

TAXONOMY OF THE FAMILY ARENAVIRIDAE AND THE ORDER

BUNYAVIRALES: UPDATE 2018

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ABSTRACT

In 2018, the family *Arenaviridae* was expanded by inclusion of 1 new genus and 5 novel species. At the same time, the recently established order *Bunyavirales* was expanded by 3 species. This article presents the updated taxonomy of the family *Arenaviridae* and the order *Bunyavirales* as now accepted by the International Committee on Taxonomy of Viruses (ICTV) and summarizes additional taxonomic proposals that may affect the order in the near future.

INTRODUCTION

The family *Arenaviridae* was established in 1976 to accommodate predominantly murid viruses with bisegmented, ambisense single-stranded RNA genomes that form enveloped particles with a “sandy” appearance [7]. Until recently, the family was monogeneric, including the single genus *Arenavirus*, with a steadily increasing number of species. The taxonomy of the family was substantially amended and emended [22] following the discovery of several distinct arenaviruses in alethinophidian snakes [4, 10, 24]. In particular, the genus *Arenavirus* was renamed *Mammarenavirus*, and a second genus, *Reptarenavirus*, was established in 2014 for several of the newly discovered snake viruses. A non-Linnean binomial species nomenclature was adopted for the entire family *Arenaviridae* [22] (ICTV TaxoProps [taxonomic proposals] 2014.011a-dV and 2014.012aV). Since then, the genus *Mammarenavirus* has been extended by 8 species for novel murid viruses discovered in Africa and Asia [3, 8, 11, 15, 21, 25] (TaxoProps 2014.013aV.A.v3.Mammarenavirus_2sp, 2015.001aM, 2016.014aM and 2016.019aM.A.v2.Mammarenavirus_sp).

The order *Bunyavirales* was established in 2017 to accommodate related viruses with segmented, linear, single-stranded, negative-sense or ambisense RNA genomes distributed among nine

families (TaxoProp 2016.030a-vM). In particular, the then existing family *Bunyaviridae* was elevated to the rank of order. The three established bunyaviral genera *Hantavirus*, *Nairovirus*, and *Tospovirus* were renamed *Orthohantavirus*, *Orthonairovirus*, and *Orthotospovirus* and included in the newly established families *Hantaviridae*, *Nairoviridae*, and *Tospoviridae*, respectively (TaxoProp 2016.030a-vM). The genus *Orthonairovirus* was expanded by five species [13] (TaxoProp 2016.026a,bM). The family *Peribunyaviridae* was created to include the established bunyaviral genus *Orthobunyavirus* and a new genus, *Herbevirus*, for bunyaviruses discovered in invertebrates [14, 17] (TaxoProps 2016.024a-dM and 2016.030a-vM). The family *Phenuiviridae* was created to accommodate the established bunyaviral genus *Phlebovirus*, the previously “free-floating” plant virus genus *Tenuivirus*, and two new genera, *Goukovirus* and *Phasivirus*, for novel invertebrate bunyaviruses [16] (TaxoProps 2016.022a-dM and 2016.027a-dM). Three new families, *Feraviridae*, *Jonviridae*, and *Phasmaviridae*, were established for newly discovered invertebrate bunyaviruses [2, 14, 18] (TaxoProps 2016.021a-dM, 2016.025a-dM and 2016.028a-dM). In addition, the family *Fimoviridae* was created to accommodate the previously “free-floating” plant virus genus *Emaravirus*, which was expanded by three species for newly discovered plant viruses [5, 6, 26] (TaxoProps 2016.016aP, 2016.017aP, 2016.018aP, and 2016.030a-vM). Finally, a non-Linnean binomial species nomenclature was adopted for the entire family (TaxoProps 2016.020aM, 2016.023a-cM, 2016.026a,bM, 2016.029aM.A.v2.Tenuivirus_spren, and 2016.030a-vM).

After the establishment of the order *Bunyavirales*, the ICTV Study Groups responsible for the taxonomy of *Arenaviridae* and *Bunyavirales* assigned unclassified viruses to existing or novel taxa and continued streamlining order nomenclature in collaboration with other virus experts.

Here we present the changes to both taxa that were proposed via official TaxoProps at <http://www.ictvonline.org/> in 2017 and that were accepted by the ICTV Executive Committee.

These changes are official ICTV taxonomy as of March 2018.

FAMILY ARENAVIRIDAE

Taxonomic changes at the family rank

In 2018, the family was extended by addition of a novel genus, *Hartmanivirus*, for Haartman Institute snake virus (HISV) isolated from a captive boa constrictor in Finland [9, 10] (TaxoProp 2017.001M.A.v1.Hartmanivirus.zip). The genus *Mammarenavirus* was extended by addition of two novel species for Ryukyo virus (RYKV) and souris virus (SOUV) discovered in mice in China and Cameroon, respectively (TaxoProps 2017.002M.A.v2.Mammarenavirus_sp and 2017.003M.A.v1.Mammarenavirus_sp). Five mammarenavirus species were renamed due to the ICTV decision to disallow diacritic marks in taxon names (TaxoProp 2017.001G.A.v2.43spren): *Amaparí mammarenavirus*, *Junín mammarenavirus*, *Paraná mammarenavirus*, *Pichindé mammarenavirus*, and *Sabiá mammarenavirus* were renamed *Serra do Navio mammarenavirus*, *Argentinian mammarenavirus*, *Paraguayan mammarenavirus*, *Cali mammarenavirus*, and *Brazilian mammarenavirus*, respectively, whereas the member virus names remained unchanged (TaxoProp 2017.001G.A.v2.43spren). Finally, the three reptarenavirus species names *Alethinophid 1 reptarenavirus*, *Alethinophid 2 reptarenavirus*, and *Alethinophid 3 reptarenavirus* were renamed *Golden reptarenavirus*, *California reptarenavirus*, and *Rotterdam reptarenavirus*. Two new reptarenavirus species were created for tavallinen suomalainen mies virus 2 (TSMV-2) and University of Giessen viruses 1–3 (UGV-1–3) discovered in captive boa constrictors; and several newly sequenced reptarenaviruses were assigned to existing species [9]

