MODULE 1: **TITLE, AUTHORS, etc**

Code assigned:	*2015.008a-dS*	(to be completed by ICTV officers)

Short title: Creation of a new species (*Potamipivirus A*) in a new genus (*Potamipivirus*).
(e.g. 6 new species in the genus *Zetavirus*)

Modules attached (modules 1 and 10 are required)	1 ☒ 2 ☒ 3 ☒ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☒

Author(s):

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Corresponding author with e-mail address:

Roland Zell (roland.zell@med.uni-jena.de)

List the ICTV study group(s) that have seen this proposal:

A list of study groups and contacts is provided at http://www.ictvonline.org/subcommittees.asp . If in doubt, contact the appropriate subcommittee chair (fungal, invertebrate, plant, prokaryote or vertebrate viruses)	*Picornaviridae* Study Group

ICTV Study Group comments (if any) and response of the proposer:

Date first submitted to ICTV:	29/06/2015
Date of this revision (if different to above):	06/07/2015

ICTV-EC comments and response of the proposer:

MODULE 2: **NEW SPECIES**

creating and naming one or more new species.

If more than one, they should be a group of related species belonging to the same genus. All new species must be placed in a higher taxon. This is usually a genus although it is also permissible for species to be "unassigned" within a subfamily or family. Wherever possible, provide sequence accession number(s) for **one** isolate of each new species proposed.

Code	*2015.008aS*		(assigned by ICTV officers)

To create 1 new species within:

		Fill in all that apply.
Genus:	*Potamipivirus* (new)	• If the higher taxon has yet to be created (in a later module, below) write "**(new)**" after its proposed name.
Subfamily:	**-**	
Family:	*Picornaviridae*	• If no genus is specified, enter "**unassigned**" in the genus box.
Order:	*Picornavirales*	

Name of new species:	Representative isolate: (only 1 per species please)	GenBank sequence accession number(s)
Potamipivirus A	F15/05 (eel picornavirus 1)	KC843627

Reasons to justify the creation and assignment of the new species:
- Explain how the proposed species differ(s) from all existing species.
  - If species demarcation criteria (see module 3) have previously been defined for the genus, **explain how the new species meet these criteria**.
  - If criteria for demarcating species need to be defined (because there will now be more than one species in the genus), please state the proposed criteria.
- Further material in support of this proposal may be presented in the Appendix, Module 9

Eel picornavirus 1 (EPV-1) is a new picornavirus detected in eels in Germany. EPV-1 is most closely related to *Avihepatovirus*, *Parechovirus* and *Pasivirus* but shows low amino acid identity with proteins of these picornaviruses:

Table: Percent amino acid identity with protein from:

EPV-1 protein	*Parechovirus* HPeV-1 (L02971)	*Parechovirus* LV-1 (AF327920)	*Avihepatovirus* DHAV-1 (DQ249299)	*Aquamavirus* SePV-1 (EU142040)	*Pasivirus* SPaV-1 (JQ316470)
1AB	30.1	33.6	25.3	27.7	24.5
1C	26.6	31.2	22.7	31.1	30.8
1D	22.8	22.7	18.7	15.9	21.5
2A1	24.0	52.2	20.7	36.4	40.0
2A2	27.9	33.8	30.0	-	-
2B	28.6	25.8	21.3	13.3	19.7
2C	27.6	27.3	29.9	26.5	27.3
3A	8.8	20.3	12.9	11.0	12.2
3C	18.3	19.1	21.0	26.1	19.1
3D	34.6	41.6	38.6	29.0	31.3

Genome organisation:

VPg+5'UTR[1AB-1C-1D-2A1$^{\text{NPGP}}$/2A2$^{\text{H-Box/NC}}$-2B-2C$^{\text{Hel}}$/3A-3B$^{\text{VPg}}$-3C$^{\text{pro}}$-3D$^{\text{pol}}$]3'UTR-poly(A)

MODULE 3: **NEW GENUS**

Ideally, a genus should be placed within a higher taxon.

Code	*2015.008bS*	(assigned by ICTV officers)

To create a new genus within:

Fill in all that apply.

