

## Case report

# Ocular myiasis due to *Oestrus ovis* (Diptera: Oestridae) in young patients from urban settings in the Himalayan region

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**ABSTRACT.** Ocular myiasis is a relatively rare clinical entity that mainly affects the old and debilitated people with poor hygiene in rural settings and has a strong occupational predisposition. Presented here are a series of two unusual cases of ocular myiasis caused by *O. ovis* after exposure to dust in young individuals with no history of direct contact with animals in the Garhwal region of the Himalayan state of Uttarakhand in India.

**Keywords:** ocular myiasis, flybot larva, zoonosis, One Health, ophthalmomyiasis

## Introduction

Ocular myiasis is caused by the dipterous insect (fly) larvae that could be present on the conjunctiva or invade the deep tissues to cause orbital myiasis, a serious complication often resulting in loss of vision and the eye. The human ocular myiasis is a relatively rare clinical entity as majority of the cases are those of cutaneous myiasis [1,2]. The usual species of flies causing ocular myiasis belong to the three main families, i.e. Oestridae which are commonly known as flybots, Sarcophagidae or the fleshflies and Calliphoridae, also known as the blowflies [3].

The nasal flybot, *Oestrus ovis*, Linnaeus, 1758, primarily causes infestation in sheep and goats while man is an accidental host where the viviparous female fly ejects larvae in the nasal cavity of the humans [1]. Such infestation in humans is generally the result of a close or direct contact with animals, thereby making it a zoonosis. Here, we present two unusual cases of ocular myiasis caused by *O. ovis* after exposure to dust in young individuals in an urban setting with no

history of contact with animals. The cases reported in this series presented in March 2021 at VCSG Government Institute of Medical Science and Research, Srinagar Garhwal, India, a tertiary care center located in the Himalayan state of Uttarakhand in India. It is pertinent to mention that the state of Uttarakhand had a documented sheep population of approx. 0.3 million with most of them located in and around the districts falling under the Garhwal region [4].

## Case history

**Case 1.** An 11-year old male patient was brought to the Ophthalmology clinic with complaint of redness, associated with pain in the left eye for one day. The patient was apparently playing outdoors in windy conditions when he was exposed to the dust from a nearby field. The onset of symptoms was sudden and the mother of the patient noted a few tiny worms in the left eye of the patient, prompting them to seek immediate medical help. There was no history of contact with animals. On examination, the visual acuity was 6/6 in both eyes. The conjunctiva

