Template for Taxonomic Proposal to the ICTV Executive Committee
Creating Species in an existing genus

Code† FT2003.126V.01 To designate the following viruses as species in the genus:

Arenavirus

belonging to the family° : ***Arenaviridae***

Bear Canyon virus (BCNV)
A0060209 AF512833
A0070039
A0060207
A0060211
A0060210

† Assigned by ICTV officers
° leave blank if inappropriate or in the case of an unassigned genus

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New Taxonomic Order

Order
Family ***Arenaviridae***
Genus ***Arenavirus***
Type Species *Lymphocytic choriomeningitis virus*
List of Species in the genus
Ippy virus
Lassa virus
Lymphocytic choriomeningitis virus
Mobala virus
Mopeia virus
Amapari virus
Flexal virus
Guanarito virus
Junín virus
Latino virus
Machupo virus

Oliveros virus
Paraná
Pichinde virus
Sabiá virus
Tacaribe virus
Tamiami virus
Whitewater Arroyo virus

List of Tentative Species in the Genus

Pampa virus

List of Unassigned Species in the Family

None reported

Argumentation to justify the designation of new species in the genus

Species demarcation criteria in the genus

Members of an arenavirus species:
- share a specific host in the same species or genus,
- share a similar geographic distribution,
- are / are not agent of disease in humans,
- share an antigenic cross-reactivity,
- show a divergence of no more than 12% in the nucleoprotein amino acid sequence.

Argumentation to justify the designation of new species in the genus

Bear Canyon virus was first isolated from *Peromyscus californicus* rodents collected in the Santa Ana Mountains in Orange County, California, USA (Fulhorst CF et al., 2002). It is the first arenavirus to be isolated from *Peromyscus* rodents, and its isolation from multiple animals in the same species indicates that this is likely to be the principal reservoir. It is also the first arenavirus to be isolated in California from wild rodents, although arenavirus-reactive antibodies had been found previously in a number of rodent species including *Peromyscus* spp. (Bennett et al., 2000). No direct evidence of the ability of *Bear Canyon virus* to infect humans or to cause disease has been reported so far. ELISA tests show a clear antigenic cross-reactivity with another North American arenavirus, *Whitewater Arroyo virus*, isolated in New Mexico. The complete small segment genomic sequence of *Bear Canyon virus* has been determined (Charrel et al., 2002). It is most closely related to *Whitewater Arroyo virus*, with a genetic distance at the amino acid level of 18.9% between the nucleoproteins of the two viruses (see Annex for phylogenetic trees). These data indicate that *Bear Canyon virus* should be assigned as a new species in the genus *Arenavirus*.

Separate analysis of the complete nucleoprotein and glycoprotein precursor sequences of *Bear Canyon virus* clearly shows that these two genes have different evolutionary origins (Charrel et al., 2002). The nucleoprotein gene is closely related to that of arenaviruses belonging to the New World phylogenetic lineage A (*Pichinde*, *Allpahuayo*, *Flexal*, *Paraná*, and *Pirital* viruses; in contrast, the glycoprotein precursor gene is more closely related to that of arenaviruses belonging to lineage B (*Junín*, *Machupo*, *Guanarito*, *Sabiá*, *Tacaribe*, *Amapari*, *Cupixi* viruses): this unambiguously demonstrates that the small genomic segment of *Bear Canyon virus* has a dual evolutionary origin and was produced by intrasegmental recombination between two ancestral viruses that belonged to different lineages. This had been previously demonstrated for *Whitewater Arroyo virus* (Charrel et al., 2001), and subsequently for *Tamiami virus* (Charrel et al., 2002, Archer and Rico-Hesse, 2002), showing that the three arenaviruses indigenous to North America are all derived from an ancestral arenavirus in which the small genomic segment had undergone intrasegmental recombination.

Bear Canyon virus (BCNV)		
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References

Archer AM and Rico-Hesse R. (2002). High genetic divergence and recombination in arenaviruses from the Americas. Virology 304:274-281.

Bennett SG, Milazzo ML, Webb JP Jr, Fulhorst CF (2000). Arenavirus antibody in rodents indigenous to coastal southern California. Am J Trop Med Hyg 62:626-630.

Charrel RN, de Lamballerie X, Fulhorst CF (2001). The Whitewater Arroyo virus: natural evidence for genetic recombination among Tacaribe serocomplex viruses (family *Arenaviridae*). Virology 283:161-166.

