

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

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| **Code assigned:** | **2021.041B** |  |
| **Short title:** Create one new genus (*Jujuvirus*)including six new species (*Caudoviricetes*) | | |
|  | | |

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

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| Andrew M. Kropinski |

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

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| Actinobacteriophage Study Group, Bacterial Viruses Subcommittee |

**ICTV study group comments and response of proposer**

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

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

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

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| --- | --- |
| Date first submitted to SC Chair | May 2021 |
| Date of this revision (if different to above) |  |

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

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| Acceptance of proposal 2021.001B.abolish\_Caudovirales by EC53 results in removal of the order *Caudovirales* and families *Myoviridae*, *Podoviridae* and *Siphoviridae*. All underlying taxa are to be assigned directly to the class *Caudoviricetes*. The Excel module of this proposal has been altered to reflect the future changes; however, the Word module has been unaltered while awaiting the ratification vote. |

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

**Text of proposal**

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

**Name of accompanying Excel module**

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| 2021.041B.R.Jujuvirus |

**Abstract**

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| The genus *Fairfaxidumvirus* was established through Taxonomy Proposal 2019.008B. In the current proposal we realize that this genus is not monophyletic and we now recognize a new genus *Jujuvirus*. The characteristics of this genus is that the genomes are, on average, 53.1 kb (67.0 %GC) and encode for 85 proteins. |

**Text of proposal**

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| |  | | --- | | **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 a number of tools, such as BLASTn – usually calculated using intergenomic distance calculator VIRIDIC [3].  **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. [9] | |

**Supporting evidence**

**Origin of the name of this taxon:** This taxon is named after Gordonia phage JuJu.

**History:** Temperate phage JuJu was isolated in 2016 by Lauren Callewaert (University of Pittsburgh) from soil on Gordonia terrae 3612 as part of the Science Education Alliance-Phage Hunters Advancing Genomics and Evolutionary Science program. Its genome possesses 10 nt 3’-cohesive termini (TGGCCGGTGA). These phages were placed in the same Cluster (CV) as several other Gordonia phages as those which we have assigned to the genus *Fairfaxidumvirus* by The Actinobacteriophage Database (<https://phagesdb.org/clusters/CV/>). Our VIRIDIC and phylogenetic analyses reveal that they can be distinguished. Because they are temperate phages we have been more lenient in defining the DNA sequence relatedness for inclusion in this genus.

**ViPTree analysis:** ViPTree analysis ([https://www.genome.jp/viptree/](about:blank); [1]) is based upon Rohwer and Edwards (2002) famous Phage Proteomic Tree [2]. Not included.

**VIRIDIC heat map:** VIRIDIC (Virus Intergenomic Distance Calculator; [3]; [http://rhea.icbm.uni-oldenburg.de/VIRIDIC/](about:blank)) computes pairwise intergenomic distances/similarities amongst phage genomes.

