



ISSN: 2456-2912

VET 2024; 9(2): 679-686

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Received: 22-12-2023

Accepted: 26-01-2024

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## Incidence of fungal dermatitis in dogs

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**DOI:** <https://dx.doi.org/10.22271/veterinary.2024.v9.i2j.1281>

### Abstract

The present research work entitled "Incidence of fungal dermatitis in dogs" was carried out at Department of Veterinary Medicine, Junagadh. A total 817 dogs were brought at small animal medicine OPD, Veterinary Clinical Complex, Kamdhenu University, Junagadh during October, 2022 - March, 2023 and out of them 123 (15.06%) were having different dermatological disorders. Among them a total 39 (4.77%) dogs were positive with canine fungal dermatitis. Canine fungal dermatitis was more common in <1 year age group. Female dogs were more infected as compared to male dogs. Labrador retriever breed of dogs was more affected than other breeds. The most common clinical signs showed by the dogs with fungal dermatitis were itching, erythema, alopecia, mixed lesions (alopecia + itching), rashes, circular lesions, rough hair coat, papules and nodules. The lesions were seen on inner thighs, abdomen, legs, neck, back, paws, face, periocular, tail and chest.

**Keywords:** Dogs, dermatological disorder, fungus, alopecia, *Microsporum canis*

### Introduction

Dogs are one of the first domesticated animals. The association of dogs and humans have promoted co-evolution of many pathogens. The body's largest organ and outermost integument, skin serves as the first line of defence for an individual, making it vulnerable to environmental hazards. Skin problems are one of the most common disorders in companion animals. Dogs are prone to a wide range of skin conditions including parasitic, fungal, bacterial or allergies of various origins. One of these conditions that produces the most suffering is fungal dermatitis.

Fungal infections of the skin, hair and nails are widespread throughout the world and their occurrence has been dramatically rising over the past 20 years. The majority of mycotic skin infections are cutaneous and those involving dermatophytes are referred to as "dermatophytosis", while those involving non-dermatophyte fungi are known as "dermatomycosis". The seven genera *Microsporum*, *Trichophyton*, *Epidermophyton*, *Nannizzia*, *Arthroderma*, *Paraphyton* and *Lophophyton* belong to the group of keratinolytic fungus known as dermatophytes (Bagra *et al.*, 2022) [1]. One of the most prevalent mycotic disorders with a significant public health impact is dermatophytosis (Ivaskiene *et al.*, 2016) [6]. Dermatophytosis is a keratinized layers of the epidermis and superficial fungal infection of hair and is caused by keratinophilic and keratinolytic genera such as *Microsporum*, *Trichophyton* and *Epidermophyton*. *Microsporum canis*, *M. gypseum* and *Trichophyton mentagrophytes* are the pathogens that are most frequently isolated (Scott *et al.*, 2001) [17]. Skin, hair and nails are typically infected by *Trichophyton* species. Skin and hair are infected by *Microsporum* spp., while skin and nails are infected by *Epidermophyton* spp. (Nasimuddin *et al.*, 2014) [12].

### Materials and Methods

The present research work was conducted at Department of Veterinary Medicine, College of Veterinary science and Animal Husbandry, Kamdhenu University, Junagadh from October, 2022 to March, 2023.

A total of 123 dogs presented to the TVCC with dermatological problems were screened for dermatophytosis. Skin scrapings and hair samples were collected and cultured using dermatophyte test medium (DTM) and Sabourad's dextrose agar (SDA). Dermatophytes were confirmed by staining of fungal isolates. Detailed epidemiological data such as age, sex, breed, a complete history of the development of clinical signs, distribution of skin lesions and its type, presence of itching, alopecia or skin lesions were recorded.

