

**HHS PUBLIC ACCESS**

Author manuscript

Arch Virol. Author manuscript; available in PMC 2020 July 01.

Published in final edited form as:

Arch Virol. 2019 July ; 164(7): 1967–1980. doi:10.1007/s00705-019-04247-4.**Taxonomy of the order *Mononegavirales*: update 2019***A full list of authors and affiliations appears at the end of the article.***Abstract**

In February 2019, following the annual taxon ratification vote, the order *Mononegavirales* was amended by the addition of four new subfamilies and 12 new genera and the creation of 28 novel species. This article presents the updated taxonomy of the order *Mononegavirales* as now accepted by the International Committee on Taxonomy of Viruses (ICTV).

Keywords

artovirid; *Artoviridae*; artovirus; bornavirid; *Bornaviridae*; bornavirus; filovirid; *Filoviridae*; filovirus; ICTV; International Committee on Taxonomy of Viruses; lispivirid; *Lispiviridae*; lispivirus; mononegavirad; *Mononegavirales*; mononegavirus; mymonavirid; *Mymonaviridae*; mymonavirus; nyamivirid; *Nyamiviridae*; nyamivirus; paramyxovirid; *Paramyxoviridae*; paramyxovirus; pneumovirid; *Pneumoviridae*; pneumovirus; rhabdovirid; *Rhabdoviridae*; rhabdovirus; sunvirid; *Sunviridae*; sunvirus; virus classification; virus nomenclature; virus taxonomy; xinmovirid; *Xinmoviridae*; xinmovirus

*Corresponding author: JHK: Integrated Research Facility at Fort Detrick (IRF-Frederick), Division of Clinical Research (DCR), National Institute of Allergy and Infectious Diseases (NIAID), National Institutes of Health (NIH), B-8200 Research Plaza, Fort Detrick, Frederick, MD 21702, USA; Phone: +1-301-631-7245; Fax: +1-301-631-7389; kuhnjens@mail.nih.gov.

§The members of the 2017–2020 International Committee on Taxonomy of Viruses (ICTV) *Bornaviridae* Study Group;

#the members of the 2017–2020 ICTV *Filoviridae* Study Group;

*the members of the 2017–2020 ICTV *Mononegavirales* Study Group;

@the members of the 2017–2020 ICTV *Mymonaviridae* Study Group;

‡the members of the 2017–2020 ICTV *Nyamiviridae* Study Group;

^the members of the 2017–2020 ICTV *Paramyxoviridae* Study Group;

%the members of the 2017–2020 ICTV *Pneumoviridae* Study Group;

&the members of the 2017–2020 ICTV *Rhabdoviridae* Study Group;

~the 2017–2020 ICTV Chair of the Fungal and Protist Viruses Subcommittee;

≈the 2018–2020 ICTV Proposal Secretary;

**the 2017–2020 ICTV Chair of the Plant Viruses Subcommittee;

\$\$the 2017–2020 ICTV Chair of the Animal dsRNA and ssRNA- Viruses Subcommittee

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, the Department of Homeland Security (DHS) Science and Technology Directorate (S&T), 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.

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.

Introduction

The virus order *Mononegavirales* was established in 1991 to accommodate related viruses with nonsegmented, linear, single-stranded, negative-sense RNA genomes classified into three families [20]. According to the previous ratification vote held in October 2018, the order included eight families [10]. Amended/emended order descriptions were published in 1995 [5], 1997 [21], 2000 [22], 2005 [23], 2011 [8], 2016 [1], 2017 [3], March 2018 [4], and October 2018 [15]. Here we present the changes that were proposed via official ICTV taxonomic proposals that were accepted by the ICTV Executive Committee (EC) in February 2019. Therefore, these changes are now part of the official ICTV taxonomy.

Taxonomic changes at the order rank

No changes were made at the order rank.

Taxonomic changes at the family rank

Artoviridae

No changes were made at the family rank.

Bornaviridae

One new genus, *Cultervirus*, including one new species, *Sharpbelly cultervirus*, was added to the family *Bornaviridae* for classification of Wūhàn sharpbelly bornavirus (WhSBV) discovered in a sharpbelly (*Hemiculter leucisculus*) [29] (TaxoProp 2018.016M.A.v1.Cultervirus.docx).

Filoviridae

The family *Filoviridae* was expanded by the addition of two new genera. The genus *Striavirus* was created to include species *Xilang striavirus* for X lǎng virus (XILV; previously “W nǐng frogfish filovirus”) discovered in striated frogfish (*Antennarius striatus*). The genus *Thamnovirus* was created to include species *Huangjiao thamnovirus* for Huángji o virus (HUJV; previously “W nǐng thamnaconus septentrionalis”) discovered in a filefish (*Thamnaconus septentrionalis*) [29] (TaxoProp 2018.015M.A.v1.Filoviridae_2gen).

Lispiviridae

No changes were made at the family rank.

Mymonaviridae

No changes were made at the family rank.

Nyamiviridae

No changes were made at the family rank.

Paramyxoviridae

After a thorough assessment [27], the family *Paramyxoviridae* was comprehensively reorganized (TaxoProp 2018.011M.A.v1.Paramyxoviridae):

- the subfamily *Avulavirinae* was created for three genera (two new [*Metaavulavirus*, *Paraavulavirus*], one renamed [*Avulavirus*→*Orthoavulavirus*]) to accommodate previously classified viruses. All included species names were renamed;
- the subfamily *Metaparamyxovirinae* was created for one new genus (*Synodovirus*) including one new species (*Synodus paramyxovirus*) for W nling triplecross lizardfish paramyxovirus (WTLPV) discovered in triplecross lizardfish (*Synodus macrops*) [29];
- the subfamily *Orthoparamyxovirinae* was created for five existing genera (*Aquaparamyxovirus*, *Ferlavirus*, *Henipavirus*, *Morbillivirus*, *Respirovirus*) and three new genera (*Jeilongvirus*, *Narmovirus*, *Salemvirus*). Genus *Respirovirus* was expanded by one species, *Caprine respirovirus 3*, for caprine parainfluenzavirus 3 (CPIV-3) discovered in goats [13, 33]. Genus *Jeilongvirus* includes six novel species: *Beilong jeilongvirus* for Beilong virus (BeiV) discovered in human kidney mesangial cells [14]; *Jun jeilongvirus* for J virus (JV) isolated from house mice (*Mus musculus*) [9, 16]; *Lophuromys jeilongvirus 1* and *2* for Mount Mabu Lophuromys virus 1 and 2 (MMLV-1/2) identified in Rungwe brush-furred rats (*Lophuromys machangui*) and *Myodes jeilongvirus* for Pohorje Myodes paramyxovirus 1 (PMPV-1) identified in bank voles (*Myodes glareolus*) [31]; and *Tailam jeilongvirus* for Tailam virus (TaiV) isolated from Indochinese forest rats (*Rattus andamanensis*) [32]. Genus *Narmovirus* includes four new species: *Mossman narmovirus* for Mossman virus (MossV) isolated from *Rattus* rats [6, 17]; *Myodes narmovirus* for bank vole virus 1 (BaV-1) detected in bank voles (*Myodes glareolus*) [2]; *Nariva narmovirus* for Nariva virus (NarV) discovered in short-tailed zygodonts (*Zygodontomys brevicauda*) [11, 30]; and *Tupaia narmovirus* for Tupaia paramyxovirus (TupV) isolated from northern treeshrews (*Tupaia belangeri*). Genus *Salemvirus* includes the species *Salem salemvirus* for Salem virus (SalV) isolated from horses [26].
- the subfamily *Rubulavirinae* was created for two genera (one new [*Pararubulavirus*], one renamed [*Rubulavirus*→*Orthorubulavirus*]) to accommodate previously classified rubulaviruses. All included species names were renamed; and
- three unassigned species were created in the family: *Cynoglossus paramyxovirus* for W nling tonguesole paramyxovirus (WTSPV) discovered in a tonguesole (*Cynoglossus* sp.); *Hoplichthys paramyxovirus* for W nling hoplichthys paramyxovirus (WHPV) identified in a flathead (*Hoplichthys* sp.); and *Scoliodon paramyxovirus* for W nzhu pacific spadenose shark paramyxovirus (WPSSPV) discovered in a Pacific spadenose shark (*Scoliodon macrorhynchos*) [29].

Pneumoviridae

No changes were made at the family rank.

Rhabdoviridae

The family *Rhabdoviridae* was expanded by the addition of two new genera. Genus *Alphanemrhavirus* was created to include two new species, *Xingshan alphanemrhavirus* and *Xinzhou alphanemrhavirus*, for Xingshan nematode virus 4 (XsNV-4) and Xinzhou nematode virus 4 (XzNV-4), respectively [28] (TaxoProp 2018.001M.A.v1.Alphanemrhavirus). Genus *Calighavirus* was created to include three new species, *Caligus calighavirus*, *Lepeophtheirus calighavirus*, and *Salmonlouse calighavirus* for *Caligus rogercresseyi* rhabdovirus (CRoRV) detected in a copepod (*Caligus rogercresseyi*) [19], *Lepeophtheirus salmonis* rhabdovirus 127 (LSalRV-127), and *Lepeophtheirus salmonis* rhabdovirus 9 (LSalRV-9), both identified in salmon lice (*Lepeophtheirus salmonis*) [18], respectively (2018.002M.A.v1.Calighavirus).

