

HAEMOPROTEIDS OF THE AVIAN FAMILY RALLIDAE IN IRAQ WITH DESCRIPTION OF A NEW SPECIES

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ABSTRACT

A survey of haemoproteids among the eight species of Iraq rallids were carried out in the middle, south, and west of Iraq. Two haemoproteids were recorded, *Haemoproteus porzanae* (Galli-Valerio, 1907) as a new record for Iraq and the new species *H. baghdadensis* described from *Fulica atra* L. collected in the middle of Iraq.

INTRODUCTION

The family Rallidae comprises eight species in Iraq (Allouse, 1962). Five of them are winter migrants while the rest are residents. They inhabit mainly marshes, lakes, and banks of rivers. These ecosystems in Iraq support high vector potentiality in view of the presence of dense vegetation and relatively high temperature.

Bennett (1980), in his study of haemoproteids of Rallidae collected from different parts of the world, reported only two species; *Haemoproteus gallinulae* de Mello, 1935 and *H. porzanae* (Galli-Vallerio, 1907). Since that no further information were available. It is of interest to study the haemoproteid parasites of Iraq rallids as a good number of specimens were available through the filed trips achieved by the staff of Iraq Natural History Museum.

MATERIALS AND METHODS

A total of 236 rallid birds belonging to eight species were collected throughout middle, south and west Iraq during the period March 1992 to July 1997. Thin blood smears were made from brachial vein or sometime heart of each bird, air dried, fixed in absolute methanol, and stained with Giemsa's stain according to protocols of Bennett (1970). 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) and Mohammad (1996). Drawings were made with the aid of Camera Lucida. The number of examined materials is indicated by N, while the nuclear displacement ratio by NDR. All measurements are presented as means following by standard deviation in parenthesis.

RESULTS

Table 1 summarizes the results on examining blood smears of rallid birds. This would show that seven species of the examined birds were infected with haemoproteids. The infected birds constitute 8.5% of the total sample. *Haemoproteus porzanae* (L.) was found infected the rallids, *Rallus aquaticus* L., *Crex crex* (L.), *Porzana porzana* (L.), and *Porzana parva* (Scopoli). Prevalence of the parasite is light to moderate.

The other haemoproteid seems to be new, its description as follows:

Haemoproteus baghdadensis sp. nov.

Type host: *Fulica atra* L.

Type locality: Al-Attariya, 45 km SE Baghdad City, middle of Iraq (44° 45' E, 33° 15' N).

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Date of collection: August 12, 1995.

Immature gametocyte: (figs. 1-2). Youngest forms seen initiate growth in fully mature erythrocytes, mostly lateral but sometimes polar to erythrocyte nucleus in position. The parasite shape is amoeboid.

Macrogametocyte: (figs. 3-4 , table 2). Parasite small, dumbbell-shaped and almost attached to the lateral margin of erythrocyte. Fully mature macrogametocyte with entire borders and the ends tapering gradually at both ends. Cytoplasm finely granular staining deep blue with Giemsa's stain. Pigment granules of medium size distributed throughout cytoplasm. Parasite nucleus of small size, compact, usually submedium, and staining deep pink with Giemsa's stain.

Microgametocyte: (fig. 5-6, table 2) General shape as macrogametocyte with the usual sexual dimorphic staining characters. Pigment granules of large size distributed throughout cytoplasm. Parasites nucleus of large size, diffuse and ill-defined.

Type material: Blood film no. NB527 deposited in the collection of Invertebrates and parasitology section, Iraq Natural History Museum, University of Baghdad taken from coot *Fulica atra* L. by the author.

Paratype material: Blood film no. NB229 from *Gallinula chloropus chloropus* (L.) collected by the author on Feb. 22, 1996 at Khalis City, Diyala province, middle of Iraq; and blood film no. NB691 from purple gallinule *Porphyrio porphyrio* (L.) collected by the author on May 17, 1996 at Hilla City, Babil province, middle of Iraq.

The necessary measurements of parasitized and unparasitized erythrocytes, to examine the hypertrophy, were presented in table 3.

Table 1: Species, number, and percentage of infection of rallid birds with haemoproteids.

Bird species	No. exam.	No. inf.	% inf.	Parasite sp.
<i>Rallus aquaticus</i>	12	2	16.6	<i>Haemoproteus porzanae</i>
<i>Crex crex</i>	19	3	15.8	<i>Haemoproteus porzanae</i>
<i>Porzana porzana</i>	17	2	11.8	<i>Haemoproteus porzanae</i>
<i>Porzana parva</i>	16	2	12.5	<i>Haemoproteus porzanae</i>
<i>Porzana pusilla</i>	2	-	-	-
<i>Fulica atra</i>	67	6	9	<i>Haemoproteus baghdadensis</i>
<i>Gallinula chloropus</i>	83	3	3.6	<i>Haemoproteus baghdadensis</i>
<i>Porphyrio porphyrio</i>	22	2	9.1	<i>Haemoproteus baghdadensis</i>

Table 2: Measurements of macro- and microgametocytes of *Haemoproteus baghdadensis* sp. nov. (Figures represent mean of 50 parasites, SD in parentheses).

Measurements	Macrogametocytes	Microgametocytes
Parasite		
Length	13.23 (1.5)	12.10 (2.0)
Width	2.15 (0.3)	2.85 (0.4)
Area	27.65	32.65
% erythrocyte-parasite complex	55.60	63.42
Parasite nucleus		
Length	2.8(0.2)	5.33(0.6)
Width	2.6 (0.1)	3.1 (0.2)
Area	5.95	18.45
% area of parasite	6.50	8.32
No. pigment granules	12.5 (1.5)	11.2 (1.6)

Table 3: Comparison of unparasitized and parasitized erythrocytes (no.=50).

