

Isolation and Identification of some blood parasites from midgut of stable fly (*Stomoxys calcitrans*)

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Abstract

Trypanosoma sp., *Microfilaria*, *Babesia* sp. and *Theileria* sp. are detected from the gut of the stable fly, *Stomoxys calcitrans*, which demonstrating an environmental reservoir for these parasites and raising the possibility that environmental contamination by insects may be important in the spread of these organisms. This study refers to isolate (*Microfilaria*, *Babesia* sp. and *Theileria* sp.) from Stable fly for first time in Iraq. The results were discussed with ratios of prevalence of these parasites in Baghdad.

Introduction

Stomoxys calcitrans is commonly called the stable fly, barn fly, biting house fly, dog fly, or power mower fly. (1) Rather unusual for a member of the family *Muscidae* is that it sucks blood from mammals. (2). Stable fly is about the size of a common house fly, has a spear – like nose that projects forward from the head, blood- feeders. The ability of some insects to transmit pathogens that cause disease was first confirmed in 1878 when the filarial worm, *Wucheria bancroftii*, the causative organism of filariasis, was found to develop inside the mosquito, *Culex quinquefasciatus*. (3). Presently, many insects are of great medical and veterinary

importance owing to their ability during the feeding process to vector (transmit) pathogens that cause infectious diseases in both human beings and livestock. Their irritating bites and the pathogens they transmit cause devastating loss of human and animal life and a significant cost to the economy of many countries. Presently, 14 000 species of biting insects are known to feed on the blood of vertebrates, and 300–400 of these feed on human beings. (4,5). This study was detected and identified the human and animal parasites that transmitted by biting of *Stomoxys calcitrans* for first time in Iraq.

Materials and Methods

A total of 183 adults of *Stomoxys calcitrans* were collected from different stables of animals in Baghdad during March to October 2010 to identify the

blood parasites; all the insects are sliced and gut deposited, stained with Giemza stain and examined under 100X.

Results

Four species of blood parasites were recorded:

Trypanosoma sp.: Highly flattened, pointed at flagellate end, nucleus near a flagellate end. There is a blepharoplast

from which the flagellum arises and runs toward opposite end, marking the outer boundary of the undulating membrane. (Fig.1).

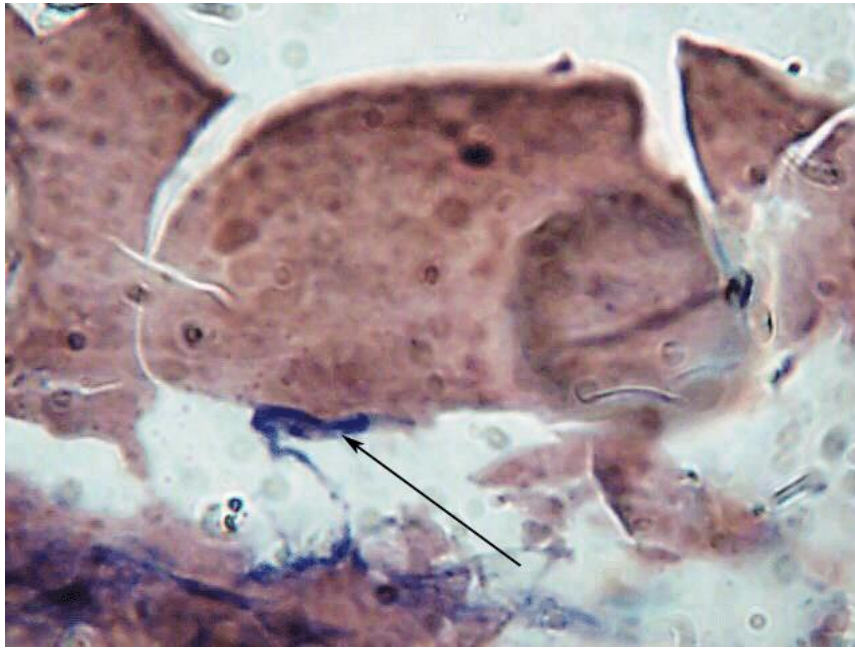


Fig.1: *Trypanosoma* sp. in stable fly. 100X.

Microfilaria: Filament larvae, slender, undulation motile, with long pointed tail, measuring 218 - 300 μ in length, 5.6 - 6.9

μ in width, milky or colorless (don't stained with Giemsa stain), surrounded by aggregation of RBCs and WBCs. (Fig.2)



Fig.2: Microfilaria in stable fly. 100X.

