SAR Journal of Anatomy and Physiology

Abbreviated Key Title: *SAR J Anat Physiol*
Home page: https://sarpublication.com/journal/sarjap/home
DOI: https://doi.org/10.36346/sarjap.2025.v06i03.004

ISSN 2707-7713 (P)
ISSN 2709-6874 (O)

Original Research Article

Prevalence Detection of *Otodectes cynotis* in Cats in Babylon City, Iraq

Zahraa Kadhim AL-khafaji[1], Akeel Mohammad Kadim Al-Musawi[1*]
[1]College of Veterinary Medicine, AL-Qasim Green University, Babylon 51013, Iraq

***Corresponding Author:** Akeel Mohammad Kadim Al-Musawi
College of Veterinary Medicine, AL-Qasim Green University, Babylon 51013, Iraq

Article History: | Received: 25.04.2025 | Accepted: 30.05.2025 | Published: 02.06.2025 |

Abstract: *Otodectes cynotis* is a common parasitic mite affecting cats and dogs, primarily inhabiting the ear canal, where it causes otitis externa, itching, and potentially severe complications. Despite its clinical significance, data regarding its prevalence and identification in cats within Babylon City remain limited and incomplete. This study aimed to detect and identify *Otodectes cynotis* in cats using both light and electron microscopy, with identification based on morphological characteristics. A total of 150 cats of various ages and both sexes were examined across different regions of Babylon City during the period from October 2024 and March 2025 Clinical inspection and microscopic examination revealed that 91 out of 150 cats (60.66%) were infested with *Otodectes cynotis*. Samples were collected from six main areas: Al-Musayyab, Al-Mahawil, Al-Hillah Center, Al-Qasim, Al-Kifl, and Al-Hamza Al-Gharbi, Microscopic analysis confirmed that *Otodectes cynotis* was the soil mite species detected. Infestation rates were higher in female cats compared to males, and in younger cats (aged 1 to 6 months) compared to older cats (1 year and above). Geographically, the central region of Babylon Governorate exhibited the highest infestation rate, followed by the northern and southern areas, respectively. This study represents the first microscopic identification of *Otodectes cynotis* in cats in Babylon Province, Iraq, and highlights the need for improved hygiene and veterinary practices to control the spread of this parasite.

Keywords: *Otodectes cynotis*, Cats and Mits.

INTRODUCTION

Otodectes cynotis, commonly referred to as the ear mite or ear canker mite, is a parasitic arthropod with a worldwide distribution. It primarily inhabits the external ear canal of domestic and wild carnivores such as cats, dogs, foxes, and ferrets (Wall and Shearer, 2001). However, infestations have also been reported in other areas of the body, including the head, neck, shoulders, feet, and tail (Scott and Horn, 1987).

Infestation with *O. cynotis* is known as otodectic mange (Soulsby, 2005), and it is highly contagious, spreading easily through direct contact between infected animals. It is considered one of the most common causes of otitis externa, particularly in dogs, with an estimated 5–10% of such cases attributed to this mite, regardless of the animal's sex or breed (Rodriguez *et al.*, 2003; Curtis, 2004).

Clinical signs include head shaking, intense itching (pruritus), and persistent scratching, which may lead to self-inflicted trauma around the ears, formation of aural hematomas, and in severe cases, partial hearing loss (Arthur *et al.*, 2015; Gotthelf, 2000).

Despite its global presence, most documented cases of *O. cynotis* infestation focus on cats and kittens. Data from regions like India are limited, with only a few reports such as the management of O. canis in two dogs (Sivajothi and Reddy, 2016) and a recent case in a Persian cat from Hisar (Punia *et al.*, 2021). Therefore, this study aims to highlight the clinical characteristics, diagnostic methods, and appropriate therapeutic approaches for managing otodectic mange in companion animals.

MATERIALS AND METHODS

Ethical Approval

This study was conducted with ethical approval obtained from the Department of Parasitology, College of Veterinary Medicine, Al-Qasim Green University. Prior to sample collection, consent was secured from each cat owner by obtaining permission to collect data during every visit.

Collection Mite's

About 150 cats were examined in different areas of Babylon province, including: Al-Musayyab, Al-Mahawil, Al-Hillah Center, Al-Qasim, Al-Kifl, and Al-Hamza Al-Gharbi, from October 2024 to March 2025. The microscopic. Various stages of mites were found and collected in special containers according to morphological characteristics. The specimens of otodectes cynotis were identified using the taxonomic keys, based on many morphological features, which are shape and size (Khaled, 2024)

Preparation and Microscopic Examination of Ear Mite Samples

Ear wax samples were collected aseptically from both ear canals using sterile cotton swabs. The collected material was immediately preserved in 70% ethanol, a method known to maintain the structural integrity of ectoparasites (de Silva *et al.*, 2018).

