

ZOOLOGY I ANIMAL DIVERSITY-I (*CLASSIFICATION, PHYLOGENY AND ORGANIZATION*)

CREDIT HOURS: 3

Aims and Objectives:

The course is designed to provide students with:

- a. concepts of evolutionary relationship of animal kingdom.
- b. knowledge about animal kingdom, emphasizing their phylogenetic relationships and simple to complex mode of animal life.
- c. The common processes of life through its chemistry, biochemical and molecular processes.

Introduction

Classification of organisms; definition, concept, evolutionary relationships and tree diagrams; patterns of organization.

Animal-Like Protists: The Protozoa:

Evolutionary perspective; life within a single plasma membrane; symbiotic life-styles. Protozoan taxonomy: (up to phyla, subphyla and super classes, wherever applicable). Pseudopodia and amoeboid locomotion; cilia and other pellicular structures; Nutrition; Genetic Control and reproduction; symbiotic ciliates; further phylogenetic considerations.

Multicellular and Tissue Levels of Organization:

Evolutionary perspective: origins of multicellularity; animal origins. Phylum porifera: cell types, and skeletons; body forms; maintenance functions, reproduction. Phylum cnidaria (coelenterata) the body wall and nematocysts; alternation of generations; maintenance functions; reproduction and classification up to class. Phylum ctenophore; further phylogenetic considerations.

The Triploblastic, Acoelomate Body Plan:

Evolutionary perspective; phylum platyhelminthes: classification up to class; the free-living flatworms and the tapeworms; phylum nemertea; phylum gastrotricha; further phylogenetic considerations.

The Pseudocoelomate Body Plan: Aschelminths:

Evolutionary perspective; general characteristics; classification up to phyla; Feeding and the Digestive System, other organ systems; Reproduction and Development of phylum phylum rotifera and phylum nematoda; phylum kinorhyncha. Some important nematode parasites of humans; further phylogenetic considerations

Molluscan Success

Evolutionary perspective: relationships to other animals; origin of the coelom; molluscan characteristics; classification up to class. The characteristics of shell and associated structures, feeding, digestion, gas exchange, locomotion, reproduction and

development, other maintenance functions and diversity in gastropods, bivalves and cephalopods; further phylogenetic considerations.

Annelida: The Metameric Body Form

Evolutionary perspective: relationship to other animals, metamerism and tagmatization; classification up to class. External structure and locomotion, feeding and the digestive system, gas exchange and circulation, nervous and sensory functions, excretion, regeneration, reproduction and development, in polychaeta, oligochaeta and hirudinea; further phylogenetic considerations.

Arthropods: Blueprint for Success

Evolutionary perspective: classification and relationships to other animals; metamerism and tagmatization; the exoskeleton; metamorphosis; classification up to class; further phylogenetic considerations.

Hexapods and Myriapods: Terrestrial Triumphs

Evolutionary perspective; classification up to class. External structure and locomotion, nutrition and the digestive system, gas exchange, circulation and temperature regulation, nervous and sensory functions, excretion, chemical regulation, reproduction and development in hexapoda; insect behavior; insects and humans; further phylogenetic considerations.

The Chemical Basis of Animal Life

Atoms and elements: building blocks of all matter; compounds and molecules: aggregates of atoms; acids, bases, and buffers; the molecules of animals: fractional account of carbohydrates, lipids, proteins, nucleotides and nucleic acids based on their structural aspects.

Energy and Enzymes: Life's Driving and Controlling Forces

Energy and the laws of energy transformation; activation energy; enzymes: structure, function and factors affecting their activity; cofactors and coenzymes; ATP: how cells convert energy? An overview.

Evaluation Criteria

Examination	Type	Marks
Internal Examination	Sessional Work	15%
	Mid-Semester	25%
External Examination	Final Semester	60%

Books Recommended

Campbell, N. A. (2002). *Biology* (6th ed). Menlo Park, California: Benjamin/Cummings Publishing Company, Inc.

Hickman, C. P. & Kats, H. L. (2000). *Laboratory studies in integrated principles of zoology*. Singapore: McGraw Hill.

Hickman, C.P., Roberts, L.S., & Larson, A. (2004). *Integrated principles of zoology* (12th ed) (International). Singapore: McGraw Hill.

Kent, G. C. & Miller, S. (2001). *Comparative anatomy of vertebrates*. New York: McGraw Hill.

Miller, S. A. (2002). *General zoology laboratory manual* (5th ed) (International). Singapore: McGraw Hill.

Miller, S. A., & Harley, J. B. (2000). *Zoology* (6th ed) (International). Singapore: McGraw Hill.

Pechenik, J. A. (2000). *Biology of invertebrates*, (5th ed) (International). Singapore: McGraw Hill.

ZOOLOGY LAB-I

CREDIT HOURS: 1

Course Content

1. Study of Euglena, Amoeba, Entamoeba, Plasmodium, Trypanosoma, Paramecium as representative of animal like protists. (Prepared slides).
2. Study of sponges and their various body forms.
3. Study of principal representative classes of phylum Coelenterata.
4. Study of principal representative classes of phylum Platyhelminthes.
5. Study of representative of phylum Rotifera, phylum Nematoda.
6. Study of principal representative classes of phylum Mollusca.
7. Study of principal representative classes of phylum Annelida.
8. Study of principal representative classes of groups of phylum Arthropoda.
9. Brief notes on medical/economic importance of the following: Plasmodium, Entamoeba histolitica, Leishmania, Liverfluke, Tapeworm, Earthworm, Silkworm, Citrus butterfly.
10. Preparation of permanent stained slides of the following: Obelia, Daphnia, Cestode, Parapodia of Nereis.
11. Tests for different carbohydrates, proteins and lipids.
Note: Emphasis on the concept that tests materials have been ultimately obtained from living organisms and constituted their body.
12. Protein digestion by pepsin.

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