



## DEPARTMENT OF BOTANY

Satavahana University, Karimnagar-505 001 Telangana, India

Date: 26-5-2014

**Prof. B. Digamber rao**  
Chairperson, BOS in Botany

To

**The Registrar**  
Satavahana University  
Karimnagar-505 001

Sir,

**Sub:** Board of Studies in Botany meeting held on 26<sup>th</sup> May, 2014 to finalize the syllabus for both III & IV semesters of M.Sc. Botany-reg.

This is to inform you that the Board of Studies in Botany meeting was held on 26<sup>th</sup> May, 2014 to revise and finalize the syllabus for both III & IV semester of M.Sc. (Botany) course of Satavahana University for both theory and practical for the academic year of 2014-2015. The revised syllabus, for the benefit of both faculty and students is at present available in the university website for wider availability. This is for your information and needful action.

With thanks,

**Prof. B. Digamber rao**  
Chairperson, BOS in Botany,  
Satavahana University

**Prof. B. Digamber Rao**  
Chairperson, B.O.S. in Botany  
Satavahana University  
Karimnagar- 505 001

**Enclosure:**

1. Revised syllabus for both III & IV semesters of M.Sc. Botany

**Copy to:**

1. Dean CDC, SU
3. PS to Vice-Chancellor, SU
4. PA to Registrar, SU
5. Principal, UCS, SU, KRMR
6. Principals of all concerned PG colleges of SU
7. In-charge, Department of Botany, SU, KRMR
8. Stack file

Titles of Papers for M.Sc. Botany effective from first year  
of students admitted in 2013-2014  
Savitribhanu Univ. Karimnagar.

### SEMESTER – I

- Paper – I : Phycology, Mycology and Microbiology  
Paper – II : Bryophyta, Pteridophyta and Gymnosperms  
Paper – III : Taxonomy and Economic Botany  
Paper – IV : Anatomy, Embryology and Palynology

### SEMESTER – II

- Paper – I : Plant Biochemistry  
Paper – II : Cytogenetics, Genetics and Evolution  
Paper – III : Ecology and Phytogeography  
Paper – IV : Molecular Biology

### SEMESTER – III

- Paper – I : Biodiversity and Conservation  
Paper – II : Plant Physiology  
Paper – III (Elective) : (i) Plant Pathology, (ii) Industrial Microbiology  
Paper – IV (Elective) : (i) Plant Breeding, (ii) Bio-fertilizers and Organic farming

### SEMESTER – IV

- Paper – I : Plant Biotechnology and Tissue Culture  
Paper – II <sup>Biophysical method</sup> : Biostatistics, Computer Applications and Bioinformatics  
Paper – III (Elective) : (i) Medicinal Plants & Pharmacognosy, (ii) Applied Phycology  
Paper – IV (Elective) : (i) Ethnobotany, (ii) Microbial Ecology

~~Arvind~~ ~~Arvind~~ ~~Arvind~~ ~~Arvind~~ ~~Arvind~~  
~~Arvind~~ ~~Arvind~~ ~~Arvind~~ ~~Arvind~~ ~~Arvind~~  
13/3/13 13/3/13 13/3/13 13/3/13 13/3/13

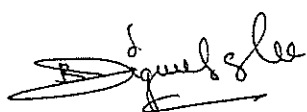
**Satavahana University**  
**M.Sc. (Final) BOTANY (Semester System)**  
**Syllabus, Scheme of Instruction and Examination (Effective for II Yr from 2014-2015)**

**Semester III (15 Weeks)**

Paper No.	Sub.Code	Subject/Paper Title	Instruction Hrs/Wk	Exam Time Hrs	Max Marks
THEORY					
I		Biodiversity and Conservation	4	3	100
II		Plant Physiology	4	3	100
III		Elective – I : Plant Pathology	4	3	100
		Elective - II : Industrial Microbiology	4	3	100
IV		Elective – I : Plant Breeding	4	3	100
		Elective – II : Biofertilizers and Organic farming	4	3	100
PRACTICALS					
I		(Title to be given)	4	3	50
II		(Title to be given)	4	3	50
III		(Title to be given)	4	3	50
IV		(Title to be given)	4	3	50
		Seminar	4	-	-
Total ....			32+4		600

