



Vaka raporu / Case report

### A case of traumatic myiasis caused by *Wohlfahrtia magnifica* (Schiner 1862) (Diptera: Sarcophagidae) in a Colt (*Equus asinus*)

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<sup>a</sup> 0000-0002-8533-387X<sup>b</sup> 0000-0002-0086-8294<sup>c</sup> 0000-0001-5399-8060A case of traumatic myiasis caused by *Wohlfahrtia magnifica* (Schiner 1862) (Diptera: Sarcophagidae) in a Colt (*Equus asinus*)

## Abstract:

A colt brought to the Department of Surgery of Hatay Mustafa Kemal University, Faculty of Veterinary Medicine, with open wounds on various parts of the body was examined. Three fly larvae were found in the open wound between the semitendinosus and semimembranosus muscles of the left hind leg and 9 fly larvae were found in the open wound on the upper part of the left fossa paralumbalis. No larvae were found in the open wound in the sacral region. Twelve larvae collected by the clinician with forceps were taken to the parasitology laboratory in 70% ethyl alcohol. The larvae were identified by the anterior and posterior stigmas and the morphological features of the cephalo-pharyngeal skeleton. Microscopic examination revealed that the larvae were third-stage larvae of *Wohlfahrtia magnifica*. According to the literature, traumatic myiasis cases in donkeys are rare worldwide. This study is the first case of traumatic myiasis caused by *W. magnifica* in a colt in Türkiye.

**Keywords:** Donkey, Larvae, Traumatic myiasis, Türkiye, *Wohlfahrtia magnifica*

#### Bir sıpada (*Equus asinus*) *Wohlfahrtia magnifica* (Schiner 1862) (Diptera: Sarcophagidae)'nin Neden Olduğu Travmatik Miyazis Vakası

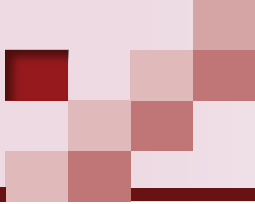
## Özet:

Hatay Mustafa Kemal Üniversitesi Veteriner Fakültesi Cerrahi Anabilim Dalı'na getirilen ve vücudunun çeşitli yerlerinde açık yaralar bulunan bir sıpa muayene edildi. Sol arka bacak semitendinosus ve semimembranosus kasları arasındaki açık yarada 3 sinek larvası ve sol fossa paralumbalis'in üst kısmındaki açık yarada 9 sinek larvası bulundu. Sakral bölgedeki açık yarada larvaya rastlanmadı. Klinisyen tarafından forseps ile toplanan 12 larva %70'lik etil alkol içinde parazitoloji laboratuvarına götürüldü. Larvalar anterior ve posterior stigmaları ve sefalo-faringeal iskeletin morfolojik özellikleri ile tanımlandı. Mikroskopik inceleme larvaların *Wohlfahrtia magnifica*'nin üçüncü evre larvaları olduğunu ortaya koydu. Literatüre göre, eşeklerde travmatik miyazis vakaları dünya çapında nadirdir. Bu çalışma Türkiye'de bir sıpada *W. magnifica*'nin neden olduğu ilk travmatik miyazis vakasıdır.

**Anahtar kelimeler:** Eşek, Larva, Travmatik miyazis, Türkiye, *Wohlfahrtia magnifica*

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## Introduction

Donkeys, which belong to the Equidae (*Equus asinus L.*), are one of the most important domestic animals. Donkeys have accompanied our lives since ancient times (Prasad, 2020). After domestication, donkeys were mainly used as draft and transportation animals (Seyiti and Kelimu, 2021). On the other hand, female donkeys are of great interest due to their milk. Donkey milk is reported to be very close to human breast milk and offers great health benefits. Due to its nutritional and health benefits, it has recently gained popularity in some parts of Europe (Prasad, 2020). The number of these animals decreased to 126,912 in 2019 (Çırak and Girişgin, 2021) and to 86,455 in 2023 (TUIK, 2023). Investigating the health and welfare problems of these animals is very important to increase their productivity and make better use of them (Getachew et al., 2012). There are many different diseases caused by bacterial, viral, and parasitic factors that threaten the health of donkeys. Myiasis, which is a parasitic disease of arthropod origin, is one of these diseases (Çırak and Girişgin, 2021).

