



## Investigation of Microfilaria in Buffalo Blood and Fly Types in Their Barns

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**F**OR the identification of microfilariae in buffaloes, seventy one blood samples were collected from a total of 10 local flocks located at different parts of Nineveh governorate /Iraq. Blood samples were tested with Modified Knott's technique. Results showed (100%) infectivity for all examined samples and belongs to genus *Setaria*. Detected microfilaria was sheathed with rounded front end and pointed posterior one with the lengths ranging from 200-625  $\mu\text{m}$ . The number/intensity of Microfilaria infection of all examined Nineveh districts were as follows, Al-Quba (93/28.7%) with a mean length of 375  $\mu$ , Al-Shalalate (60/18.5%) with a mean length of 417  $\mu$ , Al-Rahmania (57/17.6 %) with a mean length of 383  $\mu$ , Badush flocks (A, B and C) and were (24 /7.4%), (8 /2.5%), and (46 /14.2 %) with mean lengths of 435, 375 and 427  $\mu$  respectively, Bab Shams (14/ 4.3%) with a mean length of 443  $\mu$ , Al-Slamia (10 /3.1%) with a mean length of 370  $\mu$ , and with the same number and intensity both Hawy Al-Kanisa and Mafraq Telkief (6 /1.9%) with a mean length of 388 and 442  $\mu$  respectively. For identification the possible carriers of microfilaria, different flies in the same buffaloes barns were collected, and four species of flies were reared: *Musca domestica*, *Luciliasericata*, *Tabanus spp* and *Simulium spp*. The importance of Microfilariae and the role of black flies as a vector were discussed.

**Keywords:** *Setaria*, Microfilariae, Buffaloes, *Simulium spp*.

### Introduction

Buffaloes are important part of livestock in Mosul/Iraq, since they are regarded as a one of the important economic sources for milk, meat and leather products to their producers [1]. Buffaloes species are susceptible to many diseases caused by different infectious agents including parasites, of these, external parasites have great impact on farm animals. [2,3].

Most studies in the field of ectoparasites have not focused on filariasis in buffaloes. Previous published studies on this field in Mosul city are limited, except the most recent study done by [4] on detection of microfilaria from buffalo skin lesions. Microfilaria impacts negatively on general health and performance of affected

animals causing anemia, weakness, loss of appetite, reduce milk yield [5].

These parasites could be identified in different body parts such as the peritoneal cavity, arteries and subcutaneous tissue, causing skin filariasis characterized by scabies-like lesions. They could also transmit by circulating blood to the nervous system, causing neurological diseases and may reach the eye causing blindness [6].

Blackflies and biting midges are intermediate hosts of some of filarial worms through their feeding on blood or skin lesions, developing in these insects to infective stage. When these insect suck blood again from the final host they inoculate the third larval stage to complement its development into adult worms, either *Onchocerca spp.* or *Setaria spp.*, causing filariasis [7].

Saliva secreted by black flies cause poisoning in farm animals called Simulitoxicosis, resulting in death due to an anaphylactic shock [8].

Researchers have not treated blood samples for larval detection, so our aim of this study was undertaken to find out the incidence of larval microfilaria from blood samples of Buffalo in Nineveh governorate and the most prevalent flies resident in their barns.

### Materials and Methods

A field survey was carried out by regular visits to buffaloes barns in different localities of Nineveh governorate, including Al-Quba, Al-Shalalate, Al-Rahmania, Badush (3 Flocks), Bab Shams, Hawe Al-Kanisa, Al-Slamia and MafratTelkief.

Seventy one jugular vein blood samples (5 ml each), were taken randomly from the above mentioned flocks at different localities. Blood samples were collected in glass vials coated with ethylene diamine tetra acetic acid, at and at the same day they were transferred under refrigerated conditions to the parasitic research laboratory at the college of Veterinary Medicine / University of Mosul.

Microfilariae were detected by using Modified Knott's technique. One ml of blood sample was transferred to 15 ml centrifuge tube with 9 ml (2%) formalin and mixed gently. Centrifugation was carried out at 1500 rpm for five minutes. Supernatant fluid was discarded and 1-2 drops of methylene blue stain (1% concentration) was added to the sediment. After thoroughly mixing a drop of sediment was taken and placed on non-

greasy microscopic glass slide, then covered with a coverslip and examined using ocular micrometer and with X 10 magnification power under fields of 22x22mm, for the number and measurement of microfilariae [9].

