

**M.Sc. Botany (Semester II)**  
**Course Title : Systematics and Evolution**

**Unit II: Cyperaceae**

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# Cyperaceae : Sedge Family

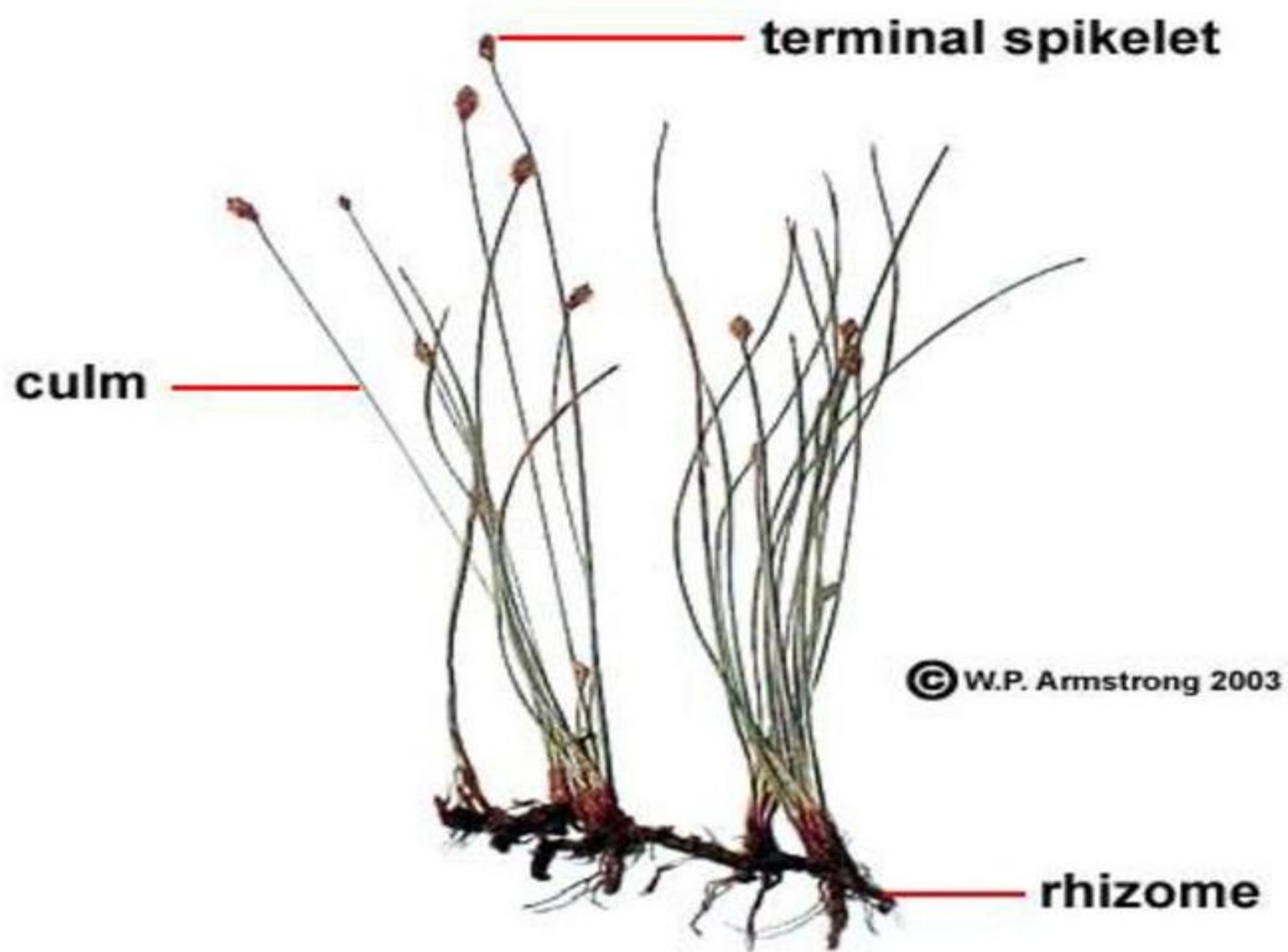
- The Cyperaceae family of monocotyledonous flowering plants commonly known as sedge family
- Third largest monocot family
- This family members are graminoid (grasslike) herbaceous plants found especially in wet regions throughout the world

