

CHAPTER

1

DIVERSITY IN LIVING WORLD

BIOLOGY

Biology is the study of different aspects of living beings. This term Biology was coined by Lamarck and Traviranus in 1802. It has three main general branches (zoology, botany and microbiology) but there are many specialized branches as follows.

Branch	Science Study of
Aerobiology	air borne organisms and structures with their distribution.
Agriculture	farming, raising crops and animal husbandry
Agroforestry	a type of land use in which in addition to crops, grasses and multipurpose shrubs and trees are grown to stabilise soil and obtain useful articles like fodder, fruit, fuel, timber etc.
Agronomy	soil management and production of crops.
Algology	algae.
Anaesthesiology	anaesthesia (induction of inability to feel pain)
Anatomy	internal structure which can be seen by naked eye.
Animal Husbandry	raising and management of domesticated animals.
Anthropology	origin, development and culture of present and past races of humans.
Aquaculture	rearing and management of aquatic animals.
Bacteriology	bacteria
Bionics	problem solving by human, animals and its technical application.
Botany	study of plants in all their aspects.
Cell Biology	cells in all their aspects.
Chemotaxonomy	taxonomy based on chemicals present in organisms.
Chorology	biogeography.
Cosmology	structure and evolution of universe.
Cryobiology	organisms, tissues, embryos, etc. cooled to low temperature.
Cybernetics	communications and control as by brain, nervous system (neurobiology) and endocrine system (endocrinology).
Cytology	cell structure
Cytotaxonomy	taxonomy (classification) based on cell constituents including chromosome number and structure.
Dermatology	skin and other body coverings.
Developmental Biology	changes in structure and physiology during various stages of life.
Endocrinology	endocrine glands, hormones and their effects.
Entomology	insects.
Enzymology	enzymes and their functions
Epidemiology	distribution, causes and control measures of infectious diseases.
Ethnobotany	relationships between primitive humans and plants.
Ethology	animal behaviour.

Etiology (Aetiology)	life cycle of pathogen, especially on host and cause of disease.
Eugenics	improvement of race by modifying fertility of different categories of individuals.
Evolution	origin and development of various life forms.
Floriculture	cultivation of plants for their flowers.
Forestry	development and Management of forests.
Gastroenterology	alimentary canal or stomach, intestine and their diseases.
Genecology	genetic compositions of populations in relation to habitat or environment.
Geneology	(genaeology) development of individual/race/pedigree.
Gene Therapy	removal and replacement of defective genes with genes of desirable traits.
Genetic Engineering	manipulation of genes for developing a desired genetic constitution.
Genetics	heredity and variations
Geology	earth
Gynaecology	female reproductive organs.
Haematology	blood.
Helminthology	parasitic worms.
Histochemistry	chemistry of living tissues.
Histology	tissues.
Horticulture	development and management of orchards and gardens.
Hygiene	care for keeping good health.
Ichthyology	fishes.
Immunology	immunity or resistance to disease.
Kalology	human beauty.
Karyology	cell nucleus and chromosomes.
Kinesiology	inter-relationship of anatomy and physiology with respect to movements.
Lichenology	lichens.
Limnology	(i) fresh water ecology (ii) snails.
Microbiology	microorganisms or organisms less than 0.1 mm.
Morphology	form and structure it can be external or internal.
Mycology	fungi.
Nematology	roundworms (nematodes).
Neonatology	new born.
Nephrology	kidneys.
Neurology	nervous system.
Occupational Therapy	treating mental and physical defects with occupation.
Olericulture	cultivation of vegetables.
Oncology	cancers and tumours.
Ophthalmology	eyes.
Organology	different organs of the body.
Ornithology	birds.
Paediatrics	children.
Palaeobotany	fossil plants and their impressions.
Parasitology	parasites.
Parazology	sponges.
Pedology/Paedology	edaphology.
Pharmacology	synthesis and effects of medicines on organisms.
Photobiology	effect of light on various biological processes.
Phycology (Algae)	algae.
Physiology	body functions.
Physiotherapy	treatment of body defects through masses and exercise.
Pisciculture	rearing, catching and management of fishes.
Platyhelminthology	flatworms or platyhelminthes.
Pomology	fruits and fruit yielding plants.
Radiology	X-rays and other imaging techniques for medical diagnosis.
Radiotherapy	treatment of disease with x-rays and radioactive substances.
Sericulture	rearing silkworms for extraction of silk.
Silviculture (Sylviculture)	cultivation of forest trees.
Speciation	formation of new and distinct species.