The genus *Dichorhavirus* was expanded by three species: *Citrus chlorotic spot dichorhavirus*, *Citrus leprosis N dichorhavirus*, and *Clerodendrum chlorotic spot dichorhavirus* for citrus chlorotic spot virus (CiCSV) discovered in sweet orange trees [7], citrus leprosis virus N (CiLV-N) also found in sweet orange trees [24], and *Clerodendrum chlorotic spot virus* (CICSV) discovered in an ornamental plant (*Clerodendrum* sp.) [25], respectively (2018.003M.A.v1.Dichorhavirus_3sp).

One new species, *Vaprio ledantavirus*, was added to genus *Ledantavirus*, for *Vaprio* virus (VAPV) of Kuhl's pipistrelles (*Pipistrellus kuhlii*) [12] (2018.004M.A.v1.Ledantavirus_sp).

Sunviridae

No changes were made at the family rank.

Xinmoviridae

No changes were made at the family rank.

Summary

A summary of the current, ICTV-accepted taxonomy of the order *Mononegavirales* is presented in Table 1.

Authors

Gaya K. Amarasinghe^{1,#}, María A. Ayllón^{2,3,@}, Y míng Bào⁴, Christopher F. Basler^{5,#}, Sina Bavari^{6,#}, Kim R. Blasdel^{7,&}, Thomas Briese^{8,\$}, Paul A. Brown^{9,%}, Alexander Bukreyev^{10,#}, Anne Balkema-Buschmann^{11,^}, Ursula J. Buchholz^{12,%}, Camila Chabi-Jesus¹³, Kartik Chandran^{14,#}, Chiara Chiapponi¹⁵, Ian Crozier^{16,#}, Rik L. de Swart^{17,%}, Ralf G. Dietzgen^{18,*†,&}, Olga Dolnik^{19,#}, Jan F. Drexler^{20,%}, Ralf Dürrwald^{21,\$}, William G. Dundon^{22,^}, W. Paul Duprex^{23,*^,%}, John M. Dye^{6,#}, Andrew J. Easton^{24,^,%}, Anthony R. Fooks^{25,&}, Pierre B. H. Formenty^{26,#}, Ron A. M. Fouchier^{17,^}, Juliana Freitas-Astúa^{27,&}, Anthony Griffiths^{28,#}, Roger Hewson^{29,#},

Masayuki Horie^{30,\$}, Timothy H. Hyndman^{31,\$}, Dàohóng Ji ng^{32,*,†,@}, Elliott W. Kitajima³³, Gary P. Kobinger^{34,#}, Hideki Kond o^{35,&}, Gael Kurath^{36,^,&}, Ivan V. Kuzmin^{37,&}, Robert A. Lamb^{38,39,^}, Antonio Lavazza¹⁵, Benhur Lee^{40,^}, Davide Lelli¹⁵, Eric M. Leroy^{41,#}, Jiànróng Lǐ^{42,%}, Piet Maes^{43,*}, Shin-Yi L. Marzano^{44,@}, Ana Moreno¹⁵, Elke Mühlberger^{28,#}, Sergey V. Netesov^{45,#}, Norbert Nowotny^{46,47,\$}, Are Nylund⁴⁸, Arnfinn L. Økland⁴⁸, Gustavo Palacios^{6,#}, Bernadett Pályi^{49,#}, Janusz T. Paw ska^{50,#}, Susan L. Payne^{51,\$}, Alice Prosperi¹⁵, Pedro Luis Ramos-González¹³, Bertus K. Rima^{52,*^}, Paul Rota^{53,^}, Dennis Rubbenstroth^{54,\$,*}, Mǎng Sh i⁵⁵, Peter Simmonds^{56,~}, Sophie J. Smither^{57,#}, Enrica Sozzi¹⁵, Kirsten Spann^{58,%}, Mark D. Stenglein^{59,\$}, David M. Stone^{60,&}, Ayato Takada^{61,#}, Robert B. Tesh^{10,&}, Keiz o Tomonaga^{62,\$}, Noël Tordo^{63,64,&}, Jonathan S. Towner^{65,#}, Bernadette van den Hoogen^{17,%}, Nikos Vasilakis^{10,†,&}, Victoria Wahl^{66,#}, Peter J. Walker^{67,*&≈}, Lin-Fa Wang^{68,^}, Anna E. Whitfield^{69,&}, John V. Williams^{23,%}, F. Murilo Zerbini^{70,*}, T o Zh ng⁴, Yong-Zhen Zhang^{71,72,*}, and Jens H. Kuhn^{73,\$,#,*†,\$\$,*}

Affiliations

¹Department of Pathology and Immunology, Washington University School of Medicine, St. Louis, MO, USA. ²Centro de Biotecnología y Genómica de Plantas, Universidad Politécnica de Madrid-Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria, Campus de Montegancedo, Pozuelo de Alarcón, Madrid, Spain. ³Departamento de Biotecnología-Biología Vegetal, Escuela Técnica Superior de Ingeniería Agronómica, Alimentaria y de Biosistemas, UPM, Madrid, Spain. ⁴Beijing Institute of Genomics, Chinese Academy of Sciences, Beijing, China. ⁵Center for Microbial Pathogenesis, Institute for Biomedical Sciences, Georgia State University, Atlanta, GA, USA. ⁶United States Army Medical Research Institute of Infectious Diseases, Fort Detrick, Frederick, MD, USA. ⁷Australian Animal Health Laboratory, CSIRO Health and Biosecurity, Geelong, VIC, Australia. ⁸Center for Infection and Immunity, and Department of Epidemiology, Mailman School of Public Health, Columbia University, New York, NY, USA. ⁹VIPAC Unit, Agence Nationale de Sécurité Sanitaire, Laboratoire de Ploufragan-Plouzané-Niort, Université Bretagne Loire, Ploufragan, France. ¹⁰The University of Texas Medical Branch, Galveston, TX, USA. ¹¹Friedrich-Loeffler-Institut, Federal Research Institute for Animal Health, Institute of Novel and Emerging Infectious Diseases, Greifswald-Insel Riems, Germany. ¹²RNA Viruses Section, Laboratory of Infectious Diseases, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Bethesda, MD, USA. ¹³Instituto Biológico, São Paulo, SP, Brazil. ¹⁴Department of Microbiology and Immunology, Albert Einstein College of Medicine, Bronx, NY, USA. ¹⁵Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna, Brescia, Italy. ¹⁶Integrated Research Facility at Fort Detrick (IRF-Frederick), Clinical Monitoring Research Program Directorate, Frederick, National Laboratory for Cancer Research sponsored by the National Cancer Institute, Frederick, MD, USA. ¹⁷Department of Viroscience, Erasmus MC, University Medical Centre Rotterdam, Rotterdam, The Netherlands. ¹⁸Queensland Alliance for Agriculture and Food Innovation, The University of Queensland, St. Lucia, QLD, Australia. ¹⁹Institute of Virology, Philipps

