This form should be used for all taxonomic proposals. Please complete all those modules that are applicable (and then delete the unwanted sections). For guidance, see the notes written in blue and the separate document "Help with completing a taxonomic proposal"

Please try to keep related proposals within a single document; you can copy the modules to create more than one genus within a new family, for example.

MODULE 1: TITLE, AUTHORS, etc

Code assigned:	***2016.008a-dS***	(to be completed by ICTV officers)

Short title: Create 1 new species (*Harkavirus A*) in a new genus (*Harkavirus*)
(e.g. 6 new species in the genus *Zetavirus*)

Modules attached
(modules 1 and 11 are required)

2 ☒ **3** ☒ **4** ☐ **5** ☐
6 ☐ **7** ☐ **8** ☐ **9** ☐ **10** ☐ **11** ☒

Author(s):

Roland Zell, Eric Delwart, Alexander E. Gorbalenya, Tapani Hovi, Andrew M.Q. King, Nick J. Knowles, A. Michael Lindberg, Mark A. Pallansch, Ann C. Palmenberg, Gabor Reuter, Peter Simmonds, Tim Skern, Glyn Stanway and Teruo Yamashita

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: 15/06/2016
Date of this revision (if different to above):

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	***2016.008aS***	(assigned by ICTV officers)

To create 1 new species within:

Genus:	***Harkavirus*** (new)
Subfamily:	
Family:	***Picornaviridae***
Order:	***Picornavirales***

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

Name of new species:	**Representative isolate: (only 1 per species please)**	**GenBank sequence accession number(s)**
Harkavirus A	Falcovirus [kestrel/VOVE0622/2013/HUN]	KP230449

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 11

A novel picornavirus was detected in a faecal sample from a 5-week-old common kestrel (*Falco tinnunculus*) in Hungary. This virus has a 4-3-4 genome layout (compare Appendix Figure 1):

VPg+5'UTR$^{\text{IRES-I}}$[1A-1B-1C-1D/2A-2B-2C$^{\text{Hel}}$/3A-3B$^{\text{VPg}}$-3C$^{\text{Pro}}$-3D$^{\text{Pol}}$]3'UTR-poly(A)

Comparison of P1 and 3CD alignments reveals a highly divergent virus (compare Table 1, below).

Table 1: *Harkavirus* divergence in picornavirus sequence alignments

	p-Distance (mean±std.dev.)	mean % aai
P1	0.8721±0.013	12.79
3CD	0.7808±0.018	21.92

Proteins 2A, 2B, 3A, 3B exhibit no similarity to known picornavirus proteins.

MODULE 3: NEW GENUS

creating a new genus

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

Code	***2016.008bS***	(assigned by ICTV officers)

To create a new genus within:

Subfamily:		Fill in all that apply. • 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
Family:	***Picornaviridae***	
Order:	***Picornavirales***	

naming a new genus

Code	***2016.008cS***	(assigned by ICTV officers)

To name the new genus: *Harkavirus*

Assigning the type species and other species to a new genus

Code	***2016.008dS***	(assigned by ICTV officers)

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

Harkavirus 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 11

Harkavirus is a highly divergent picornavirus with very low amino acid identities to the remaining picornaviruses. Its 1C protein has greatest similarity to the VP3 capsid protein of dicistroviruses! 1B, 1D and 2C have similarity to the respective hepatovirus proteins and $3C^{Pro}$ shows similarity to the kobuvirus proteinase. Part of the *Harkavirus* $3D^{Pol}$ exhibits similarity with the enterovirus polymerase. In addition, $3D^{Pol}$ has an unusual insertion of ~120 amino acids. The other proteins (1A, 2A, 2B, 3A, 3B) have no significant similarity to picornavirus proteins.
Harkavirus has a variant type I IRES which is typical of *Enterovirus*. No virus isolate is available.

Origin of the new genus name:

Harkavirus: from Harkakötöny (a village in Hungary where the first sample was collected)

Reasons to justify the choice of type species:

only a single species

Species demarcation criteria in the new genus:

If there will be more than one species in the new genus, list the criteria being used for species demarcation and explain how the proposed members meet these criteria.

only a single species

MODULE 11: **APPENDIX**: supporting material

additional material in support of this proposal

References:

Boros A, Pankovics P, Simmonds P, Pollak E, Matics R, Phan TG, Delwart E, Reuter G. 2015. Genome analysis of a novel, highly divergent picornavirus from common kestrel (*Falco tinnunculus*): The first non-enteroviral picornavirus with type-I-like IRES. Inf. Genet. Evol. 32:425-431.

Annex:

Include as much information as necessary to support the proposal, including diagrams comparing the old and new taxonomic orders. The use of Figures and Tables is strongly recommended but direct pasting of content from publications will require permission from the copyright holder together with appropriate acknowledgement as this proposal will be placed on a public web site. For phylogenetic analysis, try to provide a tree where branch length is related to genetic distance.

Genome organization:

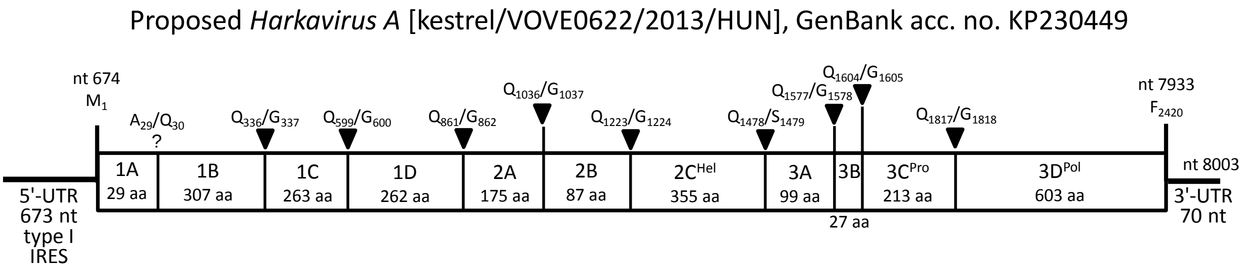

Figure 1: Schematic depiction of the harkavirus genome organization. The open reading frame is indicated by a box. Positions of putative amino acid cleavage sites and the lengths of the deduced proteins are shown as proposed by Boros et al. (2015). Triangles (▼) indicate the putative $3C^{Pro}$ cleavage sites, and a question mark (?) points to the unknown 1AB processing site.