Theileria sp.: Multiple *Theileria* are seen within hemolytic erythrocytes. Fig.3,4).

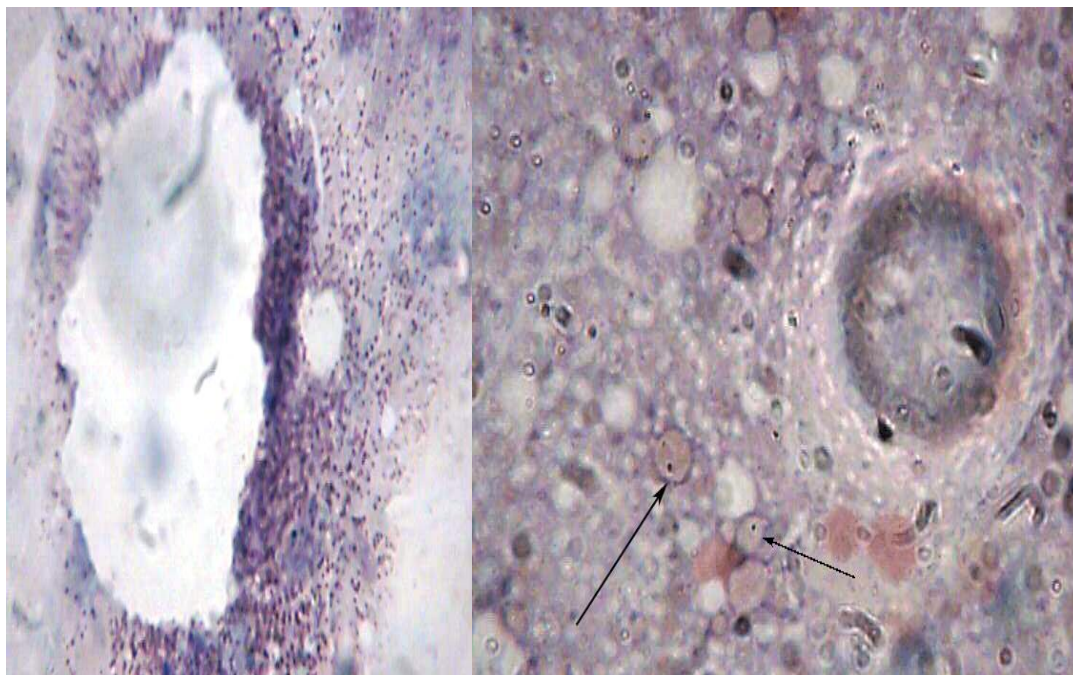


Fig.3: Multiple *Theileria sp.* are seen within hemolytic erythrocytes in stable

fly.100X Fig.4: Ring form of *Theileria sp.* in stable fly.100X

Babesia sp.: Three forms of *Babesia* were reported in this study :

Annular , Irregular and Pear – shaped form in(Fig.5,6,7).

