

ANGIOSPERM TAXONOMY, ECOLOGY, PHYTOGEOGRAPHY AND CONSERVATION BIOLOGY

Unit-I: TAXONOMY

Introduction - History of classification - A detailed study of classification - Sexual system - Carolus Linnaeus, Natural System - Bentham and Hooker, Modern System - Engler and Prantl, Hutchinson and Takhtajan - Biosystematics, Chemotaxonomy and Numerical Taxonomy, Role of Anatomy and Embryology in solving Taxonomic problems.

Unit-II: TAXONOMY

International code of Botanical Nomenclature - Typification, Principles of priority and their limitations. Effective and valid publications - Author citation, retention, choice and rejection of names. Familiarity with botanical literature - Monographs, periodicals and floras. A general account on keys - Herbarium preparation and management - A brief account of B.S.I. and its role.

Unit-III: TAXONOMY

Study of the families and their economic importance of plants mentioned in the practical syllabus.

Unit-IV: ECOLOGY

Concept and dynamics of ecosystem: Types of ecosystem, components, Food chain, Food web and energy flow - Trophic level, ecological pyramids. Productivity and biogeochemical cycles (N, P, C, S). Ecological amplitude of a species and adaptation - Ecads, ecotypes, ecospecies, Raunkiaer's Life Forms.

Types of forests and forest conservation - Utilization of energy resources - Non-renewable and renewable.

Environmental pollution - Air, water, soil, thermal and radiation. Cumulative effect of pollution on global environment, Ozone depletion, Greenhouse effect and their consequences. Ecological indicators.

Unit-V: PHYTOGEOGRAPHY & CONSERVATION BIOLOGY

Phytogeography: Range - Dispersal and migration barriers hypothesis, Continental drift hypothesis, Land - Bridges hypothesis, Age and Area hypothesis, Endemism. Introduction to Remote Sensing and its uses.

Conservation Biology - Introduction - Current practices in conservation - Ecosystem approaches - Species based approaches - Social approaches - Chipko movement. *In situ* conservation (Afforestation, Social Forestry, Agro Forestry, Botanical Gardens, Biosphere Reserves, National Parks, Sanctuaries, Sacred Groves and Sthalavrikshas) and *ex situ* conservation (Cryopreservation, Gene Banks, Seed Banks, Pollen Banks, Sperm Banks, DNA Banks, Tissue Culture and Biotechnological strategies) - Environmental Education.

References

Taxonomy

- Bhattacharyya, B. (2005). Systematic Botany. Narosa Publishing House, New Delhi.

- Dahlgren, R. (1984). The Families of Monocotyledons: Structure, Evolution and Taxonomy. Springer Verlag.
- Davis, P. H. and Heywood, V. H. (1967). Principles of Angiosperm Taxonomy. Oliver and Boyd, London.
- Gamble, J. S. (1933). Flora of the Presidency of Madras. Botanical Survey of India, Calcutta.
- Greuter, W. *et al.* (1989). International Code of Botanical Nomenclature. International Association of Plant Taxonomy, Leiden.
- Heywood, V. H. (ed.) (1968). Modern Methods in Plant Taxonomy. Academic Press, New York.
- Hutchinson, J. (1969). The Genera of Flowering Plants. Clarendon Press, Oxford, UK.
- Jeffery, C. (1969). An Introduction to Plant Taxonomy - J & A Churchill Ltd., London.
- Lawrence, G. H. M. (1944). Taxonomy of Vascular Plants. Oxford & IBH Publications, New Delhi.
- Pandey, B. P. (2007). Economic Botany. S. Chand & Co. Ltd., New Delhi.
- Pandey, B. P. (2007). Taxonomy of Angiosperms. S. Chand and Co. Ltd., New Delhi.
- Porter, C. L. (1967). Taxonomy of Flowering Plants. Euasia Publishing House, New Delhi.
- Rendle, A. B. (1925). Classification of Flowering Plants. Vol. I & II. Cambridge University Press, London.
- Sambamurthy, A. V. S. S. and Subramanian, N. S. (1989). A Text Book of Economic Botany. Wiley Eastern Ltd., New Delhi.
- Samuel, B. Jones Jr. and Arlene E. Luchsinger (1987). Plant Systematics. 2nd ed. McGraw Hill Publishing Co. Ltd., New Delhi.
- Singh, V. and Jain, K. K. (1989). Taxonomy of Angiosperms. Rastogi Publications, Meerut.
- Takhtajan, A. L. (1969). Flowering Plants: Origin and Dispersal. Oliver & Boyd, UK.
- Tiagi, Y. D. and Kshetrapal, S. (1988). An Introduction to the Taxonomy of Angiosperms. Ramesh Book Depot, Jaipur.
- Vashista, P. C. (2006). Taxonomy of Angiosperms. S. Chand and Co. Ltd., New Delhi.