Myiasis is defined as a disease caused by some fly larvae that settle in the tissues and natural cavities of humans and animals and feed on necrotic or living tissue of the host (Zumpt, 1965; Bonacci et al., 2013). Myiasis can be classified as obligate, facultative and incidental on the basis of host-parasite relationships. Clinically, myiasis can be divided into cutaneous, intestinal, ocular, vulvar and urinary myiasis, depending on the location of the larvae. An infestation caused by fly larvae that feed on traumatic lesions in the skin tissue of their hosts is called traumatic myiasis (Şaki, 2004). The myiasis-causing flies of the order Diptera belong in particular to the families Sarcophagidae, Calliphoridae, Hypodermatidae, Oestridae, and Gasterophilidae (Dik, 2015). Internal myiasis flies of the families Hypodermatidae, Oestridae and Gasterophilidae cause obligate myiasis, while external myiasis flies of the families Sarcophagidae and Calliphoridae lead to traumatic myiasis (Zumpt, 1965; Dik et al., 2012).

Studies conducted worldwide have shown that *W. magnifica*, the obligate myiasis agent in the Sarcophagidae family, and *Lucilia sericata* larvae, the facultative myiasis agent in the Calliphoridae family, are the dominant traumatic myiasis agents. Studies conducted in Türkiye reported that most of the myiasis cases of 19 Diptera species found in domestic and wild animals were caused by *L. sericata* and *W. magnifica*

(Zumpt, 1965; Dik et al., 2012; Eren et al., 2022). *Wohlfahrtia magnifica* (Schiner 1862), known as the Old World meat fly, causes traumatic myiasis in cats, dogs, sheep, goats, horses, rabbits, pigs, and humans in the warm regions of the Palaearctic (Hall and Wall, 1995; Dik et al., 2012; Bonacci et al., 2020).

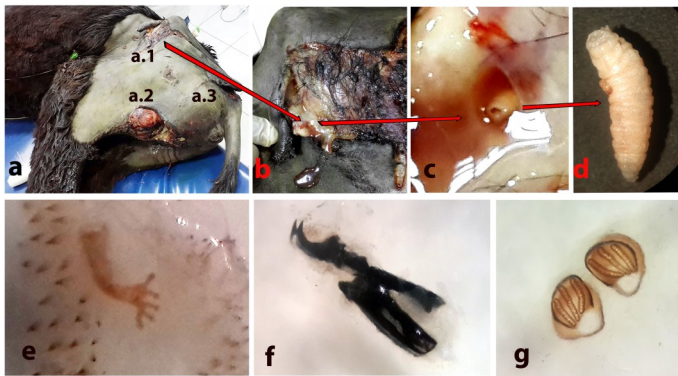
In this study carried out in Hatay Province, a case of traumatic myiasis caused by *W. magnifica* in a donkey calf was reported for the first time in Türkiye.

## Case description

A colt brought to the Department of Surgery of Hatay Mustafa Kemal University, Faculty of Veterinary Medicine, with open wounds on various parts of the body was examined. A total of 12 fly larvae were found, 3 in the open wound between the semitendinosus and the semimembranosus muscle of the left hind foot (Fig. 1-a2) and 9 in the open wound on the upper part of the left fossa paralumbalis (Fig. 1-a1, b, c). No larvae were found in the open wound in the sacral region (Fig. 1-a3).

The larvae collected by the clinician using forceps were placed in 70 % ethyl alcohol. When samples examined under a stereomicroscope, the larvae which were understood to be in the third instar, the distinctive morphological parts of the larvae such as the anterior and posterior stigmas and the cephalo-pharyngeal skeleton were dissected and revealed. After the dissected parts were kept in 10% KOH for 48 hours to become transparent, they were mounted on a slide with Canada balsam and identified under a light microscope with the help of the relevant literature (Şaki ve Özer, 1999; Bonacci et al., 2013).

Microscopic examination identified the larvae (n = 12) as third instar larvae of *W. magnifica*. The length of *W. magnifica* larvae in the 3rd instar varies between 11-14 mm (Fig. 1-d); the anterior part of the cephalo-pharyngeal skeleton, which shows a strong chitinization, is bent downwards and ends with a pointed tip (Fig. 1-f); the anterior stigma is 5-branched (Fig. 1-e), the spiracles are straight (Fig. 1-g); on the body segments there are irregularly arranged and dark-coloured spines pointing backwards (Fig. 1-d); the posterior stigmas have three slits. The ends of the slits are close and well chitinized (Fig. 1-g).



**Fig. 1.** Donkey with open wounds on various parts of the body, a1) the open wound on the upper part of the left fossa paralumbalis, a2) the open wound between the semitendinosus and the semimembranosus muscle of the left hind foot, a3) the open wound in the sacral region, b) enlarged view of fossa paralumbalis, c) the larva in the wound of the left fossa paralumbalis, d) on the body of the larva segments irregularly arranged and dark-coloured spines pointing backwards, e) 5-branched anterior stigma of the larva, f) the cephalo-pharyngeal skeleton of the larva with strong chitinization, g) the posterior stigma of the larva with 3 slits.

