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Otodectes cynotis infestation in domestic cats and its effects on hematological parameters in Nasiriyah, Iraq

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Novelty Statement: This study provides additional insight into the occurrence of Feline otodectosis in domestic cats and evaluates its impact on hematological parameters, providing additional information on the systemic effects of ear mite infestation in these cats.

Abstract: Background: This study aimed to determine the prevalence of Otodectes cynotis infestation in domestic cats and evaluate its effects on selected hematological parameters, including red blood cell count (RBC), hemoglobin concentration (HGB), hematocrit (HCT), mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC), red cell distribution width (RDW-CV and RDW-SD), platelet count (PLT), mean platelet volume (MPV), platelet distribution width (PDW), plateletcrit (PCT), platelet large cell ratio (P-LCR), lymphocytes (LYM), middle cells (MID), and granulocytes (GRAN). A total of 150 cats were examined over a six-month period from June 2025 to January 2026 in Nasiriyah, southern Iraq. Ear swab samples were collected and examined microscopically for the presence of mites and their developmental stages, while blood samples were analyzed using an automated complete blood count (CBC) analyzer. The results, compared to non-infected cats, showed that 90 out of 150 cats (60%) were infected with *O. cynotis*. No statistically significant differences ($P > 0.05$) were observed between infected and non-infected cats for all hematological parameters examined. Regarding white blood cell differentials, infected cats showed slightly lower total white blood cell counts and granulocyte counts, suggesting a localized inflammatory response rather than a systemic one. The study concludes that *O. cynotis* infestation is relatively common among domestic cats in the study area, but it has a limited effect on most hematological parameters. Routine microscopic examination of ear swabs remains an effective diagnostic method for detecting ear mite infestation in cats.

Keywords:*Otodectes cynotis*, ear mites, Feline otodectosis, hematological parameters, , otitis externa

Introduction

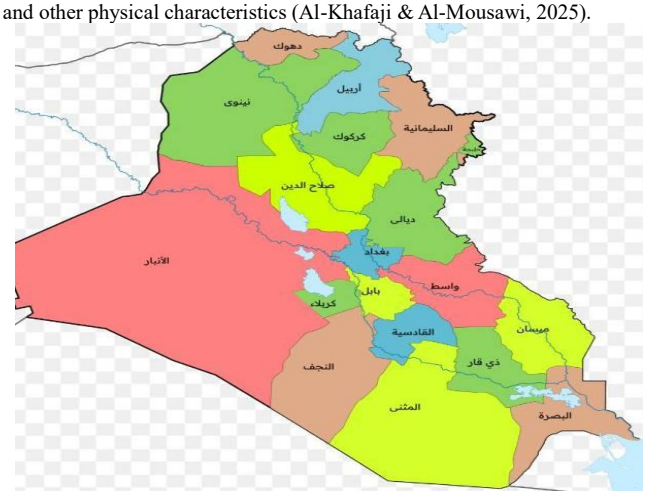
Otodectes cynotis is a global ectoparasitic mite that is a member of the genus Otodectes and family Psoroptidae. It mostly causes otodectic mange in dogs and cats and is commonly observed in companion animals (Acar & Yipel, 2016; Yang & Huang, 2016). The external ear canal is the primary habitat of this non-burrowing parasite, however it may infect other carnivores such as ferrets and foxes (Lefkaditis et al., 2021).

