



## Clinical Cases of Feline Dermatoses Presented at Veterinary Clinic in Malaysia

Imad I. Al-Sultan<sup>1</sup>, Nawfal N. Al-Mashadanie<sup>2</sup>, Fawzia J. Shalsh<sup>3\*</sup> and Abdulla Y. Al-Mahdi<sup>4</sup>



<sup>1,4</sup> International Medical School, Management and Science University (MSU), Malaysia.

<sup>2</sup> College of Pharmacy, University of Mashreq, Baghdad, Iraq.

<sup>3</sup> Scientific Research Commission, Ministry of Higher Education and Scientific Research, Baghdad, Iraq.

### Abstract

**F**ELINE skin problems can be classified into infectious cases such as bacterial, fungal, viral or parasitic; and non-infectious cases such as immune-associated, nutritional, endocrine, metabolic or traumatic injuries and miscellaneous. Most infectious feline skin diseases may pose risk of zoonosis to handlers and owners. Total 332 cats presented were examined for skin problems. In a one-year period, out of them 15.7% of the cats were presented with dermatological disorders examined at the Veterinary Clinic, Kelantan, Malaysia. In cats, the most common dermatoses were parasitic aetiologies 105 cases (31.62%), traumatic dermatoses 79 cases (23.79%), fungal dermatoses 84 cases, (25.30%), bacterial dermatoses 32 cases (9.63%), immune-associated dermatoses 17 cases (5.12%), viral dermatoses 3 cases, (0.90%), and other dermatoses 12 cases (3.61%). Parasitic skin problems overall were highly associate with cats that have access to outdoor environment which were outdoor cats (25.7%) and semi- roamer cats (38.6%) which accumulate as 67.3% from total parasitic dermatoses where there is increased risk of direct contact to infested cats. It must therefore be emphasized that the results of the study must be considering some of the following inherent biases where case material was drawn solely from the registered clinical cases, and which case distribution may vary to those available cases to the average private practitioner; individuals studied the animals emphasized on primary complaint of skin problem; and the period covered only for one year.

**Keywords:** skin, bacterial, fungal, viral.

### Introduction

Cat skin is the largest organ in the body. It provides several functions such as being a protective barrier, which helps maintain body temperature and produce glandular secretion, hair and claws. Cats are susceptible to a range of skin problems, which may affect areas with specialised skin, such as the pads and the claws, the outer ear canal, and the covering skin of whole body. Skin problems are a common cause of discomfort to cats and a primary concern to cats' owners [1] Skin problems in felines are very common and it may consume more time for diagnostic and treatment course compare to other clinical case [2]. Prevalence study of clinical cases can assist in development of a better management of skin problems [3,4]. Misdiagnosis of skin problem is common as such, for example in the cases of feline dermatophytosis which may occurs as fomite carriage where false positive fungal culture is possible even there is no active disease occurrence

causing unnecessary prolonged treatment and confinement, or even euthanasia [5]. Dermatoses cases required accurate data where chief complaint, age, breeds, sex, colour was recorded [6]. There is very little information available on breed predilections for feline dermatoses [7]. Complete patient medical history taking is vital in establishing the cause of most skin diseases [8].

There was little information on the prevalence and risk factors studied in Malaysia on feline skin disorder and there is no epidemiology report of feline skin disease in Kelantan. Lack of data on disease prevalence results in failure of disease control and eradication program. This study was conducted to identify prevalence of feline skin disorders, zoonoses and relation between disease predisposing factors. The main objective was to identify the prevalence of clinical cases of feline skin problems presented at the Veterinary Clinic.

