



Original Research



Prevalence and Pathological Lesions of Dermatophytosis in Cats (*Felis catus*) at the Animal Health Center in Cimahi: August-September 2023

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ABSTRACT

Dermatophytosis is a zoonotic fungal infection affecting the superficial skin layer, characterized by circular lesions commonly referred to as "ringworm." This condition has been recorded as the most frequently occurring ailment at the Animal Health Center in Cimahi. This study aims to determine the prevalence and characteristics of dermatophytosis lesions in cats at the Animal Health Center in Cimahi during the period of August-September 2023. Samples were collected based on physical examinations and supporting diagnostics, such as Wood's lamp inspection, on animals suspected of having dermatophytosis. The results revealed that the prevalence of dermatophytosis in cats during the specified period was 10.5%, with 91 cases out of 864 patients. The most common lesions observed included epidermal collars with scales, crusts, erythema, hyperpigmentation, and alopecia, totaling 613 lesions from 91 patients. The highest number of lesions was found in the dorsal body region, with a total of 115 lesions. Predisposing factors such as age, sex, and breed indicated that dermatophytosis was most prevalent in cats aged less than 6 months (38 cats, 41.7%), female cats (46 cats, 50.5%), and domestic breed cats (40 cats, 43.9%). This study contributes valuable epidemiological data on dermatophytosis in animals in Indonesia.

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INTRODUCTION

Dermatophytosis, commonly known as ringworm, is a prevalent zoonotic fungal infection caused by dermatophytes such as *Microsporum* spp., *Trichophyton* spp., and *Epidermophyton* spp. (Husna *et al.*, 2020). These fungi primarily infect the keratinized layers of the skin, including the stratum corneum of the epidermis, as well as hair, nails, and horns (Adzima *et al.*, 2017; Indarjulianto *et al.*, 2017). Characterized by distinctive circular lesions, dermatophytosis can be initially diagnosed through visual examination which is crucial for guiding subsequent diagnostic testing and treatment.

In domestic cats, dermatophytosis is a common dermatological issue, with a notable

incidence in various regions. Studies have reported a high prevalence of dermatophytosis in feline populations, with incidence rates varying by location and season. For example, a study in Cimahi City from September to March 2016 indicated a prevalence rate of 60% among cats (Husna *et al.*, 2020). Globally, the prevalence of dermatophytosis in cats ranges from 7-72% (Diren sığirci *et al.*, 2019). Although the disease is rarely fatal, its zoonotic potential raises significant public health concerns, as it can be transmitted between animals and humans, potentially leading to outbreaks (Segal and Elad 2021).

The diagnostic approach for dermatophytosis typically involves a combination of clinical observation, microscopic examination, and



specialized diagnostic tools such as Wood's lamp. A positive result in Wood's lamp examination is indicated by a green-yellow fluorescence, which assists in confirming the presence of dermatophytes (Iswanda and Astari 2017). Accurate diagnosis is crucial as dermatophytosis symptoms can be similar to those of other dermatological conditions, such as atopic dermatitis, flea bite dermatitis, and autoimmune diseases like pemphigus foliaceus (Moriello *et al.*, 2017; Miller *et al.*, 2012).

The Animal Health Center (Puskesmas) in Cimahi City serves as a vital facility for animal health management, handling a substantial volume of cases monthly. Recent records indicate that the center manages approximately 6,111 patients per month, with dermatophytosis frequently presenting as a significant concern. This study aims to evaluate the prevalence and characteristics of dermatophytosis lesions in cats treated at the Animal Health Center. By providing detailed epidemiological data and lesion profiles, this research will enhance the understanding of dermatophytosis in feline populations and improve diagnostic and treatment strategies.

MATERIALS AND METHODS

This study was conducted at the Animal Health Center (Puskesmas) in Cimahi City during August-September 2023 to assess the prevalence and characteristics of dermatophytosis in cats. A total of 864 cats presented to the center were examined for dermatophytosis based on clinical signs and physical examination. Suspected cases were further evaluated using Wood's lamp examination to detect fungal fluorescence. Lesions were categorized based on their appearance, including epidermal collars, scales, crusts, erythema, hyperpigmentation, and alopecia. Data on the prevalence of dermatophytosis, lesion characteristics, and demographic information such as age, sex, and breed were systematically recorded and analyzed to determine patterns and associations.

RESULTS AND DISCUSSION

The Animal Health Center in Cimahi City reported 91 cases of dermatophytosis among 864 cats between August and September 2023, which translates to a 10.5% prevalence rate. This prevalence underscores the significant impact of dermatophytosis on the feline population in the region during this period. The findings reveal several predisposing factors contributing to the incidence of dermatophytosis, including age, sex, and breed, which are discussed in detail below.