University Marburg, Marburg, Germany. ²⁰Institute of Virology, Charité-Universitätsmedizin Berlin, Corporate Member of Freie Universität Berlin, Humboldt-Universität zu Berlin, and Berlin Institute of Health, Berlin, Germany. ²¹Robert Koch Institut, Berlin, Germany. ²²Animal Production and Health Laboratory, Department of Nuclear Sciences and Applications, Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, International Atomic Energy Agency, Vienna, Austria. ²³School of Medicine, University of Pittsburgh, Pittsburgh, PA, USA. ²⁴School of Life Sciences, University of Warwick, Coventry, UK. ²⁵Animal and Plant Health Agency, Weybridge, Surrey, UK. ²⁶World Health Organization, Geneva, Switzerland. ²⁷Embrapa National Cassava and Fruits Research Center, Cruz das Almas, Bahia, Brazil. ²⁸Department of Microbiology and National Emerging Infectious Diseases Laboratories, Boston University School of Medicine, Boston, MA, USA. ²⁹Public Health England, Porton Down, Wiltshire, Salisbury, UK. ³⁰Hakubi Center for Advanced Research, Kyoto University, Kyoto, Japan. ³¹School of Veterinary Medicine, Murdoch University, Murdoch, WA, Australia. ³²State Key Laboratory of Agricultural Microbiology, The Provincial Key Lab of Plant Pathology of Hubei Province, College of Plant Science and Technology, Huazhong Agricultural University, Wuhan, China. ³³Departamento de Fitopatologia e Nematologia, Escola Superior de Agricultura “Luiz de Queiroz, Universidade de São Paulo, Piracicaba, São Paulo, Brazil. ³⁴Department of Microbiology, Immunology and Infectious Diseases, Université Laval, Quebec City, Canada. ³⁵Institute of Plant Science and Resources, Okayama University, Kurashiki, Japan. ³⁶US Geological Survey Western Fisheries Research Center, Seattle, WA, USA. ³⁷US Department of Agriculture, Animal and Plant Health Inspection, National Veterinary Services Laboratories, Diagnostic Virology Laboratory, New York, USA. ³⁸Department of Molecular Biosciences, Northwestern University, Evanston, IL, USA. ³⁹Howard Hughes Medical Institute, Northwestern University, Evanston, IL, USA. ⁴⁰Department of Microbiology, Icahn School of Medicine at Mount Sinai, New York, NY, USA. ⁴¹Centre International de Recherches Médicales de Franceville, Institut de Recherche pour le Développement, Franceville, Gabon. ⁴²Department of Veterinary Biosciences, College of Veterinary Medicine, The Ohio State University, Columbus, OH, USA. ⁴³Zoonotic Infectious Diseases Unit, KU Leuven, Rega Institute, Leuven, Belgium. ⁴⁴Department of Biology and Microbiology, Department of Plant Sciences, South Dakota State University, Brookings, SD, USA. ⁴⁵Novosibirsk State University, Novosibirsk, Novosibirsk Oblast, Russia. ⁴⁶Institute of Virology, University of Veterinary Medicine, Vienna, Austria. ⁴⁷Department of Basic Medical Sciences, College of Medicine, Mohammed Bin Rashid University of Medicine and Health Sciences, Dubai, United Arab Emirates. ⁴⁸Fish Disease Research Group, Department of Biological Sciences, University of Bergen, Bergen, Norway. ⁴⁹National Biosafety Laboratory, National Public Health Center, Budapest, Hungary. ⁵⁰Center for Emerging Zoonotic and Parasitic Diseases, National Institute for Communicable Diseases of the National Health Laboratory Service, Sandringham-Johannesburg, Gauteng, South Africa. ⁵¹Department of Veterinary Pathobiology, College of Veterinary Medicine and Biomedical Sciences, Texas A&M University,

College Station, TX, USA. ⁵²Centre for Experimental Medicine, School of Medicine, Dentistry and Biomedical Sciences, The Queen's University of Belfast, Belfast, Northern Ireland, UK. ⁵³National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention, Atlanta, GA, USA. ⁵⁴Institute of Diagnostic Virology, Friedrich-Loeffler-Institut, Greifswald-Insel Riems, Germany. ⁵⁵The University of Sydney, Sydney, Australia. ⁵⁶Nuffield Department of Medicine, University of Oxford, Oxford, UK. ⁵⁷CBR Division, Dstl, Porton Down, Salisbury, Wiltshire, UK. ⁵⁸School of Biomedical Science, Queensland University of Technology, Brisbane, QLD, Australia. ⁵⁹Department of Microbiology, Immunology, and Pathology, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins, CO, USA. ⁶⁰Centre for Environment, Fisheries and Aquaculture Science, Weymouth, Dorset, UK. ⁶¹Division of Global Epidemiology, Hokkaido University Research Center for Zoonosis Control, Sapporo, Japan. ⁶²Institute for Frontier Life and Medical Sciences (inFront), Kyoto University, Kyoto, Japan. ⁶³Institut Pasteur, Unité des Stratégies Antivirales, WHO Collaborative Centre for Viral Haemorrhagic Fevers and Arboviruses, OIE Reference Laboratory for RVFV and CCHF, Paris, France. ⁶⁴Institut Pasteur de Guinée, Conakry, Guinea. ⁶⁵Viral Special Pathogens Branch, Division of High-Consequence Pathogens Pathology, National Center for Emerging and Zoonotic Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, GA, USA. ⁶⁶National Biodefense Analysis and Countermeasures Center, Fort Detrick, Frederick, MD, USA. ⁶⁷School of Biological Sciences, University of Queensland, St. Lucia, QLD, Australia. ⁶⁸Programme in Emerging Infectious Diseases, Duke-NUS Medical School, Singapore, Singapore. ⁶⁹Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC, USA. ⁷⁰Departamento de Fitopatologia, Instituto de Biotecnologia Aplicada à Agropecuária, Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil. ⁷¹Chinese Center for Disease Control and Prevention, National Institute for Communicable Disease Control and Prevention, Changping, Beijing, China. ⁷²Shanghai Public Health Clinical Center and Institutes of Biomedical Sciences, Fudan University, Shanghai, China. ⁷³Integrated Research Facility at Fort Detrick (IRF-Frederick), Division of Clinical Research (DCR), National Institute of Allergy and Infectious Diseases (NIAID), National Institutes of Health (NIH), B-8200 Research Plaza, Fort Detrick, Frederick, MD, 2170, USA.

Acknowledgments

We thank Laura Bollinger (NIH/NIAID Integrated Research Facility at Fort Detrick, Frederick, MD, USA) for critically editing the manuscript.

Funding

This work was supported in part through Battelle Memorial Institute's prime contract with the US National Institute of Allergy and Infectious Diseases (NIAID) under Contract No. HHSN272200700016I (J.H.K.) and with federal funds from the National Cancer Institute (NCI), National Institutes of Health (NIH), under Contract No. HHSN261200800001 (I.C.). U.J.B. received funding from the Intramural Research Program of NIH/NIAID. This work was also funded in part by Contract No. HSHQDC-15-C-00064 awarded by the Department of Homeland Security (DHS) Science and Technology Directorate (S&T) for the management and operation of The National Biodefense Analysis and Countermeasures Center (NBACC), a federally funded research and development center

operated by the Battelle National Biodefense Institute (V.W.); and NIH contract HHSN272201000040I/HHSN27200004/D04 and grant R24AI120942 (N.V., R.B.T.). This work was also supported by the UK Department for Environment, Food and Rural Affairs (Defra), Scottish Government and Welsh Government (grant number SV3500) (A.R.F.). This work was also supported by the 100-Talent Program of Chinese Academy of Sciences (Y.B.). Additional funding comes from Fapesp grants 2017/50222-0 (J.F.A), 2014/08458-9 (E.W.K) and 2016/01960-6 (C.C.J.), and Capes PNP20132154 – 33141010001P4 (P.L.R.G). A.R.F. is financially supported by the UK Department for Environment, Food and Rural Affairs (Defra) and the Scottish and Welsh governments. This research was also supported by the Italian Ministry of Health (WFR GR-2011-023505919).

