

The International Committee on Taxonomy of Viruses

Taxonomy Proposal Form, 2025

**Part 1a: Details of taxonomy proposals**

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| **Title:**  | Create one new species in the genus *Myosmarvirus* (class *Caudoviricetes*, family *Lindbergviridae*) |
| **Code assigned:**  | 2025.049B.Myosmarvirus\_1ns |

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| **Author(s), affiliation and email address(es):**  |
| **Given name (+middle initial(s))**  | **Surname** | **Affiliation** | **Email address** | **Corresponding author(s)**  |
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**Part 1b: Taxonomy Proposal Submission**

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| **ICTV Subcommittee:** |
| Animal DNA Viruses and Retroviruses |  | Bacterial viruses | X |
| Animal minus-strand and dsRNA viruses |  | Fungal and protist viruses |  |
| Animal positive-strand RNA viruses |  | Plant viruses |  |
| Archaeal viruses |  | General |  |

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| **List the ICTV Study Group(s) that have seen or have been involved in creating this proposal:**  |
| *Caudoviricetes Study Group* |

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| **Optional – complete only if formally voted on by an ICTV Study Group:** |
| **Study Group** | **Number of members** |
| **Votes in support** | **Votes against** | **No vote** |
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| **Submission date:** |  20/03/2025 |

**Part 1c: Feedback from ICTV Executive Committee (EC) meeting**

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| **Executive Committee Meeting Decision code:** | **X** |
| A – Accept |  |
| Ac – Accept subject to revision by relevant subcommittee chair. No further vote required |  |
| U – Accept without revision but with re-evaluation and email vote by the EC |  |
| Uc – Accept subject to revision and re-evaluation and email vote by the EC |  |
| Ud – Deferred to the next EC meeting, with an invitation to revise based on EC comments |  |
| J - Reject |  |
| W - Withdrawn |  |

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| **Comments from the Executive Committee:** |
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**Part 1d: Revised Taxonomy Proposal Submission**

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| **Response of proposer:**  |
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| **Revision date:** |  |

**Part 3:** **TAXONOMIC PROPOSAL**

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| **Taxonomic changes proposed:** |
| Establish new taxon | X | Split taxon |  |
| Abolish taxon |  | Merge taxon |  |
| Move taxon |  | Promote taxon |  |
| Rename taxon |  | Demote taxon |  |
| Move and rename |  |

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| **Etymology (origin) of proposed taxonomic names:** |
| **Taxon name** | **Etymology of the term** |
| *Myosmarvirus Spe5P4* | species name derived from the phage name in the GenBank database – Serratia phage Spe5P4 |

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| **Permission for use of names derived from a living person** |
| **Taxon name** | **Full name of person from whom the name is derived** | **Attached** |
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| **Abstract of Taxonomy Proposal:** |
| *Taxonomic rank(s) affected*: Realm *Duplodnaviria*, kingdom *Heunggongvirae*, phylum *Uroviricota*, class *Caudoviricetes*, family *Lindbergviridae*.*Description of current taxonomy*: Currently, in the *Lindbergviridae* family, 10 genera have been distinguished. The *Myosmarvirus* genus includes three species: *Myosmarvirus MTx, Myosmarvirus myosmar,* and *Myosmarvirus SMP.**Proposed* *taxonomic change(s):* We performed a genomic analysis of phages deposited in the NCBI database. We propose to create one new species in the genus *Myosmarvirus*.*Justification*:Based on DNA and protein similarity, the one proposed new species is coherent and together with the three known species (*Myosmarvirus MTx, Myosmarvirus myosmar,* and *Myosmarvirus SMP*) can be classified in the genus *Myosmarvirus*. |

