



Short Report

Human intestinal myiasis caused by *Clogmia albipunctata* larvae (Diptera: Psychodidae): First report in Egypt

Nadia Ali El-Dib^a, Mona Ibrahim Ali^b, Doaa Ahmed Hamdy^{b,*}, Wegdan Mohamed Abd El Wahab^b

^a Department of Medical Parasitology, Faculty of Medicine, Cairo University, El Manial, Cairo, Egypt

^b Department of Medical Parasitology, College of Medicine, Beni-Suef University, Egypt



ARTICLE INFO

Article history:

Received 3 February 2019

Received in revised form 3 July 2019

Accepted 28 July 2019

Keywords:

Clogmia albipunctata

Intestinal myiasis

Scanning electron microscope

Egypt

ABSTRACT

This is the first case report in Egypt and Middle East region of human intestinal myiasis caused by *Clogmia albipunctata* larvae. A 36-year-old male patient presented to the Outpatient Clinic of Internal Medicine in Beni-Suef University Hospital complaining of abdominal pain, bloating, and diarrhea intermittent with constipation. Patient's stool sample was referred to the Department of Medical Parasitology for examination of passed larvae and treatment prescription. Examination of larvae by light and scanning electron microscopy confirmed the morphological identification of fourth instar larvae of *C. albipunctata*. Human intestinal myiasis is an unusual cause of gastrointestinal manifestations.

Published by Elsevier Limited on behalf of King Saud Bin Abdulaziz University for Health Sciences.

This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

Myiasis is an invasion of dipterous fly larvae of animal or human tissues. It usually occurs in rural areas with bad hygiene [1]. *Clogmia albipunctata* (*C. albipunctata*), is a fly of the family Psychodidae, found in houses but its larva lives in wetted unclean areas as bathrooms, toilets and sewage. It causes different forms of myiasis as nasopharyngeal, intestinal, and urinary myiasis [2–4]. Other fly larvae can cause intestinal myiasis such as *Musca domestica* and *Sarcophaga* sp. [1]. In Egypt, This is the first reported case of human intestinal myiasis caused by larvae of *C. albipunctata*.

Case history

A 36-year-old married male, living in Belefia, one of the northern agricultural villages of Beni-Suef Center, Beni-Suef Governorate, Egypt was referred from Outpatient Clinic of Internal Medicine of Beni-Suef University Hospital. The patient is highly educated, employee, with a medium socioeconomic standard. His condition started one year ago by abdominal pain, bloating sensation, diarrhea intermittent with constipation, perianal itching, irritability

and insomnia. The patient noticed passing out of small, motile, dark colored worm-like structures in stool, which caused horrible worry to him. The case was misdiagnosed as enterobiasis and treated with nanoxoxide which caused expulsion of some of these worms in the stool. Transient relief of symptoms occurred but the condition recurred after some weeks. The patient finally did endoscopy with no abnormal finding. The patient has two types of bathrooms in his house (pit latrine and toilet seat). He uses only the pit latrine justified by personal relief. His wife and children use toilet seat and have no manifestations. The patient used to eat at his work form a store infested by flies and to drink from stored water in open containers.

Informed consent was taken from the patient, after explaining the whole situation to him.

The patient was asked to deliver stool samples and collect some larvae from toilet floor. At the Medical Parasitology Department, larvae were washed several times in saline and mounted [4]. Some larvae were preserved on 5% formalin and mounted, while the remaining larvae were preserved on 4% glutaraldehyde, pH 6.5 at 4 °C until processed for examination and photographing at scanning electronic microscope (SEM) Unit in National Research Center. Rest of stool sample was examined microscopically using direct and concentrated smear and no helminth eggs/larvae or protozoan cysts/trophozoites were detected.

The patient was prescribed to take single oral dose of ivermectin (200 µg/kg) and nanoxoxide 500 mg twice daily for 3 consecutive

* Corresponding author.

E-mail addresses: naeldib@hotmail.com (N.A. El-Dib), monaib.para@yahoo.com (M.I. Ali), doahamdypara@gmail.com (D.A. Hamdy), wegdanmabdelwahab@gmail.com (W.M. Abd El Wahab).