O.cynotis is an obligatory parasite that frequently causes otitis externa in domestic animals. It resides on the epithelial lining of the vertical and horizontal ear canal and feeds on tissue fluids and epidermal debris (Wall & Shearer, 2001). Infestation affects dogs, foxes, ferrets, and even people, however it is most commonly documented in young cats (Scott et al., 2001; Lefkaditis et al., 2009; Chen et al., 2008; Beugnet et al., 2014). The parasite's whole life cycle takes place inside the ear canal and consists of the egg, larval, nymphal, and adult stages, which are typically completed in three weeks. Direct physical contact between animals particularly between mothers and their newborns is the primary means of transmission. As a result, infestation is one of the most frequent parasite infestations in cats globally and is extremely common in stray, neglected, and young animals (Scott et al., 2001; Beck et al., 2018; Mullen & O'Connor, 2019). Otitis externa, ear discharge, pruritus, and dermatitis affecting the head, neck, and ears are among the clinical signs of *O. cynotis* infestation in carnivorous animals (Aydın et al., 2025). Infested animals frequently display intense itching, head shaking, and scratching activity, which may develop to skin sores and subsequent bacterial infections. In severe instances, problems such as purulent inflammation, ear bleeding, and torticollis may arise, and lesions may expand to the face area, neck, and limbs (Scott et al., 2001; Lefkaditis et al., 2021). A dark brown ceruminous tic exudate is a distinctive symptom in the afflicted animals, and additional clinical indicators during ear examination include erythema, pruritus, and coffee-ground-like (Sotiraki et al., 2001). Although *O.cynotis* is extensively spread globally, most reports of infestations have focused exclusively on cats and kittens. Numerous studies have reported O.cynotis infection in cats in various parts of the world. For example, a European investigation revealed that ear mites were among the most often found ectoparasites in household cats and dogs, demonstrating their extensive range and significance for veterinary care (Beugnet et al., 2014). Ear mites are still a frequent parasite issue in companion animals in North Africa and the Middle East, according to a recent study done in Egypt that found *O. cynotis* infection in domestic cats (El-Dakhly et al., 2024). Numerous studies have been carried out in Iraq to ascertain the frequency of *O. cynotis* infection in cats across various areas. In one of the first known findings, Kallo (2004) tested 50 domestic cats in Baghdad and discovered that 3 of them had an *O. cynotis* infestation, indicating a 6% prevalence rate.Ear mite infestation is still somewhat widespread among cats brought to veterinary clinics, according to a more recent study carried out in Fallujah, which found that 51 out of 140 tested cats had *O.cynotis* infection(prevalence rate of 36.4%) (Hussein et al., 2024). Another study conducted in the province of Karbala found that 86 of the 187 cats evaluated had an *O.cynotis* infection, indicating a significant incidence of ear mite infestation among domestic cats in that area (Ghufran et al., 2025). Furthermore, *O.cynotis* was found in 91 out of 150 cats studied in a study carried out in Babylon province, demonstrating the parasite's widespread dissemination among cats in several Iraqi locations (Al-Khafaji & Al-Musawi, 2025). Although *O.cynotis* infestation has been the subject of several researches in other Iraqi regions, little is known about the parasite's epidemiology and hematological consequences in Nasiriyah city. In order to better understand the prevalence and hematological aspects of *O.cynotis* infestation in household cats in Nasiriyah, the current study was carried out. In addition to adding to the little knowledge on ear mite infestation in southern Iraq, this study attempts to give current data on the prevalence of this parasite and its possible influence on hematological parameters.

Materials and Methods

•Collection of Mite's

Over a six-month period from June 2025 to January 2026, samples were collected from 150 cats in Nasiriyah, a city in southern Iraq characterized by hot summers and mild winters (Figure1). Ear swabs were taken for microscopic inspection, followed by blood sampling. A Havahart trap (United States) was used for capture (Figure 2). Examination of ear mites under a light microscope revealed various developmental stages, from eggs to adult males and females. Mites were identified using taxonomic keys based on size, shape, and other physical characteristics (Al-Khafaji & Al-Mousawi, 2025).



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(Figure1) location of study in Iraq

(Figure 2) Havahart trap

• **Microscopic examination as well as preparation:** A sterile cotton swab was inserted into the cat's ear, and a small amount of ear cleaning oil was added to facilitate sample collection. The swab sample was placed on a sterile glass slide. After applying a thin layer, the sample was examined under a microscope at 10x magnification to detect parasites and identify mite stages, including adults, nymphs, and eggs. The presence of any parasite stage indicates infestation (Bowman, 2021; Figure3).

Figure (3) Coffee-colored waxy excretion collected from the infected ear

•**Blood Collection from Cats:** Of the 150 cats examined, 90 showed signs of infection. Blood samples were collected from both infected and non-infected cats for comparison. A sterile 23-gauge syringe with a secure needle was used to draw blood from the femoral after sterilization of the area (Figure4). Blood was immediately placed in tubes containing an anticoagulant to prevent clotting. The tubes were transported to the laboratory in a cooled container to preserve sample integrity. A complete blood count (CBC) analyzer was used for analysis upon arrival (Figure5). Red blood cell count, white blood cell count, hemoglobin, and platelet count were examined. All test results were recorded (Weiss & Wardrop, 2010; Harvey, 2012).

Figure(4) Blood sample collection from the femoral vein of a cat for hematological analysis

Figure(5)CBC analyser

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Statistical analysis: Data were analyzed using SPSS software (Version 25.0, IBM Corp., Armonk, NY, USA). The chi-square (χ^2) test was used to assess associations between categorical variables. Results were expressed as frequencies and percentages. A p-value ≤ 0.05 was considered statistically significant.

