Solanum.
- **Flower:** Solanaceae flowers are bisexual, displaying actinomorphic symmetry, meaning they can be divided into identical halves in any radial plane.
- **Calyx:** The calyx consists of five sepals, united to form a persistent structure. The valvate aestivation indicates that the sepals meet at the edges without overlapping, and their union results in a gamosepalous structure.
- **Corolla:** Comprising five petals, the corolla is gamopetalous, where the petals are fused. Similar to the calyx, the petals exhibit valvate aestivation.
- **Androecium:** The androecium is composed of five stamens, which are epipetalous, meaning they are attached to the petals. The anthers of the stamens are bithecous, having two lobes.
- **Gynoecium:** Solanaceae flowers typically possess a bicarpellary, syncarpous gynoecium. The ovary is positioned superiorly and features oblique septa, creating bilocular compartments. The placenta is swollen, accommodating numerous ovules, and the placentation occurs axilely.
- **Fruit:** The fruit is classified as a many-seeded berry or capsule, representing the mature ovary after fertilization.
- **Seed:** Solanaceae seeds are numerous and endospermous, meaning they contain endosperm, a tissue rich in nutrients formed after fertilization.

Economic Significance:

- **Food:** Solanaceae plants contribute significantly to the food industry. Notable examples include the consumption of potatoes, tomatoes, and Brinjal (eggplants) as essential food sources.
- **Spices:** Chili, a pungent spice widely used in culinary applications, is derived from Solanaceae plants. It adds flavor and spice to various dishes.
- **Tobacco:** The family Solanaceae includes Nicotiana tabacum, the source of tobacco. The dried and cured leaves of this plant are utilized in the production of tobacco products. Additionally, tobacco is known for its use in fumigation practices.
- **Medicine:** Several plants within Solanaceae have medicinal properties. Belladonna (Atropa belladonna) and Ashwagandha (Withania somnifera) are examples of species used in traditional medicine for their therapeutic benefits.
- **Ornamental:** The family Solanaceae contributes to ornamental horticulture, with plants like Petunia being cultivated for their aesthetic appeal. These ornamental species enhance the beauty of gardens and landscapes.

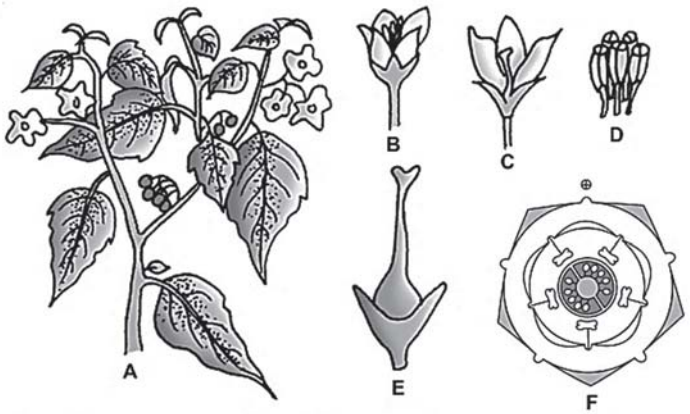

Fig. : *Solanum nigrum* (makoi) plant : **A.** Flowering twig, **B.** Flower, **C.** L.S. of Flower, **D.** Stamens, **E.** Carpel, **F.** Floral diagram

Liliaceae

Liliaceae, commonly known as 'the lily family,' comprises monocotyledonous plants that exhibit a global distribution.

Vegetative Characteristics:

- **Habit:** Members of Liliaceae are perennial herbs characterized by the presence of underground bulbs, corms, or rhizomes.
- **Roots:** The plants in this family develop adventitious, fibrous roots.
- **Stem:** The stems can be aerial or underground, displaying herbaceous or woody traits.
- **Leaves:** Predominantly basal, the leaves are arranged alternately, characterized by a linear shape, lack stipules, and exhibit parallel venation.

Floral Characteristics:

- **Inflorescence:** The arrangement of flowers occurs either singly or in cymose structures, often forming umbellate clusters.
- **Flower:** Bisexual and actinomorphic, the flowers possess a perianth consisting of six tepals (3 + 3), which are frequently fused into a tube with valvate aestivation.
- **Androecium:** The stamen count is six (3 + 3), and they are epitepalous, meaning they are attached to the tepals.

- **Gynoecium:** The gynoecium is tricarpellary, syncarpous, and features a superior ovary that is trilocular with numerous ovules. Axile placentation is observed.
- **Fruit:** Typically, the fruit is a capsule, although in some instances, it may be a berry.
- **Seeds:** Endosperm, a nutrient-rich tissue, is present in the seeds of Liliaceae, contributing to their germination and early growth.

Economic Importance of Liliaceae Plants:

- **Food:** Young shoots and root tubers derived from various Asparagus species are utilized as culinary ingredients, adding nutritional value to meals when cooked.
- **Medicines:** Aloe, a member of the Liliaceae family, holds significance as a medicinal plant. It serves as a valuable source for extracting medicinal compounds that have various therapeutic applications.
- **Ornaments:** Plants such as Gloriosa and tulip, belonging to the Liliaceae family, are sought after for their aesthetic appeal and are commonly used as ornamental plants. Their vibrant and attractive flowers make them popular choices for decorative purposes.
- **Colchicine:** Colchicum autumnale, a plant within the Liliaceae family, yields colchicine, a compound with notable applications in plant genetics. Colchicine is utilized in the process of inducing chromosome doubling, contributing to advancements in genetic research and breeding.