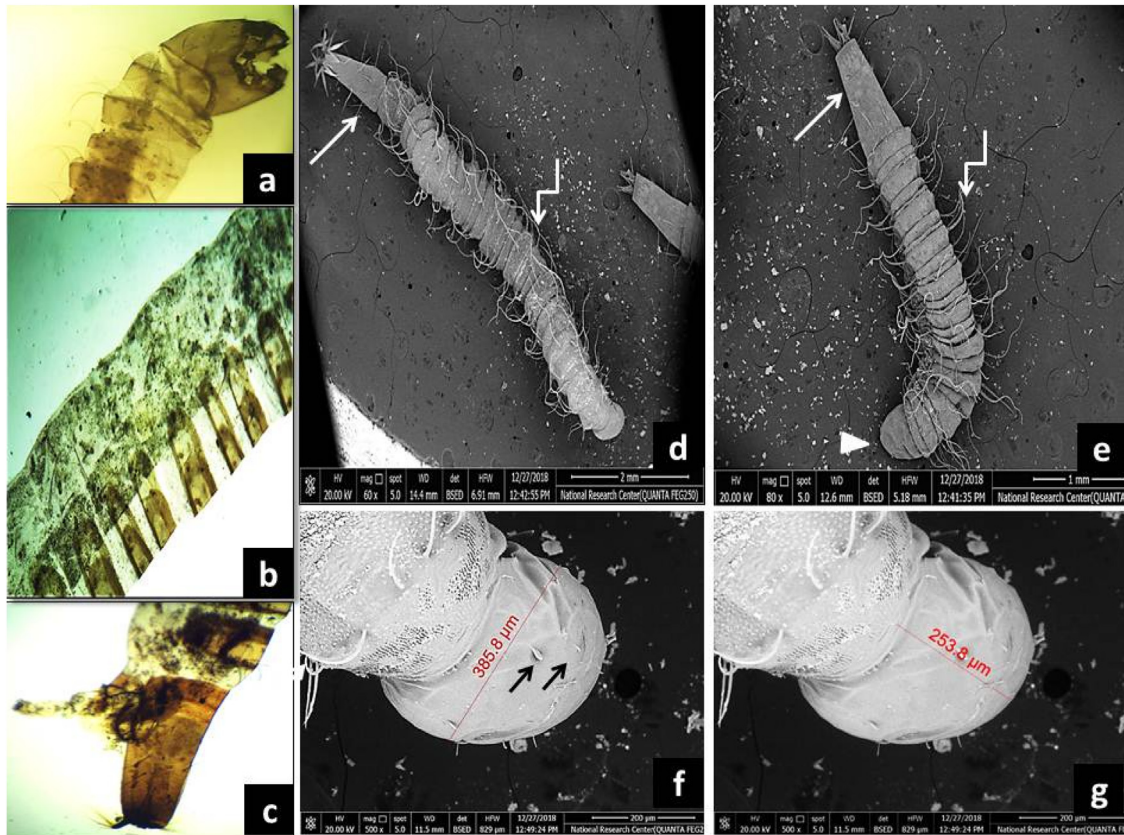


Fig. 1. (a) LM of *C. albipunctata* head (40 \times), (b) abdominal segments (100 \times), (c) the siphon (40 \times), (d and e) SEM top view of whole larvae showing the anterior (arrow head), posterior ends (arrow) and setae (curved arrow) and (f and g) larva head with setae (arrows).

