

**Part 1:** **TITLE, AUTHORS, APPROVALS, etc**

|  |  |  |
| --- | --- | --- |
| **Code assigned:** | **2022.003D** |  |
| **Short title:** Binominal naming system for virus species in the order *Lefavirales* (Families *Baculoviridae*, *Nudiviridae* and *Hytrosaviridae*) | | |
|  | | |

**Author(s) and email address(es)**

|  |  |
| --- | --- |
| van Oers MM, Harrison RL, Abd Allah AMM | monique.vanoers@wur.nl; robert.l.harrison@usda.gov; A.M.M.Abd-Alla@iaea.org |

**Author(s) institutional address(es) (optional)**

|  |
| --- |
| Wageningen University, the Netherlands (MMvO)  USDA Agricultural Research Service, Beltsville, USA (RLH)  Joint FAO/IAEA Programme of Nuclear Techniques in Food and Agriculture, Vienna International Centre, Austria (AAA) |

**Corresponding author**

|  |
| --- |
| Monique M. van Oers |

**List the ICTV Study Group(s) that have seen this proposal**

|  |
| --- |
| *Baculoviridae and Nudiviridae* Study Group  *Hytrosaviridae* Study Group |

**ICTV Study Group comments and response of proposer**

|  |
| --- |
| The list of suggested binominal species names has been circulated among the members since summer 2021. There was some discussion about correct Latin genitives for some of the epithets, which led to the correction of two earlier (2021) submitted nudivirus species names. |

**ICTV Study Group votes on proposal**

|  |  |  |  |
| --- | --- | --- | --- |
| **Study Group** | **Number of members** | | |
| **Votes support** | **Votes against** | **No vote** |
| *Baculoviridae & Nudivirdae* | 9 | 0 | 0 |
| *Hytrosavirdae* | 7 | 0 | 0 |

**Authority to use the name of a living person**

|  |  |
| --- | --- |
| **Is any taxon name used here derived from that of a living person (Y/N)** | N |

|  |  |  |
| --- | --- | --- |
| **Taxon name** | **Person from whom the name is derived** | **Permission attached (Y/N)** |
|  |  |  |
|  |  |  |
|  |  |  |

**Submission dates**

|  |  |
| --- | --- |
| Date first submitted to SC Chair | 1 March 12022 |
| Date of this revision (if different to above) | 18 May 2022 |

**ICTV-EC comments and response of the proposer**

|  |
| --- |
| **ICTV Animal DNA Viruses and Retroviruses Subcommittee chair**: I have run the species names by three members of the ICTV-EC and we suggest that for the species with a suffix “-a”, “-b”, “-c”, “-d” perhaps using a prefix uno, duo, etc, (e.g. Alphabaculovirus **uno**agsegetum, Alphabaculovirus **duo**agsegetum) may flow better and be consistent with your binomial across *Lefavirales*. Please note that this is a suggestion.  **Study group Response**:  The prefixes *uno-* and *duo-*( as suggested) are actually cardinal prefixes indicating quantity, so it would be more accurate to use ordinal prefixes derived from *secundus* or *alter* indicating order. See [https://dcc.dickinson.edu/grammar/latin/cardinal-and-ordinal-numbers](https://eur03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fdcc.dickinson.edu%2Fgrammar%2Flatin%2Fcardinal-and-ordinal-numbers&data=05%7C01%7Cmonique.vanoers%40wur.nl%7Ccdefead19376416561e208da6be0658d%7C27d137e5761f4dc1af88d26430abb18f%7C0%7C0%7C637940908770336770%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=Su2Au7FhUT8%2FqrLtgUMwZikrscmHr3Ptk5cRLiNDewk%3D&reserved=0) for the distinction. We have chosen for the prefix *alter* to indicate a second species with isolates in the same host, as *alter* can be used irrespective of the starting letter of the main part of the epithet and is easier to recognize by non-taxonomist users than abbreviations of *secundus*. In the exceptional case of a third and fourth species, with the same epithet, we go for tert(i) and quart(i). |