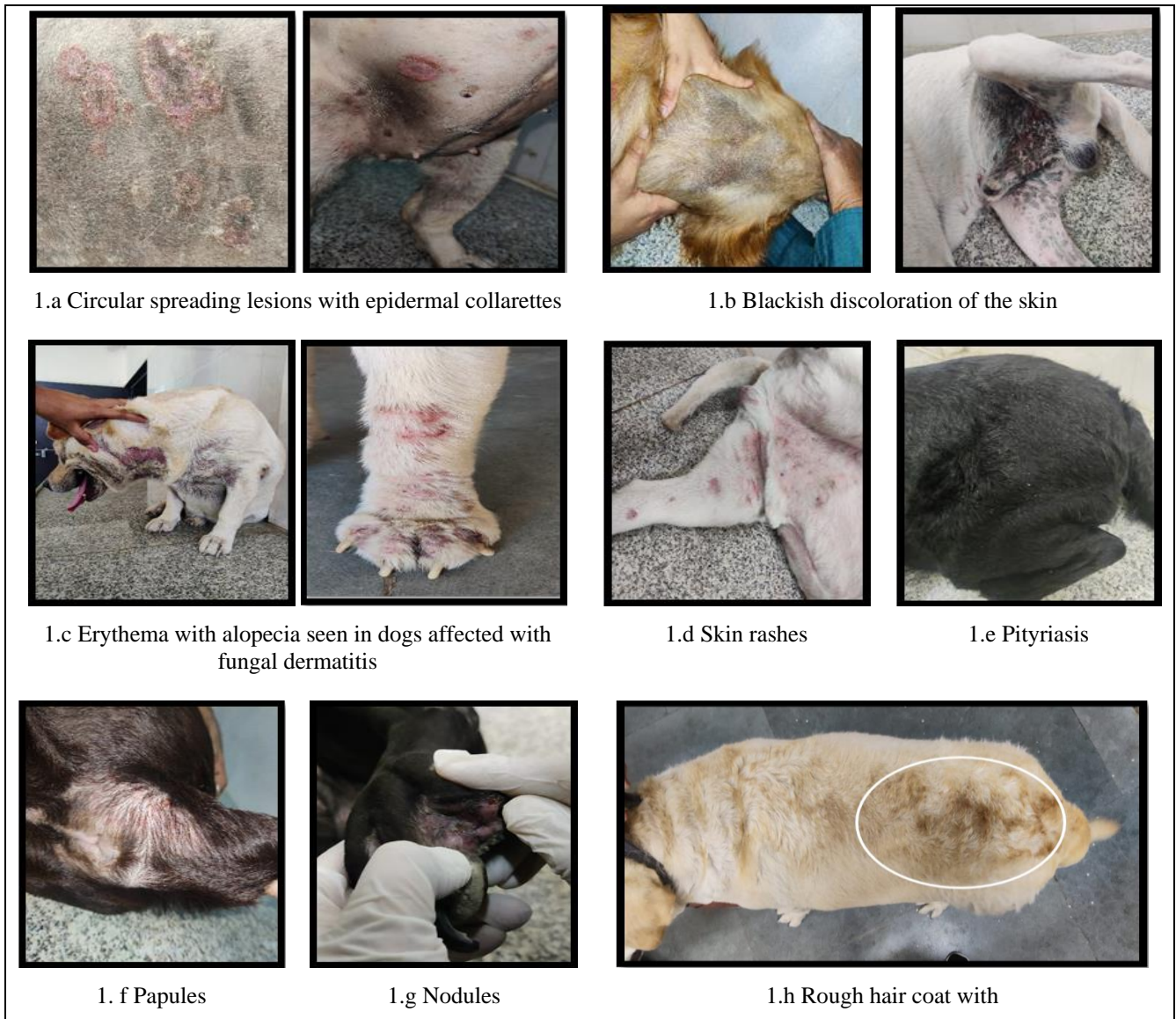
### Results and Discussion

A total 817 dogs were brought at small animal medicine OPD, Veterinary Clinical Complex, Kamdhenu University, Junagadh during October, 2022 - March, 2023 and out of them 123 (15.06%) dogs were having different dermatological disorders and out of them 39 (4.77%) dogs were found positive for fungal dermatitis. Similar level of occurrence was reported by Debnath *et al.* (2016) [3], Sever *et al.* (2017) [18] and Tarra (2021) [22], had reported 20.93, 29.6 and 25 percent, respectively. Higher number of cases of different dermatological disorders (123 cases) were found in dogs of <1 year age group (40.65%; 50 cases) followed by 1-2 years (21.95%; 27 cases), 2-5 years (21.14%; 26 cases) and >5 years (16.26%; 20 cases) age group. Table. 1 and Graph. 1. Similar findings were noticed by Singh *et al.* (2012) [21], Khurana *et al.* (2016) [9] and Thapa and Sarkar (2018) [24]. Highest number of cases of canine fungal dermatitis (39 cases) was found in dogs with <1 year age group (53.85%; 21 cases) followed by 1-2 years (23.07%; 9 cases), 2-5 years (17.95%; 7 cases) and >5 years (5.13%; 2 cases) age group in the present study. Table. 2 and Graph. 4. Similar findings were noticed by Katirae *et al.* (2021) [8], Prakash *et al.* (2022) [13] and Reddy *et al.* (2023) [14]. This might be due to an undeveloped immune system and lack of the fungistatic linoleic acid in young animals. (Ghadeer *et al.*, 1997) [5]. Higher number of cases of different canine dermatological disorders (123 cases) were found in males (62.60%; 77 cases) as compare to female dogs (37.40%; 46 cases). Table. 