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

Code† **2005.259I.04** To designate the following viruses as species in the genus:

Omegatetravirus

belonging to the family° : ***Tetraviridae***

Dendrolimus punctatus virus

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

Author(s) with email address(es) of the Taxonomic Proposal

Gordon, K. (Chair), Gorbalenya, A., Hanzlik, T., Hendry, D, Pringle, F. Ward, V. and Zeddam, J.-L.

Karl.Gordon@csiro.au Chair *Tetraviridae* SG

Old Taxonomic Order

Family *Tetraviridae*
Genus *Omegatetravirus*
Type Species *Nudaurelia capensis ω virus*

Species in the Genus
Nudaurelia capensis ω virus
Helicoverpa armigera stunt virus

New Taxonomic Order

Family *Tetraviridae*
Genus *Omegatetravirus*
Type Species *Nudaurelia capensis ω virus*

Species in the Genus
Nudaurelia capensis ω virus
Helicoverpa armigera stunt virus
Dendrolimus punctatus virus

Species demarcation criteria in the genus

- **Biological properties (host range, vectors, mode of transmission).** Since the natural host-ranges of individual recognized tetravirus species appear to be narrow, virus isolation from a new host can provide suggestive evidence of a new tetravirus species.
- **Antigenic properties.** Antisera raised against different isolates or strains of a single tetravirus species should exhibit high levels of cross-reactivity in Western blot and/or neutralization analyses. Lower levels of cross-reactivity in these assays using antisera against previously recognized tetraviruses can provide evidence of a new tetravirus species.
- **Virion physical/physicochemical characteristics.** In the absence of more definitive criteria, significant (>5%) differences in virion sedimentation coefficient or buoyant density from those of all previously recognized tetravirus species can provide evidence of a new virus species.
- **Structural protein characteristics.** The electrophoretic mobilities in SDS-PAGE of the CP precursor or its cleavage products should be compared with those of other tetravirus species.
- **Genome molecular characteristics.**
- **RNA electrophoretic mobilities.** In the absence of sequence information, the electrophoretic mobilities of the viral genomic RNAs should be compared with those of other tetraviruses.
- **RNA hybridization properties.** In the absence of differences in RNA electrophoretic mobilities, the molecular hybridization properties of the viral genomic RNAs should be compared with those of other tetraviruses.
- **Genome sequence characteristics.** The nt sequences of the genomic RNA(s) should be compared with those of other tetraviruses.

Argumentation to justify the designation of new species in the genus

The complete genome sequence of a tetravirus from *Dendrolimus punctatus* has been determined since the preparation of the VIIIth report (Yi *et al*., 2005). The biophysical and genome organisation and sequence characteristics of the virus show it to be very similar and closely related to *Nudaurelia capensis ω* virus and HaSV. In particular, the new virus shows the following characteristics:

- positive sense ss RNAs of 5492 and 2490 nts (vs 5312 and 2478 for HaSV)
- icosahedral/spherical particles (about 40nm in diameter)
- major capsid protein of 62,500 and a smaller capsid protein of 6,800 produced by processing of the larger capsid precursor.
- The genome comprises two distinct major ORFs, the larger on RNA 1 and the other on RNA 2; RNA 2 also carries the third ORF (p17) first identified on HaSV that overlaps the capsid gene.
- The genome shows high levels of sequence identity to those of HaSV and NωV (where available for the latter). Importantly the deduced amino acid sequence of the replicase encoded by RNA1 is closely related to the predicted HaSV replicase and contains core motifs for the RNA polymerase in the most conserved regions; as for the HaSV and NωV replicases, both RNA helicase or methyltransferase motifs were identified in addition to a polymerase domain. These features clearly place this virus among those tetraviruses whose replicases belong to the alpha-like virus superfamily.

The species name *Dendrolimus punctatus virus*, with the common name Dendrolimus punctatus virus and the abbreviation DpuV - to distinguish it from the existing tetravirus DpV.

List of Species in the genus

The recognised members of the *Omegatetravirus* genus will comprise the species as shown below. *Nudaurelia ω virus* remains the type member. Official virus species names are in italics. Virus names, genome sequence accession numbers [ ], and assigned abbreviations ( ) are:

Dendrolimus punctatus virus			
Dendrolimus punctatus virus		RNA1 [AY594352] RNA2 [AY594353]	(DpuV)
Helicoverpa armigera stunt virus			
Helicoverpa armigera stunt virus		RNA1 [U18246] RNA2 [L37299]	(HaSV)
Nudaurelia capensis ω virus			
Nudaurelia capensis ω virus		RNA2 [S43937]	(NωV)

References

Fuming Yi, Jiamin Zhang, Haiyang Yu, Chuanfeng Liu, Junping Wang and Yuanyang Hu (2005). Isolation and identification of a new tetravirus from *Dendrolimus punctatus* larvae collected from Yunnan Province, China. *J Gen Virol* 86, 789-796;