**Semester IV (15 Weeks)**

Paper No.	Sub.Code	Subject/Paper Title	Instruction Hrs/Wk	Exam Time Hrs	Max Marks
THEORY					
I		Plant Biotechnology and Tissue culture	4	3	100
II	Biophysical method	Biostatistics, Computer Application and Bioinformatics	4	3	100
III		Elective – I : Medicinal Plants and Pharmacognosy	4	3	100
		Elective - II: Applied Phycology	4	3	100
IV		Elective - I : Ethnobotany	4	3	100
		Elective - II: Microbial Ecology	4	3	100
PRACTICALS					
I		(Title to be given)	4	3	50
II		(Title to be given)	4	3	50
III		(Title to be given)	4	3	50
IV		(Title to be given)	4	3	50
		Seminar	4	-	-
Total ....			32+4		600

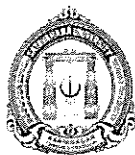


Chairman, BOS

Botany

Satavahana University, KMR.  
**Dr. B. DIGAMBER RAO**  
 Professor of Botany


DEPT. OF BOTANY  
 KAKATIYA UNIVERSITY  
 Warangal-506 009.



**SATAVAHANA UNIVERSITY**  
Karimnagar-505 001 Telangana, India  
**M. Sc. (BOTANY) III SEMESTER**  
**THEORY & PRACTICAL SYLLABUS**

---

- I. Biodiversity and Conservation
- II. Plant Physiology
- III. Elective-I: Plant Pathology  
Elective-II: Industrial Microbiology
- IV. Elective-I: Plant Breeding  
Elective-II: Biofertilizers and Organic farming

  
Prof. B. Digamber Rao  
Chairperson, B.O.S. in Botany  
Satavahana University  
Karimnagar- 505 001

**M. Sc. (BOTANY) III SEMESTER**  
**PAPER I: BIODIVERSITY AND CONSERVATION**

---

**Unit- I:** Concept of Biodiversity, Levels of Biodiversity, CBD, CITES, IUCN,  
Value of Biodiversity, Magnitude of Biodiversity,


**Unit- II:** Distribution of biodiversity, keystone species, umbrella species,  
Flagship species, endemism and biodiversity, hot spots and biodiversity

**Unit- III:** Threats of biodiversity, threatened plants and animal species of India, bio-wealth of India (forest, wetlands, mangroves, coral reefs), ecological extension

**Unit- IV:** Principles of conservation, in-situ conservation (protected areas, national parks, wild life sanctuaries, bio-reserves, sacred groves), ex-situ conservation, (botanical gardens, zoo park, cryopreservation and seed banks).

**Books recommended:**

1. Global Biodiversity Assessment – V.H. Heywood & R.T Watson, Cambridge University Press. 1995.
2. Biodiversity Principles & Conservation – Kumar & Sija. Agro Bios India. 2000.
3. Essential Environmental Studies. S.P. Misra & S.N. Pandey, Ane Books India 2008.

  
**Prof. B. Digamber Rao**  
Chairperson, B.O.S. in Botany  
Satavahana University  
Karimnagar- 505 001

**M. Sc. (BOTANY) III SEMESTER  
PAPER I: BIODIVERSITY AND CONSERVATION**

---

**PRACTICAL SYLLABUS**

**I. Major experiments**


1. Determination the Importance Value Index (IVI) for Species
2. Estimation of Total Importance Value (IV) for Economic Species
3. Determination of soil types and soil characters

**II. Minor experiments**

1. Remote Sensing of Natural Resources; Forest ecosystem nearby (Google earth)
2. Mapping of in-situ plant conservation in India
3. IUCN Threatened categories: Rare, Endangered, Vulnerable categories of plant species of Telangana/ Andhra Pradesh.