1 and Graph. 2. Similar findings were reported by Sarma *et al.* (2013) [16] and Thapa and Sarkar (2018) [24]. Highest number of cases of canine fungal dermatitis (39 cases) was found in males (66.67%; 26 cases) as compare to female dogs (33.33%; 13 cases). Table. 2 and Graph. 5. Similar findings were reported by Saleem (2021) [15], Siam *et al.* (2022) [19] and Tarra *et al.* (2022) [23]. Highest number of cases of different skin conditions (123 cases) were found in Labrador retriever

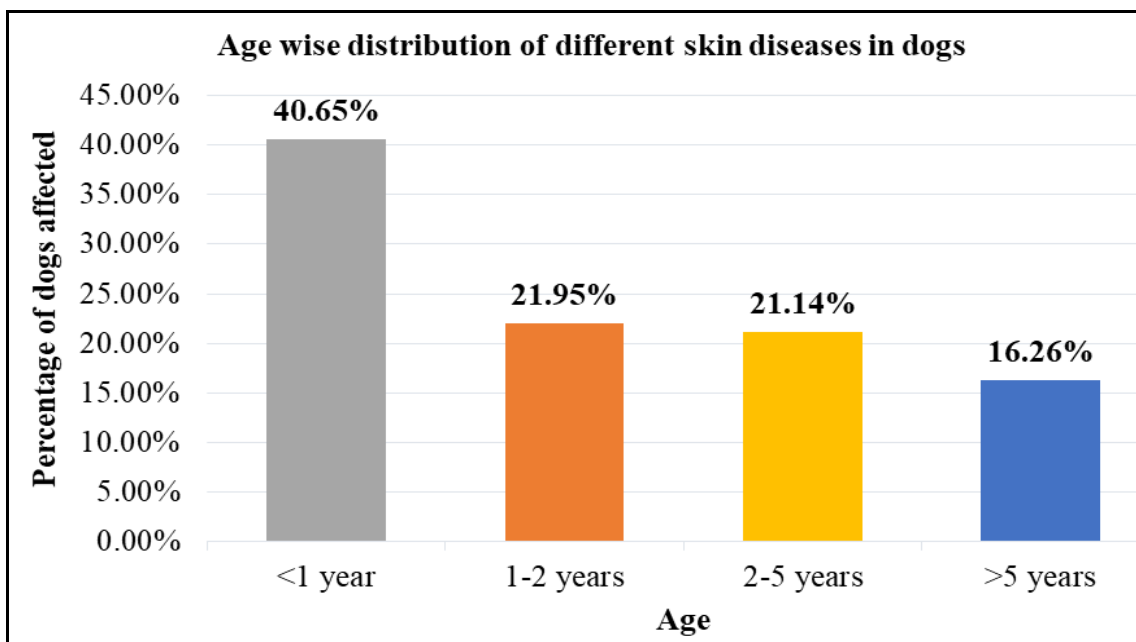
(47.15%; 58 cases) followed by German Shepherd (19.51%; 24 cases), Non-descript (13.01%; 16 cases), Spitz (5.70%; 7 cases), Beagle (3.25%; 4 cases), Doberman (2.44%; 3 cases), Golden retriever (2.44%; 3 cases), Pug (2.44%; 3 cases), Pomeranian (1.63%; 2 cases), Pit bull (0.81%; 1 case), Shih tzu (0.81%; 1 case) and Saint Bernard (0.81%; 1 case). Table. 1 and Graph. 3. Similar findings were noticed by Sarma *et al.* (2013) [16] and Thapa and Sarkar (2018) [24]. Highest number of cases of canine fungal dermatitis (39 cases) was found in Labrador retriever (30.77%; 12 cases) followed by non-descript (23.08%; 9 cases), German Shepherd (17.95%; 7 cases), Spitz (10.26%; 4 cases), Pug (5.13%; 2 cases), Golden retriever (5.13%; 2 cases), Doberman (2.56%; 1 case), Shih tzu (2.56%; 1 case) and Saint Bernard (2.56%; 1 case). Table. 2 and Graph. 6. Comparable findings were reported by Jena *et al.* (2019) [7], Saleem (2021) [15] and Prakash *et al.