\*Corresponding authors: Fawzia Jassim Shalsh, E-mail fawzia.jassim2015@gamil.com, Phone: +96477052590248 (Received 06 June 2024, accepted 30 July 2024)

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## **Material and Methods**

### *Data collection*

Data collection was acquired based on registered clinical cases of feline dermatology problems presented in the Veterinary Clinic, within a year from January 2023 till February 2024. Data acquired is recorded based on diagnostic findings, age, sex, size of cat household and cat mobility after physical examination. The common clinical presentation of skin problems in felines may range from abnormalities in behaviour of over licking due to pain, excessive scratching due to pruritus, overgrooming or clinical skin lesions such as alopecia, erythematous, hyperkeratinisation, ulcers, crusts, scales, scabs or wound. Along with that is the distribution of lesion often helps in prioritizing differential diagnoses, where lesion is described as localized, multifocal, or generalized, symmetric, or asymmetric and its regional location [6].

### *Diagnostic approach*

Feline skin problems mostly be misdiagnosed or inaccurate due to lack of thorough examination or misconception of underlying condition or concurrent infection. Basic dermatology diagnostic approaches available in most small animal practitioners are skin scrapping, deep skin scrapping, tape impression smears, slide impression smears, wood lamp examination, hair plucking, fine needle aspiration, hemogram and serum biochemistry. Extensive diagnostic approaches such as culture and isolation, and hormonal or endocrinal tests [2], which are mostly carried out by third party in clinical pathology or microbiology laboratories. Albeit the dermatology cases diagnosis inaccuracy, patient's responses towards tentative treatment contributes to achieve definite diagnosis.

### *Data analysis*

Data acquired was analyzed using Microsoft Excel for the prevalence of feline skin problem and possible associated risk.

## **Results**

A total of 332 cats presented, were examined for skin problems (Table 1). The general clinical registered cases populations during the same time period were 2109 cats. Thus, feline dermatological problem accounted for 15.7 %, of all cats examined during the study period. There were no apparent age or sex predilections for dermatological disease.

In cats, the most common dermatoses were parasitic aetiologies (105 cases, 31.62%), traumatic dermatoses (79 cases, 23.79%), fungal dermatoses (84 cases, 25.30%), bacterial dermatoses (32 cases, 9.63%), immune-associated dermatoses (17 cases, 5.12%), viral dermatoses (3 cases, 0.90%).and other dermatoses (12 cases, 3.61%) as shown in Figure 1. Parasitic dermatoses aetiologic agents in this study

were encountered, in descending order of frequency, mites 55 (52.38%), flea 32 (31.37%), lice 7 (6.66%), missies4 (3.80%) and ticks (1.49%) Figure 2.

## **Discussion**

The high incidence of traumatic injury and parasitic dermatoses is consistent with previous reports [7]. Zoonotic dermatoses accounted for in feline clinical dermatology cases is at 40.3%, which is one of the most outlook criteria. Group at increased risk of infection include children, transplant and cancer patients, people with debilitating or immunocompromising disease, and the elderly [8,9]. Cats that presented with complicated skin problems of multiple dermatoses (37.5%) compared to single problem dermatoses (62.5%). Recurrent or non-healing feline abscesses should prompt a consideration of immunosuppression due to viral or bacterial infectious agent [6].

Parasitic skin problems overall are highly associate with cats that have access to an outdoor environment which are outdoor cats (29) cases which about 27.6% and semi-roamer cats 40 cases which about (38.6%) which accumulate 67.3% from total parasitic dermatoses where there is increased risk of direct contact to infested cats.

Zoonotic gastrointestinal parasites include *Echinococcus granulosus*, *Toxocara cati*, *T. canis*, and hookworms. Parasites of major zoonotic significance include the food-borne trematodes (*Clonorchis sinensis*, *Opisthorchis viverrini*, and *Paragonimus* spp.), Therefore, control of these parasites are important to minimize diseases in cats [10].

Co-infestation of parasites in feline parasitic dermatoses is at 17.9%. Mite infestation seen in semi-roamers reached to 20 cases (38.6%), indoor reached to 19 cases (31.8%) and outdoor reached to 16 cases (29.5%) but still consistent with overall statement of parasitic dermatoses where cats with access to outdoor have higher risk to infestation. Mites are obligate parasites, which survive off the host for only few days and affect whole litters and both sexes of adult cats [6,11].