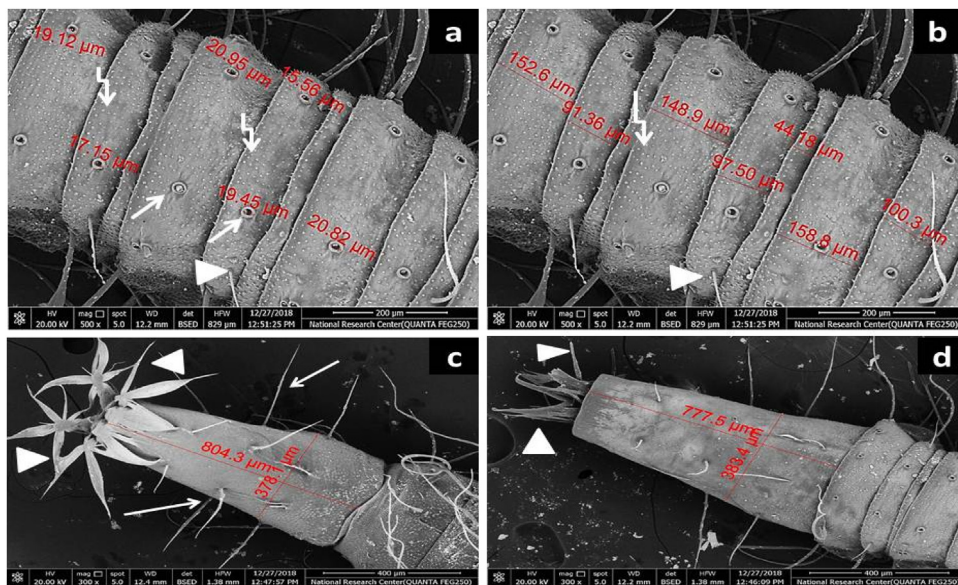


Fig. 2. (a and b) SEM of chitinous rings (arrows) and filiform setae (arrow head). The segmental spines (angled arrows). (c and d) Dorsal surface of siphon with setae (arrows), flower-shaped expanded fins (c) and contracted fins (d) (arrow head). Diameters were measured in red.

days, followed by saline purgative on the 4th day. Also, he was advised to quit unhygienic habits, and to spray the bathroom or the fieldwork with insecticides. The patient was followed for three months and his complaints were improved with complete disappearance of the larvae after treatment.

Discussion

By light microscopic examination, the larvae appeared hairy, segmented, measuring about 1–1.2 cm long and dark brown in color. The ventral aspect showed a lighter color than the whole

body. The body of the larva was composed of the head and 13 segments (3 thoracic and 10 abdominal). Lateral and dorsal aspects of the body segments were covered with 26 saddles shaped dark chitinous plates, two for each segment. The head was protruded, triangular in shape, had two hairy antennae, and two ventral mandibles. The siphon appeared longer than broad, conical in shape with apical posterior spiracles and ventral spinose anal papillae (Fig. 1a–c).

SEM used for more detailed larval description and confirmation of the diagnosis. The larvae showed elongated bodies, tapered at its anterior and posterior ends and had multiple long setae on the dorsal surface (Fig. 1d and e). Top view of heads of two larvae appeared $378.2\text{--}385.8 \times 253.8\text{--}332.4 \mu\text{m}$ in diameter, with scattered small sized setae (Fig. 1f and g). Each larval segment was divided into two secondary annuli (subdivisions) by their chitinous plates. Some of these subdivisions appeared so prominent and others were hidden under their plates. Multiple sessile papillae and rounded chitinous rings with raised outer rim appeared at the lateral sides of all segments with long filiform setae arising from it. The diameter of these chitinous openings ranged from 15.5 to $21.8 \mu\text{m}$. It acts as respiratory spiracles (Fig. 2a and b). The dorsal surface of all segments revealed sensory spinose pattern which is condensed and increased in size gradually toward the posterior end of the segments (Fig. 2a and b).

The dorsal surface of the respiratory siphon appeared smooth, longer than broader, with few radial setae, and anal fins for movement (Fig. 2c and d). From previous morphological characters, it was presumed that these larvae were fourth instar larvae of *C. albipunctata*.

After careful history taking from the patient, it was speculated that he got infected by ingestion of eggs laid by the female flies contaminating his meals and drinks during work.

C. albipunctata is a cosmopolitan Nematocera present in rural and urban communities [5,6]. The larvae get their way into the urinary tract, gastrointestinal tract, and nasopharyngeal passage which act as good breeding media for development of infection causing myiasis [7].

The first case of human intestinal myiasis due to *C. albipunctata* larvae infestation was documented in Japan [8]. Other cases had reported caused by the same larvae in Malaysia and Taiwan [3,6,9].

To the best of our knowledge it is the first time to detect *C. albipunctata* larvae in human stool in Egypt and Middle East region. Nevertheless, human urogenital and gastrointestinal myiasis by larvae of the same genus has been documented before [10].

