

## RESEARCH ARTICLE

**(Open Access)****Seroprevalence of Bluetongue virus in some municipalities in Kosovo**NUE MARKU<sup>1\*</sup>, KRISTAQ BËRXHOLI<sup>1</sup>, JETON SPAHIU<sup>2</sup>, KURTESH SHERIFT<sup>3</sup>, AGIM REXHEPI<sup>3</sup><sup>1</sup>Agricultural University of Tirana, Faculty of Veterinary Medicine, Kodër Kamëz, Albania<sup>2</sup>Food and Veterinary Agency, 10000, Prishtina, Kosovo<sup>3</sup>University of Prishtina "Hasan Prishtina", Faculty of Agriculture and Veterinary, Bill Clinton str. 10000, Kosovo\*Corresponding author email: [nue.marku@hotmail.com](mailto:nue.marku@hotmail.com)**Abstract**

The objective of this study was to describe the seroprevalence of bluetongue virus (BTV) in domestic ruminants in few municipalities in Kosovo. Bluetongue is an economically important disease caused by Orbivirus of the *Reoviridae* family. The outbreaks of diseases in sheep causing severe with typical clinical sign and economical loses and occasionally in cattle occurred in our country. Virus is transmitted between its mammalian hosts by certain species of biting midges (*Culicoides spp.*). A total of 322 blood samples were collected from 101 ruminant flocks (sheep, cattle and goat) in 27 villages, in four municipalities (Istog, Klinë, Malishevë, Rahovec). Sera were tested with competitive enzyme-linked immunosorbent assay (C-ELISA). The results showed 9.0% of all sera were positive for BTV antibodies. The highest prevalence of antibodies in serum were in municipality of Rahovec 19.26%, followed by Malishevë 9.58% and Istog 1.10%, and no positive samples were in Klinë. High prevalence of BTV antibodies in cattle serum samples emphasize that disease has an important role in domestic ruminants, primarily in sheep, causing economic losses in these regions, and probably throughout Kosovo.

**Key Words:** Bluetongue, c-ELISA, Kosovo, Seroprevalence, Ruminants**1. Introduction**

Bluetongue (BT) is an infectious but non-contagious hemorrhagic disease of ruminants, caused by bluetongue virus (BTV). Bluetongue virus is an arbovirus that belongs to genus *Orbivirus* within the family *Reoviridae* [14]. The 26 BTV serotypes of the virus are reported [7]. The BTV is transmitted between its ruminant hosts by certain species of biting midges of the genus *Culicoides* [4].

In temperate regions with cold winters, the vectors survive severe weather as larvae and the transmission cycle is interrupted, whereas BTV may be maintained in year-round transmission cycles in temperate regions with mild winters [5].

The virus can infect most species of domestic and wild ruminants, but in domestic sheep clinical signs are usually most severe. Cattle are the main

reservoir for the BT virus, although the cattle and goats disease usually assumes a subclinical course without severe symptoms [4]. Among domestic animals, clinical disease occurs most often in sheep, and can result in significant morbidity [11]. Clinical signs in sheep are: fever up to 42°C and frozen look like barely move, fever, depression, lameness, oedema of the lips, tongue and head, conjunctivitis, coronitis, excessive salivation, nasal discharge, hyperaemia and pain at muco-cutaneous junctions such as the gums and vulva. Pulmonary oedema can cause difficulty in breathing. Erosions in tongue can progress to ulcers [2]. Presence of *Culicoides* containing *Obsoletus* and *Pulicaris* Complexes but not *C. Imiciola* are reported in Kosovo in year 2010 [1]. BT disease cases caused by BTV serotype 9 is reported in Kosovo in 2001 [15].

Bluetongue has a major economic impact on the trade of ruminants and their products due to the restrictions on international movements as well as to the loss of productivity on affected farms [9,16]. The aim of the study was to estimate BT virus seroprevalence in four municipalities in Kosovo in year 2015.

## 2. Material and methods

Study region were 4 municipalities in Republic of Kosovo, including: Istog, Klinë, Malishevë, and Rahovec (fig.1).