Charrel RN, Feldmann H, Fulhorst CF, Khelifa R, de Chesse R, de Lamballerie X (2002). Phylogeny of New World arenaviruses based on the complete coding sequences of the small genomic segment identified an evolutionary lineage produced by intra-segmental recombination. Biochem Biophys Res Commun. 296:1118-1124.

Fulhorst CF, Bennett SG, Milazzo ML, Murray Jr HL, Webb Jr JP, Cajimat MNB, Bradley RB. (2002). Bear canyon virus: an arenavirus naturally associated with the California mouse (*Peromyscus californicus*). Emerg Infect Dis 8:717-721.

Annexes:

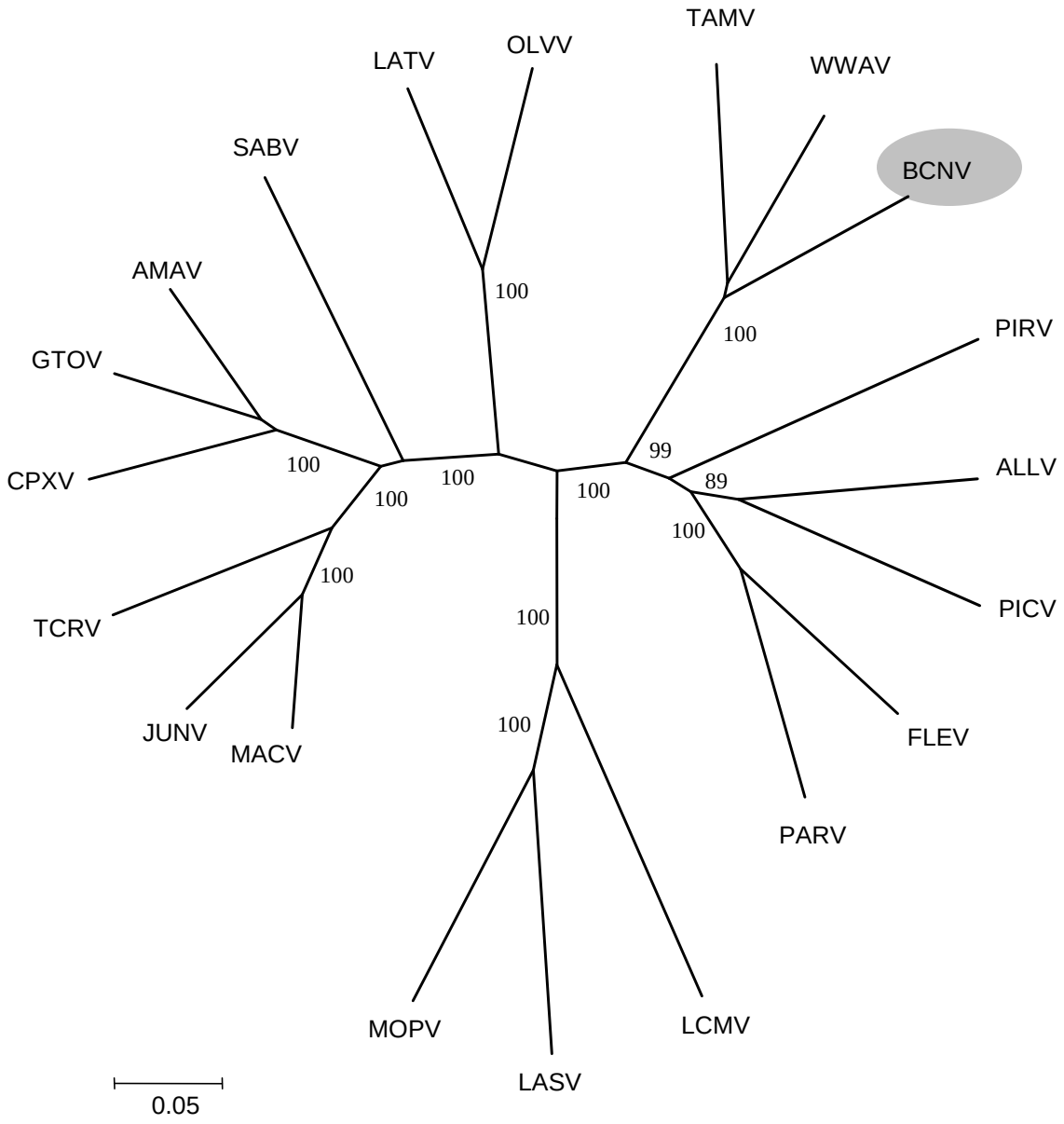

Fig.1. Phylogenetic tree showing the relationship between arenavirus species and the proposed species *Bear Canyon virus* (BCNV), using complete nucleoprotein amino acid sequences.

