

# **ICTV EXECUTIVE COMMITTEE REPORT (2017-2020)**

**Andrew Davison**

**President**

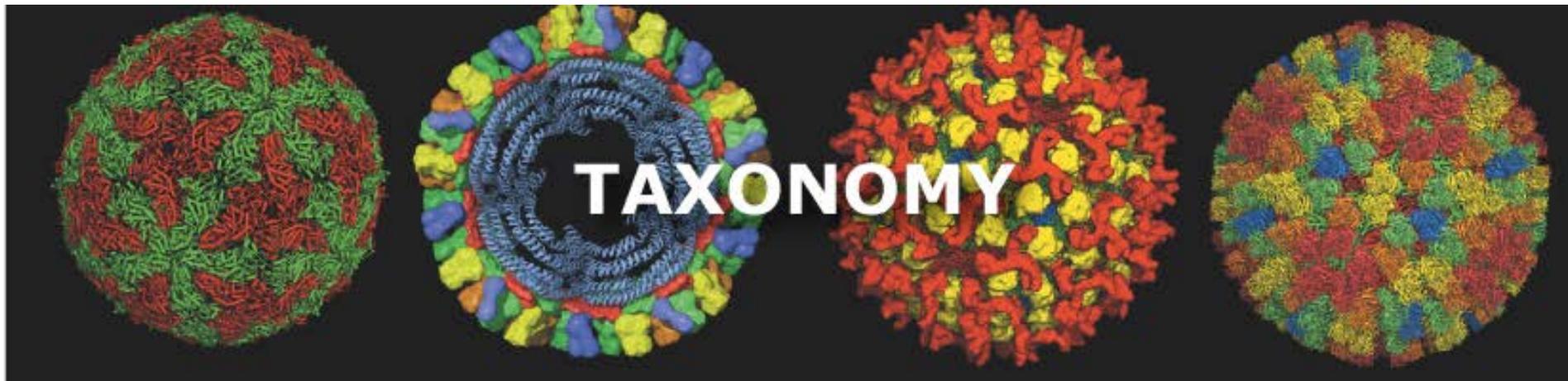


# The ICTV

Committee of the Virology Division of the International Union of Microbiological Societies (IUMS)

Responsible for developing taxonomy and names of taxa

Founded 54 years ago





# Developing taxonomy

Involves many virologists

Any virologist can submit a proposal

Study Group provides comments

Executive Committee meets annually

ICTV members vote annually

Taxonomy lists updated annually

New taxonomy published annually

ICTV Report published online





# Wellcome grant (2016-2021)

Three staff employed

Freely available online ICTV Report  
(editor-in-chief Stuart Siddell)

Freely available online citeable summaries  
published in Journal of General Virology

Freely available online resources

Focused meetings with experts

Improved connections with virologists

## ICTV Virus Taxonomy Profile: *Flaviviridae*

Peter Simmonds,<sup>1,\*</sup> Paul Becher,<sup>2</sup> Jens Bukh,<sup>3</sup> Ernest A. Gould,<sup>4</sup> Gregor Meyers,<sup>5</sup> Tom Monath,<sup>6</sup> Scott Muerhoff,<sup>7</sup> Alexander Pletnev,<sup>8</sup> Rebecca Rico-Hesse,<sup>9</sup> Donald B. Smith,<sup>10</sup> Jack T. Stapleton<sup>11,12</sup> and ICTV Report Consortium

### Abstract

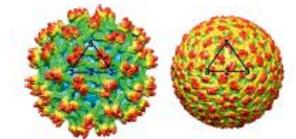
The *Flaviviridae* is a family of small enveloped viruses with RNA genomes of 9000–13 000 bases. Most infect mammals and birds. Many flaviviruses are host-specific and pathogenic, such as hepatitis C virus in the genus *Hepacivirus*. The majority of known members in the genus *Flavivirus* are arthropod borne, and many are important human and veterinary pathogens (e.g. yellow fever virus, dengue virus). This is a summary of the current International Committee on Taxonomy of Viruses (ICTV) report on the taxonomy of the *Flaviviridae*, which is available at [www.ictv.global/report/flaviviridae](http://www.ictv.global/report/flaviviridae).

Table 1. Characteristics of the family *Flaviviridae*

Typical member:	yellow fever virus-D17 (X03700), species <i>Yellow fever virus</i> , genus <i>Flavivirus</i>
Virion	Enveloped, 40–60 nm virions with a single core protein (except for genus <i>Pegivirus</i> ) and 2 or 3 envelope glycoproteins
Genome	Approximately 9.0–13 kb of positive-sense, non-segmented RNA
Replication	Cytoplasmic, in membrane vesicles derived from the endoplasmic reticulum (ER); assembled virions bud into the lumen of the ER and are secreted through the vesicle transport pathway
Translation	Directly from genomic RNA containing a type 1 cap (genus <i>Flavivirus</i> ) or an internal ribosome entry site (other genera)
Host range	Mammals (all genera); most members of genus <i>Flavivirus</i> are arthropod borne
Taxonomy	Currently four genera containing more than 60 species

### VIRION

Virions are typically spherical in shape with a lipid envelope (Table 1, Fig. 1). Virions have a single, small, basic capsid (C) protein and two (genera *Flavivirus*, *Hepacivirus* and *Pegivirus*) or three (genus *Pestivirus*) envelope proteins.



### GENOME

Virus genomes are positive-stranded, non-segmented RNA of approximately 9.2–11, 12.3–13, 8.9–10.5 and 8.9–11.3 kb for members of the genera *Flavivirus*, *Pestivirus*, *Hepacivirus* and *Pegivirus*, respectively (Fig. 2). They contain a single, long ORF flanked by 5' and 3'-terminal non-coding regions, which form specific secondary structures required for genome replication and translation. Translational initiation of genomic RNA is cap dependent in the case of members of the genus

Fig. 1. Three-dimensional cryo-electron reconstruction of immature (left) and mature (right) particles of an isolate of dengue virus (courtesy of Richard Kuhn and Michael Rossmann). Shown is a surface rendering of immature dengue virus at 12.5 Å resolution (left) and mature dengue virus at 10 Å resolution (right). The viruses are depicted to scale, but not coloured to scale. Triangles outline one icosahedral unit, with the 2-, 3- and 5-fold axes of symmetry.

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Keywords: *Flaviviridae*; taxonomy; ICTV Report.

