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Mapping the Burden of *Canine Demodicosis* in Palampur: Insights from a Regional Epidemiological Study

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Abstract

A regional epidemiological study was conducted on dogs presented to the Department of Veterinary Medicine, DGCN COVAS, Palampur, from May 2024 to September 2025. The study focused on the occurrence of *canine demodicosis* in the region. A total of 2951 canine cases were examined, among which 419 (14%) animals exhibited dermatological conditions. Of these, 46 (10.97%) dogs were confirmed to have demodicosis, accounting for approximately 1.6% of all cases screened, based on skin-scraping examination. The month-wise distribution, along with age, sex, breed, and seasonal predispositions, was evaluated. The highest prevalence (32.60%) was recorded in dogs aged 6–12 months, and male dogs showed a markedly higher prevalence (89.13%) compared to females (10.86%). Mongrels constituted the most affected breed group (34.78%). The disease was most frequently observed during July 2025 (15.55%). Overall, the findings underscore that *canine demodicosis* remains a significant dermatological concern in the Palampur region, highlighting the need for appropriate management.

Keywords: Demodicosis, Epidemiological, *Demodex canis,* Mapping, Prevalence

Canine demodicosis is a parasitic skin disorder resulting from the proliferation of *Demodex canis*, a mite normally present in the hair follicles and sebaceous glands of healthy dogs. Although these mites exist as part of the normal cutaneous microfauna, their excessive multiplication under immunosuppressed conditions leads to clinical disease[1]. The condition is classified into localised and generalised forms, with the generalised type posing greater therapeutic challenges due to its chronic and recurrent nature[2].

Several factors, such as age, sex, breed, nutritional status, concurrent illnesses and environmental conditions, influence the occurrence of the disease. Juvenile dogs, particularly those less than one year of age, are more predisposed because of their immature immune system, while adults often develop the disease secondary to systemic disorders or immunosuppressive conditions[3]. Globally, *Canine demodicosis* has been widely investigated, with prevalence varying across regions. In India, reports from Gujarat, Punjab, and Himachal Pradesh indicate that it remains an important dermatological concern in clinical practice[1,3]. However, despite these regional observations, systematic epidemiological data specific to the Palampur region are still lacking, creating a clear gap in knowledge. Since climatic and breed-related factors can influence disease patterns, addressing this gap through region-specific studies is essential for establishing baseline prevalence and improving control strategies.

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Therefore, the present investigation was undertaken to determine the prevalence of *canine demodicosis* in and around Palampur, Himachal Pradesh, during 2024–2025. It further aimed to evaluate age, sex, breed, and seasonal predispositions to clarify the disease's epidemiological patterns and enhance understanding of its regional impact.

MATERIALS AND METHODS

The investigation was undertaken in the Medicine Department of Dr G.C. Negi at the College of Veterinary and Animal Sciences, CSK Himachal Pradesh Krishi Vishwavidyalaya, Palampur (H.P.). Nestled in the mid-Himalayan region, the institute caters to a wide range of clinical cases influenced by the area's distinct climatic conditions. Clinical data from canine patients presented between May 2024 and September 2025 formed the basis of the present study. A total of 2,951 dogs of different breeds, ages, and sexes were presented to the Veterinary Medicine Clinical Complex and examined. Dogs exhibiting clinical signs like erythema, alopecia, pruritis, and pustules were further investigated, and only those confirmed positive through skin scraping were included in the study.

Deep skin scrapings were collected from affected areas until capillary bleeding occurred and examined microscopically. Samples were treated with liquid paraffin or 10% KOH for better visualisation. The presence of adult mites, larvae, nymphs, or eggs of *Demodex* was considered confirmatory for demodicosis[4] as shown in Figure 1. The prevalence of demodicosis was calculated for each month, age, sex, breed, season and clinical sign as a percentage of the total examined dogs. Descriptive statistics were used to summarise the data, and associations between these factors and disease occurrence were evaluated.