The data indicates that kittens under six months of age are the most affected, with 39 cases (42.8%) (Table 1). This higher susceptibility in younger cats is attributed to their still-developing immune systems, which renders them more

vulnerable to dermatophyte infections (Indarjulianto *et al.*, 2017). In contrast, cats over 37 months old exhibited the lowest incidence, with only 7 cases (7.6%) (Table 1). The low incidence in older cats may be due to their more mature immune systems, which are more capable of resisting fungal infections.

Sex differences do not have any play a role in the prevalence of dermatophytosis. Although the study found that female cats were slightly more affected than males, with a difference of only one case (Table 1), this difference can be attributed to factors such as hormonal influences and transmission dynamics. Female cats, particularly during early motherhood, have elevated cortisol levels, which may increase their susceptibility to dermatophytosis and facilitate the transmission of fungi to their kittens (Aleksseeva *et al.*, 2020).

Breed-specific susceptibility is another significant factor. Dermatophytosis disproportionately affected long-haired cats, accounting for 49 out of 91 cases (53.8%) (Table 1). This finding aligns with previous research, which indicates that long-haired breeds are more susceptible to dermatophyte infections due to their thicker coats, which trap fungal spores more effectively (Sattasathuchana *et al.*, 2020; Indarjulianto *et al.*, 2017).

Table 1. Distribution of Dermatophytosis Cases by Age, Sex, and Breed: Total Cases and Percentage of Affected Cats

Age/month	Total	Percentage (%)
<6	39	42.8%
7-12	21	23.0%
13-24	15	16.4%
25-36	9	9.8%
>37	7	7.6%
Sex	Total	Percentage (%)
Male	45	49.4 %
Female	46	50.5 %
Breed	Total	Percentage (%)
Long hair	49	53.8%
Short hair	42	46.1%

The study observed that the characteristic lesions of dermatophytosis, as described by Zachary (2022), primarily included epidermal collars with round or oval shapes, defined edges, and a hard, red texture. Epidermal collars were the most prevalent type of lesion observed, often accompanied by other lesions such as scales, crusts, and alopecia (Figure 1). These lesions are indicative of the inflammatory process that occurs as dermatophyte fungi invade and colonize the stratum corneum.

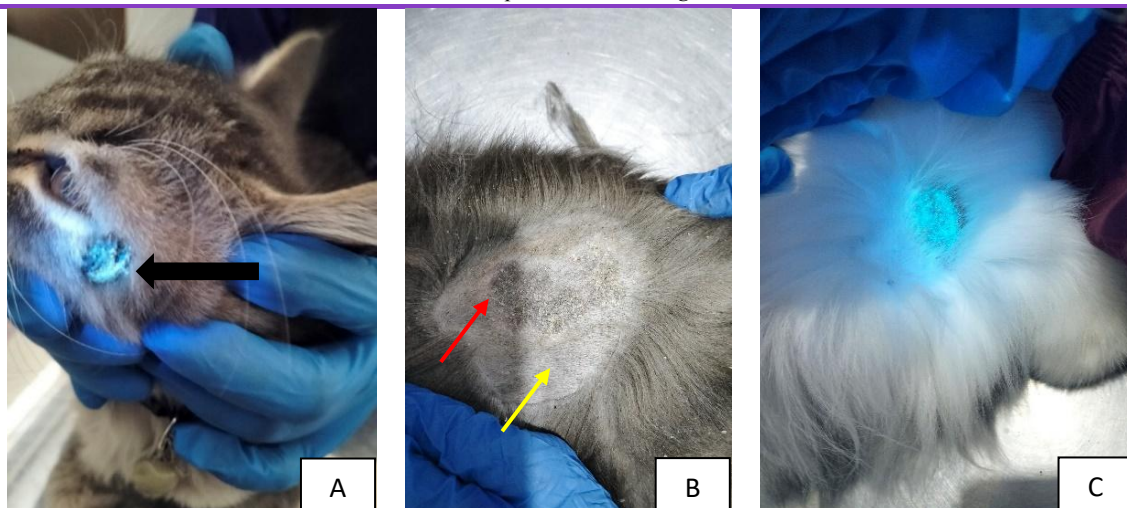


Figure 1. A) Composite lesion on K-061, displaying a combination of collar epidermis, scales, crusts, and alopecia in the head region (black arrow). B) Hyperpigmentation lesion on K-010 (red arrow) compared to normal skin (yellow arrow). C) Positive Wood's lamp test result for K-019, indicated by greenish fluorescence.