On the contrary, flea infestation occurs mostly in cats which have access to an indoor environment that is favourable to the flea [12], where occurrence is at semi roamers (33.3%), indoor cats (40.7%) and outdoor cats (25.9%). Development of flea is independent of the host's presence but dependent on the environment condition [11]. For household number of cats, parasitic dermatoses more common in multiple household cats (71.4%) compare to single household cat (28.6%). Higher number of cats per household increase risk of parasitic infestation. There is no apparent correlation with breed specific but parasitic dermatoses more presented in short hair cats (71.4%). This probably shorter hair cats are kept with

access with outdoor environment compared to long hair cats.

Cases of fungal dermatoses diagnosed, most common fungal isolated from clinical cases are Dermatophytes (53.6%), *Sporothrix* (32.1%), *Malassezia* (3.6%), *Cryptococcus* (3.6%), *Blastomyces* (3.6%), *Candida* (1.8%) and others (1.8%). Fungal dermatoses overall are at higher risk to semi-roamer cats (38.76%), and indoor cats (32.59%) but apparently least to outdoor cats (28.63%). Fungal infections are characterised by penetration of tissues by fungal elements. The environment is the most common reservoir of infection. It can be frustrating to treat because long treatment times are usually required and, even after attaining clinical cure, there may be a risk of relapse [13].

In cases of dermatophytosis, semi-roamer cats (60.0%) are at higher risk of infection followed by indoor cats (33.3%) and outdoor (6.7%). Dermatophytosis more seen in multiple household cats (80.0%) compared to single household cat (20.0%) and shorthair cats (73.3%) apparently more presented compared to long hair cats (26.7%). This is very contradicting from previous study where outdoor, long hair cats more predisposed to dermatophytosis except multiple household cats which are consistent with previous report [5].

However, microtrauma studies in humans have been established as an important disease development where sources of microtrauma in multi-cat situations include trauma from bites/scratches, ectoparasites, matted hair, maceration of the skin from high humidity associated with dampness post-cleaning, and other poor husbandry practices [14]. Therefore, it is probably due to hygiene status, environment and management of the cats that affects the disease incidence.

In some presented cases of dermatophytosis, cats that are culture positive possibly due to fomite carriage are not truly infected and do not have positive Wood's lamp examinations. However, this cannot be interpreted as a 'strain' not fluorescing, because there is no active disease which the percentage of field isolates that fluoresce is unknown [5].

Cases of traumatic Injury dermatoses accounted for outdoor cats (28.8%), indoor cats (32.2%) and semi-roamer cat (39.0%). Outdoor and semi-roamer cats were predisposed to cat fight injury outside house where indoor cats were probably involved with cat hyperactivity and hazardous house environment. Male (64.4%), short hair cats (91.5%) overwhelmingly presented with traumatic injury and most cases involved with adult cats at between 1 to 5 years old (69.5%). The prevalence rate also may be affected by most breed presented which were short-

haired cats and mostly kept with access to outdoor environments.

Traumatic Injuries such as fight wounds or penetrating traumatic injury usually associated with other complicated dermatology problems. Concurrent problem with traumatic injury encountered are complicated in descending order with fungal dermatoses (45.8%), bacterial dermatoses (27.1%), parasitic dermatoses (8.5%), and immune-associated (5.1%). Bite wounds are most common in cats and the most common isolated organism is *Pasteurella multocida* [15]. Other organisms that can be involved include *Staphylococcus*, *Streptococcus*, *Fusobacterium*, *Bacteroides*, and *Clostridium* [16,17].