Fig. 2
P1

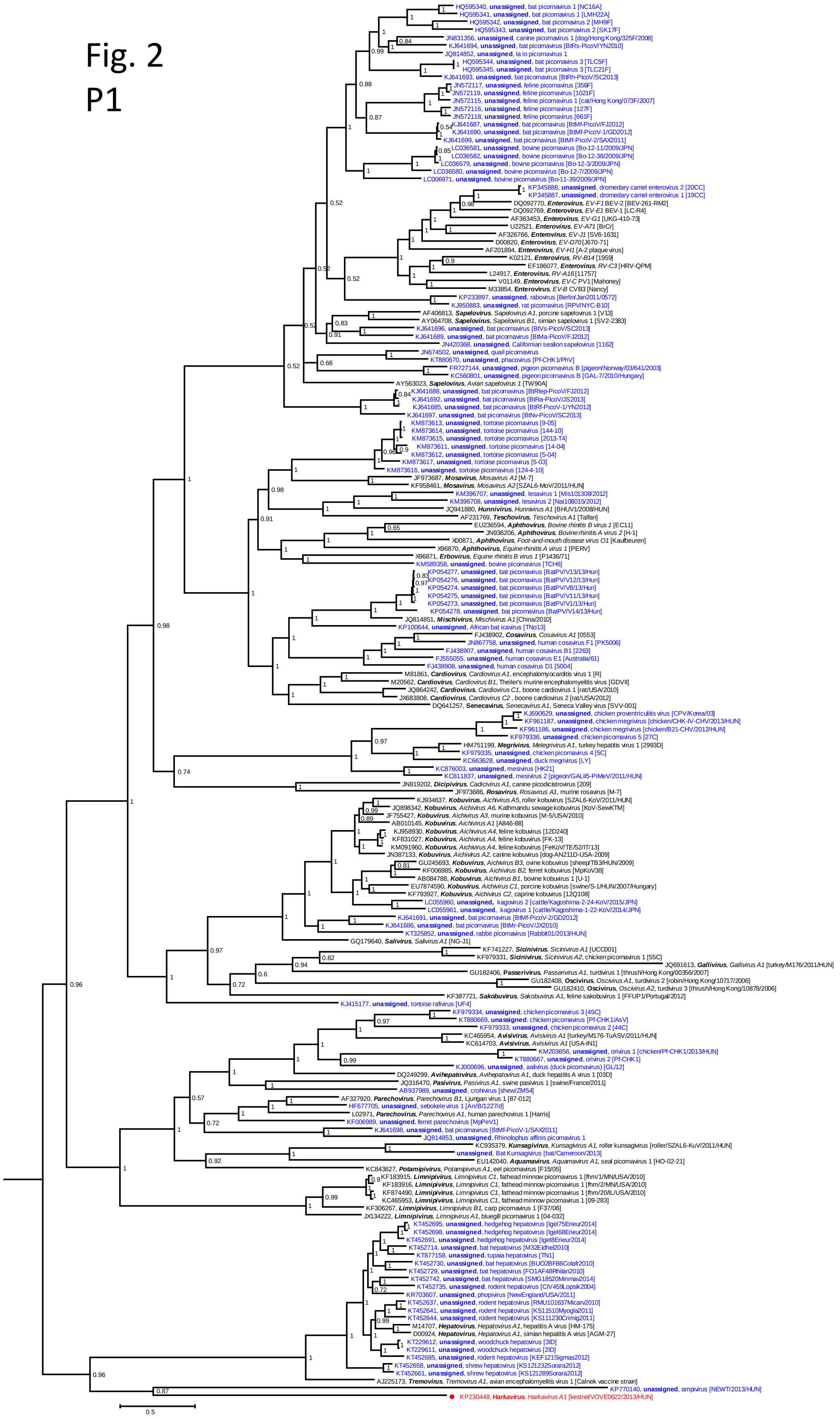
HQ595340, unassigned, bat picornavirus 1 [NC16A]
HQ595341, unassigned, bat picornavirus 1 [LMH22A]
HQ595342, unassigned, bat picornavirus 2 [MH9F]
HQ595343, unassigned, bat picornavirus 2 [SK17F]
JN831356, unassigned, canine picornavirus 1 [dog/Hong Kong/325F/2008]
KJ641694, unassigned, bat picornavirus [BtRs-PicoV/YN2010]
JQ814852, unassigned, la io picornavirus 1
HQ595344, unassigned, bat picornavirus 3 [TLC5F]
HQ595345, unassigned, bat picornavirus 3 [TLC21F]
KJ641693, unassigned, bat picornavirus [BtRh-PicoV/SC2013]
JN572117, unassigned, feline picornavirus [356F]
JN572119, unassigned, feline picornavirus [1021F]
JN572115, unassigned, feline picornavirus 1 [cat/Hong Kong/073F/2007]
JN572116, unassigned, feline picornavirus [127F]
JN572118, unassigned, feline picornavirus [661F]
KJ641687, unassigned, bat picornavirus [BtMf-PicoV/FJ2012]
KJ641690, unassigned, bat picornavirus [BtMf-PicoV-1/GD2012]
KJ641699, unassigned, bat picornavirus [BtMf-PicoV-2/SAX2011]
LC036581, unassigned, bovine picornavirus [Bo-12-11/2009/JPN]
LC036582, unassigned, bovine picornavirus [Bo-12-38/2009/JPN]
LC036579, unassigned, bovine picornavirus [Bo-12-3/2009/JPN]
LC036580, unassigned, bovine picornavirus [Bo-12-7/2009/JPN]
LC006971, unassigned, bovine picornavirus [Bo-11-39/2009/JPN]
KP345888, unassigned, dromedary camel enterovirus 2 [20CC]
KP345887, unassigned, dromedary camel enterovirus 1 [19CC]
DQ092770, Enterovirus, EV-F1 BEV-2 [BEV-261-RM2]
DQ092769, Enterovirus, EV-E1 BEV-1 [LC-R4]
AF363453, Enterovirus, EV-G1 [UKG-410-73]
U22521, Enterovirus, EV-A71 [BrCr]
AF326766, Enterovirus, EV-J1 [SV6-1631]
D00820, Enterovirus, EV-D70 [J670-71]
AF201894, Enterovirus, EV-H1 [A-2 plaque virus]
K02121, Enterovirus, RV-B14 [1959]
EF186077, Enterovirus, RV-C3 [HRV-QPM]
L24917, Enterovirus, RV-A16 [11757]
V01149, Enterovirus, EV-C PV1 [Mahoney]
M33854, Enterovirus, EV-B CVB3 [Nancy]
KP233897, unassigned, rabovirus [Berlin/Jan2011/0572]
KJ950883, unassigned, rat picornavirus [RPV/NYC-B10]
AF406813, Sapelovirus, Sapelovirus A1, porcine sapelovirus 1 [V13]
AY064708, Sapelovirus, Sapelovirus B1, simian sapelovirus 1 [SV2-2383]
KJ641696, unassigned, bat picornavirus [BtVs-PicoV/SC2013]
KJ641689, unassigned, bat picornavirus [BtMa-PicoV/FJ2012]
JN420368, unassigned, Californian sealion sapelovirus [1162]
JN674502, unassigned, quail picornavirus
KT880670, unassigned, phacovirus [Pf-CHK1/PhV]
FR727144, unassigned, pigeon picornavirus B [pigeon/Norway/03/641/2003]
KC560801, unassigned, pigeon picornavirus B [GAL-7/2010/Hungary]
AY563023, Sapelovirus, Avian sapelovirus 1 [TW90A]
KJ641688, unassigned, bat picornavirus [BtRlep-PicoV/FJ2012]
KJ641692, unassigned, bat picornavirus [BtRa-PicoV/JS2013]
KJ641685, unassigned, bat picornavirus [BtRf-PicoV-1/YN2012]
KJ641697, unassigned, bat picornavirus [BtNv-PicoV/SC2013]
KM873613, unassigned, tortoise picornavirus [9-05]
KM873614, unassigned, tortoise picornavirus [144-10]
KM873615, unassigned, tortoise picornavirus [2013-T4]
KM873611, unassigned, tortoise picornavirus [14-04]
KM873612, unassigned, tortoise picornavirus [5-04]
KM873617, unassigned, tortoise picornavirus [5-03]
KM873616, unassigned, tortoise picornavirus [124-4-10]
JF973687, Mosavirus, Mosavirus A1 [M-7]
KF958461, Mosavirus, Mosavirus A2 [SZAL6-MoV/2011/HUN]
KM396707, unassigned, lesavirus 1 [Mis101308/2012]
KM396708, unassigned, lesavirus 2 [Nai108015/2012]
JQ941880, Hunnivirus, Hunnivirus A1 [BHUV1/2008/HUN]
