



ICTV Newsletter #16 (2019)

This newsletter is aimed at keeping all who are interested in the International Committee on Taxonomy of Viruses (ICTV) up to date on recent developments. It is available publicly on the ICTV website and is sent to all those who have joined the ICTV discussion site. To register on this site, navigate to <https://ictv.global/> and click the "Login/Join" tab. Once registered, sign in using the name and password that you provided. If you are already registered, **please make sure your contact information is up to date.** You can do this by clicking on "Profile" via the login icon in the upper right-hand corner. Comments and suggestions on the newsletter are welcome. This edition, which covers the period from September 2018, and previous editions are available [here](#).

Executive Committee (EC) activities

EC51

The 51st annual EC meeting (EC51) was held on 15-17 July in Berlin, Germany and was hosted by Stuart Siddell. This was the second regular meeting of the EC that had been elected at the ICTV plenary meeting in Singapore in July 2017. The two-and-a-half-day meeting was attended by all nineteen EC members, as well as by Donald Smith, Managing Editor of the ICTV Report, and Richard Orton, Technical Editor of the ICTV Report, who are both supported by a Wellcome Trust bioresources grant. The President welcomed, in particular, Prof. Peter Walker to his first meeting as Proposals Secretary.

In addition to a sizeable number of taxonomic proposals, the agenda included issues surrounding:

- ICTV finances (presented by Andrew Davison)
- the ICTV Report (Elliot Lefkowitz and Donald Smith)
- the ICTV web site (Elliot Lefkowitz)
- the taxonomic database and browser (Elliot Lefkowitz)
- the Virus Metadata Resource (Stuart Siddell)
- the Virology Division News (Sead Sabanadzovic)

- a review of procedures for nominating and electing EC members (Arcady Mushegian)
- a review of the composition and structure of the EC and ICTV (Andrew Davison)
- a review of EC procedures and proposed changes to the Statutes and Code (Andrew Davison and Arcady Mushegian), and
- a review of revised procedures for processing taxonomic proposals (Andrew Davison).

Of note, the EC discussed extensively four topics of unusual importance:

1. A binomial nomenclature for virus species. A detailed proposal to adopt a latinized binomial system for virus species names was presented. Because of the importance and far-reaching consequences of this proposal, the EC decided to produce a detailed consultation document that presents the advantages and disadvantages of a variety of binomial formats, and to publish this document in the Virology Division News section of Archives of Virology. At the same time, the EC decided to set up an online forum and to invite all virologists to comment. The EC will take these opinions into account in making a final decision on the proposal at its annual meeting in 2020.

2. A number of detailed proposals to create higher rank taxa that would encompass the majority of DNA and RNA viruses. The EC discussed these proposals at length and decided to ask for them to be revised in light of these discussions and to solicit further opinions from all the relevant Study Groups (SGs) involved. The EC will take these opinions into account when it takes further action later this year.

3. The further development of an online proposal submission system (TPMS). A new version of the TPMS to deal with proposals at the species, genus and family ranks, and to produce an automated proposal Excel Module was presented. Significant progress in the development of the system was noted and further improvements in the functionality and implementation of the system were suggested. The EC hopes that the system will be available to aid in the production of taxonomic proposals next year.

4. The creation of a new Subcommittee (SC) to deal with viruses that infect Archaea (previously dealt with by the Bacterial and Archaeal Virus SC). This was in recognition of:

- the number of sequenced archaeal viruses is increasing significantly
- the diversity of archaeal viruses requires dedicated SGs to track progress and develop the taxonomy, and
- most groups of archaeal viruses are no more closely related to bacterial viruses than they are to eukaryotic viruses.

The EC approved this proposal and unanimously proposed Mart Krupovic as Chair. This change will be implemented in 2020 if approved by the IUMS Virology Division.

In addition, the EC approved the minutes of the previous Annual Meeting (EC50) held in Washington in 2018, an Executive Summary of which is available on the ICTV website ([here](#)).

Recent progress with taxonomic proposals

Ratification of proposals

All proposals approved by the EC need to be ratified by the entire voting membership of the ICTV for final acceptance. The ICTV membership includes the National Representatives, the members of the SCs (predominantly the SG chairs), and the Life Members.

