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A Case of Traumatic Myiasis Caused by *Wohlfahrtia magnifica* in a Dog

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Abstract
A 6-month-old female stray dog with tissue loss was brought to a private veterinary clinic. Upon examination of the dog, a 10 cm-wide wound with tissue loss was observed in the neck region. Numerous live fly larvae were detected in the wound. Larvae were carefully taken into petri dishes and kept in 70% ethyl alcohol. The collected larvae were cleared in 10% KOH solution. Species identification was performed in the parasitology laboratory though microscopic examination, based on the morphological features of the anterior and posterior spiracle and the cephalo-pharyngeal skeleton. Larvae were identified as II and III instar larvae of *Wohlfahrtia magnifica*. A total of 65 live larvae were collected, of which 57 were L3 and 8 were L2.
Keywords: Dog, Myiasis, Türkiye, *Wohlfahrtia magnifica*

Bir köpekte *Wohlfahrtia magnifica*'nın sebep olduğu travmatik myiasis olgusu

Öz
Niğde'de 6 aylık dişi, doku kayıplı bir sokak köpeği özel bir veteriner kliniğine getirildi. Köpeğin muayenesi sonucunda boyun bölgesinde 10 cm büyüklüğünde doku kayıplı yara görüldü. Yarada çok sayıda canlı sinek larvaları tespit edildi. Larvalar dikkatli bir şekilde petri kabına alınarak ve %70'lik etil alkolde muhafazada tutuldu. Toplanan larvaların %10 KOH solüsyonunda şeffaflandırma işlemi gerçekleştirildi. Parazitoloji laboratuvarında larvaların mikroskobik incelemesinde tür teşhisleri, anterior ve posterior stigmaları ile sefalo-faringeal iskeletin morfolojik özelliklerine göre gerçekleştirildi. Larvalar II ve III. dönem *Wohlfahrtia magnifica* larvası olarak teşhis edildi. 57 adet L3 ve 8 adet L2 olmak üzere toplam 65 adet canlı larva toplandı.
Anahtar kelimeler: Köpek, Myiasis, *Wohlfahrtia magnifica*, Türkiye

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Introduction

Myiasis is defined as the infestation of human and animal tissues or natural body cavities by the larvae of certain flies belonging to the order *Diptera*, leading to various disorders. Some flies within this order typically deposit their larvae and eggs on decomposing and decaying organic matter or animal carcasses. However, in some cases, they may also lay them on the wounds of living humans and animals. Examples of such flies include *Lucilia* spp., *Sarcophaga* spp., *Wohlfahrtia* spp., *Calliphora* spp., *Musca* spp., and *Stomoxys* spp. (Karatepe et al., 2005; İlhan et al., 2018; Ceylan et al., 2019; Bora et al., 2020; Uslu et al., 2021; Uslu et al., 2023a,b).

Myiasis-causing flies have a 12-segmented body, with larvae with pointed anterior ends and posterior ends featuring structures called stigmas, surrounded by a peritreme, which is important for species differentiation. The larvae secrete proteolytic enzymes to dissolve tissue and use their mouth hooks, located on the first segment to damage tissue and create wounds. The wound myiasis fly, *W. magnifica*, is an obligate myiasis-causing species with larvae that complete their development within the natural cavities of humans and animals. Adult flies are gray or ash-colored and deposit their larvae onto healthy tissues and organs (Zumpt, 1965; Aydın & Uslu, 2021). *Wohlfahrtia magnifica*, belonging to the *Sarcophagidae* family, is the primary cause of traumatic myiasis in both humans and animals (Dik et al., 2012).

The larvae feed on dead cells, exudates, and secretions while causing tissue destruction through their enzymatic activity. The enzymes released by the larvae, along with toxic substances from the lesion, can be absorbed into the bloodstream, leading to intoxication, septicemia, secondary infections, and, ultimately, death in affected animals (Ütük, 2006; Aldemir et al., 2012).

Case Description

A 6-month-old female stray dog brought to the veterinary clinic was found to have an approximately 10 cm-wide wound in the neck region, containing numerous fly larvae (Figure 1).

Figure 1. Appearance of larvae in the neck region of the dog.

The larvae collected from the wound at the clinic were placed in bottles containing 70% ethanol, labeled with the dog's age, sex, and breed. They were then transported under a cold chain to the Parasitology Laboratory of the Faculty of Veterinary Medicine at Selçuk University. The larvae were washed and preserved in 70% ethanol in the laboratory before being transferred into 10% KOH solution for clarification. The clarified larvae were dissected under a stereomicroscope, and species identification was performed (Zumpt, 1965).

A total of 65 larvae (57 L3 and 8 L2) collected from the wound were examined based on the morphological characteristics of their anterior and posterior spiracles, as well as the cephalo-

pharyngeal skeleton. The analysis revealed that 100% of the larvae were identified as *W. magnifica*.

Discussion

This case represents a traumatic myiasis detected in a stray dog in Niğde province. Myiasis is a condition commonly observed in warm climates and injured animals, where fly larvae from the order *Diptera* develop within the body, causing tissue damage (Zumpt, 1965; Aydın and Uslu, 2021). In our study, a large open wound in the neck region of the dog was observed to be heavily infested with larvae. This condition is a common issue, particularly in stray dogs, and is more prevalent in animals with traumatic injuries that lack adequate care and hygiene conditions.