**III. Spotters:**

1. Live plants or Herbarium specimens of Jatropha, Pongamia, castor etc.
2. INSAT maps
3. Aquarium
4. Quadrat
5. Agar plats (Microbial diversity)
6. Seeds (Crop plants, Energy plants)
7. Non Forest Timber Products (NTFPs) (Gums, rattans, nuts/fruits from local/near forests

  
**Prof. B. Digamber Rao**  
Chairperson, B.O.S. in Botany  
Satavahana University  
Karimnagar- 505 001

**M. Sc. (BOTANY) III SEMESTER  
PAPER II: PLANT PHYSIOLOGY**

---

**Unit-I: PLANT WATER RELATION AND MINERAL NUTRITION**

- 1) Water relation – water potential, SPAC concept, stomatal relation of transpiration-energy and hormonal development hypothesis.
- 2) Mineral nutrition: Role of micronutrients in plant nutrition, mechanism of ion uptake, role of ATPase as carries ion channels.

**Unit- II: PHOTOSYNTHESIS AND RESPIRATION**


- 1) Photochemistry and photosynthesis; general concepts and historical background: evolution of photosynthesis apparatus, photosynthetic pigments and light harvesting complexes.
- 2) Photo-oxidation of water, mechanism of electron transport, carbon assimilation; the Calvin cycle, and C<sub>4</sub> cycle; CAM, Photorespiration
- 3) Respiration; overview of plant respiration, Glycolysis, TCA cycle, Electron transport and ATP synthesis, Pentose Phosphate Pathway, Glyoxylate cycle, Cynide-Resistant Respiration.

**Unit- III: NITROGEN AND SULPHUR METABOLISM AND PLANTGROWTH REGULATIONS.**

- 4) Nitrogen fixation, nitrogen and sulphur metabolism; overview, biological nitrogen fixation, nodule formation and nod factors, mechanism of nitrate uptake and reduction, ammonium assimilation, sulphate uptake, transport and assimilation.
- 5) Structure and regulation of Nif genes, transfer of nif gene into higher plants.
- 6) Plant growth regulators; physiological effects and mechanism of action of auxines, Gibberellines, Cytokinins, Ethylene, Abscisic acid.

**Unit-IV: THE FLOWERING PLANTS &STRESS PHYSIOLOGY.**

- 7) The flowering process; Photoperiodism and its significance, endogenous clock and its regulation.
- 8) Floral induction and development- genetic and molecular analysis, role of vernalization.
- 9) Stress physiology; plant response to abiotic stress, mechanism of abiotic stress, tolerance (water stress, salt stress, temperature stress, heavy metal stress).

  
**Prof. B. Digamber Rao**  
Chairperson, B.O.S. in Botany  
Satavahana University  
Karimnagar- 505 001

M. Sc. (BOTANY) III SEMESTER  
PAPER II: PLANT PHYSIOLOGY

---

PRACTICAL SYLLABUS

**(A) Major Experiments:**


1. Estimation of Reducing Sugars
2. Separation of Chloroplast pigments by Solvent Extraction method
3. Determination of Iodine Number of Oils.

**(B) Minor Experiments:**

4. Extraction and estimation of Chlorophyll- a and Chlorophyll- b.
5. Estimation of IAA.
6. Estimation of Ascorbic Acid

**Spotters:**

1. Plasma membrane
2. ATP
3. Root Nodules
4. Nitrogenase
5. Rubisco
6. C<sub>3</sub> Plants
7. C<sub>4</sub> Plants
8. CAM Plants
9. IAA
10. IBA
11. GA<sub>3</sub>
12. Phytochrome
13. Kranz Anatomy
14. Florigen.

  
Prof. B. Digamber Rao  
Chairperson, B.O.S. in Botany  
Satavahana University  
Karimnagar- 505 004



**M.Sc. (BOTANY) SEMESTER –III**  
**Paper –III: Elective -II**  
**INDUSTRIAL MICROBIOLOGY**

---

**UNIT-I.**

- Fermentation technology, scope and prospects, isolation, screening and strain improvement of industrial microorganisms.
- Types of fermentation , batch , continuous, fed-batch solid state , submerged, dual and multiple fermentations, preservation methods for industrial microorganisms
- Microbial fermenter design. aseptic operation, body construction and types of fermentation vessels

**UNIT-II.**


- Fermentation products, primary and secondary metabolites, fermentation media formulation , carbon, nitrogen, mineral nutrients and their resources, starter culture and scale up process.
- Recovery and purification of fermentation products, fermentation economics, fermentation efficiency and its assessment, Patent concept and IPR