*2.1. Material:* collection of blood samples in sheep, cattle and goat, in different age, gender and breeds of the animal were during year 2015. A total of 322 blood samples were collected from 101 ruminant flocks (cattle, sheep, goat) in 27 villages, in four municipalities (Istog, Klinë, Malishevë and Rahovec). Serum samples were kept frozen at -20°C until tested.

*2.2. Method:* specific antibodies for BT virus in sera were detected by competitive enzyme-linked immunosorbent assay (c-ELISA) according to manufacturer instructions (IDEXX®, Westbrook, USA), at Food and Veterinary Laboratory in Kosovo.

## 3. Results and Discussion

BT virus antibodies were detected in 29 positive samples (9.00%). The number of positive samples by municipality is presented in tab 1.

Positive samples of BT virus antibodies were detected in cattle and in sheep. Positive samples were from three municipalities including Rahovec, Malisheva and Istog. The numbers of positive samples was with highest rate in cattle in Rahovec (19.26%), followed by Malishevë with (9.58%) in cattle and in Istog (1.10%) in sheep, and no positive samples were in Klinë. During serum sampling in year 2015, no clinical signs typical of BT disease are observed in any of tested animals.

**Table 1.** Prevalence of BTV antibodies in serum samples in domestic ruminants in four municipalities in Kosovo in year 2015 assessed by c-ELISA.

Municipality	No. Villages	No. Farms	Animal	No. sample	Positive cases	%
Istog	9	10	Sheep	91	1	1.10%
	2	3	Goat	13	0	0.00%
Klinë	3	4	Sheep	36	0	0.00%
Malishevë	5	37	Cattle	73	7	9.58
Rahovec	8	47	Cattle	109	21	19.26%
<b>Total</b>	<b>27</b>	<b>101</b>		<b>322</b>	<b>29</b>	<b>9.00%</b>



**Figure 1.** Map of Kosovo showing municipalities on this study and BTV seroprevalence.

Results showed that BTV infection is present in Kosovo. The BTV antibodies were observed higher in cattle (19.26%) in Rahovec followed by Malisheva (9.58%) and in Istog (1.10%) in sheep. Previous studies in Kosovo in year 2001 showed prevalence for BTV in caused by BTV serotype 9 [15], and in samples from year 2014 as preliminary report, reconfirm the presence of the virus of BTV in Kosovo [12]. Detection of samples in four municipalities of BT shows that the virus is widespread and circulating in different areas within the country.

In recent years, the global distribution and nature of BTV infection has changed significantly and new BTV serotypes are detected in most of European countries. Many studies attribute these changes due to

climate change to be implicated as a potential cause of this dramatic event observed globally [10]. These changes may be expected in our country, introduction of new BTV serotypes in particular. The outbreak of BTV in Central Europe impressively showed how sensible the animal production is and how quick an agent of an exotic disease may become introduced and spread even over far distances under the conditions of globalization [13].

Since biological vectors are reported to be present in our country in [1], this may contribute on further transmission of BTV from infected to susceptible ruminants and in the distribution of BTV in our country.

The studies on identification of BTV infections in different species and serotypes of BTV that occur within our country are poor and only few recent articles have been published. Thus, studies for evaluation of seroprevalence and distribution of BTV in domestic ruminants, and the association between serological evidence of BTV infection are necessary for disease prevention and control. Kosovo has no vaccination program for BTV.

The high seroprevalence cattle may play an important role in the spread of BTV in our country acting as reservoir for the virus enabling transmission to highly susceptible sheep, in line as reported previously in [8]. Although BTV infection in domestic ruminants is clearly widespread in Kosovo, the specific virus serotypes and vector insects that occur within the country remain uncharacterized.

#### 4. Conclusions

The obtained results from this study showed prevalence of BTV and distribution in domestic ruminant in four municipalities in Kosovo. The highest prevalence of BTV antibodies is found in serum samples of cattle. The lack of clinical cases for BT disease shows that BTV infection in domestic ruminants apparently is largely subclinical. Results suggest necessity for well-defined strategy for preventing and controlling BTV, because disease outbreak can cause serious health problems and economic losses throughout Kosovo in domestic ruminants, primarily in sheep.

#### 5. References

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