# Scientific Classification:

- Kingdom : Plantae
- Phylum : Angiosperms
- Division: Magnoliophyta- Flowering plants
- Class : Liliopsida - Monocotyledons
- Order : Cyperales
- Family : Cyperaceae (Sedge Family)
- Genera : 90
- Species : 5,500 (In India, 441 species)

## Morphological characters

- **Habit:** Plants are mostly commonly perennial herbs. Perennating by means of creeping rhizomes or tubers
- **Roots:** Adventitious, fibrous, branched or tuberous
- **Stem:** Underground rhizomes or tubers, aerial shoots, solid glaucous or glabrous, without distinction into nodes and internodes

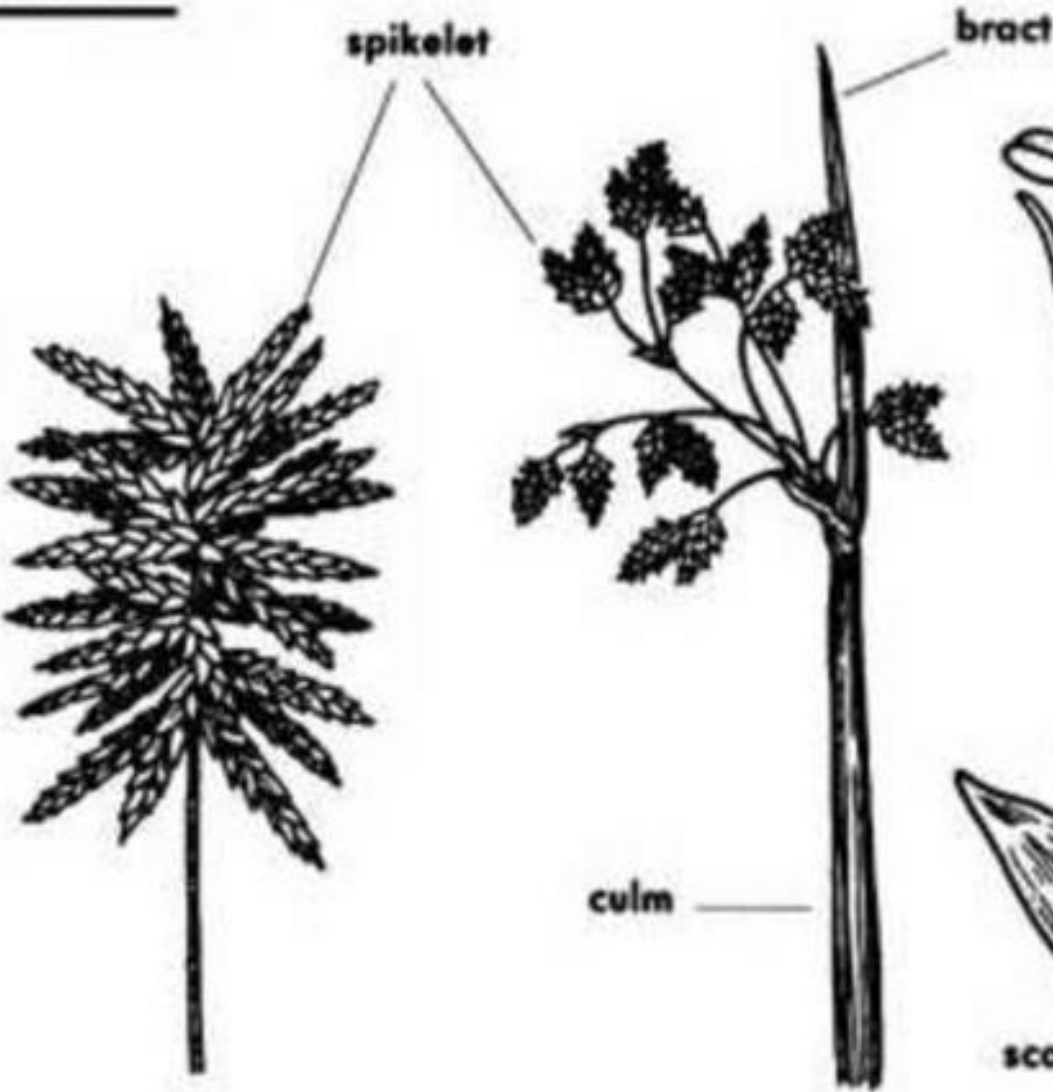


**Spike Sedge (*Eleocharis montevidensis*)**

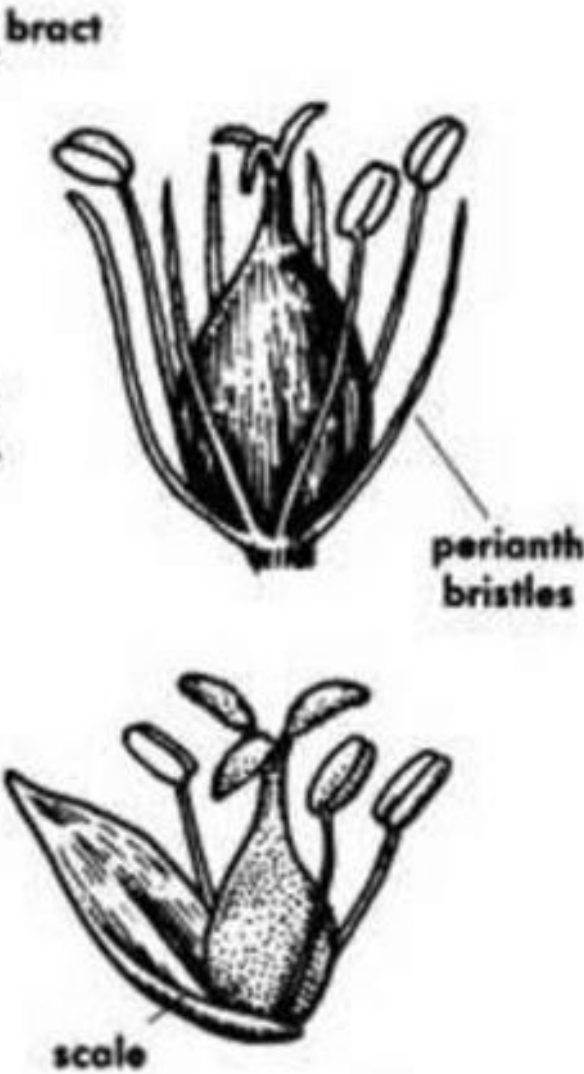
**Leaves:** Sessile, without stipulate, leaf base sheathing, sheath closed, ligulate, arranged in three rows, alternate and simple, lamina entire parallel venation