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# Taxonomic advances

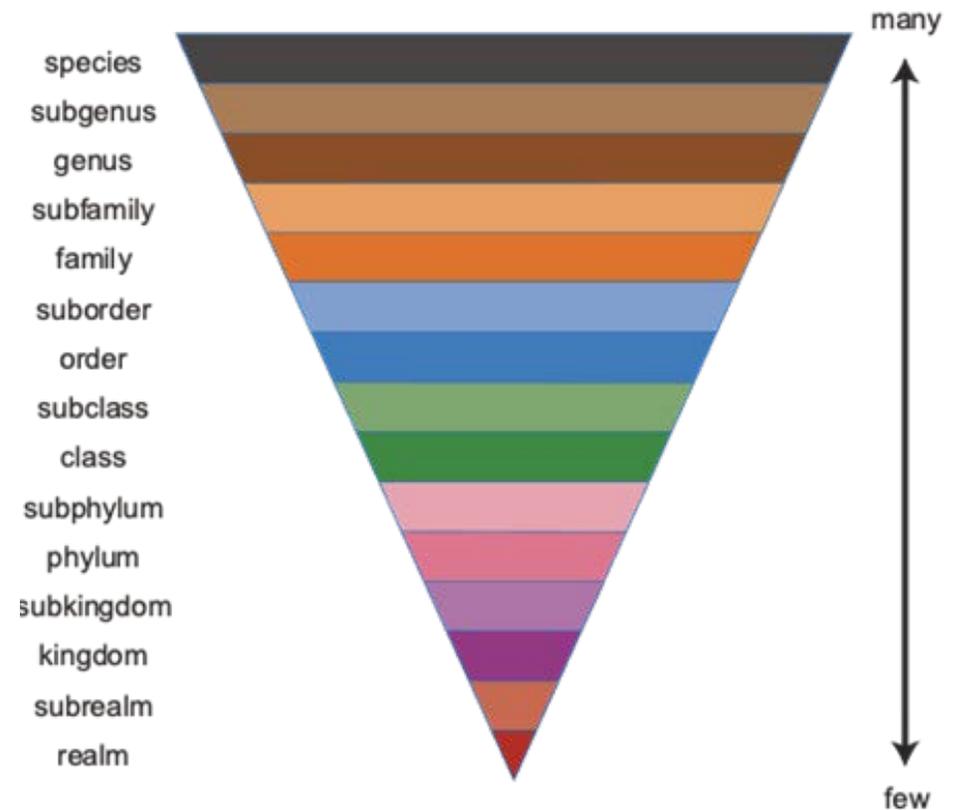
Hundreds of proposals approved

See newsletters at

<https://talk.ictvonline.org/information/newsletters/w/newsletters>

ICTV ratifies expansion of the number of taxonomic ranks from 5 to 15

Executive Committee proposes uniform binomial species nomenclature for ICTV ratification





# Executive Committee (2020-2023)

Changes to Statutes ratified by ICTV

Membership increased from 19 to 23

Online voting by ICTV members

Geographical representation improved

Gender balance greatly improved

Thanks to those leaving the Committee:  
Andrew Davison, Balázs Harrach, Robert Harrison, Nick Knowles and Max Nibert

Name	Affiliation	Residence
<b>President</b>		
Murilo Zerbini	Federal University of Viçosa	Brazil
<b>Vice-President</b>		
Stuart Siddell	University of Bristol	Germany
<b>Business Secretary</b>		
Arcady Mushegian	National Science Foundation	USA
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<b>Proposals Secretary</b>		
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Mart Krupovic	Pasteur Institute	France
Jens Kuhn	NIAID Integrated Research Facility at Fort Detrick	USA
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Sejo Sabanadzovic	Mississippi State University	USA
Peter Simmonds	University of Oxford	UK
Arvind Varsani	Arizona State University	USA
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Poliane Alfenas-Zerbini	Federal University of Viçosa	Brazil
Bas Dutilh	Utrecht University	Netherlands
María Laura García	National University of La Plata	Argentina
Sandra Junglen	Charité – Berlin University of Medicine	Germany
Amy Lambert	Centers for Disease Control and Prevention	USA
Małgorzata Łobocka	Polish Academy of Sciences	Poland
Hanna Oksanen	University of Helsinki	Finland
Nobuhiro Suzuki	Okayama University	Japan
David Robertson	University of Glasgow	UK
Koenraad Van Doorslaer	University of Arizona	USA
Anne-Mieke Vandamme	KU Leuven	Belgium



With thanks to all who  
freely give their time and  
talents to provide a great  
resource for virologists

**Elliot Lefkowitz**

**Data Secretary**



# ICTV DATA SECRETARY ACTIVITIES 2017 - 2020



# DATA SECRETARY ACTIVITIES

- Taxonomy Database
  - Database updated with each new taxonomy release
    - New/changed taxonomy
    - Updates to the historical taxonomy database
  - Compilation of the Master Species List
  - Updates to the Virus Metadata Resource (VMR)
- Web Site
  - Taxonomy browser updates
  - Application updates
  - News
  - Information
  - Membership lists
- Online ICTV Report

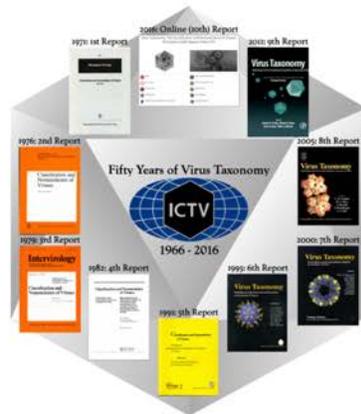


# ICTV WEB SITE

<http://ictv.global>



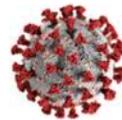
# International Committee on Taxonomy of Viruses ICTV



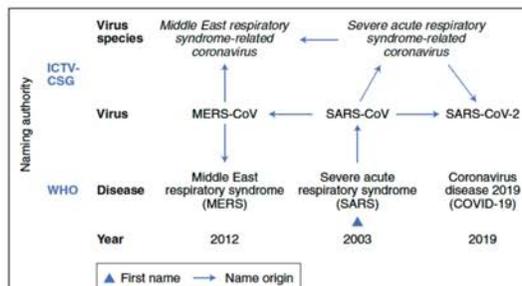
## News

### What's the point of virus taxonomy?

Stuart Siddell (ICTV Vice President) and Andrew Davison (ICTV President) discuss the importance of virus taxonomy, classification, and naming in this International Science Council blog post.



### Naming the 2019 Coronavirus



The International Committee on Taxonomy of Viruses (ICTV) is concerned with the designation and naming of virus taxa (i.e. species, genus, family, etc.) rather than the designation of virus common names or disease names. For an outbreak of a new viral disease, there are three names to be decided: the disease, the virus and the species. The World Health Organization (WHO) is responsible for the first, expert virologists for the second, the ICTV for the third.

WHO guidelines for naming of new human diseases can be found at ["WHO issues best practices for naming new human infectious diseases"](#) and ["WHO Best Practices for the Naming of New Human Infectious Diseases"](#) The following article may also be of interest: ["Naming diseases: First do no harm"](#)

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International Committee on Taxonomy of Viruses (ICTV)

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### Virus Taxonomy: 2019 Release

EC 51, Berlin, Germany, July 2019  
Email ratification March 2020 (MSL #35)  
4 realms, 9 kingdoms, 16 phyla, 2 subphyla, 36 classes, 55 orders, 8 suborders, 168 families, 103 subfamilies, 1421 genera, 68 subgenera, 6590 species