The inflammatory response to dermatophyte invasion begins when arthroconidia (dermatophyte spores) adhere to and penetrate keratin-rich tissues like skin, hair, and nails. As these fungi colonize and degrade keratin, they trigger an inflammatory reaction characterized by redness, swelling, heat, and eventually alopecia. This process can lead to the formation of classic ring-shaped lesions with defined edges, crusts, or scales (Datt *et al.*, 2019; Kurniati *et al.*, 2008; Moskaluk and VandeWoude 2022).

Lesion distribution analysis revealed that epidermal collars were most commonly found on the head region, including the cheeks, forehead, top of the head, neck, and around the ears, with 39 cases (42.8%) (Table 2). Conversely, the nose was the least affected area with only 3 cases (3.2%) (Table 2). Scales were also predominantly observed on the head, particularly on the cheeks, forehead, and around the ears, with 25 cases (26.8%) (Table 2). This distribution highlights the head as a primary site for dermatophytosis lesions.

Focal alopecia was most frequently observed on the body, particularly along the back and flanks, with 6 cases (6.5%) (Table 2). Multifocal alopecia, characterized by multiple scattered lesions, was most common in the abdominal region, with 18 lesions (19.7%) (Table 2). The distribution of lesions reflects the pattern of fungal spore transmission and the areas of the body most exposed to fungal contaminants.

Pustular and papular lesions were notably absent in this study, which may be due to their occurrence early in the infection process. These lesions tend to rupture quickly, leaving behind crusts and alopecia (Marsella, 2021). The absence of these lesions may also be related to their more frequent occurrence in bacterial rather than fungal infections.

Hyperpigmentation was observed infrequently and did not show significant variation across the cases. It was noted in areas such as the cranial extremities, back, and tail, but overall, hyperpigmentation did not emerge as a significant

feature of dermatophytosis (Table 2). This rarity may be attributed to the complex interplay of factors affecting skin pigmentation during inflammatory processes (Hossain *et al.*, 2021).

The diagnosis of dermatophytosis was supported by the use of Wood's lamp, which identifies specific fluorescence patterns associated with fungal infections. Positive results were indicated by greenish-yellow fluorescence, corresponding to porphyrin pteridine fluorescence (Dyer and Foy 2022) (Figure 1.C). Proper technique and proximity are crucial for accurate diagnosis to avoid false negatives due to pigment dilution.

The high incidence of lesions on the back area may be attributed to the ease of spore transmission through direct contact with infected cats, objects, or environmental surfaces. The Dermatophyta mold's ability to persist in the environment and resist some disinfectants (Sykes, 2013) further supports this observation. Additionally, the head area, particularly the neck and cheeks, showed a high frequency of lesions, likely due to damp conditions promoting fungal growth and the preference of *Microsporum canis* for keratin-rich areas (Khaled *et al.*, 2015) (Table 4, Figure 2).

Table 2. Total Number and Percentage of Dermatophytosis Lesions Observed in Cats

Type of Lesions	Location of Lesions										
	Head					Extremities			Body		
	Ears	Eye	Chin	Nose	Other Areas	Ex. Cranial	Ex. Caudal	Thorax	Abdomen	Back (dorsal)	Tail
Collar Epidermis	26 28.5%	9 9.8%	6 6.5%	3 3.2%	39 42.8%	25 27.4%	18 19.7%	8 8.7%	20 21.9%	36 39.5%	10 10.9%
Scales	20 21.9%	1 1.0%	3 3.2%	0 0%	25 27.4%	16 17.5%	8 8.7%	8 8.7%	15 16.4%	30 32.9%	9 9.8%
Focal Alopecia	4 4.3 %	2 2.1%	0 0%	0 0%	2 2.1%	4 4.3%	1 1.0%	3 3.2%	1 1.0%	6 6.4%	2 2.1%
Multifocal Alopecia	14 15.3%	7 7.6%	1 1.0%	2 2.1%	16 17.5%	14 15.3%	13 14.2%	7 7.6%	18 19.7%	11 12.0%	5 5.4%
Pustular	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
Papule	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%	0 0%
Erythema	13 14.2%	1 1.0%	1 1.0%	0 0%	8 8.7%	3 3.2%	3 3.2%	0 0%	5 5.4%	9 9.8%	3 3.2%
Crust	4 4.3%	2 2.1%	3 3.2%	4 4.3%	22 24.1%	8 8.7%	8 8.7%	6 6.5%	11 12%	22 24.1%	6 6.5%
Hyper-pigmentation	0 0%	0 0%	0 0%	0 0%	0 0%	1 1.0%	0 0%	0 0%	0 0%	1 1.0%	1 1.0%

*The percentage of lesions per region is calculated by dividing the number of cats with lesions by the total number of patients and then multiplying by 100.