**Unit-III.**

- Industrial production of microbial metabolites
- Antibiotics-Penicillin
- Organic acids-Citric acids
- Alcohol-Ethanol
- Amino acids-Glutamic acid
- Beverages-Beer, Wine
- Vitamines-B<sub>12</sub>
- Enzymes-Amylase

**UNIT-IV**

- Immobilization of enzymes and cells.
- Biotechnology process microbial production of foods, bread, cheese, mushroom cultivations, Single Cell Proteins (SCP).
- Microbial technology in agriculture, Biofertilisers and Biopesticides
- Mass production of Bacterial and Fungal Biofertilizers and their quality control
- Production of BT and *Trichoderma* and their quality control.



**Prof. B. Digamber Rao**  
Chairperson, B.O.S. in Botany  
Satavahana University  
Karimnagar- 505 001

**INDUSTRIAL MICROBIOLOGY**  
**Paper –III: Elective -II**

---

**PRACTICAL SYLLABUS**

**(A) Major Experiments and Minor Experiments**

1. Design of Industrial Fermentor
2. Uses of Logarithms in microbial growth
3. Assessment of Microbial growth and assessment for fermentation efficiency
4. Estimation of Penicillin by Iodometry /Bioassay
5. Estimation of Citric Acid by Calorimetry
6. Estimation of Vitamin B<sub>2</sub>(Riboflavin) by Bioassay method
7. Wine & Beer production and its quality assessment
8. Assay of  $\alpha$  – amylase by Calorimetry
9. Immobilization of Enzymes and activity determination
10. Production of Biopesticides (Trichoderma sps.) & Bt

**Spotters :**

1. *Aspergillus*
2. Yeast
3. *Trichoderma*
4. *Pseudomonas*
5. *Pencilium*
6. *Bacillus thuriengensis*
7. Lysine
8. Riboflavin
9. Cheese & Bread
10. Mushroom
11. Fermentor
12. *Spirullina*



Prof. B. Digamber Rao  
Chairperson, B.O.S. in Botany  
Satavahana University  
Karimnagar- 505 001

**M.Sc. (BOTANY) SEMESTER –III**  
**Paper-IV- Elective -II**  
**BIOFERTILIZERS AND ORGANIC FARMING**

---

**UNIT-I: INTRODUCTION TO PLANT NUTRITION**

- role of microbes in plant nutrition, plant growth promoting Rhizobacteria (PGPR) and fungi, nitrogen fixers, phosphate solubility, micro organism and VAM, modes of N<sub>2</sub> fixation, symbiosis and free living forms.
- Bio fertilizer technology, Mass cultivation techniques, Biofertilizers and soil reclamation, organic farming, organic manure, compost, microbial succession, composting.

**UNIT-II. BACTERIAL BIOFERTILIZERS**

Isolation and mass cultivation of Rhizobium, Azotobacter, Azospirillum, Frankia and Phosphate solubilizing bacteria, PGPR formulation and applications.

**UNIT-III: CYANOBACTERIA BIOFERTILIZERS**

Utilization BGA in agriculture, Reclamation of saline and alkaline soils, Symbiotic Cyanobacteria, Blue green algae and nitrogen fixation, BGA and rice fields, Free living and symbiotic nitrogen biofertilizers, cultivation of BGA, methods of cultivation – trough method, pit method, field method, azolla, anabaena and its role in rice fields

**UNIT-IV: FUNGAL BIOFERTILIZER**

Micorhizae and Arbascular Micorrhizal Fungi: *Glomus*


Ectomycorrhizae: *Pisolithus tinctorius*

Production of root based inoculum:

Plant growth promoting fungi and biocontrol agent (*Trichoderma*) production of fungal bioinoculants and their application methods, advantages and disadvantages of bioinoculants in relation to chemical fertilizer

**References:**

- 1) Biology of rice fields - BGA-SC. Santra, 1993
- 2) Biofertilizer and organic farming. H, Pards and D.Hota-2007
- 3) A textbook of biotechnology by N.S. Subbarao.