RESULTS AND DISCUSSION

Out of 419 total dogs examined, 46 were found positive for demodicosis, yielding a prevalence of 10.97%. The prevalence of *canine demodicosis* was highest in July 2025 (15.55%), followed by March 2025 (11.11%), while the lowest prevalence was in January and June 2025 (2.22%), as shown in Table 1. Comparable seasonal trends were reported by Berian *et al.*[5], who observed the greatest number of cases during July and the fewest during December, highlighting the influence of environmental conditions on disease occurrence.

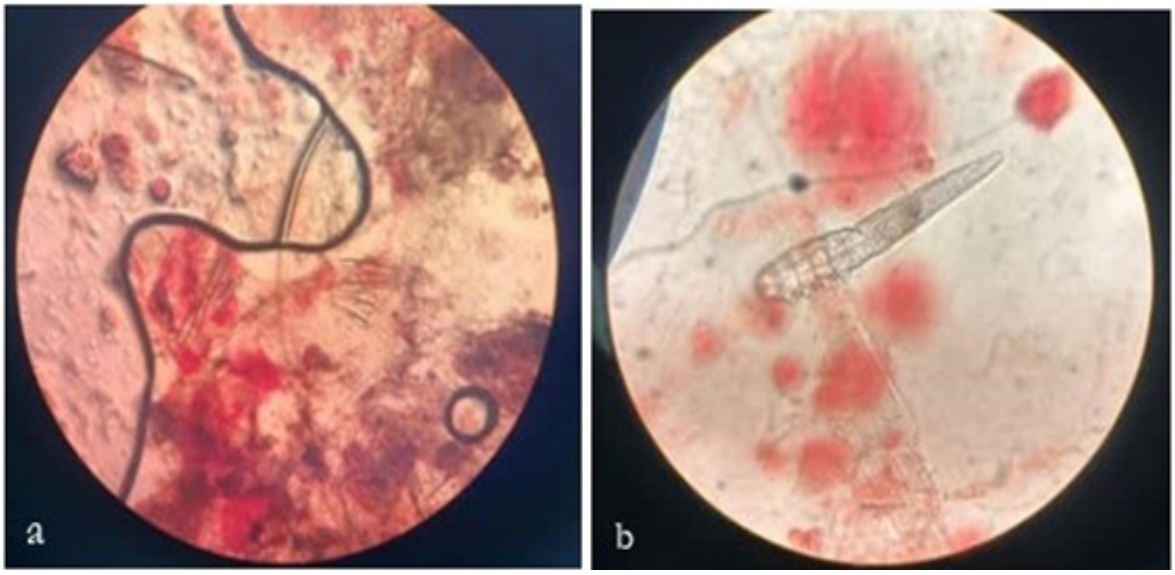


Figure 1. Deep skin scraping from an affected dog, revealing the presence of *Demodex* mites on light microscopy at **(a)** 10X magnification and **(b)** 40X magnification.

Table 1. Month-wise prevalence of demodicosis in dogs

S. No.	Month	No. of positive cases	Prevalence rate (%)
1.	May 2024	3	6.66%
2.	June 2024	3	6.66%
3.	July 2024	1	2.22%
4.	August 2024	2	4.44%
5.	September 2024	4	8.88%
6.	October 2024	3	6.66%
7.	November 2024	1	2.22%
8.	December 2024	0	0%
9.	January 2025	1	2.22%
10.	February 2025	3	6.66%
11.	March 2025	5	11.11%
12.	April 2025	3	6.66%
13.	May 2025	4	8.88%
14.	June 2025	1	2.22%
15.	July 2025	7	15.55%
16.	August 2025	2	4.44%
17.	September 2025	3	6.66%

