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BLOOD PARASITES OF TWO BEE-EATERS iN IRAQ

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ABSTRACT

Examination of 241 specimens of two bee-eater species, Merops apiaster and Merops superciliosus persicus reveal recording of Haemoproteus meropis (Zagar, 1945) emend. Bennett, 1978 and H. manwelli Bennett, 1978 for the first time in Iraq. A new species Haemoproteus hudaidensis sp. nov. is described. Microfilariae are also infected the two host species. The results are discussed with the pertinent literature and the necessary comparision of morphometric measurements of the recorded parasites with that previously reported is provided along with a taxonomic key including the newly described haemoproteid.

INTRODUCTION

Three species of bee-eaters represent family Meropidae (Coraciiformes, Ayes) in Iraq. they are: the European bee-eater Meropas apiaster L., the blue-cheeked bee-eater .1!. superciliosus persicus Pallas. 1945. and the little green bee-eater M. orientalis Latham, 1801. These birds are exclusively entomophagous especially on bees and wasps and have destructive effect on apiculture. They are summer visitors in Iraq from March to November and breeding in the north (European bee-eater), and in the middle and the south (Persian bee-eater) while the status of the little green bee-eater in the far south is obscure.

Practically, no attempts had been done to study the parasites of these birds in Iraq except for the negative results of examining only two specimens of bee-eaters for their blood parasites reported by Shammsuddin and Mohammad (1981.(

Internationally,Bennett et al (1994) in their checklist of the valid avian species of Haemoproteus, Leucocytozoon and Hepatozoon considered only three species of Haemoproteids.

A substantial collection of blood films from two bee-eaters (European and Persian) was available through a project achieved by the State Board of Plant Protection L Ministry of Agriculture to study their biology of bee-eaters in Iraq and to evaluate their impact on apiculture. Examining this collection indicates presence of Haemoproteus spp. and microfilaria infections.

MATERIALS AND METHODS

A total of 241 bee-eaters belonging to the European bee-eater Merops apiaster L. and blue checked bee-eater Merops superciliosuspersicus Pallas were collected either by shooting or capturing by digging off the nests at different localities in the north, middle, and south of Iraq during the period between January 1997 and June 1999. Thin blood films were taken immediately from the brachial vein of the bird or sometimes heart, air-dried, fixed in absolute methanol or ethanol, stained with Giemsa's solution at strength of 1:10 at pH 7-7.2 for one hour. The morphometric parameters of both parasites and host cells were determined following the methods of Bennett and Campbell (1972) as modified by Forrester et al. (1977) and Mohammad (1991). Drawings were made with the aid of camera lucida. The number of

examined material indicated by N, while the nuclear displacement ratio by NDR. All measurements are presented as means followed by standard deviation in parentheses.

RESULTS

Results are summarized in table 1. This would show that 1.7% of the total sample is infected with Haemoproteus spp. while 2.9% of it is infected with microfilaria. The infection appeared singly in all cases, this make the infection reaches to 4.9% of the total number of both bird species.

The rate of infection in the European bee-eater Merops apiaster is higher in all cases of infection with Haemoproteus spp. and microfilaria than that of the Persian bee-eater Merops superciliosus persicus.

Examining blood smears of the haemoproteid infection cases revealed that one specimen of M apiaster (2.6% of the European bee-eater sample) has been infected with H. meropis. The prevalence of the parasite is light. One specimen of M. s. persicus (0.5% of the Persian bee-eater sample) has been infected with H. manwelli Bennett, 1978. The prevalence of the parasite is light to moderate. Table 2 provided a comparison of measurements between Haemoproteus nieropis and H. manwelli recorded by Bennett (1978) and those recorded in the present study. Two specimens of H. s. persicus have been found infected with hitherto undescribed species. The description of the new haemoproteid is given below. The prevalence of the new taxon is moderate.

Haemoproteus hudaidensis sp. nov.

Figs. 1-10,table3

Type host: blue checked bee-eater ,Merops superciliosus persicus Pallas

Type locality: Al-Hudaid village, 50 kms northeast of Baghdad city, Diyala province

Immature gametocytes (figs. 1-2): youngest forms seen initiate development mostly lateral to the host cell nucleus or, sometimes, polar to the host cell nucleus. The parasite amoeboid, extending lateral to the host cell nucleus as it matures.

