



MANGALORE UNIVERSITY

Department of Applied Botany

BOS458 - Reproductive Biology of Angiosperms and Plant Morphogenesis

Course outcome:

- This is a very useful basic course in Botany
- Syllabus includes developmental studies of reproductive structures in plants and development of other regions
- This will form a good basis for subjects like tissue culture and helps in better understanding of organogenesis

Teaching Hours: 10/Unit

Unit I:

Reproductive Biology of Angiosperms: Historical over view, Contributions of P. Maheshwari; BM Johri; BGL Swamy to the development of embryology in India; Microsporogenesis-Male gametophyte development; anther wall layers and functions; Tapetum-types, Concept of male germ unit; Pollen morphological features; Unusual features: pollen development in Cyperaceae, pollen embryo sac; Scope of palynology.

Unit II:

Megasporogenesis-Female gametophyte development; Ovular structure & types; Development of monosporic, bisporic, tetrasporic & special types of embryo sacs; Ultrastructure & nutrition of female gametophyte; Fertilization-A general account; double fertilization; single fertilization; heterofertilization & polyspermy; Pollen recognition & rejection reactions-Types; structures; methods to overcome incompatibility reactions; Endosperm-Types; haustorial variations; ruminant & composite endosperm; Embryo-Structure; development of monocot, dicot & grass embryo; significance of embryonal suspensor; Experimental Embryology-Scope & applications.

Unit III:

Plant Morphogenesis: Historical developments; Models of morphogenesis-Comparison of plant v/s animal morphogenetic pathways: Embryo, Coenorhabditis elegans; Concepts-Cell fate/fate maps, gradients, stem cells in plants and their significance in development, polarity, symmetry, totipotency of cell types, pluripotency, plasticity, differentiation, redifferentiation, dedifferentiation and regeneration in Acetabularia

Unit IV:

Plant growth and development; types, Shoot apical meristems, root meristems; control of cell division in meristems; Quiescent center & Meristematic state; Arabidopsis-vascular patterning and leaf development, abnormal growth; Cellular basis of growth -Maintenance of cell shape; cytoskeletal elements; Photomorphogenesis-Definition, history, Hartmann's technique; Photoreceptors & photo morphogenesis, Localization and properties; effect of blue light-mediated photomorphogenesis with suitable examples.