Subfamily:	**-**
Family:	*Picornaviridae*
Order:	*Picornavirales*

- If the higher taxon has yet to be created (in a later module, below) write "**(new)**" after its proposed name.
- If no family is specified, enter "**unassigned**" in the family box

naming a new genus

Code		(assigned by ICTV officers)

To name the new genus: *Potamipivirus*

Assigning the type species and other species to a new genus

Code		(assigned by ICTV officers)

To designate the following as the type species of the new genus

Potamipivirus A	Every genus must have a type species. This should be a well characterized species although not necessarily the first to be discovered

The new genus will also contain any other new species created and assigned to it (Module 2) and any that are being moved from elsewhere (Module 7b). **Please enter here the TOTAL number of species (including the type species) that the genus will contain:**

1

Reasons to justify the creation of a new genus:
Additional material in support of this proposal may be presented in the Appendix, Module 9

Although Potamipivirus has a typical picornavirus genome layout (3-4-4 type) that is comparable to the Parechovirus genome, it has low amino acid identity to the orthologous proteins of other picornaviruses. The capsid polypeptide VP0 is predicted to be uncleaved. There are two 2A proteins: 2A1 has a NPG↓P sequence motif, 2A2 contains the H-Box/NC motifs.

The phylogenetic relationship of the capsid-encoding P1 region and the 3CD region with other picornaviruses is shown in Appendix Figures 2 and 3.

Origin of the new genus name:

Potamipi: from Greek potami (ποταμι), "river", and *pi* from *pi*cornavirus.

Reasons to justify the choice of type species:

Only a single species.

Species demarcation criteria in the new genus:

Only a single species.

MODULE 10: **APPENDIX**: supporting material

additional material in support of this proposal

References:

Fichtner D, Philipps A, Groth M, Schmidt-Posthaus H, Granzow H, Dauber M, Platzer M, Bergmann SM, Schrudde D, Sauerbrei A, Zell R. (2013).Characterization of a novel picornavirus isolate from a diseased European eel (Anguilla anuguilla). J. Virol. 87: 10895-10899.
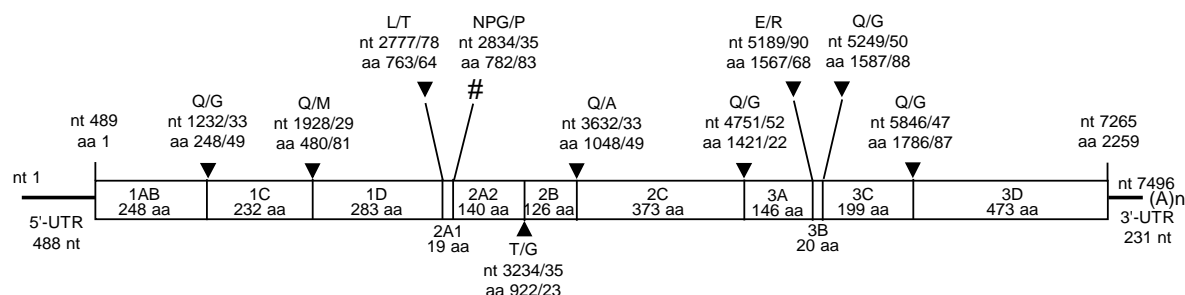
Annex:

Genome organisation:

Figure 1: Schematic depiction of the Potamipivirus genome. The open reading frame is indicated by a box. Positions of putative nt and aa cleavage sites of EPV-1 and the lengths of the deduced proteins are shown. Triangles (▼) indicate the $3C^{pro}$ cleavage sites; the hash (#) indicates the ribosomal skipping site at the NPG↓P motif.

P1

Genus:

