International Journal of Veterinary Sciences and Animal Husbandry

**ISSN:** 2456-2912
NAAS Rating (2025): 4.61
VET 2025; SP-10(7): 93-97

www.veterinarypaper.com
Received: 04-06-2025
Accepted: 03-07-2025

**Siddanna Manashetti**
Department of Veterinary Medicine, Veterinary Clinical Complex, Rajiv Gandhi Institute of Veterinary Education and Research, Puducherry, India

**Bhuvaneswari**
Department of Veterinary Medicine, Veterinary Clinical Complex, Rajiv Gandhi Institute of Veterinary Education and Research, Puducherry, India

**D Selvi**
Department of Veterinary Medicine, Veterinary Clinical Complex, Rajiv Gandhi Institute of Veterinary Education and Research, Puducherry, India

**Ganesan R**
Department of Veterinary Medicine, Veterinary Clinical Complex, Rajiv Gandhi Institute of Veterinary Education and Research, Puducherry, India

**P Vijayalakshmi**
Department of Veterinary Medicine, Veterinary Clinical Complex, Rajiv Gandhi Institute of Veterinary Education and Research, Puducherry, India

**N Devadevi**
Department of Veterinary Medicine, Veterinary Clinical Complex, Rajiv Gandhi Institute of Veterinary Education and Research, Puducherry, India

**Corresponding Author:**
**Siddanna Manashetti**
Department of Veterinary Medicine, Veterinary Clinical Complex, Rajiv Gandhi Institute of Veterinary Education and Research, Puducherry, India

# Retrospective study on epidemiological pattern of diseases in goats of Puducherry region

**Siddanna Manashetti, Bhuvaneswari, D Selvi, Ganesan R, P Vijayalakshmi and N Devadevi**

**Abstract**
A retrospective study was conducted to understand the epidemiology of diseases affecting goats from the cases reported to the Department of Veterinary Medicine, Veterinary clinical complex, RIVER, Puducherry, for a year from January 2023 to December 2023. A total of 235 caprine cases reported were grouped under 32 different diseases/conditions based on tentative diagnosis. The commonly reported diseases were Parasitic (ectendoparasites) (24.9%), Lactacidosis (12.3%), Infectious enteritis (9.7%), Simple indigestion and Bloat (9.27%), Haemoprotozoan diseases (6.3%), Respiratory tract infection (RTI), (5.15%), Polioencephalomalacia (PEM) (5.1%), Peste des Petits Ruminants (PPR) (4.6%) and the rest of the diseases had percentage of occurrence lower than 3%. Out of the total cases, 33.19 per cent were males and the rest 66.8 percent females. Animals aged between 0-3 months had a high occurrence (45.1%) followed by 3-6 months (17.87%). Diseases of the digestive system were most commonly reported (33.79%). The Occurrence of diseases was highest (34.0%) in monsoon season (September-November), followed by 27.7% in the summer season (March-May), 20.4% in the winter season (December), and lowest (17.9 %) in the pre-monsoon season (June-August). The findings of this study highlight the epidemiological pattern of disease occurrence and identify the possible risk factors in the Puducherry region, which will aid in effective therapeutic management and control strategies, including appropriate vaccination programs, deworming, tick control, etc.

**Keywords:** Puducherry, goats, diseases, retrospective study, control strategies, deworming

## Introduction
Livestock rearing forms an integral part of India's agricultural system, playing a vital role in providing nutrition, income, and employment for millions of farmers and rural dwellers. After cattle, goat rearing is emerging as a major sector, pivotal in sustaining livelihoods and nutritional needs in rural communities. Puducherry, renowned for its diverse agricultural practices, confronts unique challenges in livestock health due to varying environmental conditions and local husbandry practices. Though there is a notable increase in goat population as compared to the previous census in 2012, mortality rates also have risen due to diseases, adverse climates, and suboptimal management. To address these issues, a year-long retrospective study was conducted in 2023 at the Veterinary Clinical Complex, RIVER, and Puducherry. This study aimed to unravel the diseases among goats, analyzing factors such as age, sex, affected systems, etiology, and seasonal variations. Moreover, it attempts to find innovative solutions to empower goat owners in overcoming these challenges, thereby enhancing the resilience and sustainability of goat rearing in Puducherry.

