

BLOOD PARASITES OF THE BABBLERS OF IRAQ

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ABSTRACT

A survey of blood parasites among members of two species of Iraqi babblers Timaliidae, *Turdoides caudatus salvadori* (de Fillipi, 1865) and *Turdoides alterostris* (Hartert, 1909) was carried out in the middle and south of Iraq. Two species of haematozoa were recovered, *Haemoproteus turdoidis* sp. nov. and *Plasmodium relictum* Grassi & Felletti. The description of the new taxon is provided and discussed with pertinent literature.

INTRODUCTION

The avian family Timaliidae comprises 262 species. Bennett *et al.* (1982) reported that 127 of them were examined for blood parasites in different areas of the world.

In Iraq, two species of babblers were recorded, the common babbler *Turdoides caudatus salvadori* (de Fillipi, 1865) and the Iraqi babbler *T. alterostris* (Hartert, 1909). These two birds were resident inhabitants in the middle and south of Iraq in the dense reed, bushes, orchards, and cultivated date-palm areas (Allouse, 1962). Such environments support high vector potentiality. Al-Dabbagh and Bunni (1981) studied the breeding habits of the Iraqi babbler in Baghdad area without paying attention to the parasites of the bird. Shamsuddin and Mohammad (1981) did not examine the babblers in their survey of blood parasites among Iraq birds, while Mohammad (1991) could not find any parasites in the blood of these two species.

Recently, blood smears of these birds become available from different areas of middle and south of Iraq through the field trips achieved by the staff of Iraq Natural History Museum as a part of parasitological survey among the Iraqi birds.

MATERIALS AND METHODS

A total of 88 babblers belonging to the common babbler and the Iraqi babbler were collected either by shooting or capturing by mist nets at three localities in the middle and south of Iraq (Ammara, 7th April project 45 km southeast of Baghdad city (m) and Tarmiya 50 km north of Baghdad city) during the period June 1997 to August 1998. Thin blood films were taken immediately from the brachial vein of the bird or sometimes heart, air dried, fixed in absolute methanol, stained with Giemsa's solution at a strength of 1:10 at pH 7-7.2 for one hour. The morphometric parameters of both parasites and red blood cells were determined following the methods of Bennett and Campbell (1972) as modified by Forrester *et al.* (1977). Drawings were made with the aid of camera lucida. The number of examined material is indicated by N, while the nuclear displacement ratio by NDR. All measurements are presented as means followed by standard deviation in parentheses.

RESULTS

Table 1 shows the results of examining 88 timaliids for blood parasites. This would show that the total infection rate is 11.4%. Two species of parasites were found *Haemoproteus*

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turdoidus sp. nov. and *Plasmodium relictum* with infection rate of 6.8% and 4.5% respectively. The infection appeared singly in each case of both parasites. On comparing

Table 1: Bird species, place of collection, number of bird, *Haemoproteus* inf., *Plasmodium* inf., and percent of infection.

Place of collection	<i>Turdoidus caudatus salvadori</i>	<i>Turdoidus alterostris</i>	Total
7 th April project			
no. exam.	12	5	17
Haem. Inf.	1	1	2
Plasm. Inf.	1	-	1
%	16.7	20	17.6
Tarmiya			
no. exam.	33	11	44
Haem. Inf.	2	1	3
Plasm. Inf.	1	-	1
%	9.1	9.1	9.1
Ammara			
no. exam.	19	8	27
Haem. Inf.	1	-	1
Plasm. Inf.	1	1	2
%	10.5	12.5	11.1
Total			
no. exam.	64	24	88
no. inf.	7	3	10
%	10.9	12.5	11.4

The present haemoproteid parasite with related species it is found that it represent a new taxon, its description is as follows:

Haemoproteus turdoidus sp. nov.

Figs. 1-24

Type host: common babbler. *Turdoidus caudatus salvadori* (de Phillipi, 1865)

Type locality: 7th April project, 45 km southeast of Baghdad city.

Date of collection: 4th December, 1997.

Immature gametocytes: The immature gametocytes are rarely seen develop in nucleated erythrocytes lateral to the cell nucleus. Pigment granules in very young gametocyte absent, double infection is seldom seen, host cell nucleus slightly affected and infected cells are somewhat hypertrophied. Measurements of 10 normal and infected erythrocytes with immature gametocytes are as follows: normal erythrocytes: cytosome, 14.1(0.2) X 6.8(0.3), nucleus 6.2(0.4) X 2.1(0.2); infected erythrocytes: 14.6(0.6) X 6.9(0.7), nucleus, 6.4(0.8) X 1.9(0.3).