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100  HQ595340, unassigned, bat picornavirus 1 [NC16A]
100  HQ595341, unassigned, bat picornavirus 1 [LMH22A]
99   HQ595342, unassigned, bat picornavirus 2 [MH9F]
82   HQ595343, unassigned, bat picornavirus 2 [SK17F]
     JN831356, unassigned, canine picornavirus 1 [dog/Hong Kong/325F/2008]
88 59 JQ814852, unassigned, Ia io picornavirus 1
74   KJ641694, unassigned, bat picornavirus [BtRs-PicoV/YN2010]
     KJ641693, unassigned, bat picornavirus [BtRh-PicoV/SC2013]
100  HQ595344, unassigned, bat picornavirus 3 [TLC5F]
95   HQ595345, unassigned, bat picornavirus 3 [TLC21F]
69   KJ641687, unassigned, bat picornavirus [BtMf-PicoV/FJ2012]
100  KJ641690, unassigned, bat picornavirus [BtMf-PicoV-1/GD2012]
     KJ641699, unassigned, bat picornavirus [BtMf-PicoV-2/SAX2011]
58   JN572116, unassigned, feline picornavirus [127F]
100  JN572118, unassigned, feline picornavirus [661F]
13   JN572115, unassigned, feline picornavirus 1 [cat/Hong Kong/073F/2007]
100  JN572117, unassigned, feline picornavirus [356F]
100  JN572119, unassigned, feline picornavirus [1021F]
100  KJ641689, unassigned, bat picornavirus [BtMa-PicoV/FJ2012]
     KJ641696, unassigned, bat picornavirus [BtVs-PicoV/SC2013]
14 100 AF406813, Sapelovirus A, PSV-1 [V13]                          } Sapelovirus
15   AY064708, Sapelovirus B, SSV-1 [SV2-2383]
35   KJ641697, unassigned, bat picornavirus [BtNv-PicoV/SC2013]
100  KJ641685, unassigned, bat picornavirus [BtRf-PicoV-1/YN2012]
100  KJ641692, unassigned, bat picornavirus [BtRa-PicoV/JS2013]
81   KJ641688, unassigned, bat picornavirus [BtRlep-PicoV/FJ2012]
24   JN420368, unassigned, California sealion [1162]
     AY563023, Avian sapelovirus, ASV-1 [TW90A]                      Sapelovirus
18   JN674502, unassigned, quail picornavirus 1 [quail/HUN/2010]
100  47 FR727144, unassigned, pigeon picornavirus B [pigeon/Norway/03/641/2003]
100  KC560801, unassigned, pigeon picornavirus B [GAL-7/2010/Hungary]
100  KP233897, unassigned, rabovirus [A Berlin/Jan2011/0572]
     KJ950883, unassigned, rat picornavirus [RPV/NYC-B10]
54   K02121, Rhinovirus B, HRV-14 [1959]
70   EF186077, Rhinovirus C, HRV-C3 [QPM]
43 76 L24917, Rhinovirus A, HRV-16 [11757]
     V01149, Enterovirus C, EV-C PV-1 [Mahoney]
90   M33854, Enterovirus B, EV-B CVB3 [Nancy]