Ethical committee approval :- This study was approved by memberes of scientific committee of college of veterinary medicine, university of Shatrah

Date: September (1,2025)

Approval number:SU-EC-2025-1

Results:• Prevalence rate: There was a notable distinction between positive and negative instances in the data displayed in Table 1. Sixty percent of the cats under examination had an *O. cynotis* infection. Ninety (60%) of the 150 cats who were part in the study were positive, and sixty (40%) were negative.

Table 1. Prevalence of *O.cynotis* infestation in examined cats

Total number of cats	Positive cases N (%)	Negative cases N (%)	Prevalence rate (%)
150	90 (60)	60 (40)	60
χ^2	6		
Df	1		
P	0.014		
Chisquare = χ^2 , Degrees of freedom =df , P≤0.05			

Comparison of RBC, HGB, and HCT : Red blood cell count (RBC), hemoglobin (HGB), and hematocrit (HCT) do not significantly differ between healthy and *O.cynotis*-infected Shirazi cats (Table 2). In comparison to the healthy group (RBC: 7.88 ± 0.92 ×10⁶/µL, HGB: 11.83 ± 1.34 g/dL, HCT: 40.30 ± 4.36%), the infected group had slightly lower mean values for RBC, HGB, and HCT (RBC: 7.44 ± 1.27 ×10⁶/µL, HGB: 11.41 ± 1.56 g/dL, HCT: 37.19 ± 5.64%). However, no significant differences were found between the two groups for any of the measured parameters (RBC: t = 0.756, P = 0.296; HGB: t = 0.586, P = 0.912; HCT: t = 1.208, P = 0.338) according to statistical analysis using the independent t-test.

Table (2): Comparison of RBC, HGB, and HCT Between Healthy and Infected Male Shirazi Cats Infested with *O.cynotis* . (Mean ± SD)

Parameter	Healthy Group		Infected Group		t-test	P-value
	Mean ± SD	N	Mean ± SD	N		
RBC (10⁶/µL)	7.8767 [a]± 0.91736	5	7.4362 [a]±1.27378	16	0.756	0.296
HGB (g/dL)	11.833 [a]± 1.34114	5	11.406 [a]±1.56181	16	0.586	0.912
HCT (%)	40.300 [a]± 4.36394	5	37.186 [a]±5.64091	16	1.208	0.338

- P ≤0.05 The values marked with different small letters indicate statistically significant differences at the (P ≤ 0.05) level.

Comparison of RBC, HGB, and HCT :

The findings revealed minor differences in RBC, HGB, and HCT values between male local breed cats infected with *O. cynotis* and healthy cats. The infected group had a statistically significant increase in RBC (P ≤ 0.05), but HGB and HCT did not differ significantly (P > 0.05).

Table (3): Comparison of RBC, HGB, and HCT Between Healthy and Infected Male Local Breed Cats Infested with *O.cynotis* . (Mean ± SD)

Parameter	Healthy Group		Infected Group		t-test	P-value
	Mean ± SD	N	Mean ± SD	N		
RBC (10⁶/µL)	8.317 ± 0.451	4	8.5820 ± 0.864	15	-0.582	0.043
HGB (g/dL)	13.100 ± 2.270	4	13.173 ±1.368	15	-0.083	0.218
HCT (%)	43.080 ±3.949	4	40.90 ± 4.302	15	-0.965	0.798

≤0.05 The values marked with different small letters indicate statistically significant differences at the (P ≤ 0.05) level.

MCV, MCH, MCHC, RDW-CV, and RDW-SD comparison:

MCV, MCH, MCHC, RDW-CV, and RDW-SD did not differ significantly between healthy and infected Shirazi cats with Otodectes cynotis (Mean ± SD), according to the data displayed in table (4-2). MCV: 51.38 ± 4.69 fL vs. 47.92 ± 6.55 fL; MCH: 15.23 ± 1.89 pg vs. 14.74 ± 2.18 pg; MCHC: 295.67 ± 13.95 g/L vs. 307.40 ± 16.82 g/L; RDW-CV: 0.166 ± 0.010; RDW-SD: 27.12 ± 2.26 for healthy and infected cats, respectively. No significant differences were found between the healthy and infected groups for any of the parameters, according to statistical analysis using the independent t-test.