* (2022) [13]. Labrador retrievers and German shepherds have the highest incidence due to their long hair. German Shepherds may have a higher incidence because of their long hair coats and increase humidity levels, which play a significant role in the easy growth and spread of fungal components. A total 39 dogs affected with fungal dermatitis showed different clinical symptoms like itching (94.87%; 37 cases), erythema (82.05%; 32 cases), alopecia (79.49%; 31 cases), mixed lesions (alopecia + itching) (79.49%; 31 cases), rashes (56.41%; 22 cases), circular lesions (46.15%; 18 cases), rough hair coat (35.90%; 14 cases), papules (23.08%; 9 cases), any other discharge from lesions (12.82%; 5 cases) and nodules (5.13%; 2 cases) which summarized in Table.3 and Graph.7. The lesions were seen on inner thighs (74.36%; 29 cases), abdomen (53.85%; 21 cases), legs (41.03%; 16 cases), neck (33.33%; 13 cases), back (33.33%; 13 cases), paws (28.21%; 11 cases), face (28.21%; 11 cases), periorcular (10.26%; 4 cases), tail (10.26%; 4 cases) and chest (5.13%; 2 cases) which summarized in Table.4 and Graph.8. Similar findings noticed by Gangil *et al.* (2012) [4], Da Cunha *et al.* (2019) [2], Minnat and Khalaf (2019) [10] and Prakash *et al.* (2022) [13]. Singathia (2014) [20], Moriello *et al.* (2017) [11] and Da Cunha *et al.* (2019) [2] explained that lesions of dermatophytosis could range from mild to severe, depending on the variety of factors such as the infecting organisms, virulence factors, location of infection, secondary infections and environmental circumstances. This may be caused by variations in local skin factors, such as saturated long chain fatty acids, anatomical and functional sebaceous gland involution and unidentified immunologic factors.