Age-Wise Prevalence

The highest frequency of demodicosis was observed in dogs aged 6–12 months (32.60%), while the lowest prevalence occurred in puppies aged 0–6 months (13.04%), as shown in Table 2. These findings are in agreement with Satasiya *et al.*[3], who found that the highest prevalence was in dogs under 1 year of age, followed by those aged 1–5 years and over 5 years. Similarly, Kumari *et al.*[6] documented that 70% of affected dogs were under 2 years, 20% between 2 and 4 years and 10% above 4 years. Comparable observations

Table 2. Age-wise prevalence of Demodicosis in dogs

S. No.	Age	No. of positive cases	Prevalence Rate (%)
1.	0-6 months	6	13.04%
2.	6 months – 1year	15	32.60%
3.	I year – 3 years	12	26.08%
4.	>3 years	13	28.26%

were also reported by Chander *et al.*[7], with 72% of cases recorded in dogs up to 2 years, 12% in the 2–4-year group and 16% in dogs older than 4 years.

Sex-Wise Prevalence

Male dogs exhibited a notably higher prevalence of demodicosis (89.13%) compared to females (10.86%), as presented in Table 3. These observations align with previous reports, including Sharma *et al.*[1], who recorded 81.82% of affected dogs as males and Rahman *et al.*[8], who reported 36.59% prevalence in males versus 20.34% in females. Similarly, Thakur *et al.*[9] documented a slightly higher male predisposition (51.42%) compared to females (48.57%). The consistently higher prevalence in male dogs has been attributed to hormonal influences and managemental factors, reflecting both biological susceptibility and husbandry practices.

Breed-Wise Prevalence

In Breed wise predisposition of demodicosis in dogs (Table 4), It was found that Mongrel breed was more infested with demodicosis (34.78%) followed by German shepherd (13.04%), while Bull Dog (2.17%), Spitz (2.17%), Golden retriever (2.17%) and Pug (2.17%) breeds recorded the lowest prevalence (2.17% each). These observations align with the findings of Vivek *et al.*[10], who reported higher susceptibility in non-descript, Labrador, and German Shepherd breeds, with comparatively lower occurrence in Spitz, Saint

Table 3. Sex wise prevalence of Demodicosis in dogs

S.No.	Sex	No. of positive cases	Prevalence rate (%)
1.	Female	5	10.86%
2.	Male	41	89.13%

Table 4. Breed-wise prevalence of Demodicosis in dogs

S. No.	Breed	No. of positive cases	Prevalence Rate (%)
1.	Mongrel	16	34.78%
2.	German shepherd	6	13.04%
3.	Labrador	5	10.86%
4.	Gaddi	4	8.69%
5.	Pointer	4	8.69%
6.	Shih Tzu	3	6.52%
7.	Beagle	2	4.34%
8.	Husky	2	4.34%
9.	Pug	1	2.17%
10.	Bull dog	1	2.17%
11.	Spitz	1	2.17%
12.	Golden retriever	1	2.17%

Bernard, Rottweiler and Pug. Similar trends were described by Sarkar *et al.*[11], noting a greater burden of ectoparasitic infestations in Mongrels relative to several pure breeds. The increased involvement of Mongrels may be attributed to their free-roaming behaviour and close contact with other dogs, which heightens the likelihood of disease transmission.

Season-Wise Prevalence

Seasonal analysis revealed that demodicosis was most frequent during the rainy season (47.82%), followed by summer (41.30%) and winter (10.86%) (Table 5). This pattern may reflect the influence of increased humidity, favourable temperatures and higher ectoparasite burden during monsoon months. Comparable seasonal trends were documented by Sharma *et al.*[12] also found that highest occurrence of demodicosis during the rainy season (46.69%), Thakur *et al.*[9], who also reported the highest occurrence of demodicosis in the rainy season, and by Sarkar *et al.*[11], who observed a peak in ectoparasitic infestations during monsoon, with reduced levels in summer and winter.

Clinical Manifestations in Dogs Affected with *Demodex* spp.