Table 3. Total Number of Lesions for Each Type

Lesions Type	Collar epidermis	scales	Focal Alopecia	Multifocal Alopecia	Pustule	Papule	Erythema	Crust	hyperpigmentation	Total
n	200	135	25	108	0	0	46	96	3	613
%	32.6%	22.0%	4.0%	17.6%	0	0	7.5%	15.6%	0.4%	100 %

Table 4. Total Number of Lesions in Each Region

Location of Lesion	Head					Extremities			Body			Total
	Ear	Eye	Chin	Nose	Other Areas	Ex. Cranial	Ex. Caudal	Thorax	Abdomen	Back (Dorsal)	Tail	
n	81	22	14	9	113	70	51	32	71	115	35	613
%	13.2%	3.5%	2.2%	1.4%	18.6%	11.4%	8.3%	5.2%	11.6%	18.7%	5.7%	100

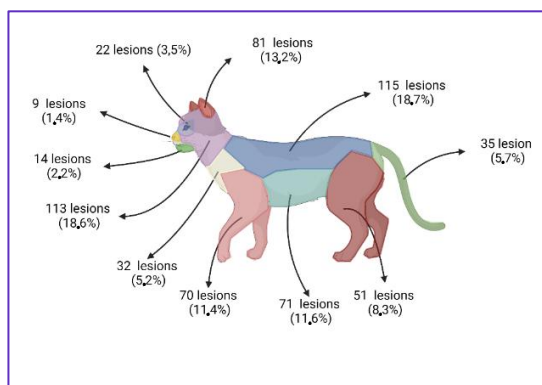


Figure 2. Schematic diagram depicting the most common locations of dermatophytosis lesions in cats. The map illustrates the distribution of lesions across various anatomical regions, highlighting the

prevalence and typical areas affected by dermatophytosis.

In summary, this study highlights the prevalence and distribution of dermatophytosis lesions in cats, emphasizing the influence of age and breed on infection rates. The findings underscore the importance of considering these factors in both diagnosis and management of dermatophytosis in feline populations. The results also suggest that targeted preventive measures and treatments should take into consideration the risk factors that have been discovered.

CONCLUSION

This study provides a comprehensive assessment of the pathological manifestations and prevalence of dermatophytosis in cats at the Animal

Health Center in Cimahi during August-September 2023. The prevalence of dermatophytosis was identified as 10.5%. with significant variation in the incidence based on age, gender, and breed. It was shown that the incidence of dermatophytosis varied significantly by breed, age, and gender, with a prevalence of 10.5%. Particularly, kittens under six months and long-haired cats were found to be more susceptible, reflecting the role of underdeveloped immune systems and the increased retention of fungal spores in thicker coats. The study elucidates the predominant lesion types, including epidermal collars, scales, and crusts, and highlights the specific areas of the body most affected, such as the head and back. The findings underscore the importance of targeted diagnostic and preventive measures to manage dermatophytosis effectively. This research contributes valuable insights into the epidemiology and clinical presentation of dermatophytosis in feline populations, informing both clinical practice and future studies.

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AUTHORS' CONTRIBUTIONS

SK and IMWD were responsible for designing the research. SNFF conducted the research, performed the analysis, and drafted the manuscript. SK and IMWD reviewed the draft manuscript and provided approval for the final version.

CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest related to the content of this manuscript.

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ETHICAL APPROVAL

The research received ethical approval from the Health Research Ethics Committee (KEPK) of the Faculty of Medicine, Universitas Padjadjaran, under approval number 1111/UN6.KEP/EC/2023.

REFERENCES

Adzima, V., Jamin, F. and Abrar, D.M. (2013) 'Isolasi dan Identifikasi Kapang Penyebab Dermatofitosis pada Anjing di Kecamatan Syiah Kuala Banda Aceh', *Jurnal Medika Veterinaria*, 7(1). Available

at: <https://doi.org/10.21157/j.med.vet.v7i1.2920>.

Alekseeva, G.S. *et al.* (2020) 'Stressed by Maternity: Changes of Cortisol Level in Lactating Domestic Cats.', *Animals: an open access journal from MDPI*, 10(5). Available at: <https://doi.org/10.3390/ani10050903>.