**Table 1:** Incidence of different dermatological disorders in dogs during study

Distribution	Animals	Total animals screened
Age wise	<1 year	50 (40.65%)
	1-2 years	27 (21.95%)
	2-5 years	26 (21.14%)
	>5 years	20 (16.26%)
Sex wise	Male	77 (62.60%)
	Female	46 (37.40%)
Breed wise	Labrador retriever	58 (47.15%)
	German Shepherd	24 (19.51%)
	Non-descript	16 (13.01%)
	Spitz	7 (5.70%)
	Beagle	4 (3.25%)
	Doberman	3 (2.44%)
	Golden retriever	3 (2.44%)
	Pug	3 (2.44%)
	Pomeranian	2 (1.63%)
	Pit-bull	1 (0.81%)
	Shih tzu	1 (0.81%)
Saint Bernard	1 (0.81%)	

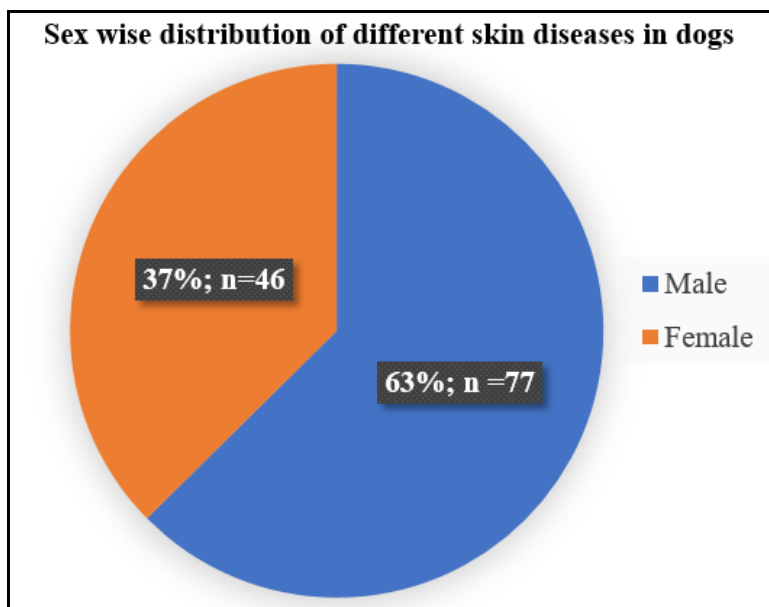


**Fig 1:** Clinical signs of canine fungal dermatitis

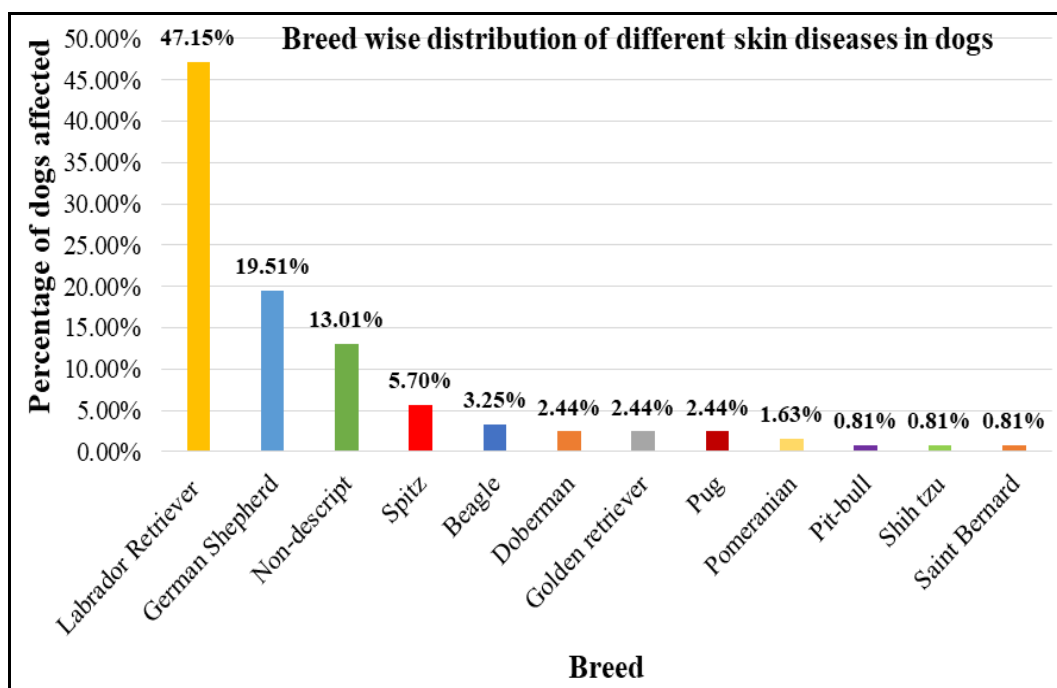


**Graph 1:** Age wise distribution of different dermatological disorders in dog





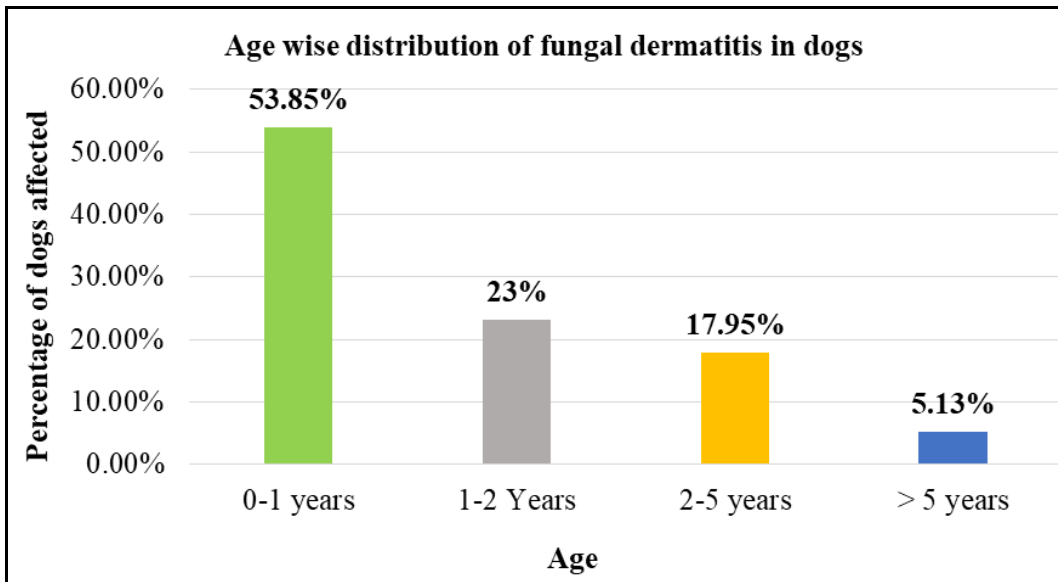
**Graph 2:** Sex wise distribution of different dermatological disorders in dogs



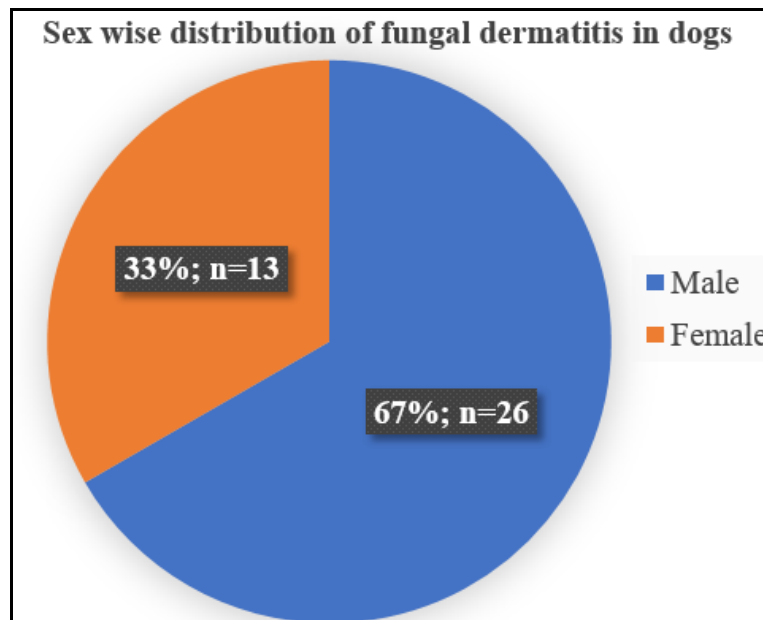
**Graph 3:** Breed wise distribution of different dermatological disorders in dogs