Measurements	Unparasitized erythrocytes	Parasitized erythrocytes	
		Macro-	Micro-
Erythrocyte			
Length	12.15(0.2)	13.30(0.3)	13.9(0.2)
Width	7.25(0.1)	8.55(0.2)	8.78(0.1)
Area	61.65(7.8)	73.35(6.5)	73.20(4.6)
Erythrocyte nucleus			
Length	5.8(0.1)	5.5(0.1)	5.3(0.1)
Width	2.4(0.1)	2.1(0.1)	2.2(0.1)
Area	9.55(1.5)	8.85(1)	10.05(1.5)
% area of nucleus to total area	16.33(2.1)	13.45(1.5)	18.25(2.5)
NDR	-	0.82	0.60

DISCUSSION

In view of lacking the necessary information on the distribution of haemoproteid parasites among the members of the avian family Rallidae in Iraq and with describing some other haemoproteid species abroad which proved later to be in synonymy with the previous described ones, this paper is devoted to study the situation of haemoproteids within the Iraqi rallids.

Reporting *Haemoproteus porzanae* constitutes a new record for Iraq, while reporting it from the hosts *Rallus aquaticus*, *Crex crex*, *Porzana porzana*, and *Porzana parva* are new host records.

The haemoproteids status of family Rallidae is of some confusion. Three species were described, *Haemoproteus porzanae* (Galli-Valerio, 1907) from *Porzana pusilla* in Tunisia, *H. gallinulae* de Mello, 1935 from *Gallinula chloropus* in India, and *H. fulicae* da Fonseca, 1938 from *Fulica atra* in India. All of the original descriptions lacked the necessary measurements and also the authors provided no illustrations except for *H. gallinulae*. Later, Bennett (1980) in his review of the haemoproteids of family Rallidae ascribed only two species, *Haemoproteus gallinulae* and *H. porzanae*, considering *H. fulicae* as a synonym of *H. gallinulae*.

In Iraq Shamsuddin and Mohammad (1980) found no haematozoa in the blood of *Gallinula chloropus* and *Fulica atra*.

Table 1 showed that four of the winter migratory rallids are infected with *Haemoproteus porzanae*, while the three resident ones are infected with *H. baghdadensis* sp. nov. This pattern of infection may be because that the migrants acquired the initial infection in their summer environments and the appropriate intermediate host is not found in Iraq, while the infection of the residents with *H. baghdadensis* sp. nov. only may suggests that the vector of this parasite is confined to our area.

Reporting the present new species from three resident rallid hosts shows strong host-vector interaction and the parasite seems endemic to the local habitat.

Haemoproteus baghdadensis sp. nov. is related to but differs from *H. porzanae* in that, it slightly hypertrophied the parasitized erythrocyte(table 3) and in having more medium size pigment granules instead of large ones.

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طفيليات الأوالي الدموية (الهيموبروتوس) في طيور العائلة المرعية في العراق مع وصف
نوع جديد

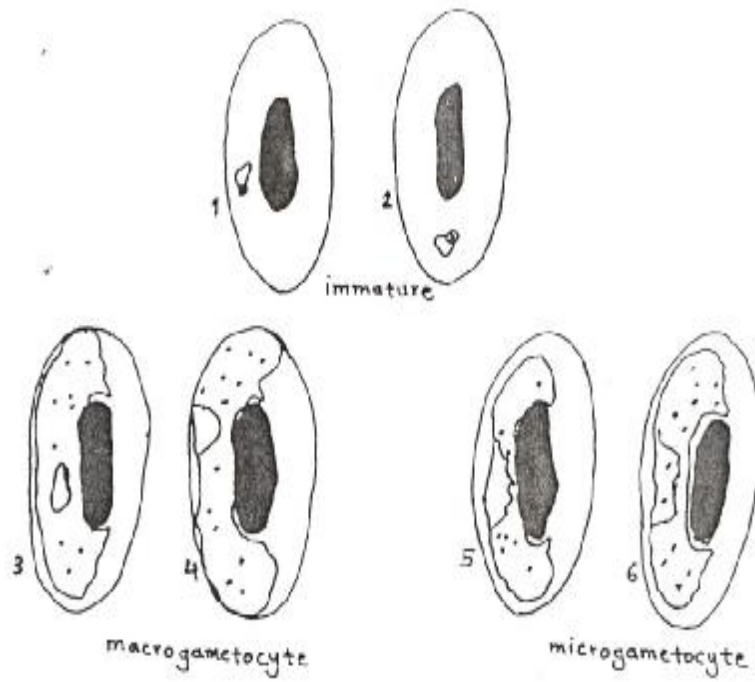
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الخلاصة

اجري مسح لطفيليات الأوالي الدموية (الهيموبروتوس) في ثمانية أنواع من الطيور المرعية في
وسط وجنوب وغرب العراق. سجل اثنان من الاوالي الدموية أحدهما سجل لأول مرة في العراق
Haemoproteus porzane أما الآخر فهو نوع جديد للعلم *H. baghdadensis* الذي وصف من
طيور الغر الذي تم جمعه من وسط العراق.

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Figs. 1-2: *Haemoproteus baghdadensis* sp. nov. , immature stages

Figs. 3-4: *Haemoproteus baghdadensis* sp. nov. , macrogametocytes

Figs. 5-6: *Haemoproteus baghdadensis*, sp. nov. , microgametocytes