Parasitic dermatoses associated with traumatic wound at 27.1% and commonly complicated with myiasis dermatitis accounted for 8.5% of traumatic wound cases. Cutaneous myiasis is always a disease of neglect but natural infection is detrimental to the patient's health, therefore daily routine wound care is necessary and patient should be housed in screened, fly-free quarters [6,18]. In some cases, demodectic mange probably usually flares up due to stress conditions [19,20] contribute to 3.4% of parasitic dermatoses. Among cases of traumatic injury, fungal dermatoses associated by 41.0% solely diagnosed as sporotrichosis at 30.5% associated with traumatic injury. Sporotrichosis has been flagged as an increasingly important feline zoonotic fungal disease in Malaysia [21] and should always be suspected in cat with non-healing fight wound abscesses [5]. Preliminary finding of slide impression smear with presence of round, oval or cigar shaped yeast form organism should be submitted for culture. In most cases of sporotrichosis, cats were euthanized due to client non-compliance, severe form of infection and public health and zoonosis concern [5]. Immune-associated dermatoses contribute 17 cases where mostly involved eosinophilic granuloma cases, allergic dermatitis, and contact dermatitis. Indoor cats 10 cases (58.82 %), multihousehold cats 11 cases (64.70%) were more presented probably associated with infectious flea environment that develop into flea allergic dermatitis.

#### *Recommendation*

It must therefore be emphasized that the results of the study must be considered in light of some of the following inherent biases where case completely withdrawn from the stored clinical case registry and which case distribution may vary to those available cases to the average private practitioner; individuals studied the animals emphasized on primary complaint of skin problem; and the period covered only for one year. It is hopefully that the similar study of greater magnitude will be undertaken in the future, so that the demographics of feline

dermatology can be more completely and meaningfully elucidated.

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#### Declaration of Conflict of Interest

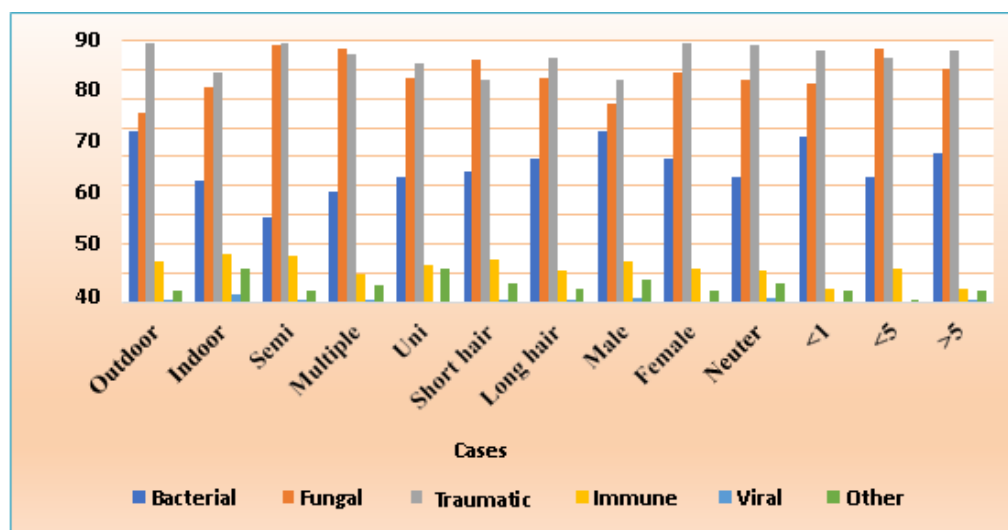
The authors declare that there is no conflict of interest.

#### Ethical of approval

Ethical Committee approval was obtained from University Malaysia Kelantan-Malaysia. The National Council for Animal Experimentation Control's (CONCEA) criteria were followed in the conduct of all animal studies.

**TABLE 1.** Distribution of feline dermatoses presented in Veterinary Clinic for one year according to different classification.

