Detection of *Eimeria* spp. of sheep in Wasit province-Iraq

Zeid M Al-Saadoon and Haider MA Al-Rubaie

**Abstract**

This study was conducted to estimate the prevalence of sheep *Eimeria* spp. in Wasit Province-Iraq during the period from 1 January -2017 to 30 July 2017. A total of 120 sheep faecal samples were collected from four regions (Alkut, Al-Nunamiyah, Al-Hay and Badra). Oocysts of *Eimeria* species were found in 69 (57.5%) of samples. The present study recorded highest prevalence of *Eimeria* parasite infection in February (85%) and March (65%) and lowest infection in June (30%). Ten species of *Eimeria* were recorded which included; *E. ahsata, E. parva, E. pallida, E. bakuensis, E. ovinoidalis, E. crandallis, E. faurei, E. intricata, E. weybridgei* and *E. granulosa*.

**Keywords:** wasit (Iraq), sheep, *Eimeria*, detection

1. **Introduction**

Sheep plays an important role in the economy of the families. They are bred primarily as a source of meat and milk, which is preferred from other livestock [1]. They are infected by different external and internal parasitic diseases [2], such as eimeriosis, that caused by the intracellular protozoa belong to *Eimeria* sp. [3]. This disease is found probably in all animals and can be a significant problem in the younger ones [4]. Eimeriosis in domestic animals becomes an economically important problem with the introduction of intensive rearing systems [5]. Ingested of infected food and water are the main source of infection and the symptoms of the disease begin with diarrhea, sometimes containing mucus and/ or blood, loss appetite, weight loss, anemia, fatigue, wool breaking and finally death of the animal. The morbidity of the disease maybe reach 10-40% and the mortality about 10% [9, 10]. Different species of *Eimeria* and mixed infections were recorded [6], and *E. ovinoidalis, E. bakuensis, E. crandallis* and *E. ahsata* were considered to be the most pathogenic species or major concerns in sheep [22]. Different infection rates were recorded in the different countries in the world ranged between 19.2% - 93.4%) [2, 7, 8]. Due to the importance of sheep eimeriosis, this study was designed to estimate the prevalence and species that infected sheep in Wasit Province-Iraq.

2. **Materials and Methods**

2.1 **Animals:** A total of 120 fresh sheep faecal samples (58 males and 62 females) were collected randomly from various farms in four districts, Al-Kut (30 animals), Al-Nunamiyah (30 animals), Al-Hay (30 animals) and Badra (30 animals) in Wasit province during the period from 1 January -2017 to 30 July 2017.

2.2 **Samples:** The faecal samples were directly collected from the rectum and kept in screw-capped plastic containers, then transported to the Department of Parasitology, Veterinary Medicine College, Baghdad University-Baghdad –Iraq for further examination.

2.3 **Laboratory examination:** Fecal samples were subjected to microscopic examination for detection and identification the *Eimeria* oocysts by the direct wet smear, microscopic examination, the floatation method with saturated NaCl solution and sporulation and morphological characteristics of the oocysts were done according to two methods obtained by several researchers [12, 13, 14, 15].

2.4 **Statistical analysis**

The data were analyzed statistically using the Chi-Square test (SPSS).
3. Results
Among 120 sheep examined in the Wasit province, 69 (57.5%) was found to harbor the *Eimeria* oocysts (Table 1) and no significant (P > 0.05) difference was recorded between gender (Table 2). The highest infection rates were found on February (85%) and March (65%) months and lowest infection rates was recorded on June (30%), (Table 3). A significant (P < 0.05) differences were found among different areas (Badra (83.33%), Al-Kut (36.66%) (Table 4).

Ten *Eimeria* species were identified according to the characteristic features of the infected sheep, that were *E. ahsata*, *E. parva*, *E. pallida*, *E. Bulkiness* (syn: *E. Ovine*), *E. ovinoidalis*, *E. crandallis*, *E. faurei*, *E. Intricate*, *E. weybridgensis*, *E. granulosa* and the most common *Eimeria* species were *E. ahsata* (22.5%), *E. bakuensis* (ovine) (20%), *E. Intricate* (21.66%) and *E. parva* (18.33%), while *E. weybridgensis* was observed at smallest proportion (2.5%) of samples (Table 5).

