

# MOLECULAR EPIDEMIOLOGY OF BLUETONGUE VIRUS SEROTYPE 9 IN THE MEDITERRANEAN REGION

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*Bluetongue virus* (BTV) is the prototype species of the genus *Orbivirus* within the family *Reoviridae*. There are 24 (possibly 25) distinct serotypes of BTV, eleven of which have entered, or have been identified in Europe and the Mediterranean region since 1998 (types 1, 2, 4, 6, 8, 9, 11, 15, 16, 24 and 25). The first BTV to arrive in Greece during 1998 was serotype 9 (isolate GRE1998/01), followed by BTV-16 (GRE1999/13) during 1999. BTV-9 spread to mainland Greece, South-Eastern Bulgaria and European Turkey during 1999, to Italy during 2000, then to Serbia, Montenegro, Kosovo, Macedonia, Bulgaria, Croatia, mainland Italy and Sicily in 2001. In 2002, BTV-9 was again identified in Bosnia, Bulgaria, Montenegro, Yugoslavia and Albania, and was identified in Libya for the first time in 2008. The whole genome was sequenced for representative field and vaccine strains of BTV-9 and 16 from the Mediterranean region, identifying the levels of genetic heterogeneity in each genome segment. The early European isolates of BTV-9 (1998 onwards) were identified as 'eastern' strains related to those from India, Indonesia and Australia. BTV-16 isolates are also eastern strains that are most closely related to strains from Turkey and the South African reference strain of type 16 (originally from Pakistan). Analyses of the more conserved genome segments coding for

structural and non-structural proteins of BTV-9 (from Bosnia, Bulgaria, Greece and Turkey) and BTV-16 (from Greece and Turkey) show that the Eastern European isolates of these two serotypes have the remaining eight genome segments (1, 3, 4, 5, 7, 8, 9 and 10) with more than 99% similarity, in each case belonging to the same eastern lineage. These data show that the BTV-9 and 16 isolates that were circulating in the Mediterranean region are reassortants, with the majority of their genome segments derived from a single parental lineage. However, the BTV-9 isolate from Libya (LIB2008/08) is more closely related to the western BTV-9 reference strain from South Africa than to the earlier BTV-9 isolates from Eastern Europe. Analysis of the more conserved segments of LIB2008/08 showed only 79.8–80.2% similarity with the eastern European BTV-9 isolates from the Eastern Mediterranean region, but 89–93.5% similarity with the BTV-9 reference and vaccine strains from South Africa. BTV-9 from Libya belongs to a distinct western lineage of viruses and represents both a new introduction to the Mediterranean region and a new threat to Europe.

**KEYWORDS:** BLUETONGUE VIRUS – SEROTYPE – DISEASE SURVEILLANCE – MEDITERRANEAN REGION.

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