100  AF201894, Enterovirus H, EV-H1 SEV-A1 A-2 plaque
     D00820, Enterovirus D, EV-D70 [J670/71]
62 100 U22521, Enterovirus A, EV-A71 [BrCr]
77 76 AF326766, Enterovirus J, EV-J1 [SV6-1631]
49   AF363453, Enterovirus G, EV-G1 (former PEV-9) [UKG/410/73]
95   DQ092769, Enterovirus E, EV-E1 (former BEV-1) [LC-R4]
93   DQ092770, Enterovirus F, EV-F1 (former BEV-2) [BEV-261 RM2]
99   KM396707, unassigned, lesavirus 1 [Mis101308/2012]
93   KM396708, unassigned, lesavirus 2 [Nsi108015/2012]
98   JQ941840, Hunnivirus A, hunnivirus A1 [cattle/2008/HUN]           Hunnivirus
     AF231769, Teschovirus A, porcine teschovirus 1 [Talfan]          Teschovirus
62   X00871, Foot-and-mouth disease virus, FMDV O1 [Kaufbeuren]
100  JN836206, Bovine rhinitis A virus, BRAV-2 [H-1]                  } Aphthovirus
98   EU236594, Bovine rhinitis B virus, BRBV-1 [EC11]
86   X96870, Equine rhinitis A virus, ERAV [PERV]
85   X96871, Erbovirus A, equine rhinitis B virus 1 [P1436/71]        Erbovirus
     KM589358, unassigned, bovine picornavirus [TCH6]
44 93 JF973687, Mosavirus A, mosavirus A1 [mouse/M-7/USA/2010]         Mosavirus
50 85 KM873616, unassigned, tortoise picornavirus [124-4-10]
100  JQ864242, Cardiovirus C, Boone cardiovirus [rat/USA/2010]
100  JX683808, Cardiovirus C, Boone cardiovirus [rat/USA/2012]        Cardiovirus
35   M81861, Cardiovirus A, Encephalomyocarditis virus 1 [R]
84   M20562, Cardiovirus B, Theiler's murine encephalomyelitis virus [GDVII]
     JQ814851, Mischivirus A, Miniopterus schreibersii picornavirus 1 [bat/China/2010]  Mischivirus
96   KP100644, unassigned, African bat icavirus A [TNo13]
57   DQ641257, Senecavirus A, Seneca Valley virus 1 [US/SVV-001]       Senecavirus
30   FJ438908, Cosavirus D, human cosavirus D1 [5004]
43   FJ438902, Cosavirus A, human cosavirus A1 [0553]
100  JN867758, Cosavirus F, human cosavirus F1 [PK5006]               } Cosavirus
63   FJ438907, Cosavirus B, human cosavirus B1 [2263]
51   FJ555055, Cosavirus E, human cosavirus E1 [Australia/81]
99   JN819202, Cadicivirus A, canine picodicistrovirus [209]          Dicipivirus
     JF973686, Rosavirus A, rosavirus A1 [mouse/USA/M-7/2010]         Rosavirus
98   HM751199, Melegrivirus A, turkey hepatitis virus [2993D]
28   KC663628, unassigned, duck megrivirus [LY]                       } Megrivirus