Classification												
Management			Household		Bree		Sex			Age		
Outdoor	Indoor	Semi	Multiple	Uni	Short	Long	Male	Female	Neuter	<1	<5	>5
45	233	54	76	256	145	187	130	123	79	80	114	140
Total	332			322		322		322			322	



**Fig1.** Distribution of the skin aetiology's (bacterial, fungal, traumatic, immune, viral and other) of the feline dermatoses presented in Veterinary Clinic for one year according to dermatology disorder classification (management ,household, bree, sex and age)

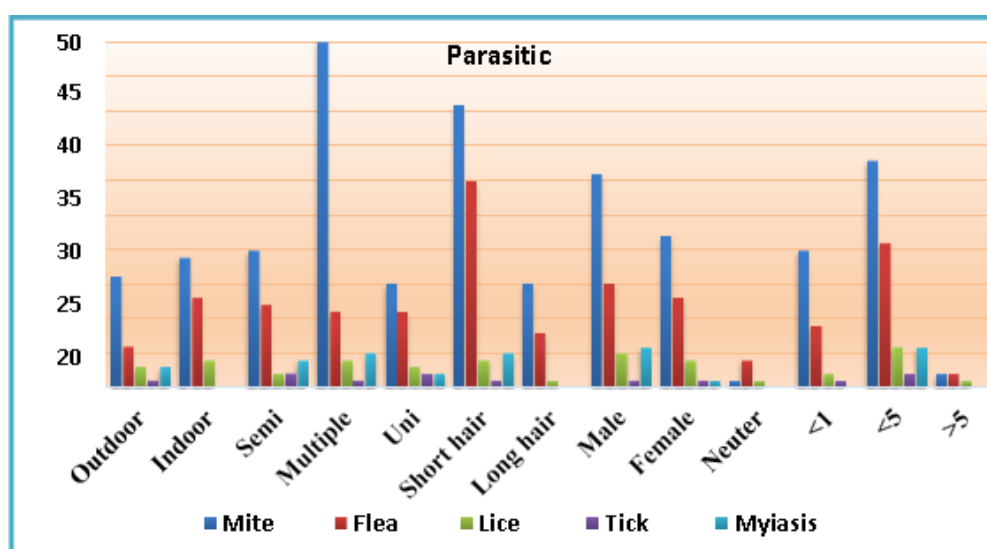


Fig. 2. Distribution of the parasitic aetiology's (mite, flea, lice, tick and myiasis) of the feline dermatoses presented in Veterinary Clinic for one year according to dermatology disorder classification (management, household, breed, sex and age)

