Summary of taxonomy changes ratified by the International Committee on Taxonomy of Viruses (ICTV) from the 2026 Archaeal viruses Subcommittee

Contents

2025.001A.Ac.v3.crust_viruses_6nf

Title: Create 6 new families and 1 new species of viruses infecting archaea found in basalt-hosted crustal fluid

Authors: Cherise R Spotkaeff, Michael S Rappe, Grieg Steward, Olivia D Nigro

Summary:
Taxonomic rank(s) affected:
Families, genera, species

Description of current taxonomy:
Currently, there are 34 families in the class *Caudoviricetes* of archaea-infecting viruses, one representative in the genus *Yumkaaxvirus* and eight defined families of spindle-shaped viruses.

Proposed taxonomic change(s):
Create 6 new families and 1 new species for archaea-infecting viruses with predicted spindle, rod (realm: *Adnaviria),* and head-tail like (realm: *Duplodnaviria)* morphologies, identified in pristine crustal fluid collected from CORKs (Circulation Obviation Retrofit Kits).

Justification:
Though the proposed viruses share hallmark genes of their characterized taxa, they share little other genomic similarity with classified viruses. Through a combination of methods including gene-sharing network construction, analysis of gene synteny, VIPTree proteomic analysis, terminase and PolB phylogenetic reconstruction, and previously established demarcation criteria for prokaryotic viruses (specifically, for archaeal tailed viruses), we propose the classification of 11 archaea-infecting viruses for which complete genome sequences are available.

Submitted: 17/06/2025; *Revised:* 24/08/2025

TABLE 1 – *crust viruses*, 23 new taxa*

Operation	Rank	New taxon name	Virus name	Exemplar
New taxon	Family	*Basaltiviridae*		
New taxon	Genus	*Tsigisvirus*		
New taxon	Species	*Tsigisvirus beckeri*	Bathyarchaeota virus JdFR006	PQ111734
New taxon	Species	*Tsigisvirus orcuttae*	Archaeal virus JdFR013	PQ111735
New taxon	Species	*Yumkaaxvirus juandefucaense*	Archaeal virus JdFR077	PQ111746
New taxon	Family	*Seadebiviridae*		
New taxon	Genus	*Hacxwiqakvirus*		

New taxon	Species	*Hacxwiqakvirus coweni*	Archaeal virus JdFR009	PQ111736
New taxon	Species	*Hacxwiqakvirus wheati*	Bathyarchaeota virus JdFR012	PQ111737
New taxon	Species	*Hacxwiqakvirus orphanae*	Archaeal virus JdFR114	PQ111738
New taxon	Family	*Altumviridae*		
New taxon	Genus	*Calorvirus*		
New taxon	Species	*Calorvirus huberae*	Archaeoglobus virus JdFR416	PQ111739
New taxon	Species	*Calorvirus bachi*	Uncultured archaeal virus isolate JdFR1000234	KY229235
New taxon	Family	*Jasonviridae*		
New taxon	Genus	*Obscurovirus*		
New taxon	Species	*Obscurovirus verheini*	Archaeal virus JdFR019	PQ111740
New taxon	Family	*Infernusviridae*		
New taxon	Genus	*Tanggwanvirus*		
New taxon	Species	*Tanggwanvirus davisi*	Archaeal virus JdFR002	PQ111741
New taxon	Family	*Tenebraviridae*		
New taxon	Genus	*Caldusvirus*		
New taxon	Species	*Caldusvirus fisheri*	Archaeoglobus virus JdFR005	PQ111742

2025.002A.Ac.v3.Archaeal_Caudoviricetes_8nf

Title: Eight new families of archaeal viruses within the class *Caudoviricetes*

Authors: Yifan Zhou, Ana Gutiérrez-Preciado, David Moreira, Michail M. Yakimov, Purificación López-García, Mart Krupovic

Summary:
Taxonomic rank(s) affected:
Families, genera, species

Description of current taxonomy:
Head-tailed viruses infecting halophilic archaea (class Halobacteria) are currently classified into 12 families within class *Caudoviricetes,* whereas viruses infecting nanohaloarchaeal hosts (candidate phylum Nanohaloarchaeota) remain unclassified.

Proposed taxonomic change(s):
We propose classifying 14 head-tailed viruses associated with haloarchaeal and nanohaloarchaeal hosts into 14 new species within 13 new genera, which are assigned to 8 new families and 3 existing families within the class *Caudoviricetes.*

Justification:
The classification is based on the proteome-wide phylogenomic analysis implemented in VipTree and further supported by comparative genomics analysis.