**Chart

Description automatically generated**

**Specific Reference:** None

**GenBank Summary:**

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| --- | --- | --- | --- | --- | --- | --- |
| Phage name | INSDC | Size (Kb) | GC% | Protein | Overall DNA sequence identity (\*) | % common proteins (\*\*) |
| Gordonia phage JuJu | [MN062704.1](https://www.ncbi.nlm.nih.gov/nuccore/MN062704.1) | 54.00 | 66.9 | [88](https://www.ncbi.nlm.nih.gov/genome/browse/#!/proteins/83117/639508%7CGordonia%20phage%20JuJu/viral%20segment/) | 100 | 100 |
| Gordonia phage Petra | [MH153808.1](https://www.ncbi.nlm.nih.gov/nuccore/MH153808.1) | 52.30 | 67.1 | [89](https://www.ncbi.nlm.nih.gov/genome/browse/#!/proteins/69768/379966%7CGordonia%20phage%20Petra/viral%20segment/) | 56.3 | 64.8 |
| Gordonia phage Walrus | [MK501729.1](https://www.ncbi.nlm.nih.gov/nuccore/MK501729.1) | 52.02 | 67.3 | [84](https://www.ncbi.nlm.nih.gov/genome/browse/#!/proteins/76273/467632%7CGordonia%20phage%20Walrus/viral%20segment/) | 57.6 | 61.4 |
| Gordonia phage Blino | [MW291016.1](https://www.ncbi.nlm.nih.gov/nuccore/MW291016.1) | 54.17 | 66.9 | [81](https://www.ncbi.nlm.nih.gov/genome/browse/#!/proteins/97228/1513228%7CGordonia%20phage%20Blino/viral%20segment/) | 67.9 | 75.0 |
| Gordonia phage Frokostdame | [MH536818.1](https://www.ncbi.nlm.nih.gov/nuccore/MH536818.1) | 52.53 | 66.9 | [84](https://www.ncbi.nlm.nih.gov/genome/browse/#!/proteins/71929/399801%7CGordonia%20phage%20Frokostdame/viral%20segment/) | 62.2 | 68.2 |
| Gordonia phage Azula | [MT723935.1](https://www.ncbi.nlm.nih.gov/nuccore/MT723935.1) | 53.62 | 67.1 | [86](https://www.ncbi.nlm.nih.gov/genome/browse/#!/proteins/94285/980562%7CGordonia%20phage%20Azula/viral%20segment/) | 64.3 | 72.7 |

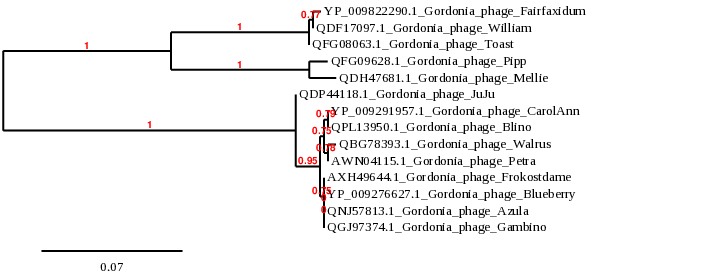
**(\*) Determined using VIRIDIC [3]**

**(\*\*) Determined using CoreGenes 3.5 at** [**http://binf.gmu.edu:8080/CoreGenes3.5/**](http://binf.gmu.edu:8080/CoreGenes3.5/) **[4]**

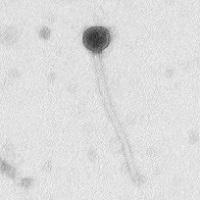
**Strains in this genus:**

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| **Name** | **Accession No.** | **Strain of:** |
| Gordonia phage CarolAnn | KX557275.1 | *Jujuvirus Blino* |
| Gordonia phage Blueberry | KU998236.1 | *Jujuvirus Azula* |
| Gordonia phage Gambino | MN586031.1 | *Jujuvirus Azula* |

**Phylogeny:** The phylogenetic tree was constructed using the terminase large subunit these and related phages with phylogeny.fr in “one click” mode [5]. "The "One Click mode" targets users that do not wish to deal with program and parameter selection. By default, the pipeline is already set up to run and connect programs recognized for their accuracy and speed (MUSCLE for multiple alignment and PhyML for phylogeny) to reconstruct a robust phylogenetic tree from a set of sequences." It also includes the use of Gblocks to eliminate poorly aligned positions and divergent regions. "The usual bootstrapping procedure is replaced by a new confidence index that is much faster to compute. See: Anisimova M., Gascuel O. Approximate likelihood ratio test for branches: A fast, accurate and powerful alternative [6] for details."

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**Electron micrographs:** Electron micrographs of negatively stained Gordonia phage JuJu (https://phagesdb.org/phages/JuJu/). Limited permission was granted by The Actinobacteriophages Database (<https://phagesdb.org/>), funded by the Howard Hughes Medical Institute, to use this electron micrograph for this taxonomy proposal; it cannot be reused without permission of The Actinobacteriophages Database.

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**References:**

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