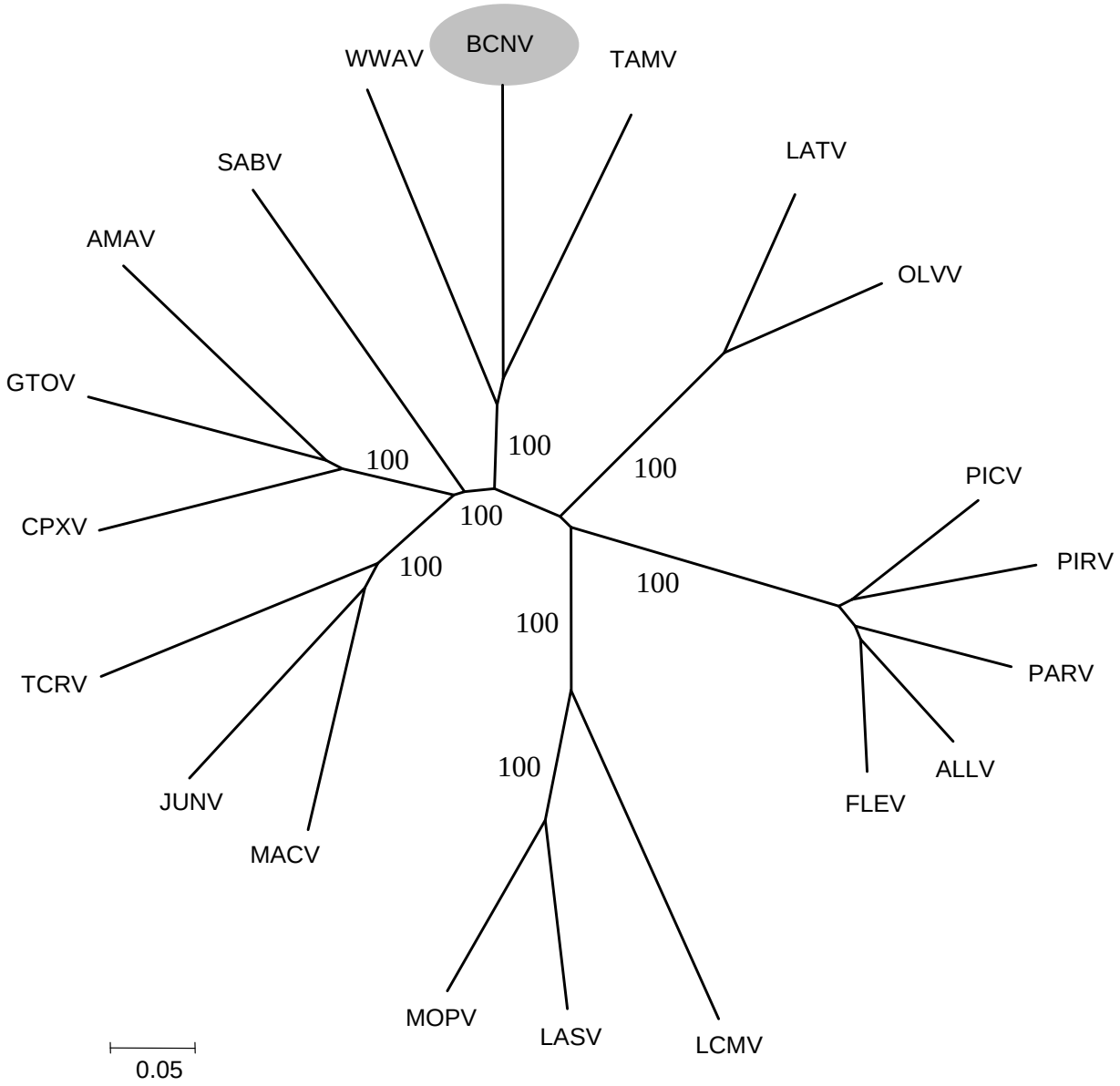

Fig.2. Phylogenetic tree showing the relationship between arenavirus species and the proposed species *Bear Canyon virus* (BCNV), using complete glycoprotein precursor amino acid sequences.