Submitted: 20/06/2025; *Revised:* 24/08/2025

TABLE 2 – *Archaeal viruses*, 35 new taxa*

Operation	Rank	New taxon name	Virus name	Exemplar
New taxon	Family	*Danacaviridae*		
New taxon	Genus	*Gablavirus*		
New taxon	Species	*Gablavirus danakilense*	Danakil Halobacteriales tailed virus 1	PQ827553

New taxon	Family	*Dallocaviridae*		
New taxon	Genus	*Kalovirus*		
New taxon	Species	*Kalovirus danakilense*	Danakil Halobacteriales tailed virus 2	PQ827554
New taxon	Family	*Assalcaviridae*		
New taxon	Genus	*Karumvirus*		
New taxon	Species	*Karumvirus danakilense*	Danakil Halobacteriales tailed virus 6	PQ827558
New taxon	Family	*Quasboviridae*		
New taxon	Genus	*Cusbovirus*		
New taxon	Species	*Cusbovirus danakilense*	Danakil Halobacteriales tailed virus 8	PQ827560
New taxon	Family	*Gulliviridae*		
New taxon	Genus	*Lemuelvirus*		
New taxon	Species	*Lemuelvirus danakilense*	Danakil Nanohaloarchaeota tailed virus 1	PQ827565
New taxon	Genus	*Latyvirus*		
New taxon	Species	*Latyvirus nanohalovivens*	Lake Tyrrell virus 2	AKVG01000002
New taxon	Family	*Lilliviridae*		
New taxon	Genus	*Mildendovirus*		
New taxon	Species	*Mildendovirus danakilense*	Danakil Nanohaloarchaeota tailed virus 2	PQ827566
New taxon	Family	*Blefusviridae*		
New taxon	Genus	*Wecalvirus*		
New taxon	Species	*Wecalvirus danakilense*	Danakil Nanohaloarchaeota tailed virus 3	PQ827567
New taxon	Family	*Saladoviridae*		
New taxon	Genus	*Crypovirus*		
New taxon	Species	*Crypovirus alicantense*	environmental halophage eHP-23	JQ807243
New taxon	Species	*Crypovirus chilense*	Grande Nanohaloarchaeota tailed virus 1	LMAX01000001
New taxon	Genus	*Morpovirus*		
New taxon	Species	*Morpovirus danakilense*	Danakil Halobacteriales tailed virus 4	PQ827556
New taxon	Genus	*Traglyvirus*		
New taxon	Species	*Traglyvirus danakilense*	Danakil Halobacteriales tailed virus 5	PQ827557
New taxon	Genus	*Haroovirus*		
New taxon	Species	*Haroovirus danakilense*	Danakil Halobacteriales tailed virus 7	PQ827559
New taxon	Genus	*Ethicavirus*		
New taxon	Species	*Ethicavirus danakilense*	Danakil Halobacteriales tailed virus 3	PQ827555

2025.003A.Ac.v3.Tailless_icosahedral_2nf

Title: Two new families of tailless icosahedral archaeal viruses

Authors: Yifan Zhou, Ana Gutiérrez-Preciado, David Moreira, Michail M. Yakimov, Purificación López-García, Mart Krupovic

Summary:
Taxonomic rank(s) affected:
Orders, families, genera, species

Description of current taxonomy:
Class *Laserviricetes* currently includes one order, *Halopanivirales,* with 3 families of viruses infecting halophilic archaea of the class Halobacteria *(Simuloviridae* and *Sphaerolipoviridae)* and thermophilic bacteria of the genus *Thermus (Matsushitaviridae).*

Proposed taxonomic change(s):
Create two new monotypic orders, *"Salinicovirales"* and *"Ducavirales",* for classification of viruses associated with haloarchaea (new family *"Halicoviridae")* and nanohaloarchaea (new family *"Nanicoviridae"),* respectively.

Justification:
The two recently discovered viruses encode divergent single jelly-roll major capsid proteins, justifying their inclusion in the *Singelaviria* realm. However, their relationship to each other as well as to currently known members of the order *Halopanivirales* is very distant, detectable only through sensitive profile-profile comparisons and structure-based searches. Consistently, VipTree analysis showed that both viruses form distinct branches in the proteome-wide phylogenomic tree.

Submitted: 20/06/2025; *Revised:* 24/08/2025

TABLE 3 – *Tailless viruses*, 8 new taxa*

Operation	Rank	New taxon name	Virus name	Exemplar
New taxon	Order	*Salinicovirales*		
New taxon	Family	*Halicoviridae*		
New taxon	Genus	*Ertavirus*		
New taxon	Species	*Ertavirus danakilense*	Danakil Halobacteriales icosahedral virus 1	PQ827550
New taxon	Order	*Ducavirales*		
New taxon	Family	*Nanicoviridae*		
New taxon	Genus	*Alevirus*		
New taxon	Species	*Alevirus danakilense*	Danakil Nanohaloarchaeota icosahedral virus 1	PQ827561

2025.004A.Ac.v3.Pleomorphic_1nf_2ns

Title: Create one new family and two new species within order *Haloruvirales*

Authors: Yifan Zhou, Ana Gutiérrez-Preciado, David Moreira, Michail M. Yakimov, Purificación López-García, Mart Krupovic

Summary:
Taxonomic rank(s) affected:
Families, genera, species

Description of current taxonomy:
Monodnavirian kingdom *Trapavirae* currently comprises two families, *Pleolipoviridae* (phylum *Saleviricota,* class *Huolimaviricetes,* order *Haloruvirales)* (Liu et al., 2022), which includes haloarchaeal viruses with enveloped pleomorphic virions and single-stranded (ss) or double-stranded (ds) DNA genomes, and *Thalassapleoviridae* (phylum *Calorviricota,* class *Caminiviricetes,*

order *Ageovirales)* (Baquero et al., 2024), which contains pleomorphic viruses infecting hyperthermophilic anaerobic archaea of the class Archaeoglobi. Both families comprise three genera.