The dogs with demodicosis showed a wide range of clinical symptoms, which are reported in Table 6. Clinical examination of 46 dogs with Demodicosis found the symptoms of alopecia (100%, 46/46), erythema (73.91%, 34/46), pruritus (58.69%, 27/46),

Table 5. Season-wise prevalence of Demodicosis in dogs

S.No.	Season	Prevalence Rate (%)
1.	Summer (March, April, May, June) 19	41.30 %
2.	Rainy (July, August, September, October) 22	47.82 %
3.	Winter (November, December, January, February) 5	10.86 %

Table 6. Clinical manifestations in dogs affected with the *demodex* species

S. No.	Signs	Numbers recorded	Prevalence rate (%)
1.	Alopecia	46	100 %
2.	Erythema	34	73.91%
3.	Pruritus	27	58.69%
4.	Foul smelling	22	47.82%
5.	Dehydration status (35-57%)	20	43.47%
6.	Hyperpigmentation	14	30.43%
7.	Crust	10	21.73%
8.	Scales	8	17.39%
9.	Papules	6	13.04%
10.	Pale mucous membrane	4	8.69%



Figure 2. Clinical signs seen in canine demodicosis.

foul smell (47.82%, 22/46), dehydration (43.47%, 20/46), hyperpigmentation (30.43%, 14/46), crusting (21.73%, 10/46), scales (17.39, 8/46), papules (13.04%, 6/46), and pale mucous (8.69%, 4/46) as shown in Figure 2 (a-f).

Where, (A). Alopecia in German shepherd (B), Hyperpigmentation and lichenification in Mongrel dog; (C) Scales and papules in Gaddi dog, (D) Crusty lesion in Shih tzu, (E) Erythema and papules in Golden retriever, (F) Spectacles eyes/eyeglass lesion in Chow-chow

Similar findings observed by Chander *et al.*[7] in a clinical examination of 25 dogs with *canine demodicosis*, symptoms included alopecia (100%), scales (60%), erythema (80%), pustules (76%), pruritus (68%), hyperpigmentation (32%), seborrheoa (20%), lichenification (32%), papules (36%), and scabs (12%). Bhusal *et al.*[13] documented that alopecia was seen in all demodicosis-affected dogs (100%, 21/21), followed by white scale (66.70%, 14/21), erythema (61.90%, 13/21), pigmentation (52.38%, 11/21), pus-filled lumps (47.61%, 10/21) and hotspots (38.09%, 8/21). These

findings were also supported by Chander *et al.*[7] which revealed alopecia in 100% of cases, and then scale at 60% and erythema at 80% in a clinical evaluation of 21 demodicosis cases. Alopecia is a common clinical complaint in dogs, which may be caused by mite inflammation and irritation of the hair[14]. Erythema or reddening of the skin can be produced by epidermal cells, exudates from infested mites, or enhanced peripheral blood circulation[7].

CONCLUSION

The current study shows that *canine demodicosis* remains a significant dermatological concern in and around Palampur, with the prevalence of 10.97% among dogs diagnosed with skin illnesses during the study period, also Nanika *et al.*[15] found that an overall prevalence of otitis externa of 3.27% among dogs in Palam valley of Himachal Pradesh that corresponds with previous data from various parts of India indicating that demodicosis remains a significant component to the dermatological caseload in canine practice. The findings thus underscore the need for routine parasitological examination of dogs presenting with alopecia and other non-specific dermatoses in this location. Further, the study provides valuable baseline epidemiological data on *canine demodicosis* in Palampur, located in the mid-Himalayas. The clear tendency in young, male, and Mongrel dogs, along with the pronounced seasonal peak during the rainy months, provides useful information for focused surveillance, owner education, and appropriate intervention. Early diagnostic screening, regular ectoparasite treatment, and increased knowledge among dog owners and doctors are predicted to lower the disease burden and enhance the general dermatological health of the canine population.

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AUTHORS CONTRIBUTION

K: conducted the experiment, analyzed the data and wrote the original manuscript. PS conceptualize the research programme, methodology, provided resources, reviewed and edited the manuscript.