Expand ranks to show: Family  Hide ranks above: Realm

+ Realm: Duplodnaviria	1 kingdom	<a href="#">history</a>
- Realm: Monodnaviria	4 kingdoms	<a href="#">history</a>
+ Kingdom: Loebvirae Realm: Monodnaviria	1 phylum	<a href="#">history</a>
+ Kingdom: Sangervirae Realm: Monodnaviria	1 phylum	<a href="#">history</a>
- Kingdom: Shotokuvirae Realm: Monodnaviria	2 phyla	<a href="#">history</a>
- Phylum: Cossaviricota Kingdom: Shotokuvirae	3 classes	<a href="#">history</a>
- Class: Mouviricetes Phylum: Cossaviricota	1 order	<a href="#">history</a>
- Order: Polivirales Class: Mouviricetes	1 family	<a href="#">history</a>
+ Family: Bidnaviridae Order: Polivirales	1 genus	<a href="#">history</a>
- Class: Papovaviricetes Phylum: Cossaviricota	2 orders	<a href="#">history</a>
- Order: Sepolyvirales Class: Papovaviricetes	1 family	<a href="#">history</a>
+ Family: Polyomaviridae Order: Sepolyvirales	4 genera, 9 species	<a href="#">history</a>
- Order: Zurhausenvirales Class: Papovaviricetes	1 family	<a href="#">history</a>
+ Family: Papillomaviridae Order: Zurhausenvirales	2 subfamilies	<a href="#">history</a>
- Class: Quintoviricetes Phylum: Cossaviricota	1 order	<a href="#">history</a>
- Order: Piccovirales Class: Quintoviricetes	1 family	<a href="#">history</a>
+ Family: Parvoviridae Order: Piccovirales	3 subfamilies	<a href="#">history</a>
+ Phylum: Cressdnaviricota Kingdom: Shotokuvirae	2 classes	<a href="#">history</a>
+ Kingdom: Trapavirae Realm: Monodnaviria	1 phylum	<a href="#">history</a>
- Realm: Riboviria	2 kingdoms, 2 families, 4 genera	<a href="#">history</a>
- Kingdom: Orthonavirae Realm: Riboviria	5 phyla, 2 families, 1 genus	<a href="#">history</a>
- Phylum: Duplornaviricota Kingdom: Orthonavirae	3 classes	<a href="#">history</a>
- Class: Chrymotiviricetes Phylum: Duplornaviricota	1 order	<a href="#">history</a>
- Order: Ghabrivirales Class: Chrymotiviricetes	4 families	<a href="#">history</a>
+ Family: Chrysoviriidae Order: Ghabrivirales	2 genera	<a href="#">history</a>
+ Family: Megabirnaviridae Order: Ghabrivirales	1 genus	<a href="#">history</a>
+ Family: Quadriviridae Order: Ghabrivirales	1 genus	<a href="#">history</a>
+ Family: Totiviridae Order: Ghabrivirales	5 genera	<a href="#">history</a>
- Class: Resentoviricetes Phylum: Duplornaviricota	1 order	<a href="#">history</a>
- Order: Reovirales Class: Resentoviricetes	1 family	<a href="#">history</a>
+ Family: Reoviridae Order: Reovirales	2 subfamilies	<a href="#">history</a>
- Class: Vidaverviricetes Phylum: Duplornaviricota	1 order	<a href="#">history</a>
- Order: Mindivirales Class: Vidaverviricetes	1 family	<a href="#">history</a>
+ Family: Cystoviridae Order: Mindivirales	1 genus	<a href="#">history</a>
- Phylum: Kitrinoviricota Kingdom: Orthonavirae	4 classes	<a href="#">history</a>
- Class: Alsuviricetes Phylum: Kitrinoviricota	3 orders	<a href="#">history</a>
- Order: Hepelivirales Class: Alsuviricetes	4 families	<a href="#">history</a>
+ Family: Alphetraviridae Order: Hepelivirales	2 genera	<a href="#">history</a>
+ Family: Benyviridae Order: Hepelivirales	1 genus	<a href="#">history</a>
+ Family: Hepeviridae Order: Hepelivirales	2 genera	<a href="#">history</a>

TAXONOMY BROWSER  
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# INFORMATION

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### About the ICTV

**FAQs**  
Frequently Asked Questions

**History**  
Information on ICTV History

**ICTV Information**  
The ICTV Code, Statutes, and Organization

**Links**  
Links that may be of interest to ICTV members

**Members**  
Members and Committees of the ICTV

**News**  
Current and past ICTV news

**Newsletters**  
ICTV Newsletters

**Virology Division News**  
Articles of interest from the VDN section of Archives of Virology

### Members and Committees of the ICTV

**Executive Committee**

**Subcommittees**

- [Animal DNA Viruses and Retroviruses Subcommittee](#)
- [Animal dsRNA and ssRNA- Viruses Subcommittee](#)
- [Animal ssRNA+ Viruses Subcommittee](#)
- [Bacterial and Archaeal Viruses Subcommittee](#)
- [Fungal and Protist Viruses Subcommittee](#)
- [Plant Viruses Subcommittee](#)

**Study Groups**

**Life Members**

**National Representatives**

**Support Personnel**

For questions or help, send an email to [info@ictvonline.org](mailto:info@ictvonline.org)  
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## STUDY GROUPS

The ICTV maintains a Study Group for each virus family. Study Groups examine the classification and nomenclature of the viruses that are members or potential members of the family, and develop criteria (phenotypic and genotypic characters) that determine which viruses belong to a particular taxon. They also review proposals to create new taxonomy or modify existing taxonomy.

- List of all Study Groups
- List of Study Groups by Subcommittee

### Study Group Wikis

The Links below provide information from the Study Group that help to describe and classify the viruses belonging to the indicated family.

<b>Flaviviridae Study Group</b> Flaviviridae Study Group wiki	11 pages	Table 1 - Confirmed ... over 1 year ago
<b>Geminiviridae Study Group</b> Geminiviridae Study Group wiki	2 pages	Begomovirus Isolate ... over 3 years ago
<b>Hepeviridae Study Group</b> Hepeviridae Study Group wiki	2 pages	Proposed Orthohepe... 3 months ago
<b>Picornaviridae Study Group</b> Picornaviridae Study Group wiki	1 page	Picornaviridae Study ... over 4 years ago

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# Virus Taxonomy

The ICTV Report on Virus Classification and Taxon Nomenclature

**Currently Available Chapters**

(Additional chapters are in preparation.)

dsDNA Viruses	Negative-sense RNA Viruses	Positive-sense RNA Viruses
<i>Ampullaviridae</i>	<i>Aspiviridae</i>	<i>Alphaflexiviridae</i>
<i>Ascoviridae</i>	<i>Deltavirus</i>	<i>Benyviridae</i>
<i>Asfarviridae</i>		<i>Botourmiaviridae</i>
<i>Baculoviridae</i>	<b>Bunyavirales</b>	<i>Bromoviridae</i>
<i>Bicaudaviridae</i>	<i>Arenaviridae</i>	<i>Caliciviridae</i>
<i>Clavaviridae</i>	<i>Fimoviridae</i>	<i>Closteroviridae</i>
<i>Corticoviridae</i>	<i>Nairoviridae</i>	<i>Endornaviridae</i>
<i>Globuloviridae</i>	<i>Peribunyaviridae</i>	<i>Flaviviridae</i>
<i>Guttaviridae</i>		<i>Hepeviridae</i>
<i>Herelleviridae</i>	<b>Mononegavirales</b>	<i>Hypoviridae</i>
<i>Hytrosaviridae</i>	<i>Artoviridae</i>	<i>Nodaviridae</i>
<i>Iridoviridae</i>	<i>Filoviridae</i>	<i>Noroniavirus</i>
<i>Nimaviridae</i>	<i>Mymonaviridae</i>	<i>Potyviridae</i>
<i>Nudiviridae</i>	<i>Nyamiviridae</i>	<i>Sarothroviridae</i>
<i>Papillomaviridae</i>	<i>Paramyxoviridae</i>	<i>Soliniviridae</i>
<i>Plasmaviridae</i>	<i>Pneumoviridae</i>	<i>Togaviridae</i>
<i>Polyomaviridae</i>		<i>Virgaviridae</i>

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Rhabdoviridae - Rhabdoviridae - Mononegavirales - International Committee on Taxonomy of Viruses (ICTV)

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ICTV Reports > ICTV Report > Negative-sense RNA Viruses

Mononegavirales > Rhabdoviridae

+ New

Virus Taxonomy  
The ICTV Report on  
Virus Classification and Taxonomy Nomenclature

Abbreviations : [Report Help](#)

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▼ Rhabdoviridae

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- Genus: [Alphanemrhavirus](#)
- Genus: [Caligrhavirus](#)
- Genus: [Curiovirus](#)
- Genus: [Cytorhabdovirus](#)
- Genus: [Dichorhavirus](#)
- Genus: [Ephemerovirus](#)
- Genus: [Hapavirus](#)
- Genus: [Ledantevirus](#)
- Genus: [Lyssavirus](#)
- Genus: [Novirhabdovirus](#)
- Genus: [Nucleorhabdovirus](#)
- Genus: [Perhabdovirus](#)
- Genus: [Sigmavirus](#)
- Genus: [Sprivirus](#)
- Genus: [Sripuvirus](#)
- Genus: [Tibrovirus](#)
- Genus: [Tupavirus](#)
- Genus: [Varicosavirus](#)
- Genus: [Vesiculovirus](#)
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- Authors: [Rhabdoviridae](#)
- Resources: [Rhabdoviridae](#)
- Further reading: [Rhabdoviridae](#)
- References: [Rhabdoviridae](#)
- Citation: [Rhabdoviridae](#)