**Table 2:** Details of dog’s positive for fungal dermatitis which are included in the study

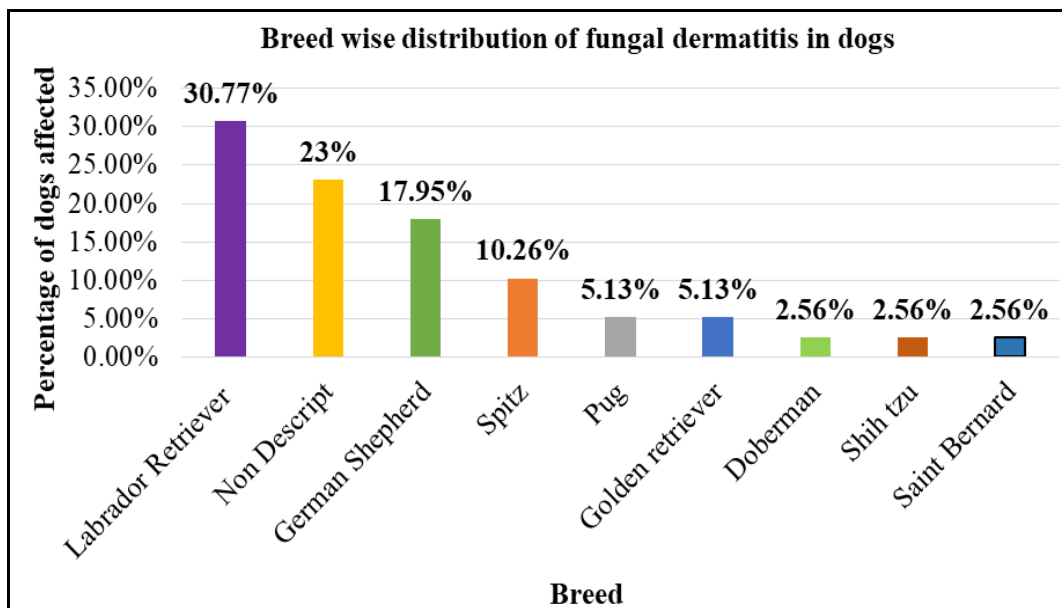
Distribution	Animals	Total fungal dermatitis animals
Age wise	< 1 year	21 (53.85%)
	1-2years	9 (23.07%)
	2-5 years	7 (17.95%)
	>5 years	2 (5.13%)
Sex wise	Male	26 (66.67%)
	Female	13 (33.33%)
Breed wise	Labrador retriever	12 (30.77%)
	Non-descript	9 (23.08%)
	German Shepherd	7 (17.95%)
	Spitz	4 (10.26%)
	Pug	2 (5.13%)
	Golden retriever	2 (5.13%)
	Doberman	1 (2.56%)
	Shih tzu	1 (2.56%)
Saint Bernard	1 (2.56%)	



Graph 4: Age wise distribution of canine fungal dermatitis



Graph 5: Sex wise distribution of canine fungal dermatitis



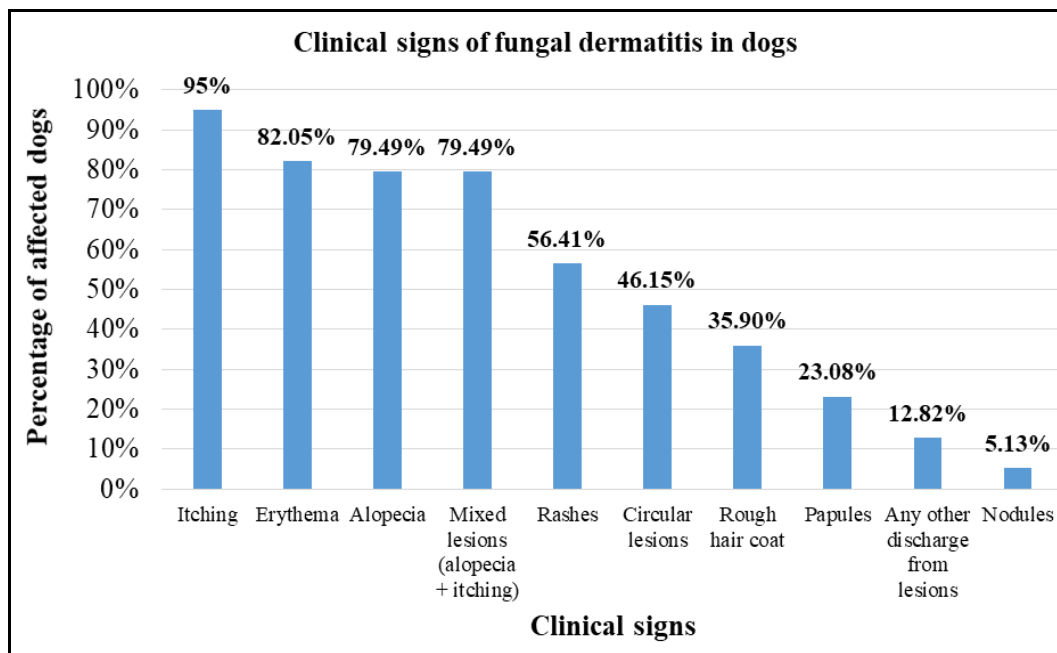
Graph 6: Breed wise distribution of canine fungal dermatitis

