

Template for Taxonomic Proposal to the ICTV Executive Committee To create a new Genus in an existing Family

Code[†] To create a new genus in the family*

Code[†] To name the new genus*

Code[†] To designate the species
As the type species of the new genus*

Code[†] To designate the following as species of the new genus*:

Code[†] To designate the following as tentative species in the new genus*:

[†] Assigned by ICTV officers

* repeat these lines and the corresponding arguments for each genus created in the family

Author(s) with email address(es) of the Taxonomic Proposal

Houssam ATTOUI, study group member : h-attoui-ets-ap@gulliver.fr

Peter P.C. Mertens, Study group chair : peter.mertens@bbsrc.ac.uk

Old Taxonomic Order

Order
Family *Reoviridae*
Genus
Type Species
Species in the Genus
Tentative Species in the Genus

New Taxonomic Order

Order
Family *Reoviridae*
Genus *Dinovernavirus*
Type Species *Aedes pseudoscutellaris reovirus*
Species in the Genus *Aedes pseudoscutellaris reovirus*
Tentative Species in the Genus
Unassigned Species in the family

ICTV-EC comments and response of the SG

Argumentation to choose the type species in the genus

Aedes Pseudoscutellaris reovirus was isolated from AP61 cells persistently infected with a single-shelled dsRNA virus with a genome composed of 9 Segments of dsRNA. At present Apirnavirus is the only representative of the proposed new genus

Species demarcation criteria in the genus

List of Species in the created genus

Aedes pseudoscutellaris reovirus (APRV)

List of Tentative Species in the created genus

Argumentation to create a new genus:

APRV morphology is similar to that of cypoviruses, with a capsid composed of only a single shell of protein. None of the other reoviruses have a similar structure.

The cypoviruses do not have well established cell culture systems, while APRV replicates in a variety of mosquito cell lines.

Characteristically the cypoviruses can also become occluded within in crystalline structures called polyhedra (made of the viral polyhedrin protein), while APRV is a virus that is found free in culture supernatant, from which it could easily be purified by gradient ultracentrifugation.

The APRV genome is made of 9 segments of dsRNA, five of which have lengths higher than 3.2 Kbp. Sequence analysis has shown **partial** sequence matches between APRV and other viruses from three distinct genera, including:

- **Cypoviruses** : homologies detected in segments 1, 2, 3, 4, 5 and 6 with aa identities between 21-26%
- **Oryzaviruses** : homologies detected in segments 1, 2, 3, 4, 5 and 6 with aa identities of between 19 and 29%
- **Fijiviruses** : homologies detected in segments 1, 2, 3, 6 and 9 with aa identities between 21 and 29%

Similar aa identity values also exist between the homologous proteins of the cypoviruses, oryzaviruses and fijiviruses, which are already recognised as members of three distinct genera.

The terminal sequences of the APRV are distinct from those cypoviruses, oryzaviruses and fijiviruses (see annex 1). Terminal sequences have been used for identification of species and close members of a single genus within the Reoviridae.

Phylogenetic analysis (annex 1), based on the polymerase sequences, showed that although APRV clusters with the turreted reoviruses, it has only 22 to 26 % identity to any of the cypoviruses, oryzaviruses or Fijiviruses and is distinct from these three groups of viruses.

Taken together these arguments indicate that APRV should be classified as a member of a new and distinct genus that we designated *Dinovernavirus*.

Origin of the proposed genus name

Dinovernavirus

(sigla from **D**: Double-stranded, **i**: insect, **nove**: nine from the latin "novem", **rna**: RNA, virus)

References

Houssam ATTOUI, Fauziah MOHD JAAFAR, Mourad BELHOUCHE, Philippe BIAGINI, Jean-François CANTALOUBE, Philippe de MICCO and Xavier de LAMBALLERIE. Expansion of family *Reoviridae* to nine-segmented dsRNA viruses: Isolation and characterization of a new virus designated Apirnavirus assigned to a proposed genus (Dinovernavirus). *Virology*.