## Materials and Methods
A retrospective study was conducted at the Veterinary Clinical Complex, RIVER, Puducherry, for a period of one year (2023). A total of 235 cases reported to VCC were selected from case sheets, which accounted for 32 different diseases such as infectious, noninfectious, metabolic, and other health conditions affecting goats. Statistical analysis was carried out by SPSS software version 29.

## Results and Discussion

According to the case records, a total of 235 caprine cases were reported with different tentative diagnoses. The commonly reported diseases were Parasitic (ectendoparasites) (24.9%), Lactic acidosis (12.3%), Infectious enteritis (9.7%), Simple indigestion and bloat (9.27%), Haemoprotozoan diseases (6.3%), Respiratory tract infection (RTI), (5.15%), Polioencephalomalacia (PEM) (5.1%), Peste des Petits Ruminants (PPR) (4.6%) and the rest of the diseases had occurrence lower than 3% such as Tetanus (3%), Pregnancy toxemia (2.8%), Orf (2.7%), Goat pox (2.5%), Mastitis (2.2%), Listeriosis/Encephalitis (2%), Urinary tract infections (1.7%), Neonatal hypoglycemia (1.4%), Joint ill (1.2%), Snake bite (1.1%), Sting bite (1.3%) and Hemorrhagic septicemia (0.9%). Out of the total cases 33.19 percent were males and 66.8 percent were females. Animals aged between 0-3 months had a high occurrence (45.1%) followed by 3-6 months (17.87%). Diseases of the digestive system were most commonly reported (33.79%), and diseases of the cardiovascular system (0.4%) were least commonly reported. The Occurrence of diseases was highest (34.0%) in the monsoon season (September-November) followed by 27.7 per cent in the summer season (March-May), 20.4% in the winter season (December-February), and lowest (17.9 %) in the pre-monsoon season (June-August), (Table 3).