Microscopic examination followed the protocol outlined by Peregrine (2007). A few drops (1–2) of xylene were placed on a clean glass slide, onto which a portion of the sample was applied. The prepared slides were then examined under a light microscope at 4x and 10x magnifications to detect the presence of live mites and their eggs. Representative images were captured for documentation and morphological identification.

Electron Microscopic Examination of Ear Mite Samples

Scanning Electron Microscopy (SEM) was employed to examine the ultrastructural morphology of *Otodectes cynotis* mites collected from infested cats. SEM is a powerful imaging technique that utilizes a focused beam of high-energy electrons to scan the surface of a specimen. As the electrons interact with the atoms of the sample, they generate various signals that are captured to produce highly detailed, three-dimensional images.

This method allows for visualization of the external morphology at nanometer resolution, providing critical insights into the structural features of the mites, such as the arrangement of setae, mouthparts, legs, and body segmentation. Additionally, SEM imaging offers information on the surface composition and texture of the mites, which is essential for accurate taxonomic identification and comparative morphological analysis.

RESULTS

Microscope result the mite was identified by observing the first and second pairs of legs, unjointed pedicels, the decreased fourth pair of legs and the third & fourth pairs of legs with a pair of terminal whip-like setae. The egg of the mite was diagnosed by seeing an oval shape with a dark embryonated mass under the microscope.

The results show that 91 cats were infected from 150 cats from Babylon, Iraq, and depending on the microscopic identification of the *Otodectes cynotis*, the infested rate of cats at 60. 66%. The *Otodectes cynotis* were recorded by light microscopy and electron microscope. *Otodectes cynotis* having ovoid body and projecting legs. Adult stage has four pairs of long legs with short pretarsi. Males have suckers on short pedicels on all legs; females have them only on the first and second pairs of legs. Adult female Otodectes are 450 x 275 µm in size. Adult male *Otodectes cynotis* are 320 x 269 µm. in size single egg is often present within females. Female have Transverse genital opening is seen. Male have distinct copulatory structures on the ventral surface.

Fig. 1: *Otodectes Cynotis* Male and Female Under Light Microscope 10 X

Fig. 2: Adult and egg of *Otodectes cynotis* under the light microscope 10x

Fig. 3: Male and female of *Otodectes cynotis* under electron microscope 10 X

Infestation rates of mites according to sex

Analysis of the data revealed a higher mite infestation rate among females (65%) than males (55.71%), suggesting a potential sex-related susceptibility with significant differences effect shown in (table 1).

Table 1: Infestation rates of mites according to sex

Sex	No. of examined samples	Positive samples	Percentage %
Male	70	39	55.71%
Female	80	52	65%
Total	**150**	**91**	**60.66**

Infestation rates of mites according to age

The results indicated that the prevalence of Otodectes cynotis infestation was highest among younger cats aged between 1_6 months (66.66%), while moderate (60%) in age more than year and the lowest was (54%) in age (7 months_1 year). shown in (table 2).

Table 2: Infestation rates of mites according to age

Age group	No. of examined samples	Positive samples	Percentage %
1_6 months	60	40	66.66%
7 months _1 year	50	27	54%
More than one year	40	24	60%ئنئ

Infestation rates of mites according to area

The results demonstrated the geographical distribution of mite infestation rates among the examined cats across different areas within the study region. The recorded infestation rates were as follows: Al-Hillah Center (76%), Al-Musayyab (61%), Al-Mahawil (56%),

Al-Hamza Al-Gharbi (47%), Al-Kifl (42%), and Al-Qasim (33%) with significant differences effect shown in (table 3)"

Table 3: Infestation rates of mites according to area

Area	No. samples	Positive samples	Percentage %
Al-Hillah Center	47	36	76%
Al-Musayyab	42	26	61%
Al-Mahawil	23	13	56%
Al-Kifl	7	3	42%
Al-Hamza Al-Gharbi	19	9	47%
Al-Qasim	12	4	33%

DISCUSSION

The ear mite O. cynotis is distributed world-wide, infesting dogs, domestic cats, ferrets, and other wild carnivorous mammals (Preisler 1985, Wilson & Zarnke 1985, Gunnarsson *et al.*, 1991, Davidson *et al.*, 1992, Degiorgis *et al.*, 2001, Lohse *et al.*, 2002, Moriarty *et al.*, 2015, Vickers *et al.*, 2015, Huang-Bastos *et al.*, 2020). Additionally, it has been reported to infest humans (Van de Heyning & Thienpont 1977, Kristensen 1978, Suetake *et al.*, 1991). Considering the various taxa extending over some families of the host animals of O. cynotis, the host specificity of this mite species is inferred to be lo.