At its meeting in Washington (EC50, July 2018), the EC approved a total of 225 taxonomic proposals. Of these, 9 were of particular significance and the EC decided that the ratification of these proposals should be expedited by an exceptional ratification vote of the ICTV, which was held in October 2018. With this vote, the ICTV has approved, by an absolute majority, the proposal to create additional taxonomical ranks in addition to those recognized previously. A total of 15 ranks (realm, subrealm, kingdom, subkingdom, phylum, subphylum, class, subclass, order, suborder, family, subfamily, genus, subgenus, and species) are now available to encompass the entire spectrum of virus diversity. Classification at ranks above genus is not obligatory but can be used by the authors of new taxonomic proposals when scientific justification is provided.

At the same time, the ICTV ratified 8 further proposals that utilize some of the newly created ranks, primarily in the taxonomy of negative-strand RNA viruses and in the reorganisation of taxa in the order *Nidovirales*. An article reporting the taxonomic changes ratified in October 2018 is available [here](#) (see summary in Table 1).

| Rank | New | Abolish | Move | Rename | Total MSL33^a |
|-------------|------------|----------------|-------------|---------------|------------------------------------|
| Phylum | 1 | 0 | 0 | 0 | 1 |
| Subphylum | 2 | 0 | 0 | 0 | 2 |
| Class | 6 | 0 | 0 | 0 | 6 |
| Order | 5 | 0 | 2 | 0 | 14 |
| Suborder | 7 | 0 | 0 | 0 | 7 |
| Family | 15 | 3 | 21 | 0 | 143 |
| Subfamily | 18 | 0 | 2 | 1 | 64 |
| Genus | 50 | 7 | 73 | 3 | 846 |
| Subgenus | 59 | 0 | 0 | 0 | 59 |
| Species | 107 | 2 | 504 | 43 | 4,958 |

^aTotal number of taxa in the ICTV Master Species List MSL33

Furthermore, a total of 216 taxonomic proposals from 2018 were ratified by the ICTV membership in February 2019. Notably, these proposals included the creation of seven new virus families, and the creation of the realm *Riboviria*, a likely monophyletic group encompassing all viruses with positive-strand, negative-strand and double-strand RNA genomes that use virus -encoded RNA-directed RNA polymerases for replication. An article reporting the taxonomic changes ratified in February 2019 is available [here](#) (see summary in Table 2).

| Table 2. Summary of taxonomic changes ratified in February 2019 | | | | | | |
|---|------------|----------------|---------------|--------------|--------------|------------------------------------|
| Rank | New | Abolish | Rename | Merge | Split | Total MSL34^a |
| Realm | 1 | 0 | 0 | 0 | 0 | 1 |
| Phylum | 0 | 0 | 0 | 0 | 0 | 1 |
| Subphylum | 0 | 0 | 0 | 0 | 0 | 2 |
| Class | 0 | 0 | 0 | 0 | 0 | 6 |
| Order | 0 | 0 | 0 | 0 | 0 | 14 |
| Suborder | 0 | 0 | 0 | 0 | 0 | 7 |
| Family | 7 | 0 | 0 | 0 | 0 | 150 |
| Subfamily | 15 | 0 | 0 | 0 | 0 | 79 |
| Genus | 175 | 0 | 137 | 0 | 2 | 1019 |
| Subgenus | 0 | 0 | 0 | 0 | 0 | 59 |
| Species | 614 | 11 | 59 | 2 | 0 | 5,560 |

^aTotal number of taxa in the ICTV Master Species List MSL34

The latest version of the official virus taxonomy can be downloaded as the ICTV [Master Species List MSL34](#).

Any virologist can make proposals to the ICTV via the appropriate SC chair, preferably in consultation with the relevant SG. New proposals that have been submitted recently for discussion at EC52 can be examined [here](#). All TPs were prepared using substantially revised templates that now include a summary table of taxonomic changes ([available here](#)).

ICTV publications

The ICTV web site

The ICTV is charged with the task of developing, refining and maintaining a universal virus taxonomy. This task encompasses classifying virus species and higher-level taxa, naming the taxa, maintaining a database detailing the currently approved taxonomy, and providing the database, supporting proposals and other virus-related information from an open-access, public web site.