Flies of *Muscadomestica*, *Luciliasericata*, *Tabanus*spp were collected using petri dishes containing insecticide. Black flies were collected by holding the fly in plastic bags on the animals ears. Closed petri dishes and plastic bags were taken to parasite diagnostic laboratory at the college of Veterinary Medicine. Anatomical dissecting microscope was used for identifying fly types and their wing vacuolization in order to identify their species [10,3].

### Results

Sheathed microfilaria of the genus *Setaria* appeared in all blood samples, with rounded front end and pointed posterior one (Fig.1).

The mean number / intensity of microfilariae detected in blood samples of all examined Nineveh districts were as follows, Al-Quba (93/28.7%) with a mean length of 375  $\mu$ , Al-Shalalate (60/18.5%) with a mean length of 417  $\mu$ , Al-Rahmania (57/17.6%) with a mean length of 383  $\mu$ , Badush flocks (A,B and C) and were (24/7.4%), (8/2.5%), and (46/14.2%) with mean lengths of 435, 375 and 427  $\mu$  respectively, Bab Shams (14/4.3%) with a mean length of 443  $\mu$ , Al-Slamia (10/3.1%) with a mean length of 370  $\mu$ , and with the same number and intensity both Hawy Al-Kanisa and MafratTelkief (6/1.9%) with a mean length of 388 and 442  $\mu$ , respectively (Table 1).

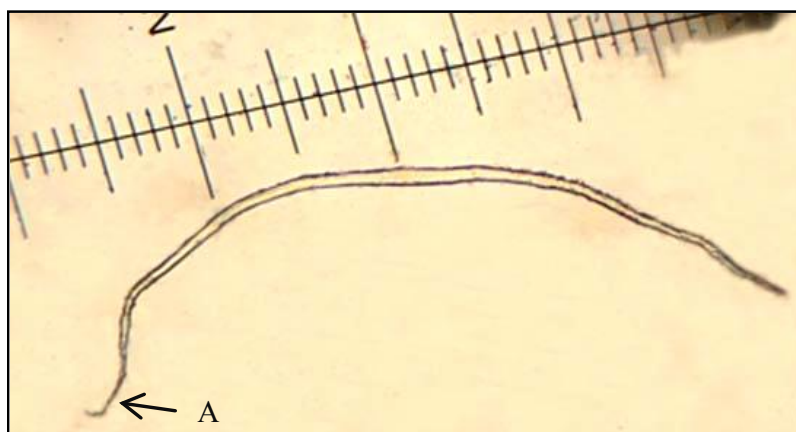


Fig. 1. Isolated Microfilaria stained by methylene blue (100 X)

(A): Sheath of Microfilaria

**TABLE 1. Number/intensity and length of Microfilariae in examined buffalo herds at different localities of Nineveh governorate.**

Localities	Number of animals in herds	Number of blood samples examined/Positives	Mean number/intensity (%) of Microfilariae in examined blood samples	Length of Microfilariae (microns)	
				Range	Mean
Al-Quba	100	19/19	93/28.7	200-625	375
Al-Shalalate	20	16/16	60/18.5	200-625	417
Al-Rahmania	30	12/12	57/17.6	200-625	383
Badush A	60	5/5	24 /7.4	200-625	435
Badush B	120	3/3	8 /2.5	325-625	375
Badush C	30	8/8	46 /14.2	200-625	427
Bab Shams	100	3/3	14/ 4.3	200-625	443
Hawy Al-Kanisa	50	2/2	6 /1.9	375-500	388
Al-Salamia	200	2/2	10 /3.1	300-625	370
MafraqTelkief	250	1/1	6 /1.9	300-500	442
Total	960	71/71	324/100	200-625	405.5

In this study, different types of flies parasitize on examined buffaloes were identified. Three types of these flies were detected in Badush, Al-Rahmania and Al-Shalalate sheds and were *Musca domestica* (houseflies) with length of 6.25 mm., *Simulium spp.* (black flies), with length of 3 mm., and *Lucilia sericata* flies with length of 8.75 mm., while *Tabanus spp.* (Horse flies) were detected only in Al-Rahmania buffalo sheds with a length of 22 mm. These flies were identified by means of their formal, standard and their wing venation parameters as shown in Fig. (2,3,4,5).