Macrogametocytes (figs 3-6): The parasite is halteridial in shape with one end flexing around one pole of the erythrocyte nucleus; outline entire, cytoplasm faintly granular staining blue with Giemsa's stain; pigment granules golden brown, medium sized and scattered throughout the parasite, averaging 19.2 granules per parasite; parasite nucleus submedian and subtriangular; averaging 2.9 um in length, 2.1 um in width and 4.9 urn2 in area, staining deep pink with Giemsa's stain; parasite averages 14.8 um in length, 3.5 urn in width and 49.8 um2 in area, constituting about 70% of the host-parasite complex. The host cell nucleus only slightly displaced laterally, NDR= 0.85.

Microgametocytes (figs. 7-10): The parasite is halteridial in shape with one end enclosing the pole of the erythrocyte nucleus; outline entire; cytoplasm faintly granular staining pale blue with Giemsa's stain; parasiter nucleus large, diffuse and ill-defined. Other characters as for macrogametocytes.

Syntype material: Blood film no. NB 1027 from M. s. persicus shooted at Al-Hudaid village on 27.8.1998. The slide is deposited in the collection ofv Invertebrates and Parasitology section, Iraq Natural History Museum, University of Baghdad.

Paratype material: Blood films nos. NB 1028 and NB 1029. The same data as for syntype material.

The infection of the two bird species with microfilariae constitutes 2.9% of the total sample. The infection rate of the European bee-eater is 5.1%. This is more than twice than that recorded for the Persian bee-eater, which is 2.5%The prevalence of the parasite/s is moderate to high.The microfilariae seen in the periphery blood are frequently sheathed. The unsheathed forms are seen sometimes also.

DISCUSSION

Recording of Haemoproteus meropis and H. manwelli constitute the first record of these haemoproteids to the Iraqi parasitic fauna, and reporting them from the hosts Merops apiaster and M. s. persicus represents new host record.

Cramp (1985) and Fry (1991) gave excellent reviews for both species encountered in this study in regard to their biology and ecology, but they did not pay attention to the blood parasites.

The infection rates of the European bee-eater with both kinds of parasites may be related to the smaller sample size compared with that for the Persian bee-eater since the number of examined specimens of the former bird is 39 while it is 202 for the latter species (table I).

Comparing the morphometric measurements of Haemoproteus meropis recorded by Bennett (1978) from Asian and African meropids with those of the present study revealed that the Iraqi specimens are more allied to African ones (table 2), while the differences noted between some morphometric parameters among the specimens of the present study and that reported by Bennett (1978) may be due to, in part, to their presence in different species of host birds. On the other hand, the same parameters showed less fluctuation between the African and Iraqi specimens of Haemoproteus manwelli. This reflects more stability of the morphic characters of this haemoproteid.

The present new species Haemoproteus hudaidensis sp. nov. is related to H. meropis in that they have a halteridial shape and their outlines are entire, but differs from it in that the microgametocyte always has one of its ends around one pole of the host cell nucleus and has more pigment granules of medium size instead of prominent ones. The host bird seems to acquired the initial infection here since different stages of maturation are seen in the single blood film including very small early immature gametocytes.

With the description of H. hudaidensis sp nov. the haemoproteids of the family Meropidae become four in number. The following key is based partially on that provided by Bennett (1978) and modified to include the new haemoproteid:

1- most mature gametocytes in enucleate erythrocytes …….. H. lairdi
1- mature gametocytes in nucleated red cells only ……..(2)
2- mature parasites markedly displace host cell nucleus laterally (NDRO.l)……..H. manwelli
2- mature parasites only slightly displace host cell nucleus ……(3)
3- pigment granules prominent, average 14 ……H. meropis
3- pigment granules of medium size, average 19 …….H. hudaidensis

In regard to the infection with microfilariae, the rate of infection seems high and it is not obvious wether the birds acquired the infection in Iraq or at their winter habitats. However, the high infection rates reflect high intermediate arthropod vector potentiality. It is customary to report only microfilaria positive or negative hosts in the survey reports since the generic or specific identification is impossible in view of the absence of their adult forms.

