

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

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### ABSTRACT

Three scolopacids out of 150 are found infected with *Haemoproteus scolopaci* Galli-Valerio 1929 and *H. tringae* n. sp. A detailed description of the new taxon is presented along with a comparison of the diagnostic measurements between the two species.

### INTRODUCTION

The avian family Scolopacidae comprises 24 species in Iraq (Allouse, 1961), this constitutes 30% of the total number of the scolopacid species of the world. Nineteen of them are winter migrants while the rest are spring and autumn visitors.

The scolopacids, usually, do not leave water and they tend to aggregate and make flocks. This will increase their infection although the prevalence of their blood parasites is extremely low. In Iraq, Shamsuddin and Mohammad (1981) examined eight scolopacid specimens belonging to 5 species and found no parasites.

Recently, a good deal of specimens was available through the field trips achieved by the staff of Iraq Natural History Museum – University of Baghdad during the years 1992-1997. Therefore, it seems of interest to study the haemoproteids of these birds.

### MATERIALS AND METHODS

A total of 158 birds belonging to 7 genera and 20 species were collected throughout middle and south of Iraq during the years 1992-1997. Blood smears were made immediately from each bird, air dried, fixed in absolute methanol or ethanol, and stained with Giemsa's stain. 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 (1990). Drawings were made with aid of camera lucida. The number of examined erythrocyte was indicated by N, while the nuclear displacement ratio by NDR. All measurements are presented as means followed by standard deviation in parenthesis.

### RESULTS

Table 1 shows the results of examining 20 species of scolopacid birds for haemoproteid parasites. This would show that 1.9% of the sample was infected with *haemoproteus* spp. One of each of *Capella g. gallinago* and *Limosa l. limosa* was infected with *Haemoproteus scolopaci* Galli-Valerio, 1929 with infection rates of 9% and 6.3% respectively. The necessary morphometric and meristic measurements are presented in table 2. Other morphic and staining characters are the same as reported by Bennett (1979). Also, one specimen of *Tringa totanus* was infected with hitherto undescribed species. The description of the new species is as follows:

Type host: Redshank, *Tringa totanus* (L.).

Type locality: Kut City, Wasit province, middle of Iraq.

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Date of collection: September 24<sup>th</sup>, 1993.

Immature gametocytes: Youngest forms are not seen. Only premature parasites are infrequently seen (fig. 1).

Macrogametocytes: (figs. 2-3, table 2) Parasite halteridial with the ends flexing about the erythrocyte nucleus. The parasite outline entire. Cytoplasm granular, staining deep blue with Giemsa's stain. Pigment granules of medium size scattered throughout the cytoplasm averaging 10.1 per parasite. Parasite nucleus submedian, triangular in shape and staining deep pink. The necessary measurements are presented in table 2.

Microgametocytes: (figs. 4-5, table 2) Parasite halteridial with ends flexing about the erythrocyte nucleus. The parasite outline entire. Cytoplasm granular, staining faint blue with Giemsa's stain. Pigment granules of medium size scattered throughout the cytoplasm averaging 9.9 granules per parasite. Parasite nucleus ill-defined staining faint pink and representing 25% of the parasite area. The necessary measurements are presented in table 2.

Type material: Blood film no. NB861 from *Tringa totanus*, deposited in the collection of the Invertebrates and parasitology section, Iraq Natural History Museum, University of Baghdad, Baghdad.

Table 1: Species of Scolopacidae and the number of examined and infected birds.

Bird species	No. examined	No. infected
<i>Calidris alpina alpina</i>	5	-
<i>C. minuta</i>	17	-
<i>C. temmincki</i>	9	-
<i>C. testacea</i>	2	-
<i>Capella g. gallinago</i>	11	1
<i>C. media*</i>	3	-
<i>Limosa l. lapponica</i>	2	-
<i>L. l. limosa</i>	16	1
<i>Lymnocyrtus minimus</i>	6	-
<i>Numenius arquata</i>	2	-
<i>N. p. phaeops*</i>	1	-
<i>Philomachus pygnaux</i>	3	-
<i>Tringa cinerea*</i>	2	-
<i>T. erythrops</i>	4	-
<i>T. glareola</i>	5	-
<i>T. hypoleucos</i>	13	-
<i>T. nebularia</i>	11	-
<i>T. ochropus</i>	21	-
<i>T. stagnalis</i>	6	-
<i>T. tetanus</i>	19	1
Total number	150	3

- spring-autumn visitor, the rest of species are winter migrants.