There is no specific treatment for intestinal myiasis until now; however, mebendazole, levamisole, albendazole and purgatives were prescribed to treat some cases [6,11]. Ivermectin has anti-helminthic activity, and it is an important insecticide used for treatment of myiasis, scabies, pediculosis and demodicidosis. In this case, we prescribed ivermectin and nanozoxide followed by saline purgative. This was accompanied by larval passage for 2 days followed by disappearance of symptoms and larvae for 3 months.

Conclusion

Although myiasis is not considered as a true parasitic infection, it may lead to significant morbidity. Clinicians should diagnose the

condition appropriately to initiate proper suitable management for the patient. Personal hygiene, healthy sanitation and environmental insecticides application may prevent or reduce fly infestation magnitude.

Funding source

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Competing interests

None declared.

Ethical approval

Not required.

Acknowledgement

We are so grateful to Dr Yusuf Abd El-Aziz Edmardash, Department of Entomology, Faculty of Science, Cairo University for his kind help in the identification of the species of the larvae.

References

- [1] Zumpt F. Myiasis in man and animals in the old world. London, UK: Butterworths; 1965. p. 267.
- [2] Mohammed N, Smith KG. Nasopharyngeal myiasis in man caused by larvae of *Clogmia* (= *Telmatoscopus*) *albipunctatus* Williston (Psychodidae, Dipt.). Trans R Soc Trop Med Hyg 1976;70(1):91. [http://dx.doi.org/10.1016/0035-9203\(76\)90022-5](http://dx.doi.org/10.1016/0035-9203(76)90022-5).
- [3] Tu W, Chen H, Chen K, Tang L, Lai S. Intestinal myiasis caused by larvae of *Telmatoscopus albipunctata* in a Taiwanese man. J Clin Gastroenterol 2007;41:400. <http://dx.doi.org/10.1097/01.mcg.0000212615.66713.ba>.
- [4] El-Dib NA, Abd El Wahab WM, Hamdy DA, Ali MI. Case report of human urinary myiasis caused by *Clogmia albipunctata* (Diptera: Psychodidae) with morphological description of larva and pupa. J Arthropod-Borne Dis 2017;11(4):533–8. PMID: PMC5775159.
- [5] Fernandes LF, Pimenta FC, Fernandes FF. First report of human myiasis in Goias state, Brazil: frequency of different types of myiasis, their various etiological agents, and associated factors. J Parasitol 2009;95:32–8. <http://dx.doi.org/10.1645/GE-1103.1>.
- [6] Mokhtar AS, Braima KAO, Chin HP, Jeffery J, Zain SNM, Rohela M, et al. Intestinal myiasis in a Malaysian patient caused by larvae of *Clogmia albipunctatus* (Diptera: Psychodidae). J Med Entomol 2016;1–4. <http://dx.doi.org/10.1093/jme/tjw014>.
- [7] Zhang B, Wang L, Liu J, Xu L, Song L, Wu X, et al. Case report: a rare case of urinary myiasis induced by the fourth instar larvae of *Telmatoscopus albipunctatus*. PLoS Negl Trop Dis 2017;11(12):e0006016. <http://dx.doi.org/10.1371/journal.pntd.0006016>.
- [8] Tokunaga M. Moth-flies that cause myiasis in man in Japan. Jpn J Sanit Zool 1953;4:101–7. <http://dx.doi.org/10.7601/mez.4.101.1>.
- [9] Smith KG, Thomas V. Intestinal myiasis in man caused by larvae of *Clogmia* (*Telmatoscopus*) *albipunctatus* Williston (Psychodidae, Diptera). Trans R Soc Trop Med Hyg 1979;73:349–50. PMID: 473335.
- [10] Lotfy WM. Gastrointestinal and urogenital myiasis caused by psychodid fly (Diptera: Nematocera) in Egypt: case report. PUJ 2011;4(1):115–6.
- [11] Francesconi F, Lupi O. Myiasis. Clin Microbiol Rev 2012;25:79–105. <http://dx.doi.org/10.1128/CMR.00010-11>.