**Inflorescence:** Spikelets, panicles or in spikes of cymose

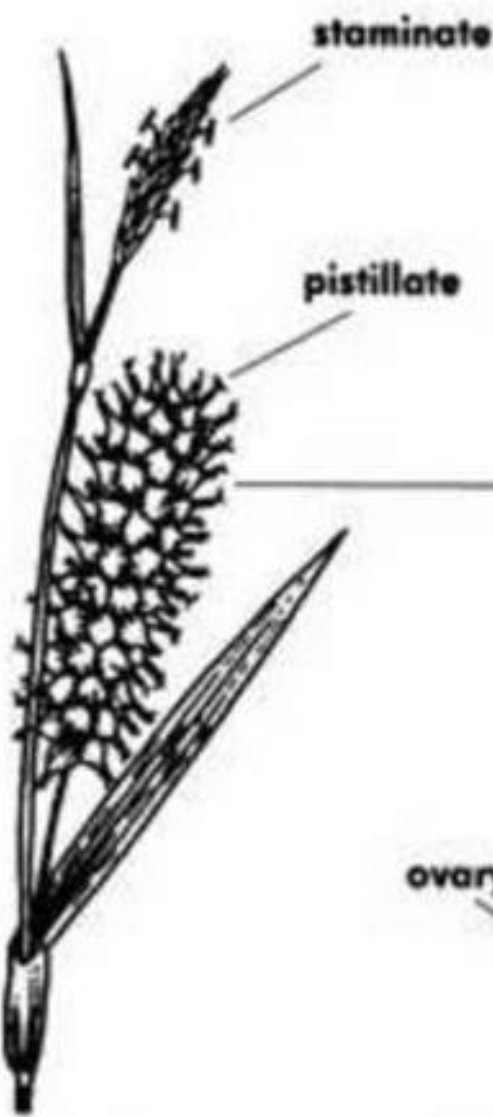
**SEDGES**



**INFLORESCENCES**



**SEDGE FLOWER**



**SPIKELETS**



**PERIGYNIUM**

## Reproductive characters

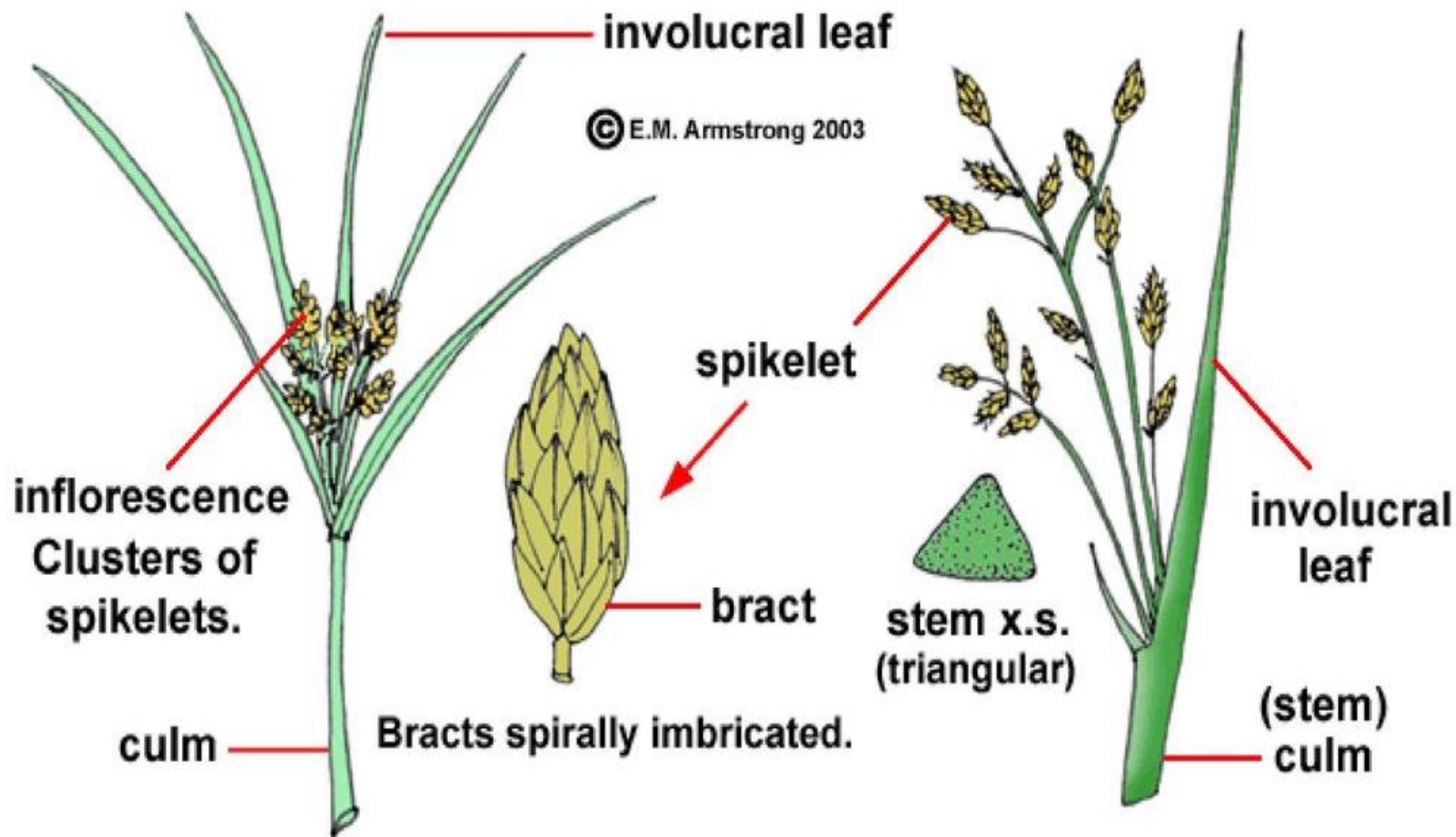
### **Flower:**

Sessile, bracteate, zygomorphic hermaphrodite or unisexual, bracteolate (arising in the axil of a glume), hypogynous