Macrogametocytes: N=50. Cytoplasm granular stains blue with very small vacuoles to virtually absent. Parasites average 13.3(0.7) X 3(0.7) , 47.1(3.4) squared um in area and occupy about 62.8% (range: 53.4-73.6%) of the host cell-parasite

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complex. Parasite nucleus off centre usually located near one of end of the pole, triangular to subrectangular in shape staining pink to deep pink and measuring 2.85(0.86)(range: 2.1-4) X 2 (0.14)(range: 1.9-2.2). Erythrocyte nucleus displaced laterally, nuclear displacement ratio 0.58. Host cell hypertrophied. Pigment granules small, dark brown to black, scattered averaging 15.8(range: 14-17).

Microgametocytes: N=50. Cytoplasm granular stains faint blue, vacuoles rarely present, parasites average 14.5(0.56) X 6.25(0.27), 43.2(6.6) squared um in area and occupy about 58.1%(range: 48.1-66.2) of the host cell-parasite complex. Parasite nucleus dispersed, ill defined and not clearly distinguishable from the cytoplasm. Nuclear displacement ratio NDR 0.73. Other characters are the same as for macrogametocyte.

Vector: unknown.

Syntype slide: Blood film No. 2128B deposited in the collection of the Invertebrates and parasitology section, Iraq Natural History Museum, University of Baghdad, Baghdad.

Paratype slides: Blood films Nos. 2129B-2131B.

Plasmodium relictum Grassi and Feletti, 1890 (figs. 21-27). The infected birds show intense parasitemia. The parasite cytoplasm faint blue with Giemsa's stain and finely vacuolated. The developing gametocytes are frequently seen in the blood film and their number far exceeds than that of fully mature gametocytes. The parasite usually infects red blood cell (average measurements of 10 are: length 13.2, width 3.10) develops gradually and then the host cell membrane ruptures and the fully mature gametocyte becomes naked (average measurements of 10 are: length 11.6, width 5.1). Infection of white blood cells was seldom seen.

DISCUSSION

The infection of babblers with haemoproteids seems wide since Bennett *et al.* (1982) recorded infection of 53 species (20.2% of the total number of species) with *Haemoproteus* spp. This includes recording of *Haemoproteus danilewskyi* Grassi and Feletti*** from *Garrulax albogularis* (Gould) and *Leothrix argentauris* (Hodgson) (Plimmer, 1913); *H. fallisi* Bennett and Campbell from *Garrulax erythrocephalus* (Vigors) and *Leothrix argentauris* (Bennett and Campbell, 1972); and *H. orizivora* Anschutz from *Turdoides striatus* (Sykes) (Nandi, 1978). The previously mentioned records seem confusing and misleading since both Plimmer's hosts were in captivity in a zoo. Using of these records to interpret parasite distribution or host specificity should be approached with caution (Bennett *et al.*, 1982). *Haemoproteus danilewskyi* is valid when limited to Corvidae and it seems that its presence in Timaliidae is not probable. The taxonomic status of *Haemoproteus orizivora* reported by Nandi (1978) from *Turdoides striatus* is uncertain and needs redescription. However, this parasite was first described from Ploceidae. *Haemoproteus fallisi* is a valid species, but it was originally described from Turdidae. Phylogenetically, Turdidae and Timaliidae are far from each other. So, the record of Bennett and Campbell (1972) of *H. fallisi* from two timaliids seems unjustified. The present species, however, differs from the above mentioned haemoproteids as follows, from *H. danilewskyi* in that the mature parasite not encircling erythrocyte nucleus while in *H. danilewskyi* the mature parasite encircles erythrocyte nucleus; from *H. orizivora* in that the erythrocyte nucleus is moderately to markedly displaced to periphery while in *H. orizivora* the erythrocyte nucleus is not displaced to periphery; from *H.*

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fallisi in the length being 13.3-14.5 um while *H. fallisi* of length of 10.1 um and by smaller pigment granules. It differs also from *H. timalus* reported by Bennett *et al.* (1994) in that the present parasite border is entire and not amoeboid as in *H. timalus* and the number of pigment granules is 15.8 instead of 11. The present parasite differs from all above haemoproteids in that it has one of its ends always pointed off the erythrocyte nucleus. Also, it differs from *H. beckeri* Roudabush and Coatney of the avian family Mimidae which has some affinities with the Turdidae in having smaller pigment granules with an average of 15.8(14-17) instead of 8.3(4-11).