## Discussion

One of the most important pathogens of myiasis caused by flies of the Sarcophagidae family is *W. magnifica* (Davulcu et al., 2020). In contrast to species that cause facultative myiasis, *W. magnifica* can infest animals and humans without predisposing conditions (Hall, 1995). If the myiasis *W. magnifica* causes are not treated, the larvae can damage the healthy tissue of the host within a few days and cause severe lesions and deep wounds (Hall and Farkas, 2000).

Cases of internal myiasis caused by *Gasterophilus* and *Rhinoestrus* species are quite common in donkeys throughout the world and in the Mediterranean region (Zumpt, 1965; Attia et al., 2018). Studies in various African countries, including Sudan and Egypt, have found *Rhinoestrus* infestations in donkeys at a rate of 50-100% (Attia et al., 2018; Rouatbi et al., 2019). *Gasterophilus* cases are; while the rate is very low in Ethiopia at 0.72% and in Germany at 2.25%, it is 43% in Ireland, 53% in England, 94-95.2% in Italy, 66.6-97.5% in Egypt (Attia et al., 2018) and 72.2-92.4% in Sudan (İsmail et al., 2013) due to owner indifference, poor care and feeding conditions. In studies conducted to date in Türkiye, numerous cases of internal myiasis caused by *Rhinoestrus* (Eren et al., 2022), *Hypoderma* and *Gasterophilus* species in equids have been reported. Among these, infestations by *Gasterophilus* species are the most common case and occur at rates of 0.08-83% (Çırak and Girişgin, 2021).

On the other hand, traumatic myiasis in donkeys in Hungary is reported to be less than 1% according to veterinary surveys (Farkas and Hall, 1998). In fact, a review of the literature

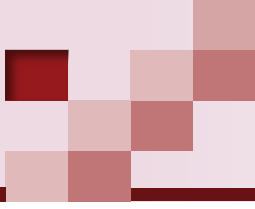
found no reports worldwide, apart from a few cases caused by *Sarcophaga* (Zumpt, 1965) *Chrysomya* (Zumpt, 1965; Abo-Shehada, 2005) and *Wohlfahrtia* species (Pavlovskii, 1934; Zumpt, 1965; Remesar et al., 2022). One of these cases are *Sarcophaga ruficornis*, *Chrysomya megacephala*, *Chrysomya bezziana*, *W. magnifica* mentioned in Zumpt's book (1965). Other cases are the infestation with *C. bezziana* from Saudi Arabia (Abo-Shehada, 2005) and the infestation with *W. magnifica*, which was reported from Spain (Remesar et al., 2022) and Turkmenistan (Pavlovskii, 1934). Cases of myiasis caused by *W. magnifica* usually occur in sheep and goats (Bonacci et al., 2020). In Türkiye, cases of myiasis caused by this fly have been reported in sheep, goats, dogs, cattle, and humans (Eren et al., 2022).

In this case, *W. magnifica* larvae were detected in open wounds in two different parts of a donkey in Hatay, and this case of traumatic myiasis, which is rare in donkeys in the world, was reported for the first time from Türkiye.

Myiasis can lead to irritation, poisoning, septicemia and secondary infections in animals, resulting in decreased productivity, economic losses and even death. In addition, cases of myiasis occur in humans living in close contact with animals, especially in rural areas. When controlling myiasis, it is essential to keep garbage, carcasses and other organic materials that are breeding grounds for myiasis flies indoors or destroy them without leaving them in the open. Since the flies lay their eggs or larvae in natural body openings or wounds of animals such as ears, nose, mouth and anus, care should be taken to keep these areas clean by frequent inspections. When treating traumatic myiasis, the larvae in the wounds should be removed mechanically, and the larvae that cannot be removed since they are in deep tissue should be treated with insecticides.

It is noted that neglected open wounds are one of the predisposing factors for myiasis. In developing countries, myiasis is a sign of neglected wound care and poor hygiene. Patients are advised not to neglect their wounds and to seek appropriate medical care; failure to do so may result in myiasis. In addition, clinicians should focus on the treatment of secondary bacterial infections and proper debridement of maggot-infested wounds (Singh and Singh, 2015).

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**Conflict of Interest:** The authors declare that there is no actual, potential or perceived conflict of interest for this article.

**Author Contributions:** Main Idea: AZ, MY; Analysis: AZ, MY, İE; Data provision: AZ, MY, İE; Spelling: AZ, MY, İE; Correction: AZ, MY, İE; Approval: AZ, MY, İE

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