### DISCUSSION

Members of the family Scolopacidae inhabit water bodies most of their life spans. This is reflected by the concentration of collection sites in the middle and south of Iraq which include vast areas of marshes, lakes, rivers, and temporary and permanent ponds and streams.

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Table 2: A comparison of morphometric parameters of *Haemoproteus scolopaci* Galli-Valerio, 1929 and *H. tringae* n. sp.

Parameter	<i>H. scolopaci</i>	<i>H. tringae</i>
<b>Uninfected erythrocytes</b>		
N	50	50
Length	12.1(0.9)	11.9(0.9)
Width	6.3(0.9)	6.5(0.9)
Area	55.9(6.3)	56.5(7.2)
<b>Erythrocyte nucleus</b>		
Length	5.4(0.2)	5.7(0.4)
Width	2.1(0.3)	2.2(0.4)
Area	10.1(0.8)	10.9(0.2)
% area of total cell	18.1	19.3
<b>Erythrocyte parasitized by macrogametocyte</b>		
N	25	20
Length	12.7(0.7)	12.9(1.1)
Width	6.6(0.3)	7.3(0.4)
Area	62.1(7.4)	70.8(6.8)
<b>% hypertrophy: atrophy of host cell</b>		
Length	+5	+8.4
Width	+9.5	+12.3
Area	+11	+25.3
<b>Host cell nucleus</b>		
Length	5.2(0.4)	5.8(0.3)
Width	1.9(0.1)	2.1(0.2)
Area	8.2(1.0)	10.2(0.2)
% area of host-parasite complex	13.2	14.4
<b>% hypertrophy: atrophy of host cell nucleus</b>		
Length	-3.6	+1.8
Width	-9.5	-4.5
Area	-18.8	-6.4
NDR	0.70	0.75
<b>Macrogametocyte</b>		
Length	18.1(1.3)	19.2(3.1)
Width	2.7(0.1)	2.9(0.7)
Area	40.2(2.2)	43.6(4.9)
% area of host-parasite complex	64.7	61.6
No. pigment granules	16.5(1.5)	10.1(0.3)
<b>Macrogametocyte nucleus</b>		
Length	4.1(0.9)	3.8(0.2)
Width	2.2(0.2)	2.1(0.2)
Area	4.9(0.5)	6.1(0.1)
% area of parasite	12.2	14
<b>Erythrocyte parasitized by microgametocyte</b>		
N	25	20
Length	12.1(0.9)	12.5(0.6)
Width	6.2(0.9)	6.5(0.8)
Area	56.1(5.9)	61.1(6.3)

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<b>% hypertrophy: atrophy of host cell</b>		
Length	0	+5
Width	-1.6	0
Area	+3.6	+8.1
Host cell nucleus		
Length	5.3(0.6)	5.0(0.3)
Width	1.7(0.3)	1.8(0.1)
Area	7.9(1.1)	8.9(1.0)
% area of host-parasite complex	14.1	12.9
<b>% hypertrophy: atrophy of host cell nucleus</b>		
Length	-1.8	-3.5
Width	-24	+18.1
Area	-21.7	-18.3
NDR	0.72	0.78
<b>Microgametocyte</b>		
Length	15.1(2.1)	17.9(3.7)
Width	2.6(0.9)	3(0.9)
Area	35.5(6.7)	39.1(5.5)
% area of host-parasite complex	63.2	69.2
No. pigment granules	15.7(2.1)	9.9(0.4)
<b>Microgametocyte nucleus</b>		
Length	5.2(0.7)	5.1(0.2)
Width	2.4(0.5)	2.3(0.3)
Area	10.3(1.8)	9.8(0.7)
% area of parasite	30	25.1

Note: Linear measurements in micronmeters, areas in squared micrometers, hypertrophy as +, atrophy as -, standard deviation in parenthesis.

This study is devoted to haemoproteids only because of the lack of infection of these birds with other parasites in the examined material.