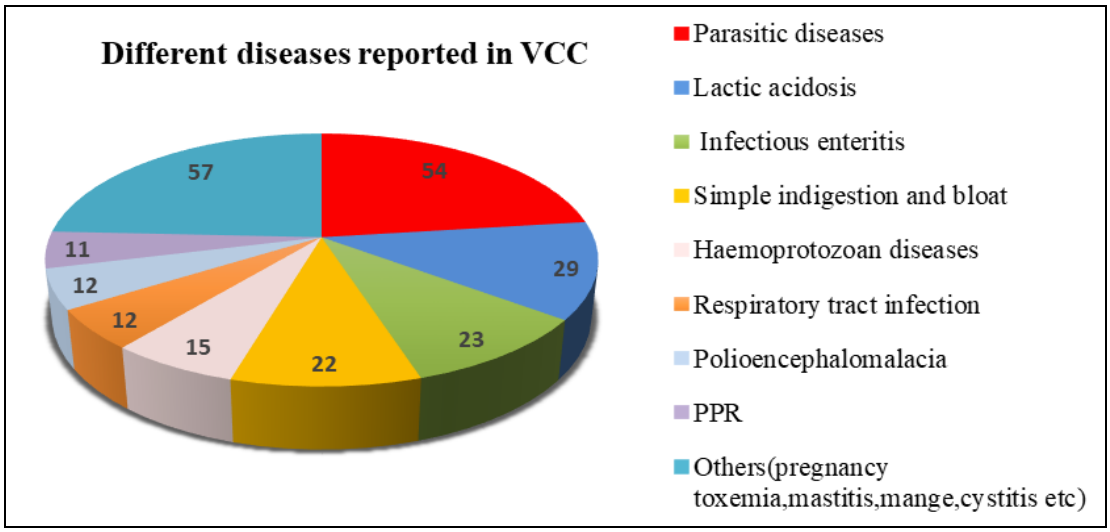


**Fig 1:** Different diseases reported to VCC from Jan 2023 to Dec 2023

## Parasitic Diseases

Parasitic diseases emerged as the predominant (24.9%) diagnostic group among diseases of goats reported to VCC, Gopal *et al*. (2015) [16], (Table 1). Both endoparasite and ectoparasitic infestations were observed at the highest proportion (46.57%) among young goats of age 0-3 months (Table 2). This might be because of their weaker immunity at a younger age. Throughout the year, parasitic infections were observed, which were primarily attributed to roundworms (*Strongylus, Strongyloides,* and *Trichuris), coccidial oocysts*, flukes, and external parasites such as ticks (Hyalomma), flies, and mites (Sarcoptes). Goats in this region were reared under a semi-intensive housing system, often accessing water bodies while grazing that harbor appropriate intermediate hosts, and most of the owners were not aware of the regular deworming practice, which acts as a predisposing factor for parasitic infections. Seasonally, the incidence of parasitic disease was most prevalent during the monsoon (September-November) and summer (March-May), each accounting for 31% (Table 3). And most of the female (24.2%) animals were affected (Table 1). This observation is in accordance with findings by Ajith *et al.,* (2020) [2], who noted higher percentages of nematode infections in goats during the monsoon and summer seasons.

## Rumen Lactacidosis

Rumen acidosis was reported as second highest disease (12.3 %), (Figure 1). Occurrence was highest in female goats (15.92%) compared to bucks (Table 1) may be of their more population which is supported by Mahbubur *et al.,* (2014) and most of the cases were had history of excess grains feeding, which is one of the potential cause for acidosis. Goats in the age group of 12-36 months are predominantly (44.82%) affected (Table 2).

**Table 1:** Sex-wise distribution of diseases in goats

| | Sex | | | | | |
|---|---|---|---|---|---|---|
| **Disease** | **Male** | | **Female** | | **Total** | |
| | **Number** | **Percent** | **Number** | **Percent** | **Number** | **Percent** |
| Parasitic diseases | 20 | 25 | 38 | 24.2 | 58 | 24.9 |
| Lactacidosis | 4 | 5.1 | 25 | 15.9 | 29 | 12.3 |
| Infectious enteritis | 8 | 10.2 | 15 | 9.5 | 23 | 9.7 |
| Indigestion and bloat | 9 | 11.5 | 13 | 8.2 | 22 | 9.2 |
| Haemoprotozoan diseases | 6 | 7.6 | 9 | 5.7 | 15 | 6.3 |
| Respiratory tract infection | 4 | 5.1 | 8 | 5 | 12 | 5.1 |
| Polioencephalomalacia | 6 | 7.6 | 6 | 3.8 | 12 | 5.1 |
| PPR | 4 | 5.1 | 7 | 4.4 | 11 | 4.6 |
| Others | 19 | 24.3 | 34 | 21.6 | 53 | 22.5 |
| TOTAL | 78 | | 157 | | 235 | |

**Infectious Enteritis**

Infectious enteritis was commonly reported in young animals (19.7%) at 0-3 months of age (Table 2). The reason could be due to concurrent infection with various pathogens such as viruses (rotavirus, adenovirus, coronavirus, and herpes virus), bacteria (*Clostridium perfringens*, *enteropathogenic E. coli*), protozoans (coccidia), and endoparasites. Similar findings were also reported by Heller and Chigerwe (2018) [7], Singh *et al.* (2018) [17] in their respective research studies. A higher number of cases were reported during the monsoon season (18.86%), (Table 3), which may have been due to increased incidence of coccidiosis and gastrointestinal nematodes.

