HAEMOPROTEUS BURHINUSA NEW SPECIES FROM THE STONE CURLEW, BURHINUS OEDICNEMUS SAHARAE (REICHENOW) IN IRAQ

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ABSTRACT

Haemoproteus burhinus is described from the stone curlew, Burhinus oedicnemus saharae (Reichenow) from Al-Attariya, 45 km SE Baghdad city middle of Iraq. It is related to but differs from H. peireci in that it hypertrophied the erythrocyte and the erythrocyte nucleus is always laterally displaced in microgametocytes.

INTRODUCTION

The stone curlew, Burhinus oedicnemus saharae (Reichenow) (Burhinidae, Charadriiformes) is a common bird in many parts of Iraq all over the year. Its numbers are highly increased especially during the migration periods in spring and autumn. It inhabits the desert and semidesert areas usually in flocks (Allouse, 1961).

So far, no parasite had been reported from this bird neither in Iraq except for reporting negative results for blood parasites examinations (Mohammad, 1991), nor
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abroad (McClure et al., 1978; Bennett et al., 1978; Bennett et al., 1982). Among the avian family Burhinidae only *Haemoproteus* sp. was reported from *Burhinus seneghalensis* in Africa (Hamerton, 1936; Rousselot, 1953; McClure et al., 1978).

**MATERIALS AND METHODS**

Blood films were made from 16 birds in Al-Attariya, middle of Iraq on 1st-3rd November 1990.

Blood smears were made from blood drawn from the femoral or brachial artery and sometimes from the heart, air dried and fixed in absolute methanol. The slides then were stained with Giemsa's stain according to the protocols of Bennett (1970) and then examined for blood parasites. Photomicrographs were done with Olympus Research Microscope (Vanox), while drawings were made with the aid of a camera lucida. Measurements are expressed as the means followed (in parentheses) by the standard deviations. The number of specimens measured is indicated by N and the nuclear displacement ratio by NDR.

**RESULTS**

Fourteen birds out of 16 (87.5%) were found infected with a heitherto undescribed haemoproteid. Table 1 represents a measurement comparision between uninfected erythrocytes and those infected with macro- and microgametocytes respectively, and this would show a clear hypertrophy in the infected ones. While table 2 express
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the mean measurements of macro-and microgametocytes of *H. burhinus* sp. n. which would show a strong dimorphism between them.

**Haemoproteus burhinus** sp. n. (Figs. 1-10)

**Type Host:** The Stone Curlew *Burhinus oedicnemus saharae* (Reichenow)

**Type Locality:** Al-Attariya, 45 km SE Baghdad City, Middle of Iraq (44°45' E, 33°15' N)

**Date of Collection:** 1-3 November 1990

**Immature gametocytes:** (Fig. 1) Youngest forms seen initiate growth in fully mature erythrocytes, polar to the erythrocyte nucleus in position. The parasites lack the amoeboid structure.

**Macrogametocytes:** (Figs. 2-6) Parasite of a large size. Fully mature macrogametocytes completely encircle the erythrocyte nucleus; cytoplasm finely granular staining faint blue with Giemsa's stain; pigment granules small, black, usually scattered throughout the cytoplasm; parasite nucleus of small size, compact, dense, irregular in shape, and staining deep pink with Giemsa's stain.

**Microgametocytes:** (Figs. 7-10) Parasite of large size. General configuration is completely different from that of macrogametocyte. The parasite never encircle the erythrocyte nucleus; host cell nucleus always displaced laterally almost to erythrocyte periphery; cytoplasm staining deep pink with Giemsa's stain; pigment granules medium size, black, clumped at one or both ends of the containing space.
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parasite, usually less in number than in macrogametocyte; parasite nucleus of large size, diffuse and ill-defined.

**Type Material:** Blood film No. NB665 deposited in the collection of The Invertebrates and Parasitology section, Iraq Natural History Museum, University of Baghdad taken from stone curlew by the author on November 1990.

**Paratype Material:** Blood films Nos. NB665, NB667, NB 668 (same informations for type material).

**DISCUSSION**

The haemoproteids are well known to be family specific (Bennett *et al.* 1982), and since no species had been described from the avian family burhinidae, therefore it is reasonable to consider this parasite as a new taxon.