Systematics	biosystematics.
Taxonomy	classification, nomenclature and identification of organisms.
Therapeutics	treatment of disease.
Toxicology	harmful effects of drug and other substances.
Urology	structure, action functions and disorders of urinary tract (urinogential tract in males).
Venereology	venereal diseases.
Virology	viruses.
Zoogeography	geographical distribution of animals.
Zoology	animals in their various aspects.
Zootaxy	classification of animals.
Zymology	fermentation process.

ORIGINATORS/FATHERS

Branch	Father	Branch	Father
Medicine	Hippocrates (460 - 37B.C.).	Antiseptic Surgery	Joseph Lister.
Biology, Embryology and Zoology	Aristotle (384 - 322 B.C.).	Bacteriology	Koch.
Botany and Ecology	Theophrastus (370-287 B.C.).	Microbiology	Pasteur.
Anatomy	Andreas Vesalius (1514-1564).	Palynology	Erdtman.
Plant Anatomy	N. Grew (1641-1712).	Endocrinology	Thomas Addison.
Microscopy (Protozoology)	Antony van Leeuwenhoek (1632-1723).	Palaeontology	Leonardo da Vinci.
Microbiology (Bacteriology)	Robert Hooke (1635-1703).	Antibiotics	Alexander Fleming (1881-1955).
Cytology	Carolus (Carl von) Linnaeus (1707-1778).	Blood circulation	William Harvey (1578-1657).
Taxonomy and Nomenclature	C.F. Wolff (1738-1794).	Blood Groups	Landsteiner.
Embryology	Edward Jenner (1749-1823).	Green Revolution	Norman E. Borlaug.
Immunology	Liebig.	Indian Green Revolution	M.S. Swaminathan.
Biochemistry	Stephen Hales (1677-1761).	Bird man of India	Salim Ali.
Plant Physiology	Micheli.	Indian Palaeobotany	Birbal Sahni.
Mycology	Hedwig.	Radiation Biology	Muller.
Bryology	Platter.	Genetics	Gregor Johann Mendel.
Parasitology		Eugenics	Francis Galton.
		Biochemical/Human Genetics	Archibald Garrod.
		Experimental Genetics	T. H. Morgan.
		Genetic Engineering	Paul Berg.
		DNA Fi	

FAMOUS INDIAN BIOLOGIST

A.K. Sharma	Cytology
B.B. Mundkur	Plant Pathology
B.K. Nair	Palynology
B.P. Pal	Plant Breeding
Birbal Sahni	Palaeobotany (Father of Indian Palaeobotany)
H. Santapau	Taxonomy
Indira Hinduja	in vitro Fertilization
J.C. Bose	Plant Physiology
J.J. Chinoy	Plant Physiology
K.A. Chaudhari	Xylotomy
K.C. Mehta	Plant Pathology
Lalji Singh	DNA Finger Printing
M.S. Swaminathan	Cytogenetics
O.P. Iyengar	Phycology (Father of Indian Algology)

P. Maheshwari	Embryology (Father of Indian Embryology)
P.N. Mehra	Pteridology
Prof. Salim Ali	Ornithology
R. Mishra	Ornithology
R.P. Roy	Ecology
S.R. Kashyap	Cytogenetics, Tissue Culture and Plant Breeding
T.S. Sadasivan	Mycology
V. Puri	Morphology

Understanding Life

Even after all attempts, life has not been defined absolutely satisfactorily so far. It may be called that state of an animal or a plant in which its organs are capable of performing their functions, or in which the performance of functions has not permanently ceased.