Hello students, my name is Dr. Sushama Desai and in this module I'll be talking about classification of viruses. Outline: classification of viruses, LHT system and ICTV. In this module the student will be able to explain LHT system of virus classification and describe role of ICTV in virus classification.

Viruses are acellular and obligate intracellular parasites. A complete virus particle or virion consists of one or more molecules of DNA or RNA enclosed in a coat of protein called capsid. Some viruses have additional layers that can be very complex and contain carbohydrates, lipids, and additional proteins.

Virus classification: Virus taxonomy is the scientific study of naming, defining and classification of viruses. Virus classification arranges viruses showing similar properties into same groups. Viruses are grouped into taxa and these groups are given a taxonomic rank. Groups of a given rank are aggregated to form a more inclusive group of higher rank, thus creating a taxonomic hierarchy. Taxonomy is important, but not fixed. Changes are continuously made to include new information of known and novel viruses. Virus taxonomy began when Adolf Mayer grouped a set of similar infectious diseases of tobacco plants.

The first systematic classification of viruses was proposed in 1939 by Bennett on behalf of newly formed Committee for Virus Nomenclature of Council of American Phytopathological Society. The purpose of virus classification is that it helps a communication between virologists. It enables properties of new viruses to be predicted. It helps to reveal possible evolutionary relationships. It helps communication between virologists and non-virologists.

LHT system: It is the first taxonomic system to receive broad attention worldwide. It was given by three scientists: Lwoff, Horne, and Antonio and hence it has got the name LHT system. It was first published in 1962 and finalized in 1966. This was approved by Provisional Committee on the Nomenclature of Viruses that is PCNV of International Association of Microbiological society.

This system is based on following characteristics.
1: the nucleic acid - whether it is DNA or RNA,
2: symmetry of the viral capsid - whether these helical, cubic or cubic tailed,

3: presence or absence of envelopes.
4: diameter of helical capsid
5: number of capsomers.

So according to this classification system, all the viruses were placed in under single phylum called Vira. This phylum was subdivided into two subphyla namely Deoxyvira, and Ribovira. This subdivision was based on the type of nucleic acid present in the virus. All the viruses containing DNA as the genetic material were placed in subphylum, Deoxyvira, whereas all the viruses containing RNA as genetic material were placed under subphylum, Ribovira. Deoxyvira was further subdivided into deoxyhelica, Deoxyrubica and deoxybinala based on the shape of capsid. Deoxyhelica contained all the DNA viruses possessing helical capsid. Deoxyrubica includes all the DNA viruses having spherical capsid. Whereas class deoxybinala includes all the DNA viruses having head and tail morphology. Similarly, ribovira subhylum was subdivided into two classes: Ribohelica and Ribocubica based on the shape of capsid. Ribohelica contained all RNA viruses with helical capsid, whereas Ribocubica contained all RNA viruses having spherical capsids. All these classes were further subdivided into order, suborder, and family based on the presence or absence of envelope, and the number of capsomers.

ICTV: In 1966 at International Congress for Microbiology, held in Moscow, the International Committee on Nomenclature of Viruses that is ICNV was established by an international group of 43 virologists. The name of ICNV was changed in 1974 to ICTV. ICTV stands for International Committee on Taxonomy of Viruses. ICTV is an international official body dedicated to taxonomy and nomenclature of viruses. Certain rules are put forward by ICTV for the nomenclature and virus classification. It considers proposals for new taxonomic groups and virus names. ICTV uses the familiar systematic taxonomy scheme of order, family, subfamily and genus.

In assigning a virus to a taxonomic group, the ICTV considers a range of characteristics which include

1. The host range,
2. Morphological feature of the virion
3. Nature of the genome nucleic acid.
4. Length of a tail of a phage

5. Presence or absence of specific genes in the genomes of similar viruses

ICTV is basically a non-profit organization composed of prominent virologists from across the world. The ICTV operates through a number of committees, subcommittees, and study groups of eminent virologists. Taxonomic proposals are initiated and formulated by individuals or by study groups. These proposals are revised and accepted by the corresponding subcommittees and presented for executive Committee approval. All decisions are ratified at a plenary session held at each virology congress. The ICTV does not impose any taxonomic terms or taxa but ensures that all propositions are compatible with ICTV rules.

ICTV periodically publishes reports describing all existing virus taxa with a list of classified viruses as well as descriptions of various families and genera. The ICTV report is a freely available as online resource, which updates and replaces previous ICTV reports that had been available as printed books. Correct ICTV report, which was published in 2011, describes 6 orders of viruses, namely Caudovirales, Herpesvirales, Mononegavirales, Nidovirales, Picornavirales, and Tymovirales. So in this module we learned what is taxonomy of viruses? What is LHT system and also the role of ICTV in classification of viruses. So these are my references. Thank you.