Table (4): Comparison of MCV, MCH, MCHC, RDW-CV and RDW-SD Between Healthy and Infected Male Shirazi Cats Infested with *O.cynotis* . (Mean ± SD)

Parameter	Healthy Group		Infected Group		t-test	P-value
	Mean ± SD	N	Mean ± SD	N		
MCV (fL)	51.38 [a] ± 4.69	5	47.92 [a] ± 6.55	16	1.173	0.667
MCH (pg)	15.23 [a] ± 1.89	5	14.74 [a] ± 2.18	16	0.485	0.850
MCHC (g/L)	295.67 [a] ± 13.95	5	307.40 [a] ± 16.82	16	-1.507	0.339
RDW-CV (%)	0.166 [a] ± 0.017	5	0.173 [a] ± 0.010	16	-1.138	0.426
RDW-SD(%)	27.12 [a] ± 2.26	5	26.79 [a] ± 3.59	16	0.207	0.237

- P ≤0.05 The values marked with different small letters indicate statistically significant differences at the (P ≤ 0.05) level.

MCV, MCH, MCHC, RDW-CV, and RDW-SD comparison:

MCV, MCH, MCHC, and RDW-SD did not differ statistically significantly between the two groups (P > 0.05). RDW-CV, on the other hand, revealed a significant difference (P < 0.05).

Table (5): Comparison of MCV, MCH, MCHC, RDW-CV and RDW-SD Between Healthy and Infected Male Local Breed Cats Infested with *O.cynotis* . (Mean ± SD)

Parameter	Healthy Group		Infected Group		t-test	P-value
	Mean ± SD	N	Mean ± SD	N		
MCV (fL)	49.125±3.560	4	49.873 ±2.879	15	-0.442	0.702
MCH (pg)	15.72 ± 2.428	4	15.420 ±1.600	15	0.305	0.468
MCHC (g/L)	318.50 ±28.384	4	300.866 ±21.931	15	1.351	0.590
RDW-CV (%)	0.1742±.003	4	0.17040 ±.0138	15	0.543	0.029
RDW-SD(%)	27.500 ± 2.076	4	27.486 ±2.665	15	0.009	0.285

P ≤0.05 The values marked with different small letters indicate statistically significant differences at the (P ≤ 0.05) level.

PLT, MPV, PW, PCT, and PLCR comparison:

Table 6 shows that healthy cats had greater platelet counts (PLT), platelet crit (PCT), and platelet large cell ratios (PLCR) than infected cats, although these differences were not statistically significant (P > 0.05). On the other hand, there were significant differences in mean platelet volume (MPV) and platelet distribution width (PDW) between the two groups (P < 0.05), with PDW somewhat greater in infected cats and MPV higher in healthy cats.

Table (6): Comparison of PLT, MPV, PDW, PCT and PLCR Between Healthy and Infected Male Shirazi Cats Infested with *O.cynotis* . (Mean ± SD)

Parameter	Healthy Group		Infected Group		t-test	P-value
	Mean ± SD	N	Mean ± SD	N		
PLT(×10⁹/L)	211.6667 ± 88.6874	6	101.9333 ± 86.95768	15	2.599	.207
MPV(fL)	8.9333 ± 1.74203	6	8.2533 ± 0.72788	15	1.291	.046
PDW(%)	13.3167± 1.61173	6	13.6067± 0.47879	15	-.650	.033
PCT(%)	1.9550 ±0.96006	6	0.8233± 0.65934	15	3.123	.491
PLCR(%)	0.2220 ± 0.15157	6	0.0838± 0.11985	15	2.219	.627

- P ≤0.05 The values marked with different small letters indicate statistically significant differences at the (P ≤ 0.05) level.

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Comparison of PLT, MPV, PDW, PCT, and PLCR: PLT, MPV, PDW, and PCT:

did not significantly change between healthy and infected cats ($P > 0.05$). The infected group's PLCR increased statistically significantly ($P < 0.05$).

Table (7): Comparison of PLT, MPV, PDW, PCT and PLCR Between Healthy and Infected Male Local Breed Cats Infested with *O.cynotis* . (Mean ± SD)

Parameter	Healthy Group		Infected Group		t-test	P-value
	Mean ± SD	N	Mean ± SD	N		
PLT(×10⁹/L)	150.50 ±62.506		206.133±127.068		-.836	0.126
MPV(fL)	8.125±0.330		8.453±0.855		-.739	0.118
PDW(%)	13.600±0.48305		13.7067±0.389		-.465	0.779
PCT(%)	1.467±0.472		1.771±1.077		-.541	0.139
PLCR(%)	0.1078±0.012		0.1465±0.12261		-.619	0.010

- P ≤0.05 The values marked with different small letters indicate statistically significant differences at the (P ≤ 0.05) level.

