



Perianal Traumatic *Myiasis* in a Goat Caused by *Wohlfahrtia magnifica* (Schiner 1862) (Diptera: Sarcophagidae) in Konya Province of Turkey

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Abstract

Introduction: The infestation of live humans and animals with dipterous larvae is called Myiasis. These larvae feed on the living or dead tissues, body fluids, and ingested foods of hosts at least for a certain period in myiasis cases.

Case Presentation: During clinical examination, several larvae were detected in the perianal area of a goat at Selcuk University, Faculty of Veterinary Medicine, Internal Medicine Clinics. All visible larvae were cleaned by the clinician with the help of forceps. Ivermectin administered against larvae possibly penetrated deep into the wound. A topical antibiotic was also applied, and the wound was washed with an antiseptic solution. Several larvae were preserved in tubes including ethanol (70%) and transferred to parasitology laboratory. Firstly, the larvae were incised with a scalpel and cleared in potassium hydroxide (10%). Then, they were rinsed in distilled water, put into 70% ethanol for dehydration, and stored in 99% ethanol until dissection. The larvae were morphologically examined under a stereo microscope and dissected. The larvae were identified as third instar larvae of *Wohlfahrtia magnifica* according to the morphological characteristics of cephalo-pharyngeal skeleton, anterior spiracles, and peritremes.

Conclusion: It should be kept in mind that in myiasis cases, early diagnosis is a very important factor in preventing deep tissue loss.

Keywords: Perianal myiasis, Goat, Larvae, *Wohlfahrtia magnifica*, Turkey

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Introduction

Myiasis is the infestation of live humans and animals with dipterous larvae (1). Myiasis caused by fly larvae can be classified into 3 types including obligatory, facultative, and accidental. Myiasis can be clinically classified as cutaneous, traumatic, intestinal, ocular, vulvar, and urinary myiasis according to the location of the larvae (2). Although many dipteran species can cause myiasis in animals, the genera commonly detected in myiasis cases of goats and sheep belong to Calliphoridae, Sarcophagidae, Oestridae, Hypodermatidae, and Gasterophilidae families (3)

Wohlfahrtia magnifica (Schiner, 1862), an obligate parasite, is one of the most well-known agents of myiasis in the Palaearctic zone (4). Infestation occurs between late spring and early autumn when the flies are active. Sarcophagid flies, especially *W. magnifica*, are generally attracted by the odors of feces and decaying organic matters, where they deposit larvae or eggs (1).

Larviparous flies put their larvae on skin, wounds, or natural body openings (mouth, nose, eyes, ear, genital

organs, and anus) of humans and animals (3). As a result of intoxication, septicemia and deaths can occur in animals caused by enzymes secreted by the larvae and the toxic substances form in the affected areas (1). Additionally, the larvae cause serious tissue damage depending on their movements and excretions (3).

In the following report, we described a case of myiasis caused by *W. magnifica* in a goat which was transferred to Selcuk University, Veterinary Faculty, Internal Medicine Clinic in December 2020 and discussed its clinical presentation, as well as response to treatment.

Case Presentation

In December 2020, a 1-year-old goat was transferred to Selcuk University, Veterinary Faculty, Internal Medicine Clinic with the complaint of diarrhea, and 40 larvae were detected in the perianal area during the clinical examination. All visible larvae were collected using fine forceps. Ivermectin subcutaneously administered against larvae possibly penetrated deep into the wound. A topical antibiotic was also applied, and the wound was washed



with an antiseptic solution. The larvae were preserved in tubes including 70% ethanol until species identification. Firstly, the larvae were incised (ventral side between abdominal segments three and five) with a scalpel and cleared in 10% potassium hydroxide (KOH) at room temperature for a day. Then, they were rinsed in distilled water to remove KOH. Subsequently, the larvae were transferred to 70% ethanol about 24 hours for dehydration and preserved in 99% ethanol until dissection. The larvae were morphologically examined and dissected under a stereo zoom microscope. Then, they were mounted on slides using Canada balsam and a coverslip. The larvae were identified as third instar larvae of *W. magnifica* according to the morphological characteristics of cephalo-pharyngeal skeleton, anterior spiracles, and peritremes (Figure 1).

Discussion

Wohlfahrtia magnifica and *Lucilia sericata* are the dominant dipteran fly species causing traumatic myiasis in animals and humans (5). *W. magnifica* is one of the most significant etiological agent of myiasis belonging to the Sarcophagidae family, and this obligatory myiasis causes serious lesions by damaging healthy tissues of hosts (6,7). In contrast to the species causing facultative myiasis, *W. magnifica* may infest animals and humans without any predisposing conditions (8). In fact, if left untreated, myiasis caused by *W. magnifica* can produce several larvae within a few days, resulting in deep wounds (4).