Proposed taxonomic change(s):
We propose creating one new species within genus *Betapleolipovirus* (family *Pleolipoviridae)* and one new family, *"Nanopleoviridae",* within the order *Haloruvirales,* for classification of viruses associated with archaea of the candidate phylum Nanohaloarchaeota.

Justification:
Previously established demarcation criteria for the family *Pleolipoviridae* suggested that Danakil Halobacteriales pleomorphic virus 1 should be placed within genus *Betapleolipovirus.* By contrast, Danakil Nanohaloarchaeota pleomorphic virus 1 branched outside of the *Pleolipoviridae,* suggesting that it represents a separate virus family.

Submitted: 20/06/2025; *Revised:* 24/08/2025

TABLE 4 - *Pleomorphic*, 4 new taxa*

Operation	Rank	New taxon name	Virus name	Exemplar
New taxon	Species	*Betapleolipovirus danakilense*	Danakil Halobacteriales pleomorphic virus 1	PQ827551
New taxon	Family	*Nanopleoviridae*		
New taxon	Genus	*Milaagivirus*		
New taxon	Species	*Milaagivirus danakilense*	Danakil Nanohaloarchaeota pleomorphic virus 1	PQ827562

2025.005A.Ac.v3.Spindle-shaped_viruses_2nf_3ns

Title: Create 2 new families of spindle-shaped archaeal viruses

Authors: Yifan Zhou, Ana Gutiérrez-Preciado, David Moreira, Michail M. Yakimov, Purificación López-García, Mart Krupovic

Summary:
Taxonomic rank(s) affected:
Families, genera, species

Description of current taxonomy:
Spindle-shaped viruses of halophilic archaea are currently classified into the family *Halspiviridae,* which includes a single species, *Salterprovirus australiense.* Spindle-shaped archaeal viruses have not been assigned to any higher-level taxonomic rank.

Proposed taxonomic change(s):
We propose creating two new families for the classification of spindle-shaped viruses associated with haloarchaeal and nanohaloarchaeal hosts. The family *"Xigoviridae"* will include a single species, *"Ispindelvirus danakilense",* whereas family *"Lomiviridae"* will include two species, *"Gomizavirus danakilense"* and *"Gomizavirus assalense".*

Justification:
Members of the proposed families *"Xigoviridae"* and *"Lomiviridae"* are not closely related to each other or to previously characterized and classified viruses, justifying the creation of the new families. This conclusion is consistent with VipTree analysis in which the two groups of viruses clustered

separately.

Submitted: 20/06/2025; *Revised:* 24/08/2025

TABLE 5 - *Spindle-shaped viruses*, 7 new taxa*

Operation	Rank	New taxon name	Virus name	Exemplar
New taxon	Family	*Xigoviridae*		
New taxon	Genus	*Ispindelvirus*		
New taxon	Species	*Ispindelvirus danakilense*	Danakil Halobacteriales spindle-shaped virus 1	PQ827552
New taxon	Family	*Lomiviridae*		
New taxon	Genus	*Gomizavirus*		
New taxon	Species	*Gomizavirus danakilense*	Danakil Nanohaloarchaeota spindle-shaped virus 1	PQ827563
New taxon	Species	*Gomizavirus assalense*	Danakil Nanohaloarchaeota spindle-shaped virus 2	PQ827564

2025.006A.Ac.v3.Yamazakiviridae_1nf

Title: Create a new family for classification of a spindle-shaped virus infecting a hyperthermophilic archaeon *Aeropyrum pernix*

Authors: Tomohiro Mochizuki, David Prangishvili, Mart Krupovic

Summary:Taxonomic rank(s) affected:
Family, genus, species

Description of current taxonomy:
Viruses with spindle-shaped virions are classified into 8 families, none of which has been assigned to higher-level taxonomic ranks.

Proposed taxonomic change(s):
We propose classifying Aeropyrum pernix spindle-shaped virus 1 (APSV1) into a new species within a new genus and a new *family, "Yamazakiviridae".*

Justification:
APSV1 is not closely related to other spindle-shaped viruses and in the VipTree proteomic tree the virus formed a separate branch.

Submitted: 25/06/2025; *Revised:* 24/08/2025

TABLE 6 - *Yamazakiviridae*, 3 new taxa*

Operation	Rank	New taxon name	Virus name	Exemplar
New taxon	Family	*Yamazakiviridae*		
New taxon	Genus	*Kodayamazakivirus*		
New taxon	Species	*Kodayamazakivirus kyodaii*	Aeropyrum pernix spindle-shaped virus 1	HE580238