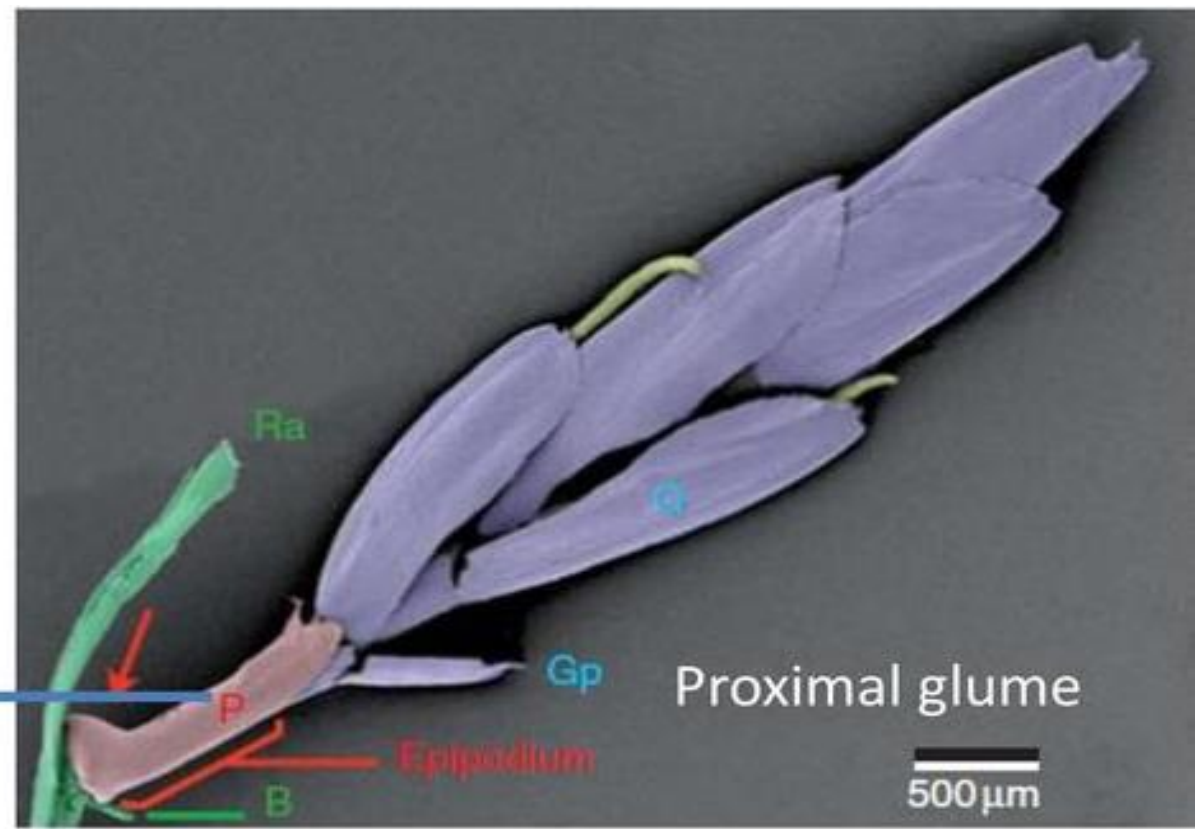
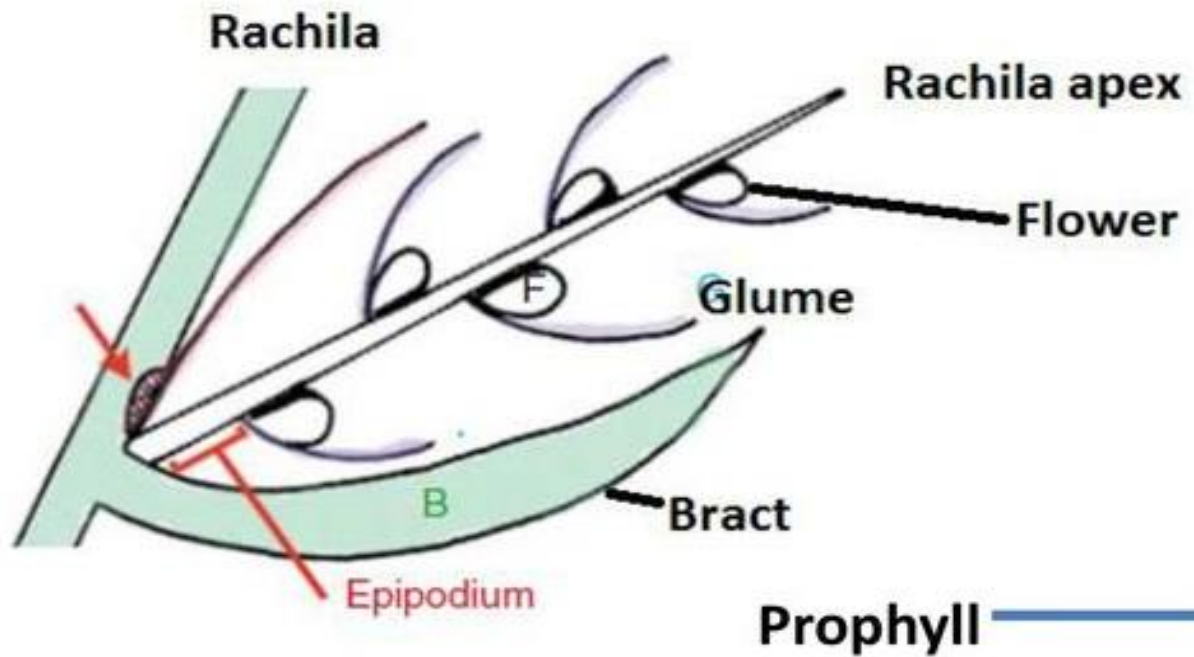
### **Perianth or tepals:**

