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

Code assigned:	***2010.004.a-dV***	(to be completed by ICTV officers)

Short title: Create genus *Lambdatorquevirus* in the family *Anelloviridae*
(e.g. 6 new species in the genus *Zetavirus*)

Modules attached
(modules 1 and 9 are required)

1 ☒ 2 ☒ 3 ☒ 4 ☐ 5 ☐
6 ☐ 7 ☐ 8 ☐ 9 ☒

Author(s) with e-mail address(es) of the proposer:

Philippe Biagini on behalf of the Anelloviridae-Circoviridae Study Group
philippe.biagini@efs.sante.fr / pbiagini-ets-ap@gulliver.fr

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)	Anelloviridae-Circoviridae Study Group

ICTV-EC or Study Group comments and response of the proposer:

Date first submitted to ICTV:
Date of this revision (if different to above): 13 July 2010

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	*2010.004.aV*	(assigned by ICTV officers)

To create 1 new species within:

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

And name the new species:	
Torque teno zalophus virus 1	**FJ459582**

Reasons to justify the creation and assignment of the new species:
The current criterion demarcating species in the genus is: ORF1 nucleotide sequence divergence >35%. The isolate listed above meets the species demarcation criteria.
Further material in support of this proposal is presented in the Appendix, Module 9.

MODULE 3: **NEW GENUS**

creating a new genus

Code	*2010.004.bV*	(assigned by ICTV officers)

To create a new genus within:

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

Subfamily:	
Family:	*Anelloviridae*
Order:	

naming a new genus

Code	*2010.004.cV*	(assigned by ICTV officers)

To name the new genus: *Lambdatorquevirus*

Assigning the type species and other species to a new genus

Code	*2010.004.dV*	(assigned by ICTV officers)

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

Torque teno zalophus virus 1	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 are presented in the Appendix, Module 9

The family *Anelloviridae* comprises a large and growing number of viruses that share a similar genome organization but are extremely variable in sequence. This prompts the creation of new genera (and species). The current criterion demarcating genera in the family is: ORF1 nucleotide sequence divergence >56%. The isolate listed above meets the genus demarcation criteria.

Origin of the new genus name:

Genera in the family *Anelloviridae* are listed as: *Alphatorquevirus*, *Betatorquevirus*, *Gammatorquevirus*, … according to the Greek alphabet.
Zalophus relates to the animal species in which the virus was identified (California sea lion).

Reasons to justify the choice of type species:

First species in the genus.

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.

additional material in support of this proposal

References:

Biagini, P., Todd, D., Bendinelli, M., Hino, S., Mankertz, A., Mishiro, S., Niel, C., Okamoto, H., Raidal, S., Ritchie, B.W & Teo, G.C. (2005). Anellovirus. In: Virus Taxonomy, VIIIth Report of the International Committee for the Taxonomy of Viruses (C.M. Fauquet, M.A. Mayo, J. Maniloff, U. Desselberger, and L.A. Ball, eds), 335-341. Elsevier/Academic Press, London.

Biagini, P. (2009). Classification of TTV and related viruses (anelloviruses). Curr Top Microbiol Immunol 331, 21-33.

Ng, T.F., Suedmeyer, W.K., Wheeler, E., Gulland, F. & Breitbart, M. (2009). Novel anellovirus discovered from a mortality event of captive California sea lions. J Gen Virol 90, 1256-1261.

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.

Host: California sea lion.

The new isolate which is considered here has been compared with the currently available full-length ORF1 nt sequences belonging to the family *Anelloviridae* (n=210).

Analysis of the distribution of pairwise comparisons (not shown) confirmed the current criteria demarcating species and genera in the family *Anelloviridae* (cut-off values for sequence divergence: species >35%, genera >56%). The corresponding phylogenetic tree (p-distance / Neighbor-joining method) (Figure 1) is shown; in order to improve its legibility, genus *Alphatorquevirus* is described by representative sequences only.

The isolate listed above meets the genus demarcation criteria.