White blood cell count comparison:

Total white blood cell count (WBC), absolute lymphocyte, middle cell, and granulocyte counts were marginally lower in infected cats than in healthy ones, according to the results show .however, these differences were not statistically significant ($P > 0.05$). On the other hand, the differential percentages revealed significant differences between the groups: granulocyte percentage was greater in infected cats ($P = 0.033$), but lymphocyte percentage and middle cell percentage were marginally higher in healthy cats ($P = 0.013$ and $P = 0.026$, respectively).

Table (8): Comparison of total and deferential WBC count Between Healthy and Infected Male Shirazi Cats Infested with *O.cynotis* . (Mean ± SD)

Parameter	Healthy Group		Infected Group		t-test	P-value
	Mean ± SD	N	Mean ± SD	N		
WBC (×10³/µL)	8.78 ± 1.93	6	7.98 ± 2.99	15	0.605	0.233
Lymphocyte (×10³/µL)	7.33 ± 1.79	6	6.33 ± 2.31	15	0.955	0.550
Middle cells (×10³/µL)	0.60 ± 0.54	6	0.49 ± 0.22	15	0.657	0.093
Granulocyte (×10³/µL)	1.03 ± 0.46	6	1.16 ± 0.54	15	-0.507	0.444
Lymphocyte %	80.20 ± 11.51	6	79.58 ± 3.09	15	0.198	0.013
Middle cells %	6.33 ± 5.33	6	6.29 ± 1.77	15	0.036	0.026
Granulocyte %	11.92 ± 4.87	6	14.07 ± 2.65	15	-1.323	0.033

- P ≤0.05 The values marked with different small letters indicate statistically significant differences at the (P ≤ 0.05) level.

White blood cell count comparison:

The total WBC and lymphocyte counts did not change significantly ($P > 0.05$). Granulocytes were significantly reduced in infected animals ($P < 0.05$).

Table (9) Comparison of total and deferential WBC count Between Healthy and Infected Male Local Breed Cats Infested with *O.cynotis* . (Mean ± SD)

Parameter	Healthy Group		Infected Group		t-test	P-value
	Mean ± SD	N	Mean ± SD	N		
WBC (×10³/µL)	11.400 ± 2.412	4	8.5667 ± 4.211	15	1.273	0.450
Lymphocyte (×10³/µL)	8.375 ± 2.670	4	7.133 ± 3.788	15	0.610	0.594
Middle cells (×10³/µL)	0.800 ± 0.336	4	0.453± 0.216	15	2.543	0.284
Granulocyte (×10³/µL)	2.225 ± 0.095	4	0.98± 0 0.644	15	3.771	0.047
Lymphocyte %	.7210.09496	4	0.828 ±0.09698	15	-1.974	0.892
Middle cells %	0.077 ± 0.059	4	0.053 ± 0.025	15	1.266	0.031
Granulocyte %	0.201 ± 0.038	4	0.1170±.07578	15	2.097	0.402

- ≤0.05 The values marked with different small letters indicate statistically significant differences at the (P ≤ 0.05) level.

Female Owned Cats:

RBC, HGB, and HCT comparison:

The female Shirazi cats infested with *O. cynotis* group had slightly lower RBC, HGB, and HCT findings than the healthy group, but this difference was not statistically significant.

Table (10): Comparison of RBC, HGB, and HCT Between Healthy and Infected Female Shirazi Cats Infested with *O. cynotis* . (Mean ± SD)

Parameter	Healthy Group		Infected Group		t-test	P-value
	Mean ± SD	N	Mean ± SD	N		
RBC (10⁶/µL)	7.8138 ± 0.9544	8	7.6758 ± 1.041	20	0.322	0.526
HGB (g/dL)	12.000 ± 1.394	8	11.660 ± 1.456	20	0.564	0.626
HCT (%)	40.925 ± 7.018	8	39.635 ± 4.432	20	0.587	0.144

- P ≤0.05 The values marked with different small letters indicate statistically significant differences at the (P ≤ 0.05) level.

RBC, HGB, and HCT comparison:

Infected female local cats showed slight increases in RBC, HGB, and HCT levels, but these variations were not statistically significant ($P > 0.05$).

