



# First Case of Nosocomial Nasal Myiasis Caused by *Chrysomya bezziana* in Kuwait

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## Abstract

Myiasis is a parasitic infection of live human and animal tissues caused by the invasion of fly larvae or maggots. Nosocomial myiasis usually occurs in bedridden patients while admitted to the hospital. We report nasal myiasis in a 62-year-old Kuwaiti female hospitalized in an intensive care unit in Ibn Sina Hospital in Kuwait city with cerebellar tumor with hematoma, diabetes mellitus, hypertension, bronchial asthma and end-stage renal disease. On the 10th day of admission, she started passing worms from her; both nostrils were fixed, cleared, and identified as the third instar of *Chrysomya bezziana* (Diptera: Calliphoridae). The larvae were cleared after five days of treatment using topical ivermectin and manual removal of larvae from the nostrils. Since the presence of larvae was recorded after a stay of at least 10 days in the hospital, therefore, this infestation is considered nosocomial.

## Subject Areas

Infectious Diseases

## Keywords

*Chrysomya bezziana*, Nasal Myiasis, Nosocomial, Kuwait

## 1. Introduction

Myiasis is derived from the Greek word “myia,” meaning the invasion of fly larvae into vital tissue of humans or other mammals [1]. The term myiasis was first given by Hope in 1840 [2] and later by Zumpt [3]. The larvae can infest vertebrate animals including humans and feed on living or dead tissue as well as on body fluids [4]. Human myiasis is a rare clinical condition but is more frequently seen in tropical and subtropical areas. A hot and humid climate with inadequate

sanitary conditions favors the development of this condition. Dermatitis, psychiatric illnesses, leprosy, and diabetes are some contributory factors [5].

*Chrysomya bezziana*, two-winged flies, also known as old world screwworm, is an obligate parasite in mammals and is known to infest wounds. Nasal myiasis is not a rare pathology and is associated with poor nasal hygiene, alcoholism, senility, and suppurating lesions. In the case of humans, the most sites of infestation are the limbs, perineal and inguinal regions, ear, eye, nose, face, vagina, skin, nasopharynx, and rarely the oral cavity.

Human myiasis caused by *C. bezziana* was first reported in 1909 in India [6], and at least 291 cases have been reported worldwide in humans now. *Chrysomya bezziana* larvae can cause aggressive and serious destruction of the living tissues, and even bones, of the host, and if vital organs are involved, death may occur [6] [7].

The flies attracted by odoriferous lesions deposit their eggs on surfaces contaminated with blood or mucous and females lay 150 - 500 eggs at sites of wounds or in body orifices, which hatch after 18 - 24 h. Eggs can be transferred to other sites by the patient's own fingers. On hatching, maggots penetrate deep into the host tissues. The larvae feed on the host tissue for five to seven days while they complete their development. The larvae, while feeding on infected or necrotic tissues, release toxins, which result in the progression of necrosis. The pupal stage lasts for seven to nine days in tropical conditions, but up to eight weeks in the subtropical winter months.

The endemic distribution of *C. bezziana* includes South East Asia and Africa. In the Middle East, *C. bezziana* is endemic in Saudi Arabia, Iran, United Arab Emirates, Sultanate of Oman and Yemen [8] [9]. The infection of *C. bezziana* has been reported in Bahrain and Kuwait in animals through the shipments of livestock passing the Gulf of Oman *en route* to ports in the Persian Gulf [10]. Only one human case of nasal myiasis caused by *Lucilia sericata* was reported in Kuwait [11]. In 1996, a major outbreak was reported in Iraq. Human myiasis due to this family has been reported in the United States of America [12], Canada [13] and urogenital myiasis in Pakistan [14]. The importance of this study was to report the new species of nasal myiasis caused by *C. bezziana* in Kuwait.

