

NON CHORDATA PART I

I SEMESTER B.SC. ZOOLOGY CORE COURSE 1

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The background features a vertical gradient from light purple at the top to light blue at the bottom. Scattered throughout are several realistic water droplets of various sizes, some with highlights and shadows. A large, faint, light-colored circular graphic is centered in the upper half of the page.

CLASSIFICATION OF LIVING WORLD

CHAPTER 2

TWO KINGDOM CLASSIFICATION

- SCIENTISTS FROM ARISTOTLE – TWO KINGDOM CLASSIFICATION
 - PLANTAE
 - ANIMALIA

THREE KINGDOM CLASSIFICATION

- EARNST HAECKEL – 1862
 - PROTISTA
 - PLANTAE
 - ANIMALIA

FOUR KINGDOM CLASSIFICATION

- HERBERT COPELAND – 1938
 - MONERA
 - PROTISTA
 - PLANTAE
 - ANIMALIA

FIVE KINGDOM CLASSIFICATION

- R. H. WHITTAKER – 1969
 - MONERA
 - PROTISTA
 - FUNGI
 - PLANTAE
 - ANIMALIA

THREE-DOMAIN, SIX-KINGDOM CLASSIFICATION

- *CARL WOESE (1977)*
- *THREE DOMAINS - BACTERIA, ARCHAEA AND EUKARYA*
- *BACTERIA – EUBACTERIA*
- *ARCHAEA – ARCHAEBACTERIA*
- *EUKARYA – PROTOZOA, FUNGI, CHROMISTA, PLANTAE AND ANIMALIA.*

TWO-DOMAIN, SIX-KINGDOM CLASSIFICATION

- THOMAS CAVALIER - SMITH
- DOMAIN – PROKARYOTA – KINGDOM BACTERIA & KINGDOM ARCHAEA
- DOMAIN – EUKARYOTA –
 - KINGDOM PROTISTA
 - KINGDOM FUNGI
 - KINGDOM PLANTAE
 - KINGDOM ANIMALIA

EIGHT KINGDOM CLASSIFICATION

- CAVALIER – SMITH - 1993
- EUBACTERIA
- ARCHAEBACTERIA
- ARCHAEZOA
- PROTOZOA
- CHROMISTA
- FUNGI
- PLANTAE
- ANIMALIA

BACTERIA

- BACTERIA – UNICELLULAR PROKARYOTES
- ABSENCE OF NUCLEUS AND MEMBRANE BOUND CELL ORGANELLES
- BACTERIAL DNA – COVALENTLY CLOSED DOUBLE-STRANDED CIRCLE
- BACTERIA – MITOSIS, MEIOSIS, CROSSING OVER AND TRUE SEXUAL REPRODUCTION ARE ABSENT – NO MECHANISM FOR GENETIC RECOMBINATION AND VARIATION
- ACCOMPLISH GENE TRANSFER BY PARASEXUAL PROCESSES – CONJUGATION, TRANSFORMATION, TRANSDUCTION
- HENCE ELEVATED TO THE RANK OF KINGDOM - MONERA

VIRUS

- VIRUSES WERE NOT REGARDED AS LIVING ORGANISM - DO NOT HAVE PROTOPLASM AND CELLULAR ORGANIZATION
- THEY ARE LIVING BEINGS BECAUSE
 - (I) THEY **CONTAIN NUCLEIC** ACID AND PROTEIN
 - (II) THEY CAN CARRY OUT METABOLIC FUNCTIONS
 - (III) THEY CAN UNDERGO REPRODUCTION.
- SINCE VIRUSES LACK CELLULAR ORGANIZATION, THEY ARE NEITHER PROKARYOTES NOR EUKARYOTES, BUT ARE ONLY SUB-CELLULAR ORGANISMS.
- THEY DO NOT DESERVE A PROPER SYSTEMATIC **POSITION ANY** WHERE IN ANY OF THE FIVE KINGDOMS.

VIRUS

- THE MOST PLAUSIBLE EXPLANATION REGARDING THE ORIGIN OF VIRUSES IS THAT THEY REPRESENT THE "ESCAPED NUCLEIC ACID" I.E. NUCLEIC ACID WHICH HAS BECOME CAPABLE OF REPLICATING ITSELF INDEPENDENT OF THE CELL.
- THUS, VIRUSES CANNOT BE CONSIDERED AS THE PRIMITIVE FORE-RUNNERS OF CELLULAR ORGANISMS, SINCE THEY ARE DERIVED FROM CELLULAR ORGANISMS.

VIROIDS

- VIROIDS ARE DISEASE-CAUSING AND NON-CAPSIDATED SUB-VIRAL PARTICLES, SMALLER AND SIMPLER THAN VIRUSES.
- THEIR GENETIC MATERIAL IS RNA.
- A PROTEIN COAT IS ABSENT.
- VIROIDS ARE BELIEVED TO CAUSE SOME PLANT DISEASES, SUCH AS POTATO SPINDLE TUBER DISEASE, STUNTING OF *CHRYSATHEMUM*, ETC.
- A VIROID IS A COVALENTLY CLOSED AND SINGLE-STRANDED RNA CIRCLE, WITHOUT A CAPSID OR PROTEIN COAT.
- IT IS CAPABLE OF AUTONOMOUS REPLICATION. IT DOES NOT CODE FOR PROTEINS, AND ITS BIOLOGICAL FUNCTIONS DEPEND UPON ITS INTERACTION WITH THE HOST

PRIONS

- PRIONS ARE INFECTIOUS SUB-VIRAL PROTEIN PARTICLES, DEVOID OF NUCLEIC ACIDS.
- THEY ARE NEARLY 100 TIMES SMALLER THAN THE SMALLEST VIRUS.
- SINCE THEY ARE DEVOID OF NUCLEIC ACID.
- THEY ARE NEITHER VIRUSES NOR VIROIDS.
- EVEN THOUGH PRIONS ARE DEVOID OF NUCLEIC ACIDS, THEY CAN INFECT HOST CELLS, INITIATE THE PRODUCTION OF NEW PRIONS AND CAUSE TRANSMISSIBLE NEUROLOGICAL DISEASES.
- THEY ARE THE CAUSATIVE AGENTS OF SOME NEUROLOGICAL DISEASES IN MAN, SHEEP, CATTLE, DEER, ETC.



THANK YOU!