Datt, S. and Datt, T. (2019) 'Pathogenesis and Clinical Significance of Dermatophytes', *International Journal of Current Microbiology and Applied Sciences*, 8(11), pp. 1877–1886. Available at: <https://doi.org/10.20546/ijcmas.2019.811.220>.

Diren siğirci, B. *et al.* (2019) 'Dermatophytes Isolated From Dogs and Cats Suspected Dermatophytoses in Istanbul, Turkey Within A 15-Year-Period: An Updated Report', *Kocatepe Veterinary Journal*, pp. 1–1. Available at: <https://doi.org/10.30607/kvj.495736>.

Dyer, J.M. and Foy, V.M. (2022) 'Revealing The Unseen: A Review of Wood's Lamp in Dermatology', *The Journal of clinical and aesthetic dermatology*, 15(6), pp. 25–30. PMID: 35783566; PMCID: PMC9239119.

Hossain, M.R. *et al.* (2021) 'Diversified Stimuli-Induced Inflammatory Pathways Cause Skin Pigmentation', *International Journal of Molecular Sciences*, 22(8), pp. 3970. Available at: <https://doi.org/10.3390/ijms22083970>.

Husna, N., Wismandanu, O. and Sujatmiko, B. (2020) 'Gambaran Kejadian Dermatofitosis pada Kucing di Pusat Kesehatan Hewan Kota cimahi dengan Pendekatan Sistem Informasi Geografis', *Indonesia Medcus Veterinus*, 9(4), pp. 552–565. Available at: <https://doi.org/10.19087/imv.2020.9.4.552>.

Indarjulianto, S. *et al.* (2017) 'Infeksi Microsporum canis pada Kucing Penderita Dermatitis', *Jurnal Veteriner*, 18(2), p. 207. Available at: <https://doi.org/10.19087/jveteriner.2017.18.2.207>.

Iswanda, P. A. and Astari, L. (2017) 'Profil dan Evaluasi Pasien Dermatofitosis (Profile and Evaluation of Dermatophytosis)', *Berkala Ilmu Kesehatan Kulit dan Kelamin*, 29(2), pp. 135–141. Available at: <https://doi.org/10.20473/bikk.V29.2.2017.135-141>.

Khaled, J.M. *et al.* (2015) 'Dermatophyte and non dermatophyte fungi in Riyadh City, Saudi Arabia', *Saudi Journal of Biological Sciences*, 22(5), pp. 604–609. Available at: <https://doi.org/10.1016/j.sjbs.2014.12.006>.

Kurniati and Rosita, C. (2008) 'Etiopatogenesis Dermatofitosis', *Berkala Ilmu Kesehatan Kulit & Kelamin*, 20(3), pp. 243–250.

Marsella, R. (2021) 'Dermatophytoses in Dogs and cats', *Today's Veterinary Practice*. Available at: <https://todaysveterinarypractice.com/dermatology/dermatophytoses-in-dogs-and-cats/>

- cats/#:~:text=Folliculitis.FIGURE%203)%2C%20and%20crusts. (Accessed: 26 December 2023).
- Miller, W.H., Griffin, C. and Campbell, K.L. (2012) 'Small Animal Dermatology', 7th ed.
- Moriello, K.A. *et al.* (2017) 'Diagnosis and treatment of dermatophytosis in dogs and cats', *Veterinary Dermatology*, 28(3), p. 266. Available at: <https://doi.org/10.1111/vde.12440>.
- Moskaluk, A.E. and VandeWoude, S. (2022) 'Current Topics in Dermatophyte Classification and Clinical Diagnosis', *Pathogens*, 11(9), p. 957. Available at: <https://doi.org/10.3390/pathogens11090957>.
- Sattasathuchana, P., Bumrungpun, C. and Thengchaisri, N. (2020) 'Comparison of subclinical dermatophyte infection in short- and long-haired cats', *Veterinary World*, 13(12), pp. 2798–2805. Available at: <https://doi.org/10.14202/vetworld.2020.2798-2805>.
- Segal, E. and Elad, D. (2021) 'Human and Zoonotic Dermatophytoses: Epidemiological Aspects', *Frontiers in Microbiology*, Frontiers Media S.A. Available at: <https://doi.org/10.3389/fmicb.2021.713532>.
- Sykes, J.E. (2013) 'Canine and feline infectious diseases. Canine and Feline Infectious Diseases', Available at: <https://doi.org/10.1016/C2009-0-41370-9>.
- Zachary, J.F. (2022) 'Pathologic Basis of Veterinary Disease', 7th ed.