The avian plasmodial parasites had been attracted researchers more than all of the blood parasites combined. Studies of Garnham (1966) and Griener *et al.* (1975) concluded that the host specificity does not exist among members of this genus. Bennett *et al.* (1982) reported that most species occur over a wide range of several avian families and certain species, especially, *P. relictum*, *P. circumflexum* Kikuth, and *P. vughani* Novy & MacNeal and have extensive host range encompassing a number of avian families and order. The specific identification, however, of *Plasmodium relictum* was possible through the description and illustrations provided by Garnham (1966).

The host-parasite catalogue of the avian haematozoa of Bennett *et al.* (1982) contained records of 127 species of Timaliidae examined for blood parasites, 27 of them were found infected with eight *Plasmodium* spp. They recognized six as valid species, these include *Plasmodium cathamerium* Hartmann, *P. relictum* and *P. rouxi* Sergent *et al.* from Ploceidae; *P. circumflexum* and *P. vughani* from Turdidae; and *P. dissanaike* de jong from Psittacidae. They considered *P. praecox* Grassi and Feletti from Ploceidae as a synonym of *P. relictum* and the only plasmodid parasite of Timaliidae, *P. tenue* Laveran & Marullaz, as a doubtful species and requires review. Their catalogue contained other records of *Plasmodium* sp. from 14 Timaliid hosts. This is the first record of *P. relictum* from Timaliidae.

All localities yielded presence of parasites with some difference in their rate of infection which may reflect different vector potentiality between the three different localities. Two localities (Al-Tarmiya and 7th April project) situated near Baghdad City, middle of Iraq comprise semi-arid areas with presence of some irrigated lands and scattered shrubs and trees. The third locality (Ammara) is a marshy area. The 7th April project area show higher rate of infection (17.6%) with moderate to intense parasitemia.

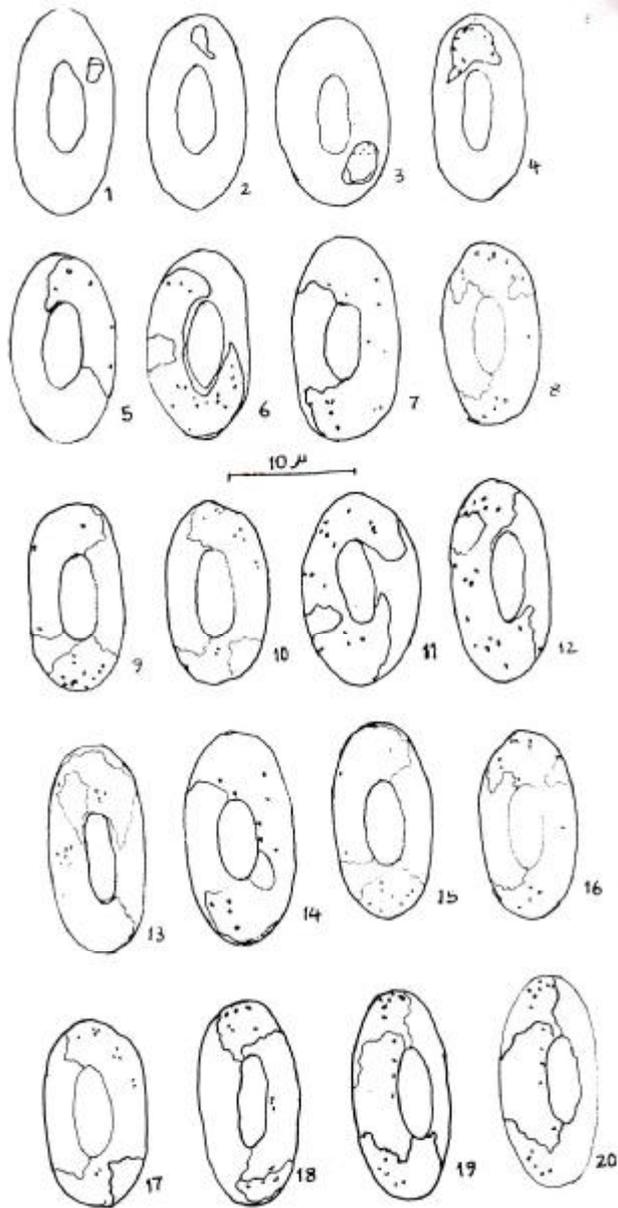
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