

SYSTEMATIC BOTANY (M.Sc., 2008 – 2009)

CORE THEORY

UNIT I

Taxonomy and systematics, their aims and phases. Phenetic and phylogenetic systems of classification. An outline of classifications proposed by Linnaeus, Bentham and Hooker, Engler and Prantl, Hutchinson, Takhtajan, Cronquist and Kubitzki. APG-II Classification and Angiosperm Phlogeny

Floras, revisions and monographs. Keys - single entry and multiple entries. Species concepts: morphological, biological, phylogenetic

UNIT II

Taxonomic evidences: morphology, anatomy, embryology, palynology, cytology and phytochemistry (secondary metabolites). Molecular systematics - proteins and serology, DNA and RNA of nucleus and organelles

Cladistics: Plesiomorphous and apomorphous characters; homologous and analogous characters; homoplasy; monophyly, polyphyly and paraphyly. Character coding. Constructing of cladograms; polarity and rooting. Principle of parsimony. Phenetic methods: Similarity matrix, cluster analysis

UNIT III

Herbaria - functions and kinds. Field work and herbarium methods. Some important herbaria - Herbarium of Royal Botanic Gardens (Kew), Herbarium of Natural History Museum (Paris), Central National Herbarium (Calcutta), Madras Herbarium (Coimbatore), The Rapinat Herbarium (Tiruchirappalli)

Botanic gardens and their importance. Important botanic gardens in India. Indian Botanic Garden (Calcutta), National Botanic Garden (Lucknow), Tropical Botanic garden (Thiruvananthapuram), National Orchidarium and Experimental Botanic Garden, Yercaud

UNIT IV

History of ICBN - typification, priority, publication, author citation, homonym, synonym, tautonym, autonym, basionym. Retention, choice and rejection of names

UNIT V

Study of the following Docotyledonous families: Magnoliaceae, Nymphaeaceae, Menispermaceae, Rhamnaceae, Combretaceae, Melastomataceae, Molluginaceae, Rubiaceae, Ebenaceae, Convolvulaceae, Boraginaceae, Bignoniaceae, Verbenaceae, Lamiaceae, Nyctaginaceae, Chenopodiaceae, Polygonaceae, Lauraceae, Euphorbiaceae and Moraceae

UNIT VI

Orchidaceae, Alismataceae, Arecaceae, Cyperaceae and Poaceae

Suggested Reading

- AHMEDULLAH, M., AND M.P. NAYAR. 1987. Endemic Plants of the Indian Region. Vol. I. Botanical Survey of India. Howrah.
- CRONQUIST, A. 1968. The Evolution and Classification of Flowering Plants. Houghton Mifflin. Boston.
- DAVIS, P.H., AND V.H. HEYWOOD. 1965. Principles of Angiosperm Taxonomy. Oliver & Boyd. Edinburgh.
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- GAMBLE, J.S., AND C.E.C. FISCHER. 1967. Flora of the Presidency of Madras. Vols. I - III. Botanical Survey of India. Calcutta.
- GRAHAM, L.E. 1993. Origin of Land Plants. John Wiley & Sons. Inc. New York.
- GREUTER, W, (Ed.). 2000. International Code of Botanical Nomenclature. (St. Louis Code). Koeltz Vesentific Books. Germany.
- GROOMBRIDGE, B, (Ed.). 1992. Global Biodiversity: Status of The Earth's Living Resources. Chapman and Hall. London.
- HENRY ,A.N., M.CHANDRABOSE. 1980. An Aid to International Code of Botanical Nomenclature. Today & Tomorrow's Printers and Publishers. New Delhi.
- HESLOP-HARRISON, J. 1953. New Concepts in Flowering Plant Taxonomy. Heinemann Ltd. London.
- HEYWOOD, V.H. 1967. Plant Taxonomy. Edward Arnold Ltd. Great Britain.
- HEYWOOD, V.H. 1995. Global Biodiversity Assessment. Cambridge University Press, Cambridge, U.K.
- HUTCHINSON, J. 1973. The Families of Flowering Plants. 3rd Edition. Oxford University Press. Oxford.
- JAIN, S.K. and R.R. RAO. 1977. A Handbook of Field and Herbarium Methods. Today and Tomorrow's Printers and Publishers, New Delhi.
- JOHRI, B.M. 1994. Botany in India: History and Progress. Vol-I. Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi.
- JONES, S.B., AND A.E. LUCHSINGER. 1987. Plant Systematics. 2nd Edition. McGraw-Hill Book Company. New York.
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- LAWRENCE, G.H.M. 1951. Taxonomy of Vascular Plants. The Macmillan Company. New York.
- MABBERLEY, D.J. 2005. *The Plant-Book, A portable dictionary of the vascular plants*. Cambridge University Press, United Kingdom
- MOORE, R., W.D. CLARK, K.R. STERN AND D. VODOPICH. 1995. Botany : Plant Diversity. Wm. C. Brown Publishers. London.
- NAIK, V. N. 2000. Taxonomy of Angiosperms. Tata McGraw – Hill Publishing Company Limited , New Delhi.
- NAYAR, M.P., AND R.K. SASTRY. 1987-1990. Red Data Book on Indian Plants. Vols. I - III. Botanical Survey of India. Howrah.

- NAYAR, M.P., 1996. "Hot Spots" of Endemic plants of India, Nepal and Bhutan. Tropical Botanic Garden and Research Institute, Thiruvananthapuram, India.
- QUICKE, D.L.J. 1993. Principles and Techniques of Contemporary Taxonomy. Chapman and Hall. London.
- RADFORD, A.E., W.C. DICKISON, J.R. MASSEY, AND C.R. BELL. 1974. Vascular Plant Systematics. Harper & Row. New York.
- RAVEN, P.H., R.F. EVERT, AND S.E. EICHHON. 1992. Biology of Plants. 5th Edition. Worth Publishers. New York.
- SANTAPAU, H. AND H.A. HENRY. 1994. A dictionary of the flowering plants in India, CSRI, New Delhi.
- SINGH, G. 2005. Plant Systematics – Theory and Practice. Oxford & IBH, New Delhi.
- SOLTIS, D. E., P. S. SOLTIS, P. K. ENDRESS AND M. W. CHASE. 2005. Phylogeny and Evolution of Angiosperms. Sinauer Associates, Inc, Massachusetts, USA.
- SIMPSON, M. G. 2006. Plant Systematics. Elsevier Academic Press, California, USA.
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- STACE, C.A. 1989. Plant Taxonomy and Biosystematics. Edward Arnold, London.
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- TAKHTAJAN, A. 1997. Diversity and Classification of Flowering Plants. Bishen Singh and Mahendra pal Singh, Dehra Dun, India.