



Short Communication

Caprine Arthritis Encephalitis and Bluetongue Virus Infections in Maltese, Saanen and Hair Goat Breeds

Semra Okur Gumusova^{1*} and Yavuz Selim Memis²

¹Department of Virology, Faculty of Veterinary Medicine, University of Ondokuz Mayıs, Turkey

²Avanos Food, Agriculture and Animal Husbandry Department, Nevsehir, Turkey

ABSTRACT

Caprine arthritis-encephalitis virus (CAEV) and Bluetongue virus (BTV) infections cause economic loss to the goat populations. This study was conducted to investigate the susceptibility of the Maltese, Saanen and Hair goat breeds to BTV and CAEV infections. A total of 368 goat serum samples were collected in the same district but different goat breeds and tested by ELISA. Seropositivity rates of BTV infection were detected as 17.74 % in Maltese goat breeds, 2.94% in Saanen goat breeds, but no seropositivity was found in Hair goat breeds. CAEV antibody prevalences in Hair, Maltese and Saanen goat breeds were detected 1.40%, 1.61% and 0.98%, respectively. As a result of this study, Maltese goat breed was more susceptible to BTV infection than Saanen and Hair goat breeds but no significant difference to susceptibility for CAEV infection.

Article Information

Received 28 August 2015

Revised 4 March 2016

Accepted 3 April 2016

Available online 1 August 2016

Authors' Contribution

SOG conceived and designed the experiments, analysed the data and wrote the paper. YSM performed the experiments.

Key words

Bluetongue virus,
Caprine arthritis-encephalitis virus,
ELISA
Goat breeds

The goats are maintained in low quality pasture areas with shrubs and bushes. They are source of meat, milk and other products. Caprine arthritis-encephalitis virus (CAEV) and Bluetongue virus (BTV) infections have great negative impact on goat breeding.

Bluetongue is a non-contagious, arthropod-borne viral disease that affects domestic and wild ruminants. *Culicoides* species are effective in spreading the disease (MacLachlan and Dubovi, 2011). Previous studies have shown that indigenous sheep breeds show a natural resistance to BTV in contrast to introduced breeds (Gibbs and Greiner, 1994; Koumbati *et al.*, 1999) but susceptibility of goat breeds to BTV was not examined in any study.

Caprine arthritis encephalitis virus (CAEV) is a lentivirus that is closely related to sheep Meadi-Visna virus. It has been reported that this infection is widespread in goat populations. Milk and colostrum are the main source of CAEV infection during the first year of life (MacLachlan and Dubovi, 2011). The susceptibility of sheep breeds to lentiviruses were determined by Albayrak *et al.* (2012) but there is no data about susceptibility of goat breeds.

Hair, Maltese and Saanen goat breeds are found in the Black Sea region of Turkey that was located in the north of the Black Sea coast, where local goat which is highly resistant to the environmental conditions are raised for milk and meat production. Saanen goat originated from

Saanen Valley of Switzerland and Maltese goats are from the east and central Mediterranean area.

The seroprevalences of CAEV and BTV infections are determined in previous studies but distribution of antibodies among Maltese, Saanen and Hair goat breeds have not been reported. This study was performed to determine the susceptibility of Saanen, Hair and Maltese goat breeds to CAEV and BT infections.

Materials and methods

In this study, a total of 368 goats (102 Saanen goats, 124 Maltese goats and 142 Hair goats) were sampled from the same district of Black Sea Region in Turkey. These goats were 2-3 years old and did not show any clinical symptoms and were not vaccinated against CAEV and BTV infections. Indirect CAEV ELISA commercial kits (ID Screen® Maedi Visna / CAEV Indirect ELISA kit) and BTV commercially-competition ELISA kits (ID Screen® Bluetongue Competition ELISA kit (c-ELISA) were used to detect CAEV and BTV antibody in goat sera. Tests were performed according to the manufacturer's recommendations.

Results and discussion

The c-ELISA test results showed that 25 out of 368 goats (6.79%) were seropositive for BTV infection. The seropositivities were 17.74% and 2.94% for Maltes and Saanen goat breeds, respectively, whereas Hair goat breeds were not seropositive (Table I).

CAEV infection seroprevalences was 1.35% by indirect ELISA test. CAEV infection seroprevalence of

* Corresponding author: semragumusova@hotmail.com

0030-9923/2016/0005-1567 \$ 8.00/0

Copyright 2016 Zoological Society of Pakistan

Hair, Maltese and Saanen goat breeds was 1.40%, 1.61% and 0.98%, respectively (Table I).

