

**SINGLE AND MIXED BLOOD PROTOZOA INFECTION
WITH *ANAPLASMA* AND *THEILERIA* IN BUFFALOES
(*BUBALUS BUBALIS*) IN BAGHDAD - IRAQ**

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SUMMARY

One hundred & six blood smears from buffaloes, slaughtered at Al- Futhaliya slaughter house in Baghdad, were examined. Ages of buffaloes ranged from 6 months to 10 years. Numbers of positive blood smears were 48 (45.28%) , of them only one showed clinical signs. Single, double, and triple protozoal infections with *Anaplasma centrali* , *Anaplasma marginale*, and *Theileria annulata*, were found. The most common type of infection was the *Anaplasma marginale* (22.64%), while *Anaplasma centrali* and *Anaplasma centrali* + *Theileria annulata* (0.94%) each. This investigation confirmed the presence of *Anaplasma centrali* infection in buffaloes for the first time.

الإصابة المفردة والمختلطة للدم بأوالي الأنابلازما والثاليريا في الجاموس في بغداد

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الخلاصة

شملت الدراسة فحص 106 مسحة دموية من الجاموس المحلي المذبوح في مجزرة الفضيلية في مدينة بغداد. تراوحت أعمار الحيوانات التي أخذت منها العينات بين 6 شهور و10 سنوات. أما عدد الحالات الموجبة فبلغت 48 حالة (% 45.28) منها واحدة أظهرت العلامات السريرية. من خلال الفحص لوحظت الإصابة المفردة والمزدوجة والثلاثية بطفيليات الدم *Anaplasma centrali* و *Anaplasma marginale* و *Theileria annulata*. سجلت الإصابة المفردة بـ *Anaplasma marginale* أعلى نسبة إذ بلغت (% 22.64) وأوطأ نسبة إصابة مفردة بـ *Anaplasma centrali* والإصابة المزدوجة بـ *Theileria annulata* + *Anaplasma centrali* إذ بلغت (% 0.94) لكل منها. سجلت هذه الدراسة الإصابة *Anaplasma centrali* في الجاموس لأول مرة.

INTRODUCTION

Blood protozoa are important diseases found in different species of animals in Iraq^(1,2). The recorded genera and species of blood protozoa in buffaloes, in Iraq, are *Anaplasma marginale*⁽³⁾ and *Theileria annulata*^(4,5).

Clinical signs depend on the genus of the protozoa and its numbers. Because of the importance of blood protozoa and the scanty research on such protozoa in buffaloes, this investigation was designed to record single and mixed blood protozoa infection with *Anaplasma*, *Babesia*, and *Theileria* in buffaloes using blood smears.

MATERIALS AND METHODS

The study included 106 blood samples collected from buffaloes from AL Futhaliya slaughterhouse from 1/2/1999 till 1/9/1999. Ages of buffaloes ranged from 6 months to 10 years, and most of them were about 8 months to 2.5 years old. Percentage of males was 85% while percentage of females was 15%. Thin and thick blood smears were made and stained with Giemsa stain after fixation with absolute methanol and examined under the oil immersion lens⁽⁶⁾.

RESULTS

Examination of the blood smears revealed single double and triple protozoal infection. The total percentage of infection was 45.28%.

The highest percentage of infection was with *Anaplasma marginale* (22.64%), followed by mixed infection with *Anaplasma. Centrali*+ *Theileria annulata* (10.38%), then mixed infection with *Anaplasma centrali*+ *Anaplasma marginale* (5.66%), followed by single infection with *Theileria annulata* (2.83%) then triple infection with *Anaplasma. Centrali*+ *Anaplasma marginale* + *Theileria annulata* (1.89%), and finally with *Anaplasma centrali* and *Anaplasma centrali* + *Theileria annulata* (0.94%) each (Fig. 1&2). The distribution and number of cases as shown in Table 1.

All smears were negative for *Babesia* protozoa.

Table 1: Distribution of parasitic blood protozoa in the buffaloes in Baghdad area.

Type of infection	Species of protozoa	Positive Number	%
Single	<i>Anaplasma centrali</i>	1	0.94
Single	<i>Anaplasma marginale</i>	24	22.64
Single	<i>Theileria annulata</i>	3	2.83
Double	<i>A. centrali</i> + <i>A. marginale</i> ,	6	5.66
Double	<i>A. centrali</i> + <i>T. annulata</i>	1	0.94
Double	<i>A. marginale</i> + <i>T. annulata</i>	11	10.38
Triple	<i>A. centrali</i> + <i>A. marginale</i> + <i>T. annulata</i>	2	1.89
Total		48	45.28

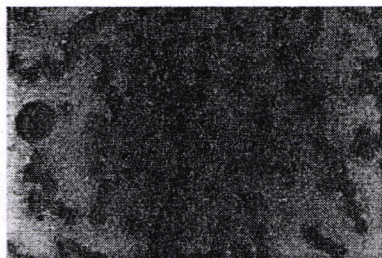


Figure 1: *Anaplasma, centrali* in the center of a buffalo RBC.



Figure 2: *Anaplasma marginale* and *Theileria annulata* both inside buffalo RBCs.

DISCUSSION

This investigation revealed the presence of *A. centrali*, *A. marginale*, and *T. annulata* in local buffaloes. In spite of the confirmation of *A. marginale* by AL-Saad⁽³⁾, *T. annulata* by Haddow and Latif⁽⁴⁾, and Latif and Jasim⁽⁵⁾. In this study *A. centrali* is being recorded for the first time. Only one case positive for *A. marginale* showed obvious clinical signs while the remaining of the positive cases with single, double, or triple infections did not show clinical signs and they were either carrier or sub-clinically infected and these results are in agreement with others^(7,8,2). The absence of *Babesia* in buffaloes does not confirm its absolute absence in Iraqi buffaloes, but could be attributed to the limited number of

samples examined or the absence of the vector (tick) in this specific area of Iraq. This is in agreement with⁽⁸⁾ where experimental infection of buffalo (yearlings) with *B. bigemina* elicited, no clinical response and parasites were not present in the erythrocytes. Further studies are recommended with large number of animals, other techniques, and different areas could highlight the presence or absence of *Babesia* in buffaloes because *Babesia bigemina* in cows has been confirmed in Iraq by laboratory method since 1957⁽¹¹⁾.

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