  
Prof. B. Digamber Rao  
Chairperson, B.O.S. in Botany  
Satavahana University  
Karimnagar- 505 001

**M.Sc. (BOTANY) SEMESTER –III**  
**Paper-IV- Elective -II**  
**BIOFERTILISERS AND ORGANIC FARMING**


---

**PRACTICAL SYLLABUS**

- 1) Estimation method of biological N<sub>2</sub> fixation, acetylene reduction (GC) and total N<sub>2</sub> Estimation
- 2) Isolation of bacteria from soil and root nodules and assessment for PGPR characters.
- 3) Cultivation of biofertilizer bacteria (*Rhizobium/Azatobacteria*) and its GC assessment
- 4) Nodulation of legume seedlings by *Rhizobium* inoculants
- 5) Cultivation of BGA (*Anabaena/ Nostoc*) and assessment for N<sub>2</sub> fixation.
- 6) Cultivation of trichoderma and testing biocontrol activity (Growth inhibition in plate/ Chitinase activity).

**Spotters:**

1. Biofertilizers
2. VAM
3. Root Nodules
4. *Rhizobium* culture plate
5. Bio pesticide (*Trichoderma* Sps.)
6. Compost
7. Nitrogenase
8. Organic Fruit
9. Organic Vegetable
- 10 *Azolla*

  
**Prof. B. Digamber Rao**  
Chairperson, B.O.S. in Botany  
Satavahana University  
Karimnagar- 505 001



**SATAVAHANA UNIVERSITY**  
Karimnagar-505 001 Telangana, India  
**M. Sc. (BOTANY) Semester-IV**  
**THEORY & PRACTICAL SYLLABUS**

---

**THEORY**

1. Plant Biotechnology and Tissue culture
2. Biophysical method, Biostatistics, Computer Application and Bioinformatics
3. Elective-I: Medicinal Plants and Pharmacognosy  
Elective-II: Applied Phycology
4. Elective-I: Ethnobotany  
Elective-II: Microbial Ecology

**Prof. B. Digamber Rao**  
Chairperson, B.O.S. in Botany  
Satavahana University  
Karimnagar- 505 001

**M. Sc. (BOTANY) Semester-IV**  
**PAPER-I. PLANT BIOTECHNOLOGY AND TISSUE CULTURE**

---

**UNIT-I. BIOTECHNOLOGY**

- Recombinant DNA technology.
- GENE cloning principle and technique, Choice of vector ,
- Construction of genomic and DNA libraries.
- Blotting techniques – Southern, Northern and Western blotting.
- Polymerase chain reaction and its application, DNA finger printing
- Strategies for engineering biotic (Insect and fungal) and a biotic (drought and salinity) stress to tolerance in plant.

**UNIT-II.**


- Genetic engineering, basic concepts, aims and strategies for development of transgenics.
- Agro bacterium-natural genetic engineer T-DNA transfer mechanism, direct gene transfer techniques – selectable markers and reporter genes.
- Transgenics – possible risks and benefits.
- Current global status of transgenic crops.

**UNIT-III. TISSUE CULTURE**

- History scope and perspectives of plant cell, tissue and organic culture.
- Micropropagation through tissue culture and its application.
- Somaclonal variation and crop improvement.
- Protoplast isolation, culture and somatic hybridization types and their importance in agriculture.

**UNIT-IV.**

- Androgenic haploidy and its application embryo rescue and wide hybridization plants as bioreactors, Molecular forming.

  
**Prof. B. Digamber Rao**  
Chairperson, B.O.S. in Ectany  
Satavahana University  
Karimnagar- 505 001

**M. Sc. (BOTANY) Semester-IV**  
**PAPER-1 PLANT BIOTECHONOLOGY AND TISSUE CULTURE**

---

**PRACTICAL SYLLABUS**

**MAJOR EXPERIMENTS:**

- 1) Isolation of DNA
- 2) Isolation of plasmid DNA
- 3) Agrobacterium – mediated genetic transformation.
- 4) Agarose gel electrophoresis

**MINOR EXPERIMENTS**


- 5) Biolistic method of transformation. (gene gun)
- 6) Invitro amplification of DNA by PCR
- 7) Southern blotting

**MAJOR EXPERIMENTS:**

- 1) Preparation of tissue culture media (MS and BS media) sterilization of tissue culture media of inoculation of various explain.
- 2) Introduction of cellulose from different explain.
- 3) Micro propagation through induction of multiple shoot by using shoot tips and axillary buds.
- 4) Organogenesis and somatic embryogenesis using appropriate explains.
- 5) Enzymatic isolation of protoplast and their fusion employing PEG.