## 2. Materials and Methods

The larvae passing from nostrils were collected in saline and transferred into 70% ethanol, cleared in lactophenol, dehydrated and mounted with polyvinyl alcohol [15], and finally observed under a light microscope to localize the anterior and posterior spiracles and count the number of papillae and its arrangement and number of spiracular slits, respectively. The posterior spiracles do not have a distinct button and the numbers of lobes or papillae on the anterior spiracles are six.

## 3. Morphology

The third instar larva is approximately 10 mm in length white in color with

strong mouth hooks (mh) (**Figure 1**). The posterior spiracles (ps) are observed with the spiracular slits (sl). It has two black cephalopharyngeal skeletons (c), anterior spiracle (as) has six papillae arranged in a single row. It has the dark inter-segmental spines (is) in rows all over the body (**Figure 2**).

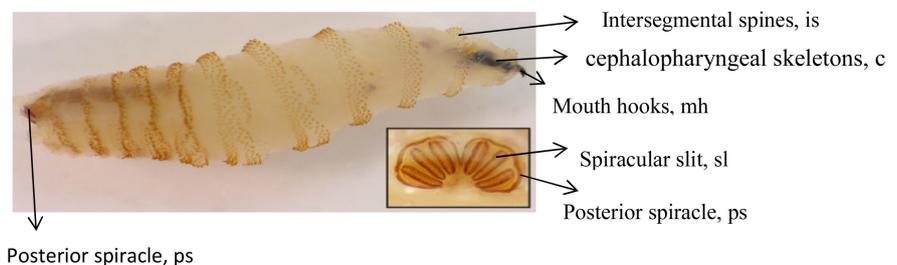
#### 4. Discussion

Myiasis is defined by Zumpt as the infestation of live human and vertebrate animals with dipterous larvae which at least for a certain period feed on the host's dead or living tissue, liquid body substance, or ingested food [6]. According to the documented cases in the literature, myiasis occurs more in rural than urban areas. The predisposing factors could be Diabetes mellitus, leprosy, cancer, and poor oral hygiene, open wounds due to maxillofacial trauma or patients who are senile, mouth breathers or hemiplegic [7]. The present Kuwaiti patient belonged to a high socioeconomic status residing in a city area with cerebellar tumor with hematoma; diabetes mellitus, hypertension, bronchial asthma and end-stage renal disease are thought to be the predisposing and contributing factors to nasal myiasis. There was a probability that the flies had entered the ICU from the vicinity of the hospital which has desert with plantations. No report of *C. bezziana* infection in humans was found in the literature in Kuwait.

The most important and effective treatment is the removal of all living larvae of *C. bezziana* quickly and thoroughly from the infested sites. Early and proper treatment is essential to help wound healing and stop the rapid and destructive process of *C. bezziana* myiasis [16] [17]. The treatment for myiasis comprises local and systemic measures. The local measures consist of topical application of



**Figure 1.** Third instar larvae of *Chrysomya bezziana*.



**Figure 2.** Third instar larva of *Chrysomya bezziana* with morphological features.

oil of turpentine, mineral oil, ether, chloroform, ethyl chloride, mercuric chloride, creosote, saline, phenol, calomel, olive oil, iodoform, or other such comparable solvents as advocated in the literature [8]. These local measures irritate the maggots causing larval asphyxia and forcing them out of the deeply burrowed cavitations. Systemic treatment includes broad-spectrum antibiotics to avoid secondary infection of the wounds.

## 5. Conclusion

Nasal myiasis caused by *Chrysomya bezziana* is a devastating and progressing condition, posing a risk to public health. Unfortunately, the disease is under-recognized as a serious medical and veterinary condition for humans and animals. The clinician should be aware of this disease and should take appropriate measures for its prevention. Prevention of myiasis involves addressing open wounds, maintaining good personal hygiene, controlling of fly population, basic cleanliness of surrounding areas and provision for basic sanitation and health education. Extra care should be taken in patients who lack manual dexterity in maintaining personal hygiene and the attention should be raised by the public health agencies towards the aged-home sectors and the primary health clinics.

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## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of the case report.

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