*Haemoproteus burhinus* sp. n. is similar to *H. peireci* of the family Ciconiidae (Ciconiformes) reported by Forrester *et al.* (1977) depending on Wenyon's illustration in; 1. the macrogametocyte completely encircle the erythrocyte nucleus and 2. the pigment granules are larger in microgametocyte than those of macrogametocyte. However, both species could be separated by; 1. *Haemoproteus burhinus* highly hypertrophied the erythrocyte (table 1) while no hypertrophy occurs in *H. peireci* infection, and 2. the erythrocyte nucleus is always (but not sometimes as *H. peireci* infection) laterally displaced in microgametocyte.
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Table 1. A comparison of unparasitized and parasitized erythrocytes (N = 30)

<table>
<thead>
<tr>
<th></th>
<th>unparasitized erythrocyte</th>
<th>erythrocyte macro-</th>
<th>parasit. micro-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erythrocyte length</td>
<td>11.4(1.6)</td>
<td>12.3(1.4)</td>
<td>12.5(1.1)</td>
</tr>
<tr>
<td>width</td>
<td>7 (0.5)</td>
<td>8.2(0.9)</td>
<td>7.3(1.0)</td>
</tr>
<tr>
<td>area</td>
<td>62.7(6.2)</td>
<td>71.1(8.3)</td>
<td>70.4(8.1)</td>
</tr>
<tr>
<td>Erythrocyte nucleus length</td>
<td>6.3(0.6)</td>
<td>5.9(0.7)</td>
<td>5.5(0.7)</td>
</tr>
<tr>
<td>width</td>
<td>2.2(0.2)</td>
<td>2.0(0.1)</td>
<td>2.7(0.2)</td>
</tr>
<tr>
<td>area</td>
<td>12.2(1.9)</td>
<td>10.3(1.9)</td>
<td>16.6(2.3)</td>
</tr>
<tr>
<td>% area of nucleus to total area</td>
<td>19.4(3.5)</td>
<td>13.3(2.1)</td>
<td>23.6(3.5)</td>
</tr>
</tbody>
</table>

NDR  
0.5  0.9

Table 2. Measurements of macro- and microgametocytes of Haemoproteus burhinus sp. n. (N = 30)

<table>
<thead>
<tr>
<th></th>
<th>macrogametocyte</th>
<th>microgametocyte</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parasite length</td>
<td>21.8(4.1)</td>
<td>12.0(1.5)</td>
</tr>
<tr>
<td>width</td>
<td>3.2(0.1)</td>
<td>4.7(0.5)</td>
</tr>
<tr>
<td>area</td>
<td>51.5(9.3)</td>
<td>56.2(10.4)</td>
</tr>
<tr>
<td>% erythrocyte-parasite complex</td>
<td>62.14</td>
<td>74.33</td>
</tr>
<tr>
<td>Parasite nucleus length</td>
<td>2.8(0.2)</td>
<td>7.3(1.0)</td>
</tr>
<tr>
<td>width</td>
<td>2.2(0.2)</td>
<td>4.6(0.2)</td>
</tr>
<tr>
<td>area</td>
<td>4.1(0.8)</td>
<td>37.5(4.3)</td>
</tr>
<tr>
<td>% area of parasite</td>
<td>5.9</td>
<td>49.6</td>
</tr>
<tr>
<td>No. of pigment granules</td>
<td>15.6</td>
<td>8.2</td>
</tr>
</tbody>
</table>

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The immature macrogametocyte gradually encircles the host cell nucleus as it grows, and once it becomes fully mature the erythrocyte nucleus is then completely encircled. While the microgametocyte gradually pushing the nucleus toward the cell border and when it is fully mature it is difficult to differentiate between the erythrocyte and its nucleus borders.

The results clearly show a strong dimorphism between macro- and microgametocyte, not only in staining characters but in NDR (0.5 for macro-, 0.9 for micro-) and in the number and size of pigment granules (15.6 small size in macro-, 8.2 medium size in micro-).

The collection site (Al-Attariya) seems to support high vector potentiality since the infection rate is very high (87.5%) and a large number of different stages of the parasite could be easily seen in a single blood film. For this, the described haemoproteid probably establish a good population among the members of this bird species.
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LITERATURE CITED


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وصف نوع جديد من طفليات الدم في طير الكروان الصحراوي في العراق

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الفلاصة

تم وصف نوع جديد من طفليات الدم Haemoproteus burhinus sp. n.

من طير الصحراوي الذي يجتمع في منطقة المطارية (وسط العراق). إن هذا النوع الجديد يشبه النوع H. peircei ولكن يتميز بأنه يضخم حجم الكريات الدم الحمراء المشابهة ويزيح نواة الكريات الحمراء دائما إلى الجانب الذي

الإشاج الذكريّ