Cypovirus terminal sequences: www.iah.bbsrc.ac.uk/dsRNA_virus_proteins/CPV-RNA-Termin.htm

Annexe 1:

Conserved terminal sequences of APRV, cypoviruses, fijiviruses and oryzaviruses

	5' end	3' end
APRV	5' -AGUU ^A _{/U} AA ⁿ _n ⁿ _{/c} ^A _{/c} ----- ^U _{/G} UU ⁿ _n ⁿ _{/U} nn ^A _{/U} AGU-3'	
<i>Cypovirus</i>		
CPV1	5' -AGUAAA-----	-----GUUAGCC-3'
CPV2	5' -AGUUU-----	-----GAGUUUGC-3'
CfCPV	5' -AGUUU-----	-----UUUGUGC-3'
<i>Fijivirus</i>		
NLRV	5' -AGU-----	-----GUUGUC-3'
<i>Oryzavirus</i>		
RRSV	5' -GAUAAA-----	-----GUGC-3'

Near terminal sequences of the cypoviruses are listed at http://www.iah.bbsrc.ac.uk/dsRNA_virus_proteins/CPV-RNA-Termin.htm

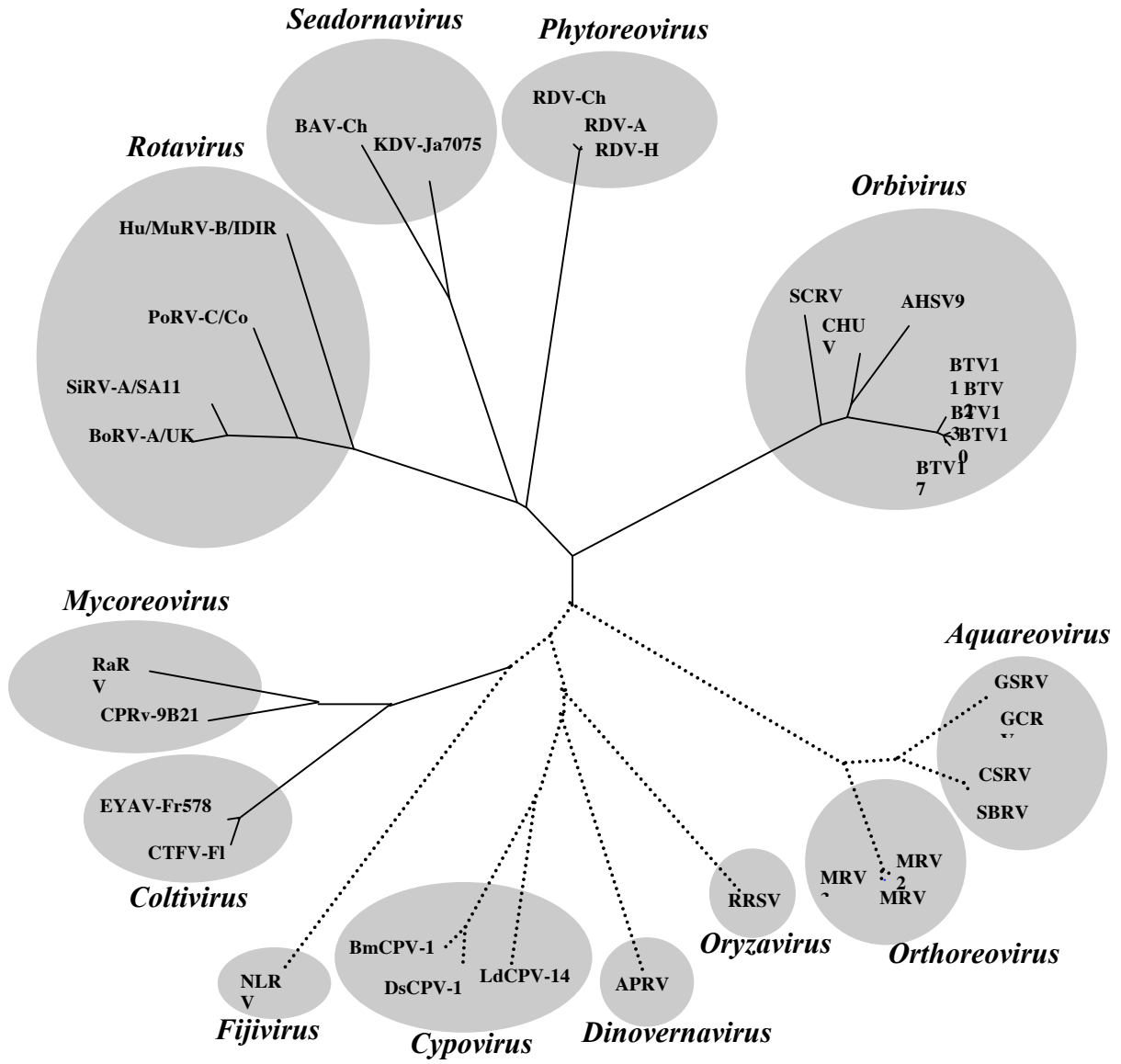
APRV : *Aedes pseudoscutellaris* reovirus