## Rhabdoviridae

Peter J. Walker, Rachel Breyta, Kim R. Blasdel, Charles H. Calisher, Ralf G. Dietzgen, Anthony R. Fooks, Juliana Fieitas-Astúa, Hideki Kondo, Gael Kurath, Ivan V. Kuzmin, Ben Longdon, David M. Stone, Robert B. Tesh, Noël Tordo, Nikos Vasilakis and Anna E. Whitfield

Edited by Jens H. Kuhn and Stuart G. Siddell

### Chapter contents

Posted April 2018, updated November 2019

*Rhabdoviridae*: The family

- [Citation](#), [Summary](#), [Virion](#), [Genome](#), [Biology](#), [Phylogeny](#)

Member taxa

Vertebrate host

- [Lyssavirus](#)
- [Novirhabdovirus](#)
- [Perhabdovirus](#)
- [Sprivirus](#)
- [Tupavirus](#)

Vertebrate host, arthropod vector

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- [Ephemerovirus](#)
- [Hapavirus](#)
- [Ledantevirus](#)
- [Sripuvirus](#)
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Invertebrate host

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- [Alphanemrhavirus](#)
- [Caligrhavirus](#)
- [Sigmavirus](#)

Plant host

**Virus Taxonomy: 2019 Release**  
EC 51, Berlin, Germany, July 2019

REPORT CHAPTER  
<https://ictv.global/report/rhabdoviridae/>



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Rhabdoviridae - Rhabdoviridae - Mononegavirales - International Committee on Taxonomy of Viruses (ICTV)

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**Rhabdoviridae**

- Genus: *Almendravirus*
- Genus: *Alphanemrhavirus*
- Genus: *Calighavirus*
- Genus: *Curiovirus*
- Genus: *Cytorhabdovirus*
- Genus: *Dichorhavirus*
- Genus: *Ephemerovirus*
- Genus: *Hapavirus*
- Genus: *Ledantevirus*
- Genus: *Lyssavirus*
- Genus: *Novirhabdovirus*
- Genus: *Nucleorhabdovirus*
- Genus: *Perhabdovirus*
- Genus: *Sigmavirus*
- Genus: *Sprivivirus*
- Genus: *Sripivirus*
- Genus: *Tibrovirus*
- Genus: *Tupavirus*
- Genus: *Varicosavirus*
- Genus: *Vesiculovirus*
- Unassigned species
- Authors: *Rhabdoviridae*
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- References: *Rhabdoviridae*
- Citation: *Rhabdoviridae*

**Virus Taxonomy: 2019 Release**  
 EC 51, Berlin, Germany, July 2019  
 Email ratification March 2020 (MSL #35)  
*Rhabdoviridae*: 30 genera, 191 species

- Family: *Rhabdoviridae*
- + Genus: *Almendravirus*
- + Genus: *Alphanemrhavirus*
- + Genus: *Alphanucleorhabdovirus*
- + Genus: *Arurhavirus*
- + Genus: *Barhavirus*
- + Genus: *Betanucleorhabdovirus*
- + Genus: *Calighavirus*
- + Genus: *Curiovirus*
- + Genus: *Cytorhabdovirus*
- + Genus: *Dichorhavirus*
- + Genus: *Ephemerovirus*
- + Genus: *Gammanucleorhabdovirus*
- + Genus: *Hapavirus*
- + Genus: *Ledantevirus*
- + Genus: *Lostrhavirus*
- + Genus: *Lyssavirus*
- + Genus: *Moushavirus*

### Citation

A summary of this ICTV Report chapter has been published as an ICTV Virus Taxonomy Profile article in the Journal of General Virology, and should be cited when referencing this online chapter as follows:

Walker, P.J., Blasdell, K.R., Calisher, C.H., Dietzgen, R.G., Kondo, H., Kurath, G., Longdon, B., Stone, D.M., Tesh, R.B., Tordo, N., Vasilakis, N., Whitfield, A.E., and ICTV Report Consortium. 2018, [ICTV Virus Taxonomy Profile: \*Rhabdoviridae\*](#), Journal of General Virology, 99:447–448

### Summary

The family *Rhabdoviridae* includes 20 genera and 144 species of viruses with negative-sense, single-stranded RNA genomes of approximately 10–16 kb (Table 1.*Rhabdoviridae*). Virions are typically enveloped with bullet-shaped or bacilliform morphology but non-enveloped filamentous virions have also been reported. The genomes are usually (but not always) single RNA molecules with partially complementary termini. Almost all rhabdovirus genomes have 5 genes encoding the structural proteins (N, P, M, G and L); however, many rhabdovirus genomes encode other proteins in additional genes or in alternative open reading frames (ORFs) within the structural protein genes. The family is ecologically diverse with members infecting plants or animals including mammals, birds, reptiles or fish. Rhabdoviruses are also detected in invertebrates, including arthropods some of which may serve as unique hosts or may act as biological vectors for transmission to other animals or plants. Rhabdoviruses include important pathogens of humans, livestock, fish or agricultural crops.

**Table 1.*Rhabdoviridae***. Characteristics of members of the family *Rhabdoviridae*.

Characteristic	Description
Typical member	vesicular stomatitis Indiana virus (AF473864), species <i>Indiana vesiculovirus</i> , genus <i>Vesiculovirus</i>
Virion	Bullet-shaped or bacilliform particle 100–430 nm in length and 45–100 nm in diameter comprised of a helical nucleocapsid surrounded by a matrix layer and a lipid envelope. Some rhabdoviruses have non-enveloped filamentous virions.
Genome	Negative-sense, single-stranded RNA of 10.8–16.1 kb (unsegmented or bi-segmented).
Replication	Ribonucleoprotein (RNP) complexes containing anti-genomic RNA are generated and serve as templates for synthesis of nascent RNP complexes containing genomic RNA.
Translation	From capped and polyadenylated mRNAs transcribed processively from each gene (3' to 5'), sometimes containing multiple ORFs.
Host Range	Vertebrates, arthropods and plants; many vertebrate and plant rhabdoviruses are arthropod-borne.

**TAXON SUMMARY**  
<https://ictv.global/report/rhabdoviridae/>



talk.ictvonline.org/ictv-reports/ictv\_online\_report/negative-sense-rna-viruses/mononeg...

Genus: Vesiculovirus - Rhabdoviridae - Mononegavirales - International Committee on Taxonomy of Viruses (ICTV)

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Abbreviations : Report Help

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- If the list is long, use the scroll bars to view the complete list.

▼ Rhabdoviridae

- Genus: *Almendravirus*
- Genus: *Alphanemrhavirus*
- Genus: *Calighravirus*
- Genus: *Curlovirus*
- Genus: *Cytorhabdovirus*
- Genus: *Dichorhavirus*
- Genus: *Ephemerovirus*
- Genus: *Hapavirus*
- Genus: *Ledantevirus*

**Virus Taxonomy: 2019 Release**  
 EC 51, Berlin, Germany, July 2019  
 Email ratification March 2020 (MSL #35)  
 Vesiculovirus: 16 species

— Genus: Vesiculovirus

- Species: *Alagoas vesiculovirus*
- Species: *American bat vesiculovirus*
- Species: *Carajas vesiculovirus*
- Species: *Chandipura vesiculovirus*
- Species: *Cocal vesiculovirus*
- Species: *Indiana vesiculovirus*
- Species: *Isfahan vesiculovirus*
- Species: *Jurona vesiculovirus*
- Species: *Malpais Spring vesiculovirus*
- Species: *Maraba vesiculovirus*
- Species: *Morretton vesiculovirus*
- Species: *New Jersey vesiculovirus*
- Species: *Perinet vesiculovirus*
- Species: *Piry vesiculovirus*
- Species: *Radi vesiculovirus*
- Species: *Yug Bogdanovac vesiculovirus*