Table (11): Comparison of RBC, HGB, and HCT Between Healthy and Infected Female Local Breed cats Infested with *O. cynotis* . (Mean ± SD)

Parameter	Healthy Group		Infected Group		t-test	P-value
	Mean ± SD	N	Mean ± SD	N		
RBC (10⁶/µL)	7.3000 ± 2.37410	5	8.5214+1.0800	7	-1.214	0.239
HGB (g/dL)	11.4800 ± 3.05074	5	14.028 ± 2.494	7	-1.594	0.536
HCT (%)	37.7200 ± 7.60441	5	44.700± 8.3090	7	-1.484	0.856

- ≤0.05 The values marked with different small letters indicate statistically significant differences at the (P ≤ 0.05) level.

MCV, MCH, MCHC, RDW-CV, and RDW-SD comparison:

The MCV, MCH, and MCHC values of the infected female Shirazi cats did not differ significantly, according to the results. Table (4-6) compares the *O. cynotis*-infested group to the control group. Conversely, the RDW-CV value of the infected female was significantly lower ($P < 0.05$) than that of the healthy group.Similarly, the infected group's RDW-SD exhibited a significantly significant drop ($P < 0.05$).

Table (12): Comparison of MCV, MCH, MCHC, RDW-CV and RDW-SD Between Healthy and Infected Female Shirazi Cats Infested with *O. cynotis* . (Mean ± SD)

Parameter	Healthy Group		Infected Group		t-test	P-value
	Mean ± SD	N	Mean ± SD	N		
MCV (fL)	52.1875 ± 4.282	8	51.025 ± 3.893	20	0.694	0.577
MCH (pg)	15.3625 ± 1.210	8	14.9950 ± 1.444	20	0.634	0.542
MCHC (g/L)	295.625 ± 25.082	8	294.55 ± 24.739	20	0.103	0.541
RDW-CV (%)	0.1740 ± 0.026	8	0.1595 ± 0.007	20	2.224	0.001
RDW-SD(%)	29.437 ± 5.371	8	26.4700 ± 1.736	20	2.247	0.000

- P ≤0.05 The values marked with different small letters indicate statistically significant differences at the (P ≤ 0.05) level.

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MCV, MCH, MCHC, RDW-CV, and RDW-SD comparison:

While MCH, MCHC, and RDW-SD revealed significant differences ($P \leq 0.05$), MCV and RDW-CV showed no significant differences ($P > 0.05$).

Table (13): Comparison of MCV, MCH, MCHC, RDW-CV and RDW-SD Between Healthy and Infected Female Local Breed Cats Infested with *O. cynotis* . (Mean ± SD)

Parameter	Healthy Group		Infected Group		t-test	P-value
	Mean ± SD	N	Mean ± SD	N		
MCV (fL)	47.7400 ± 20.00	5	48.871±3.176	7	-.150	0.062
MCH (pg)	19.060 ± 6.156	5	15.1857 ±1.300	7	1.645	0.040
MCHC (g/L)	287.600 ± 32.431	5	311.142 ±14.993	7	-1.706	0.009
RDW-CV (%)	0.1796 ±0.009	5	0.1694 ± 0.016	7	1.251	0.356
RDW-SD(%)	35.540 ± 8.034	5	26.628 ± 2.561	7	2.790	0.00

- ≤0.05 The values marked with different small letters indicate statistically significant differences at the ($P \leq 0.05$) level.

Comparison of PLT, MPV, PDW, PCT and PLCR:

PLT, MPV, PDW, PCT, and PLCR were all greater in the infected group than in the healthy group, according to the data shown in table (13); however, this difference was not statistically significant.

There was no discernible change between the two groups, but the infected group's PLT and MPVvalue increased somewhat. The infected group also showed a little increase in platelet distribution width (PDW), however this difference was not statistically significant. Furthermore, there was a little increase in plateletcrit (PCT) in the infected group as compared to the healthy group; however, this difference was not statistically significant.Similarly, there was no statistically significant difference between the two groups, but the infected group's platelet large cell ratio (PLCR) was somewhat higher.