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Table 1: Total infection rate of *Eimeria* sp.

<table>
<thead>
<tr>
<th>Samples</th>
<th>Positives</th>
<th>Negatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>69 (57.5%)</td>
<td>51 (42.5%)</td>
</tr>
</tbody>
</table>

Table 2: Infection rate of *Eimeria* sp. according to gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>No. of samples examined</th>
<th>Positives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>58</td>
<td>31 (53.44%)</td>
</tr>
<tr>
<td>Female</td>
<td>62</td>
<td>38 (61.29%)</td>
</tr>
</tbody>
</table>

Table 3: Infection rate of *Eimeria* sp. according to the months

<table>
<thead>
<tr>
<th>Months</th>
<th>No. of samples examined</th>
<th>Positives</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>20</td>
<td>9 (45%) c</td>
</tr>
<tr>
<td>February</td>
<td>20</td>
<td>17 (85%) a</td>
</tr>
<tr>
<td>March</td>
<td>20</td>
<td>13 (65%) b</td>
</tr>
<tr>
<td>April</td>
<td>20</td>
<td>12 (60%) b</td>
</tr>
<tr>
<td>May</td>
<td>20</td>
<td>12 (60%) b</td>
</tr>
<tr>
<td>June</td>
<td>20</td>
<td>6 (30%) d</td>
</tr>
</tbody>
</table>

Table 4: The infection rate of *Eimeria* sp. in Wasit Province, according to the areas of the study.

<table>
<thead>
<tr>
<th>Areas</th>
<th>No. of samples examined</th>
<th>Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kut</td>
<td>30</td>
<td>11 (36.66%)</td>
</tr>
<tr>
<td>Al-Numaniyah</td>
<td>30</td>
<td>16 (53.33%)</td>
</tr>
<tr>
<td>Al-Hayy</td>
<td>30</td>
<td>17 (56.66%)</td>
</tr>
<tr>
<td>Badra</td>
<td>30</td>
<td>25 (83.33%)</td>
</tr>
<tr>
<td>Chi square value</td>
<td></td>
<td>13.74</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td>0.003</td>
</tr>
</tbody>
</table>
Sporulated and unsporulated *E.ovina*

Sporulated and unsporulated *E.ahsata*

Sporulated and unsporulated *E.granulosa*

Sporulated and unsporulated *E.crandallis*

Sporulated and unsporulated *E.intricata*

Sporulated and unsporulated *E.weybridgetensis*

Sporulated and unsporulated *E.faueri*

Sporulated and unsporulated *E.oinoidalis*

Sporulated and unsporulated *E.pallida*

Sporulated and unsporulated *E.parva*

Fig 1: *Eimeria* sp. of sheep sporulated and nonsporulated
4. Discussion
A highest infection rate was recorded in Wasit province (57.5 %). This result is within the range 19.2 – 91.02% obtained by several researches [23, 24, 25, 26, 27, 28, 30, 31]. From 15 Eimeria species were described in sheep by Platzer et al. [16], ten Eimeria spp were identified in the present study (E. ahsata, E. parva, E. ovinaodalis, E. bakunensis, E. faurei, E. Intricate). Similar results were documented in Iran by Yakhchali and Golami [17], but E. gonzalezi, E. gilruthi, E. punctata and E. dali were not recorded in this study. The differences in the prevalence depend on different factors such as the environment, breed, sex and farm management. It was found that 89.3% of sheep had mixed infections by different types of Eimeria and at least 2-10 species has been previously reported [17, 18]. The most prevalent species was E. ahsata that agreed with Galip [19]. E. ovinaodalis was the predominant species in surveys that have been carried out in Germany [20], Gahna [18], Brazil and Iran [17, 21]. On the other hand, E. bakunensis and E. ahsata were found to be the most prevalent species in sheep of the present study.

5. Conclusion
The results of the present study provide relevant “base-line” data for the types of Eimeria sp. in Wasit province and assessing the effectiveness of future control strategies against eimeriosis in sheep.

6. Acknowledgement
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7. References
14. Pout DD. Coccidiosis of lamb’s III. The reaction of the small intestinal mucosa to experimental infection Eimeria arlengni B and E crandallis. IV. The clinical response to infection Eimeria arlengni B crandallis in laboratoryreared lambs British Veterinary Journal. 1974; 130:54-60.