### Discussion

Microfilariae were identified here in all of the 71 (100%) buffaloes examined blood samples. This result encourages us to give more attention and a detailed study on this issue. The presence of the transmissible black flies (*Simulium spp.*) in the barns of buffaloes from which blood samples were collected confirm and support our findings of Microfilaria infection.

The length and the percentage of sheathed Microfilaria identified in this study which belongs to genus *Setaria* were higher than those reported in a previous study conducted on horses in the same city of Mosul (204-228) microns and (30.76%) respectively [11]. The importance of *Setaria* referred to its transmission

(*Setariaequina*) not only to other farm animals like donkeys by causing ulceration and persistent eye bleeding (12), but also to the eye infection of human being which was recorded in Iran and other countries of the Middle East [13].

In this study, four types of flies were identified: house flies, black flies, horse flies, and *leucilia sericata* flies. Mismanagement and lack of interest in the cleanliness and the accumulation of waste in animal pens considered the main reasons for increasing flies number, which in turn transfer the various pathogens of animals [14].

The presence of house flies in the animal pens could lead to their reduction in growth rate meat and milk production [15], and play a crucial role in the transferring of parasitic worms [10,16].

Locally and broadly, various studies support our results concerning house flies, since in Mosul city (AL-Shalalat), a study was conducted to estimate the percentage of different flies in stable of horses, they found that house flies were the highest and recorded to 97.33 % [17], while out borders, New York City, especially during summer months, the number of house flies were also being the highest followed by stable flies in breeding cattle fields through using large adhesive traps and were 900 and 142 thousand flies, respectively [18].



Fig. 2. *Musca domestica* (House fly).(A): House fly with anatomical microscope (25X) , ( B): Wing of House fly with anatomical microscope (75 X), (C): R5= cell is nearly closed.

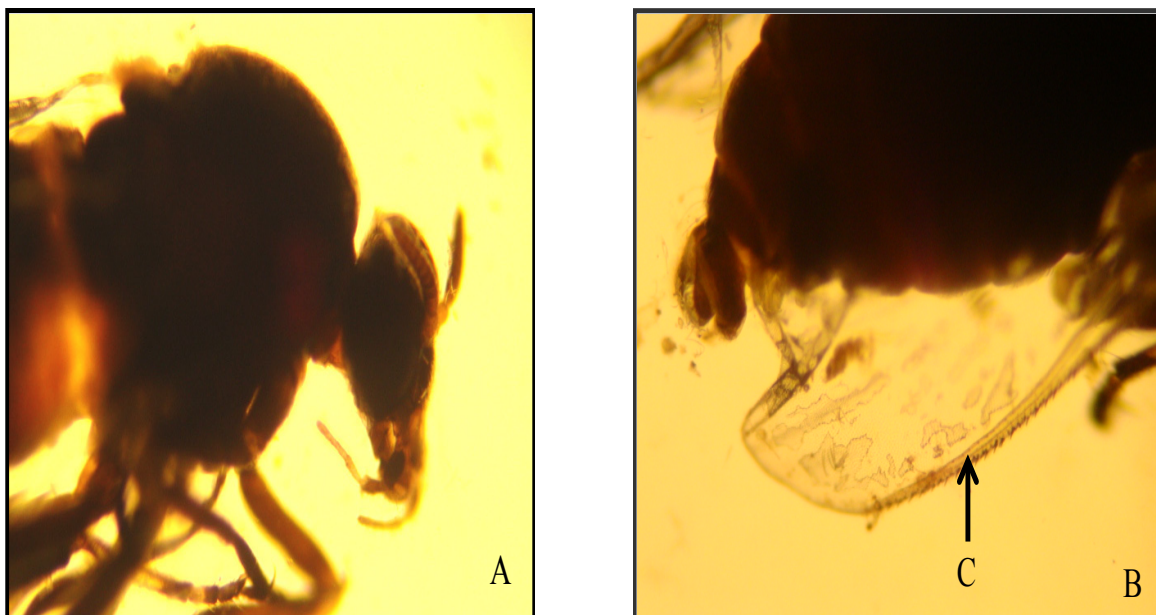


Fig. 3. *Simulium spp.* (Black fly).

(A): Black fly with an anatomical microscope (75X) , (B): Wing of black fly with an anatomical microscope (75 X), (C): Bristles on the thick anterior veins.