Table (13): Comparison of PLT, MPV, PDW, PCT and PLCR Between Healthy and Infected Female Shirazi Cats Infested with *O. cynotis* . (Mean ± SD)

Parameter	Healthy Group		Infected Group		t-test	P-value
	Mean ± SD	N	Mean ± SD	N		
PLT(×10⁹/L)	132.14 ± 72.735	8	159.90 ± 65.414	20	-0.984	0.639
MPV(fL)	8.80 ± 0.910	8	9.18 ± 1.034	20	-0.906	0.500
PDW(%)	13.78 ± 0.443	8	13.92 ± 0.474	20	-0.717	0.839
PCT(%)	1.37 ± 0.505	8	1.45 ± 0.593	20	-0.330	0.918
PLCR(%)	0.18 ± 0.130	8	0.22 ± 0.152	20	-0.547	0.419

- P ≤0.05 The values marked with different small letters indicate statistically significant differences at the ($P \leq 0.05$) level.

PLT, MPV, PDW, PCT, and PLCR comparison:

No statistically significant variations were seen in any of the platelet parameters between female cats infected and those in good condition ($P > 0.05$).

Table (14): Comparison of PLT, MPV, PDW, PCT and PLCR Between Healthy and Infected Female Local Breed Cats Infested with *O.cynotis* . (Mean ± SD)

Parameter	Healthy Group		Infected Group		t-test	P-value
	Mean ± SD	N	Mean ± SD	N		
PLT(×10⁹/L)	23.860 ±4.954	5	116.1429 ± 20.899	7	-9.558	0.099
MPV(fL)	9.4600 ± 2.046	5	8.8429± 0.419	7	.790	0.049
PDW(%)	13.506 ± 0.277	5	13.7286 ± 0.446	7	-.980	0.546
PCT(%)	1.238 ± 0.527	5	1.5571 ±1.651	7	-.412	0.235
PLCR(%)	0.2184± 0.051	5	0.2147 ± 0.044	7	.133	0.615

- ≤0.05The values marked with different small letters indicate statistically significant differences at the ($P \leq 0.05$) level.

Comparison of White Blood Cell Count:

Results illustrated in table (4-8) showed a slightly higher increase in the total white blood cell count (WBC) in the infected group compared to the healthy group; however, this difference was not statistically significant . Similarly, lymphocyte count showed a higher mean value in the infected group, but the difference did not reach statistical significance. Granulocyte count also demonstrated a slight increase in the infected group with no significant difference between the two groups**.**

In contrast, the infected group's middle cell count decreased statistically significantly ($P \leq 0.05$) as compared to the healthy group. In terms of leukocyte percentages, there was no discernible variation between the two groups' lymphocyte percentages. But in the infected group, the proportion of intermediate cells was much smaller. Furthermore, the infected group's granulocyte percentage was significantly lower ($P \leq 0.05$) than that of the healthy group.

Table (15) Comparison of total and deferential WBC count Between Healthy and Infected Female Shirazi Cats Infested with *O.cynotis* . (Mean ± SD)

Parameter	Healthy Group		Infected Group		t-test	P-value
	Mean ± SD	N	Mean ± SD	N		
WBC (×10³/µL)	7.3000+ 2.965	8	8.3450+2.484	20	-0.952	0.918
Lymphocyte (×10³/µL)	5.8375+2.799	8	6.9000+2.259	20	-1.051	0.802
Middle cells (×10³/µL)	0.4875+0.461	8	0.4050+.08256	20	0.790	0.009
Granulocyte (×10³/µL)	0.975+0.554	8	1.0350+0.368	20	-0.336	0.120
Lymphocyte %	0.794 + 0.113	8	0.7840 + 0.168	20	0.157	0.752
Middle cells %	0.0658 +0.054	8	0.0510 + 0.015	20	1.122	0.028
Granulocyte %	0.1400 +0.077	8	0.1269 + 0.034	20	0.625	0.001

- P ≤0.05 The values marked with different small letters indicate statistically significant differences at the ($P \leq 0.05$) level.

White blood cell count comparison:

There was no detectable systemic immunological response, as evidenced by the fact that the total or differential WBC counts of healthy and infected female cats did not differ substantially ($P > 0.05$).