Ecology

- Agrawal, K. C. (1987). Environmental Biology. Agro-botanical Publications, India.
- Ambasht, R. S. (1974). A Textbook of Plant Ecology. 3rd ed. Students' Friends Co., Varanasi, India.
- Ananthakrishnan, T. N. (1982). Bioresources Ecology. Oxford & IBH Publications, New Delhi.
- Billings, W. B. (1965). Plants and the Ecosystem. Wardsworth Publishing Co. Inc., Belmont.
- Jogdand, S. N. (2003). Environmental Biotechnology (Industrial Pollution Management). Himalaya Publishing House, Delhi.
- Kershaw, K. A. (1973). Quantitative and Dynamic Plant Ecology. Edward Arnold Publishers Ltd., London.
- Kormandy, E. J. (1978). Concepts of Ecology. 2nd ed. Prentice Hall of India Pvt. Ltd., New Delhi.

- Krishnan Kannan (1997). Fundamentals of Environmental Pollution. S. Chand and Co. Ltd., New Delhi.
- Kumar, H. D. (1978). Modern Concepts of Ecology. Vikas Publishing House Pvt. Ltd., New Delhi.
- Levitt, J. (1980). Responses of Plants to Environmental Stresses. Academic Press, New York.
- Mistra, R. (1968). The Ecology Workbook. Oxford & IBH Publications, Calcutta.
- Mistra, R. C. (1974). Manual of Plant Ecology. Oxford & IBH Publications, New Delhi.
- Odum, E. P. (1971). Fundamentals of Ecology. W. B. Saunders & Co., Philadelphia, USA.
- Odum, E. P. (1975). Ecology. 2nd ed. Oxford & IBH Publications, New Delhi.
- Puri, G. S. (1960). Indian Forest Ecology. Vol. I & II. Oxford & IBH Publications, New Delhi.
- Smith, J. M. (1974). Models in Ecology. Cambridge University Press, London.
- Suresh K. Dhameja (2004). Environmental Engineering and Management. S. K. Kataria and Sons, Delhi.
- Vashista, P. C. (1974). A Textbook of Plant Ecology. Vishal Publications, Jullunder.

Phytogeography

- Cain, S. A. (1944). Foundation of Plant Geography. Harper & Brothers, New York.
- Gates, D. M. (1980). Biophysical Ecology. Springer Verlag, New York.
- Good, R. (1953). The Geography of Flowering Plants. 2nd ed. Longmans Green & Co. Inc., London.
- MacArthur, R. H. and Wilson, E. O. (1967). The Theory of Island Biogeography - Princeton University Press, New Jersey.
- Mani, M. S. (1974). Ecology and Biogeography of India. Dr. W. Junk Publishers, The Hague.
- Margalef, R. (1968). Perspectives in Ecological Theory. University of Chicago Press, Chicago.

Conservation Biology

- Frankel, O. H., Brown, A. H. D. and Burdon, J. J. (1995). The Conservation of Plant Diversity. Cambridge University Press, London.
- Heywood, V. H. (1995). Global Biodiversity Assessment. UNEP, Cambridge University Press, London.
- Krishnamurthy, K. V. (2004). An Advanced Textbook on Biodiversity: Principles and Practice. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
- Leakey, R. E., Bynum, W. F. and Barrett, J. A. (1979). The Illustrated Origin Species. Charles Darwin Hill & Wang, New York.
- Meffe, G. K. and Carroll, C. R. (1994). Principles of Conservation Biology. Sinauer Associates. Sunderland, Mass, USA.