References

1. Afonso CL, Amarasinghe GK, Bányai K, Bào Y, Basler CF, Bavari S, Bejerman N, Blasdel KR, Briand F-X, Briese T, Bukreyev A, Calisher CH, Chandran K, Chéng J, Clawson AN, Collins PL, Dietzgen RG, Dolnik O, Domier LL, Dürrwald R, Dye JM, Easton AJ, Ebihara H, Farkas SL, Freitas-Astúa J, Formenty P, Fouchier RA, Fù Y, Ghedin E, Goodin MM, Hewson R, Horie M, Hyndman TH, Ji ng D, Kitajima EW, Kobinger GP, Kondo H, Kurath G, Lamb RA, Lenardon S, Leroy EM, Li C-X, Lin X-D, Liú L, Longdon B, Marton S, Maisner A, Mühlberger E, Netesov SV, Nowotny N, Patterson JL, Payne SL, Paweska JT, Randall RE, Rima BK, Rota P, Rubbenstroth D, Schwemmler M, Shi M, Smither SJ, Stenglein MD, Stone DM, Takada A, Terregino C, Tesh RB, Tian J-H, Tomonaga K, Tordo N, Towner JS, Vasilakis N, Verbeek M, Volchkov VE, Wahl-Jensen V, Walsh JA, Walker PJ, Wang D, Wang L-F, Wetzel T, Whitfield AE, Xiè JT, Yuen K-Y, Zhang Y-Z, Kuhn JH (2016) Taxonomy of the order Mononegavirales: update 2016. *Arch Virol* 161:2351–2360 [PubMed: 27216929]
2. Alkhovsky S, Butenko A, Eremyan A, Shchetinin A (2018) Genetic characterization of bank vole virus (BaVV), a new paramyxovirus isolated from kidneys of bank voles in Russia. *Arch Virol* 163:755–759 [PubMed: 29129019]
3. Amarasinghe GK, Bào Y, Basler CF, Bavari S, Beer M, Bejerman N, Blasdel KR, Bochnowski A, Briese T, Bukreyev A, Calisher CH, Chandran K, Collins PL, Dietzgen RG, Dolnik O, Dürrwald R, Dye JM, Easton AJ, Ebihara H, Fang Q, Formenty P, Fouchier RAM, Ghedin E, Harding RM, Hewson R, Higgins CM, Hong J, Horie M, James AP, Ji ng D, Kobinger GP, Kondo H, Kurath G, Lamb RA, Lee B, Leroy EM, Li M, Maisner A, Mühlberger E, Netesov SV, Nowotny N, Patterson JL, Payne SL, Paweska JT, Pearson MN, Randall RE, Revill PA, Rima BK, Rota P, Rubbenstroth D, Schwemmler M, Smither SJ, Song Q, Stone DM, Takada A, Terregino C, Tesh RB, Tomonaga K, Tordo N, Towner JS, Vasilakis N, Volchkov VE, Wahl-Jensen V, Walker PJ, Wang B, Wang D, Wang F, Wang L-F, Werren JH, Whitfield AE, Yan Z, Ye G, Kuhn JH (2017) Taxonomy of the order Mononegavirales: update 2017. *Arch Virol* 162:2493–2504 [PubMed: 28389807]
4. Amarasinghe GK, Ceballos NGA, Banyard AC, Basler CF, Bavari S, Bennett AJ, Blasdel KR, Briese T, Bukreyev A, Cai Y, Calisher CH, Lawson CC, Chandran K, Chapman CA, Chiu CY, Choi K-S, Collins PL, Dietzgen RG, Dolja VV, Dolnik O, Domier LL, Dürrwald R, Dye JM, Easton AJ, Ebihara H, Echevarría JE, Fooks AR, Formenty PBH, Fouchier RAM, Freuling CM, Ghedin E, Goldberg TL, Hewson R, Horie M, Hyndman TH, Ji ng D, Kityo R, Kobinger GP, Kond H, Koonin EV, Krupovic M, Kurath G, Lamb RA, Lee B, Leroy EM, Maes P, Maisner A, Marston DA, Mor SK, Müller T, Mühlberger E, Ramírez VMN, Netesov SV, Ng TFF, Nowotny N, Palacios G, Patterson JL, Paweska JT, Payne SL, Prieto K, Rima BK, Rota P, Rubbenstroth D, Schwemmler M, Siddell S, Smither SJ, Song Q, Song T, Stenglein MD, Stone DM, Takada A, Tesh RB, Thomazelli LM, Tomonaga K, Tordo N, Towner JS, Vasilakis N, Vázquez-Morón S, Verdugo C, Volchkov VE, Wahl V, Walker PJ, Wang D, Wang L-F, Wellehan JFX, Wiley MR, Whitfield AE, Wolf YI, Yè G, Zh ng Y-Z, Kuhn JH (2018) Taxonomy of the order Mononegavirales: update 2018. *Arch Virol* 163:2283–2294 [PubMed: 29637429]
5. Bishop DHL, Pringle CR (1995) Order Mononegavirales In: Murphy FA, Fauquet CM, Bishop DHL, Ghabrial SA, Jarvis AW, Martelli GP, Mayo MA, Summers MD (eds) *Virus Taxonomy—Sixth Report of the International Committee on Taxonomy of Viruses/Archives of Virology Supplement 10*. Springer-Verlag, Vienna, Austria, pp 265–267
6. Campbell RW, Carley JG, Doherty RL, Domrow R, Filippich C, Gorman BM, Karabatsos N (1977) Mossman virus, a paramyxovirus of rodents isolated in Queensland. *Search* 8:435–436
7. Chabi-Jesus C, Ramos-González PL, Tassi AD, Guerra-Peraza O, Kitajima EW, Harakava R, Beserra JEA Jr., Salaroli RB, Freitas-Astúa J (2018) Identification and characterization of citrus

- chlorotic spot virus, a new dichorhavirus associated with citrus leprosis-like symptoms. *Plant Dis* 102:1588–1598 [PubMed: 30673423]
8. Easton AJ, Pringle CR (2011) Order Mononegavirales In: King AMQ, Adams MJ, Carstens EB, Lefkowitz EJ (eds) *Virus Taxonomy—Ninth Report of the International Committee on Taxonomy of Viruses*. Elsevier/Academic Press, London, United Kingdom, pp 653–657
 9. Jack PJM, Boyle DB, Eaton BT, Wang L-F (2005) The complete genome sequence of J virus reveals a unique genome structure in the family Paramyxoviridae. *J Virol* 79:10690–10700 [PubMed: 16051861]
 10. King AMQ, Lefkowitz EJ, Mushegian AR, Adams MJ, Dutilh BE, Gorbalenya AE, Harrach B, Harrison RL, Junglen S, Knowles NJ, Kropinski AM, Krupovic M, Kuhn JH, Nibert ML, Rubino L, Sabanadzovic S, Sanfaçon H, Siddell SG, Simmonds P, Varsani A, Zerbini FM, Davison AJ (2018) Changes to taxonomy and the International Code of Virus Classification and Nomenclature ratified by the International Committee on Taxonomy of Viruses (2018). *Arch Virol* 163:2601–2631 [PubMed: 29754305]
 11. Lambeth LS, Yu M, Anderson DE, Crameri G, Eaton BT, Wang LF (2009) Complete genome sequence of Nariva virus, a rodent paramyxovirus. *Arch Virol* 154:199–207 [PubMed: 19104752]
 12. Lelli D, Prosperi A, Moreno A, Chiapponi C, Gibellini AM, De Benedictis P, Leopardi S, Sozzi E, Lavazza A (2018) Isolation of a novel rhabdovirus from an insectivorous bat (*Pipistrellus kuhlii*) in Italy. *Virology* 15:37 [PubMed: 29454370]
 13. Li W, Mao L, Cheng S, Wang Q, Huang J, Deng J, Wang Z, Zhang W, Yang L, Hao F, Ding Y, Sun Y, Wei J, Jiang P, Jiang J (2014) A novel parainfluenza virus type 3 (PIV3) identified from goat herds with respiratory diseases in eastern China. *Vet Microbiol* 174:100–106 [PubMed: 25236986]
 14. Li Z, Yu M, Zhang H, Magoffin DE, Jack PJ, Hyatt A, Wang HY, Wang LF (2006) Beilong virus, a novel paramyxovirus with the largest genome of non-segmented negative-stranded RNA viruses. *Virology* 346:219–228 [PubMed: 16325221]
 15. Maes P, Amarasinghe GK, Ayllón MA, Basler CF, Bavari S, Blasdel KR, Briese T, Brown PA, Bukreyev A, Balkema-Buschmann A, Buchholz UJ, Chandran K, Crozier I, de Swart RL, Dietzgen RG, Dolnik O, Domier LL, Drexler JF, Dürrwald R, Dundon WG, Duprex WP, Dye JM, Easton AJ, Fooks AR, Formenty PBH, Fouchier RAM, Freitas-Astúa J, Ghedin E, Griffiths A, Hewson R, Horie M, Hurwitz JL, Hyndman TH, Ji ng D, Kobinger GP, Kond H, Kurath G, Kuzmin IV, Lamb RA, Lee B, Leroy EM, Li J, Marzano S-YL, Mühlberger E, Netesov SV, Nowotny N, Palacios G, Pályi B, Paw ska JT, Payne SL, Rima BK, Rota P, Rubbenstroth D, Simmonds P, Smither SJ, Song Q, Song T, Spann K, Stenglein MD, Stone DM, Takada A, Tesh RB, Tomonaga K, Tordo N, Towner JS, van den Hoogen B, Vasilakis N, Wahl V, Walker PJ, Wang D, Wang L-F, Whitfield AE, Williams JV, Yè G, Zerbini FM, Zhang Y-Z, Kuhn JH (2019) Taxonomy of the order Mononegavirales: second update 2018. *Arch Virol*
 16. Mesina JE, Campbell RS, Glazebrook JS, Copeman DB, Johnson RH (1974) The pathology of feral rodents in North Queensland. *Tropenmed Parasitol* 25:116–127 [PubMed: 4599296]
 17. Miller PJ, Boyle DB, Eaton BT, Wang L-F (2003) Full-length genome sequence of Mossman virus, a novel paramyxovirus isolated from rodents in Australia. *Virology* 317:330–344 [PubMed: 14698671]
 18. Økland AL, Nylund A, Øvergård A-C, Blindheim S, Watanabe K, Grotmol S, Arnesen C-E, Plarre H (2014) Genomic characterization and phylogenetic position of two new species in Rhabdoviridae infecting the parasitic copepod, salmon louse (*Lepeophtheirus salmonis*). *PLoS One* 9:e112517 [PubMed: 25402203]
 19. Økland AL, Skoge RH, Nylund A (2018) The complete genome sequence of CrRV-Ch01, a new member of the family Rhabdoviridae in the parasitic copepod *Caligus rogercresseyi* present on farmed Atlantic salmon (*Salmo salar*) in Chile. *Arch Virol* 163:1657–1661 [PubMed: 29445987]
 20. Pringle CR, Alexander DJ, Billeter MA, Collins PL, Kingsbury DW, Lipkind MA, Nagai Y, Orvell C, Rima B, Rott R, ter Meulen V (1991) The order Mononegavirales. *Archives of Virology* (Vienna) 117:137–140
 21. Pringle CR (1997) The order Mononegavirales—current status. *Arch Virol* 142:2321–2326 [PubMed: 9672597]
 22. Pringle CR (2000) Order Mononegavirales In: van Regenmortel MHV, Fauquet CM, Bishop DHL, Carstens EB, Estes MK, Lemon SM, Maniloff J, Mayo MA, McGeoch DJ, Pringle CR, Wickner