Table (16): Comparison of total and deferential WBC count Between Healthy and Infected Female Local Breed Cats Infested with *O. cynotis* . (Mean ± SD)

Parameter	Healthy Group		Infected Group		t-test	P-value
	Mean ± SD	N	Mean ± SD	N		
WBC (×10³/µL)	12.100 ± 6.189	5	12.114±5.880	7	-.004	0.972
Lymphocyte (×10³/µL)	11.7400±6.622	5	10.442±5.830	7	.360	0.537
Middle cells (×10³/µL)	0.620 ± 0.349	5	0.5857 ±0.167	7	.229	0.128
Granulocyte (×10³/µL)	1.540 ± 0.47223	5	1.0857 ± 0.558	7	1.477	0.876
Lymphocyte %	0.8224 ±0.060	5	0.8454 ±0.064	7	-.625	0.814
Middle cells %	0.0562 ±0.022	5	0.0583±0.024	7	-.149	0.723
Granulocyte %	3.25081±1.595	5	2.98153±1.229	7	.202	222222.751

- P ≤0.05 The values marked with different small letters indicate statistically significant differences at the ($P \leq 0.05$) level. The i The incidence, clinical signs, and biological impacts of an *O.cynotis* infestation in household cats were

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Discussion: This study evaluated the prevalence of *O. cynotis* infection and its hematological consequences in cats in Nasiriyah, a city in southern Iraq characterized by extremely hot summers and moderate winters. Several factors, including high temperatures, a large cat population, and poor hygiene, contribute to the high infection rate in this environment. Of the 150 cats evaluated, 90 (60%) were infected. Similarly, Ghufran H. Kadhim and colleagues (2025) reported a prevalence rate of 45.99% among domestic cats in the Karbala region of Iraq. The similarity in prevalence rates between the two studies may be explained by comparable environmental conditions, climatic fluctuations, and cat management practices in Iraqi regions. Additionally, frequent contact between cats and the presence of stray animals may have contributed to the high infection rates in both studies by promoting the spread of *O. cynotis* infection.The current study demonstrated differences between infected and non-infected cats in several hematological parameters, including red blood cells, white blood cells, platelets, and hemoglobin levels. These findings may be related to inflammatory responses induced by *O. cynotis* infestation. Foreyt (2001) reported similar findings, suggesting that ear mite infestations may cause slight changes in leukocyte counts due to inflammatory reactions. Similarly, Bowman (2021) observed that ectoparasitic infections may affect hematological parameters through host stress and immunological responses. However, some researchers, such as Dryden (2019), have argued that hematological alterations associated with infestation may occasionally be minimal, as *O. cynotis* primarily affects the external ear canal.Red blood cell count (RBC), hemoglobin (HGB), and hematocrit (HCT) did not significantly differ between healthy and *O. cynotis*-infected Shirazi and local cats. The current study agrees with Rahmawati et al. (2025), who supported the idea that parasite infection often has little effect on these markers in uncomplicated cases. They pointed to changes in the blood immunological profile (white blood cells) following ivermectin therapy without noting significant changes in RBC, HGB, or HCT.Similarly, MCV, MCH, MCHC, RDW-CV, and RDW-SD did not differ significantly between healthy and infected cats. The current study agrees with Al-Obaidi et al. (2025), who noted that the pathogenic effect was limited to the external auditory canal. In straightforward cases, no serious hematological abnormalities or notable systemic changes were observed.The results indicate that healthy cats had higher platelet counts (PLT), plateletcrit (PCT), and platelet large cell ratio (PLCR) than infected cats, although these differences were not statistically significant. This finding is consistent with Rahmawati et al. (2025), who found that parasite infection mainly affects white blood cells while platelet count and size indices (PLT, MPV, PDW, PCT) remain stable. Furthermore, this partially supports Iraqi studies, including those by Al-Khafaji & Al-Musawi (2025) and Ghufran et al. (2025), which showed that the infection is frequently localized rather than systemic and does not result in appreciable alterations in blood or platelets.

Total white blood cell count (WBC), absolute lymphocyte count, middle cell count, and granulocyte count were marginally lower in infected cats than in healthy ones. The current study agrees with Peregrine et al. (2007) and Bowman et al. (2021), who observed that *O. cynotis* infections frequently do not result in overt leukocytosis, with few exceptions. According to these authors, there may not be a noticeable rise in WBC because external parasites like mites trigger a more localized inflammatory response rather than a systemic one. However, migration to the site of inflammation may lead certain granulocytes to shift or decrease.

Conclusion:

O. cynotis infestation is widespread among domestic and local cats in Nasiriyah. Studies have shown that ear mite infestation does not affect blood components, as the infestation appears only externally at the site of the ear infection

Author's Contribution:

Nothaila Rasheed Hameed.: Conceptualization and study design.

Aqeel Khazal.: Data collection and experimental work.

Nabeel Mahdi Abed: Data analysis and interpretation of results.

Aqeel Khazal.: Writing the original draft of the manuscript.

All authors reviewed, edited, and approved the final version of the manuscript.

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