**MINOR EXPERIMENTS:**

- 6) Demonstration of anther culture experiment in culture
- 7) Encapsulation of somatic embryos.

  
**Prof. B. Digamber Rao**  
Chairperson, B.O.S. in Ectany  
Satavahana University  
Karimnagar- 505 001

**M. Sc. (BOTANY) Semester-IV**  
**PAPER-II. BIOPHYSICAL METHOD, BIOSTATISTICS, COMPUTER APPLICATION**  
**AND BIOINFORMATICS**

---

**Unit-I. BIOPHYSICAL METHOD**

- Molecular analysis using UV/ visible, florescence, circular dichroism, NMR and ESR Spectroscopy, Molecular structure determination using X-ray diffraction and NMR, Molecular analysis using light scattering, different types of mass spectrometry and surface plasma resonance methods.

**Unit-II. BIOSTATISTICS**


- Introduction to Biostatistics: Variables – Random discrete and continuous variables, population, sample estimate, mean, median, mode; frequency distribution, frequency curve and polygon; histograms
- Measures of disperse: Range, Variance, Coefficient of variance, standard deviation (SD) and standard error (SE)
- Probability distributions; Normal, binomial and passion
- Test of hypothesis; students T-test, chi-square distribution; correlation, coefficient and analysis of variance (ANOVA)

**Unit-III. COMPUTER APPLICATIONS**

- Basics of computers; concepts of hardware and software, disc operating systems, storage media such as disc CD-ROM
- Introduction to windows, MS-Excel, Data processing
- UNIX, LINUX
- Internet and Networking concepts

**Unit-IV. BIOINFORMATICS**

- Importance of Biological data bases; DNA data bank
- Protein sequence data bases
- Genomic and Proteomics: An Introduction
- Gene and Protein chips

  
**Prof. B. Digamber Rao**  
Chairperson, B.O.S. in Ectany  
Satavahana University  
Karimnagar- 505 001



**M. Sc. (BOTANY) Semester-IV**  
**PAPER-II. BIOSTATISTICS, COMPUTER APPLICATION & BIOINFORMATICS**

---

**PRACTICAL SYLLABUS**

**A. MAJOR EXPERIMENTS**

I. Problems on Biostatistics

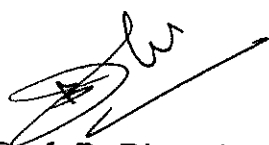
1. Measures of central tendencies: Mean, Median and Mode
2. Standard Deviation and Variance, Coefficient of variance
3. Test of Hypothesis; Students "t" test and Chi-square " $X^2$ " test
4. Correlation coefficient
5. Analysis of variance (ANOVA)

**B. MINOR EXPERIMENTS**

6. Block diagram of Computer
7. Protein modeling
8. Protein chips

**SPOTTERS:**

9. Computer hard disc
10. Compact Disc (CD)
11. Pen Drive
12. DNA Data bank
13. Importance of Biostatistics in Biology experiments
14. Graphs and Diagrams



**Prof. B. Digamber Rao**  
Chairperson, B.O.S. in Botany  
Satavahana University  
Karimnagar- 505 001

**M. Sc. (BOTANY) Semester-IV**  
**PAPER III: ELECTIVE -II-APPLIED PHYCOLOGY**

---

**UNIT-I.**

- History perspectives and scope of algae
- Algal as a source of food, feed and bio fertilizer
- Algal culture, preservation, and source of algal culture

**UNIT-II**

- Single cell protein studies with reference to *Spirulina*, *Chlorella* and *Scenedesmus*
- Mass cultivation and commercial value of sea weeds.
- Algae in agriculture

**UNIT-III**

- Aquatic pollution causes and consequences, Eutrophication and its impact on water quality.
- Algae as indicators in assessing and water quality and pollution.
- Algae in environmental health, sewage treatment and treatment in industrial water quality, algal blooms, nuisance of algae and their control.

