

# Human cutaneous myiasis under-reported in Dilla, Ethiopia

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## Abstract

**Background:** Myiasis is an infestation of living vertebrate animals, including humans, by fly larvae (Diptera, Brachycera, Cyclorrhapha) that develop on the host's dead or living tissue. Subcutaneous myiasis is endemic to sub-Saharan Africa. Reports of human myiasis are few and understudied disease in Ethiopia in general, around Gedeo zone in particular.

**Case details:** A case of furuncular myiasis was reported for the first time in a 42-year-old man and his 5 year old son living in Dilla town, Gedeo zone, SNPPRS, Ethiopia. During the month of September 2016, furuncle-like lesions were observed on the top right side of the head and right axilla (son) and at the superior part of the left buttock (father). Both complained of crawling sensations and growth of an enlarged single furuncular nodule within the mentioned sites. After applying petroleum jelly to the infected sites, by using digital pressure, the invasive larvae were extruded from the furuncular lesions of both patients.

**Conclusion:** Myiasis is not rare, but yet is a neglected tropical disease in Ethiopia. The prevalence rate and the responsible species of myiasis are not well known hence this informative case study is a clue to perform species identification and prevalence rate studies in the region. The disease is preventable and therefore deserves greater medical attention and awareness for both clinicians and to the inhabitants of endemic areas.

## Keywords

furuncular myiasis; cutaneous myiasis; cordylobia SPP; gedeo zone

## Introduction

Myiasis, from the Greek myia for “fly,” is the infestation of live tissue of humans and other vertebrates by larvae of flies primarily by *Dermatobia* and *Cordylobia* SPP. Among different species, *Cordylobia anthropophagi* (the Tumbu fly) and *Dermatobia hominis* (the human botfly) are the most common causes of myiasis in Africa, Central and South America. Larvae of flies can infect skin, necrotic tissues and natural cavities of living persons. Myiasis can be primary, if it infects intact skin or secondary, if it infects a previous injury. Depending on the degree of parasitism, myiasis may be obligatory (requiring a live host for parasite survival), facultative (developing in live or dead organic matter), or accidental [1,2]. Cutaneous myiasis might be furuncular myiasis in which a furuncle-like nodule develops with one or more maggots in it, and migratory myiasis in which the maggots migrate aimlessly

through burrows in the skin and produce numerous furuncular lesions [3]. Cases of myiasis are observed in communities of the south and south-eastern part of Ethiopia but the cause of myiasis has been associated to traditional beliefs rather than fly species. Even though myiasis is believed to be endemic to Ethiopia, there are limited published articles available.

## Case Presentation

During September, 2016, a case of furuncular myiasis was reported for the first time in a 42-year-old father and his 5-year-old son residing in Dilla town, Ethiopia. In their body parts both noticed a papule resembling an insect bite on the right side of the forehead and under the right armpit of the son and on the upper left side of buttock of the father. Both observed pain, creeping sensations and the gradual growth of an enlarged single furuncular nodule at the infected site of the son and at 5 different furuncular nodule points of the father's buttock. Infected father and son did not consult any dermatologist or medical practitioner. They simply applied petrolatum on and to the surrounding furuncular nodules for one day. Nevertheless, continual itching and inflammation of skin was observed for a week.

One week later, the nodule, which had a central pore from which serosanguineous fluid drained, was seen on most of the infected sites (Fig. 1). With the help of digital pressure the father removed one maggot from himself and two from the son (Fig 2). The wound healed within 3 weeks with scarring in the father (Fig 3). No hematological examination, blood or serological tests were performed. The worms were not morphologically identified because there were no taxonomic identification keys to the myiasis species at hand at that time. Myiasis cases are observed in the rainy or moist seasons but under reported to health centers.


## Discussion

Myiasis infestations may be classified as accidental, facultative or obligate. Human cases are considered obligate and often result in subcutaneous infestation or furuncular myiasis [4]. *Dermatobia hominis* is the most common cause of furuncular myiasis in Central and South America, while *Cordylobia anthropophaga* is endemic in West African countries and *Cordylobia rhodaini* is found in the rainforest areas of tropical Africa [5]. In most cases, species *C. anthropophaga* (named also tumbu or mango fly) infestation has been reported from the West African countries Ghana, Nigeria and Senegal. Myiasis due to *C. ruandae* and *C. rodhaini* has been very rarely reported in the literature. *C. rhodaini* (named also Lund fly), availability and infestation cases reported from Ethiopia, Ghana, Cameroon and Uganda and all are travel associated [6,7].

Even though it is travel associated, myiasis in Ethiopia has been caused by *C. rodhaini*. Based on the reported cases of myiasis in Ethiopia, it is believed that the current cases of myiasis are due to *C. rodhaini* but taxonomic identification of the species is not done, hence the species might be another one.