- RB (eds) *Virus Taxonomy—Seventh Report of the International Committee on Taxonomy of Viruses*. Academic Press, San Diego, California, USA, pp 525–530
23. Pringle CR (2005) Order Mononegavirales In: Fauquet CM, Mayo MA, Maniloff J, Desselberger U, Ball LA (eds) *Virus Taxonomy—Eighth Report of the International Committee on Taxonomy of Viruses*. Elsevier/Academic Press, San Diego, California, USA, pp 609–614
 24. Ramos-González PL, Chabi-Jesus C, Guerra-Peraza O, Tassi AD, Kitajima EW, Harakava R, Salaroli RB, Freitas-Astúa J (2017) Citrus leprosis virus N: a new dichorhavirus causing citrus leprosis disease. *Phytopathology* 107:963–976 [PubMed: 28398876]
 25. Ramos-González PL, Chabi-Jesus C, Banguela-Castillo A, Tassi AD, Rodrigues MDC, Kitajima EW, Harakava R, Freitas-Astúa J (2018) Unveiling the complete genome sequence of clerodendrum chlorotic spot virus, a putative dichorhavirus infecting ornamental plants. *Arch Virol* 163:2519–2524 [PubMed: 29869032]
 26. Renshaw RW, Glaser AL, Van Campen H, Weiland F, Dubovi EJ (2000) Identification and phylogenetic comparison of Salem virus, a novel paramyxovirus of horses. *Virology* 270:417–429 [PubMed: 10793001]
 27. Rima B, Collins P, Easton A, Fouchier R, Kurath G, Lamb RA, Lee B, Maisner A, Rota P, Wang L-F (2018) Problems of classification in the family Paramyxoviridae. *Arch Virol* 163:1395–1404 [PubMed: 29372404]
 28. Shi M, Lin X-D, Tian J-H, Chen L-J, Chen X, Li C-X, Qin X-C, Li J, Cao J-P, Eden J-S, Buchmann J, Wang W, Xu J, Holmes EC, Zhang Y-Z (2016) Redefining the invertebrate RNA virosphere. *Nature*
 29. Shi M, Lin X-D, Chen X, Tian J-H, Chen L-J, Li K, Wang W, Eden J-S, Shen J-J, Liu L, Holmes EC, Zhang Y-Z (2018) The evolutionary history of vertebrate RNA viruses. *Nature* 556:197–202 [PubMed: 29618816]
 30. Tikasingh ES, Jonkers AH, Spence L, Aitken THG (1966) Nariva virus, a hitherto undescribed agent isolated from the Trinidadian rat, *Zygodontomys b. breviceauda* (J. A. Allen & Chapman). *Am J Trop Med Hyg* 15:235–238 [PubMed: 4956232]
 31. Vanmechelen B, Bletsa M, Laenen L, Lopes AR, Vergote V, Beller L, Deboutte W, Korva M, Avši Županc T, Goüy de Bellocq J, Gryseels S, Leirs H, Lemey P, Vrancken B, Maes P (2018) Discovery and genome characterization of three new Jeilongviruses, a lineage of paramyxoviruses characterized by their unique membrane proteins. *BMC Genomics* 19:617 [PubMed: 30115009]
 32. Woo PCY, Lau SKP, Wong BHL, Wong AYP, Poon RWS, Yuen K-Y (2011) Complete genome sequence of a novel paramyxovirus, Tailam virus, discovered in Sikkim rats. *J Virol* 85:13473–13474 [PubMed: 22106385]
 33. Yang L, Li W, Mao L, Hao F, Wang Z, Zhang W, Deng J, Jiang J (2016) Analysis on the complete genome of a novel caprine parainfluenza virus 3. *Infect Genet Evol* 38:29–34 [PubMed: 26631811]

ICTV-accepted taxonomy of the order *Mononegavirales* as of February 2019. Listed are all mononegaviruses that are classified into species.

Table 1

Genus	Species [†]	Virus (Abbreviation) [‡]
Family <i>Artoviridae</i>		
<i>Peropuvirus</i>	<i>Barnacle peropuvirus</i>	B ihai barnacle virus 8 (BhBV-8)
	<i>Beihai peropuvirus</i>	B ihai rhabdo-like virus 1 (BhRLV-1)
	<i>Hubei peropuvirus</i>	Hüb i rhabdo-like virus 6 (HbRLV-6)
	<i>Odonate peropuvirus</i>	Hüb i rhabdo-like virus 8 (HbRLV-8)
	<i>Pillworm peropuvirus</i>	Hüb i rhabdo-like virus 5 (HbRLV-5)
	<i>Pteromalus puparum peropuvirus</i> *	Pteromalus puparum negative-strand RNA virus 1 (PpNSRV-1)
	<i>Woodlouse peropuvirus</i>	B ihai rhabdo-like virus 2 (BhRLV-2)
Family <i>Bornaviridae</i>		
<i>Carthovirus</i>	<i>Queensland carthovirus</i> *	jungle carpet python virus (JCPV)
	<i>Southwest carthovirus</i>	southwest carpet python virus (SWCPV)
<i>Cultervirus</i>	<i>Sharpbelly cultervirus</i> *	Wühàn sharpbelly bornavirus (WhsBV)
<i>Orthobornavirus</i>	<i>Elapid 1 orthobornavirus</i>	Loveridge's garter snake virus 1 (LGSV-1)
	<i>Mammalian 1 orthobornavirus</i> *	Borna disease virus 1 (BoDV-1)
	<i>Mammalian 2 orthobornavirus</i>	Borna disease virus 2 (BoDV-2)
	<i>Passeriform 1 orthobornavirus</i>	variegated squirrel bornavirus 1 (VSBV-1)
		canary bornavirus 1 (CnBV-1)
		canary bornavirus 2 (CnBV-2)
		canary bornavirus 3 (CnBV-3)
	<i>Passeriform 2 orthobornavirus</i>	estrildid finch bornavirus 1 (EsBV-1)
	<i>Psittaciform 1 orthobornavirus</i>	parrot bornavirus 1 (PaBV-1)
		parrot bornavirus 2 (PaBV-2)
		parrot bornavirus 3 (PaBV-3)
		parrot bornavirus 4 (PaBV-4)
		parrot bornavirus 7 (PaBV-7)
	<i>Psittaciform 2 orthobornavirus</i>	parrot bornavirus 5 (PaBV-5)
	<i>Waterbird 1 orthobornavirus</i>	aquatic bird bornavirus 1 (ABBV-1)
		aquatic bird bornavirus 2 (ABBV-2)

Genus	Species [†]	Virus (Abbreviation) [‡]
Family Filoviridae		
<i>Cuevavirus</i>	<i>Llovitu cuevavirus</i> *	Llovitu virus (LLOV)
<i>Ebolavirus</i>	<i>Bundibugyo ebolavirus</i>	Bundibugyo virus (BDBY)
	<i>Reston ebolavirus</i>	Reston virus (RESTV)
	<i>Sudan ebolavirus</i>	Sudan virus (SUDV)
	<i>Tai Forest ebolavirus</i>	Tai Forest virus (TAFV)
	<i>Zaire ebolavirus</i> *	Ebola virus (EBOV)
<i>Marburgvirus</i>	<i>Marburg marburgvirus</i> *	Marburg virus (MARV)
		Ravn virus (RAVV)
<i>Striavirus</i>	<i>Xilang striavirus</i> *	Xilang virus (XILV)
<i>Thannovirus</i>	<i>Huangjiao thannovirus</i> *	Huangjiao virus (HUJV)
Family Lispiviridae		
<i>Arivirus</i>	<i>Gerrid arivirus</i>	Sixia water strider virus 4 (SxWSV-4)
	<i>Hubei arivirus</i>	Hubei rhabdo-like virus 3 (HBRLV-3)
	<i>Lishi arivirus</i> *	Lishi spider virus 2 (LSV-2)
	<i>Odonate arivirus</i>	Hubei odonate virus 10 (HBOV-10)
	<i>Tacheng arivirus</i>	Tacheng tick virus 6 (TcTV-6)
	<i>Wuchang arivirus</i>	Wuchang romanomermis nematode virus 2 (WeRNV-2)
Family Mymonaviridae		
<i>Sclerotimonavirus</i>	<i>Dadou sclerotimonavirus</i>	soybean leaf-associated negative-stranded RNA virus 3 (SLaNSRV-3)
	<i>Drop sclerotimonavirus</i>	Sclerotinia sclerotiorum negative-stranded RNA virus 2 (SsNSRV-2)
		Sclerotinia sclerotiorum negative-stranded RNA virus 4 (SsNSRV-4)
	<i>Glycine sclerotimonavirus</i>	Fusarium graminearum negative-stranded RNA virus 1 (FgNSRV-1)
		soybean leaf-associated negative-stranded RNA virus 1 (SLaNSRV-1)
	<i>Hubei sclerotimonavirus</i>	Hubei rhabdo-like virus 4 (HBRLV-4)
	<i>Illinois sclerotimonavirus</i>	soybean leaf-associated negative-stranded RNA virus 2 (L.SaNSRV-2)
	<i>Phyllosphere sclerotimonavirus</i>	soybean leaf-associated negative-stranded RNA virus 4 (L.SaNSRV-4)
	<i>Sclerotinia sclerotimonavirus</i> *	Sclerotinia sclerotiorum negative-stranded RNA virus 1 (SsNSRV-1)
		Sclerotinia sclerotiorum negative-stranded RNA virus 3 (SsNSRV-3)
Family Nyamiviridae		