**Table 2:** Age-wise distribution of diseases in goats

| Diseases | 0-3M | | 3-6M | | 6-12M | | >12M | |
|---|---|---|---|---|---|---|---|---|
| | Number | Percent | Number | Percent | Number | Percent | Number | Percent |
| Parasitic diseases | 34 | 46.5 | 12 | 30.7 | 5 | 16.1 | 5 | 17.2 |
| Lactic acidosis | 3 | 4.1 | 3 | 7.6 | 8 | 25.8 | 13 | 44.8 |
| Infectious enteritis | 14 | 19.1 | 2 | 5.1 | 4 | 12.9 | 2 | 6.8 |
| Indigestion & bloat | 6 | 8.2 | 6 | 15.3 | 4 | 12.9 | 4 | 13.7 |
| Haemoprotozoan diseases | 3 | 4.1 | 7 | 17.9 | 2 | 6.4 | 1 | 3.4 |
| RTI | 6 | 8.2 | 4 | 10.2 | 1 | 3.2 | 1 | 3.4 |
| PEM | 3 | 4.1 | 2 | 5.1 | 4 | 12.9 | 3 | 10.3 |
| PPR | 4 | 5.4 | 3 | 7.6 | 3 | 9.6 | 0 | 0 |
| Total | 73 | | 39 | | 31 | | 29 | |

**Simple indigestion and bloat**

Goats were reported with a history of recurrent bloat, along with other symptoms, such as decreased appetite, dehydration, abdominal distention, weakened rumen activity, cessation of rumination, and bradycardia. This condition predominantly affects kids aged 3-6 months, likely due to their voracious feeding tendencies (Table 2). Notably, Peaked occurrence during the monsoon season (16.98%), (Table 3), correlating with a surge in gastrointestinal nematode prevalence during this period. Research underscores a notable gender disparity, with female goats experiencing a higher prevalence of frothy bloat at 8.28 percent compared to their male counterparts (Table 1).

**Table 3:** Season-wise distribution of diseases in goats

| | Seasons | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Diseases | Monsoon (Sept-Nov) | | Summer (March-May) | | Winter (Dec-Feb) | | Pre-Monsoon (June-Aug) | |
| | Number | Percent | Number | Percent | Number | Percent | Number | Percent |
| Parasitic diseases | 18 | 33.9 | 18 | 33.3 | 14 | 32.5 | 8 | 25 |
| Lactoacidosis | 4 | 7.5 | 7 | 12.9 | 10 | 23.2 | 8 | 25 |
| Infectious enteritis | 10 | 18.8 | 7 | 12.9 | 4 | 9.3 | 2 | 6.2 |
| Indigestion&bloat | 9 | 16.9 | 8 | 14.8 | 2 | 4.6 | 3 | 9.3 |
| Haemoprotozoan diseases | 4 | 7.5 | 4 | 7.4 | 2 | 4.6 | 5 | 15.6 |
| RTI | 2 | 3.7 | 4 | 7.4 | 5 | 11.6 | 1 | 3.1 |
| PEM | 2 | 3.7 | 2 | 3.7 | 5 | 11.6 | 3 | 9.3 |
| PPR | 4 | 7.5 | 4 | 7.4 | 1 | 11.6 | 2 | 6.2 |
| Total | 53 | | 54 | | 43 | | 32 | |

**Heamoprotozoan Diseases**

In the present study, a striking occurrence of haemoprotozoan diseases among goats were reported during the pre-monsoon season, 15.62 percent (June-August), followed by in the summer, with 7.4 percent (March-May), (Table 3). The occurrence was common in young to adult goats that more out for graze, exposing them extensively to disease vectors. Common pathogens observed in Puducherry included *Babesia* spp, *Theileria spp* and mixed infections thereof Jayalakshmi and Premalatha, (2020) [8]. These findings underscore the seasonal dynamics and significant health implications for goat populations, emphasizing the need for vigilant vector control strategies and targeted veterinary interventions.