100  KC876529, unassigned, mesivirus [HK21]
81   KC811837, unassigned, mesivirus 2 [pigeon/GALI5-PiMeV/2011/HUN]
     KJ415177, unassigned, tortoise rafivirus [UF4]                   } Oscivirus
100  GU182408, Oscivirus A, oscivirus A1 [robin/Hong Kong/10717/2006]
27   GU182410, Oscivirus A, oscivirus A2 [robin/Hong Kong/10878/2006]  Sicinivirus
24 100 KF741227, Sicinivirus A, sicinivirus A1 [chicken/UCC001/Eire]
47   KF979331, Sicinivirus A, sicinivirus A1 [ChPV-1 chicken/55C/Hong Kong/2008]  Gallivirus
80   JQ691613, Gallivirus A, gallivirus A1 [turkey/M176/2011/HUN]      Passerivirus
     GU182406, Passerivirus A, passerivirus A1 [thrush/Hong Kong/00356/2007]  Sakobuvirus
86   KF387721, Sakobuvirus A, sakobuvirus A1 [FFUP1/Portugal/2012]    Salivirus
     GQ179640, Salivirus A, salivirus A1 [NG-J1]
58   KJ641691, unassigned, bat picornavirus [BtMf-PicoV-2/GD2012]
100  KJ641686, unassigned, bat picornavirus [BtMr-PicoV/JX2010]
94 75 AB010145, Aichivirus A, AiV-A1 [A846/88]
87 100 JN387133, Aichivirus A, CKV-1 [dog/AN211D/USA/2009]
     JF755427, Aichivirus A, MKV-1 [M-5/USA/2010]                     } Kobuvirus
90   EU784590, Aichivirus C, PKV [swine/S-1-HUN-2007/Hungary]
87   AB084788, Aichivirus B, BKV-1 [U-1]
100  KF006985, Aichivirus B, ferret kobuvirus [ferret/MpKoV38/NL]
68   KF183915, Limnipivirus C*, fathead minnow picornavirus [fhm/1/MN/USA/2010]
98   KF183916, Limnipivirus C*, fathead minnow picornavirus [fhm/2/MN/USA/201]
62   KF874490, Limnipivirus C*, fathead minnow picornavirus [fhm/20/IL/USA/2010]  } Limnipivirus*
94   KC465953, Limnipivirus C*, fathead minnow picornavirus [09-283]
100  KF306267, Limnipivirus B*, carp picornavirus 1 [F37/06]
     JX134222, Limnipivirus A*, bluegill picornavirus 1 [04-032]
100  KC465954, Avisivirus A, avisivirus A1 [turkey/M176-TuASV/2011/HUN]  } Avisivirus
39   KC614703, Avisivirus A, avisivirus A1 [USA-IN1]
98   KM203656, unassigned, chicken orivirus 1 [chicken/Pf-CHK1/2013/HUN]
96   DQ249299, Avihepatovirus A, duck hepatitis A virus 1 [03D]        Avihepatovirus
57   KJ000696, unassigned, aalivirus A1 [duck picornavirus GL/12]
     JQ316470, Pasivirus A, pasivirus A1 [swine/France/2011]          Pasivirus
84   AB937989, unassigned, crohivirus 1 [shrew/ZM54/Zambia/2012]