Table 1 shows that the total infection rate among the scolopacid birds encountered in this study is extremely low and only 1.9%. This is not surprising in that the family Scolopacidae is well known to be infrequently infected as explained by Griener *et al.* (1975), and as seen through the results of Mohammad and Al-Taqi (1975) in Kuwait and Shamsuddin and Mohammad (1981) and Mohammad (1990) in Iraq. Internationally, the infection rate was less than 1% in North America (Griener *et al.*, 1975), 2.9% in the neotropics (White *et al.*, 1979), 2.1% in southeast Asia (McClure *et al.*, 1978). Furthermore, Bennett (1979) stated that the prevalence of haemoproteids appear to be virtually absent from scolopacids in the New World and Africa.

The high percentage of infection rates among *C. g. gallinago* and *L. l. limosa* which are infected with *Haemoproteus scolopaci* of 9% and 6.3% respectively and it is of 5.3% in *Tringa tetanus* infected with *H. tringae* seems to be related with small sample size in this study.

The infection of the three species of Scolopacidae with haemoproteid parasites seems acquired at their breeding habitats. As they are winter migrants, the period between their arriving to Iraq and the date of collection left no enough time to get fully mature gametocytes in the periphery blood if the initial infection was acquired here, this is in accordance with the

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complete absence of youngest forms of the haemoproteids recorded in this study. So, it seems reasonable to assume that initial infection was acquired at the breeding period as they were weak and the vectors were active during April-May.

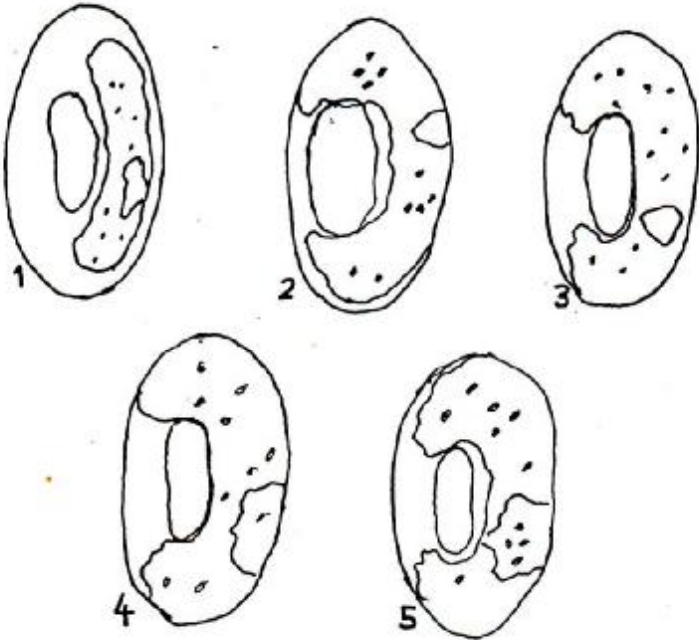
The measurements of the specimens recorded in Iraq of *Haemoproteus scolopaci* from *C. g. gallinago* and *L. l. limosa* (table 2) are slightly smaller than these given by Bennett (1979). This may represent geographical race of *H. scolopaci*, or may be because of presence in different host species. This is supported by Bennett (1979) who stated that although the Scolopacidae are cosmopolitan, their haemoproteid parasites show a marked geographic localization.

*Haemoproteus tringae* n. sp. could be distinguished from the other three haemoproteids recorded from Scolopacidae in that it differs from *H. rotator* Bennett 1979 by not rotating the host cell nucleus and from *H. contortus* Bennett 1979 by being typical halteridial in shape and its borders are entire. The present new taxon is related to *H. scolopaci* by its typical halteridial shape with ends flexing about the erythrocyte nucleus, but differs from it in the number and size of pigment granules, the gametocytes less displaced the host cell nucleus and hypertrophied the host cell almost more than twice that of *H. scolopaci*.

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ا. همسويوتر بلجا : Galli-Valerio, 1929 *Haemoproteus scolopaci* همد . يجع نو *H.*

*tringae* n. sp. قزيمة لاسيقلاتنا. نلقطل . مع بع مده يلخ و نبالايه . فنة للفص و اي طعأ

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