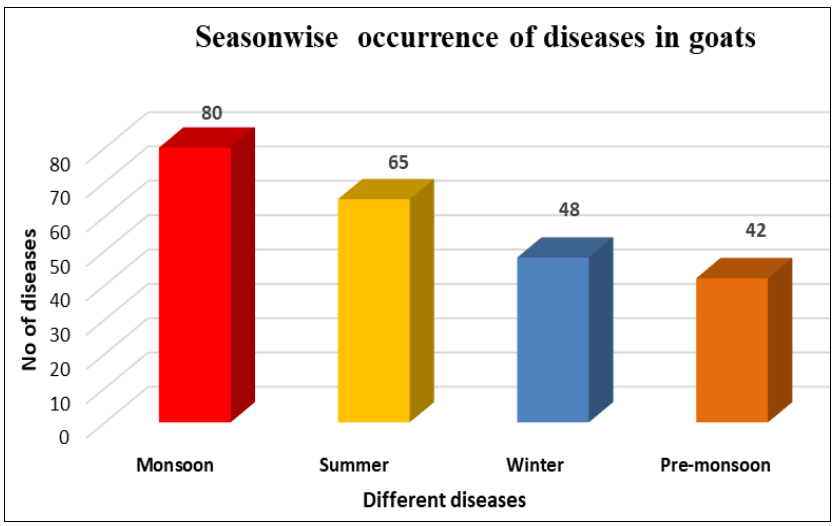


**Fig 2:** Bar diagram depicting the season-wise occurrence of diseases in goats

**Respiratory Tract Infection**

Kids aged between 0-3 months were highly susceptible to respiratory tract infections, 8.21 percent (Table 2). This susceptibility was attributed to concurrent infections by pathogens such as Parainfluenza-3 virus and bacteria like *Staphylococcus* spp., *E. coli*, and *Klebsiella* spp. among sick goats, as highlighted by researchers including Kumar *et al.* (2014) [11]. The Highest number of cases were reported in the winter season, 11.62% (Table 3), because of predisposing factors, such as cold stress, temperature fluctuations, and extreme weather conditions during these months provide an optimal environment for respiratory pathogens to thrive and spread among susceptible goats. This seasonal pattern has been consistently observed in studies by Bordeanu *et al.* (2012) [4], and Muheet *et al.* (2020) [12], emphasizing the critical need for these dynamics is crucial for enhancing the overall health and performance of young goats.

**Table 4:** Age and sex-wise occurrence of diseases in goats

| Sex | Age | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0-3M | | 3-6M | | 6-12M | | 12-36M | | >36M | | Total | |
| | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent |
| Male | 56 | 52.83 | 11 | 26.19 | 8 | 25.8 | 3 | 7.89 | 0 | 0 | 78 | 33.19 |
| Female | 50 | 47.16 | 31 | 73.8 | 23 | 74.19 | 35 | 92.1 | 18 | 100 | 157 | 66.8 |
| Total | 106 | | 42 | | 31 | | 38 | | 18 | | 235 | |

**Polioencephalomalacia (PEM)**

Polioencephalomalacia, a condition associated with cerebrocortical necrosis, can be caused by different nutritional and dietary factors such as thiamine deficiency, lead poisoning, sulfur toxicosis, and salt intake. The presence of high sulfur content in feed, water, dietary supplements, and habitat with elevated hydrogen sulfide concentration can contribute to the development of polioencephalomalacia in small ruminants, particularly in young, growing animals. But the present study did not exhibit any significant correlation between the occurrence of polioencephalomalacia in goats with age, sex, or seasons (Cork *et al.*, 1974) [5].

**Peste Des Petits Ruminants (PPR):** In the present study, it was evident that younger animals, aged 0-3 months, exhibited a higher frequency of occurrence compared to older animals (Table 2), supported by Rashid *et al.*, (2008) [15] in their study mentioned that increased susceptibility of kids to PPR, which was confirmed by histopathological examination and elevated mortality rates during outbreaks. Furthermore, seasonal analysis revealed a notable rise in cases of PPR in goats during the rainy and summer seasons compared to winter (Table 3), as observed by Parvez *et al.*, (2014) [13]. This seasonal pattern was attributed to environmental predisposing factors such as rainfall, relative humidity, and daily air temperature, which collectively create favorable conditions for the transmission and spread of infectious diseases among goat populations.

