

How to write the names of virus species

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In formal virus taxonomy, the names of Orders, Families, Subfamilies and Genera are always printed in italics and the first letters of the names are capitalized. At its meeting in San Diego in March 1998, The Executive Committee of the ICTV decided to extend this practice to the names of species taxa in order to give a clear indication that the species name has been approved as the official, internationally recognized name [2].

The new rule 3.40 of the International Code of Virus Classification and Nomenclature is as follows: "Species names are printed in italics and have the first letter of the first word capitalized. Other words are not capitalized unless they are proper nouns, or parts of proper nouns." [1]

This rule applies when the species name is used to refer to a taxonomic entity, i.e. an abstraction corresponding to a taxon in the virus classification. Examples of correct spelling and typographical style for the corresponding taxonomic entities are *Tobacco mosaic virus*, *Poliiovirus* and *Murray River encephalitis virus* (River is a proper noun).

It should be stressed that italics and capital letters need to be used only if the species name refers to a taxonomic category. This is the case, for instance, when in the Materials and methods section of a paper, the virus used in a study is referred to as a member of a particular species, e.g. *Poliiovirus*, genus *Enterovirus*, family *Picornaviridae*. However, taxonomic names are not appropriate when referring to physical entities like the virions found in a preparation seen in an electron micrograph. It is, indeed, not possible to centrifuge or visualize the family *Picornaviridae*, the genus *Enterovirus* or the species *Poliiovirus*, for abstractions cannot be centrifuged or seen in a microscope.

When referring to concrete viral objects such as virions, italics and capital initial letters are not needed and the names are written in lower case Roman script. This corresponds to informal vernacular usage and is appropriate, for instance, when picornaviruses (not italicized) or poliiovirus particles are being centrifuged or are visualized in a microscope. This also applies when the names are used in adjectival form, for instance tobacco mosaic virus polymerase.

The use of italics when referring to the name of a species as a taxonomic entity will clearly signal that it has the status of an officially recognized species. A complete list of all the virus species that have been recognized so far can be found in the 7th ICTV Report to be published in August 1999 [4]. When the taxonomic status of a new putative species is uncertain or its positioning within an established genus has not been clarified, it will be

considered a “tentative” species and its name will not be given in italics, although its initial letter will be capitalized. At a later stage, transition to italicisation would then signal recognition of full species status.

A uniform italicized spelling of all taxonomic levels from Order to Species will reinforce in a visible manner the status of virus species as taxonomic entities. This new rule also removes some past oddities in orthography of species names. When a virus species name contained a Latin host name, it was customary to use italics and capitals for that part of the virus name. However, when the host name was the same in botanical Latin and in English (e.g. *Iris*), it was unclear what the form should be. The new orthography removes such ambiguities.

Scientific names in biology are usually Latin words and the use of italics indicates the Latin origin. However, the international community of virologists is strongly opposed to the introduction of Latin binomials for naming viruses [4] and the nomenclature system developed by ICTV reflects this position.

It is a moot point whether genus names like *Enterovirus* or *Tobamovirus* should be considered Latin names, and the use of italics in such cases is simply a convenient way to indicate that these terms refer to formal genus taxa. The use of italics for English species names serves the same function.

References

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