AF231769, Teschovirus, Teschovirus A1 [Talfan]
EU236594, Aphthovirus, Bovine rhinitis B virus 1 [EC11]
JN936206, Aphthovirus, Bovine rhinitis A virus 2 [H-1]
X00871, Aphthovirus, Foot-and-mouth disease virus O1 [Kaufbeuren]
X96870, Aphthovirus, Equine rhinitis A virus 1 [PERV]
X96871, Erbovirus, Equine rhinitis B virus 1 [P1436/71]
KM589358, unassigned, bovine picornavirus [TCH6]
KP054277, unassigned, bat picornavirus [BatPV/V13/13/Hun]
KP054276, unassigned, bat picornavirus [BatPV/V12/13/Hun]
KP054274, unassigned, bat picornavirus [BatPV/V8/13/Hun]
KP054275, unassigned, bat picornavirus [BatPV/V11/13/Hun]
KP054273, unassigned, bat picornavirus [BatPV/V1/13/Hun]
KP054278, unassigned, bat picornavirus [BatPV/V14/13/Hun]
JQ814851, Mischivirus, Mischivirus A1 [China/2010]
KP100644, unassigned, African bat icavirus [TNo13]
FJ438902, Cosavirus, Cosavirus A1 [0553]
JN867758, unassigned, human cosavirus F1 [PK5006]
FJ438907, unassigned, human cosavirus B1 [2263]
FJ555055, unassigned, human cosavirus E1 [Australia/61]
FJ438908, unassigned, human cosavirus D1 [5004]
M81861, Cardiovirus, Cardiovirus A1, encephalomyocarditis virus 1 [R]
M20562, Cardiovirus, Cardiovirus B1, Theiler's murine encephalomyelitis virus [GDVII]
JQ864242, Cardiovirus, Cardiovirus C1, boone cardiovirus 1 [rat/USA/2010]
JX683808, Cardiovirus, Cardiovirus C2 , boone cardiovirus 2 [rat/USA/2012]
DQ641257, Senecavirus, Senecavirus A1, Seneca Valley virus [SVV-001]
KJ690629, unassigned, chicken proventriculitis virus [CPV/Korea/03]
KF961187, unassigned, chicken megrivirus [chicken/CHK-IV-CHV/2013/HUN]
KF961186, unassigned, chicken megrivirus [chicken/B21-CHV/2012/HUN]
KF979336, unassigned, chicken picornavirus 5 [27C]
HM751199, Megrivirus, Melegrivirus A1, turkey hepatitis virus 1 [2993D]
KF979335, unassigned, chicken picornavirus 4 [5C]
KC663628, unassigned, duck megrivirus [LY]
KC876003, unassigned, mesivirus [HK21]
KC811837, unassigned, mesivirus 2 [pigeon/GALII5-PiMeV/2011/HUN]
JN819202, Dicipivirus, Cadicivirus A1, canine picodicistrovirus [209]
JF973686, Rosavirus, Rosavirus A1, murine rosavirus [M-7]
KJ934637, Kobuvirus, Aichivirus A5, roller kobuvirus [SZAL6-KoV/2011/HUN]
JQ898342, Kobuvirus, Aichivirus A6, Kathmandu sewage kobuvirus [KoV-SewKTM]
JF755427, Kobuvirus, Aichivirus A3, murine kobuvirus [M-5/USA/2010]
AB010145, Kobuvirus, Aichivirus A1 [A846-88]
KJ958930, Kobuvirus, Aichivirus A4, feline kobuvirus [12D240]
KF831027, Kobuvirus, Aichivirus A4, feline kobuvirus [FK-13]
KM091960, Kobuvirus, Aichivirus A4, feline kobuvirus [FeKoV/TE/52/IT/13]
JN387133, Kobuvirus, Aichivirus A2, canine kobuvirus [dog-AN211D-USA-2009]
GU245693, Kobuvirus, Aichivirus B3, ovine kobuvirus [sheep/TB3/HUN/2009]
KF006985, Kobuvirus, Aichivirus B2, ferret kobuvirus [MpKoV38]
AB084788, Kobuvirus, Aichivirus B1, bovine kobuvirus 1 [U-1]
EU7874590, Kobuvirus, Aichivirus C1, porcine kobuvirus [swine/S-1/HUN/2007/Hungary]
KF793927, Kobuvirus, Aichivirus C2, caprine kobuvirus [12Q108]
LC055960, unassigned, kagovirus 2 [cattle/Kagoshima-2-24-KoV/2015/JPN]
LC055961, unassigned, kagovirus 1 [cattle/Kagoshima-1-22-KoV/2014/JPN]
KJ641691, unassigned, bat picornavirus [BtMf-PicoV-2/GD2012]
KJ641686, unassigned, bat picornavirus [BtMr-PicoV/JX2010]
KT325852, unassigned, rabbit picornavirus [Rabbit01/2013/HUN]
GQ179640, Salivirus, Salivirus A1 [NG-J1]
KF741227, Sicinivirus, Sicinivirus A1 [UCC001]
KF979331, Sicinivirus, Sicinivirus A2, chicken picornavirus 1 [55C]
JQ691613, Gallivirus, Gallivirus A1 [turkey/M176/2011/HUN]