Usually absent but in some epitomized by hairs or scales (*Oreobolus obtusangulus*); flowers naked (*Cyperus*, *Carex hirta*)





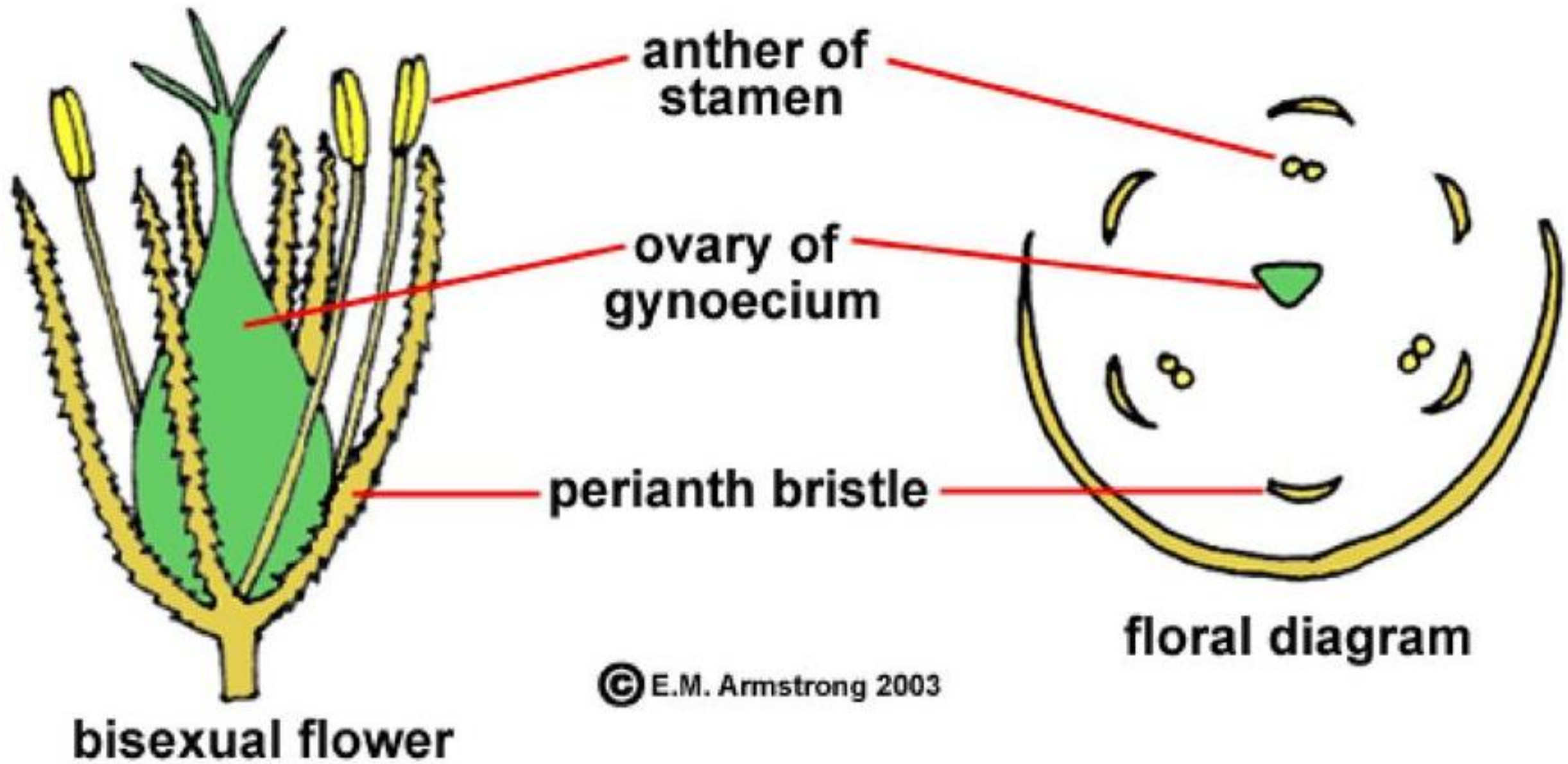
***Scirpus* (bulrush or tule):** Depending on the species, one-several involucral leaves subtend the inflorescence of spikelet clusters.



