VIRUS

Introduction → The virus are inities that were two small to be seen in a light microscope some viruses of bacteriophages are 200 - 280 mm in length and T.M.V. about 300 mm in length. So the features of viruses can be obtained by the use of electrone microscope.

The viruses multiply only in living cells and have the ability to cause disease in plants and animals. Although the viruses are agents of disease and have the ability to reproduces they behaves as chemical molecules.

General characters of Viruses →

⇒ All the viruses ultra microscopic so the features of the viruses can be obtained with the use of electron microscope.

⇒ All the viruses are obligatory intra cellular parasites.

⇒ The viruses can't be grown in artificial medium. in any case, the living cells are essentials for the multiplication of viruses.

⇒ They are crystalline nucleoprotein of very high molecular weight. Each virus particles contains of one nucleic acid molecule either DNA or RNA which is covered by protein coat. An additional lipid or lipo protein envelope may also represents in some plants viruses. A complete viruses particles with its nucleic acid protein coat and envelope is called VIRION.

⇒ In viruses cellular structure is absent

⇒ They do not have ribosome.

⇒ There are absence of information for the synthesis of ribosomal proteins and ribosomal RNA and t RNA

⇒ There is also absence of enzyme in the cycle.

information for the production of enzyme by the
cycle.
⇒ They reproduces from its genetic material only.
⇒ They functions as disease causing agent.

Morphology of viruses →

SHAPE :— They may be filtrial, rod shaped, polyhedral or sperm or tadpole shaped. A purely isolated virus may have a crystalline shape. Usually animals and plants viruses are not motile with the bacterial viruses are motile.
On the basis of shape the plant viruses divided into groups —

[A] Anisometric viruses
(i) Bacillus eg - TMV.
(ii) Flexible eg - Potato x virus
[B] Isometric
(i) Crystalline viruses eg - Turnip yellow mosaic virus.

Size of virus :→ Viruses after considerably in size the foot and mouth disease viruses are the smallest of the viruses and are only of 10 nm in size the maximum size 300 nm has seen recorded by chlopox - virus.

Structure of virus →

Usually the surface of spherical and rod shaped viruses are rough or bumpy the bumps are made up of protein subunits or capsomeres are arranged spherically while in spherical viruses these are at the edges of polyhedral Particles.

Nomenclature of various parts of viruses →

The complete single particle of virus is called virion. The protecting protein coat of virus is known as capsida and smaller subunits of the protein core termed as capsomeres. The nucleic acid which is enveloped with capsida is called nucleocapsida.

The nomenclature as follows —

(1) Virus or virion = Protein + nucleic acid
(2) Protein coat = Capsid
(3) Subunits of protein = Capsomeres
(4) Nucleic acid surrounded with protein = Nucleocapsida.

Detail morphological str. of virus →

The morphological analysis of various kinds of virus particle reveals the following symmetry.

(1) Spherical → Actually polyhedral with or without naked capsida.
(2) Helical → Cylindrical or rod like with or without naked capsid.
(3) Complex →

(i) Polyhedral Symmetry → Polyhedral symmetry is of following types. (A) Tetrahedral (B) Octahedral & (C) Icosahedral. Icosahedral shape is considered the most efficient. It has 20 faces which are formed by the triangular and 12 intersecting. The subunits of protein like small buds the total number of balls on the Icohedron is 1252 e.g. Adenovirus.

(ii) Helical Symmetry → This type of viruses consists of a helical capsid in which the capsomeres are oriented in a helix around a single rotational axis.

[B] **Bacteriophage** →

It is differentiated into following structure
① Head
② Tail
③ Attachment region

⇒ Head is Hexagonal in outline and bears numerous ∫. It consists of head protein coat and DNA molecule. The DNA lacks base cytosine. Instead it has another base hydroxy methyl cytosine.

⇒ The tail is made up of hollow tube are surrounded by a contaxitile protein sheath. At the other end of the tail a hexagonal end plate is present which has six (6) short tail fibre and 6 long tail fibres which aries from the corner of the end plate.