GU182406, Passerivirus, Passerivirus A1, turdivirus 1 [thrush/Hong Kong/00356/2007]
GU182408, Oscivirus, Oscivirus A1, turdivirus 2 [robin/Hong Kong/10717/2006]
GU182410, Oscivirus, Oscivirus A2, turdivirus 3 [thrush/Hong Kong/10878/2006]
KF387721, Sakobuvirus, Sakobuvirus A1, feline sakobuvirus 1 [FFUP1/Portugal/2012]
KJ415177, unassigned, tortoise rafivirus [UF4]
KF979334, unassigned, chicken picornavirus 3 [45C]
KT880669, unassigned, chicken picornavirus [Pf-CHK1/AsV]
KF979333, unassigned, chicken picornavirus 2 [44C]
KC465954, Avisivirus, Avisivirus A1 [turkey/M176-TuASV/2011/HUN]
KC614703, Avisivirus, Avisivirus A1 [USA-IN1]
KM203656, unassigned, orivirus 1 [chicken/Pf-CHK1/2013/HUN]
KT880667, unassigned, orivirus 2 [Pf-CHK1]
KJ000696, unassigned, aalivirus (duck picornavirus) [GL/12]
DQ249299, Avihepatovirus, Avihepatovirus A1, duck hepatitis A virus 1 [03D]
JQ316470, Pasivirus, Pasivirus A1, swine pasivirus 1 [swine/France/2011]
AB937989, unassigned, crohivirus [shew/ZM54]
AF327920, Parechovirus, Parechovirus B1, Ljungan virus 1 [87-012]
HF677705, unassigned, sebokele virus 1 [An/B/1227/d]
L02971, Parechovirus, Parechovirus A1, human parechovirus 1 [Harris]
KF006989, unassigned, ferret parechovirus [MpPeV1]
KJ641698, unassigned, bat picornavirus [BtMf-PicoV-1/SAX2011]
JQ814853, unassigned, Rhinolophus affinis picornavirus 1
KC935379, Kunsagivirus, Kunsagivirus A1, roller kunsagivirus [roller/SZAL6-KuV/2011/HUN]
unassigned, Bat Kunsagivirus [bat/Cameroon/2013]
EU142040, Aquamavirus, Aquamavirus A1, seal picornavirus 1 [HO-02-21]
KC843627, Potamipivirus, Potamipivirus A1, eel picornavirus [F15/05]
KF183915, Limnipivirus, Limnipivirus C1, fathead minnow picornavirus 1 [fhm/1/MN/USA/2010]
KF183916, Limnipivirus, Limnipivirus C1, fathead minnow picornavirus 1 [fhm/2/MN/USA/2010]
KF874490, Limnipivirus, Limnipivirus C1, fathead minnow picornavirus 1 [fhm/20/IL/USA/2010]
KC465953, Limnipivirus, Limnipivirus C1, fathead minnow picornavirus 1 [09-283]
KF306267, Limnipivirus, Limnipivirus B1, carp picornavirus 1 [F37/06]
JX134222, Limnipivirus, Limnipivirus A1, bluegill picornavirus 1 [04-032]
KT452695, unassigned, hedgehog hepatovirus [Igel75Erieur2014]
KT452698, unassigned, hedgehog hepatovirus [Igel68Erieur2014]
KT452691, unassigned, hedgehog hepatovirus [Igel8Erieur2014]
KT452714, unassigned, bat hepatovirus [M32Eidhel2010]
KT877158, unassigned, tupaia hepatovirus [TN1]
KT452730, unassigned, bat hepatovirus [BUO2BF86Colafr2010]
KT452729, unassigned, bat hepatovirus [FO1AF48Rhilan2010]
KT452742, unassigned, bat hepatovirus [SMG18520Minmav2014]
KT452735, unassigned, rodent hepatovirus [CIV459Lopsik2004]
KR703607, unassigned, phopivirus [NewEngland/USA/2011]
KT452637, unassigned, rodent hepatovirus [RMU101637Micarv2010]
KT452641, unassigned, rodent hepatovirus [KS11510Myogla2011]
KT452644, unassigned, rodent hepatovirus [KS111230Crimig2011]
M14707, Hepatovirus, Hepatovirus A1, hepatitis A virus [HM-175]
D00924, Hepatovirus, Hepatovirus A1, simian hepatitis A virus [AGM-27]
KT229612, unassigned, woodchuck hepatovirus [3ID]
KT229611, unassigned, woodchuck hepatovirus [2ID]
KT452685, unassigned, rodent hepatovirus [KEF121Sigmas2012]
KT452658, unassigned, shrew hepatovirus [KS121232Sorara2012]
KT452661, unassigned, shrew hepatovirus [KS121289Sorara2012]
AJ225173, Tremovirus, Tremovirus A1, avian encephalomyelitis virus 1 [Calnek vaccine strain]
KP770140, unassigned, ampivirus [NEWT/2013/HUN]
● KP230449, Harkavirus, Harkavirus A1 [kestrel/VOVE0622/2013/HUN]
0.5