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| **Text of Taxonomy proposal:**  |
| *Taxonomic rank(s) affected*: Realm *Duplodnaviria*, kingdom *Heunggongvirae*, phylum *Uroviricota*, class *Caudoviricetes*, family *Lindbergviridae*.*Description of current taxonomy*: Currently, in the *Lindbergviridae* family, 10 genera have been distinguished. The *Myosmarvirus* genus includes three species: *Myosmarvirus MTx, Myosmarvirus myosmar,* and *Myosmarvirus SMP.**Proposed* *taxonomic change(s)*: We performed a genomic analysis of phages deposited in the NCBI database. We propose to create one new species in the genus *Myosmarvirus*.*Demarcation criteria:***Species demarcation criteria:** Two phages are assigned to the same species if their genomes are more than 95% identical over their genome length for isolates. These values can be calculated by several tools, such as BLASTn [1] – usually calculated using the intergenomic distance calculator VIRIDIC [2].**Genus demarcation criteria:** In search for criteria that create cohesive and distinct genera that are reproducible and monophyletic, the Bacterial Viruses Subcommittee has established 70% nucleotide identity of the genome length as the cut-off for genera. Genus-level groupings should always be monophyletic in the signature genes, as tested with a phylogenetic tree [3].*Justification*: Based on DNA and protein similarity, the one proposed new species is coherent and together with the three known species (*Myosmarvirus MTx, Myosmarvirus myosmar,* and *Myosmarvirus SMP*) can be classified in the genus *Myosmarvirus*. |

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| **References:**  |
| 1. Sayers EW, Beck J, Bolton EE, Bourexis D, Brister JR, Canese K, Comeau DC, Funk K, Kim S, Klimke W, Marchler-Bauer A, Landrum M, Lathrop S, Lu Z, Madden TL, O'Leary N, Phan L, Rangwala SH, Schneider VA, Skripchenko Y, Wang J, Ye J, Trawick BW, Pruitt KD, Sherry ST. Database resources of the National Center for Biotechnology Information. *Nucleic Acids Res.* 2021, 49(D1):D10-D17.
2. Moraru C, Varsani A, Kropinski AM. VIRIDIC - a novel tool to calculate the intergenomic similarities of prokaryote-infecting viruses. *Viruses* 2020, 12(11):1268.
3. Turner D, Kropinski AM, Adriaenssens EM. A roadmap for genome-based phage taxonomy. *Viruses* 2021, 13(3):506.
4. Nishimura Y, Yoshida T, Kuronishi M, Uehara H, Ogata H, Goto S. ViPTree: the viral proteomic tree server. *Bioinformatics* 2017, 33(15):2379-2380.
5. Rohwer F, Edwards R. The Phage Proteomic Tree: a genome-based taxonomy for phage. *J. Bacteriol.* 2002, 184(16):4529-35.
6. Turner D, Reynolds D, Seto D, Mahadevan P. CoreGenes3.5: a webserver for the determination of core genes from sets of viral and small bacterial genomes. *BMC Res. Notes.* 2013, 6:140.
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| **Accompanying files:** |
| **Filename** | **Description of contents** |
|  |  |
| **Tables, Figures:**  |

**Figure 1. VIRIDIC heat map:** VIRIDIC (Virus Intergenomic Distance Calculator [2]; http://rhea.icbm.uni-oldenburg.de/VIRIDIC/) computes pairwise intergenomic distances/similarities amongst phage genomes. Phages belonging to the same species (nucleotide similarity above 95%) are marked with a **red** frame. The currently distinguished three species belonging to the genus *Myosmarvirus* are marked in **blue**.

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**Figure 2. ViPTree analysis\*:** ViPTree analysis (https://www.genome.jp/viptree/; [4]) is based upon Rohwer and Edwards (2002) Phage Proteomic Tree [5]. The phage of interest is indicated with a **red star** and a **blue bar**.



\* The *Autographiviridae* family shown in **Figure 2** (automatically labeled by the software) is outdated. In 2025, the *Autographiviridae* family was elevated to the rank of order and renamed *Autographivirales*.

**Genome summary:**

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| Phage name | RefSeq No. | INSDC | Size (bp) | GC% | Protein | Overall % DNA sequence identity (\*) | Overall % homologous proteins (\*\*) |
| **Serratia phage MTx****(*Myosmarvirus MTx*; reference genome)** | **NC\_048759.1** | **NC\_048759** | **68,621** | **49.9** | **103** | **100.0** | **100.0** |
| Serratia phage Spe5P4 |  | PP858852 | 68,389 | 49.2 | 116 | 71.2 | 89.32 |

(\*) determined using VIRIDIC [2]

(\*\*) determined using CoreGenes 3.5 [6]