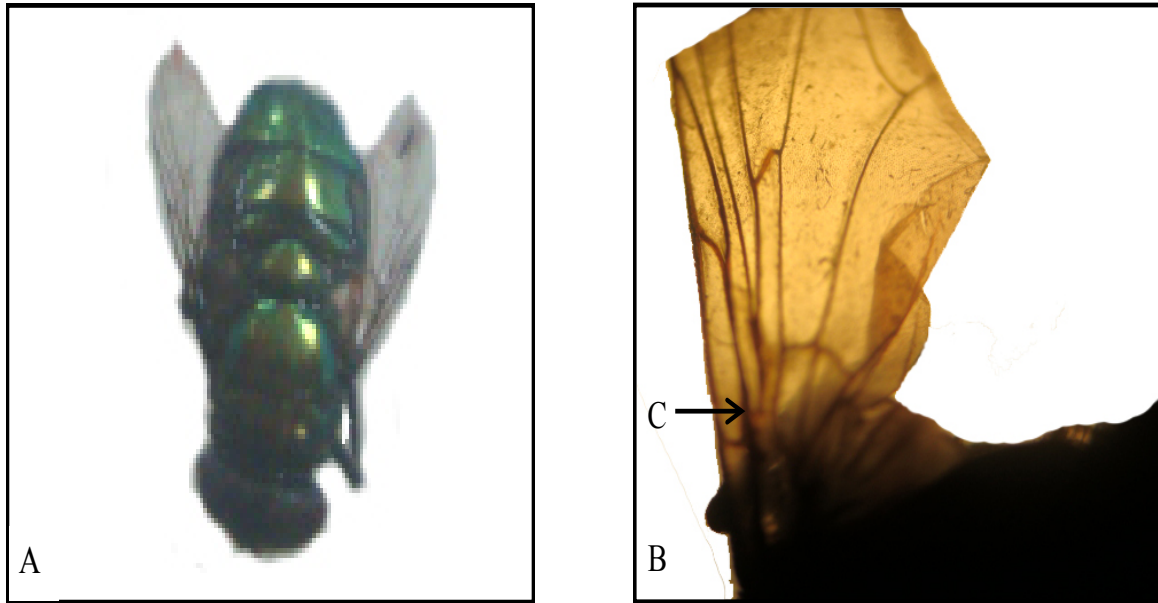


Fig. 4. *Lucilia sericata*, (A): Complete fly using an anatomical microscope (25 X) (B): Wing anatomic microscope fly (75X), ( C): A bare stem- vein .