Figure 2 (previous page): Phylogenetic analyses of picornavirus P1 using maximum likelihood tree inference (MEGA5.2). 178 picornavirus sequences were retrieved from GenBank. Presented are GenBank accession numbers, ***genus names***, *species names* and *types*. If available, common names and designations of isolates [in square brackets] are given. Yet unassigned viruses are printed in blue. Proposed names are printed in red and indicated by a dot (●). Numbers at nodes indicate bootstrap values obtained after 200 replications. The optimal substitution model (GTR+G+I) was determined with MEGA 5. The scale indicates substitutions/site.

Fig. 3

3CD

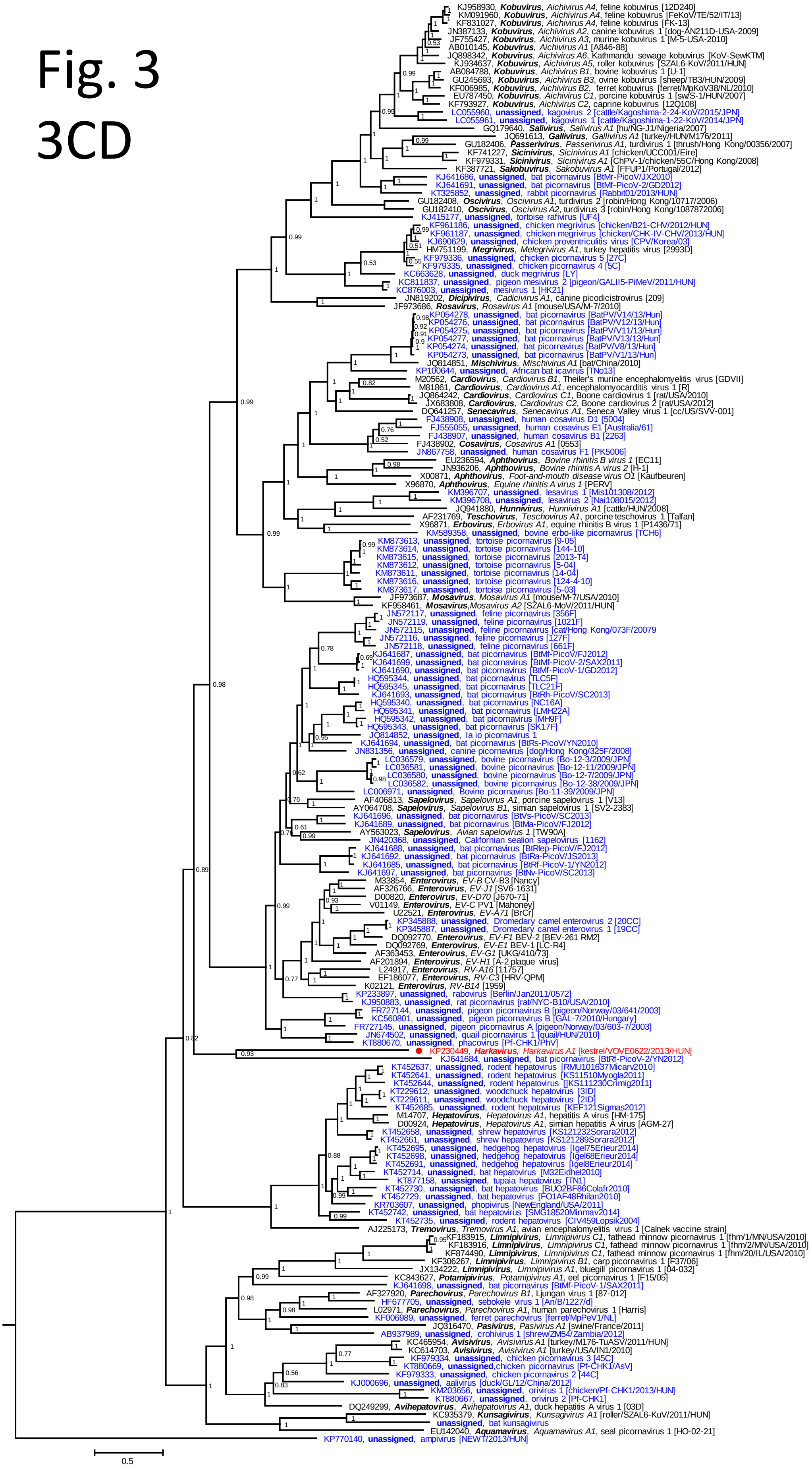
KJ958930, Kobuvirus, Aichivirus A4, feline kobuvirus [12D240]
KM091960, Kobuvirus, Aichivirus A4, feline kobuvirus [FeKoV/TE/52/IT/13]
KF831027, Kobuvirus, Aichivirus A4, feline kobuvirus [FK-13]
JN387133, Kobuvirus, Aichivirus A2, canine kobuvirus 1 [dog-AN211D-USA-2009]
JF755427, Kobuvirus, Aichivirus A3, murine kobuvirus 1 [M-5-USA-2010]
AB010145, Kobuvirus, Aichivirus A1 [A846-88]
JQ898342, Kobuvirus, Aichivirus A6, Kathmandu sewage kobuvirus [KoV-SewKTM]
KJ934637, Kobuvirus, Aichivirus A5, roller kobuvirus [SZAL6-KoV/2011/HUN]
AB084788, Kobuvirus, Aichivirus B1, bovine kobuvirus 1 [U-1]
GU245693, Kobuvirus, Aichivirus B3, ovine kobuvirus [sheep/TB3/HUN/2009]
KF006985, Kobuvirus, Aichivirus B2, ferret kobuvirus [ferret/MpKoV38/NL/2010]
EU787450, Kobuvirus, Aichivirus C1, porcine kobuvirus 1 [sw/S-1/HUN/2007]
KF793927, Kobuvirus, Aichivirus C2, caprine kobuvirus [12Q108]
LC055960, unassigned, kagovirus 2 [cattle/Kagoshima-2-24-KoV/2015/JPN]
LC055961, unassigned, kagovirus 1 [cattle/Kagoshima-1-22-KoV/2014/JPN]
GQ179640, Salivirus, Salivirus A1 [hu/NG-J1/Nigeria/2007]
JQ691613, Gallivirus, Gallivirus A1 [turkey/HUN/M176/2011]
GU182406, Passerivirus, Passerivirus A1, turdivirus 1 [thrush/Hong Kong/00356/2007]
KF741227, Sicinivirus, Sicinivirus A1 [chicken/UCC001/Eire]
KF979331, Sicinivirus, Sicinivirus A1 [ChPV-1/chicken/55C/Hong Kong/2008]
KF387721, Sakobuvirus, Sakobuvirus A1 [FFUP1/Portugal/2012]
KJ641686, unassigned, bat picornavirus [BtMr-PicoV/JX2010]
KJ641691, unassigned, bat picornavirus [BtMf-PicoV-2/GD2012]
KT325852, unassigned, rabbit picornavirus [Rabbit01/2013/HUN]
GU182408, Oscivirus, Oscivirus A1, turdivirus 2 [robin/Hong Kong/10717/2006)
GU182410, Oscivirus, Oscivirus A2, turdivirus 3 [robin/Hong Kong/1087872006]
KJ415177, unassigned, tortoise rafivirus [UF4]
KF961186, unassigned, chicken megrivirus [chicken/B21-CHV/2012/HUN]
KF961187, unassigned, chicken megrivirus [chicken/CHK-IV-CHV/2013/HUN]
KJ690629, unassigned, chicken proventriculitis virus [CPV/Korea/03]
HM751199, Megrivirus, Melegrivirus A1, turkey hepatitis virus [2993D]
KF979336, unassigned, chicken picornavirus 5 [27C]
KF979335, unassigned, chicken picornavirus 4 [5C]
KC663628, unassigned, duck megrivirus [LY]
KC811837, unassigned, pigeon mesivirus 2 [pigeon/GALII5-PiMeV/2011/HUN]