**Table 3:** Clinical symptomatology of dogs affected with fungal dermatitis

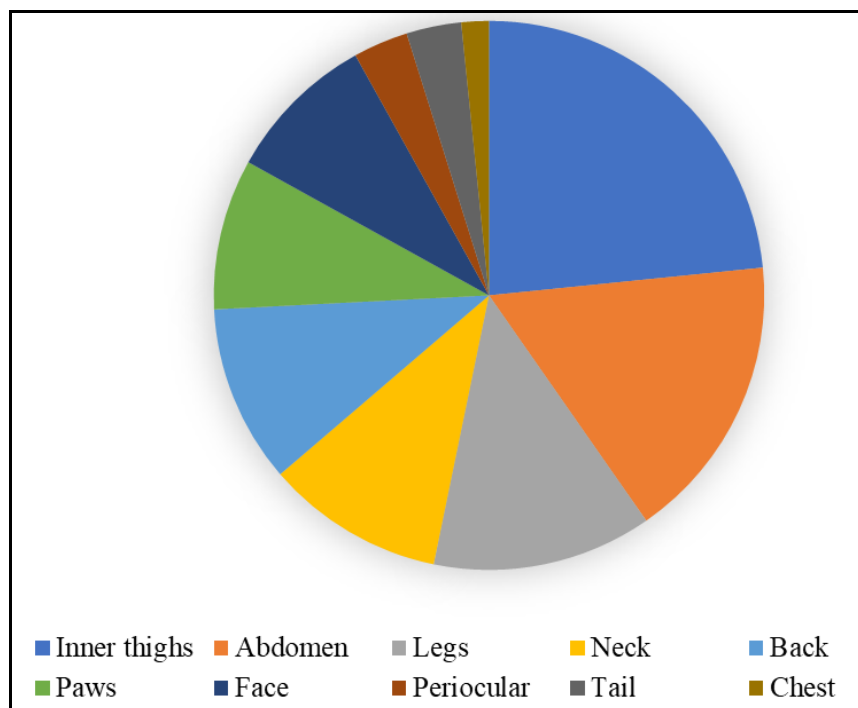
Sr. No.	Clinical signs	Number of affected dogs (n=39)	Percentage of affected dogs
1.	Itching	37	94.87%
2.	Erythema	32	82.05%
3.	Alopecia	31	79.46%
4.	Mixed lesions (alopecia + itching)	31	79.46%
5.	Rashes	22	56.41%
6.	Circular lesions	18	46.15%
7.	Rough hair coat	14	35.90%
8.	Papules	09	23.08%
9.	Any other discharge from lesions	05	12.82%
10.	Nodules	02	5.13%

**Table 4:** Distribution of lesions in dogs affected with fungal dermatitis

Sr. No.	Distribution of lesions	Number of affected dogs (n=39)	Percentage of affected dogs
1.	Inner thighs	29	74.36%
2.	Abdomen	21	53.85%
3.	Legs	16	41.03%
4.	Neck	13	33.33%
5.	Back	13	33.33%
6.	Paws	11	28.21%
7.	Face	11	28.21%
8.	Periocular	04	10.26%
9.	Tail	04	10.26%
10.	Chest	02	5.13%



**Graph 7:** Clinical symptomatology of dogs affected with fungal dermatitis



**Graph 8:** Distribution of lesions in dogs affected with fungal dermatitis

### Conclusion

The present study investigated on different epidemiological factors which predisposes dogs to fungal dermatitis. The incidence of different dermatological disorder in dogs was observed to be 15.06%. Different dermatological disorders were found to be higher in dogs of <1 year age group and in male dogs. In breed wise prevalence Labrador retriever (47.15%) was more affected. The incidence of fungal dermatitis was 4.77% in dogs. It was found high in male dogs (66.67%) and in dogs with less than 1 year of age group. Labrador retriever dogs were highly affected with canine fungal dermatitis followed by non-descript and German Shepherd dogs during the study period. The most common clinical signs showed by the dogs with fungal dermatitis were itching, erythema, alopecia, mixed lesions (alopecia + itching), rashes, circular lesions, rough hair coat, papules, any other discharge from lesions and nodules.

### Acknowledgement

The authors thank the Dean, College of Veterinary Sciences and Animal Husbandry, Kamdhenu University, Junagadh for providing facilities for conduct of the study.

### Conflict of interest

The authors declare that they have no conflict of interest.

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