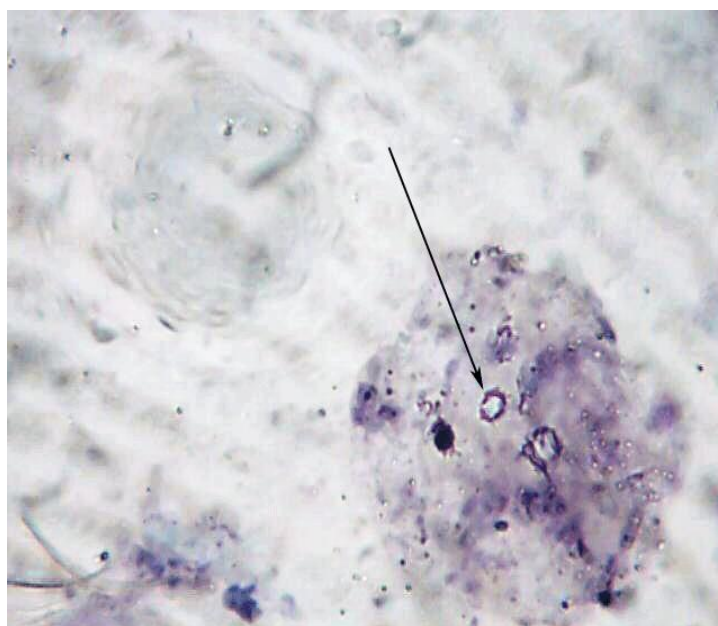


Fig.5:Annular form of *Babesia sp.* in stable fly.100X



Fig.6:Irregular form of *Babesia sp.* in stable fly.100X



Fig.7:Pear – shaped of *Babesia sp.* in stable fly.100X

Discussion

Vector-borne disease (disease spread by vector insects) transmission in the human population and in farmed animals mainly involves members of the arthropod class Insecta.(1).A trypanosomatid flagellate was isolated from the muscioid fly *Muscina stabulans* .(6) Cloned cultures of this organism contained promastigotes, opisthomastigotes, and forms containing a long flagellum doubled or coiled within the cell but not protruding outside.(6) This study, was revealed to isolation of *Trypanosoma sp.* that similar to previous study in Baghdad ,which confirmed that *Stomoxys calcitrans* can transmitted the infection of *Trypanosoma evansi* from

laboratory infected mice.(7).All filarioids and helminthic nematodes, consists of 5 developmental or larval stages in a vertebrate host and an arthropod (mosquito)(8) . Adult female worms produce thousands of first-stage larvae or microfilariae that ingested by blood sucking insect. (8)The arthropod vectors, mosquitoes and flies, have a circadian rhythm in which they obtain blood meals. The highest concentration of microfilariae usually occurs when the local vector is most actively feeding. The current identified *Microfilaria* in the gut of the stable fly, *Stomoxys calcitrans*, as an environmental reservoir for the first time in

Iraq. Stable flies have a worldwide distribution; they are blood feeders that primarily feed on cattle, horses, dogs, pigs, and humans, but they will also take a blood meal from reptiles and birds. Dogs may be infected with ten species of Genus *Dirofilaria*(9), *Dirofilaria* was recorded in horses (10), in wolves, foxes and cats(11); whereas in Baghdad and Karbala infected rate with *Dirofilaria immitis* 19.5% in dogs (12). In a previous study Charles (1966), filarioid larvae found in 455 of 3,707 female flies and six of 2,234 male flies collected from cattle having stephanofilariasis were morphologically identical to the immature forms of *Stephanofilaria stilesi* recovered from stephanofilarial lesions. When laboratory-reared horn flies were allowed to feed on stephanofilarial lesions of naturally infected cattle (13); we need similar research to identify the species of *Microfilaria*. Iraq is considered an endemic area of cattle Theileriosis & Babesiosis that transmitted by hard ticks(14), who record that infected females and males of *Hyalomma a. anatolicum* with *Theileria*

annulata were 65.1% , 34.9% respectively. Any research don't be found about transmission of Theileriosis & Babesiosis by Stable fly ;the presence of these parasites in gut of Stable fly may be coincidence when feeding blood from infected animals. The fate of these parasites in insects gut was unknown, it may be declined or complete their cycles ; these results were discussed with other Professors. In the world, they advised to complete this work with other biological researches to assure that *Stomoxys calcitrans* transmitted *Microfilaria* , *Babesia* and *Theileria* biologically. Present results indicated that *Trypanosoma* sp., *Microfilaria*, *Babesia* sp. and *Theileria* sp. detected from the gut of the Stable fly, *Stomoxys calcitrans*, demonstrating an environmental reservoir for these parasites and raising the possibility that environmental contamination by insects may be important in the spread of this opportunistic organism. This study refers to isolate (*Microfilaria*, *Babesia* sp. and *Theileria* sp.) from Stable fly for first time in Iraq.

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عزل وتشخيص بعض طفيليات الدم من القناة الهضمية لذبابة الإسطبل (*Stomoxys calcitrans*).

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الخلاصة

تم تثبيت الطفيليات الآتية: *Trypanosoma* sp., *Microfilaria*, *Babesia* sp. and *Theileria* sp.: من القناة الهضمية لذبابة الإسطبل والتي تعد مخازنا بيئية تساعد على التلوث البيئي و نشر الإصابة بهذه الطفيليات. أشارت الدراسة إلى عزل الطفيليات الآتية: *Microfilaria*, *Babesia* sp. and *Theileria* sp.: من القناة الهضمية لذبابة الإسطبل لأول مرة في العراق. نوقشت النتائج مع نسب انتشار هذه الطفيليات في بغداد.