57   KJ641698, unassigned, bat picornavirus isolate [BtMf-PicoV-1/SAX2011]
     JQ814853, unassigned, Rhinolophus affinis picornavirus 1
100  KC935379, Kunsagivirus A, kunsagivirus A1 [roller/SZAL6-KuV/2011/HUN]  Kunsagivirus
26 97 unassigned, Bat Kunsagivirus
     EU142040, Aquamavirus A, Aquamavirus A1 (SePV-1) [HO-02-21]       Aquamavirus
20   KC843627, Potamipivirus A*, eel picornavirus [F15-05]            Potamipivirus*
     KF006989, unassigned, ferret parechovirus [ferret/MpPeV1/NL]
35   L02971, Parechovirus A, human parechovirus 1 [Harris]            } Parechovirus
95   AF327920, Parechovirus B, ljunganvirus 1 [87-012]
92   KP230449, unassigned, falcovirus A1 [kestrel/VOVE0622/2013/HUN]
     KJ641684, unassigned, bat picornavirus [BtRf-PicoV-2/YN2012]
85   AJ225173, Tremovirus A, avian encephalomyelitis virus 1 [Calnek vaccine strain]  Tremovirus
96   M14707, Hepatovirus A, human hepatitis A virus [HM-175]          Hepatovirus
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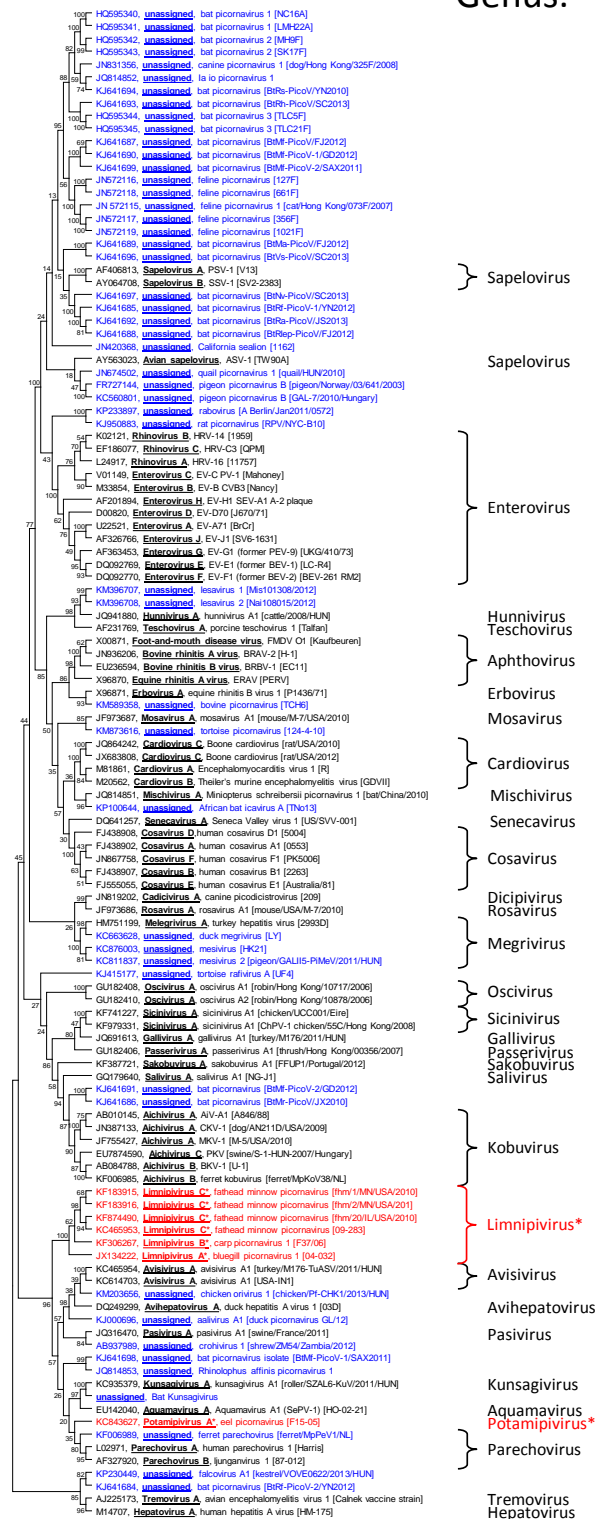
Figure 2: Maximum likelihood tree of picornavirus P1 gene region. 118 picornavirus sequences retrieved from GenBank were included. Presented are GenBank accession numbers, species names (in bold print and underlined) and type designations. If available, designations of isolates and sequenced specimens, respectively, are given in square brackets. Unassigned viruses are printed in blue. Proposed names are printed in red and indicated by an asterisk (*). Braces indicate acknowledged and proposed (*) genera. Numbers at nodes indicate bootstrap support obtained after 1000 replicates. The scale indicates substitutions/site.
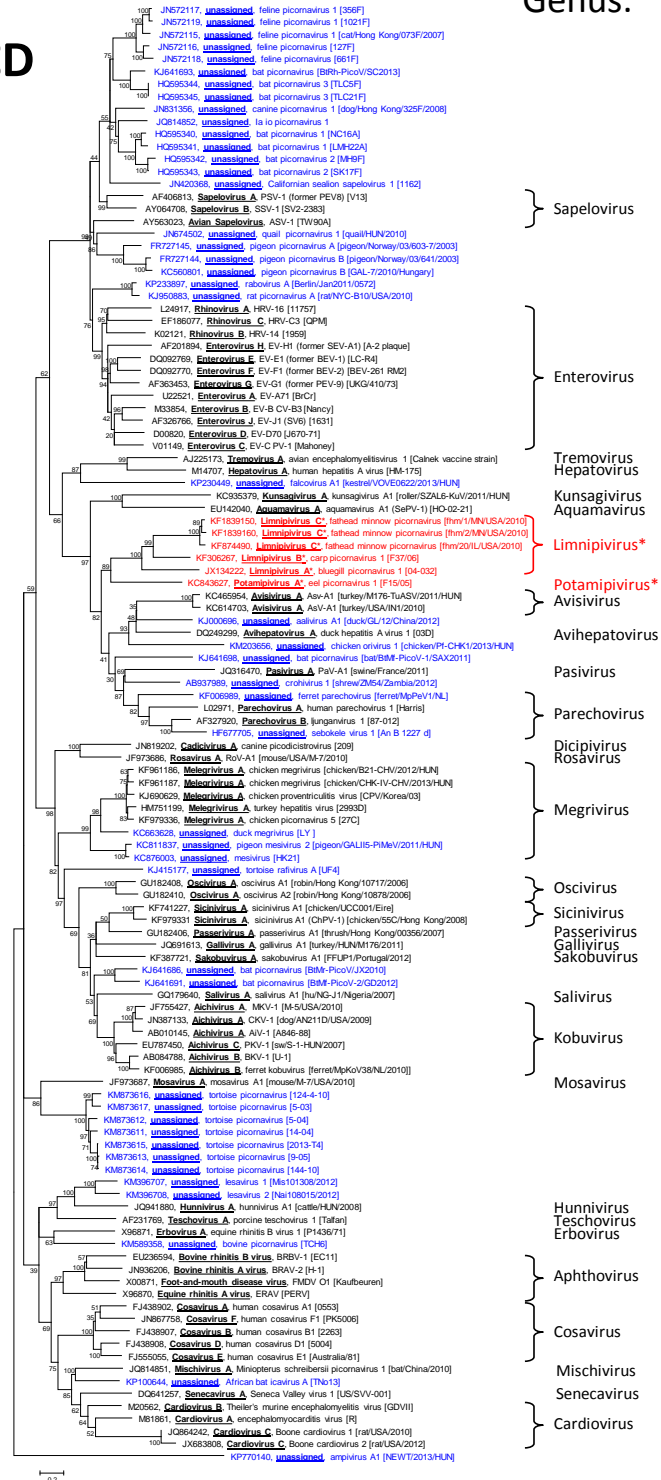
Figure 3: Maximum likelihood tree of picornavirus 3CD gene region. 117 picornavirus sequences retrieved from GenBank were included. Presented are GenBank accession numbers, species names (in bold print and underlined) and type designations. If available, designations of isolates and sequenced specimens, respectively, are given in square brackets. Unassigned viruses are printed in blue. Proposed names are printed in red and indicated by an asterisk (*). Braces indicate acknowledged and proposed (*) genera. Numbers at nodes indicate bootstrap support obtained after 1000 replicates. The scale indicates substitutions/site.