(TaxoProp 2017.015M.A.v1.Reptarenavirus_2sp3ren).

ORDER *BUNYAVIRALES*

Taxonomic changes at the order rank

In 2018, no changes were made at the order rank.

Taxonomic changes at the family rank

Feraviridae

In 2018, no changes were made at the family rank.

Fimoviridae

In 2018, no changes were made at the family rank.

Hantaviridae

In 2018, no changes were made at the family rank.

Jonviridae

In 2018, no changes were made at the family rank.

Nairoviridae

The family *Nairoviridae* was expanded in 2018 by addition of two new species for the long-known but previously unsequenced Artashat virus (ARTSV) and Chim virus (CHIMV), both originally isolated from ticks. In addition, the species *Burana orthonairovirus* was renamed *Tamdy orthonairovirus* to better reflect the discovery history of species members, and several

newly sequenced nairoviruses were classified into existing species [1] (TaxoProp 2017.008M.A.v1.Orthonairovirus_2sp1ren).

Peribunyaviridae

The family *Peribunyaviridae* was expanded in 2018 by addition of a novel species for Wolkberg virus (WBV) discovered in wingless bat flies (*Eucampsipoda africana*) in South Africa [12] (TaxoProp 2017.007M.A.v1.Orthobunyavirus_sp).

Phasmaviridae

In 2018, no changes were made at the family rank.

Phenuiviridae

In 2018, no changes were made at the family rank.

Tospoviridae

In 2018, no changes were made at the family rank.

OUTLOOK

The taxonomy of viruses of the family *Arenaviridae* and the order *Mononegavirales* remains in flux and additional important changes are likely forthcoming. Indeed, in 2017, two additional taxonomic proposals that would affect the family *Arenaviridae* and the order *Mononegavirales* were debated during the most recent ICTV EC meeting in Singapore. TaxoProp 2017.006M.U.v2.Negarnaviricota proposes the

- establishment of a phylum for negative-sense RNA viruses that is subdivided into two

subphyla; and

- establishment of a class including the order *Bunyavirales*, to be assigned to one of the subphyla.

TaxoProp 2017.012M.U.v2.Bunyavirales_rev proposes

- dissolution of the families *Feraviridae*, *Jonviridae*, and *Tospoviridae* and absorption of their genera into remaining families;
- the creation of three new bunyaviral families for novel invertebrate viruses [[19](#), [20](#), [23](#)];
- the inclusion of the family *Arenaviridae* in the order; and
- the creation of 19 new bunyaviral genera. These genera are planned to accommodate novel, mostly invertebrate, viruses [[14](#), [23](#)], but some of them are deemed necessary for reclassification of certain hantaviruses and phleboviruses.

These two proposals failed to find unanimous approval at a final ICTV EC vote in fall of 2017 and were deferred to the 2018 ICTV EC meeting, at which a simple majority vote would suffice for approval of the original proposals.

SUMMARY

Summaries of the current, ICTV-accepted taxonomies of the family *Arenaviridae* and the order *Bunyavirales* are presented in Tables 1 and 2, respectively. These tables also include corrections and updates in virus name or abbreviation spelling.

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Table 1. ICTV-accepted taxonomy of the family *Arenaviridae* as of 2018. Listed are all arenaviruses that have been classified into species.

| Genus | Species[¶] | Virus (Abbreviation)[¶] |
|-----------------------|-----------------------------------|---|
| <i>Hartmanivirus</i> | <i>Haartman hartmanivirus</i> | Haartman Institute snake virus (HISV) |
| <i>Mammarenavirus</i> | <i>Allpahuayo mammarenavirus</i> | Allpahuayo virus (ALLV) |
| | <i>Argentinian mammarenavirus</i> | Junín virus (JUNV) |
| | <i>Bear Canyon mammarenavirus</i> | Bear Canyon virus (BCNV) |
| | <i>Brazilian mammarenavirus</i> | Sabiá virus (SBAV) |
| | <i>Chapare mammarenavirus</i> | Chapare virus (CHAPV) |
| | <i>Cupixi mammarenavirus</i> | Cupixi virus (CUPXV) |
| | <i>Flexal mammarenavirus</i> | Flexal virus (FLEV) |
| | <i>Gairo mammarenavirus</i> | Gairo virus (GAIV) |
| | <i>Guanarito mammarenavirus</i> | Guanarito virus (GTOV) |
| | <i>Ippy mammarenavirus</i> | Ippy virus (IPPYV) |
| | <i>Lassa mammarenavirus</i> | Lassa virus (LASV) |
| | <i>Latino mammarenavirus</i> | Latino virus (LATV) |