Figure 1. Neighbor-joining phylogenetic tree built with ORF1-nt sequences.
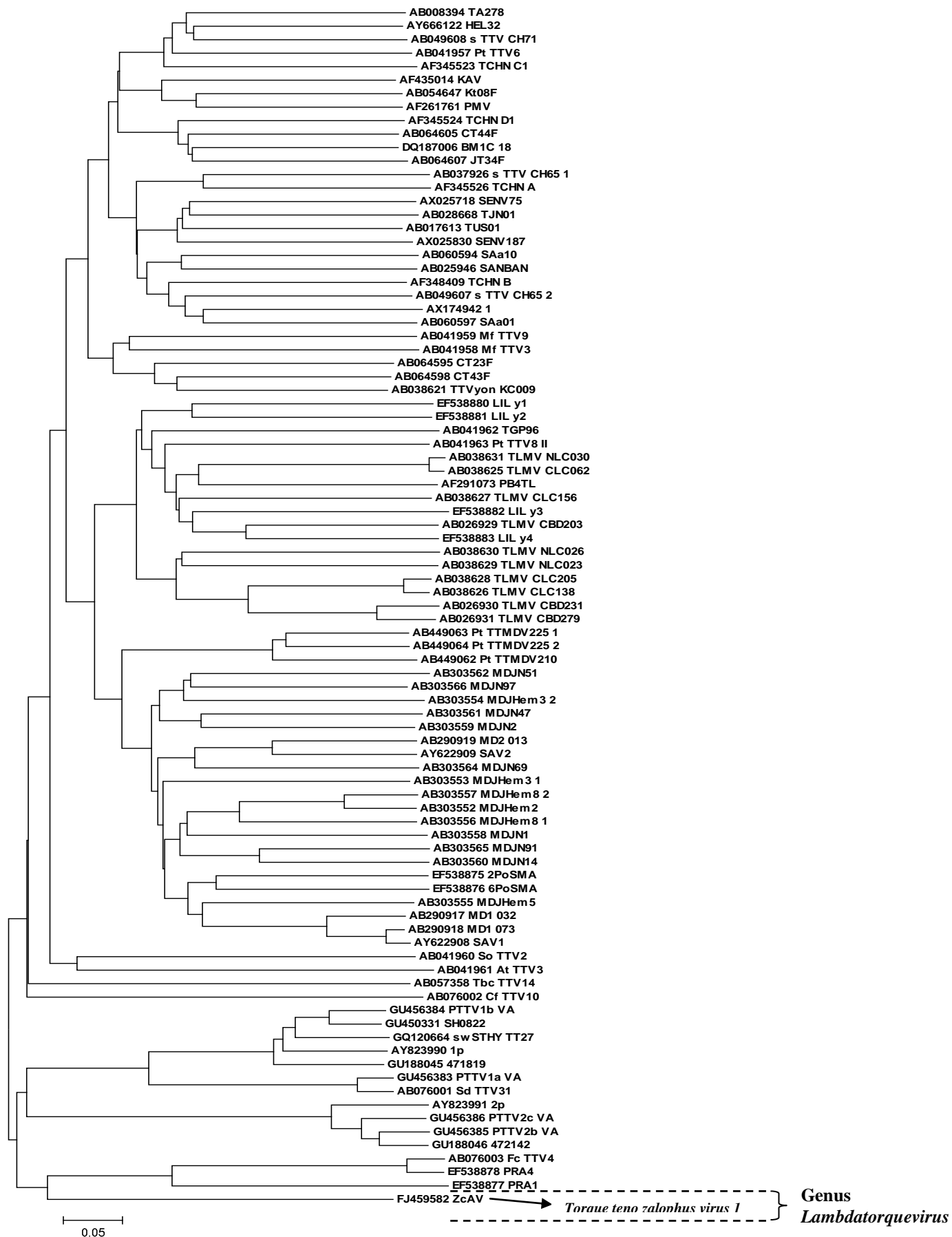
ASSIGNMENT OF ACCESSION NUMBER TO TAXA (new proposal : in bold)

Alphatorquevirus

Torque teno virus 1	AB008394
Torque teno virus 2	AB049608
Torque teno virus 3	AY666122
Torque teno virus 4	AB041957
Torque teno virus 5	AF345523
Torque teno virus 6	AF435014
Torque teno virus 7	AF261761
Torque teno virus 8	AB054647
Torque teno virus 9	DQ187006
Torque teno virus 10	AB064607
Torque teno virus 11	AF345524
Torque teno virus 12	AB064605
Torque teno virus 13	AF345526
Torque teno virus 14	AB037926
Torque teno virus 15	AB028668
Torque teno virus 16	AB017613
Torque teno virus 17	AX025830
Torque teno virus 18	AX025718
Torque teno virus 19	AB025946
Torque teno virus 20	AB060594
Torque teno virus 21	AF348409
Torque teno virus 22	AX174942
Torque teno virus 23	AB049607
Torque teno virus 24	AB060597
Torque teno virus 25	AB041959
Torque teno virus 26	AB041958
Torque teno virus 27	AB064595
Torque teno virus 28	AB064598
Torque teno virus 29	AB038621

Betatorquevirus

Torque teno mini virus 1	AB026931
Torque teno mini virus 2	AB038629
Torque teno mini virus 3	AB038630
Torque teno mini virus 4	AB041963
Torque teno mini virus 5	AB041962
Torque teno mini virus 6	AB026929
Torque teno mini virus 7	AB038627
Torque teno mini virus 8	AF291073
Torque teno mini virus 9	AB038631
Torque teno mini virus 10	EF538880
Torque teno mini virus 11	EF538881
Torque teno mini virus 12	EF538882

Gammatorquevirus

Torque teno midi virus 1	AB290918

Torque teno midi virus 2	AB290919
Torque teno midi virus 3	EF538875
Torque teno midi virus 4	EF538876
Torque teno midi virus 5	AB303552
Torque teno midi virus 6	AB303553
Torque teno midi virus 7	AB303554
Torque teno midi virus 8	AB303558
Torque teno midi virus 9	AB303559
Torque teno midi virus 10	AB303560
Torque teno midi virus 11	AB303561
Torque teno midi virus 12	AB303562
Torque teno midi virus 13	AB303564
Torque teno midi virus 14	AB303566
Torque teno midi virus 15	AB449062

Deltatorquevirus
    Torque teno tupaia virus   AB057358

Epsilontorquevirus
    Torque teno tamarin virus   AB041960

Zetatorquevirus
    Torque teno douroucouli virus   AB041961

Etatorquevirus
    Torque teno felis virus 1   AB076003
    Torque teno felis virus 2   EF538877

Thetatorquevirus
    Torque teno canis virus   AB076002

Iotatorquevirus
    Torque teno sus virus 1   AB076001
    Torque teno sus virus 2   AY823990

Kappatorquevirus
    Torque teno sus virus 3   AY823991

Lambdatorquevirus
    Torque teno zalophus virus 1   **FJ459582**