**UNIT-IV**

- Mutation of genetic of algae
- Extra cellular products of algae.
- Algae in industrial uses (Cosmetic. Pharmaceutical. Agriculture and Biofuel)
- Toxic algae (fresh water and marine algae)



**Prof. B. Digamber Rao**  
Chairperson, B.O.S. in Botany  
Satavahana University  
Karimnagar- 505 001

## APPLIED PHYCOLOGY

### References :

- Algae and water pollution - Palmer, C.M  
Limnology - Werch, P.S.  
Seaweeds and their uses - Chapman, V.J.  
Metabolism in Algae - F.E.Fogg  
Cultivation of Algae - G.S. Venkatraman  
The Blue -Green - Peter Fay  
Cyanophyta - Desikchary, T.V.  
Algae and human affairs - Carole, A .Lembi et al.,  
Micro -algae biotechnology - Michael Borowitzka  
Handbook of Phycological method - Stein J.R.



**Prof. B. Digamber Rao**  
Chairperson, B.O.S. in Botany  
Satavahana University  
Karimnagar- 505 004

M. Sc. (BOTANY) Semester-IV  
PAPER III: ELECTIVE -II-APPLIED PHYCOLOGY

---

PRACTICAL SYLLABUS

MAJOR EXPERIMENTS


1. Algae as bioindicator of the assessment of water quality
2. Preparation of algal beads (sodium alginate)
3. Estimation of Phycocyanin pigment
4. Algal biofertilisers
5. Algal cytology (Chlorophyceae) by acetocarmine squash method
6. Cultivation of soil algae by using general media

MINOR EXPERIMENTS

7. Induction and conjugation in Chlorophyceae (Conjugales)
8. Biofuels

SPOTTERS:

9. Biofertilisers
10. Agar agar media
11. *Spirullina*
12. Commercial sea weeds (*Gracillaria*, *Gigartina*, *Gelidium* and *Laminaira*)
13. Toric Algae (*Gymnodinium*, *Anabaena*, *Lyngbya* and *Oscillatoria*)
14. Algal culture
15. Algal pigments
16. Phyco-colloids
17. Single Cell Protein
18. Nitrogen Fixation (Nitrogenase)

  
Prof. B. Digamber Rao  
Chairperson, B.O.S. in Botany  
Satavahana University  
Karimnagar- 505 001

**M.Sc .BOTANY – SEMESTER –IV**  
**PAPER-IV- ELECTIVE : I – ETHNOBOTANY**

---

**UNIT-I**

- Ethnobotany: Introduction, scope and relevance and interdisciplinary science.
- The ethnic groups of India: Major ethnic groups of Andhra Pradesh, and their life styles.
- The dependence of ethnic groups on the forests.
- The ethnobotanical data documentation: role of Indigenous Traditional Botanical Knowledge(TBK) .

**UNIT-II**

- The centers of ethnobotanical studies in the world.
- Ethnobiology research in Telangana/Andhra Pradesh. Plants of Magico-religious beliefs, social customs and taboos.
- The history of plant-human interactions: Paleobotanical evidence.
- Archaeo-ethnobotany: A brief account.

**UNIT-III**

- Ethnomedicine: Introduction and scope.
- Ethnoveterinary medicine and its significance.
- The important Indian ethnobotanical drugs.
- WHO and Ethno-directed drug discovery.

**UNIT-IV**

- Ethnoagriculture: Podu/Jhum/Shifting cultivation and its impact on the surrounding environment.
- The minor (non-timber) forest products collected by the ethnic tribes (Chenchus, Gonds, Koyas, Konda Reddi and Yanadi) of Telangana/Andhra Pradesh.
- Role of ethnobotany in the conservation of native plant genetic resources.
- Applied Ethnobotany. Ethnobotany and Employment opportunities.