**Part 2:** **NON-TAXONOMIC PROPOSAL**

**Text of proposal**

|  |
| --- |
|  |

**Part 3: TAXONOMIC PROPOSAL**

**Name of accompanying Excel module**

|  |
| --- |
| 2022.003D.N.v2.Lefavirales\_106rensp.xlsx |

**Abstract**

|  |
| --- |
| The ICTV membership has recently ratified the proposal to adopt a binominal species naming system that follows the method of Linnaeus. Since the order *Lefavirales* has three families (*Baculoviridae, Nudiviridae* and *Hytrosaviridae*), it makes sense to name the species in these families in a similar way. In short, the first word of the latinized binominal species name will be the name of the genus to which the virus species belongs. The second word is a composition of the first letters of the Latin species name of the organism from which the virus was isolated, coupled to the genitive form of the epithet of the host species name (e.g. *Alphabaculovirus aucalifornicae* will replace *Autographa californica nucleopolyhedrovirus* as species name). This proposal can also serve as manual for the order *Lefavirales*. An appendix with all, updated species names is provided. |

**Text of proposal**

|  |  |
| --- | --- |
| |  | | --- | | **Giving binominal species names in the order *Lefavirales (*families *Baculoviridae, Nudiviridae,*** and ***Hytrosaviridae)***  **Background**  The ICTV membership has recently ratified the proposal to adopt a binominal species naming system. This means we will follow the style of Linnaean species names for virus species naming. Accordingly, ICVCN Rule 3.21 now reads:  *"A species name shall consist of only two distinct word components separated by a space.*  *The first word component shall begin with a capital letter and be identical in spelling to the name of the genus to which the species belongs. The second word component shall not*  *contain any suffixes specific for taxa of higher ranks. The entire species name (both word*  *components) shall be italicized”.*  New species names immediately need to follow the new format and old species names need to be adapted before 2023. Below we explain how we have proceeded for virus species names in the order *Lefavirales* and how it works for specific names.  **Previous way of species naming**  For the families *Baculoviridae* and *Nudiviridae* we used to derive the virus species name from the binominal Latin name of the host species followed by the word nucleopolyhedrovius, granulovirus or nudivirus (e.g *Autographa californica nucleopolyhedrovirus*, *Cydia pomonella granulovirus* and *Oryctes rhinoceros nudivirus)*. So, three words instead of two, and without a direct reference to the genus to which the virus species belongs. A letter was appended to the end of the name to distinguish among baculovirus species with isolates originating from the same host insect (e.g., *Mamestra configurata nucleopolyhedrovirus A*, *Mamestra configurata nucleopolyhedrovirus B*). For the two species in the family *Hytrosaviridae* we used the genus of the host (e..g *Glossina*) followed by hytrosavirus before, so no reference to the epithet of the host species.  Since these three families are all classified in the order *Lefavirales*, it makes sense to name them in a similar matter, for which this document is written as a (proposed) manual.  **Strategy adopted (explained for baculoviruses)**   * The family *Baculoviridae* has 4 genera: *Alphabaculovirus, Betabaculovirus, Gammabaculovirus* and *Deltabaculovirus*. According to the new rule: the first word of the new name of a virus species is the name of the genus to which the species belongs. So, for instance, *Alphabaculovirus* * The second word of the name, the “epithet” is a contraction of the first 2-4 letters of the host’s genus name followed by the epithet of the host in the genitive form (e.g. *Alphabaculovirus aucalifornicae; Betabaculovirus cypomonellae).* * The prefix alter is added when a second species is recognized with isolates originating from a particular host., e.g. *Alphabaculovirus maconfiguratae* and, *Alphabaculovirus altermaconfiguratae,*. For third and fourth species, the ordinal prefixes *tert(i)* and *quart(u)* will be used, respectively, the exact form depending on ease of pronunciation. The first virus species recognized carrying an epithet referring to a particular host, will not get a prefix and does therefore not have to be renamed later on.   ***Explanations:***   * The variation of taking the 2-4 first letters of the host’s genus names comes from the fact that the new epithet needs to be readable and pronounceable. * The genus name ending on “-virus” is of neutral gender in Latin, and here comes the difficulty. We cannot simply use the original epithet of the host, which may have been of female, male, or neutral gender. Therefore, we have chosen to use the genitive form of the original epithet of the insect species. The genitive form has the meaning: owned by, derived from, belonging to. * The previously used A and B suffixes for first and second species, are now longer allowed, nor are -a and -b suffixes.   **Remark 1:** If the host’s epithet is already in the genitive form or looks the same as the genitive form, we decided to leave it as it is, as the use of double genitives is not useful.  Examples:  *Alphabaculovirus anpernyi* (from the host *Antheraea pernyi)*  *Betabaculovirus cnamedinalis* (from *Cnaphalocrocis medinalis*), medinalis is already a genitive.  *Betabaculovirus agsegetum* (already genitive plural in *Agrotis segetum,* [*segetum* meaning from the grain fields/crops (*seges*)]  **Remark 2:** If the hosts epithet already appears neutral then there would not be a strict need to change it. However, for overall consistency we decided to use the genitive form there as well.  Example:  *Betabaculovirus xecnigri* – from the host *Xestia c-nigrum*  **Explanations for less obvious virus species names**  *Alphabaculovirus adhonmai* (previous *Adoxophyes honmai nucleopolyhedrovirus*) – *honmai* evidently came from Honma, a Japanese clan name, which was presumably changed to the nominative *honmaus* and from there to the genitive *honmai* for the species name of this tortricid moth.  Since *honmai* is already in the genitive, there is no need for us to further modify the ending for the species *Alphabaculovirus adhonmai*.  *Alphabaculovirus trini,* “ni” in the host’s name *Trichoplusia ni* appears to be derived from the lowercase Greek letter “nu” (n), a pattern displayed on the wings of this moth. ‘*ni*” might be a genitive form of the nominative form “nu”.  *Alphabaculovirus bomori* (from the host B*ombyx mori*) – “mori” may have a non-Latin root in the japanese word “mori” meaning forest. In Latin it already sounds like a genitive, so it has not been changed.  *Glossinavirus glopallidipedis* (from the host *Glossina pallidipes),* pallidipes meaning something like “pale-footed”, genitive of pes = pedis | |