## Member species

★ Exemplar isolate of the species

Species	Virus name	Isolate	Accession number	RefSeq number	Available sequence	Virus Abbrev.
★ <i>Alagoas vesiculovirus</i>	vesicular stomatitis Alagoas virus	Indiana 3	EU373658	NC_025353	Complete genome	VSAV
★ <i>American bat vesiculovirus</i>	American bat vesiculovirus	TFFN-2013	JX569193	NC_022755	Complete coding genome	ABVV
★ <i>Carajas vesiculovirus</i>	Carajas virus	BeAr4113 91	KM205015	NC_038285	Complete coding genome	CARV
★ <i>Chandipura vesiculovirus</i>	Chandipura virus	CIN 0451	GU212856	NC_020805	Complete coding genome	CHPV
★ <i>Cocal vesiculovirus</i>	Cocal virus	TRVL402 33	EU373657	NC_028255	Complete genome	COCV
★ <i>Indiana vesiculovirus</i>	vesicular stomatitis Indiana virus	98COE	AF473864	NC_038236	Complete genome	VSIV
★ <i>Isfahan vesiculovirus</i>	Isfahan virus	91026-167	AJ810084	NC_020806	Complete genome	ISFV
★ <i>Jurona vesiculovirus</i>	Jurona virus	BeAr4057 8	KM204996	NC_039206	Complete coding genome	JURV
★ <i>Malpais Spring vesiculovirus</i>	Malpais Spring virus	85-488NM	KC412247	NC_025364	Complete genome	MSPV
★ <i>Maraba vesiculovirus</i>	Maraba virus	BeAr 411459	HQ660076	NC_025255	Complete genome	MARV
★ <i>Morretton vesiculovirus</i>	Morretton virus	CoAr1910 48	KM205007	NC_034508	Complete coding genome	MORV
★ <i>New Jersey vesiculovirus</i>	vesicular stomatitis New Jersey virus	NJ1184H DB	JX121109	NC_024473	Complete genome	VSNJV
★ <i>Perinet vesiculovirus</i>	Perinet virus	DAkAr Mg802	HM566195	NC_025394	Complete coding genome	PERV
★ <i>Piry vesiculovirus</i>	Piry virus	BeAn242 3	KU178986	NC_038286	Complete coding genome	PIRYV
★ <i>Radi vesiculovirus</i>	Radi virus	ISS PH1-166	KM205024	NC_038267	Complete coding genome	RADV
★ <i>Yug Bogdanovac vesiculovirus</i>	Yug Bogdanovac virus	YU4-76	JF911700	NC_025378	Complete coding genome	YBV

Virus names, the choice of exemplar isolates, and virus abbreviations, are not official ICTV designations.

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MEMBER SPECIES TABLE

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**JOURNAL OF GENERAL VIROLOGY:  
ICTV VIRUS TAXONOMY PROFILES**



www.microbiologyresearch.org/content/ictv-virus-taxonomy-profiles

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## ICTV Virus Taxonomy Profiles



*Journal of General Virology* ICTV Virus Taxonomy Profiles are a freely available series of concise, review-type articles that provide overviews of the classification, structure and properties of individual virus orders, families and genera.

ICTV Virus Taxonomy Profiles are written by the International Committee on Taxonomy of Viruses (ICTV) study groups, comprised of leading experts in the field. The profiles summarise the individual chapters from the ICTV's online 10th Report on Virus Taxonomy, and provide the latest taxonomic information on viruses.

The Microbiology Society is publishing these citable profiles online, while the full chapters are available to all through the ICTV website, thanks to a five-year Biomedical Resources grant from the Wellcome Trust.

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## ICTV Virus Taxonomy Profile: *Rhabdoviridae*

Peter J. Walker,<sup>1\*</sup> Kim R. Blasdel,<sup>2</sup> Charles H. Calisher,<sup>3</sup> Ralf G. Dietzgen,<sup>4</sup> Hideki Kondo,<sup>5</sup> Gael Kurath,<sup>6</sup> Ben Longdon,<sup>7</sup> David M. Stone,<sup>8</sup> Robert B. Tesh,<sup>9</sup> Noël Tordo,<sup>10</sup> Nikos Vasilakis,<sup>9</sup> Anna E. Whitfield<sup>11</sup> and ICTV Report Consortium

### Abstract

The family *Rhabdoviridae* comprises viruses with negative-sense (–) single-stranded RNA genomes of 10.8–16.1 kb. Virions are typically enveloped with bullet-shaped or bacilliform morphology but can also be non-enveloped filaments. Rhabdoviruses infect plants and animals including mammals, birds, reptiles and fish, as well as arthropods which serve as single hosts or act as biological vectors for transmission to animals or plants. Rhabdoviruses include important pathogens of humans, livestock, fish and agricultural crops. This is a summary of the International Committee on Taxonomy of Viruses (ICTV) Report on the taxonomy of *Rhabdoviridae*, which is available at [www.ictv.global/report/rhabdoviridae](http://www.ictv.global/report/rhabdoviridae).

Table 1. Characteristics of the family *Rhabdoviridae*

Typical member:	vesicular stomatitis Indiana virus (AF473864), species <i>Indiana vesiculovirus</i> , genus <i>Vesiculovirus</i>
Virion	Bullet-shaped or bacilliform particle 100–430 nm in length and 45–100 nm in diameter comprised of a nucleocapsid surrounded by a matrix layer and a lipid envelope. Some rhabdoviruses have non-enveloped filamentous virions
Genome	Negative-sense, single-stranded RNA of 10.8–16.1 kb (unsegmented or bi-segmented)
Replication	Ribonucleoprotein (RNP) complexes containing anti-genomic RNA are generated and serve as templates for synthesis of nascent RNP complexes containing genomic RNA
Translation	Capped and polyadenylated mRNAs transcribed processively from each gene (3' to 5'), sometimes containing multiple ORFs
Host range	Vertebrates, arthropods and plants; many vertebrate and plant rhabdoviruses are arthropod-borne
Taxonomy	18 genera containing >130 species. Many rhabdoviruses remain unclassified

### VIRION

Virions are usually enveloped and bullet-shaped or bacilliform (i.e. with two rounded ends) and contain five structural proteins (Table 1, Fig. 1). The nucleocapsid protein (N), the large multi-functional RNA-dependent RNA polymerase (L) and the polymerase-associated phosphoprotein (P) together with the RNA genome form the ribonucleoprotein (RNP) complex. The nucleocapsid is encased in the matrix protein (M) layer which also interacts with the envelope containing the transmembrane glycoprotein (G). Plant rhabdoviruses assigned to the genus *Varicosavirus* are filamentous and lack an envelope.

### GENOME

Rhabdovirus negative sense (–) single-stranded RNA genomes range from 10.8 to 16.1 kb [1]. Almost all rhabdovirus genomes are unsegmented but rhabdoviruses with bi-segmented genomes are also known [2]. Terminal non-coding regions are partially complementary. Genomes usually encode five major structural proteins but may also encode additional (accessory) proteins either in additional genes or as alternative ORFs within the structural protein genes (Fig. 2) [1, 3].

### REPLICATION

Rhabdovirus replication generally occurs in the cytoplasm following receptor-mediated endocytosis. Primary

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**Keywords:** *Rhabdoviridae*; rhabdoviruses; ICTV; Taxonomy.

**Abbreviations:** N, nucleocapsid protein; L, large polymerase protein; P, phosphoprotein; M, matrix protein; G, glycoprotein; RdRP, RNA-dependent RNA polymerase; RNP, ribonucleoprotein.