- Spikelet consist of a spikelet axis (rachila) and few to several spirally or distichously arranged glumes, each subtending one unisexual or bisexual flower
- First scale on a lateral spikelet is prophyll (Bracteole)
- Internodes between prophyll and second glume is epipodium

**Androecium:** In male or hermaphrodite flowers stamens usually 3, may be 1 to 6 or one (*Hemicarpha*), polyandrous; anthers dithecous, basifixed, oblong or linear; filaments long and thread-like.

**Gynoecium:** In female flowers or hermaphrodite flowers gynoecium is bicarpellary (*Rhyncospora*) or tricarpellary (*Carex*), syncarpous, superior, unilocular, single basal ovule; style single or divided into the equal number of carpels; stigma linear or feathery corresponding to the number of carpels.



**Simple flower of a bulrush (*Scirpus*)**



- **Fruits:** Non-fleshy, indehiscent achene
- **Seed:** Endospermic
- **Pollination:** By wind
- **Floral Formula**

**Hermaphrodite flower :**  $0|0 \quad \text{♂} \quad P_0 A_3 \text{ or } 6 \quad G_{\underline{(3)} \text{ or } \underline{(2)}}$

**Male flower :**  $0|0 \quad \text{♂} + P_0 A_3 G_0$

**Female flower :**  $0|0 \quad \text{♀} \quad P_0 A_0 G_{\underline{(3)}}$

*Carex gracillima*- graceful sedge



*Carex vesicaria*



*Cyperus polystachyos*



*Cyperus esculentus*





## Economic Importance

This family has little economic importance:

- **Food:** Tubers of *Cyperus esculentus* (chufa sedge, nut grass) are used as food due to their high oil content.
- **Fodder:** Many species of *Cyperus* are used by cattle

**Medicinal importance:** Many plants of this family are used in medicines.

- The tubers and rhizomes of *Cyperus articulatus*, *C. longus* are carminative, stimulant and tonic.
- The tubers of *Cyperus stoloniferous* are stimulant for heart.
- The tubers of *Scirpus kysoor*, *S. grossus* are used in diarrhea and vomiting.
- *Scirpus articulatus* is purgative.
- *Kyllingia triceps* is used in diabetes.



- **Poisonous:** *Carex cernua* is cattle poison.
- **Ornamentals :** *Cyperus alterifolius* and *Isolepis* are cultivated in gardens.
- *Carex arenaria* and species of *Cyperus* are good sand binders.
- *Scirpus lacustris* is used for matting.
- Aromatic scented oil is obtained from *Cyperus stoloniferous*.

# Difference between Poaceae and Cyperaceae

Family	Stem	Leaves	Flower	Fruit
<b>Poaceae</b>	Rounded, hollow at internodes	Ligulate, Sheaths open, 2 ranked	Modified into glumes, lemma and paleas	caryopsis
<b>Cyperaceae</b>	3-sided, solid	Sheath closed, 3- ranked	Scales	Achene

# Acknowledgements

- Pandey BP (2010) A Textbook of Botany: Angiosperms. S. Chand & Co. Ltd. (ISBN: 9788121904049, 9788121904049)
- Stussy TF (1990) Plant taxonomy. Columbia University Press, USA
- Sharma OP (1993) Plant Taxonomy. Tata McGraw-Hill Education
- <https://en.wikipedia.org/wiki/laminaceae>
- I apologize to all authors whose findings could not be substantiated or cited in our presentation due to reasons of brevity

**Thank you for your attention**