There are many studies regarding myiasis caused by *W. magnifica* in animals worldwide (9-11). Several studies concerning the myiasis caused by *W. magnifica* in animals and humans have also been reported in Turkey. A case of gingival myiasis in a lamb (12) and a case of traumatic myiasis in dogs (13,14) caused by *W. magnifica* were detected in Turkey. Cases of aural myiasis (15-17) and cutaneous myiasis (18) caused by *W. magnifica* were reported in humans in the country as well. As a result

of the literature search, many other myiasis cases were detected. In these cases, *W. magnifica* larvae were found in the vulva of horses and sheep, genital organs of female camels, the mouth of humans and the wings of geese (19-23).

In a study conducted by Dik et al, 28 animals were clinically examined and 15 of them were found to be infested with *W. Magnifica* larvae. It was reported that the location of myiasis can be variable according to the animal that the larvae infest. For example, traumatic myiasis was detected in different parts of the body of 8 dogs (one of them is perianal myiasis), traumatic myiasis in the interdigital region in a cattle, perianal myiasis in a sheep, traumatic myiasis in the neck of a goat, and aural myiasis in two people (5). In another study, myiasis caused by *W. magnifica* were found in the tail and nipple area of 2 goats (24). In another study conducted in Israel, 3 of the 8 goats were found to be infested with *Przhevalskiana silenus* and 5 of them with *W. magnifica* (recorded on the hoof, sternum, ear, and perianal area) (25).

Myiasis is a major animal welfare problem causing severe pain and suffering in goats and, if untreated, may cause severe tissue injury, reproduction and productivity losses, and even death (26,27). Usually, there are a small number of larvae in *W. magnifica* infestation; however, they create large wounds in the host that can cause serious problems (11). In a study, impaired general condition and unwillingness to move were observed in a goat infested with *W. magnifica* larvae. The larvae had completely filled the intestinal lumen and urinary difficulty was observed due to the presence of larvae in the vulva (28). *Wohlfahrtia magnifica* larvae are frequently localized in natural body orifices (26), and it has been noted that wounds are not prerequisites for infestation with *W. magnifica* as adult female flies can be attracted by volatile products of vaginal discharges or urine (27).

Myiasis is of veterinary importance. It can cause yield decrease, economic losses, and even death by causing irritation, intoxication, septicemia, shock, and secondary infections in animals. Considering that myiasis can cause these problems, the first thing that comes to mind is the fight against dipteran flies, but this is very difficult. For the prevention of myiasis, it is necessary to remove the dumps, keep the garbage in closed areas, destroy animal carcasses, treat the wounds of animals and dispose of the other organic materials, which are the ideal breeding places for flies. More importantly, improving the care and feeding conditions of the animals should be an important factor. The animal owners or shelter staff should observe the general hygiene of the animal and pay special attention to the cleaning of natural body orifices of animals such as ears, nose, mouth, and anus, where flies can lay eggs or larvae. In addition, it should be kept in mind that in myiasis cases, early diagnosis is a very important factor in preventing deep tissue loss.



Figure 1. (a) Goat Transferred to the Clinic with the Complaint of Diarrhea, (b) the Third Instar Larvae of *Wohlfahrtia Magnifica*, (c) Cephalo-pharyngeal Skeleton, (d) the Larvae in Perianal Area of Goat, (e) Anterior Spiracle, (f) Peritreme.

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Competing Interests

The authors declare no conflict of interest.