Genus	Species [†]	Virus (Abbreviation) [‡]
<i>Berhavirus</i>	<i>Beihai berhavirus</i>	B ihai rhabdo-like virus 4 (BhRLV-4)
	<i>Echinoderm berhavirus</i>	B ihai rhabdo-like virus 5 (BhRLV-5)
	<i>Sipunculid berhavirus</i> *	B ihai rhabdo-like virus 3 (BhRLV-3)
<i>Crustavirus</i>	<i>Beihai crustavirus</i>	B ihai rhabdo-like virus 6 (BhRLV-6)
	<i>Wenling crustavirus</i>	W nling crustacean virus 12 (WlCV-12)
<i>Nyavirus</i>	<i>Wenzhou crustavirus</i> *	W nzh u crab virus 1 (WzCV-1)
	<i>Midway nyavirus</i>	Midway virus (MIDWV)
	<i>Nyamamini nyavirus</i> *	Nyamamini virus (NYMV)
<i>Orinovirus</i>	<i>Sierra Nevada nyavirus</i>	Sierra Nevada virus (SNVV)
<i>Socycivirus</i>	<i>Orinoco orinovirus</i> *	Orinoco virus (ONCV)
<i>Tapewormvirus</i>	<i>Soybean cyst nematode socycivirus</i> *	soybean cyst nematode virus 1 (SbCNAV-1)
	<i>Tapeworm tapewormvirus</i> *	W nzh u tapeworm virus 1 (WzTWV-1)
Family Paramyxoviridae		
	Subfamily <i>Avulavirinae</i>	
<i>Metaavulavirus</i>	<i>Avian metaavulavirus 2</i> *	avian paramyxovirus 2 (APMV-2)
	<i>Avian metaavulavirus 5</i>	avian paramyxovirus 5 (APMV-5)
	<i>Avian metaavulavirus 6</i>	avian paramyxovirus 6 (APMV-6)
	<i>Avian metaavulavirus 7</i>	avian paramyxovirus 7 (APMV-7)
	<i>Avian metaavulavirus 8</i>	avian paramyxovirus 8 (APMV-8)
	<i>Avian metaavulavirus 10</i>	avian paramyxovirus 10 (APMV-10)
	<i>Avian metaavulavirus 11</i>	avian paramyxovirus 11 (APMV-11)
	<i>Avian metaavulavirus 14</i>	avian paramyxovirus 14 (APMV-14)
	<i>Avian metaavulavirus 15</i>	avian paramyxovirus 15 (APMV-15)
	<i>Avian metaavulavirus 20</i>	avian paramyxovirus 20 (APMV-20)
	<i>Avian orthoavulavirus 1</i> *	avian paramyxovirus 1 (APMV-1)
	<i>Avian orthoavulavirus 9</i>	avian paramyxovirus 9 (APMV-9)
	<i>Avian orthoavulavirus 12</i>	avian paramyxovirus 12 (APMV-12)
	<i>Avian orthoavulavirus 13</i>	avian paramyxovirus 13 (APMV-13)
	<i>Avian orthoavulavirus 16</i>	avian paramyxovirus 16 (APMV-16)
	<i>Avian orthoavulavirus 17</i>	Antarctic penguin virus A (APV-A)

Genus	Species [†]	Virus (Abbreviation) [‡]
<i>Paraavulavirus</i>	<i>Avian orthoavulavirus 18</i>	Antarctic penguin virus B (APV-B)
	<i>Avian orthoavulavirus 19</i>	Antarctic penguin virus C (APV-C)
	<i>Avian paraavulavirus 3*</i>	avian paramyxovirus 3 (APMV-3)
	<i>Avian paraavulavirus 4</i>	avian paramyxovirus 4 (APMV-4)
<i>Synodovirus</i>		Subfamily <i>Metaparamyxovirinae</i>
	<i>Synodus paramyxovirus</i> ^{#2}	W nling triplecross lizardfish paramyxovirus (WTLPV)
<i>Aquaparamyxovirus</i>		Subfamily <i>Orthoparamyxovirinae</i>
	<i>Salmon aquaparamyxovirus*</i>	Atlantic salmon paramyxovirus (AsaPV)
	<i>Reptilian ferlavirus*</i>	fer-de-lance virus (FDLV)
	<i>Cedar henipavirus</i>	Cedar virus (CedV)
	<i>Ghanaian bat henipavirus</i>	Ghana virus (GhV)
	<i>Hendra henipavirus*</i>	Hendra virus (HeV)
	<i>Mojiang henipavirus</i>	Mojiang virus (MoJV)
	<i>Nipah henipavirus</i>	Nipah virus (NiV)
	<i>Beilong jeilongvirus*</i>	Beilong virus (BeiV)
	<i>Jun jeilongvirus</i>	J virus (JV)
<i>Morbilivirus</i>	<i>Lophuronyx jeilongvirus 1</i>	Mount Mabu Lophuronyx virus 1 (MMLV-1)
	<i>Lophuronyx jeilongvirus 2</i>	Mount Mabu Lophuronyx virus 2 (MMLV-2)
	<i>Myodes jeilongvirus</i>	Pohorje Myodes paramyxovirus 1 (PMPV-1)
	<i>Tailam jeilongvirus</i>	Tailam virus (TaiV)
	<i>Canine morbillivirus</i>	canine distemper virus (CDV)
<i>Narmovirus</i>	<i>Cetacean morbillivirus</i>	cetacean morbillivirus (CeMV)
	<i>Feline morbillivirus</i>	feline morbillivirus (FeMV)
	<i>Measles morbillivirus*</i>	measles virus (MeV)
	<i>Phocine morbillivirus</i>	phocine distemper virus (PDV)
	<i>Rinderpest morbillivirus</i>	rinderpest virus (RPV)
	<i>Small ruminant morbillivirus</i>	pesto-des-petits-ruminants virus (PPRV)
	<i>Mossman narmovirus</i>	Mossman virus (MossV)
	<i>Myodes narmovirus</i>	bank vole virus 1 (BaV-1)
	<i>Nariva narmovirus*</i>	Nariva virus (NarV)

Genus	Species [†]	Virus (Abbreviation) [‡]	
Respirovirus	<i>Tupaia narmovirus</i>	Tupaia paramyxovirus (TupV)	
	<i>Bovine respirovirus 3</i>	bovine parainfluenza virus 3 (BPIV-3)	
	<i>Caprine respirovirus 3</i>	caprine parainfluenza virus 3 (CPIV-3)	
	<i>Human respirovirus 1</i>	human parainfluenza virus 1 (HPIV-1)	
	<i>Human respirovirus 3</i>	human parainfluenza virus 3 (HPIV-3)	
	<i>Murine respirovirus*</i>	Sendai virus (SeV)	
Salemvirus	<i>Porcine respirovirus 1</i>	porcine parainfluenza virus 1 (PPIV-1)	
	<i>Salem salemvirus*</i>	Salem virus (SalV)	
Orthorubulavirus	Subfamily <i>Rubulavirinae</i>		
	<i>Bat mumps orthorubulavirus 3</i>	bat mumps virus (BMV)	
	<i>Human orthorubulavirus 2</i>	human parainfluenza virus 2 (HPIV-2)	
	<i>Human orthorubulavirus 4</i>	human parainfluenza virus 4a (HPIV-4a)	
	<i>Mammalian orthorubulavirus 5</i>	human parainfluenza virus 4b (HPIV-4b)	
	<i>Mapuera orthorubulavirus</i>	parafluenza virus 5 (PIV-5)	
	<i>Mumps orthorubulavirus*</i>	Mapuera virus (MapV)	
	<i>Porcine orthorubulavirus</i>	mumps virus (MuV)	
	<i>Simian orthorubulavirus</i>	La Piedad Michoacán Mexico virus (LPMV)	
	Pararubulavirus	<i>Simian orthorubulavirus</i>	simian virus 41 (SV-41)
		<i>Achimota pararubulavirus 1</i>	Achimota virus 1 (AchPV-1)
		<i>Achimota pararubulavirus 2</i>	Achimota virus 2 (AchPV-2)
<i>Menangle pararubulavirus*</i>		Menangle virus (MenPV)	
<i>Sosuga pararubulavirus</i>		Sosuga virus (SOSV)	
<i>Teviot pararubulavirus</i>		Teviot virus (TevPV)	
Unassigned	<i>Tioman pararubulavirus</i>	Tioman virus (TioPV)	
	<i>Tuhoko pararubulavirus 1</i>	Tuhoko virus 1 (ThkPV-1)	
	<i>Tuhoko pararubulavirus 2</i>	Tuhoko virus 2 (ThkPV-2)	
	<i>Tuhoko pararubulavirus 3</i>	Tuhoko virus 3 (ThkPV-3)	
		Unassigned	
		Unassigned	
Unassigned	<i>Cynoglossus paramyxovirus</i>	W nling tonguesole paramyxovirus (WTSPV)	
Unassigned	<i>Hoplichthys paramyxovirus</i>	W nling hoplichthys paramyxovirus (WHPV)	