Table I.- BTV and CAEV infection seroprevalences of goat breeds

Breeds	Number	BTV positive	CAEV positive
Hair goat	142	-	2 (1.40%)
Maltese goat	124	22 (17.74%)	2 (1.61%)
Saanen goat	102	3 (2.94%)	1 (0.98%)
Total	368	25 (6.79%)	5 (1.35%)

BTV infection seroprevalence (17.74%) was found statistically significantly high ($p < 0.001$) in Maltese goat breed compared to Saanen and Hair goat breeds (2.94% and 0%).

Yousef *et al.* (2012) and Waseem *et al.* (2015) have shown that BTV infection and CAEV infection seroprevalences in goats have been reported 53.3% and 3.33%. In this study, BTV and CAEV seroprevalences was 6.79% and 1.35%, respectively. Our results show that BTV and CAEV infections are less common in the examined region.

In Turkey, seropositivity of BTV infections of goat has been reported to be 16 to 53.5% in Konya and Burdur, 4% in Samsun and 14.5% in eastern and south-eastern regions of Turkey (Ataseven *et al.*, 2006; Bulut *et al.*, 2006; Ozan *et al.*, 2012). In our study, seroprevalence (6.79%) of BTV infection was detected as less than the previous data in Turkey. So, we conclude that, BTV infection risk is low in goats of the investigated area. But our study was shown that, Maltese goat breeds was more sensitive to BTV infection than Saanen and Hair goat breeds.

Seroprevalence of CAEV infection in goats has been studied many times in Turkey. It has been found to vary between 1.03 -13.05% in different regions of the Turkey by AGID and ELISA tests (Aslantas *et al.*, 2005; Azkur *et al.*, 2011). Otherwise, Aslantas *et al.* (2005) have not detected significant difference between Kilis and Damascus goat breed, just as in the present study. Maltese, Saanen and Hair Goat breeds.

Maltese goat breed was found to be more sensitive to

BTV infection than Saanen and Hair goat breeds but no significant susceptibility difference was found against CAEV infection. It was concluded that seroprevalence of BTV infection was high in goats in these area, hence more protective measures become imperative, Hair goat breed might be preferable for goat farming in the region.

Acknowledgment

This research was summarized from Master's Thesis and supported by Scientific Research Fund of Ondokuz Mayıs University/Turkey (Project No. PYO.VET.1904.11.009) and this study was reviewed and approved by the Local Ethics Commission for Experiments on Animals in Samsun, Ondokuz Mayıs University.

Statement of conflict of interest

Authors have declared no conflict of interest.

References

- Albayrak, H., Yazıcı, Z., Okur-Gumusova, S. and Ozan, E., 2012. *Trop. Anim. Hlth. Prod.*, **44**: 939-941.
- Aslantas, O., Ozyoruk, F., Pinar, D. and Gungor, B., 2005. *Rev. Med. Vet.*, **156**: 402-404.
- Ataseven, V.S., Ataseven, L., Tan, T., Babur, C. and Oguzoglu, T.C., 2006. *Rev. Med. Vet.*, **157**: 545-550.
- Azkur, A.K., Gazyagci, S. and Aslan, M.E., 2011. *Kafkas Univ. Vet. Fak. J.*, **17**: 803-808.
- Bulut, O., Yavru, S., Yapkiç, O., Simsek, A., Kale, M. and Avci, O., 2006. *Bull. Vet. Inst. Pulawy*, **50**: 305-307.
- Gibbs, E.P. and Greiner, E.C., 1994. *Comp. Immunol. Microbiol. Infect. Dis.*, **17**: 207-220.
- Koumbati, M., Mangana, O., Nomikou, K., Mellor, P.S. and Papadopoulos, O., 1999. *Vet. Microbiol.*, **64**: 277-285.
- MacLachlan, N.J. and Dubovi, J., 2011. In: *Fenner's veterinary virology* (eds. N. J. MacLachlan and E. J. Dubovi), Academic Press, London, pp. 267-269.
- Ozan, E., Turan, H.M., Albayrak, H. and Cavunt, A., 2012. *Atatürk Univ. J. Vet. Sci.*, **7**: 27-33.
- Yousef, M., Al-Eesa, R.A. and Al-Blowi, M.H., 2012. *Vet. World*, **5**: 389-393.
- Waseem, R.V.S., Pawaiya, R., Singh, V.K., Gupta, K., Rajukumar, M.S., Mir, S. and Amir, A., 2015. *Indian J. Vet. Pathol.*, **39**: 15-19.