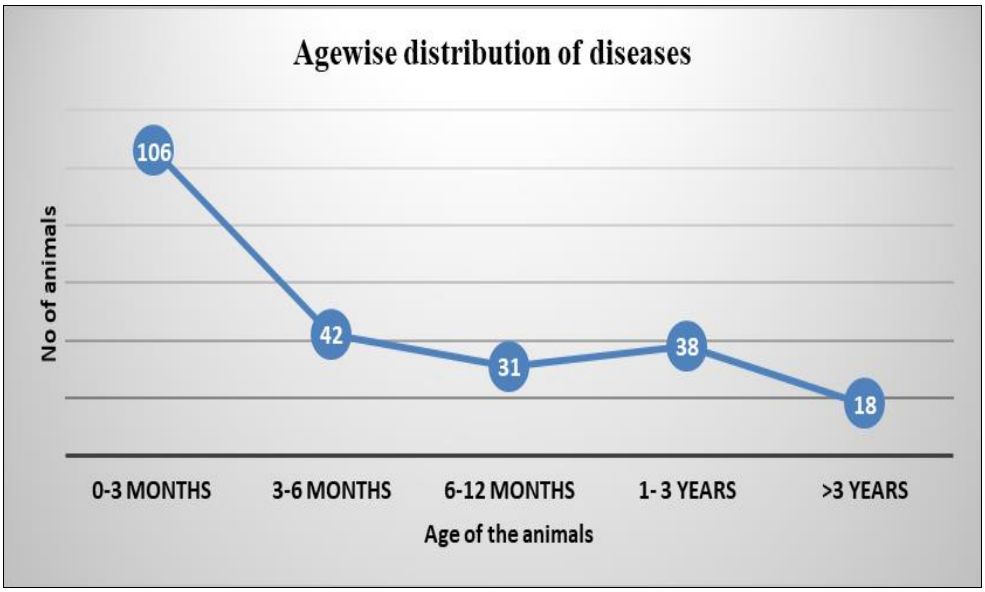


**Fig 3:** Graph depicting age-wise occurrence of diseases

**Other Diseases**

The other diseases reported, such as Tetanus, Pregnancy toxemia, Orf, Goat pox, Joint ill, Mastitis, Neonatal hypoglycemia, Snake bite, Sting bite, Hemorrhagic septicemia, Urinary tract infections, Listeriosis, etc.

**Statistical Analysis**

Statistical Analysis of data collected during the study was carried out using SPSS software version 29, and the association between different diseases and the age of animals was examined using a chi-square test. The analysis revealed a strong association between disease type and age group ($\chi^2$ = 60.068, $p$<0.001). This indicates that the distribution of diseases varies significantly across different age groups of animals. Such findings underscore need for strategic measures to address the age specific diseases.

Conclusion: Based on the comprehensive retrospective study, our findings could highlight critical insights into the prevalent diseases among goats in the region. The high incidence of parasitic diseases, acidosis, infectious enteritis, and other health conditions reflects the poor management practices and lack of veterinary facilities in most of the villages. From the

study, it is clear that seasonal variations can significantly influence disease prevalence, especially during monsoon and summer seasons. These limitations can be overcome by adopting better management practices, including regular deworming and proper feeding protocols, strengthening veterinary services and ensuring timely access to medical care in rural areas, educating the farmers about seasonal impacts on animal health and the importance of preventive measures, such as vaccinations, proper housing and effective vector control can help to reduce the incidence of these diseases for sustainable and profitable goat farming.

**Acknowledgement**
The authors are thankful to the Dean, RIVER and faculty of Veterinary Medicine for providing facilities for conducting the research.

