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Detection of Toxoplasmosis gondii Seropositivity in sheep in Yalova by Sabin Feldman Dye Test and Latex Agglutination Test

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SUMMARY: Sera collected from 63 sheep older than one year of age in two regions of Yalova were tested for anti- *Toxoplasma gondii* antibodies using the Sabin-Feldman Dye Test (SFDT) and Latex Agglutination Test (LAT). Of the 63 samples tested, 42 (66.66%) and 41 (65.08 %) were determined to be seropositive by SFDT and by LAT, respectively. Of the positive sheep serum samples, 23 were positive at a dilution of 1/16; 13, at a dilution of 1/64; and 6, at a dilution of 1/256. SFDT was accepted as a reference test. The sensitivity and specificity of LAT were 78.57% and 61.90 %, respectively. The correlation between these two tests was determined to be 73.01%.

Key words: Toxoplasmosis, sheep, SFDT, LAT, Yalova

Yalova ili Koyunlarında Toxoplasmosis gondii Seropozitifliğinin Sabin Feldman Dye Testi ve Latex Aglütinasyon Testi ile Saptanması

ÖZET: Yalova iline bağlı iki ilçeden bir yaşın üstünde 63 koyuna ait serum örnekleri, Sabin Feldman Dye Testi (SFDT) ve Latex Aglütinasyon Testi (LAT) ile anti- *Toxoplasma gondii* antikorları yönünden kontrol edilmişlerdir. Yapılan serolojik muayene sonucunda 63 koyun serumunun 42'si (%66.66) SFDT ile; 41'i (%65.08) LAT ile seropozitif bulunmuştur. Seropozitif koyunlardan sulandırma basamağı 1/16'da 23 pozitif serum, 1/64'de 13 pozitif serum, 1/256'da 6 pozitif serum tespit edilmiştir. SFDT referans test olarak kabul edildiğinde LAT'ın duyarlılığı %78.57; özgüllüğü %61.90 olarak hesaplanmıştır. İki test arasındaki uyumluluk %73.01 olarak belirlenmiştir.

Anahtar Sözcükler: Toksoplazmosis, koyun, SFDT, LAT, Yalova

GİRİŞ

Toxoplasmosis is a zoonotic disease caused by *Toxoplasma gondii* which is an intracellular protozoon. The disease is observed in most of the species including human beings, reptiles and birds. It causes important economic losses in sheep by resulting in prenatal deaths, stilbirths and abortions. The definitive hosts of the parasite are domestic cats and other felines. *T. gondii* is transmitted by the ingestion of feline oocysts in contaminated food and water or cysts in the tissues of an infected animal. Cysts formed in sheep are also sources of infection for human beings too (1, 6, 10, 11, 16) . Transplacental transmission of tachyzoites or following ingestion of tachyzoites in unpasteurised sheep or goats milk or blood transfusions can occure but are probably not important epidemiologically (15).

The seroprevalence of toxoplasmosis has been reported by many researchers all around the world and *T. gondii* has been known in many countries since 1908 (7). The prevalence rates in sheep have been varied among countries and diagnostic methods used (16). In Turkey, it was reported that these rates were between 7.1 % and 88.7 % on regional basis (2, 3, 4, 5, 8, 12, 17). Prevalence of the infection has not been investigated in small ruminants in Marmara region. The purpose of this study was to determine both the prevalance of toxoplasmosis in sheep in Yalova in Marmara region and differences between SFDT (Sabin-Feldman Dye Test) and LAT (Latex Agglutination Test).

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MATERIALS AND METHODS

Blood samples were collected from 63 sheep. Of the samples 37 were from Çınarcık and 26 were from Çiftlikköy. None of the sheep were younger than one age. SFDT (Sabin- Feldman Dye Test) and LAT (Latex Agglutinasyon Test) were used to detect *Toxoplasma gondii* antibodies.

The sera were separated in room temparature at 4000 rpm by centrifuging for ten minutes and samples were kept at – 20 ^{o}C untill test process starts.