**Supporting evidence**

Some Latin grammar:

Nouns can belong to any of five declensions in Latin. The genitive ending is used in the dictionary because each of the five declensions has its own genitive form. The five forms in singular form are:

|  |  |  |
| --- | --- | --- |
| **Declension** | **Nominative ending on** | **Genitive form** |
| I | **-a** | -ae |
| II | **-us** | -i |
| III | -**e**, **-es**, -**ex** or -**is** | -is |
| IV | -**u** or -**us** | -us |
| V | -**es** | -ei |

Examples from each of the 5 declensions:

1. *puellae* – the girl’s (*puella* f.)
2. *servi* - the slave's (*servus,* m.)
3. *maris -* the sea’s (*mare*, n.), *segetis* - the grainfield’s (*seges,*, m.); *regis* – the king’s (*rex*, m), *pedis* – the foot’s (pes, m.)
4. *cornus* - the horn's (*cornū,,* n.)
5. *rei* – concerning the case (res*,* m.)

If a word ends in "**-o**" or *-****on***, then the genitive generally ends in "**-onis**". ***Cicero*** becomes ***ciceronis***.

Many other words change their ending to "**-is**", whose rules are more difficult and are not detailed here. Here are some, just as examples:

***audens*** in genitive becomes ***audentis***,

***venus*** in genitive is ***veneris***,

***homo*** in genitive is ***hominis***,

***consul*** in genitive is ***consulis***

***praetor*** in genitive is ***praetoris*** and so on.

The plural genitive ends on **– um,** for all declensions, Examples: *puellarum, servorum*, *hominum*, *cornorum,* *rerum, segetum*

**References**

Information on Latin from: <http://www.novaroma.org/nr/Genitive>; <https://www.thoughtco.com/genitive-singular-in-5-latin-declensions-117587>; <https://bencrowder.net/latin-declensions/>)

Handy sites for looking up meaning and declension of individual words: <http://latindictionary.wikidot.com/noun:pes> and <https://www.online-latin-dictionary.com/>

The background for the adopted strategy and some more general rules for composing epithets can be found in:

* Advice and guidelines to Study Groups on the implementation of binomial species names

[*https://ictv.global/ictv/proposals/2018.001G.R.binomial\_species.pdf*](https://ictv.global/ictv/proposals/2018.001G.R.binomial_species.pdf)