References

- Zumpt F. Myiasis in Man and Animals in the Old World: A Textbook for Physicians, Veterinarians, and Zoologists. London: Butterworths; 1965.
- Şaki CE. Elazığ'da köpeklerde tespit edilen travmatik myiasisler. Fırat Üniversitesi Sağlık Bilimleri Dergisi. 2004;18(1):29-33.
- Dik B. Veteriner Entomoloji. 2nd ed. Konya, TR: Selcuk University Publishing ; 2015.
- Hall MJ, Farkas R. Traumatic myiasis of humans and animals. In: Papp L, Darvas B, eds. Contributions to a Manual of Palaearctic Diptera. Volume 1: General and Applied Dipterology. Budapest, Hungary: Science Herald Publishing; 2000. p. 751-68.
- Dik B, Uslu U, Işık N. Myiasis in animals and human beings in Turkey. Kafkas Univ Vet Fak Derg. 2012;18(1):37-42. doi: 10.9775/kvfd.2011.4654.
- Panu F, Cabras G, Contini C, Onnis D. Human auricular myiasis caused by *Wohlfahrtia magnifica* (Schiner) (Diptera: Sarcophagidae): first case found in Sardinia. J Laryngol Otol. 2000;114(6):450-2. doi: 10.1258/0022215001905814.
- Uzun L, Cinar F, Beder LB, Aslan T, Altıntaş K. Radical mastoidectomy cavity myiasis caused by *Wohlfahrtia magnifica*. J Laryngol Otol. 2004;118(1):54-6. doi: 10.1258/002221504322731655.
- Hall MJ. Trapping the flies that cause myiasis: their responses to host-stimuli. Ann Trop Med Parasitol. 1995;89(4):333-57. doi: 10.1080/00034983.1995.11812964.
- Dehghani R, Zarghi I, Sayyedi HR. Genital myiasis of a sheep by *Wohlfahrtia magnifica*, in Ghamsar, Kashan, Iran. Bangladesh J Med Sci. 2014;13(3):332-5. doi: 10.3329/bjms.v13i3.15451.
- Li Y, Li X, Liu J, Liu A, Guo P, Han Y, et al. Molecular identification and detection of *Wohlfahrtia magnifica* in ovine vulvar myiasis in Gansu, China. Trop Anim Health Prod. 2019;51(8):2629-34. doi: 10.1007/s11250-019-01925-y.
- Rafinejad J, Akbarzadeh K, Rassi Y, Nozari J, Sedaghat MM, Hosseini M, et al. Traumatic myiasis agents in Iran with introducing of new dominant species, *Wohlfahrtia magnifica* (Diptera: Sarcophagidae). Asian Pac J Trop Biomed. 2014;4(6):451-5. doi: 10.12980/apjtb.4.2014c1029.
- Aydenizöz M, Dik B. Bir kuzuda *Wohlfahrtia magnifica* (Diptera: Sarcophagidae)'dan kaynaklanan gingival miyaz olgusu. Türkiye Parazit Derg. 2008;32(1):79-81.
- Köse M, Bozkurt MF, Kartal K, Yaprakçı V. Wound myiasis by *Wohlfahrtia magnifica* in a dog. Bornova Veteriner Bilimleri Dergisi. 2013;35(49):31-4.
- Kılıncı ÖO, Oğuz B, Sona A, Biçek K, Özdal N, Değer MS. Traumatic myiasis associated with *Wohlfahrtia magnifica* (Schiffner, 1862; Diptera: Sarcophagidae) larvae in a dog. Animal Health, Production and Hygiene. 2013;2(2):209-11.
- Bayindir T, Miman O, Miman MC, Atambay M, Saki CE. Bilateral aural myiasis (*Wohlfahrtia magnifica*): a case with chronic suppurative otitis media. Türkiye Parazit Derg. 2010;34(1):65-7.
- Karaman E, Samasti M, Saritzali G, Ozdemir S, Halil MC, Isildak H. Otomyiasis by *Wohlfahrtia magnifica*. J Craniofac Surg. 2009;20(6):2123-4. doi: 10.1097/SCS.0b013e3181bec66e.
- Yazgi H, Uyanik MH, Yoruk O, Aslan I. Aural myiasis by *Wohlfahrtia magnifica*: case report. Eurasian J Med. 2009;41(3):194-6.
- Kokcam I, Saki CE. A case of cutaneous myiasis caused by *Wohlfahrtia magnifica*. J Dermatol. 2005;32(6):459-63. doi: 10.1111/j.1346-8138.2005.tb00780.x.
- Ciftçioğlu N, Altıntaş K, Haberal M. A case of human orotracheal myiasis caused by *Wohlfahrtia magnifica*. Parasitol Res. 1997;83(1):34-6. doi: 10.1007/s004360050203.
- Farkas R, Hall MJ, Kelemen F. Wound myiasis of sheep in Hungary. Vet Parasitol. 1997;69(1-2):133-44. doi: 10.1016/s0304-4017(96)01110-7.
- Farkas R, Hall MJ. Prevalence of traumatic myiasis in Hungary: a questionnaire survey of veterinarians. Vet Rec. 1998;143(16):440-3. doi: 10.1136/vr.143.16.440.
- Farkas R, Képes G. Traumatic myiasis of horses caused by *Wohlfahrtia magnifica*. Acta Vet Hung. 2001;49(3):311-8. doi: 10.1556/004.49.2001.3.8.
- Valentin A, Baumann MP, Schein E, Bajanbileg S. Genital myiasis (wohlfahrtiosis) in camel herds of Mongolia. Vet Parasitol. 1997;73(3-4):335-46. doi: 10.1016/s0304-4017(97)00127-1.
- Sayin İpek DN, Saki CE. External myiasis on cows, sheep and goats in Diyarbakır province. Dicle Üniversitesi Veteriner Fakültesi Dergisi. 2010;1(1):1-7.
- Schnur HJ, Zivotofsky D, Wilamowski A. Myiasis in domestic animals in Israel. Vet Parasitol. 2009;161(3-4):352-5. doi: 10.1016/j.vetpar.2009.01.026.
- Sotiraki S, Hall MJR. A review of comparative aspects of myiasis in goats and sheep in Europe. Small Rumin Res. 2012;103(1):75-83. doi: 10.1016/j.smallrumres.2011.10.021.
- Farkas R, Hall MJ, Bouzagou AK, Lhor Y, Khallaayoune K. Traumatic myiasis in dogs caused by *Wohlfahrtia magnifica* and its importance in the epidemiology of wohlfahrtiosis of livestock. Med Vet Entomol. 2009;23 Suppl 1:80-5. doi: 10.1111/j.1365-2915.2008.00772.x.
- Gaglio G, Brianti E, Abbene S, Giannetto S. Genital myiasis by *Wohlfahrtia magnifica* (Diptera, Sarcophagidae) in Sicily (Italy). Parasitol Res. 2011;109(5):1471-4. doi: 10.1007/s00436-011-2431-3.

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