Science 2 - Chapter: Classification of Plants

 ***1. Introduction to Classification of Plants***- Plants are autotrophic, eukaryotic organisms with cell walls and chlorophyll.
- Classification helps in studying and understanding the diversity of plants by grouping them based on similarities.

***2. Basis for Classification of Plants***
Plants are classified on the following criteria:
- Presence or absence of organs.
- Presence or absence of conducting tissues for transporting water and food.
- Presence or absence of seeds.
- Whether seeds are enclosed in fruits or not.
- Number of cotyledons (seed leaves) in seeds.

***3. Major Groups of Plants***
|

|  |  |  |
| --- | --- | --- |
| **Group**  |  **Characteristics**  |  **Examples**  |
| Cryptogams\* |  Do not produce seeds; reproduce by spores.  |  Algae, Bryophytes, Pteridophytes  |
|  \*\*Phanerogams\*\* |  Produce seeds; these are seed-bearing plants.  |  Gymnosperms, Angiosperms  |

**3.1 Sub-Kingdom: Cryptogams**- Plants reproduce by spores.
- No flowers, fruits, or seeds.
- Divisions:
- \*\*Thallophyta\*\* - simplest plants with soft, fiber-like bodies (e.g., algae)
- \*\*Bryophyta\*\* - called the "amphibians of plant kingdom"; need water for reproduction (e.g., moss)
- \*\*Pteridophyta\*\* - vascular plants reproducing by spores (e.g., ferns)

**3.2 Sub-Kingdom: Phanerogams**- Seed-bearing plants with flowers and fruits.
- Divided into:
- \*\*Gymnosperms\*\* (naked seeds; seeds not enclosed in fruit)
- Mostly evergreen, woody plants.
- Male and female reproductive organs on different sporophylls of the same plant.
- Stem unbranched, leaves form crown.
- Examples: Cycas, Pinus, Thuja.
- \*\*Angiosperms\*\* (seeds enclosed in fruit)
- Flowers are reproductive organs.
- Seeds develop inside fruits.
- Further divided into monocots and dicots based on seed leaves count.

**4. Monocots vs Dicots**

|  |  |  |
| --- | --- | --- |
| **Feature** | **Monocots** | **Dicots** |
| Number of cotyledons | 1 | 2 |
| Root type | Fibrous root | Tap root |
| Branched | Stem branching | Usually unbranched |
| Leaf venation | Parallel venation | Reticulate venation |
| Flower parts | Usually in multiples of 3 | Usually in multiples of 4 or 5 |
| Examples | Maize, wheat, banana | Sunflower, mustard, tamarind |

**5. Additional Important Points**- Plants are autotrophic because they synthesize food through photosynthesis using chlorophyll.
- Classification helps in understanding evolutionary relationships and adapting plants for different environments.
- Gymnosperms do not bear fruits, whereas angiosperms bear fruits containing seeds.
- Plants with no conducting tissues are non-vascular (algae, bryophytes), while those with conducting tissues are vascular (pteridophytes, gymnosperms, angiosperms).

**6. Quick Review - Key Definitions.**

- \*\*Spore:\*\* A reproductive unit in cryptogams for asexual reproduction.
- \*\*Zygote:\*\* Formed during sexual reproduction in plants.
- \*\*Cryptogams:\*\* Plants without flowers, fruits, and seeds.
- \*\*Phanerogams:\*\* Plants with flowers, fruits, and seeds.