KC876003, unassigned, mesivirus 1 [HK21]
JN819202, Dicipivirus, Cadicivirus A1, canine picodicistrovirus [209]
JF973686, Rosavirus, Rosavirus A1 [mouse/USA/M-7/2010]
KP054278, unassigned, bat picornavirus [BatPV/V14/13/Hun]
KP054276, unassigned, bat picornavirus [BatPV/V12/13/Hun]
KP054275, unassigned, bat picornavirus [BatPV/V11/13/Hun]
KP054277, unassigned, bat picornavirus [BatPV/V13/13/Hun]
KP054274, unassigned, bat picornavirus [BatPV/V8/13/Hun]
KP054273, unassigned, bat picornavirus [BatPV/V1/13/Hun]
JQ814851, Mischivirus, Mischivirus A1 [bat/China/2010]
KP100644, unassigned, African bat icavirus [TNo13]
M20562, Cardiovirus, Cardiovirus B1, Theiler's murine encephalomyelitis virus [GDVII]
M81861, Cardiovirus, Cardiovirus A1, encephalomyocarditis virus 1 [R]
JQ864242, Cardiovirus, Cardiovirus C1, Boone cardiovirus 1 [rat/USA/2010]
JX683808, Cardiovirus, Cardiovirus C2, Boone cardiovirus 2 [rat/USA/2012]
DQ641257, Senecavirus, Senecavirus A1, Seneca Valley virus 1 [cc/US/SVV-001]
FJ438908, unassigned, human cosavirus D1 [5004]
FJ555055, unassigned, human cosavirus E1 [Australia/61]
FJ438907, unassigned, human cosavirus B1 [2263]
FJ438902, Cosavirus, Cosavirus A1 [0553]
JN867758, unassigned, human cosavirus F1 [PK5006]
EU236594, Aphthovirus, Bovine rhinitis B virus 1 [EC11]
JN936206, Aphthovirus, Bovine rhinitis A virus 2 [H-1]
X00871, Aphthovirus, Foot-and-mouth disease virus O1 [Kaufbeuren]
X96870, Aphthovirus, Equine rhinitis A virus 1 [PERV]
KM396707, unassigned, lesavirus 1 [Mis101308/2012]
KM396708, unassigned, lesavirus 2 [Nai108015/2012]
JQ941880, Hunnivirus, Hunnivirus A1 [cattle/HUN/2008]
AF231769, Teschovirus, Teschovirus A1, porcine teschovirus 1 [Talfan]
X96871, Erbovirus, Erbovirus A1, equine rhinitis B virus 1 [P1436/71]
KM589358, unassigned, bovine erbo-like picornavirus [TCH6]
KM873613, unassigned, tortoise picornavirus [9-05]
KM873614, unassigned, tortoise picornavirus [144-10]
KM873615, unassigned, tortoise picornavirus [2013-T4]
KM873612, unassigned, tortoise picornavirus [5-04]
KM873611, unassigned, tortoise picornavirus [14-04]
KM873616, unassigned, tortoise picornavirus [124-4-10]
KM873617, unassigned, tortoise picornavirus [5-03]
JF973687, Mosavirus, Mosavirus A1 [mouse/M-7/USA/2010]
KF958461, Mosavirus,Mosavirus A2 [SZAL6-MoV/2011/HUN]
JN572117, unassigned, feline picornavirus [356F]
JN572119, unassigned, feline picornavirus [1021F]
JN572115, unassigned, feline picornavirus [cat/Hong Kong/073F/20079
JN572116, unassigned, feline picornavirus [127F]
JN572118, unassigned, feline picornavirus [661F]
KJ641687, unassigned, bat picornavirus [BtMf-PicoV/FJ2012]
KJ641699, unassigned, bat picornavirus [BtMf-PicoV-2/SAX2011]
KJ641690, unassigned, bat picornavirus [BtMf-PicoV-1/GD2012]
HQ595344, unassigned, bat picornavirus [TLC5F]
HQ595345, unassigned, bat picornavirus [TLC21F]
KJ641693, unassigned, bat picornavirus [BtRh-PicoV/SC2013]
HQ595340, unassigned, bat picornavirus [NC16A]