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| | <i>Loei River mammarenavirus</i> | Loei River virus (LORV) |
| | <i>Lujo mammarenavirus</i> | Lujo virus (LUJV) |
| | <i>Luna mammarenavirus</i> | Luna virus (LUAV) |
| | | Luli virus (LULV) |
| | <i>Lunk mammarenavirus</i> | Lunk virus (LNKV) |
| | <i>Lymphocytic choriomeningitis mammarenavirus*</i> | lymphocytic choriomeningitis virus (LCMV) |
| | <i>Machupo mammarenavirus</i> | Machupo virus (MACV) |
| | <i>Mariental mammarenavirus</i> | Mariental virus (MRLV) |
| | <i>Merino Walk mammarenavirus</i> | Merino Walk virus (MRWV) |
| | <i>Mobala mammarenavirus</i> | mobala virus (MOBV) |
| | <i>Mopeia mammarenavirus</i> | Mopeia virus (MPOV) |
| | | Morogoro virus (MORV) |
| | <i>Okahandja mammarenavirus</i> | Okahandja virus (OKAV) |
| | <i>Oliveros mammarenavirus</i> | Oliveros virus (OLVV) |

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| | <i>Paraguayan mammarenavirus</i> | Paraná virus (PRAV) |
| | <i>Cali mammarenavirus</i> | Pichindé virus (PICHV) |
| | <i>Pirital mammarenavirus</i> | Pirital virus (PIRV) |
| | <i>Ryukyu mammarenavirus</i> | Ryukyu virus (RYKV) |
| | <i>Serra do Navio mammarenavirus</i> | Amaparí virus (AMAV) |
| | <i>Solwezi mammarenavirus</i> | Solwezi virus (SOLV) |
| | <i>Souris mammarenavirus</i> | souris virus (SOUV) |
| | <i>Tacaribe mammarenavirus</i> | Tacaribe virus (TCRV) |
| | <i>Tamiami mammarenavirus</i> | Tamiami virus (TMMV) |
| | <i>Wenzhou mammarenavirus</i> | Wēnzhōu virus (WENV) |
| | <i>Whitewater Arroyo mammarenavirus</i> | Big Brushy Tank virus (BBRTV) |
| | | Catarina virus (CTNV) |
| | | Skinner Tank virus (SKTV) |
| | | Tonto Creek virus (TTCV) |
| | | Whitewater Arroyo virus (WWAV) |

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| <i>Reptarenavirus</i> | <i>California reptarenavirus</i> | CAS virus (CASV) |
| | <i>Giessen reptarenavirus</i> | University of Giessen virus 1 (UGV-1) |
| | | University of Giessen virus 2 (UGV-2) |
| | | University of Giessen virus 3 (UGV-3) |
| | <i>Golden reptarenavirus</i> * | Golden Gate virus (GOGV) |
| | <i>Ordinary reptarenavirus</i> | tavallinen suomalainen mies virus 2 (TSMV-2) |
| | <i>Rotterdam reptarenavirus</i> | ROUT virus (ROUTV) |
| | | University of Helsinki virus 1 (UHV-1) |

*Asterisks denote type species. Please note that viruses are real objects that are assigned to concepts that are called taxa. Species, genera, families, and orders are taxa. Taxon names are always italicized and always begin with a capital letter. Virus names, on the other hand, are not italicized and are not capitalized, except if the name or a name component is a proper noun. This column lists the virus names with their correct (lack of) capitalization.

Table 2. ICTV-accepted taxonomy of the order *Bunyavirales* as of 2018. Listed are all bunyaviruses that have been classified into species.

| Genus | Species [¶] | Virus (Abbreviation) [¶] |
|----------------------------------|---|--|
| Family <i>Feraviridae</i> | | |
| <i>Orthoferavirus</i> | <i>Ferak orthoferavirus</i> * | ferak virus (FERV) |
| Family <i>Fimoviridae</i> | | |
| <i>Emaravirus</i> | <i>Actinidia chlorotic ringspot-associated emaravirus</i> | Actinidia chlorotic ringspot-associated virus (AcCRaV) |
| | <i>European mountain ash ringspot-associated emaravirus</i> * | European mountain ash ringspot-associated virus (EMARaV) |
| | <i>Fig mosaic emaravirus</i> | fig mosaic virus (FMV) |
| | <i>High Plains wheat mosaic emaravirus</i> | High Plains wheat mosaic virus (HPWMoV) |
| | <i>Pigeonpea sterility mosaic emaravirus 1</i> | pigeonpea sterility mosaic virus (PPSMV) |
| | <i>Pigeonpea sterility mosaic emaravirus 2</i> | pigeonpea sterility mosaic virus 2 |

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| | | (PPSMV-2) |
| | <i>Raspberry leaf blotch emaravirus</i> | raspberry leaf blotch virus (RLBV) |
| | <i>Redbud yellow ringspot-associated emaravirus</i> | redbud yellow ringspot-associated virus (RYRaV) |
| | <i>Rose rosette emaravirus</i> | rose rosette virus (RRV) |
| Family <i>Hantaviridae</i> | | |
| <i>Orthohantavirus</i> | <i>Amga orthohantavirus</i> | Amga virus (MGAV) ¹ |
| | <i>Andes orthohantavirus</i> | Andes virus (ANDV) |
| | | Castelo dos Sonhos virus (CASV) |
| | | Lechiguanas virus (LECV = LECHV) |
| | | Orán virus (ORNV) |
| | <i>Asama orthohantavirus</i> | Asama virus (ASAV) |
| | <i>Asikkala orthohantavirus</i> | Asikkala virus (ASIV) |
| | <i>Bayou orthohantavirus</i> | bayou virus (BAYV) |
| | | Catacamas virus (CATV) |