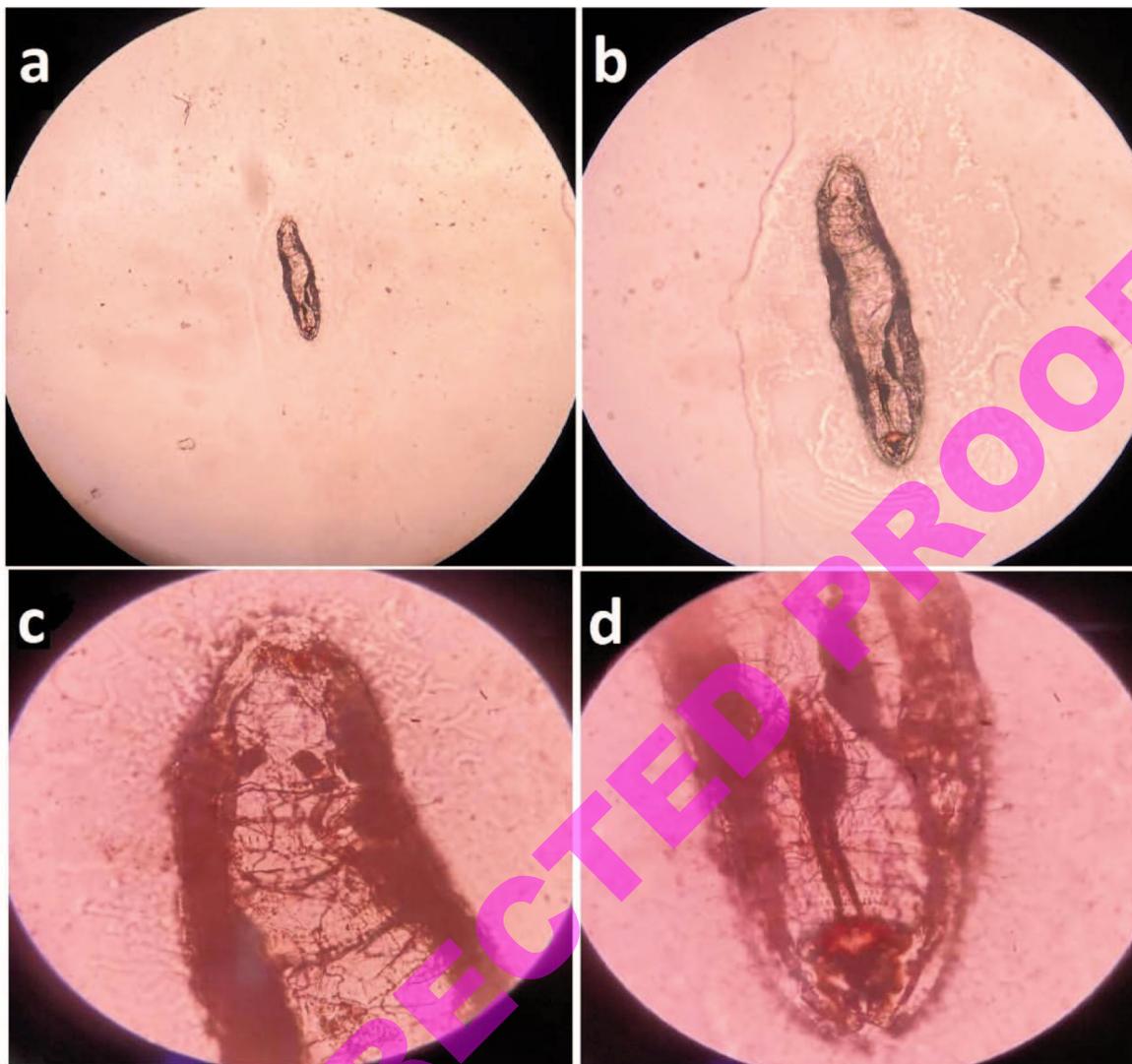


Figure 1. Morphological characteristics of *Oestrus ovis* larva using 4× (a); 10× (b) and 40× (c and d) objective lens and standard 10× eye piece. The tail end (c) shows the tubercle containing spines whereas the cephalic end (d) shows a prominent cephalopharyngeal skeleton in the center

in the affected eye had mild congestion and chemosis. Tiny foreign bodies were noted on gross examination; slit lamp examination revealed motile larva under diffuse illumination. Subsequently, multiple, white larvae were observed in the fornices.

The larvae were removed after application of topical lignocaine and sent to the Microbiology laboratory for identification. A reference Parasitology laboratory of a tertiary care center (Post Graduate Institute of Medical Sciences and Research, Chandigarh, India) was consulted and the larvae were confirmed as belonging to the *O. ovis* fly (Fig. 1). The tail end of the larva (Fig. 1c) shows the tubercle containing spines whereas its cephalic end (Fig. 1d) shows a prominent cephalopharyngeal skeleton in the center. The patient was managed with topical chloramphenicol-dexamethasone and

Carboxymethyl cellulose eye drops. The patient recovered satisfactorily upon follow up.

**Case 2.** A 21-year old female patient, who was a student presented to the Ophthalmology clinic with history of exposure of the left eye to dust while dusting the house two days back. The patient started experiencing pain and foreign body sensation within 3–4 hours following which she sought medical care at a local hospital. She was prescribed ocular drops and topical antibiotics. The patient continued to experience pain and foreign body sensation, associated with pain in the affected eye. The patient subsequently observed a tiny worm in her left eye near the medial canthus the next morning upon which she presented to Ophthalmology department.

The examination of the affected eye showed conjunctival congestion. Upon careful examination,

small, white larvae were seen that moved away from light on slit lamp examination. The larvae were promptly removed under local anesthesia. The reference Parasitology laboratory was again consulted for confirmation of the larvae to be those of *O. ovis* fly. The patient was asked to continue her topical antibiotic and lubricant eye drops and a satisfactory resolution was observed upon follow up.

## Discussion

The present cases represent unusual patient profile in terms of multiple parameters. Generally, the risk factors of ocular myiasis include older age, poor personal care and hygiene, debilitation, malnutrition or occupational exposure to animals (farmers, animal handlers etc.) [5]. In the present cases, however, both patients were young, active individuals, having no direct contact with animals, with good personal hygiene and self-care. Abosdera et al. [6] described myiasis in three cases of pediatric age group but the site of involvement was oral cavity. Moreover, those cases had classic predisposing factors, such as low socioeconomic condition, malnutrition, and inability to perform daily activities due to the neurodegenerative disease in one of the cases. The cases are often seen in the rural background and are very rare in the urban areas. Moreover, in India, most of the cases of *O. ovis* myiasis have been reported from the Southern parts and only recently, cases have been reported from urban setting in the state of Punjab [7]. Pandey et al reported myiasis in a young patient from another rapidly growing urban area that reported no cases before [8].

In the absence of direct contact with sheep in the present study, the alternate modes of infestation could be explored. The northern Himalayan province of India has traditionally been among those with highest forest cover, resulting in good soil binding; however, there has been a dramatic change due to escalated human activities in the quest for development. These activities include encroachment of housing societies into the agricultural land, and rampant deforestation for construction, building of roads and hydroelectric projects in the region [9], thereby increasing the exposure to dust by the urban dwellers. It is a known fact that the L3 larvae of *O. ovis* reside in the soil to molt into an adult after encountering favorable environmental factors [1]. Alternatively, the larvae

could have been deposited directly into the eyes/onto the face of the patients by the flies which they failed to notice.

Both patients described above developed symptoms after exposure to dust and sought medical care within the next 24–48 hours. This early presentation is important since *O. ovis* larvae have been associated with keratitis and uveitis in the patients. Although their invasive ability is not established, rare and potentially fatal presentations have been reported as the larvae of the *O. ovis* secrete serine proteases in experimental studies [10].

The mainstay of the management is mechanical removal of the worms from the eye along with medical management in the form of artificial tears and topical antibiotics to prevent secondary infections. The larvae exhibit negative phototaxis, i.e. they move away from the light causing difficulty in their removal. Thus, the mechanical removal of the larvae can be aided by the instillation of local anesthetic eye drops that cause the paralysis of the larvae, thus, preventing negative phototaxis [11].

To conclude, these cases highlight the possibility of ocular myiasis occurring in younger, active individuals without direct contact with animals (sheep). In Ophthalmic terms, a meticulous examination including the eversion of the lids is recommended in view of difficulty in visualizing the tiny larvae exhibiting negative phototaxis, however, from an ecological perspective, the observed change in this zoonotic condition may be a harbinger of other similar conditions in the coming years.

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Received 29 August 2025

Accepted 02 March 2026

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