HQ595341, unassigned, bat picornavirus [LMH22A]
HQ595342, unassigned, bat picornavirus [MH9F]
HQ595343, unassigned, bat picornavirus [SK17F]
JQ814852, unassigned, Ia io picornavirus 1
KJ641694, unassigned, bat picornavirus [BtRs-PicoV/YN2010]
JN831356, unassigned, canine picornavirus [dog/Hong Kong/325F/2008]
LC036579, unassigned, bovine picornavirus [Bo-12-3/2009/JPN]
LC036581, unassigned, bovine picornavirus [Bo-12-11/2009/JPN]
LC036580, unassigned, bovine picornavirus [Bo-12-7/2009/JPN]
LC036582, unassigned, bovine picornavirus [Bo-12-38/2009/JPN]
LC006971, unassigned, Bovine picornavirus [Bo-11-39/2009/JPN]
AF406813, Sapelovirus, Sapelovirus A1, porcine sapelovirus 1 [V13]
AY064708, Sapelovirus, Sapelovirus B1, simian sapelovirus 1 [SV2-2383]
KJ641696, unassigned, bat picornavirus [BtVs-PicoV/SC2013]
KJ641689, unassigned, bat picornavirus [BtMa-PicoV/FJ2012]
AY563023, Sapelovirus, Avian sapelovirus 1 [TW90A]
JN420368, unassigned, Californian sealion sapelovirus [1162]
KJ641688, unassigned, bat picornavirus [BtRlep-PicoV/FJ2012]
KJ641692, unassigned, bat picornavirus [BtRa-PicoV/JS2013]
KJ641685, unassigned, bat picornavirus [BtRf-PicoV-1/YN2012]
KJ641697, unassigned, bat picornavirus [BtNv-PicoV/SC2013]
M33854, Enterovirus, EV-B CV-B3 [Nancy]
AF326766, Enterovirus, EV-J1 [SV6-1631]
D00820, Enterovirus, EV-D70 [J670-71]
V01149, Enterovirus, EV-C PV1 [Mahoney]
U22521, Enterovirus, EV-A71 [BrCr]
KP345888, unassigned, Dromedary camel enterovirus 2 [20CC]
KP345887, unassigned, Dromedary camel enterovirus 1 [19CC]
DQ092770, Enterovirus, EV-F1 BEV-2 [BEV-261 RM2]
DQ092769, Enterovirus, EV-E1 BEV-1 [LC-R4]
AF363453, Enterovirus, EV-G1 [UKG/410/73]
AF201894, Enterovirus, EV-H1 [A-2 plaque virus]
L24917, Enterovirus, RV-A16 [11757]
EF186077, Enterovirus, RV-C3 [HRV-QPM]
K02121, Enterovirus, RV-B14 [1959]
KP233897, unassigned, rabovirus [Berlin/Jan2011/0572]
KJ950883, unassigned, rat picornavirus [rat/NYC-B10/USA/2010]
FR727144, unassigned, pigeon picornavirus B [pigeon/Norway/03/641/2003]
KC560801, unassigned, pigeon picornavirus B [GAL-7/2010/Hungary]
FR727145, unassigned, pigeon picornavirus A [pigeon/Norway/03/603-7/2003]
JN674502, unassigned, quail picornavirus 1 [quail/HUN/2010]
KT880670, unassigned, phacovirus [Pf-CHK1/PhV]
● KP230449, Harkavirus, Harkavirus A1 [kestrel/VOVE0622/2013/HUN]
KJ641684, unassigned, bat picornavirus [BtRf-PicoV-2/YN2012]
KT452637, unassigned, rodent hepatovirus [RMU101637Micarv2010]
KT452641, unassigned, rodent hepatovirus [KS11510Myogla2011]
KT452644, unassigned, rodent hepatovirus []KS111230Crimig2011]
KT229612, unassigned, woodchuck hepatovirus [3ID]
KT229611, unassigned, woodchuck hepatovirus [2ID]
KT452685, unassigned, rodent hepatovirus [KEF121Sigmas2012]
M14707, Hepatovirus, Hepatovirus A1, hepatitis A virus [HM-175]
D00924, Hepatovirus, Hepatovirus A1, simian hepatitis A virus [AGM-27]
KT452658, unassigned, shrew hepatovirus [KS121232Sorara2012]
KT452661, unassigned, shrew hepatovirus [KS121289Sorara2012]