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| | <i>Black Creek Canal orthohantavirus</i> | Black Creek Canal virus (BCCV) |
| | <i>Bowe orthohantavirus</i> | Bowé virus (BOWV) |
| | <i>Bruges orthohantavirus</i> | Bruges virus (BRGV) |
| | <i>Cano Delgadito orthohantavirus</i> | Caño Delgadito virus (CADV) |
| | <i>Cao Bang orthohantavirus</i> | Cao Bắng virus (CBNV) |
| | | Liánghé virus (LHEV) |
| | <i>Choclo orthohantavirus</i> | Choclo virus (CHOV) |
| | <i>Dabieshan orthohantavirus</i> | Dàbiéshān virus (DBSV) |
| | <i>Dobrava-Belgrade orthohantavirus</i> | Dobrava virus (DOBV) |
| | | Kurkino virus (KURV) |
| | | Saaremaa virus (SAAV) |
| | | Sochi virus |
| | <i>El Moro Canyon orthohantavirus</i> | Carrizal virus (CARV) |
| | | El Moro Canyon virus (ELMCV) |
| | | Huitzilac virus (HUIV) |

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| | <i>Fugong orthohantavirus</i> | Fúgòng virus (FUGV) |
| | <i>Fusong orthohantavirus</i> | Fūsōng virus (FUSV) |
| | <i>Hantaan orthohantavirus*</i> | Amur virus (AMRV) |
| | | Hantaan virus (HTNV) |
| | | Soochong virus (SOOV) |
| | <i>Imjin orthohantavirus</i> | Imjin virus (MJNV) |
| | <i>Jeju orthohantavirus</i> | Jeju virus (JJUV) |
| | <i>Kenkeme orthohantavirus</i> | Kenkeme virus (KKMV) |
| | <i>Khabarovsk orthohantavirus</i> | Khabarovsk virus (KHAV) |
| | | Topografov virus (TOPV) |
| | <i>Laguna Negra orthohantavirus</i> | Laguna Negra virus (LANV) |
| | | Maripa virus (MARV) |
| | | Río Mamoré virus (RIOMV) |
| | <i>Laibin orthohantavirus</i> | Láibīn virus (LBV) |
| | <i>Longquan orthohantavirus</i> | Lóngquán virus (LQUV) |

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| | <i>Luxi orthohantavirus</i> | Lúxī virus (LUXV) |
| | <i>Maporal orthohantavirus</i> | Maporal virus (MAPV) |
| | <i>Montano orthohantavirus</i> | Montaño virus (MTNV) |
| | <i>Necocli orthohantavirus</i> | Necoclí virus (NECV) |
| | <i>Nova orthohantavirus</i> | Nova virus (NVAV) |
| | <i>Oxbow orthohantavirus</i> | Oxbow virus (OXBV) |
| | <i>Prospect Hill orthohantavirus</i> | Prospect Hill virus (PHV) |
| | <i>Puumala orthohantavirus</i> | Hokkaido virus (HOKV) |
| | | Muju virus (MUJV) |
| | | Puumala virus (PUUV) |
| | <i>Quezon orthohantavirus</i> | Quezon virus (QZNV) |
| | <i>Rockport orthohantavirus</i> | Rockport virus (RKPV) |
| | <i>Sangassou orthohantavirus</i> | Sangassou virus (SANGV) |
| | <i>Seoul orthohantavirus</i> | gōu virus (GOUV) |
| | | Seoul virus (SEOV) |

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| | <i>Sin Nombre orthohantavirus</i> | New York virus (NYV) ² |
| | | sin nombre virus (SNV) |
| | <i>Thailand orthohantavirus</i> | Anjzorobe virus |
| | | Serang virus (SERV) ³ |
| | | Thailand virus (THAIV) |
| | <i>Thottapalayam orthohantavirus</i> | Thottapalayam virus (TPMV) |
| | <i>Tula orthohantavirus</i> | Adler virus (ADLV) |
| | | Tula virus (TULV) |
| | <i>Yakeshi orthohantavirus</i> | Yákèshí virus (YKSV) |
| Family <i>Jonviridae</i> | | |
| <i>Orthojonvirus</i> | <i>Jonchet orthojonvirus</i> * | jonchet virus (JONV) |
| Family <i>Nairoviridae</i> | | |
| <i>Orthonairovirus</i> | <i>Artashat orthonairovirus</i> | Artashat virus (ARTSV) |
| | <i>Chim orthonairovirus</i> | Chim virus (CHIMV) |
| | <i>Crimean-Congo hemorrhagic fever</i> | Crimean-Congo hemorrhagic fever virus |

