

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

Code[†] **FT2003.062V.01** To designate the following viruses as unassigned species in the family: ***Birnaviridae***

Blotched Snakehead Virus

[†] 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 *Birnaviridae*

List of Unassigned Species in the Family

Blotched snakehead virus

Argumentation to justify the designation of unassigned species in the family

A bisegmented dsRNA virus has been discovered and characterized. This virus was found persistently infecting a cell line derived from blotched snakehead fish (*Channa lucius*). The estimated molecular weights of the two genome segments A and B were 2.56×10^6 and 2.00×10^6 , respectively. cDNA clones for the two genomic segments have been analyzed. Two overlapping open reading frames (ORFs) were found on the same strand of genomic segment A. The large ORF of 1,069 codons is preceded by a 165-nucleotide 5'-untranslated region and is capable of encoding a long polypeptide which was designated as the polyprotein ORF. The small ORF of 139 codons started at nucleotide 452. The genomic segment B encodes a 867-amino acid long protein that shares homologies with other birnavirus VP1 polymerases. This genome structure and organization are typical of members of the *Birnaviridae*. However, several features indicate that this new virus is not a member of an existing species. Reciprocal cross-neutralization tests incorporating classical strains of IPNV and this new virus established the complete distinctness of this virus from IPNV.

In vitro processing analysis showed that the large ORF encodes a polyprotein cotranslationally processed by the viral protease to generate pVP2 (the VP2 capsid protein precursor), a 71-amino-acid-long peptide [X], VP4 (the viral protease), and VP3 (the internal capsid protein). This [X] peptide has no counterpart in other birnaviruses. Cleavage site motifs were also shown to be different to those identified in other birnaviruses.

A small ORF was identified within the 5'-terminal half of the large ORF (in the VP2 encoding domain), but in a different reading frame. This location of a small ORF in the genomic segment A is unique. In Aqua- and Avi-birnaviruses, a small ORF (encoding VP5) overlaps the initiation codon of the polyprotein. In Entomo-birnavirus, an ORF has been identified overlapping the VP4 and VP3 junction domain.

Comparative analysis of the VP1, pVP2, VP3 and VP4 predicted sequences showed partial matches to those of other birnaviruses. However, the level of identity calculated for these proteins was relatively low, ranging from 18 to 49%, indicating that the new virus belongs to a distinct virus species.

We propose the new virus to be named blotched snakehead virus (BSNV).

List of created Unassigned Species in the family

Blotched snakehead virus

References

- John K.R., and R.H. Richards.** (1999). Characteristics of a new birnavirus associated with a warm-water fish cell line. *J.Gen. Virol.* 80:2061-2065.
- Da Costa, B., S. Soignier, C. Chevalier, C. Henry, C. Thory, J.-C. Huet and B. Delmas.** (2003). Blotched Snakehead virus is a new aquatic birnavirus that is slightly more related to avibirnavirus than to aquabirnavirus. *J. Virol.* 77:719-725.

Annexes: