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Cordylobia anthropophaga Myiasis in a Patient Returning from São Tomé and Príncipe

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Abstract:

Myiasis is a frequent dermatological condition among travelers returning from tropical and subtropical regions, with *Cordylobia anthropophaga* being endemic mainly in Sub-Saharan Africa. We report a case of furuncular myiasis in a 39-year-old man following travel to São Tomé and Príncipe. The patient presented with painful furuncular lesions on the trunk that evolved from erythematous patches. Surgical removal revealed live larvae, which were morphologically identified as transitional second/third instar *C. anthropophaga*. This case provides detailed images of *C. anthropophaga* instar morphology helpful in their identification. Additionally, the case highlights the importance of considering furuncular myiasis in travelers even outside the rainy season.

Keywords:

Cordylobia anthropophaga, São Tomé and Príncipe, myiasis, furuncular myiasis, travel medicine.

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Introduction

Myiasis is one of the most common skin diseases found in travelers returning from tropical and subtropical regions. There are several species of flies causing myiasis that differ in the resulting clinical picture and geographic ranges. The endemic areas for *C. anthropophaga* are tropical parts of Sub-Saharan Africa between Cape Verde and Ethiopia, with the majority of reported infestations coming from West Africa. Isolated endemic areas were also reported in southwestern Saudi Arabia [1] and in the Republic of South Africa and Namibia [2]. There are single reports of infestations with *Cordylobia* (Grünberg) acquired in Spain [3] and in Portugal [4].

Adult *C. anthropophaga* (also known as the Tumbu fly) are most active in the morning and evening, with day activity limited to shaded areas. The female normally lays eggs on moist ground, which is why laundry hung to dry is an attractive place for oviposition [2]. The eggs hatch after 1 to 3 days, and

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the first instars live up to 2 weeks, actively seeking a passing host thanks to temperature and vibration sensitivity. Rodents are the usual host for *Cordylobia*, and larvae undergo further moltings in their skin over 8 days. Around 6% of peridomestic rats were found to be carriers in Cape Verde [5]. Domestic animals, especially guinea pigs and dogs, can acquire *C. anthropophaga* from rats, serving as an epidemiologically important parasite reservoir. In endemic regions, up to 25% of guinea pigs [6] and 85% of dogs may be *Cordylobia* carriers [7, 8]. Cases in pets have also been reported in animals accompanying tourists traveling to endemic countries, as well as in imported animals [9-12].

Case Report

A 39-year-old patient with a recent history of travel to São Tomé and Príncipe presented to the outpatient clinic with a week-long history of erythematous and furuncular lesions up to 2x5 cm on his trunk **(Figure 1A)**. The lesions initially started as asymptomatic erythematous patches, which became slightly pruritic and then evolved into painful furuncles. On dermoscopy, a central whitish 3 mm papule with off-center crusting became evident. In larger lesions, a homogenous erythematous ring surrounding apparently normal skin and a grey-purplish center was present **(Figure 1B)**.

Based on the recent history of travel, a clinical diagnosis of myiasis was formed. The lesions were delicately incised, and living larvae up to 8 mm long were removed with precision tweezers. The larva showed the general pattern for Calyptratae flies, with the body being divided into a pseudocephalon, three thoracic segments (the first one with anterior spiracles), seven abdominal segments, and an anal division carrying the posterior spiracles **(Figure 2A)**.

The larva was macerated by immersion in 10% potassium hydroxide for 24 hours. Subsequently, the larval parts were dehydrated by placing them in 99.5% EtOH and transferred to a drop of Euparal on a microscope slide and covered with a coverslip. Light microscope illustrations were produced from photographs made using a digital Nikon 8400 camera mounted on a Nikon Eclipse E200 microscope. Based on the morphology of the cephaloskeleton, spinulation, and the anterior and posterior spiracles (shape of spiracular slits) **(Figure 2B–F)**, the larva was identified using the key provided by Zumpt [13] as the transitional second/third instar of *Cordylobia anthropophaga* (Blanchard & Bérenger-Féraud).

The patient was treated with topical fusidic acid twice daily for seven days and a single oral dose of ivermectin. The lesions healed uneventfully.

Discussion

Cordylobia invades uncompromised skin, unlike traumatic myiasis agents like *Cochliomyia hominivorax* (Coquerel) and *Chrysomya bezziana* (Villeneuve), which prefer mucous membranes and only wounded skin. *Dermatobia hominis* (Linnaeus Jr. in Pallas) is also capable of invading intact human skin, but it is endemic to tropical regions of the New World; therefore, travel anamnesis is sufficient for differential diagnosis.

Because oviposition on drying laundry is often implicated, infestation of the trunk, including genital skin [14-16], is the most common presentation; however, scalp and facial lesions, including the eyelids, have also been reported [17, 18]. Although larvae stay in the skin of rodents for only up to 8 days, in humans they usually persist for 2 weeks [19], with cases of 4 weeks' presence reported **[2]**.

Diagnosis of furuncular myiasis can be made solely based on clinical findings and a history of travel to the endemic region. In doubtful cases, high-frequency ultrasonography or continuous optical coherence tomography may also be useful [20]. The topical use of Vaseline, which blocks the larvae's posterior spiracles and forces them to move closer to the skin surface to avoid suffocation, is a sufficiently effective intervention, though superficial surgical incision is much quicker. Squeezing out the larvae is not recommended since a possible larva rupture may lead to inflammation with a granulomatous reaction. Systemic ivermectin is effective in killing *Cordylobia* larvae but should be used only as an adjunct to the removal of identified larvae. Living larvae secrete antimicrobial substances shielding the furuncle from superimposed infection [18]; however, once the larva is eliminated, superinfections are common, and a topical antibiotic should be considered.

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Cordylobia infestation leads to an immune response, though infestation resistance is transient (up to several months) [2]. Prophylaxis with selamectin every 30 days is effective in reducing the level of infestation in pet animals and the risk of transmission to humans [21].

Conclusions

Infestations with *C. anthropophaga* are believed to occur most commonly during the rainy season in endemic countries; however, in the presented case, the patient became infested during the peak of the dry season, highlighting the need for proper prophylaxis year-round.

Declarations

Authors' Contributions: Clinical examination: MJ. Specimen preparation and identification: KS. Figures: KS. Writing – draft: MJ. Writing – review and editing: MJ, KS.

Competing Interests: The authors declare that they have no competing interests.

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Consent for Publication: Permission to publish was obtained from the presented individual.

Ethics Approval and Consent to Participate: The need for ethics approval for this manuscript was waived by the institutional review board.

