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Contents lists available at ScienceDirect

Small Ruminant Research

journal homepage: www.elsevier.com/locate/smallrumres

Occurrence and spatial distribution of Toggenburg Orbivirus in Switzerland

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ARTICLE INFO

Article history:

Received 12 February 2010

Received in revised form 21 May 2010

Accepted 28 May 2010

Available online 1 July 2010

Keywords:

Toggenburg Orbivirus

Epidemiology

Prevalence

Goat

Sheep

Cattle

ABSTRACT

Recently, a new member of the Bluetongue virus (BTV) serogroup named Toggenburg Orbivirus (TOV) in goats from Switzerland has been described. The epidemiology and host range of TOV are currently unknown. Since TOV causes cross-reactions in laboratory tests used for BTV diagnosis, this study was carried out in order to determine the spatial and temporal spread of TOV. Therefore, serum samples from a national survey in goats, collected during winter and spring 2008 in Switzerland, were serologically examined. Additionally, cattle and sheep from holdings with seropositive goats were tested for the presence of viral RNA and antibodies against BTV and TOV. All goat samples analysed within routine diagnostics at the Institute of Virology and Immunoprophylaxis from 2008 to 2009 were also tested for the presence of TOV. Finally, goat sera collected 1998 in the Canton of Ticino (TI) were analysed.

Although the TOV index cases had been identified in flocks north of the Alps, no additional TOV-positive herds were found by serological testing in this region. In contrast, south of the Alps, i.e. in the Canton of Ticino (TI), an apparent seroprevalence of 49% in goats was found at animal and 60% at herd level. In the eastern and western part of the Swiss Alps 15.2% and 10% of tested goats were serologically positive, respectively. A within-herd prevalence of up to 100% was found in some of the positive flocks. The positive flocks in TI were mainly found in three of the five districts, but seropositive animals were identified in each district. Certain selected seropositive flocks were investigated virologically. By RT-qPCR and genome sequencing, the presence of TOV could be confirmed in all investigated seropositive flocks.

By testing the goats within routine diagnostics, TOV genome was detected in one goat showing BT-like clinical symptoms from the central Alps and in three healthy animals imported from Germany.

Although 3.8% of the sheep from flocks with TOV-positive goats or in contact with these animals showed a positive antibody reaction, TOV-specific RNA was not found in any of the tested sheep and also not in cattle from flocks with TOV-positive goats.

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0921-4488/\$ – see front matter © 2010 Elsevier B.V. All rights reserved.

doi:10.1016/j.smallrumres.2010.05.016