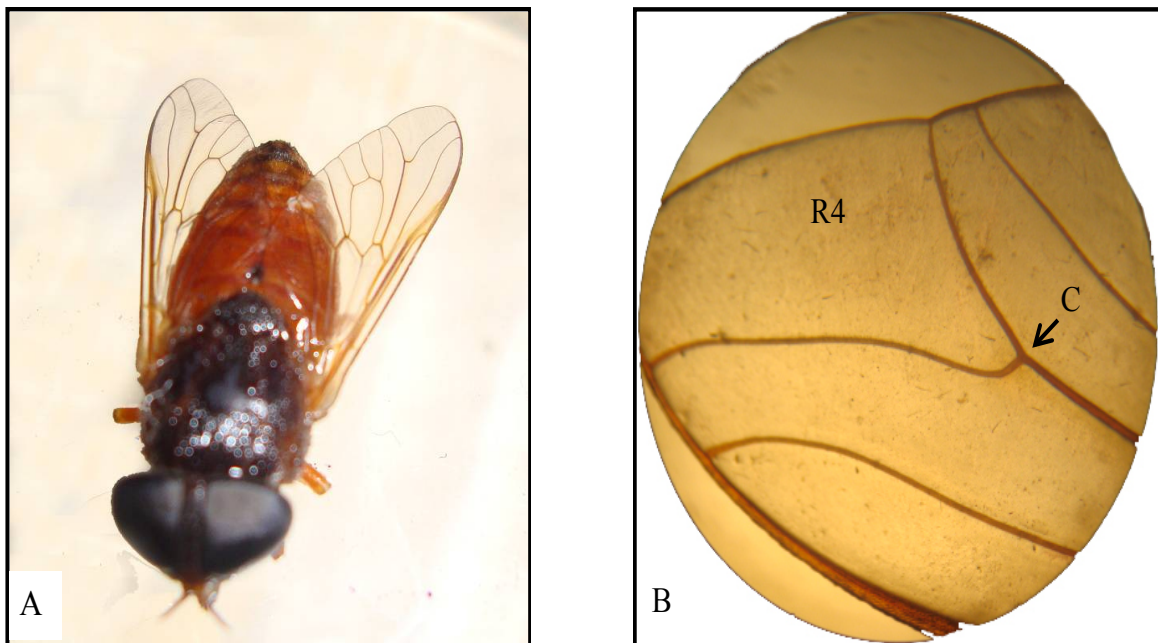


Fig. 5. *Tabanus* spp.( Fly Horse). (A):Complete fly with an anatomical microscope (25X), (B): Fly wing with optical microscope 75), (C): R4= The branching of the fourth longitudinal vein.

Our findings were also in line with the work of Al-Lahaibi and Al-Taee (4) who found a large percentage of black flies (13.2 %) around buffalo ears which is consistent also with [7], these flies since they play a role as an intermediate host for *Onchocercaspp* filarial worms causing skin microfilaria. In addition *Simulium spp* and *Culicoides spp*. are not less important in transmission of *Onchocercaspp*.

As for horse fly *Tabanus spp* as well as being a source of nuisance due to the painful bite of the animal resulting in hypersensitivity characterized by redness and swelling, it is also considered as a vector of many blood parasites like *Anaplasma marginale* [19,20].

The fourth fly identified in this study was *leucilia* flies, which could also cause strike in farm animals and ends in huge mortalities of infected untreated animals [21,22].

### Conclusion

It is concluded that all blood samples collected from buffalos herds which were examined for detection of microfilaria larvae in Nineveh Governorate / Iraq. All samples were positive. Detected microfilariae were sheathed with rounded front and pointed posterior ends belonging to the genus *Seteria*. *Simulium spp*. (black flies) were identified in buffalo barn playing a crucial role in Microfilariae transmission.

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### Conflict of interest

The author declared no conflict of interest.

### Funds statement

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### التحري عن اليرقات الخيطية الدقيقة في دم الجاموس و انواع الذباب في حظانها

احلام فتحي محمود الطائي و بيداء بونس محمود اللهيبي

فرع الاحياء المجهرية - كلية الطب البيطري - جامعة الموصل - الموصل - العراق.

اجري فحص 10 قطيع من الجاموس المحلي من بعض مناطق محافظة نينوى/ العراق للتحري عن اليرقات الخيطية الدقيقة. تم جمع 71 عينة دم وفحصت بتقنية Modified Knott's technique. اظهرت النتائج ان جميعها كانت موجبة (100%) وظهرت اليرقات مغمدة ذات نهاية امامية مدورة وخلفية مدببة وتعود الى جنس *Setaria* وبأطوال تتراوح بين 200-225 مايكرون. وان اعداد / وشدة الاصابة (%) لليرقات الخيطية الدقيقة في عينات الدم لجميع مناطق نينوى التي تم فحصها كانت على النحو التالي؛ القبة (28,7/93%) مع متوسط طول 375 مايكرون. الشلالات (18,5/60%) بمتوسط طول قدره 417 مايكرون، الرحمانية (17,6/57%) وبمتوسط طول 383 مايكرون، قطعان بادوش (A، B و C) وكانت (24/7,4%)، (8/2,5%)، (4,3%) و (46/14,2%) مع متوسط أطوال 435 و 375 و 427 مايكرون على التوالي، باب شمس (14/1,4%) و (4,3%) و متوسط طولها 443 مايكرون، السلامية (10/3,1%) و متوسط طولها 370 مايكرون، وبنفس العدد والكثافة كلا من حاوي الكنيسة ومفرق تلكيف (6/1,9%) مع متوسط طول 388 و 442 مايكرون على التوالي. وللتعرف على الناقل تم جمع عينات من الذباب المتوطن في الحظائر وكشف عن تواجد اربعة انواع وهي ذبابة المنزل (*Musca domestica*) وذبابة السروء (*Lucilia sericata*) وذبابة الخيل (*spp. Tabanus*) والذباب الاسود (*spp. Simulium*). ونوقشت اهمية اليرقات الخيطية ودور الذباب الاسود كناقل لها في قطعان الجاموس.