Myiasis is caused by the larvae of various fly species, primarily *Lucilia sericata* and *W. magnifica* (Dik et al., 2012; Uslu et al., 2021). In stray dogs, traumatic wounds often result from exposure to external environments, providing a suitable site for flies to deposit their larvae. The larvae rapidly consume the surrounding tissues, leading to necrotic damage and potentially triggering secondary infections (Farkas et al., 2009; Bonacci et al., 2020). In our case, the larvae observed in high numbers within the wound on the neck region were likely due to a traumatic injury that remained uncleaned for an extended period. Stray dogs are frequently exposed to unsanitary conditions and external factors such as traffic accidents, which increase the risk of such infections.

Case reports on traumatic myiasis in dogs in Türkiye indicate that, alongside *L. sericata*, *W. magnifica* also plays a significant role as a causative agent. In these studies, Aldemir et al. (2012) encountered myiasis larvae while examining a dog's right hind leg in Aydın province and identified them as *Lucilia spp.* third-stage larvae, while Dik et al. (2018) detected *Musca domestica* third-stage larvae in a dog in Konya province. Gökpınar and Karslı (2018) reported that most of the larvae collected from the neck region of a dog in Kırıkkale province were *W. magnifica*, with a smaller proportion belonging to *L. sericata* third-stage larvae. Şaki (2004) identified *W. magnifica* first-, second-, and third-stage larvae in all 18 dogs examined in Elazığ province, whereas Sevgili et al. (2009) found many *L. sericata* first-stage larvae in a dog's mouth in Şanlıurfa province. Eren et al. (2010) identified *L. sericata* third-stage larvae in the back and neck region of a dog in Aydın province, while Dik et al. (2012) detected both *W. magnifica* and *L. sericata* larvae in dogs with traumatic myiasis in Konya province. Additionally, Kılınç et al. (2013) identified *W. magnifica* third-stage larvae in the neck region of a dog in Van province. In this study, all the larvae collected from the neck region of a dog brought to a private veterinary clinic in Niğde province were identified as belonging to the species *W. magnifica*. Among these, 57 were determined as third-stage larvae, while 8 were identified as second-stage larvae (Figure 2).

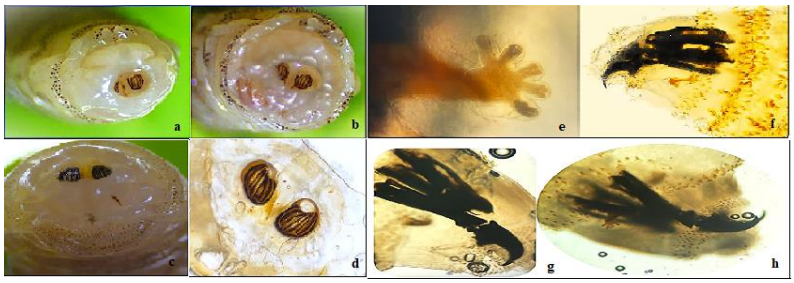

Figure 2. (a. b) Posterior spiracle of *W. magnifica* second-stage larva, (c. d) Posterior spiracle of *W. magnifica* third-stage larva, (e. f) Anterior spiracle of *W. magnifica, (g. h)* Cephalo-pharyngeal skeleton of *W. magnifica*.

Myiasis caused by *W. magnifica* typically develops in areas of the animal's body with open wounds, injuries, or tissue damage. The female fly deposits its larvae in the wounded area, where they begin to develop. The toxins produced by the larvae can cause necrosis in the infected tissues and lead to more severe infections. If left untreated, this condition may result in life-threatening complications (Moshaverinia & Kazemi Mehrjerdi, 2016). The larvae of *W. magnifica* can cause more aggressive tissue destruction compared to other causative agents, making early intervention and appropriate treatment strategies crucial (Farkas et al., 2009; Bonacci et al., 2020).

The treatment of traumatic myiasis begins with the removal of larvae (Dik et al., 2018; Uslu et al., 2021). In our case, wound cleaning and mechanical removal of larvae were successfully performed. In addition to wound care, antibiotic treatment was administered to prevent secondary infections. It was observed that *W. magnifica* larvae entered through open wounds, settled in deep tissues, and rapidly grew, leading to infection. The toxins released by the larvae caused necrosis around the wound, complicating the treatment process. It is important to recognize that stray dogs often have limited access to medical care. Early diagnosis and improvements in hygienic conditions are known to positively impact the treatment process and shorten the animal's recovery time.

Conclusion

In conclusion, myiasis in stray dogs is associated with traumatic wounds and is often caused by environmental factors and a lack of hygiene. This case demonstrates that if left untreated, myiasis can lead to severe complications. Proper wound care and early detection of myiasis are considered crucial in preventing its occurrence in stray animals.

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Ethical Statement

This study does not present any ethical concerns.

Author Contribution

Investigation: U.U., B.K. and M.K.; Material and Methodology: M.K., O.C. and S.Ç.; Supervision: U.U. and B.K.; Visualization: U.U. and O.C.; Writing-Original Draft: U.U., B.K. and M.K.; Writing- Review & Editing: U.U., B.K., M.K., O.C. and S.Ç.

Conflict of Interest

The authors declared that there is no conflict of interest.

Data Availabilty Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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