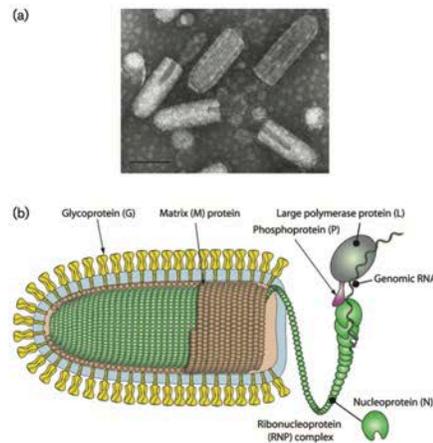


Fig. 1. (a) Negative-contrast electron micrograph of vesicular stomatitis Indiana virus particles. The bar represents 100 nm (courtesy of P. Perrin). (b) Schematic illustration of a rhabdovirus virion and ribonucleoprotein structure. Unravelling of the RNP is illustrative to show its association with L and P (courtesy of P. Le Mercier).

transcription is initiated from the incoming (–)RNP complex by the RNA-dependent RNA polymerase (RdRP). Stop–start transcription occurs 3' to 5' using gene start and gene end sequences, separated by non-transcribed intergenic sequences, to generate capped and polyadenylated mRNAs. Replication is initiated by the RdRP from a single promoter at the 3' end, ignoring gene start and end sequences to generate a (+)RNP. This is the template to generate nascent (–)RNPs which are assembled with M and G into enveloped virions. Budding can occur at either the plasma membrane or internal membranes. Some plant rhabdoviruses replicate in the nucleus.

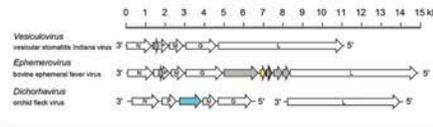


Fig. 2. Schematic representation of rhabdovirus genome organization, exemplifying variations in architecture and the number and location of accessory genes. Arrows indicate the position of long ORFs. Alternative ORFs occur within some genes; only ORFs (>180 nt) that appear likely to be expressed are shown. ORFs encoding viroporin (yellow) and movement proteins (blue) are shown.



# RHABDOVIRIDAE TAXONOMY PROFILE

<https://www.microbiologyresearch.org/content/journal/jgv/10.1099/jgv.0.001020>

### TAXONOMY

The *Rhabdoviridae* includes 18 genera and one unassigned species (*Moussa virus*). Viruses assigned to each genus form a monophyletic clade based on phylogenetic analyses of L protein sequences and usually have similar genome organizations, including the number and locations of accessory genes. Rhabdoviruses have been isolated from a wide range of vertebrates and plants; many have been isolated from arthropods [4, 5]. Members of the genus *Lyssavirus* infect only mammals, including humans in which they can cause fatal encephalitis (rabies). Members of the genera *Vesiculovirus*, *Ephemerovirus*, *Tibrovirus*, *Hapavirus*, *Curiovirus*, *Sripuvirus* and *Ledantevirus* infect vertebrates (mammals, birds or reptiles) and are transmitted by arthropods. Some arthropod-borne rhabdoviruses are associated with diseases of livestock; some may cause disease in humans. Members of the genus *Tupavirus* have only been isolated from vertebrates. Members of the genera *Novirhabdovirus*, *Sprivivirus* and *Perhabdovirus* infect only fish, some causing economically important diseases. Rhabdoviruses assigned to the genus *Sigmavirus* each infect only dipteran flies of a single species and they are transmitted vertically. Members of the genus *Almendravirus* replicate only in insects. Plant rhabdoviruses are assigned to the genera *Cytorhabdovirus*, *Nucleorhabdovirus*, *Dichorhavirus* and *Varicosavirus* and are transmitted by either arthropods or chytrid fungi. Many are associated with diseases of agricultural or horticultural importance.

### RESOURCES

Full ICTV Online (10th) Report:  
[www.ictv.global/report/rhabdoviridae](http://www.ictv.global/report/rhabdoviridae).

### Funding information

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### Conflicts of interest

The authors declare that there are no conflicts of interest.

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# An ongoing revolution in phage taxonomy

Morphology → genome-based classification

Holistic approach at multiple ranks

- DNA sequence identity for species and genus
- DNA and amino acid identity for subfamilies
- Shared (predicted) protein content and organisation at family & order level
- Supported at all ranks by phylogenies of signature genes

*Syst. Biol.* 69(1):110–123, 2020

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## **Analysis of Spounaviruses as a Case Study for the Overdue Reclassification of Tailed Phages**

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# Progress of the last 3 years

Expansion in membership to be more diverse with regional representatives from across the globe

Changes ratified since 2017:

- Name change of prokaryotic virus genera to be euphonious
- New and reclassified taxa:
  - 1 order
  - 12 families
  - 464 genera
  - 1084 species

New submissions in 2020:

2020	species	genus	subfamily	family	order	class	phylum	kingdom	realm
<b>Abolish</b>	20	2	0	0	0	0	0	0	0
<b>Create new</b>	1328	781	38	20	3	1	1	1	1
<b>Create new; assign as type species</b>	737	0	0	0	0	0	0	0	0
<b>Move</b>	77	46	9	1	1	0	0	0	0
<b>Move; rename</b>	3	2	0	0	0	0	0	0	0
<b>Promote</b>	0	0	1	0	0	0	0	0	0
<b>Rename</b>	32	8	0	1	1	1	0	0	0

# Software used by the Subcommittee

(non-exhaustive list)

**GRAViTy:** <http://gravity.cvr.gla.ac.uk>

Aiewsakun, P. & Simmonds, P. The genomic underpinnings of eukaryotic virus taxonomy: creating a sequence-based framework for family-level virus classification. *Microbiome* **6**, 38 (2018).

**vConTACT2:** <https://bitbucket.org/MAVERICLab/vcontact2/src/master/>

Jang, H. Bin *et al.* Taxonomic assignment of uncultivated prokaryotic virus genomes is enabled by gene-sharing networks. *Nat. Biotechnol.* **37**, 632–639 (2019).

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Turner D, Reynolds D, Seto D, Mahadevan P. CoreGenes3.5: a webserver for the determination of core genes from sets of viral and small bacterial genomes. *BMC Res Notes.* **6**, 140 (2013).

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Moraru, C., Varsani, A. & Kropinski, A. M. VIRIDIC – a novel tool to calculate the intergenomic similarities of prokaryote-infecting viruses. *bioRxiv* (2020). doi:10.1101/2020.07.05.188268

**VICTOR:** <https://ggdc.dsmz.de/victor.php> (Be advised: taxonomic predictions by this tool do not always correspond with ICTV)

