



MCC, Department of Botany

**Paper 12a Combined Practical**  
**PLANT PHYSIOLOGY, BIOCHEMISTRY, ECOLOGY,**  
**ENVIRONMENT, FORESTRY, REMOTE SENSING**  
**AND SYSTEMATIC BOTANY**

M.Sc. va (Candidates admitted from the academic year 2008-2009)

**Core Practical**

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**PLANT PHYSIOLOGY, BIOCHEMISTRY, ECOLOGY,**  
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**Core Practical**

**Plant Physiology and Biochemistry**

1. Preparation of different solutions: Molar, molal and Normality solutions, pH and Buffers.
2. Determination of water potential using Chardakov's, gravimetric and plasmolytic methods.
3. Factors affecting membrane permeability in beet root cells.
4. Extraction and separation of known and unknown amino acids using Paper Chromatographic method.
5. Separation of chloroplast pigments. Quantification of Chlorophyll a, b and carotenoids.
6. Estimation of starch (Anthrone reagent method / Phenol-Sulphuric Acid method).
7. Estimation of free amino acids by ninhydrin method.
8. Estimation of proteins (Lowry's method / Bradford method).
9. Determination of enzyme activity of catalase, amylase and peroxidase..
10. Effect of light and wind on rate of transpiration.
11. Determining pathways of water movement through dye movement studies.
12. Localisation of potassium ions in the guard cells of stomata during stomatal opening and closure.
13. Structure, function and relationship in C<sub>3</sub> and C<sub>4</sub> photosynthetic subtypes.  
(C<sub>3</sub>-*Bambusa, Oryza*; C<sub>4</sub> Subtypes- NADP-ME - *Aristida, Digitaria, Cenchrus*;  
NAD-ME - *Cynodon, Eleusine*; PEP-CK - *Chloris, Eragrostis*).
14. Comparative rate of respiration – titration method.
15. Demonstration of Hill reaction with isolated chloroplast by DCPIP method.
16. Demonstration of protein separation by Gel electrophoresis.
17. Demonstration of Gravitropic response in grass pulvinus.
18. Demonstration of effect of PGRs on seed germination and internodal elongation.

## Ecology, Environment, Forestry and Remote Sensing

**Terrestrial Environment:** Measurement of air temperature at regular intervals of the day.

Measurement of relative humidity at different weather conditions and at different times.

Humidity meter and wet and dry bulb thermometer - working principle. Soil thermometer and measurement of soil temperatures.

Computation of saturation vapour pressure deficit. Rain gauge -working principle.

Study of bioclimates of India according to methods of Gaussen; construction of ombrothermic diagrams and interpretation of their ecological implications.

Qualitative study of soil texture, pH, acidity, chlorinity and organic matter.

**Aquatic Environment:** Estimation of alkalinity, chlorinity, free carbon dioxide, dissolved oxygen, nitrates, phosphates and dissolved organic matter.

Study of environmental profile of a local pond ecosystem.

**Community Study in Relation to Biodiversity:** Sampling techniques - quadrat, transect and other methods of quantitative sampling.

Statistical techniques in species diversity: diversity indices; indices of similarity, Simpson's index, Shannon-Weiner index.

Estimation of above and below ground biomass in a grazing land or forest.

Estimation of primary productivity by the Winkler's method. Estimation of primary productivity of a terrestrial plant.

### **Remote Sensing:**

Study of educational, aerial photographs, topo sheets and satellite imageries. Sample collection of different imageries/ photographs and their interpretation.

Visit to the Institute of Remote Sensing, Anna University, Chennai.

## **Systematic Botany**

1. Study of plants belonging to the families mentioned in theory in addition to a knowledge of the local flora.
2. Construction of dichotomous indented keys.
3. Construction of simple cladograms and phenograms.
4. Solving nomenclatural problems.
5. Field visits to study flora.
6. A set of 20 herbarium specimens and field diary to be submitted during the End of Semester practicals.

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