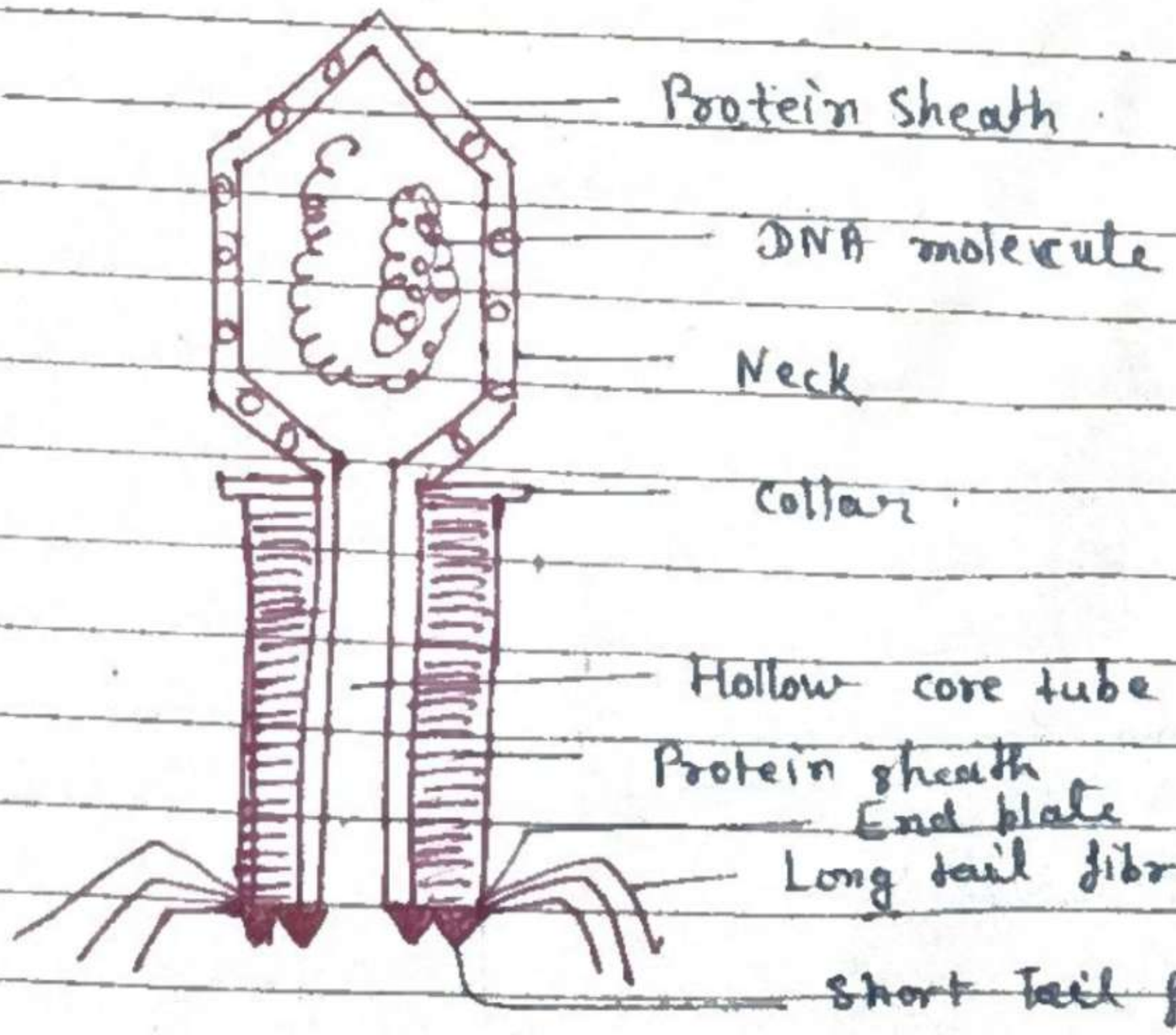

fig - Diagramatic representation of L.S. of Ty bacteriophages.