**Prof. B. Digamber Rao**  
Chairperson, B.O.S. in Botany  
Satavahana University  
Karimnagar- 505 001

### **Ethnobotany: Reference Books and Journals:**

- Balick, M.J. & Cox, P.A. Plants, 1996. People and Culture –The Science of Ethnobotany. Scientific American Library, New York.
- Ciran 1993. 1993-2003, Indigenous Knowledge and Development Monitor.
- Cotton, C.M. 1966. Ethnobotany: Principles and Applications. John Wiley & Sons, New York.
- Haimendorf, C.V.F.1943. The Chenchus. Mac Millan & Co, London.
- Haimendorf, C.V.F.1945. The Reddis of Bisson Hills. Mac Millan & Co, London.
- Haimendorf, C.V.F.1979. The Gonds of Andhra Pradesh. Vikas Publishing House, New Delhi.
- Harsberger, J.W.1986. The purpose of ethnobotany. Botanical Gazette 21: 146-154.
- Hasian, N. 1995. *Bharateeya Girijanulu* (in Telugu). Orient Longman, Hyderabad.
- Hemadri, K. 1994. *Shastravettalanu Akarshisissthunna Girijana Vaidyam*. TCRTI, Hyderabad (in telugu).
- Jain, S.K. (Edited) 1981. Glimpses of Indian Ethnobotany. Oxford & IBH, New Delhi.
- Jain, S.K. (Edited) 1985. Ethnobiology in Human Welfare. Deep Publications. New Delhi.
- Jain, S.K. 1987. A Manual of Ethnobotany. Scientific Publishers , Jodhpur.
- Jain, S.K (Assist. by S. Srivastava) 1998. Dictionary of Ethnobotany Plants. Deep Publications, New Delhi.
- Mathias, E., Rangnekar,D.V.& McCorkle, C.M.(Ed.) 1999. Ethnoveterinary Medicines – Alternative for Livestock Development. BAIF Development Research Foundation, Pune.
- Ramarao, N. & Henry, A.N. 1996. The Ethnobotany of Eastern Ghats of Andhra Pradesh, India. BSI, Kolkata.
- Ravishankar, T. & Henry, A.N. 1992. The Ethnobotany of Adilabad district, Andhra Pradesh, Ethnobotany 4:45-52.
- Reddy, C.S., Nagesh, K., Reddy, K.N. & Raju, V.S. 2003. Plants used in ethnoveterinary practices by Gonds of Karimnagar district, Andhra Pradesh, India. J.Econ. Tax. Bot. 27(3): 631-634.
- Thurston,E. 1909. Casts and Tribes of Southern India. Govt. Press, Madras.



**Prof. B. Digamber Rao**  
Chairperson, B.O.S. in Botany  
Satavahana University  
Karimnagar- 505 001

M.Sc .BOTANY – SEMESTER –IV  
PAPER-IV- ELECTIVE : I – ETHNOBOTANY

---

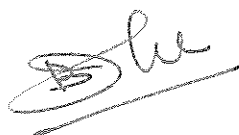
PRACTICAL SYLLABUS

**Major and Minor Experiments**

1. Collection of ethnobotanical data: From a local forest area and from a local forest tribe ethnobotanical data are to be collected. The details of resource persons are documented (photography, video, tape recording etc.)
2. Analysis of ethnobotanical data-disease-wise, plant part wise, habit-wise, tribe-wise and pictorial presentation of these data
3. Calculation of total important value (TIV) index of a species based on ethnobotanical uses; demonstrate the evaluation of two ethnobotanical sites for prioritization or disposal
4. Submission of Ethnomedicinal herbarium/Museum specimens like leaves, barks, tubers, nuts, etc. of economic/medicinal use.

**Spotters:**

1. Ethnic food plants:
  - a) *Cajanus cajana* (Kandi); b) *Sorghum bicolor* (jonnalu); c) *Dioscoria* spp. (Nalla gadda, kasi teega)
2. Ethnomedicinal plants:
  - a) *Andrographis paniculata* (nelavemu); b) *Rauwolfia serpentine* (sarpagandhi); c) *Terminalia bellarica* (tani)
3. Ethno-veterinary plants:
  - a) *Litsea glutinosa* (narra mamidi); b) *Gymnema sylvestre* (china pala teega); c) *Vitex negundo* (tella vavili)
4. Magico-religious/ ornamental plants:
  - a) *Abrus precatorius* (guriya); b) *Achyranthus aspera* (uttareni); c) *Cassia glauca* (bhuthankush, nerdi).

  
Prof. B. Digamber Rao  
Chairperson, B.O.S. in Botany  
Satevahana University  
Karimnagar- 505 001