Summary of Lecture 1: Seeds (Pharmacognosy-2)

- **Seed definition:** A mature fertilized ovule highly adapted for reproduction and distribution of the plant. It contains an embryo.
- **Parts of a seed:**

- Testa: One or two seed coats originating from the integument of ovule.
- Perisperm: Formed from the tissue of the nucellus and membranous coat surrounding the embryo (Ricinus) or developing infolding penetrating the endosperm (nutmeg).
- Endosperm: Formed from the tissue of the nucellus and surrounding the embryo.
- Embryo: Originates from zygote after fertilization of ovule.

- **Types of seeds or ovules:**

1. **Orthotropous (erect or straight):** Ovule grows up straight on the placenta. Hilum, micropyle, and chalaza on the same straight line. No raphe. Hilum and chalaza on same side, micropyle at opposite side. Example: Cannabinaeae.
2. **Anatropous:** Common type. Ovule completely inverted and bent upon the funicle. Hilum and micropyle on one side, chalaza on opposite side, forming a raphe that extends all over the length of the ovule. Example: Liliaceae.
3. **Amphitropous:** A part of the ovule is bent upon the funicle. A raphe is formed extending half the distance between chalaza and micropyle. Chalaza and micropyle on straight line perpendicular to hilum. Example: Nuxvomica.
4. **Campylotropous:** Nucellus is bent upon itself due to uniform or rapid growth of one side together with the coats of the same side. Micropyle, hilum, and chalaza are adjacent to each other. No raphe. Example: Datura.

- **Testa (seed coat) consists of:**

- Epidermis layer: outer layer, may be palisade-like cells, mucilagenous, hairy, etc.
- Nutritive (collapsed or hyaline) layer: compressed layer of thin-walled empty collapsed cells.
- Other layers (may be present or absent): subepidermal layer (hypodermis), pigment layer, sclerenchymatous layer.

- **Kernel (endosperm and embryo):** All tissues inside testa. Seeds divided into:

- Exalbuminous: kernel formed mainly of the embryo.
- Albuminous: embryo surrounded by endosperm or perisperm.

- **Forms of embryo:** Composed of one or two cotyledons, radicle, and plumule. Types based on shape of cotyledons and location of radicle:

1. Straight: cotyledons straight (linseed).
2. Curved: cotyledons curved (papaver).
3. Coiled: cotyledons coiled (Solanaceous drug).
4. Bent: radicle bent in front of cotyledons in three ways:

- A- Accumbent: radicle bent in front of two straight cotyledons (Foenugreek).
- B- Incumbent: radicle bent in front of only one of the two straight cotyledons (Cannabis).
- C- Orthoplocous: like incumbent but cotyledons folded to enclose the bent radicle (Black mustard).

- **Seed outgrowths:**

1. Aril (arillus): originates from tissues of the hilum, covers part or whole seed (cardamom).
2. Arillode: originates from tissue of the micropyle only, covers part of seed (Nutmeg).
3. Strophiole: enlargement over the position of the raphe (Colchicum).
4. Caruncle: fleshy or spongy outgrowth formed from neighbourhood tissue of the micropyle (Castor).
5. Awn: a plume with stalk (Strophanthous).