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# **Balázs Harrach**

**Chair – Animal DNA Viruses and  
Retroviruses Subcommittee**

Animal DNA Viruses and Retroviruses	2015	2016	2017	2018	2019	2020		Report chapter
<i>Adenoviridae</i> Mária Benkő	+	12s	12s	-	6s	1g 6s	streamlined	2020 revision
<i>Anelloviridae</i> Arvind Varsani	+	-	-	2g 8s	-	17g 89s	streamlined	?
<i>Ascoviridae</i> Xiao-Wen Cheng	+	rn	-	-	-	-		2017
<i>Asfarviridae</i> (1 sp) Alonso Covadonga	-	-	-	-	-	-		2018
<i>Baculoviridae</i> Robert Harrison	+	11s	2s	8s	8s 1rn	1s	streamlined	2018
<i>Nudiviridae</i>				-	-	3g 8s	streamlined	2020
<i>Bidnaviridae</i> (1 sp) Mart Krupovic		-	-	-	-	-		?
<i>Circoviridae</i> Arvind Varsani	-	19s rn	4s	13s	7s	8s	streamlined	2017 updated 2018
<i>Hepadnaviridae</i> Lars Magnius	+	3s	2s	1s	3g 3s	1corr	streamlined	2020
hepatitis delta virus				-	-	1r 1f 7g 8s		2018
<i>Herpesvirales</i> Andrew Davison	+	-	1s	18s	-	4g 8s 2m	streamlined	2020?
<i>Hytrosaviridae</i> (2 sp) Adly Abd-Alla	-	-	-	-	2rn	-		2019
<i>Iridoviridae</i> Gregory Chinchar	+	2sf 1s	1s	1g 9s 3abo	-	1g 3s	streamlined	2017 updated 18, 20
<i>Nimaviridae</i> (1 sp) Han-Ching Wang	-	-	-	-	-	-		2019
<i>Papillomaviridae</i> Koenraad Van Doorslaer	+	-	2sf 4g 17s	-	3sf 28g	-		2018
<i>Parvoviridae</i> Judit Péntzes	-	6s	17s	1s	1sf 43s	3g 20s	streamlined	2019
<i>Polydnaviridae</i> (53 sp) Michael Strand	-	-	-	-	-	-		?
<i>Polyomaviridae</i> Bernhard Ehlers	+	4s	8s	10s 1rn	4s	2g 15s	streamlined	2017 updated 18, 20
<i>Poxviridae</i> Geoffrey Smith	+	1g 2s	-	-	8g 13s 1rn	-		?
<i>Retroviridae</i> Johnson, Welkin	-	2s	4g 13s	1s 1cor 1abo	-	-		2020 under review
		2sf 1g 60s						
<i>Ortervirales</i> Mart Krupovic			1o	-	-	-		not a family
<i>Belpaoviridae</i> (in Ortervirales SG) Carlos Llorens			1f 3s	-	-	-		2020 Oct/Nov
<i>Smacoviridae</i> (in Circoviridae SG) Arvind Varsani			1f 6g 43s	-	-	6g 41s	streamlined	?
			1o 2f 2sf					
			14g 119s					
				3g 69sp				
<i>Redondoviridae</i> Arwa Abbas					1f 2g	-		2020 reviewed
<i>Cressdnaviricota</i> Mart Krupovic					1ph	-		not a family
					1ph 1f 4sf			
					41g 84s			
<i>Metaviridae</i> (in Ortervirales SG) Carlos Llorens						-		2020 proof
<i>Pseudoviridae</i> (in Ortervirales SG) Carlos Llorens						-		2020 under review
<i>Adintoviridae</i> Michael Tisza/Christopher Buck						1c 1o 1f 2g 2s		2021?
<i>Naldaviricetes</i> Robert Harrison						1c 1o		not a family
						1r 2c 2o 2f 44g 209s		

**Jens Kuhn**

**Chair – Animal dsRNA and ssRNA-  
Viruses Subcommittee**

## ss(-)RNA and dsRNA Virus Taxa

- Inclusion of all established taxa into a new hierarchical framework including realm, kingdom, phyla, and classes
- Expansion of non-Latinized binomial species names to all taxa except dsRNA viruses and *Orthomyxoviridae* (e.g., *Puumala orthohantavirus*)
- Adoption of first sequence-based species demarcation criteria for *Nairoviridae*, *Peribunyaviridae*, and *Phenuiviridae*
- Regular communication of all taxonomic changes (with exception of dsRNA viruses) via Archives of Virology Virology Division News articles

Year	Realm	Kingdom	Phyla	Classes	Orders
2017	0	0	0	0	2
2018	0	0	1	6	7
2019	1	0	1	6	8
2020	1	1	3	8	9

## On the Horizon (2020 Onwards)

- Expansion and refinement/standardization of nomenclature in *Reovirales*
- Dramatic expansion and reorganization of *Orthomyxoviridae* and related articlavirals
- Adoption of species demarcation criteria for *Hantaviridae* and *Lispiviridae*
- Further development of the taxonomy of *Jingchuvirales*
- Adoption of a uniform species naming format for all virus species → renaming of almost all species names
- Declassification of all viruses for which coding-complete genome sequence is not available?
- Development of etymologies and pronunciation guidelines for all taxa and classified viruses
- Step-wise elimination of duplicate virus name abbreviations