The life of the adult of *C. rodhaini* is approximately one month. The female adult fly lays nearly 500 eggs on dry sand/soil polluted with the excrement of animals or on human clothing. The eggs hatch 2-4 days later. On contact with the skin of a suitable host, the larvae penetrate. After 12-15 days, the larvae develop into second and third stage. During this period the larvae can reach a length up to 1.5 cm, after which mature larvae may emerge from the skin spontaneously [7].

Myiasis in Ethiopia is under reported. Two studies around Jimma zone have been reviewed. A



21% prevalence rate of subcutaneous myiasis, observed from an interview survey conducted among 174 students at Jimma Institute of Health Sciences in Jimma town, was reported by Mehari [8]. Additionally, a higher prevalence of myiasis in Jimma Zone, on Southwestern Ethiopia, but neither illustrated the causative species which highlights the need for further studies aimed at assessing the extent of the myiasis problem in other parts of Ethiopia [4]. Myiasis is a disease of vertebrates. Due to the agro climatic condition that Ethiopia has, there may be different species which can cause myiasis to humans and other vertebrates. For better management of the disease, emphasis has to be placed on taxonomic species identification of myiasis-causing flies in different regions of Ethiopia.

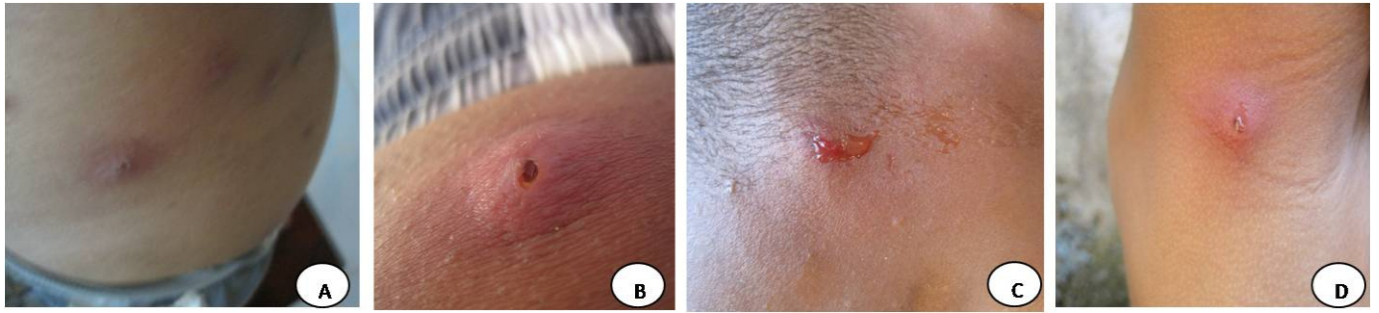
Myiasis occurs mainly in tropical and subtropical latitudes and often originates in these areas even though is reported in temperate climates. Clinically myiasis is self-limiting, with the vast majority of cases exhibiting minimal clinical pathology. In some cases, however, feeding and growing larvae may cause severe inflammation, acute pain and pruritus, resulting in sleep and mood disturbances [5]. There might be a chance of misdiagnosing myiasis since clinical symptoms of cutaneous myiasis are non-specific and are often confused with other conditions such as actinomycosis, staphylococcal abscesses, cellulitis, sebaceous cysts, leishmaniasis, tungiasis, and others [3].

The main contributing factors to development of myiasis are probably the higher levels of exposure to myiasis-causing flies, the increased aggressiveness of myiasis-causing flies in the tropics, low socioeconomic status, advanced age, alcoholism and neurologic diseases. Moreover, factors predisposing to attacks by myiasis-producing flies include: 1) summer season, 2) contact with infested hosts or visits to areas of infested hosts, 3) sleeping outdoors, 4) poor hygiene and poor treatment of wounds (often associated with homelessness), and 5) travel to an endemic area [9-12].

## Conclusion

Most cutaneous myiasis cases are reported in the literature as travel-associated cases or skin problem among returning travelers but this informative case study shows that myiasis is also a problem for residents of endemic areas. Myiasis is not rare, but yet is a neglected, underreported tropical disease. The disease is preventable and therefore deserves greater medical attention and awareness. To achieve this, species taxonomic identification is important for the management of the disease. Health care practitioners in the endemic area should be encouraged to perform parasitic collection and identification of the larvae, if available and recovered from the lesion. For molecular identification the larva can be stored in 70% isopropyl alcohol while for morphological examination, the larvae can be fixed with 10% formaldehyde solution. The advice of an entomologist or a parasitologist would also be helpful to classify at family, genus, and sometimes species-level.

## Figures



**Figure 1:** An inflammatory atheroma-like lesion on the left upper buttock of the father. This photograph was taken just before (A) after the removal of larva (B) and lesion on the right upper forehead (C); and on the right upper right arm pit (D) of the son 2016.



**Figure 2:** Three *larvae* removed from tumors at three different sites on the patient's body, 2016.



**Figure 3:** Scar remaining in the father one and half month after the removal of Myiasis larva Nov, 2016

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