KT452695, unassigned, hedgehog hepatovirus [Igel75Erieur2014]
KT452698, unassigned, hedgehog hepatovirus [Igel68Erieur2014]
KT452691, unassigned, hedgehog hepatovirus [Igel8Erieur2014]
KT452714, unassigned, bat hepatovirus [M32Eidhel2010]
KT877158, unassigned, tupaia hepatovirus [TN1]
KT452730, unassigned, bat hepatovirus [BUO2BF86Colafr2010]
KT452729, unassigned, bat hepatovirus [FO1AF48Rhilan2010]
KR703607, unassigned, phopivirus [NewEngland/USA/2011]
KT452742, unassigned, bat hepatovirus [SMG18520Minmav2014]
KT452735, unassigned, rodent hepatovirus [CIV459Lopsik2004]
AJ225173, Tremovirus, Tremovirus A1, avian encephalomyelitis virus 1 [Calnek vaccine strain]
KF183915, Limnipivirus, Limnipivirus C1, fathead minnow picornavirus 1 [fhm/1/MN/USA/2010]
KF183916, Limnipivirus, Limnipivirus C1, fathead minnow picornavirus 1 [fhm/2/MN/USA/2010]
KF874490, Limnipivirus, Limnipivirus C1, fathead minnow picornavirus 1 [fhm/20/IL/USA/2010]
KF306267, Limnipivirus, Limnipivirus B1, carp picornavirus 1 [F37/06]
JX134222, Limnipivirus, Limnipivirus A1, bluegill picornavirus 1 [04-032]
KC843627, Potamipivirus, Potamipivirus A1, eel picornavirus 1 [F15/05]
KJ641698, unassigned, bat picornavirus [BtMf-PicoV-1/SAX2011]
AF327920, Parechovirus, Parechovirus B1, Ljungan virus 1 [87-012]
HF677705, unassigned, sebokele virus 1 [An/B/1227/d]
L02971, Parechovirus, Parechovirus A1, human parechovirus 1 [Harris]
KF006989, unassigned, ferret parechovirus [ferret/MpPeV1/NL]
JQ316470, Pasivirus, Pasivirus A1 [swine/France/2011]
AB937989, unassigned, crohivirus 1 [shrew/ZM54/Zambia/2012]
KC465954, Avisivirus, Avisivirus A1 [turkey/M176-TuASV/2011/HUN]
KC614703, Avisivirus, Avisivirus A1 [turkey/USA/IN1/2010]
KF979334, unassigned, chicken picornavirus 3 [45C]
KT880669, unassigned,chicken picornavirus [Pf-CHK1/AsV]
KF979333, unassigned, chicken picornavirus 2 [44C]
KJ000696, unassigned, aalivirus [duck/GL/12/China/2012]
KM203656, unassigned, orivirus 1 [chicken/Pf-CHK1/2013/HUN]
KT880667, unassigned, orivirus 2 [Pf-CHK1]
DQ249299, Avihepatovirus, Avihepatovirus A1, duck hepatitis A virus 1 [03D]
KC935379, Kunsagivirus, Kunsagivirus A1 [roller/SZAL6-KuV/2011/HUN]
unassigned, bat kunsagivirus
EU142040, Aquamavirus, Aquamavirus A1, seal picornavirus 1 [HO-02-21]
KP770140, unassigned, ampivirus [NEWT/2013/HUN]
0.5

Figure 3 (previous page): Phylogenetic analyses of picornavirus 3CD gene regions using Bayesian tree inference (MrBayes 3.2). 178 sequences were retrieved from GenBank. Presented are GenBank accession numbers, ***genus names***, *species names* and *types*. If available, common names and designations of isolates [in square brackets] are given. Yet unassigned viruses are printed in blue. Proposed names are printed in red and indicated by a dot (●). Numbers at nodes indicate posterior probabilities obtained after 4,750,000 generations. The optimal substitution model (GTR+G+I) was determined with MEGA 5. The scale indicates substitutions/site.