Genus	Species [†]	Virus (Abbreviation) [‡]
Unassigned	<i>Scoliodon paramyxovirus</i>	W nzh u pacific spadenose shark paramyxovirus (WPSSPV)
Family Pneumoviridae		
<i>Metapneumovirus</i>	<i>Avian metapneumovirus</i> *	avian metapneumovirus (AMPV)
	<i>Human metapneumovirus</i>	human metapneumovirus (HMPV)
<i>Orthopneumovirus</i>	<i>Bovine orthopneumovirus</i>	bovine respiratory syncytial virus (BRSV)
	<i>Human orthopneumovirus</i> *	human respiratory syncytial virus (HRSV)
	<i>Murine orthopneumovirus</i>	murine pneumonia virus (MPV)
Family Rhabdoviridae		
<i>Almendravirus</i>	<i>Arboretum alمندravirus</i>	Arboretum virus (ABTV)
	<i>Balsa alمندravirus</i>	Balsa virus (BALV)
	<i>Coot Bay alمندravirus</i>	Coot Bay virus (CBV)
	<i>Puerto Almendras alمندravirus</i> *	Puerto Almendras virus (PTAMV)
	<i>Rio Chico alمندravirus</i>	Rio Chico virus (RCHV)
<i>Alphanemhavirus</i>	<i>Xingshan alphanemhavirus</i> *	Xingshan nematode virus 4 (XsNV-4)
	<i>Xinzhou alphanemhavirus</i>	Xinzhou nematode virus 4 (XzNV-4)
<i>Caligtrhavirus</i>	<i>Caligus caligtrhavirus</i>	Caligus rogerresseyi rhabdovirus (CRogRV)
	<i>Lepeophtheirus caligtrhavirus</i> *	Lepeophtheirus salmonis rhabdovirus 127 (L.SaIRV-127)
	<i>Salmonlouse caligtrhavirus</i>	Lepeophtheirus salmonis rhabdovirus 9 (L.SaIRV-9)
<i>Curiovirus</i>	<i>Curionopolis curiovirus</i> *	Curionopolis virus (CURV)
	<i>Iriti curiovirus</i>	Iriti virus (IRIRV)
	<i>Itacaunas curiovirus</i>	Itacaunas virus (ITAV)
	<i>Rochambeau curiovirus</i>	Rochambeau virus (RBUV)
<i>Cytorhabdovirus</i>	<i>Alfalfa dwarf cytorhabdovirus</i>	alfalfa dwarf virus (ADV)
	<i>Barley yellow striate mosaic cytorhabdovirus</i>	barley yellow striate mosaic virus (BYSMV)
	<i>Broccoli necrotic yellows cytorhabdovirus</i>	broccoli necrotic yellows virus (BNYV)
	<i>Colocasia bobone disease-associated cytorhabdovirus</i>	Colocasia bobone disease-associated virus (CBDaV)
	<i>Festuca leaf streak cytorhabdovirus</i>	Festuca leaf streak virus (FLSV)

Genus	Species [†]	Virus (Abbreviation) [‡]
<i>Dichorhavirus</i>	<i>Lettuce necrotic yellows cytorhabdovirus</i> *	lettuce necrotic yellows virus (LNYV)
	<i>Lettuce yellow mottle cytorhabdovirus</i>	lettuce yellow mottle virus (LYMoV)
	<i>Northern cereal mosaic cytorhabdovirus</i>	northern cereal mosaic virus (NCMV)
	<i>Sonchus cytorhabdovirus 1</i>	Sonchus virus (SonV)
	<i>Strawberry crinkle cytorhabdovirus</i>	strawberry crinkle virus (SCV)
	<i>Wheat American striate mosaic cytorhabdovirus</i>	wheat American striate mosaic virus (WASMV)
	<i>Citrus chlorotic spot dichorhavirus</i>	citrus chlorotic spot virus (CiCSV)
	<i>Citrus leprosis N dichorhavirus</i>	citrus leprosis virus N (CILV-N)
	<i>Clerodendrum chlorotic spot dichorhavirus</i>	clerodendrum chlorotic spot virus (CICSV)
	<i>Coffee ringspot dichorhavirus</i>	coffee ringspot virus (CoRSV)
<i>Ephemerovirus</i>	<i>Orchid fleck dichorhavirus</i> *	orchid fleck virus (OFV)
	<i>Adelaide River ephemerovirus</i>	Adelaide River virus (ARV)
	<i>Berrimah ephemerovirus</i>	Berrimah virus (BRMV)
	<i>Bovine fever ephemerovirus</i> *	bovine ephemeral fever virus (BEFV)
	<i>Kimberley ephemerovirus</i>	Kimberley virus (KIMV)
		Malakal virus (MALV)
	<i>Koolpinyah ephemerovirus</i>	Koolpinyah virus (KOOLV)
	<i>Kotonkan ephemerovirus</i>	kotonkan virus (KOTV)
	<i>Obodhiang ephemerovirus</i>	Obodhiang virus (OBON)
	<i>Yata ephemerovirus</i>	Yata virus (YATV)
<i>Hapavirus</i>	<i>Flanders hapavirus</i> *	Flanders virus (FLAV)
	<i>Gray Lodge hapavirus</i>	Gray Lodge virus (GLOV)
	<i>Hart Park hapavirus</i>	Hart Park virus (HPV)
	<i>Joiinjakaka hapavirus</i>	Joiinjakaka virus (JOIV)
	<i>Kamese hapavirus</i>	Kamese virus (KAMV)
	<i>La Joya hapavirus</i>	La Joya virus (LJV)
	<i>Landjia hapavirus</i>	Landjia virus (LANV = LJAV)
	<i>Manitoba hapavirus</i>	Manitoba virus (MANV = MNTBV)

Genus	Species [†]	Virus (Abbreviation) [‡]
	<i>Marco hapavirus</i>	Marco virus (MCOV)
	<i>Mosqueiro hapavirus</i>	Mosqueiro virus (MQOV)
	<i>Mossuril hapavirus</i>	Mossuril virus (MOSV)
	<i>Ngaingan hapavirus</i>	Ngaingan virus (NGAV)
	<i>Ord River hapavirus</i>	Ord River virus (ORV)
	<i>Parry Creek hapavirus</i>	Parry Creek virus (PCV)
	<i>Wongabel hapavirus</i>	Wongabel virus (WONV)
	<i>Barur ledantevirus</i>	Barur virus (BARV)
	<i>Fikirini ledantevirus</i>	Fikirini virus (FKRV)
	<i>Fukuoka ledantevirus</i>	Fukuoka virus (FUKV)
	<i>Kanyawara ledantevirus</i>	Kanyawara virus (KYAV)
	<i>Kern Canyon ledantevirus</i>	Kern Canyon virus (KCV)
	<i>Keuraliba ledantevirus</i>	Keuraliba virus (KEUV)
	<i>Kolente ledantevirus</i>	Kolente virus (KOLEV)
	<i>Kumasi ledantevirus</i>	Kumasi rhabdovirus (KRV)
	<i>Le Dantec ledantevirus</i> *	Le Dantec virus (LDV)
	<i>Mount Elgon bat ledantevirus</i>	Mount Elgon bat virus (MEBV)
	<i>Nishimuro ledantevirus</i>	Nishimuro virus (NISV)
	<i>Nkolbisson ledantevirus</i>	Nkolbisson virus (NKOV)
	<i>Oita ledantevirus</i>	Oita virus (OITAV)
	<i>Vaprio ledantevirus</i>	Vaprio virus (VAPV)
	<i>Wuhan ledantevirus</i>	Wuhan louse fly virus 5 (WLFV-5)
	<i>Yongjia ledantevirus</i>	Yongjia tick virus 2 (YTV-2)
<i>Lyssavirus</i>	<i>Aravan lyssavirus</i>	Aravan virus (ARAV)
	<i>Australian bat lyssavirus</i>	Australian bat lyssavirus (ABLV)
	<i>Bokeloh bat lyssavirus</i>	Bokeloh bat lyssavirus (BBLV)
	<i>Duvenhage lyssavirus</i>	Duvenhage virus (DUVV)
	<i>European bat 1 lyssavirus</i>	European bat lyssavirus 1 (EBLV-1)
	<i>European bat 2 lyssavirus</i>	European bat lyssavirus 2 (EBLV-2)
	<i>Gannoruwa bat lyssavirus</i>	Gannoruwa bat lyssavirus (GBLV)
	<i>Ikona lyssavirus</i>	Ikona lyssavirus (IKOV)