CPV: Cypovirus

NLR : *Nilaparvata luguens* reovirus

RRSV : Rice ragged stunt virus

neighbour-joining tree built with the available sequences of RdRps of representative members of family *Reoviridae*.



The sequences used in RdRps phylogenetic analysis of ApiV: the abbreviations listed are those used in the figure above

Species	Isolate	Abbreviation	Accession number
Genus <i>Seadornavirus</i> (12 segments)			
<i>Banna virus</i>	Ch	BAV-Ch	AF168005
<i>Kadipiro virus</i>	Java-7075	KDV-Ja7075	AF133429
Genus <i>Coltivirus</i> (12 segments)			
<i>Colorado tick fever virus</i>	Florio	CTFV-FI	AF134529
<i>Eyach virus</i>	Fr578	EYAV-Fr578	AF282467
Genus <i>Orthoreovirus</i> (10 segments)			
<i>Mammalian orthoreovirus</i>	Lang strain	MRV-1	M24734
	Jones strain	MRV-2	M31057
	Dearing strain	MRV-3	M31058
Genus <i>Orbivirus</i> (10 segments)			
<i>African horse sickness virus</i>	serotype 9	AHSV-9	U94887
<i>Bluetongue virus</i>	serotype 2	BTV-2	L20508
	serotype 10	BTV-10	X12819
	serotype 11	BTV-11	L20445
	serotype 13	BTV-13	L20446
	serotype 17	BTV-17	L20447
<i>Palyam virus</i>	Chuzan	CHUV	Baa76549
<i>St Croix river virus</i>	SCRV	SCRV	AF133431
Genus <i>Rotavirus</i> (11 segments)			
<i>Rotavirus A</i>	bovine strain UK	BoRV-A/UK	X55444
	simian strain SA11	SiRV-A/SA11	AF015955
<i>Rotavirus B</i>	human/murine strain IDIR	Hu/MuRV-B/IDIR	M97203
<i>Rotavirus C</i>	porcine Cowden strain	PoRV-C/Co	M74216
Genus <i>Aquareovirus</i> (11 segments)			
<i>Golden shiner reovirus</i>	GSRV	GSRV	AF403399
<i>Grass Carp reovirus</i>	GCRV-873	GCRV	AF260511
<i>Chum salmon reovirus</i>	CSRV	CSRV	AF418295
<i>Striped bass reovirus</i>	SBRV	SBRV	AF450318
Genus <i>Fijivirus</i> (10 segments)			
<i>Nilaparvata lugens reovirus</i>	Izumo strain	NLRV-Iz	D49693
Genus <i>Phytoreovirus</i> (10 segments)			
<i>Rice dwarf virus</i>	isolate China	RDV-Ch	U73201
	isolate H	RDV-H	D10222
	isolate A	RDV-A	D90198
Genus <i>Oryzavirus</i> (10 segments)			
<i>Rice ragged stunt virus</i>	Thai strain	RRSV-Th	U66714
Genus <i>Cypovirus</i> (10 segments)			
<i>Bombyx mori cytoplasmic polyhedrosis virus 1</i>	Strain I	BmCPV-1	AF323782
<i>Dendrymus punctatus cytoplasmic polyhedrosis 1</i>	DsCPV-1	DsCPV-1	AAN46860
<i>Lymantria dispar cytoplasmic polyhedrosis 14</i>	LdCPV-14	LdCPV-14	AAK73087
Genus <i>Mycoreovirus</i> (11 or 12 segments)			
<i>Rosellinia anti-rot virus</i>	W370	RaRV	AB102674
<i>Cryphonectria parasitica reovirus</i>	9B21	CPRV	AY277888