# **Nick Knowles**

**Chair – Animal ssRNA+ Viruses  
Subcommittee**



# Animal ssRNA+ Viruses Subcommittee

Chair: Nick J. Knowles

The Pirbright Institute, Pirbright, Woking, Surrey, United Kingdom

# Subcommittee Members

## Study Group

*Alpha-, Carmo-, and Permuto- tetraviridae*

*Arteriviridae*

*Astroviridae*

*Caliciviridae*

*Coronaviridae*

*Dicistroviridae/Iflaviridae*

*Flaviviridae*

*Hepeviridae*

*Mesoniviridae*

*Nidovirales*

*Nodaviridae*

*Picornavirales*

*Picornaviridae*

*Roniviridae*

*Togaviridae*

## Chair

Rosemary A. Dorrington,

Margo A. Brinton

Simon J. Anthony

Jan Vinjé

John Ziebuhr

Steven M. Valles

Rebecca Rico-Hesse

Michael A. Purdy

Alexander E. Gorbalenya

Alexander E. Gorbalenya

A.S. Sahul Hameed

Peter Simmonds

Roland Zell

Nick Moody/Peter Walker

Rubing Chen

## Country

South Africa

USA

USA

USA

Germany

USA

USA

USA

Netherlands

Netherlands

India

UK

Germany

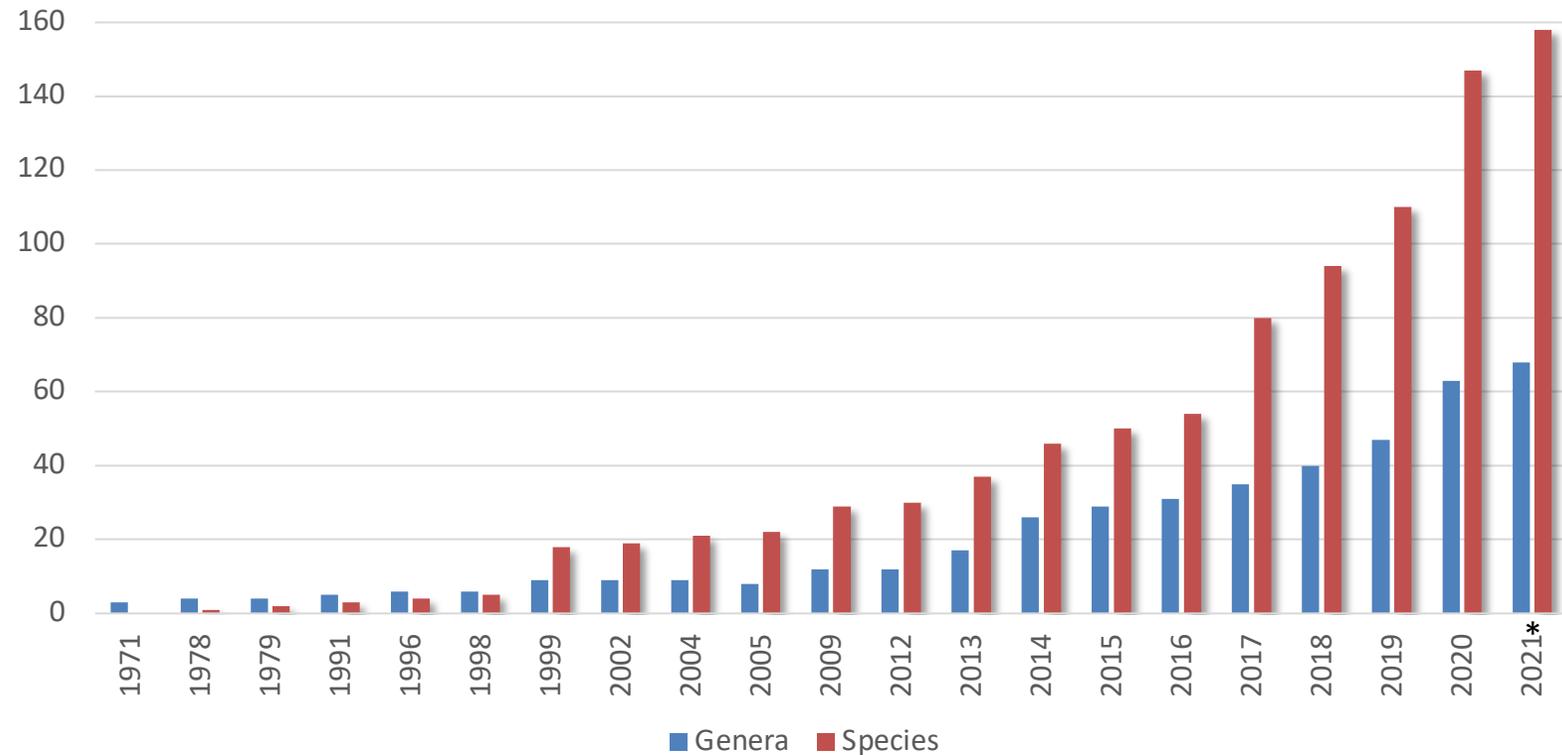
Australia

USA

# Main Taxonomic Changes: 2018 to 2020

- New family, *Polycipiviridae*, containing 3 genera within the order *Picornavirales*
- *Caliciviridae* now included in the order *Picornavirales*
- 6 new genera created in the *Caliciviridae*
- *Rubella virus* moved from the *Togaviridae* and placed in a new family, *Matonaviridae*
- Major reorganisation of the order *Nidovirales* resulting in 14 families contain 25 subfamilies, 39 genera, 65 subgenera and 109 species
- 28 new genera containing 67 new species created in the *Picornaviridae*
- Taxon levels of Realm, Kingdom, Phylum and Class created for all positive-sense ssRNA animal viruses

# Cumulative increase in the number of *Picornaviridae* genera & species



\* Includes proposed taxa

**Peter Simmonds**

**Chair – Fungal and Protist Viruses  
Subcommittee**

# Study Groups

## Current Study Groups

<b>Family</b>	<b>SG Chair</b>	<b>Country</b>	<b>ICTV Report</b>
<i>Barnaviridae</i>	Peter Revill	Australia	
<i>Botourmiaviridae</i>	Maria Ayllon	Spain	Yes
<i>Chrysoviridae</i>	Robert Coutts	UK	Yes
<i>Hypoviridae</i>	Nobuhiro Suzuki	Japan	Yes
<i>Marnaviridae</i>	Andrew Lang	Canada	
<i>Marseilleviridae</i>	Phillipe Colson	France	
<i>Mimiviridae</i>	Matthias Fischer	Germany	
<i>Narnaviridae</i>	Bradley Hillman	USA	
<i>Partitiviridae</i>	Eeva Vainio	Finland	Yes
<i>Phycodnaviridae</i>	James van Etten	USA	
<i>Totiviridae</i>	Max Nibert	USA	

## Fungal virus families without Study Groups:

<i>Megabirnaviridae</i>	<i>Quadriviridae</i>	<i>Endornaviridae</i>
<i>Bacilladnaviridae</i>	<i>Lavidaviridae</i>	<i>Mycodnaviridae</i>
<i>Botybirnaviridae</i>		

# Main Taxonomic Changes: 2018 to 2020

- 2020
  - Creation of the new virus family, *Curvulaviridae* (bipartite sdRNA)
  - Expansion of the *Botourmiaviridae*
  - Expansion of *Mymonoviridae*
  - Classification of fungal viruses in the *Genomoviridae* family
- 2019
  - Creation of new family, *Polymycoviridae*, 4-8 segments, dsRNA
  - Expansion and reorganization of *Chysoviridae* and *Marnaviridae*
- 2018
  - Creation of new family, *Ourmiaviridae*, bipartite dsRNA
  - Expansion and reorganization of *Chysoviridae* and *Marnaviridae*

**Murilo Zerbini**

**Chair – Plant Viruses  
Subcommittee**

# Update from the Plant Virus Sub-Committee

2017-2020



# Plant Virus Sub-Committee (2017-2020)

Zerbini, F. Murilo	Plant Virus Subcommittee - Chair	Brazil
Kreuze, Jan	<i>Alphaflexiviridae</i> Study Group - Chair	Peru
Sabanadzovic, Sead	<i>Amalgaviridae</i> Study Group - Chair	USA
García, Maria Laura	<i>Aspiviridae</i> Study Group - Chair	Argentina
Di Serio, Francisco	<i>Avsunviroidae</i> and <i>Pospiviroidae</i> Study Group - Chair	Italy
Tzanetakis, Ioannis	<i>Beta-, Gamma- and Deltaflexiviridae</i> Study Group - Chair	USA
Gallitelli, Donato	<i>Bromoviridae</i> Study Group - Chair	Italy
Teycheney, Pierre-Yves	<i>Caulimoviridae</i> Study Group - Chair	France
Fuchs, Marc	<i>Closteroviridae</i> Study Group - Chair	USA
Valverde, Rodrigo	<i>Endornaviridae</i> Study Group - Chair	USA
Elbaino, Toufic	<i>Fimoviridae</i> Study Group - Chair	Italy
Fiallo-Olivé, Elvira	<i>Geminiviridae</i> and <i>Tolecusatellitidae</i> Study Group - Chair	Spain
Melzer, Michael	<i>Kitaviridae</i> Study Group - Chair	USA
Miller, W Allen	<i>Luteoviridae</i> Study Group - Chair	USA
Thomas, John E	<i>Nanoviridae</i> Study Group - Chair	Australia
Wylie, Steve	<i>Potyviridae</i> Study Group - Chair	Australia
Karasev, Alexander	<i>Secoviridae</i> Study Group - Chair	USA
Somera, Merike	<i>Solemoviridae</i> Study Group - Chair	Estonia
Sasaya, Takahide	<i>Tenuivirus</i> Study Group - Chair	Japan
Scheets, Kay	<i>Tombusviridae</i> Study Group - Chair	USA
Adkins, Scott	<i>Tospoviridae</i> Study Group - Chair	USA
Hammond, Rosemarie	<i>Tymoviridae</i> Study Group - Chair	USA
Ryu, Ki Hyun	<i>Virgaviridae</i> and <i>Benyvirus</i> Study Group - Chair	Korea

**23 members**

17 M

6 F

10 North Am

6 Europe

3 South Am

2 Asia

2 Australasia

# Plant virus chapters of the ICTV Report

Published/updated in 2018-2020: *Alphaflexiviridae*

*Aspiviridae*

*Avsunviroidae*

*Botourmiaviridae*#

*Bromoviridae*

*Caulimoviridae*

*Closteroviridae*

*Endornaviridae*

*Fimoviridae*

*Geminiviridae*

*Potyviridae*

*Secoviridae*

To be published soon:

*Nanoviridae*

*Pospiviroidae*

*Solemoviridae*

# Together with Fungal and Protists

# Changes to the taxonomy since 2017

**75** plant virus Taxonomy Proposals ratified in 2018, 2019, 2020

## **Creation of new taxa**

5 families, 5 sub-families, 25 genera, 361 species

## **New families**

*Alphasatellitidae, Deltaflexiviridae, Kitaviridae, Mayoviridae, Solemoviridae*

## **Creation of a second family of ssDNA satellites**

Family *Alphasatellitidae* (two subfamilies, 11 genera, 71 species)

## **Major reorganizations/updates**

*Tombusviridae, Tospoviridae*

## **All plant virus families classified in the four Realms**

Only DNA satellites and viroids not classified

# Proposals under consideration at EC52 (for 2021 ratification vote)

**36** plant virus Taxonomy Proposals

## **New taxa**

Family *Metaxyviridae* (one genus, one species)

Subfamily *Petromopalphasatellitinae* (four genera, seven species)

Nine new genera (*Alphasatellitidae*, *Caulimoviridae*, *Geminiviridae*)

164 new species

## **R.I.P. *Luteoviridae***

Its three genera will be reassigned to *Tombusviridae* and *Solemoviridae*

**All proposals posted on the ICTV website**