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| | <i>orthonairovirus</i> | (CCHFV) |
| | <i>Dera Ghazi Khan orthonairovirus</i> | Abu Hammad virus (AHV) ⁴ |
| | | Abu Mina virus (AMV) |
| | | Dera Ghazi Khan virus (DGKV) |
| | | Sapphire II virus (SAPV) |
| | <i>Dugbe orthonairovirus</i> * | Dugbe virus (DUGV) |
| | | kupe virus (KUPEV) |
| | <i>Hazara orthonairovirus</i> | Hazara virus (HAZV) |
| | | Tofla virus (TFLV) |
| | <i>Hughes orthonairovirus</i> | Caspiy virus (CASV) |
| | | Farallon virus (FARV) |
| | | Great Saltee virus (GRSV) |
| | | Hughes virus (HUGV) |
| | | Punta Salinas virus (PSV) |
| | | Raza virus (RAZAV) |

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| | | Soldado virus (SOLV) |
| | | Zirqa virus (ZIRV) |
| | <i>Kasokero orthonairovirus</i> | Kasokero virus (KASV = KASOV) |
| | | Leopards Hill virus (LPHV) |
| | | Yogue virus (YOGV) |
| | <i>Keterah orthonairovirus</i> | Gossas virus (GOSV) |
| | | Issyk-kul virus (ISKV) |
| | | Keterah virus (KTRV) ⁵ |
| | | Uzun-Agach virus (UZAV) |
| | <i>Nairobi sheep disease orthonairovirus</i> | Nairobi sheep disease virus (NSDV) ⁶ |
| | <i>Qalyub orthonairovirus</i> | Bandia virus (BDV) |
| | | Geran virus (GERV) |
| | | Qalyub virus (QYBV) |
| | <i>Sakhalin orthonairovirus</i> | Avalon virus (AVAV) |
| | | Clo Mor virus (CMV = CLMV) |

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| | | Sakhalin virus (SAKV) |
| | | Taggert virus (TAGV) |
| | | Tillamook virus (TILLV) |
| | <i>Tamdy orthonairovirus</i> | Burana virus (BURV) |
| | | Huángpí tick virus 1 (HpTV-1) |
| | | Tamdy virus (TAMV) |
| | | Tǎchéng tick virus 1 (TcTV-1) |
| | | Wēnzhōu tick virus (WzTV) |
| | <i>Thiafora orthonairovirus</i> | Erve virus (ERVEV) |
| | | Thiafora virus (TFAV) |
| Family <i>Peribunyaviridae</i> | | |
| <i>Herbevirus</i> | <i>Herbert herbevirus</i> * | Herbert virus (HEBV) |
| | <i>Kibale herbevirus</i> | Kibale virus (KIBV) |
| | <i>Shuangao insect herbevirus 1</i> | Shuāngào insect virus 1 (SgIV-1) |
| | <i>Tai herbevirus</i> | Tāi virus (TAIV) |

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| <i>Orthobunyavirus</i> | <i>Acara orthobunyavirus</i> | Acará virus (ACAV) |
| | | Moriche virus (MORV) |
| | <i>Akabane orthobunyavirus</i> | Akabane virus (AKAV) |
| | | Sabo virus (SABOV) |
| | | Tinaroo virus (TINV) |
| | | Yaba-7 virus (Y7V) |
| | <i>Alajuela orthobunyavirus</i> | Alajuela virus (ALJV) |
| | | Brus Laguna virus |
| | | San Juan virus (SJV) |
| | <i>Anopheles A orthobunyavirus</i> | Anopheles A virus (ANAV) |
| | | Arumateua virus (ARTV) |
| | | Caraipé virus (CPEV) |
| | | Las Maloyas virus (LMV) |
| | | Lukuni virus (LUKV) |
| | | Trombetas virus (TRMV) |

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| | | Tucuruí virus (TUCV) |
| | <i>Anopheles B orthobunyavirus</i> | Anopheles B virus (ANBV) |
| | | Boracéia virus (BORV) |
| | <i>Bakau orthobunyavirus</i> | Bakau virus (BAKV) |
| | | Ketapang virus (KETV) |
| | | Nola virus (NOLAV) |
| | | Tanjong Rabok virus (TRV) |
| | | Telok Forest virus (TFV) |
| | <i>Batama orthobunyavirus</i> | Batama virus (BMAV) |
| | <i>Benevides orthobunyavirus</i> | Benevides virus (BVSV) |
| | <i>Bertioga orthobunyavirus</i> | Bertioga virus (BERV) |
| | | Cananéia virus (CNAV) |
| | | Guaratuba virus (GTBV) |
| | | Itimirim virus (ITIV) |
| | | Mirim virus (MIRV) |

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| | <i>Bimiti orthobunyavirus</i> | bimiti virus (BIMV) |
| | <i>Botambi orthobunyavirus</i> | Botambi virus (BOTV) |
| | <i>Bunyamwera orthobunyavirus*</i> | Anadyr virus (ANADV) |
| | | Batai virus (BATV) ⁷ |
| | | Birao virus (BIRV) |
| | | Bozo virus (BOZOV) |
| | | Bunyamwera virus (BUNV) |
| | | Cache Valley virus (CVV) |
| | | Fort Sherman virus (FSV) |
| | | Germiston virus (GERV) |
| | | Ilesha virus (ILEV) |
| | | Lokern virus (LOKV) |
| | | Maguari virus (MAGV) |
| | | Mboké virus (MBOV) |
| | | Ngari virus (NRIV) ⁸ |

