

BOT -106
GOVERNMENT COLLEGE (AUTONOMOUS), RAJAMAHENDRAVARAM
II B.Sc., - Botany - 3 / III Semester End (W.E.F. 2018-19)

Plant Taxonomy and Embryology

Total Hrs. of Teaching-Learning: 60 @ 4 h / Week

Total Credits : 03

Course Objectives: Plant Taxonomy and Embryology

- To study and understand the plant taxa and classification of Angiosperms.
- To study the families of angiosperms.
- To critically understand various taxonomical aids for identification of angiosperms.
- To analyze the morphology of the most common angiosperms of their localities and recognize their families.
- To illustrate and interrupt various aspects of embryology.

Unit -1 Introduction to Plant Taxonomy (12 h)

1. Fundamental components of taxonomy (identification, nomenclature, classification)
2. Taxonomic resources: Herbarium, Herbaria of National and International importance.
3. Botanical Nomenclature - Principles and rules of ICBN (ranks and names; principle of priority, binomial system; type method, author citation, valid-publication).

Unit - 2 Classification (12 h)

1. Types of classification- Artificial, Natural and Phylogenetic.
2. Bentham & Hooker's system of classification- merits and demerits.
3. Hutchinson system of classification- merits and demerits
4. Phylogeny, Origin and Evolution of Angiosperms; Angiospermic Phylogenetic Group - (APG IV - 2016 Classification)

Unit - 3 Systematic Taxonomy - I (12 h)

1. Systematic study and economic importance of plants belong to the following families:
2. **Polypetalous** : Annonaceae, Brassicaceae, Rutaceae, Cucurbitaceae and Apiaceae.

Unit - 4 Systematic Taxonomy - II (12 h)

1. Systematic study and Economic importance of plants belong to the following
2. families:
3. **Gamopetalous** : Asteraceae, Asclepiadaceae and Lamiaceae
4. **Monochlamydeous** : Euphorbiaceae
5. **Monocotyledonous** : Poaceae

Unit - 5 Embryology (12 h)

1. Anther structure, microsporogenesis and development of male gametophyte.
2. Ovule structure and types.
3. Megasporogenesis; development of Monosporic (*Polygonum*, *Oenothera*), Bisporic (*Allium*, *Endymion*) and Tetrasporic (*Peperomia*, *Drusa* and *Adoxa* types).
4. Pollination and Fertilization (out lines) Endosperm development and types.
5. Development of Dicot and Monocot embryos, Polyembryony.

Additional Inputs For CIA:

1. Botanical gardens, Floras, Single and Multiple Access Keys,
2. Areceae, Orchidaceae.
3. Apomixis

GOVERNMENT COLLEGE (AUTONOMOUS), RAJAMAHENDRAVARAM

Text Books for Botany - 3

- A text book for BOTANY – III Semester : Telugu Akademi, Hyderabad

Suggested Readings for Botany - 3

- **Pandey, A. K. (2000)** *Introduction to Embryology of Angiosperms*. CBS Publishers & Distributors Pvt. Ltd. , New Delhi
- **Sambamurty, A.V.S.S. (2005)** *Taxonomy of Angiosperms* I. K .International Pvt. Ltd., New Delhi
- **S.K.Mukharjee (2012)** *College Botany Volume-III (Angiosperms, Families of Angiosperms Phytogeography and Tissue Culture)* New Central Book Agency (P) Ltd., London

Reference books for Botany - 3

- **Jeffrey, C. (1982)** *An Introduction to Plant Taxonomy*. Cambridge University Press, Cambridge. London.
- **Lawrence, George H.M. (1951)** *Taxonomy of Vascular Plants*. The McMillan Co., New York
- **Mathur, R.C. (1970):** *Systematic Botany (Angiosperms)* Agra Book Stores – Lucknow, Ajmer, Allahabad, Delhi.
- **Heywood, V. H. and D. M. Moore (1984)** *Current Concepts in Plant Taxonomy*. Academic Press, London.
- **Bhojwani, S. S. and S. P. Bhatnagar (2000)** *The Embryology of Angiosperms (4th Ed.)*, Vikas Publishing House, Delhi
- **Maheswari, P. (1971)** *An Introduction to Embryology of Angiosperms*. McGraw Hill Book Co., London.
- **Johri, B.M. (2011)** *Embryology of Angiosperms*. Springer-Verlag, Berlin

Learning outcomes:

- Students can acquire the knowledge of classification of plants.
- One can identify the important plant species in our daily life.
- Students can acquire knowledge to maintain Botanical gardens.
- Students can gain knowledge about Embryo structure and their development.

Employability:

1. Knowledge about medicinally useful plants can create opportunities in Ayurveda.
2. Cultivation of Orchids can create self-employability.
3. Knowledge about apomixis useful in the process of hybrid seed production.

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II B.Sc., Botany Practical Paper - III Practical Syllabus (w.e.f. 2018-19)
(Plant Taxonomy and Embryology)

Total hours of laboratory Exercises 30hrs @ 2 per week

Credits 2

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1. Systematic study of locally available plants belonging to the families prescribed in theory syllabus.
 2. Preparation of taxonomic key for *Cleome*, *Sida*, *Crotalaria* species
 3. Demonstration of herbarium techniques.
 4. Structure of pollen grains using whole mounts (*Catharanthus*, *Hibiscus*, *Acacia*, Grass).
 5. Demonstration of Pollen viability test using *in-vitro* germination (*Catharanthus*).
 6. Study of ovule types and developmental stages of embryo sac using permanent slides / Photographs.
 7. Structure of endosperm (nuclear and cellular)
 8. Developmental stages of dicot and monocot embryos using permanent slides / Photographs
 9. Isolation and mounting of embryo (using *Symopsis* / *Senna* / *Crotalaria*)
 10. Field visits. Study of local flora and submission of Field Note Book.