

Tabanid Infestation of Cattle and Its Implications for Public Health

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Abstract

Female tabanids are important for public health and veterinary. As bloodsucking pests and vectors of disease agents they give harm to humans. They serve as vectors of such agents as *Dermatobia hominis*, *Loa loa*, Tularemi, *Bacillus anthracis*, *Trypanosoma evansi*, *Coxiella burnetii*, *Dirofilaria repens*. Cattlemen living here raise their cattle on vineyards and orchards, olive groves, almond groves or uncultivated lands. These animals are tied with a halter and a long strap fixed to the ground. The aim of this study was to investigate tabanids infestation in Datça, Muğla. The study was conducted from April 2018 in Datça district. In this paper the Holstein hybrid cattle, old male cattle, tabanids sucking its blood as well as the diseases caused by tabanids are the subject of the study. The skin integrity on the lateral aspect of distal metacarpus in the left hind limb of the cattle was impaired. Hundreds of tabanids lacerated the skin, and sucked blood, causing hemorrhage in the epidermis. This study revealed that tabanids constitute a threat to animal and public health. We highlight the importance of effective prevention and control measures during periods in which these flies are active. More comprehensive epidemiological studies should be undertaken and national control programs are required to keep the tabanids infestation under control.

Key words: Cattle, public health, tabanids

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Main text and Results

Tabanids are ectoparasites which are widely seen in Turkey just as in other parts of the world. They are colloquially known as moth, warble fly or horsefly. In Turkey there are 173 tabanid species of tabanus genus (Girişkin, 2017).

Female tabanids are important for public health and veterinary. As bloodsucking pests and vectors of disease agents they give harm to humans. They serve as vectors of such agents as *Dermatobia hominis*, *Loa loa*, Tularemi, *Bacillus anthracis*, *Trypanosoma evansi*, *Coxiella burnetii*, *Dirofilaria repens* (Taylor and Smith, 1989).

With their piercing-sucking mouthparts tabanids impair the skin integrity of hosts, thereby causing pain. Having anticlotting enzymes in their salivary glands, tabanids feed on the blood of hosts, which wells up. Being large, robust and agile these flies have a body length between 5 and 30 mm. Their

body parts are head, thorax and abdomen (Bernard, 2003).

Tabanids can be found all over the world except for Antarctica. Their natural habitats are the bush, meadows, forests, scrubs, ponds, lakes and swamp. They are usually found in warm areas. They cannot fly when it is below 13°C, windy, stormy, rainy and dark. They are active in the daytime (Yücel, 2015).

To complete their life cycle tabanids may require one year while an average lifespan of an adult is one to one and a half month. As for mating the female of the species needs a blood meal before depositing her egg mass. Following the mating process, they lay their eggs at the hottest time of the day on wet sites or vegetation that stands over water. The larval stage usually lasts from 6 to 11 months, although it shows variation across species. Until the arrival of warmer seasons larvae stay inactive 5 to 10 cm. below the soil surface. Larvae mature and pupate when spring arrives. The pupal stage can last one month depending on climate conditions. After that period pupae become adults (Wall and Shearer, 1997).

Tabanids are given as vectors of blood-dwelling pathogens of several human diseases (e.g., tularemia, anaplasmosis, filariosis, anthrax, Lyme disease), and they induce allergic reactions in the host when sucking blood (Hornok et al., 2007).

This study deals with tabanids as nuisance pests of cattle as well as their importance for public health.

Methods

The study area is Datca, a district of Mugla Province in the Aegean region. Datca peninsula is at the meeting point of the Aegean and the Mediterranean, lying approximately between 36.60° -36.75° N. latitude and 27.40° - 28°E.longitude. Its shoreline length is 235 km. It has 52 bays of different sizes. The peninsula, which is between Gökova and Hisarönü bays, has a Mediterranean climate, characterized by rainy winters and dry summers. The locals depend mostly upon tourism for their livelihood (Anonymous, 2018).

This study was carried out in Datca in April 2018. Cattlemen living here raise their cattle on vineyards and orchards, olive groves, almond groves or uncultivated lands. These animals are tied with a halter and a long strap fixed to the ground. In the pastures they consume the required amount of dry matter on a daily basis. In this paper the Holstein

hybrid cattle, an old male cattle, tabanids sucking its blood as well as the diseases caused by tabanids are the subject of the study.