## References

- Shojai, A. Complete care for your aging cat. Quick Tips Guide. Furry Muse Publications. (2024).
- Lilly, M.L. and Siracusa, C. Skin Disease and Behavior Changes in the Cat. *Veterinary Clinics: Small Animal Practice*, **54**(1), 135-151(2024). doi.org/10.1016/j.cvsm.2023.09.004
- Scott, D.W., Miller, W.H. and Erb, H.N. Feline dermatology at Cornell University: 1407 cases (1988–2003). *Journal of Feline Medicine and Surgery*, **15**(4), 307-316 (2013). https://doi.org/10.1177/1098612X12468922
- Alizadeh, A., Sadr, S., Azizzadeh, M. and Khoshnegah, J. Feline dermatoses at Ferdowsi University of Mashhad (Iran): 154 cases (2009–2020). *Veterinary Dermatology*, **35**(4), 1-3 (2024). https://doi.org/10.1111/vde.13244.
- Monello, K.A. Management of dermatophyte infections in catteries and multiple-cat households. *Veterinary Clinics of North America: Small Animal Practice*, **20**(6), 1457-1474(1990). https://doi.org/10.1016/S0195-5616(90)50155-2
- Miller, W.H., Griffin, C.E., Campbell, K.L. and Muller, G.H. Muller and Kirk's Small Animal Dermatology7: Muller and Kirk's Small Animal Dermatology: Elsevier Health Sciences. Hardback ISBN: (2013). 9781416000280. 9 7 8 - 1 - 4 1 6 0 - 0 0 2 8 - 0. eBook ISBN:9780323241939
- Scott, D.W. and Paradis, M. A survey of canine and feline skin disorders seen in a university practice: Small Animal Clinic, University of Montreal, Saint-Hyacinthe, Quebec (1987-1988). *The Canadian Veterinary Journal*. **31**(12); 830-835(1990). PMID: 17423707; PMCID: PMC1480900
- Older, C.E., Hoffmann, A.R. and Diesel, A.B. The feline skin microbiome: interrelationship between health and disease. *Journal of Feline Medicine and Surgery*, **25**(7), 80231 (2023). doi.org/10.1177/1098612X231180231
- Greene, C. E. Infectious diseases of the dog and cat: Elsevier Health Sciences. Hardback ISBN: 9780323509343. 9 7 8 - 0 - 3 2 3 - 5 0 9 3 4 - 3. eBook ISBN: 9780323509336 (2013).
- Khatoon, Sanweer. "General Introduction to Canine and Feline Parasitic Diseases." *Principles and Practices of Canine and Feline Clinical Parasitic Diseases*, Department of Veterinary Parasitology CVAS, Navania Udaipur India, 1-9 (2024). https://doi.org/10.1002/9781394158256.ch1
- Jatav, R.S., Pratap, A., Vaishnav, N. and Sharma, N. General aspects of introduction to diseases, diagnosis, and management of dogs and cats. In *Introduction to Diseases, Diagnosis, and Management of Dogs and Cats*. 3-17, Academic Press (2024). https://doi.org/10.1016/B978-0-443-18548-9.00001-9
- Robinson, W.H. Distribution of cat flea larvae in the carpeted household environment. *Veterinary Dermatology*, **6**(3), 145-150 (1995). https://doi.org/10.1111/j.1365-3164.1995.tb00058.x
- Barrs, V.R., Bęczkowski, P.M., Talbot, J.J., Hobi, S., Teoh, S. N., Hernandez Muguiro, D. and Sandy, J. (2024). Invasive fungal infections and oomycoses in cats: 1. Diagnostic approach. *Journal of Feline Medicine and Surgery*, **26**(1), 1098612X231219696 (2024). doi.org/10.1177/1098612X231219696
- Kligman, A.M. The pathogenesis of tinea capitis due to *Microspodium audouini* and *Microspodium canis*. *J. Invest. Dermatol.*, **18**, 231-246 (1952).
- Vecilla, D.F., Matheus, M.P.R., Hidalgo, G.I. and de Tuesta del Arco, J.L.D. Osteomyelitis caused by *Pasteurella multocida* and *Bacteroides pyogenes* after cat bite. *European Journal of Clinical Microbiology &*

- Infectious Diseases*, **42**(1), 125-128 (2023). <https://doi.org/10.1007/s10096-022-04520-6>
16. Kennis, R.A. and Wolf, A.M. Chronic bacterial skin infections in cats. *Compendium on Continuing Education for the Practicing Veterinarian*, **21**(12), 1108 (1999).
17. Cheung, K.T. and Chan, H. Y. Oral flora of domestic cats in Hong Kong: Identification of antibiotic-resistant strains. *Veterinary Medicine and Science*, **9**(1), 25-36 (2023). <https://doi.org/10.1002/vms3.1040>
18. Pezzi, M., Scapoli, C., Chicca, M., Leis, M., Marchetti, M.G., Del Zingaro, C.N.F. and Bonacci, T. Cutaneous myiasis in cats and dogs: Cases, predisposing conditions and riskfactors. *Veterinary Medicine and Science*, **7**(2), 378-384 (2021). <https://doi.org/10.1002/vms3.370>
19. Beale, K. Feline demodicosis A consideration in the itchy or overgrooming cat. *Journal of Feline Medicine and Surgery*, **14**(3), 209-213 (2012). <https://doi.org/10.1177/1098612X12439268>.
20. Gregory, C.W., Davros, A.M., Cockrell, D.M. and Hall, K. E. Evaluation of outcome associated with feline trauma: A Veterinary Committee on Trauma registry study. *Journal of Veterinary Emergency and Critical Care*, **33**(2), 201-207(2023). <https://doi.org/10.1111/vec.13277>
21. Zamri-Saad, M., Salmiyah, T.S., Jasni, S., Cheng, B.Y. and Basri K. Feline sporotrichosis: an increasingly important zoonotic disease in Malaysia. *Vet Rec.*, **127**(19),480 (1990). PMID: 2270639