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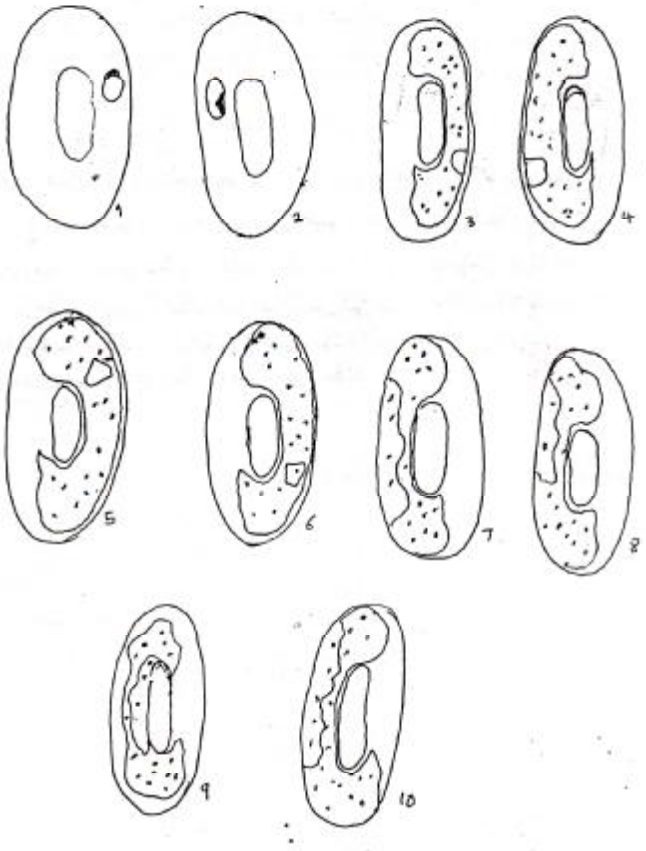
Table 1: Bird species, no. of examined and infected birds and percentage of infection.

Bird species	No. collected	No. infected with Haemoproteus	%	No. infected with microfilaria	%	No. total with infected	%
Meropsapiaster	93	1	2.6	2	5.1	3	7.7
M. s. persicus	202	3	1.5	5	2.5	8	4
total	241	4	1.7	7	2.9	11	4.9

Table 2: Morphometric parameters of Haemoproteus meropis and H. manwelli reported by Bennett (1978) compared with those reported in this study.

parameter	H. meropis			H. manwelli	
	Asia	Africa	Iraq	Africa	Iraq
Uninfected erythrocyte	N=50	N=20	N=30	N=40	N=30
Host cell					
Length	11.9 (0.68)	12.5 (0.85)	13.1 (0.9)	12 (0.9)	13.1 (1)
Width	7.1 (0.47)	6.8 (0.5)	7 (0.4)	6.8 (0.58)	6.2 (0.4)
Area	57.1 (5.6)	60.3 (6.3)	69.6 (7.1)	57 (7.5)	58.3 (8.3)
Host cell nucleus					
Length	5.9 (0.65)	5.7 (0.24)	6 (0.3)	5.7 (0.64)	6 (0.5)
Width	2.1 (0.34)	2.1 (0.21)	2.3 (0.2)	2.1 (0.47)	2.2 (0.5)
Area	9.2 (2)	9.3 (1.3)	9.8 (1)	8.9 (2.3)	9.2 (1.7)
NDR Parasitized erythroycyte	1	1	1	1	1
Host cell					
Length	13.4 (0.69)	15.2 (1.4)	14.9 (1.5)	12.5 (1)	12.7 (1.1)
Width	6.9 (0.63)	7 (0.56)	7 (0.8)	6.9 (0.87)	7.1 (0.5)
Area	64.8 (7)	78 (8.8)	73.5 (8)	59 (7.2)	62.2 (8)
Host cell nucleus					
Length	5.3 (0.73)	5.4 (0.7)	5.8 (0.3)	4.7 (0.52)	5.1 (0.3)
Width	2.1	2 (0.34)	2.3	2.1	2.2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طفيليات الدم في نوعين من طيور الوروار في العراق

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الخلاصة

أظهرت نتائج فحص ٢٤١ نموذجاً تعود لنوعين من طيور الوروار (أبو الخضير) هما الوروار الاوربي والوروار العراقي وجود نوعين من طفيليات الدم الاوالي يسجلان لاول مرة من العراق وتم وصف نوع جديد للعلم من هذه الطفيليات. كما وجدت المراحل اليرقية للديدان الخيطية في دم هذين النوعين. تمت مناقشة النتائج ععلى ضوء البحوث ذات العلاقة واجريت المقارنات الضرورية بين النماذج العراقية من الطفيليات وتلك المسجلة سابقاً.