**Conflict of Interest**
Not available

**Financial Support**
Not available

**Reference**

1. Aher TK. Master of Veterinary Science [dissertation]. Anand (IN): Anand Agricultural University; 2011.
2. Ajith Y, Dimri U, Madhesh E, Gopalakrishnan A, Verma MR, Samad HA, *et al*. Influence of weather patterns and air quality on ecological population dynamics of ectoparasites in goats. Int J Biometeorol. 2020;64:1731-42. doi:10.1007/s00484-020-01952-7.
3. Aniță A, Aniță D, Răileanu C, Savuța G. Detection of parainfluenza type 3 virus antigens in goats. DOI: 10.15835/buasvmcn-vm:10385.
4. Bordeanu AD, Krupaci FA, Kiss T, Spînu M. Study of seasonal dynamics in respiratory microbial flora in extensively raised goats. Vet Med. 2012;8(4):38-45.
5. Cork LC, Hadlow WJ, Crawford TB, Gorham JR, Piper RC, *et al*. Infectious leukoencephalomyelitis of young goats. J Infect Dis. 1974;129(2):134-41. DOI: 10.1093/infdis/129.2.134.
6. Gawai P, Gupta D, Mourya A, Das G, Sharma S, *et al*. Prevalence of frothy bloat in goats. J Pharmacogn Phytochem. 2019;8(5):2483-2485.
7. Heller MC, Chigerwe M. Diagnosis and treatment of infectious enteritis in neonatal and juvenile ruminants. Vet Clin North Am Food Anim Pract. 2018;34(1):101-17. DOI: 10.1016/j.cvfa.2017.08.001.
8. Jayalakshmi K, Premalatha N. Investigation of helminthic and haemoprotozoan diseases in anaemic goats. J Entomol Zool Stud. 2020;8(3):43-5.
9. Kattimani TS, Ravindra B, Vivek R, Halmandge S, Patil N, *et al*. Prevalence of pneumonia in goats in and around Bidar. Pharma Innov J. 2020;9:250-252.
10. Kaur S, Singla LD, Sandhu BS, Bal MS, Kaur P, *et al*. Coccidiosis in goats: pathological observations on intestinal developmental stages and anticoccidial efficacy of amprolium. Indian J Anim Res. 2019;53(2):245-249. DOI: 10.18805/ijar.b-3471.
11. Kumar A, Tikoo SK, Malik P, Kumar AT. Respiratory diseases of small ruminants. Vet Med Int. 2014;2014:373642. DOI: 10.1155/2014/373642.
12. Muheet HU, Parray OR, Bhat RA, Yatoo MI. Seasonal and periodic rhythmicity of respiratory infections in small ruminants. Biol Rhythm Res. 2020;51(7):1066-1074. DOI: 10.1080/09291016.2019.1576283.
13. Parvez MA, Khatun R, Al Noman MA. Prevalence and associated risk factors of Peste des Petits Ruminants (PPR) in goats in Chittagong district, Bangladesh. Res J Vet Sci. 2014;2(1s):14-17. DOI: 10.14737/journal.rjvp/2014/2.1s.14.17.
14. Rahman MM, Islam MS, Adam GO, Alam MR, You MJ, *et al*. Prevalence of ruminal lactic acidosis and clinical assessments of four therapeutics in goats of Bangladesh. J Vet Clin. 2014;31(3):199-205. DOI: 10.17555/ksvc.2014.06.31.3.199.
15. Rashid A, Asim M, Hussain A. An outbreak of peste des petits ruminants in goats at district Lahore. J Anim Plant Sci. 2008;18(2-3):72-75.
16. Gopal SSG, Allwin BBA, Senthil NR, Vedamanickam SSV, Kumar VN, *et al*. A retrospective study of ailments in goats at Thiruvallur district, Tamil Nadu state. Int J Livest Res. 2015;5(3). DOI: 10.5455/ijlr.20150318092127.
17. Singh DD, Pawaiya RVS, Gururaj K, Gangwar NK, Mishra AK, Singh R, *et al*. Detection of *Clostridium perfringens toxinotypes*, *enteropathogenic E. coli*, Rota and Corona viruses in the intestine of neonatal goat kids by molecular techniques. Indian J Anim Res. 2018;88(6):655-61. DOI: 10.56093/ijans.v88i6.80863.

**How to Cite This Article**
Manashetti S, Bhuvaneswari, Selvi D, Ganesan R, Vijayalakshmi P, N Devadevi. Retrospective study on epidemiological pattern of diseases in goats of Puducherry region. International Journal of Veterinary Sciences and Animal Husbandry. 2025;SP-10(7):93-97.