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| | | Northway virus (NORV) |
| | | Playas virus (PLAV) |
| | | Potosi virus (POTV) |
| | | Santa Rosa virus (SARV) |
| | | Shokwe virus (SHOV) |
| | | Stanfield virus (STAV) |
| | | Tensaw virus (TENV) |
| | | Tlacotalpan virus (TLAV) |
| | | Xingu virus (XINV) |
| | <i>Bushbush orthobunyavirus</i> | Benfica virus (BENV) |
| | | Bushbush virus (BSBV) |
| | | Juan Díaz virus (JDV) |
| | <i>Bwamba orthobunyavirus</i> | Bwamba virus (BWAV) |
| | | Pongola virus (PGAV) |
| | <i>California encephalitis orthobunyavirus</i> | Achiote virus (ACHOV) |

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| | | California encephalitis virus (CEV) |
| | | infirmatus virus (INFV) |
| | | Inkoo virus (INKV) |
| | | Jamestown Canyon virus (JCV) |
| | | Jerry Slough virus (JSV) |
| | | Keystone virus (KEYV) |
| | | Khatanga virus (KHATV) ⁹ |
| | | La Crosse virus (LACV) |
| | | Lumbo virus (LUMV) |
| | | Melao virus (MELV) |
| | | Morro Bay virus (MBV) |
| | | San Angelo virus (SAV) |
| | | Serra do Navio virus (SDNV) |
| | | snowshoe hare virus (SSHV) |
| | | South River virus (SORV) |

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| | | Ťahyňa virus (TAHV) |
| | | trivittatus virus (TVTV) |
| | <i>Capim orthobunyavirus</i> | Capim virus (CAPV) |
| | <i>Caraparu orthobunyavirus</i> | Apeú virus (APEUV) |
| | | Bruconha virus (BRUV) |
| | | Caraparú virus (CARV) |
| | | El Huayo virus |
| | | Itaya virus (ITYV) |
| | | Ossa virus (OSSAV) |
| | | Vinces virus (VINV) |
| | <i>Catu orthobunyavirus</i> | Catú virus (CATUV) |
| | <i>Estero Real orthobunyavirus</i> | Estero Real virus (ERV) |
| | <i>Gamboa orthobunyavirus</i> | Calchaquí virus (CQIV) |
| | | Gamboa virus (GAMV) |
| | | Pueblo Viejo virus (PVV) |

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| | | Soberanía virus |
| | <i>Guajara orthobunyavirus</i> | Guajará virus (GJAV) |
| | <i>Guama orthobunyavirus</i> | Ananindeua virus (ANUV) |
| | | Guamá virus (GMAV) |
| | | Mahogany Hammock virus (MHV) |
| | | Moju virus (MOJUV) |
| | <i>Guaroa orthobunyavirus</i> | Guaroa virus (GROV) |
| | <i>Kaeng Khoi orthobunyavirus</i> | Kaeng Khoi virus (KKV) |
| | <i>Kairi orthobunyavirus</i> | Kairi virus (KRIV) |
| | <i>Koongol orthobunyavirus</i> | koongol virus (KOOV) |
| | | wongal virus (WONV) |
| | <i>Madrid orthobunyavirus</i> | Madrid virus (MADV) |
| | <i>Main Drain orthobunyavirus</i> | Main Drain virus (MDV) |
| | <i>Manzanilla orthobunyavirus</i> | Buttonwillow virus (BUTV) |
| | | Cát Quế virus (CQV) |

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| | | Ingwavuma virus (INGV) |
| | | Inini virus (INIV) |
| | | Manzanilla virus (MANV) |
| | | Mermet virus (MERV) |
| | <i>Marituba orthobunyavirus</i> | Gumbo Limbo virus (GLV) |
| | | Marituba virus (MTBV) |
| | | Murutucú virus (MURV) |
| | | Nepuyo virus (NEPV) |
| | | Restan virus (RESV) |
| | | Zungarococha virus (ZUNV) |
| | <i>Minatitlan orthobunyavirus</i> | Minatitlán virus (MNTV) |
| | | Palestina virus (PLSV) |
| | <i>MPoko orthobunyavirus</i> | M'Poko virus (MPOV) |
| | | Yaba-1 virus (Y1V) |
| | <i>Nyando orthobunyavirus</i> | Nyando virus (NDV) |

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| | | Eretmapodites virus (ERETV) |
| | <i>Olifantsvlei orthobunyavirus</i> | Bobia virus (BIAV) |
| | | Dabakala virus (DABV) |
| | | Olifantsvlei virus (OLIV) |
| | | Oubi virus (OUBIV) |
| | <i>Oriboca orthobunyavirus</i> | Itaquí virus (ITQV) |
| | | Oriboca virus (ORIV) |
| | <i>Oropouche orthobunyavirus</i> | Facey's paddock virus (FPV) |
| | | IQUITOS virus (IQTV) ^d |
| | | Madre de Dios virus (MDDV) |
| | | Oropouche virus (OROV) |
| | | Perdões virus (PDEV) |
| | | Pintupo virus (PINTV) |
| | | Utinga virus (UTIV) |
| | | Utivé virus (UVV = UTVEV) |