Results

It was observed that hundreds of flies were flying around the cattle. Cattle's restlessness and not grazing were noted. At the clinical examination of the animal, a heavy infestation with tabanids was detected especially in its slower-extremity. The skin integrity on the lateral aspect of distal metacarpus in the left hind limb of the cattle was impaired. Hundreds of tabanids lacerated the skin, and sucked blood, causing hemorrhage in the epidermis (Fig.1).



Figure 1. Tabanids feeding on a cattle's leg. Previous feeding lesions can also be seen.

Discussion and Conclusion

Tabanids are mechanical and/or biological vectors of 27 infections, posing a real risk to human and animal health (Table 1).

The study was conducted in Datça, Mugla Province, which has major tourist destinations. In 2007 alone Mugla Province received 2.089.503 million tourists, 7 percent of the average number of international tourists to Turkey (Anonymous, 2018). With its 235 km. shoreline and 52 bays Datça has a great significance for Mugla Province. Datca receives a huge influx of tourists especially between May and October. As cattle raising takes place near the seaside, a heavy infestation with tabanids affects public health in the town as well. Since many tourists from different countries come to this holiday destination, it is also probable that people

whosuffer from Filaria, Loiasis and Q fever travel to here.

In general tabanids suck blood every 5 minutes and change hosts very frequently. As a result, they play a significant role in the transmission of infectious agents (Hornok et al., 2007). We argue that this may pose a great risk to the health of local residents as well as tourists in Datca.

Table 1. Tabanids of infections that infect humans and other animals

No	Disease agent	Vectoring
1	<i>Besnoita besnoiti</i>	mechanical
2	<i>Trypanosoma evansi</i> (Surra)	mechanical
3	<i>Trypanosoma vivax</i>	mechanical
4	<i>Trypanosoma congolense</i>	mechanical
5	<i>Trypanosoma equinum</i>	mechanical
6	<i>Haemoproteus metchnikovi</i>	+biological
7	<i>Loiasis</i>	biological
8	<i>Elaeophora schneideri</i>	biological
9	<i>Dirofilaria repens</i>	biological
10	<i>Dirofilaria. roemeri</i>	biological
11	<i>Clostridium perfringens</i>	mechanical
12	<i>Fusobacterium necrophorum</i>	mechanical
13	<i>Coxiella burnetii</i> (Q fever)	mechanical
14	<i>Anaplasma marginale</i> <i>Francisella tularensis</i>	mechanical
15	(Tularemia) <i>Bacillus anthracis</i>	mechanical
16	(Anthrax)	mechanical
17	<i>Borrelia burgdorferi</i>	mechanical
18	<i>Influenza</i>	mechanical
19	<i>Bovine Viral Diarrhoea</i>	mechanical
20	<i>Equine Infectious Anemia</i>	mechanical
21	<i>Enzootic bovine leucosis</i>	mechanical
22	<i>Rinderpest</i>	mechanical
23	<i>Tick-Borne Encephalitis</i>	mechanical
24	<i>West Nile Virus Infection</i>	mechanical
25	<i>Swine Fever</i>	mechanical
26	<i>California encephalitis</i>	mechanical
27	<i>Dermatobia hominis</i>	mechanical

Because of considerable irritation caused by tabanids, bovine animals cannot graze sufficiently

and lose weight. According to the findings of a study conducted during a grazing season in the USA, a cattle suffered from a weight loss of 90 kg. because of serious irritation caused by tabanids (Davis 1979). Furthermore, in another study it was reported that tabanids led to a decrease in the milk production of dairy cattle (Lehane 2005). The present study showed that being irritated by tabanids, most of the animals cannot eat enough feed.

A study found the amount of blood which tabanids suck at every bite is 0.168 ml (Tashiro and Schwardt, 1953). The present study reported attacks by tabanids on the cattle for bloodsucking. This resulted in open wounds on the skin, which in turn attracted myiatic flies as well as made the cattle susceptible to severe infection with secondary bacterial agents.

In conclusion, tabanids constitute a threat to animal and public health. We highlight the importance of effective prevention and control measures during periods in which these flies are active. More comprehensive epidemiological studies should be undertaken and national control programs are required to keep the tabanids infestation under control.

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