The ICTV web site, ictv.global, provides access to the current taxonomy database in online and downloadable formats, and maintains a complete [history](#) of virus taxa dating back to the first release in 1971. The following references can be used to cite the taxonomic proposals that have been ratified in 2018 and 2019:

Siddell, S.G., Walker, P.J., Lefkowitz, E.J., et al., 2019. Additional changes to taxonomy ratified in a special vote by the International Committee on Taxonomy of Viruses (October 2018). *Arch. Virol.* 164, 943–946. doi.org/10.1007/s00705-018-04136-2

Walker, P.J., Siddell, S.G., Lefkowitz, E.J., et al., 2019. Changes to virus taxonomy and the International Code of Virus Classification and Nomenclature ratified by the International Committee on Taxonomy of Viruses (2019). *Arch. Virol.* 164:2417-2429. doi: 10.1007/s00705-019-04306-w

The ICTV Report and Profiles

This ICTV Report ([here](#)) is published online as a completely open-access, continuously updated publication. It provides a comprehensive description of all virus taxa and includes extensive information on virus structure, genome structure, biology and phylogenetics. Currently, the ICTV Report includes about 60 chapters that update chapters published in the previous ICTV Report (the 9th, 2011), and further chapters are being added at a rate of approximately two per month.

In addition, summaries of the ICTV Report chapters are published in a special section of the *Journal of General Virology*, ICTV Virus Taxonomy Profiles ([here](#)). These profiles provide concise, review-type articles of individual chapters from the ICTV Report. Written by ICTV SGs, these reviews provide overviews of the classification, structure and properties of individual virus orders, families and genera. The summaries are linked to the ICTV Report chapters and are indexed in PubMed. The EC has also discussed the possibility of producing a printable (PDF) version of the ICTV Report chapters.

Virus Metadata Resource (VMR)

The VMR is a downloadable spreadsheet that provides information on exemplar and additional viruses for each species. This information includes virus names, isolate designations and abbreviations, GenBank and RefSeq accession numbers, genome composition and coverage, and the type of host. The current version can be accessed [here](#).

Virology Division News (VDN)

The VDN section of Archives of Virology remains an important open-access vehicle for freely communicating ICTV news to the virology community and beyond. Reports and articles that deal with the development of virus taxonomy should be sent to VDN, with a clear indication of whether the article presents changes officially recognised by the ICTV, the substance of taxonomic proposals currently being considered by the ICTV, or informal suggestions for discussion. Many articles of taxonomic interest have been published in VDN in 2018 and 2019 and a list of available articles can be viewed [here](#).

Persons

Dr Michael J Adams has been elected as a Life Member of the ICTV, following nomination by the President, recommendation by the Executive Committee, and ratification by the ICTV membership. Mike was involved in the work of the ICTV in many different roles from 2001, and most recently served as ICTV Business Secretary from 2011 until 2017. We wish him all the best in his retirement.

The chair of the Bacterial and Archaeal Virus SC, Andrew Kropinski, has decided to step down in February 2020. The EC unanimously approved the appointment of Dr Evelien M Adriaenssens as the interim chair until the plenary meeting of the ICTV in October 2020.

Meetings

The ICTV co-sponsors meetings that address current developments in virus taxonomy. This includes focussed meetings funded by a Wellcome Trust bioresources grant. The next meeting is planned to take place in Oxford, UK, in April 2020. This meeting will address aspects such as the evaluation of informative characters in virus taxonomy and the relationship between bacterial and eukaryotic virus taxonomies. Meeting information is available [here](#).

The next annual meeting of the EC (EC52) will take place in Daejeon, South Korea in October 2020.

Funding

The ICTV is very grateful to IUMS Virology Division, the American Society for Virology, the Microbiology Society, and the Wellcome Trust for generous support.

Important links

[Main Website for ICTV](#)

[ICTV virus taxonomy database: current classification and history of each taxon since 1971](#)

[The current MSL](#)

[The current VMR](#)

[Templates for taxonomic proposals](#)

[The ICTV Report](#)

Problems, comments and questions

As always, comments and suggestions are welcome. To ensure efficient distribution of this and other information, we again ask you to keep your personal information up to date at the ICTV web site. In particular, **if you are a National Representative**, please make sure that all the appropriate information is on the web site, and also send a note to Arcady Mushegian (mushegian2@gmail.com) to inform him of any changes.

Editor: Stuart Siddell