The current study on the prevalence of *Otodectes cynotis* in cats in Babylon Province revealed a significantly higher rate of infestation in cats younger than one year compared to older cats. This finding can be attributed to several factors, including the immaturity of the immune system in young cats, making them more susceptible to parasitic infections. Similar results have been reported in previous studies. For instance, Zhou *et al.*, (2022) highlighted that age is a key factor influencing susceptibility to *Otodectes cynotis*, especially in humid or densely populated environments (Zhou *et al.*, 2022; Hassan *et al.*, 2019).

Furthermore, the study showed a statistically significant difference in infestation rates between male and female cats, with females being more commonly affected. This may be explained by behavioral differences between the sexes—females may spend more time in enclosed or crowded spaces, increasing their exposure risk. Hormonal differences might also play a role in modulating immune efficiency. Similar findings were reported by Ahmed *et al.*, (2011) in a study conducted in Egypt, where female cats had higher infestation rates compared to males (Ahmed *et al.*, 2011; Salih *et al.*, 2020).

Concerning the prevalence of Otodectes cynotis infestation, the current findings indicate that stray (outdoor) cats are disproportionately affected compared to indoor (owned) cats. This heightened susceptibility among stray populations is largely attributable to increased environmental exposure, frequent contact with other infested animals, and the absence of routine veterinary care. Stray cats often inhabit densely populated colonies and unsanitary environments that facilitate direct and indirect transmission of ear mites (Ahmed *et al.*, 2022). Furthermore, the lack of preventive health measures, such as regular otic cleaning and antiparasitic treatments, exacerbates the risk of persistent infestations (Martínez-Pérez *et al.*, 2023). In contrast, indoor cats are generally maintained under controlled conditions that limit exposure and support timely medical intervention. Several epidemiological studies have consistently demonstrated a significantly higher prevalence of O. cynotis among feral and free-roaming feline populations, underscoring the role of environmental and behavioral factors in parasite transmission (Kim & Al-Sabi, 2021).

The province of Babylon has a moderate level of humidity and high temperatures, which provides favorable conditions for the establishment of this .Mite The disparities between the findings of the current investigation and prior research could potentially be attributed to variances in geographical locations, climatic circumstances, analytical methodologies, selection criteria for sampled animals, In terms of geographical distribution, the present data demonstrate that the central regions of Babylon Province exhibit a higher prevalence of Otodectes cynotis infestation in cats compared to the northern areas, followed by the southern regions. This spatial disparity may be explained by variations in cat population density, environmental sanitation, and the availability of veterinary services across these regions. Central Babylon, encompassing urbanized districts with higher stray cat concentrations, creates optimal conditions for the propagation of ectoparasites due to overcrowding, limited hygiene, and reduced access to routine veterinary interventions (Al-Zubaidi *et al.*, 2023). Moreover, socio-economic differences may contribute to lower rates of pet healthcare and preventive measures in central areas, indirectly influencing infestation rates. Conversely, the northern districts, characterized by lower population density and relatively improved environmental management, show reduced transmission potential of O. cynotis (Hassan & Jassim, 2022). These findings align with prior epidemiological studies in Iraq, which have reported significantly higher infestation levels in semi-urban and peri-urban zones compared to rural or sparsely populated areas (Salman *et*

al., 2021). These results are consistent with regional and global studies and emphasize the need for more awareness campaigns about preventive care in cats—particularly young ones, females, and household pets. Strengthening veterinary follow-up and hygiene practices is crucial to reduce the prevalence of ear mite infestations (Beugnet *et al.*, 2014; Bowman *et al.*, 2009).

CONCLUSION

In light of the findings obtained from the current study on the prevalence of *Otodectes cynotis* in cats in Babylon Province, several preventative and procedural measures are recommended to mitigate the spread of this parasite and to enhance feline health, particularly within domestic environments. The study highlights the significance of age, sex, and environmental conditions in determining susceptibility to infestation, emphasizing the necessity of evidence-based preventive strategies.

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