

A case of enteric myiasis by *Sarcophaga* spp. larvae in stable worker from Iran

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Summary

Myiasis is the infestation of tissues of animals or man by parasitic dipterous fly larvae. Enteric myiasis occurs when eggs or larvae of the fly, placed on food or water, then, swallowed by man and are passed out in faeces. This case report describes a type of intestinal myiasis caused by *Sarcophaga* species larva in a 34-year-old stable worker man in Kurdistan Province, western Iran. The clinical signs consisted of abdominal distress, gastroenteritis, abdominal pain and loose faeces. Following the disposal of maggots in his stool, larvae were identified to be *Sarcophaga* spp. based on characteristic patterns of posterior spiracles. The symptoms were completely resolved within 2 days. The patient seems to have been infested accidentally. This paper is the second report of human enteric myiasis caused by *Sarcophaga* species.

Keywords: Enteric myiasis, *Sarcophaga* spp., Iran.

Introduction

Myiasis is defined as an infestation of human and vertebrates by dipterous fly larvae that feed on the host's necrotic or living tissue, body fluids, or ingested foods, at least for a desired period of time (Tachibana et al., 1987). Clinically, myiasis may be classified as cutaneous and sub cutaneous, eye, ear, atrial, wound, nasopharynx, intestinal, or genitourinary tract, depending on the location of the fly larvae (Sehgal et al., 2002).

Myiasis producing flies have been classified as obligatory or mandatory (when the fly requires a live or dead host to lay its eggs or maggots) and facultative or accidental (when a person accidentally eats the eggs or maggots of flies in food – intestinal or urinary) (Sehgal et al., 2006;

Garcia et al., 1997). Myiasis is most likely to occur in areas with overcrowding, poor hygienic conditions and rural regions where people are in close contact with domestic animals (Loureiro et al., 2010). Over 50 fly species of dipterous larvae have been encountered from the human digestive tract, and most of the species that cause gastric myiasis are facultative or accidental parasites (Yilmaz et al., 1999).

The intestinal myiasis is usually an accidental phenomenon which occurs due to the ingestion of eggs or larvae in food by man. It is developed in the stomach or intestine, giving rise to gastric or intestinal myiasis (Karabiber et al., 2010). Most larvae are destroyed by the digestive secretions, however, some are able to live in the intestinal tract and produce intestinal distress. Moreover, the larvae can also

exceptionally reach the intestinal tube through the anus (rectal myiasis) (Nagakura et al., 1990).

The intestinal myiasis due to the larvae of the flesh fly Sarcophagidae family is reported sporadically from various countries, but this case is the second report of human enteric myiasis caused by *Sarcophaga* species in Iran. The large grayish flesh fly belonging to family Sarcophagidae and genus *Sarcophaga* has a nearly worldwide distribution. These flies are generally well-sized and of a grayish color; like many of their relatives, the typical patterns are lengthwise darker stripes on the thorax and dark and light square dots on the abdomen. Many have conspicuous red compound eyes. As the common name implies, their larvae typically feed on decaying meat (Bake et al., 1986). About 30 species of dipterous larvae including *Sarcophaga* species have been found capable of producing intestinal myiasis till now. This kind of myiasis is very rare in Iran and has the only three reports including *Sarcophaga haemorrhoidalis* (Khalili et al., 2007), *Er. tenax* (Youssefi et al., 2010) and *Lucilia illustris* (Norouzi and Manochehri, 2017). This paper is the fourth report of human intestinal myiasis in Iran.

Case report

A 34-year-old male stable worker resident in the west of Iran, Kurdistan province with a specific abdominal pain and loose faces was referred to the Shahid Ghazi hospital, Kurdistan, Iran. The patient had always habitated in a suburban area and worked in the stable as a worker

and initially the ingestion of some contaminated food was suspected. He did not have any other abdominal or general symptoms. The stool examination and other complementary studies were performed. The physical and complete medical examination did not indicate any abnormal conditions. The samples revealed the presence of two cylindrical vermiform maggot measuring 13 mm in length and 4 mm in diameter (Fig. 1). The larvae had 12 segments each with short spines at its posterior margin. It had a broader posterior end and a tapering anterior end with two oral hooks. The maggots were removed from his stool and after three days incubation at 25 °C pupated for 4 days after which adults were born (Fig. 2). The flies were identified as *Sarcophaga* spp. on the basis of the morphological features of the adults. The typical patterns of *Sarcophaga* flies are lengthwise darker stripes on the thorax and dark and light square dots on the abdomen. The larvae were identified as third instars of *Calliphora* spp. containing the posterior spiracles (Fig. 3). Following excretion of the larva, the symptoms have subsided within a few hours and remained asymptomatic several weeks later. The patient was also very relaxed and happy on follow-up.



Fig. 1. A typical third-stage larva of the *Sarcophaga* spp.



Fig. 2. The puparium and adult of *Sarcophaga* spp.



Fig. 3. Posterior spiracle of larva, 20X

Discussion

Enteric myiasis in humans is caused by dipterous larvae which are caused by accidentally swallowing of contaminated uncooked food or drink by eggs or larvae of flies. Most larvae are destroyed by the digestive secretions of the gastrointestinal tract, while some are able to live in the intestinal tract and produce intestinal distress and enteritis (Sehgal et al., 2002; Scuderi, 1964). However, in the case of *Sarcophaga* spp., the larvae survives the gastric digestion as it happened in the present case in which live larvae have been recovered from a fresh stool sample verifying a case of true intestinal myiasis.

In the urban areas of developed countries, cases of intestinal myiasis are rare; most have occurred in countries where nutrition and sanitary conditions are unsatisfactory. In this report, the patient was residing in suburban areas working in a close contact with horses. The total number of myiasis cases in all published documents from Iran was 78. The various climatic conditions in different parts of Iran has provided suitable environments for the presence of different potentially myiasis agents. More than 62% of all myiasis reports were from Fars Province (Alizadeh et al., 2014).

There are few reports of intestinal infestation, especially from developing countries such as India (Lakshminarayana et al., 1975; Arya et al., 1988; Bhatia, 1989; Singh and Samantaray, 1988; Sood et al., 1994; Shenoy et al., 1996; Shivekar et al., 2008; Udgaonkar et al., 2010), Africa (Bardach et al., 1981), North America (Baird et al., 1981), Thailand (Sukontason et al., 2014), Japan (Nagakura et al., 1990; Sehgal et al., 2002; Haruki et al., 2005), China (Jiang, 2003), Taiwan (Wu-Chun et al., 2007), Spain (Scuderi, 1964), Egypt (Atal et al., 1963; Mandour and Omran, 1978; Mazayad and Rifaat, 2005; K. Ahmad et al., 2011), Macao (Ferreira et al., 1990) and Iran (Khalili et al., 2007; Youssefi et al., 2010; Norouzi and Manochehri, 2017).

The clinical presentation is variable depending on the number and species of fly larvae and their location within the digestive tract, including asymptomatic cases, abdominal pain, nausea, diarrhea, loss of appetite and weight, vomiting and anal pruritus (Aguilera et al., 1999). The

patient in the present report had specific abdominal pain and loose faces. The most cases of enteric myiasis are caused by Calliphoridae, Anthomyidae, Muscidae and Sarcophagidae.

Intestinal myiasis is easily prevented by educational programs, especially persons dealing with animals. The best protective practice consists of washing fruits and vegetables and adequate cooking of food before consumption. The need for correct diagnosis of myiasis which is potentially destructive needs to be emphasized.

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