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| | <i>Patois orthobunyavirus</i> | Abras virus (ABRV) |
| | | Babahoya virus (BABV) |
| | | Pahayokee virus (PAHV) |
| | | Patois virus (PATV) |
| | | Shark River virus (SRV) |
| | <i>Sathuperi orthobunyavirus</i> | Douglas virus (DOUV) |
| | | Sathuperi virus (SATV) |
| | <i>Shamonda orthobunyavirus</i> | Peaton virus (PEAV) |
| | | Sango virus (SANV) |
| | | Shamonda virus (SHAV) |
| | <i>Shuni orthobunyavirus</i> | Aino virus (AINOV) |
| | | Kaikalur virus (KAIV) |
| | | Shuni virus (SHUV) |
| | <i>Simbu orthobunyavirus</i> | Simbu virus (SIMV) |
| | | Oya virus (OYAV) |

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| | <i>Tacaiuma orthobunyavirus</i> | Tacaiuma virus (TCMV) |
| | | CoAr 1071 virus (CA1071V) |
| | | CoAr 3627 virus (CA3626V) |
| | | Virgin River virus (VRV) |
| | <i>Tete orthobunyavirus</i> | Bahig virus (BAHV) |
| | | Matruh virus (MTRV) |
| | | Tete virus (TETEV) |
| | | Tsuruse virus (TSUV) |
| | | Weldona virus (WELV) |
| | <i>Thimiri orthobunyavirus</i> | Thimiri virus (THIV) |
| | <i>Timboteua orthobunyavirus</i> | Timboteua virus (TBTV) |
| | <i>Turlock orthobunyavirus</i> | Lednice virus (LEDV) |
| | | Turlock virus (TURV) |
| | | Umbre virus (UMBV) |
| | <i>Wolkberg orthobunyavirus</i> | Wolkberg virus (WBV) |

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| | <i>Wyeomyia orthobunyavirus</i> | Anhembi virus (AMBV) |
| | | BeAr 328208 virus (BAV) |
| | | Cachoeira Porteira virus (CPOV) |
| | | Iaco virus (IACOV) |
| | | Macauã virus (MCAV) |
| | | Rio Pracupi virus |
| | | Sororoca virus (SORV) |
| | | Taiassui virus (TAIAV) |
| | | Tucunduba virus (TUCV) |
| | | Wyeomyia virus (WYOV) |
| | <i>Zegla orthobunyavirus</i> | Zegla virus (ZEGV) |
| Family Phasmaviridae | | |
| <i>Orthophasmavirus</i> | <i>Kigluaik phantom orthophasmavirus*</i> | Kigluaik phantom virus (KIGV) |
| | <i>Nome phantom orthophasmavirus</i> | Nome phantom virus (NOMV) |
| | <i>Shuangao insect orthophasmavirus 2</i> | Shuāngào insect virus 2 (SgIV-2) |

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| | <i>Wuchang cockroach orthophasmavirus 1</i> | Wǔchāng cockroach virus 1 (WeCV-1) |
| | <i>Wuhan mosquito orthophasmavirus 1</i> | Wǔhàn mosquito virus 1 (WhMV-1) |
| | <i>Wuhan mosquito orthophasmavirus 2</i> | Wǔhàn mosquito virus 2 (WhMV-2) |
| Family Phenuiviridae | | |
| <i>Goukovirus</i> | <i>Cumuto goukovirus</i> | Cumuto virus (CUMV) |
| | <i>Gouleako goukovirus*</i> | Gouléako virus (GOLV) |
| | <i>Yichang insect goukovirus</i> | Yíchāng insect virus (YcIV) |
| <i>Phasivirus</i> | <i>Badu phasivirus*</i> | Badu virus (BADUV) |
| | <i>Phasi Charoen-like phasivirus</i> | Phasi Chaeron-like virus (PCLV) |
| | <i>Wuhan fly phasivirus</i> | Wǔhàn fly virus 1 (WhFV-1) |
| | <i>Wutai mosquito phasivirus</i> | Wǔtái mosquito virus (WtMV) |
| <i>Phlebovirus</i> | <i>Bujaru phlebovirus</i> | Bujaru virus (BUJV) |
| | | Munguba virus (MUNV) |
| | <i>Candiru phlebovirus</i> | Alenquer virus (ALEV) |
| | | Ariquemes virus (ARQV) |

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| | | Candiru virus (CDUV) |
| | | Itaituba virus (ITAV) |
| | | Jacundá virus (JCNV) |
| | | Maldonado virus (MLOV) |
| | | Morumbi virus (MR(M)BV) |
| | | Mucura virus (MCRV/MRAV) |
| | | Nique virus (NIQV) |
| | | Oriximiná virus (ORXV) |
| | | Serra Norte virus (SRNV) |
| | | Turuna virus (TUAV) |
| | <i>Chilibre phlebovirus</i> | Cacao virus (CACV) |
| | | Chilibre virus (CHIV) |
| | <i>Frijoles phlebovirus</i> | Frijoles virus (FRIV) |
| | | Joá virus (JOAV) |
| | <i>Punta Toro phlebovirus</i> | Buenaventura virus (BUEV) |

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| | | Campana virus (CMAV) |
| | | Capira virus (CAPIV) |
| | | Coclé virus (CCLV) |
| | | Leticia virus (LTCV) |
| | | Punta Toro virus (PTV) |
| | <i>Rift Valley fever phlebovirus*</i> | Rift Valley fever virus (RVFV) |
| | <i>Salehabad phlebovirus</i> | Adana virus (ADAV) |
| | | Adria virus (ADRV) |
| | | Alcube virus |
| | | Arbia virus (ARBV) |
| | | Arumowot virus (AMTV) |
| | | Medjerda Valley virus |
| | | Odrénisrou virus (ODRV) |
| | | Olbia virus (OLBV) |
| | | Salehabad virus (SALV) |

