

## **Lab (9): Advanced Vascular plants (Angiosperms)**

**Angiosperm** is a synonym for **flowering plant**. It means "seed within a vessel" or "enclosed seed." The defining angiosperm feature is the enclosure of the ovules within surrounding tissue called an ovary. The ovary is part of a flower, a structure that occurs only in angiosperms. The ovary, and sometimes associated tissues, eventually forms a fruit, another unique angiosperm structure.



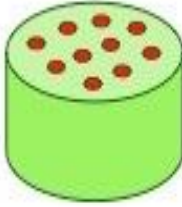
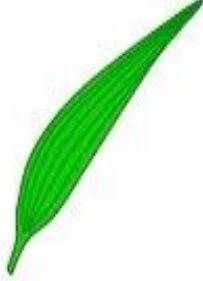






### **The major characteristics of Angiosperm**

- 1- The largest and most diverse group within the kingdom Plantae.
- 2- About 300,000 species of flowering plants represent approximately 80 percent of all the known green plants now living.
- 3- Occurring in wide range of habitats.
- 4- They range in size from the smallest *Wolffia* to tall trees of *Eucalyptus* (over 100 meters).
- 5- They provide us with food, fodder, fuel, medicines and several other commercially important products.
- 6- Angiosperms possess true root, true stem and true leaves.
- 7- They are divided into two classes: the dicotyledons (dicot) and the monocotyledons (monocot).

### **There are 6 characteristics used to compare between dicot and the monocot**

- 1- Monocots have one cotyledon (corn, lily, etc) while Dicots have two cotyledons (bean, oak, etc). Cotyledon is defined as a seed leaf of a flowering plant; it provides nutrients for the developing plant embryo before photosynthesis begins.
- 2- Type of stem in monocot is Herbaceous while in dicot is herbaceous or woody.
- 3- Type of root system in monocot usually Fibrous while in dicot is Tap root.

- 4- Leaf venation parallel in monocot while dicot have net-veined leaves.
  - 5- Flower parts in monocot are groups of three while in dicot are groups of four or five.
  - 6- Arrangement of vascular tissue in monocot is scattered while in dicot is bundle or ring.
- Monocots consist of such economically and ecologically important plants as agaves, bananas, grasses, onions, palms, rushes, and yuccas.
  - dicots include such economically and ecologically important plants as blueberries, buckwheat, cacti, carrots, coffee, grape vines, legumes, melons, potatoes, roses, sandalwood, strawberries, sunflowers, tea, tomatoes, and walnuts.

	Seed	Root	Vascular	Leaf	Flower
<b>Monocot</b>					
	One cotyledon	Fibrous roots	Scattered	Parallel veins	Multiples of 3
<b>Dicot</b>					
	Two cotyledon	Tap roots	Ringed	Net-like veins	4 or 5

**Figure(1): Comparison of Monocotyledons and Dicotyledons**

## **Practical section**

### **1-See under microscope:**

- C.s in stem show vascular bundle in both Monocotyledons (*Zea mays*) and Dicotyledons ( *Helianthus sp*)

2-Differentiate between **Monocotyledons and Dicotyledons** in terms to structure of root, leaves and seeds