The SFDT described by Sabin and Feldman (14) was performed in Parasitology Laboratory of Refik Saydam Epidemic Diseases Research Directorate.

Toxolatex test kit (Fumouze Laboratories) was used as Latex Agglutinasyon Test. Procedures taking place in test prospectus were applied completely.

RESULTS

Totally 42 (66.66%) samples by SFDT and 41 (65.08%) samples by LAT were found to be seropositive among 63 blood samples (Table 1).

Of the samples tested, 22 (59.46%) by SFDT and 25 (67.57%) by LAT were found to be seropositive in Çınarcık; and 20 (76.92%) by SFDT and 16 (61.54%) by LAT were found to be seropositive in Çiftlikköy (Table 2).

Table 1. Comparison of SFDT and LAT seropositivity in total sheep sera in Yalova

LAT	SFDT		Total
	Positive	Negative	
Positive	33 (52.38%)	8 (12.70%)	41 (65.08%)
Negative	9 (14.28%)	13 (20.63%)	22 (34.92%)
Total	42 (66.66%)	21 (33.33%)	63

Table 2. Comparison of SFDT and LAT seropositivity in sheep in Çınarcık and Çiftlikköy

	LAT	SFDT		Total
		Positive	Negative	
Çınarcık	**Positive**	19 (51.35%)	6 (16.22%)	25 (67.57%)
	Negative	3(8.1%)	9 (24.32%)	12 (32.43%)
	Total	22 (59.46%)	15 (40.54%)	37
Çiftlikköy	Positive	14 (53.85%)	2 (7.69%)	16 (61.54%)
	Negative	6 (23.08%)	4 (15.38%)	10 (38.46%)
	Total	20 (76.92%)	6 (23.08%)	26

Table 3. Number of sera given SFDT seropositivity in different dilution steps.

	Dilution steps				
	1/16	1/64	1/256	1/1024	Total (+)
Çınarcık	15	5	2	0	22
Çiftlikköy	8	8	4	0	20

While a total of 33 (52.38%) samples were found to be positive with SFDT and LAT; 8 (12.70%) sera were found to be LAT positive but SFDT negative, and 9 (14.28%) samples were determined as LAT negative SFDT positive. It was found that 21 (33.33%) samples had negative results with both tests (Table 1). Test results were compared for *Toxoplasma gondii* seropositivity by region; 19 (51.35%) and 14 (%53.85) sheep were positive in both tests in Çınarcık and Çiftlikköy respectively (Table 2).

Serum samples giving seropositivity with SDFT in different titration steps were given in Table 3.

When SFDT was chosen as a reference test, LAT sensitivity was determined as 78.57% and specifity was determined as 61.90%.The correlation between two tests was found as 73.01%.

DISCUSSION

The aim of this study was to determine the prevalence of antibodies against *Toxoplasma gondii* in sheep in Yalova, Marmara region. 42 (66.66%) and 41 (65.08%) samples were found to be seropositive using SFDT and LAT respectively. The confirmation between two tests was determined as 73.01%. Babur *et al*. (3) found confirmation between SFDT and LAT was 60.14%. The result of our study is consistent with that reported .

The high seroprevalence of anti-*T. gondii* antibodies in sheep may be associated with the presence of cats in almost every farm sampled (6, 17). In the few cases where the farmers owned no cats, cats were present in the neighbourhood and had access to the water and feed of the livestock. No data concerning the infection status of *T. gondii* in cats in Yalova are available.

Higher prevalence rates of toxoplasmosis in warm, moist areas compared to cold, dry ones is attributed to the longer viability of *T. gondii* oocysts in moist or humid environments (6, 9, 13). Yalova is a warm and moist area that helps *T. gondii* oocysts maintain their viability.

The result of this study demonstrated the presence of toxoplasmosis in Yalova and is the first report for this region. On the other hand, it seems necessary that 19 sheep (30.15%) that have titres of 1/16 and above needs to be kept under control to observe clinical maintenance and to decide on treatment.

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