### الأمراض الجلدية لدى القطط المقدمة في العيادة البيطرية في ماليزيا، الحالات السريرية

عماد ابراهيم السلطان<sup>١</sup>، نوفل المشهداني<sup>٢</sup>، فوزيه جاسم شلش<sup>٣</sup> وعبد الله يحيى المهدي<sup>٤</sup>

<sup>١</sup>٤٠١ كلية الطب الدولية، جامعة الإدارة والعلوم (MSU)، ماليزيا.

<sup>٢</sup>كلية الصيدلة، جامعة المشرق، بغداد، العراق.

<sup>٣</sup>وزارة التعليم العالي والبحث العلمي، بغداد، العراق

### الملخص

يمكن تصنيف مشاكل جلد القطط إلى حالات معدية مثل البكتيرية أو الفطرية أو الفيروسية أو الطفيلية. والحالات غير المعدية مثل الإصابات المرتبطة بالمناعة أو التغذية أو الغدد الصماء أو التمثيل الغذائي أو الصدمات والمتنوعة. قد تشكل معظم الأمراض الجلدية المعدية لدى القطط خطر الإصابة بالأمراض الحيوانية المنشأ على المتعاملين والمالكين. تم فحص إجمالي ٣٣٢ قطة مقدمة بحثاً عن مشاكل جلدية. وفي فترة سنة واحدة، عانت ١٥,٧٪ من القطط من اضطرابات جلدية تم فحصها في العيادة البيطرية، كيلانتان، ماليزيا. في القطط، كانت الأمراض الجلدية الأكثر شيوعاً هي المسببات الطفيلية ١٠٥ حالة (٣١,٦٢٪)، والأمراض الجلدية المؤلمة ٧٩ حالة (٢٣,٧٩٪)، والأمراض الجلدية الفطرية ٨٤ حالة، (٢٥,٣٠٪)، والأمراض الجلدية البكتيرية ٣٢ حالة (٩,٦٣٪)، والأمراض الجلدية المرتبطة بالمناعة ١٧ حالة (٥,١٢٪)، الأمراض الجلدية الفيروسية ٣ حالات (٠,٩٠٪)، والأمراض الجلدية الأخرى ١٢ حالة (٣,٦١٪). كانت مشاكل الجلد الطفيلية بشكل عام مرتبطة بشكل كبير بالقطط التي لديها إمكانية الوصول إلى البيئة الخارجية والتي كانت القطط الخارجية (٢٥,٧٪) والقطط شبه المتجولة (٣٨,٦٪) والتي تتراكم بنسبة ٦٧,٣٪ من إجمالي الأمراض الجلدية الطفيلية حيث يوجد خطر متزايد للاتصال المباشر بالقطط. القطط المصابة. لذلك يجب التأكيد على أن نتائج الدراسة يجب أن تأخذ في الاعتبار بعض التحيزات المتأصلة التالية حيث تم استخلاص مواد الحالة فقط من الحالات السريرية المسجلة، وقد يختلف توزيع الحالات باختلاف الحالات المتاحة للممارس الخاص العادي؛ الأفراد الذين درسوا الحيوانات لفترة سنة واحدة فقط أكدوا على الشكوى الأولية من مشكلة الجلد.

**الكلمات الدالة:** القطط، الجلد، البكتيرية، الفطرية، الفيروسية، الجلدية.