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Figure Legends

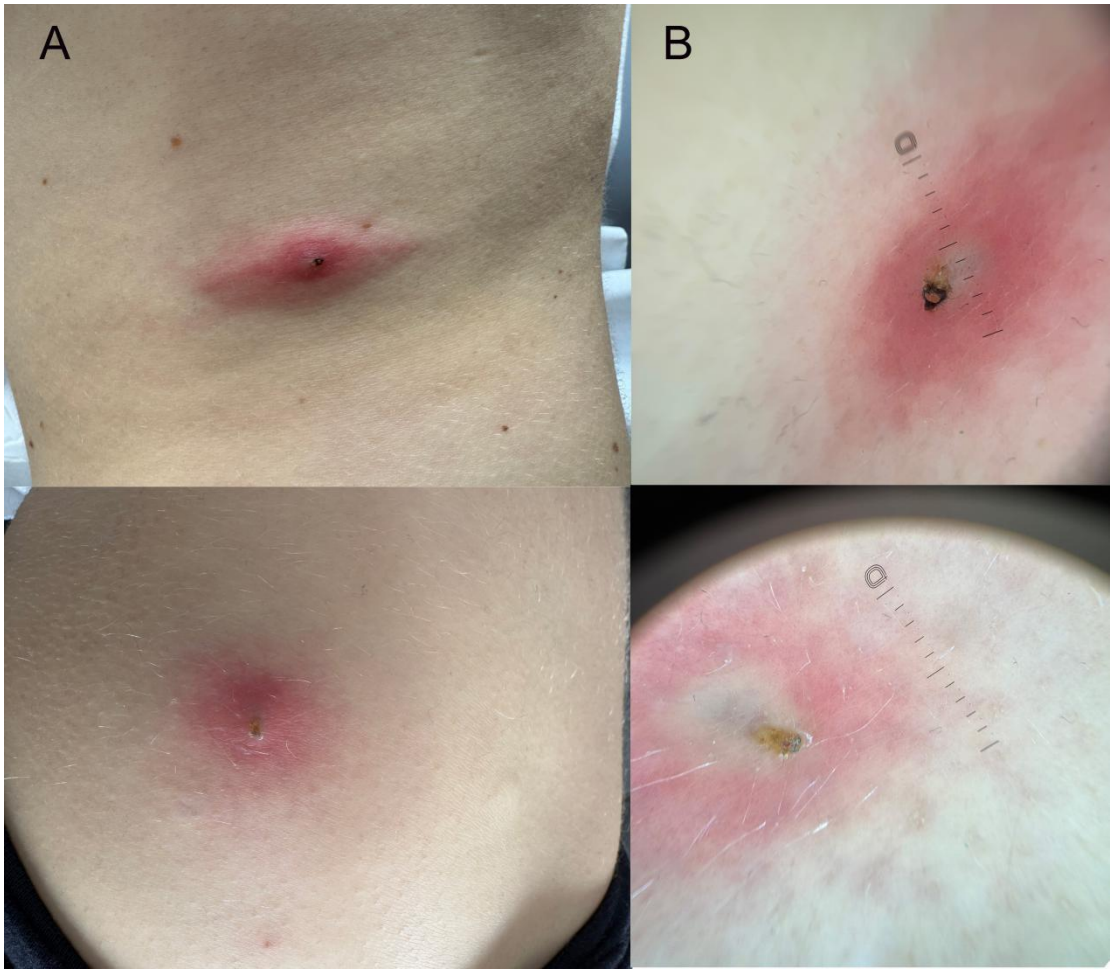

Figure 1. Skin lesions due to Cordylobia anthropophaga: (A) clinical picture, (B) dermoscopic image.

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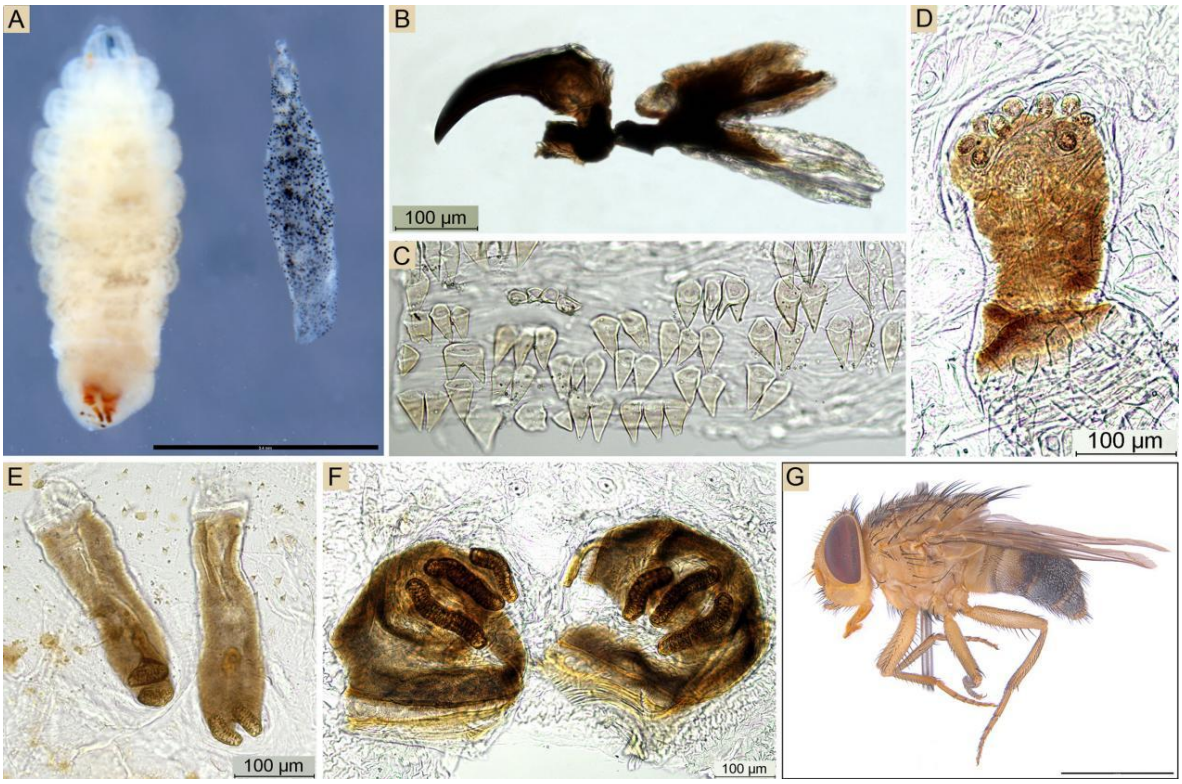

Figure 2. *Cordylobia anthropophaga*, preserved material: (A) left - extracted larva, transitional stage between second/third instar, dorsal view; right - integument of first instar. (B) cephaloskeleton, third instar larva, lateral view. (C) spines, third thoracic segment, third instar larva. (D) anterior spiracle, third instar larva. (E) posterior spiracles, second instar larva. (F) posterior spiracles, third instar larva. (G) habitus of adult fly (specimen from collection of Department of Ecology and Biogeography, NCU).