Genus	Species [†]	Virus (Abbreviation) [‡]
	<i>Irkut lyssavirus</i>	Irkut virus (IRKV)
	<i>Khujand lyssavirus</i>	Khujand virus (KHUV)
	<i>Lagos bat lyssavirus</i>	Lagos bat virus (LBV)
	<i>Lleida bat lyssavirus</i>	Lleida bat lyssavirus (LLEBY)
	<i>Mokola lyssavirus</i>	Mokola virus (MOKV)
	<i>Rabies lyssavirus</i> *	rabies virus (RABV)
	<i>Shimoni bat lyssavirus</i>	Shimoni bat virus (SHIBV)
	<i>West Caucasian bat lyssavirus</i>	West Caucasian bat virus (WCBV)
<i>Novirhabdovirus</i>	<i>Hirame novirhabdovirus</i>	hirame rhabdovirus (HIRRV = HIRV)
	<i>Piscine novirhabdovirus</i>	viral hemorrhagic septicaemia virus (VHSV)
	<i>Salmonid novirhabdovirus</i> *	infectious hematopoietic necrosis virus (IHNV)
	<i>Snakehead novirhabdovirus</i>	snakehead rhabdovirus (SHRV)
<i>Nucleorhabdovirus</i>	<i>Datura yellow vein nucleorhabdovirus</i>	datura yellow vein virus (DYVV)
	<i>Eggplant mottled dwarf nucleorhabdovirus</i>	eggplant mottled dwarf virus (EMDV)
	<i>Maize fine streak nucleorhabdovirus</i>	maize fine streak virus (MSFV)
	<i>Maize Iranian mosaic nucleorhabdovirus</i>	maize Iranian mosaic virus (MIMV)
	<i>Maize mosaic nucleorhabdovirus</i>	maize mosaic virus (MMV)
	<i>Potato yellow dwarf nucleorhabdovirus</i> *	potato yellow dwarf virus (PYDV)
	<i>Rice yellow stunt nucleorhabdovirus</i>	rice yellow stunt virus (RYSV)
	rice transitory yellowing virus (RTYV)	
	<i>Sonchus yellow net nucleorhabdovirus</i>	Sonchus yellow net virus (SYNV)
	<i>Sowthistle yellow vein nucleorhabdovirus</i>	sowthistle yellow vein virus (SYVV)
	<i>Taro vein chlorosis nucleorhabdovirus</i>	taro vein chlorosis virus (TaVVCV)
<i>Perhabdovirus</i>	<i>Anguillid perhabdovirus</i>	eel virus European X (EVEX)
	<i>Perch perhabdovirus</i> *	perch rhabdovirus (PRV)

Genus	Species [†]	Virus (Abbreviation) [‡]
<i>Sigmavirus</i>	<i>Sea trout perhabdovirus</i>	lake trout rhabdovirus (LTRV)
	<i>Drosophila affinis sigmavirus</i>	Drosophila affinis sigmavirus (DAffSV)
	<i>Drosophila ananassae sigmavirus</i>	Drosophila ananassae sigmavirus (DAAnaSV)
	<i>Drosophila immigrans sigmavirus</i>	Drosophila immigrans sigmavirus (DIImmSV)
	<i>Drosophila melanogaster sigmavirus</i> *	*Drosophila melanogaster sigmavirus (DMelSV)
	<i>Drosophila obscura sigmavirus</i>	Drosophila obscura sigmavirus (DObsSV)
	<i>Drosophila tristis sigmavirus</i>	Drosophila tristis sigmavirus (DTrisSV)
	<i>Muscina stabulans sigmavirus</i>	Muscina stabulans sigmavirus (MStiaSV)
	<i>Carp sprivivirus</i> *	spring viremia of carp virus (SVCV)
	<i>Pike fry sprivivirus</i>	grass carp rhabdovirus (GrCRV)
<i>Sripuvirus</i>	<i>Almipiwar sripuvirus</i>	pike fry rhabdovirus (PFRV)
	<i>Chaco sripuvirus</i>	tench rhabdovirus (TenRV)
	<i>Niakha sripuvirus</i> *	Almipiwar virus (ALMV)
	<i>Sena Madureira sripuvirus</i>	Chaco virus (CHOV)
	<i>Sripur sripuvirus</i>	Niakha virus (NIaV)
	<i>Bas Congo tibrovirus</i>	Sena Madureira virus (SMV)
	<i>Beatrice Hill tibrovirus</i>	Sripur virus (SRIV)
	<i>Coastal Plains tibrovirus</i>	Bas-Congo virus (BASV)
	<i>Ekpoma 1 tibrovirus</i>	Beatrice Hill virus (BHV)
	<i>Ekpoma 2 tibrovirus</i>	Coastal Plains virus (CPV)
<i>Tupavirus</i>	<i>Sweetwater Branch tibrovirus</i>	Ekpoma virus 1 (EKV-1)
	<i>Tibrogagan tibrovirus</i> *	Ekpoma virus 2 (EKV-2)
	<i>Durham tupavirus</i> *	Sweetwater Branch virus (SWBV)
	<i>Klamath tupavirus</i>	Bivens Arm virus (BAV)
	<i>Tupaia tupavirus</i>	Tibrogagan virus (TIBV)
	<i>Lettuce big-vein associated varicosavirus</i> *	Durham virus (DURV)
	<i>Alagoas vesiculovirus</i>	Klamath virus (KLAV)
		tupaia virus (TUPV)
		lettuce big-vein associated virus (LBVaV)
		vesicular stomatitis Alagoas virus (VSAV)

Genus	Species [†]	Virus (Abbreviation) [‡]
	<i>American bat vesiculovirus</i>	American bat vesiculovirus (ABVV)
	<i>Carajas vesiculovirus</i>	Carajas virus (CJSV)
	<i>Chandipura vesiculovirus</i>	Chandipura virus (CHPV)
	<i>Cocal vesiculovirus</i>	Cocal virus (COCV)
	<i>Indiana vesiculovirus</i> *	vesicular stomatitis Indiana virus (VSVI)
	<i>Isfahan vesiculovirus</i>	Isfahan virus (ISFV)
	<i>Jurona vesiculovirus</i>	Jurona virus (JURY)
	<i>Malpais Spring vesiculovirus</i>	Malpais Spring virus (MSPV)
	<i>Maraba vesiculovirus</i>	Maraba virus (MARAV)
	<i>Morretton vesiculovirus</i>	Morretton virus (MORV)
	<i>New Jersey vesiculovirus</i>	vesicular stomatitis New Jersey virus (VSNJV)
	<i>Perinet vesiculovirus</i>	Perinet virus (PERV)
	<i>Piry vesiculovirus</i>	Piry virus (PIRYV)
	<i>Radi vesiculovirus</i>	Radi virus (RADV)
	<i>Yug Bogdanovac vesiculovirus</i>	Yug Bogdanovac virus (YBV)
Unassigned	<i>Moussa virus</i>	Moussa virus (MOUV)
Family Sunviridae		
<i>Sunshinevirus</i>	<i>Reptile sunshinevirus 1</i> *	Sunshine Coast virus (SunCV)
Family Xinmoviridae		
<i>Anphevirus</i>	<i>Bolahun anphevirus</i>	Bolahun virus (BLHV)
		Gambie virus (GAMV)
	<i>Dipteran anphevirus</i>	Hüb 1 diptera virus 11 (HbDV-11)
	<i>Drosophilid anphevirus</i>	Drosophila unispina virus 1 (DumV-1)
	<i>Odonate anphevirus</i>	Hüb 1 rhabdo-like virus 7 (HbRLV-7)
	<i>Orthopteran anphevirus</i>	Hüb 1 orthoptera virus 5 (HbOV-5)
	<i>Shuangao anphevirus</i>	Shu ngào fly virus 2 (SgFV-2)
	<i>Xincheng anphevirus</i> *	X nchéng mosquito virus (XcMV)

* type species

† includes Newcastle disease virus (NDV).

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

²Due to a formal classification mistake, this species was incorrectly named *Synodus paramyxovirus* in 2019. A proposal to change the species name to the correct “*Synodus synodomyxovirus*” will be submitted prior to the next taxonomic proposal submission deadline.

³Due to a formal classification mistake, the species *Bat mumps orthorubulavirus* was not abolished as outlined in the original proposal to reorganize the family *Paramyxoviridae*. A proposal to abolish this species will be submitted prior to the next taxonomic proposal submission deadline.

⁴Please 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.