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| | | Bregalaka virus (BREV) |
| | | Zaba virus (ZABAV) |
| | <i>Sandfly fever Naples phlebovirus</i> | Arrábida virus (ARRV) |
| | | Balkan virus (BALKV) |
| | | Fermo virus (FERV) |
| | | Gordil virus (GORV) |
| | | Granada virus (GRV = GRAV) |
| | | Massilia virus (MASV) |
| | | Punique virus (PUNV) |
| | | Saddaguia virus (SADV) |
| | | Saint-Floris virus (SAFV) |
| | | sandfly fever Naples virus (SFNV) |
| | | Tehran virus (THEV) |
| | | Toscana virus (TOSV) |
| | | Zerdali virus (ZERV) |

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| | <i>SFTS phlebovirus</i> | severe fever with thrombocytopenia syndrome virus (SFTSV) |
| | <i>Uukuniemi phlebovirus</i> | Chizé virus (CHZV) |
| | | EgAN 1825-61 virus (EGAV) |
| | | Fin V 707 virus (FINV) |
| | | Oceanside virus (OCV = OCEV) |
| | | Pontevès virus (PTVV) |
| | | St. Abbs Head virus (SAHV) |
| | | Uukuniemi virus (UUKV) |
| | | Zaliv Terpenyia virus (ZTV) |
| <i>Tenuivirus</i> | <i>Echinochloa hoja blanca tenuivirus</i> | Echinochloa hoja blanca virus (EHBV) |
| | <i>Iranian wheat stripe tenuivirus</i> | Iranian wheat stripe virus (IWSV) |
| | <i>Maize stripe tenuivirus</i> | maize stripe virus (MStV = MSpV) |
| | <i>Rice grassy stunt tenuivirus</i> | rice grassy stunt virus (RGSV) |
| | <i>Rice hoja blanca tenuivirus</i> | rice hoja blanca virus (RHBV) |

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|-----------------------------------|--|---|
| | <i>Rice stripe tenuivirus*</i> | rice stripe virus (RSV = RStV) |
| | <i>Urochloa hoja blanca tenuivirus</i> | Urochloa hoja blanca virus (UHBV) |
| Family <i>Tospoviridae</i> | | |
| <i>Orthospovirus</i> | <i>Groundnut bud necrosis orthospovirus</i> | groundnut bud necrosis virus (GBNV) ¹⁰ |
| | <i>Groundnut ringspot orthospovirus</i> | groundnut ringspot virus (GRSV) |
| | <i>Groundnut yellow spot orthospovirus</i> | groundnut yellow spot virus (GYSV) ¹¹ |
| | <i>Impatiens necrotic spot orthospovirus</i> | impatiens necrotic spot virus (INSV) |
| | <i>Iris yellow spot orthospovirus</i> | iris yellow spot virus (IYSV) |
| | <i>Polygonum ringspot orthospovirus</i> | Polygonum ringspot virus (PolRSV) |
| | <i>Tomato chlorotic spot orthospovirus</i> | tomato chlorotic spot virus (TCSV) |
| | <i>Tomato spotted wilt orthospovirus*</i> | tomato spotted wilt virus (TSWV) |
| | <i>Watermelon bud necrosis orthospovirus</i> | watermelon bud necrosis virus (WBNV) |
| | <i>Watermelon silver mottle orthospovirus</i> | watermelon silver mottle virus (WSMoV) |
| | <i>Zucchini lethal chlorosis orthospovirus</i> | zucchini lethal chlorosis virus (ZLCV) |

*Asterisks denote type species. ¹⁰Please note that viruses are real objects that are assigned to concepts that are called taxa. Species, genera, families, and orders are taxa. Taxon names are always italicized and always begin with a capital letter. Virus names, on the

other hand, are not italicized and are not capitalized, except if the name or a name component is a proper noun. This column lists the virus names with their correct (lack of) capitalization. Lists of viruses within a given species are provisional at this point and will likely be amended in the near future.

¹Synonym: Artybash virus (ARTV); ²synonym: New York 1 virus (NY-1V); ³synonym: Jurong virus; ⁴includes the strain previously referred to as Tunis virus (TUNV); ⁵includes the strain previously referred to as soft tick bunyavirus (STBV); ⁶includes the strain previously referred to as Ganjam virus (GANV); ⁷synonyms: Čalovo virus (CVOV), Chittoor virus (CHITV), Olkya virus, Olyka virus, UgMP-6830 virus; ⁸includes the strain previously referred to as Garissa virus; ⁹also mistakenly referred to in the literature as Chantanga virus (CHATV) and Chatanga virus (CHATV); ¹⁰synonym: peanut bud necrosis virus (PDNV); ¹¹synonym: peanut yellow spot virus (PYSV).

COMPLIANCE WITH ETHICAL STANDARDS

The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the US Department of the Army, the US Department of Defense, the US Department of Health and Human Services, or of the institutions and companies affiliated with the authors. In no event shall any of these entities have any responsibility or liability for any use, misuse, inability to use, or reliance upon the information contained herein. The US departments do not endorse any products or commercial services mentioned in this publication.

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Conflict of Interest

The authors declare no conflicts of interest.

Ethical approval

This article does not contain any studies with human participants or animals performed by any of the authors.

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