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Research Reports

## Prevalence of Gastrointestinal Protozoal Infections in Local Cats (*Felis catus*) in Harau District, Limapuluh Kota Regency

### Prevalensi Infeksi Protozoa Saluran Cerna pada Kucing Lokal (*Felis catus*) di Kecamatan Harau Kabupaten Limapuluh Kota

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#### ABSTRACT

**Background:** One disease that often affects cats' health is infection caused by viruses, bacteria, or protozoa. Protozoa are parasites that can live in the cat's digestive tract. **Purpose:** This study aims to determine the prevalence of digestive tract protozoa in local cats and determine the types of digestive tract protozoa that infect local cats in Harau District. This study also calculated the percentage of cats infected with protozoa based on the sex and age of the cat. **Method:** The examination method used in this research is the floating method. Examinations were carried out at the Animal Health and Disease Laboratory of the Payakumbuh State Agricultural Polytechnic on 50 feces samples from local cats kept in Harau District. Cat feces samples were taken using purposive sampling in Harau District. **Results:** The results of the examination showed that 7 out of 50 cat feces samples in Harau District tested positive for digestive tract protozoa with a prevalence of 14%. Two types of protozoa were found, namely *Isoospora* spp. with a prevalence of 10%, *Toxoplasma gondii* 8% and double infections (*Isoospora* spp. and *Toxoplasma gondii*) with a prevalence of 4%. Based on the gender of cats infected with digestive tract protozoa, the percentage of male cats was 10.5% and female cats were 16.1%. Based on the age group of cats infected with digestive tract protozoa, the percentage was 20% in the kitten group (1-7 months), 15% in the juvenile group (7 months-2 years) and in the prime period group (2-6 years) none were positive. **Conclusion:** These findings highlight the presence and distribution patterns of protozoal infections in local feline populations, emphasizing the need for targeted preventive measures based on age and sex.

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#### ABSTRAK

**Latar Belakang:** Salah satu penyakit yang sering mengganggu kesehatan kucing adalah infeksi yang disebabkan oleh virus, bakteri ataupun protozoa. Protozoa merupakan parasit yang dapat hidup pada saluran pencernaan kucing. **Tujuan:** Penelitian ini bertujuan untuk mengetahui prevalensi protozoa saluran pencernaan pada kucing lokal dan mengetahui jenis protozoa saluran pencernaan yang menginfeksi kucing lokal di Kecamatan Harau. Pada penelitian ini juga menghitung persentase kucing yang terinfeksi protozoa berdasarkan jenis kelamin dan umur kucing. Metode pemeriksaan yang digunakan dalam penelitian ini adalah metode apung. **Metode:** Pemeriksaan dilakukan di Laboratorium Kesehatan dan Penyakit Hewan Politeknik Pertanian Negeri Payakumbuh terhadap 50 sampel feses kucing lokal yang dipelihara di Kecamatan Harau. Pengambilan sampel feses kucing dilakukan secara purposive sampling pada setiap kenagarian yang berada di Kecamatan Harau. **Hasil:** Hasil pemeriksaan didapatkan 7 dari 50 sampel feses kucing di Kecamatan Harau dinyatakan positif protozoa saluran pencernaan dengan prevalensi 14%. Ditemukan 2 jenis protozoa, yaitu *Isoospora* spp. dengan prevalensi 10%, *Toxoplasma gondii* 8% dan infeksi ganda (*Isoospora* spp. dan *Toxoplasma gondii*) sebanyak 4%. Berdasarkan jenis kelamin kucing yang terinfeksi protozoa saluran pencernaan didapatkan persentase pada kucing jantan sebesar 10.5% dan kucing betina 16.1%. Berdasarkan kelompok usia kucing yang terinfeksi protozoa saluran pencernaan didapatkan pada kelompok kitten (1-7 bulan) persentasenya sebesar 20%, kelompok masa remaja (7 bulan-2 tahun) 15% dan kelompok masa prima (2-6 tahun) tidak ada yang positif. **Kesimpulan:** Temuan ini menyoroti keberadaan dan pola distribusi infeksi protozoa pada populasi kucing lokal, dan menekankan perlunya tindakan pencegahan yang ditargetkan berdasarkan usia dan jenis kelamin.

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**Kata kunci:** Gastrointestinal; Kucing; Prevalensi; Protozoa



## INTRODUCTION

Cats are pets favored by many people, including both purebred and local cats (*Felis catus*). Cat health should be taken into consideration, as cats are popular among children and serve as their playmates. Currently, the maintenance of local cats often involves allowing them to roam freely outside, although some are kept entirely indoors and provided with food. The method of cat care influences their health condition. Oktaviana, et al., (2014) stated that cat welfare is often overlooked, as many cats live as strays and consume food from unsanitary sources. This condition poses a significant challenge in cat maintenance, as it can lead to health problems. One of the common diseases affecting cat health is infection caused by viruses, bacteria, or protozoa.

Protozoa are parasitic organisms that inhabit the digestive tract of cats and have zoonotic potential. Subekti (2010), reported that zoonotic protozoa found in cat digestive tracts include *Cryptosporidium* sp., *Giardia* sp., and *Toxoplasma gondii*. Infection by these protozoa is concerning because they can spread to other cats and humans. Gastrointestinal protozoal infections are a global health issue impacting human health. Irawan, et al., (2023), noted that gastrointestinal protozoal infections are often asymptomatic, but in severe cases, they manifest as diarrhea, anorexia, weakened immunity, and growth disorders.

This study aims to determine the prevalence of digestive tract protozoa in local cats in Harau District and identify the types of protozoa infecting these cats. A study by Sucitrayani, et al., (2014), in Denpasar found a prevalence of 31.3% in local cats, with 22.5% in pet cats and 40% in stray cats, based on an examination of 80 cat fecal samples. Research by Setyoning-sih, (2004), in Denpasar found protozoal infections in 33.3% of 33 examined cats. The high prevalence of protozoal infections in the digestive tract is a concern for cat owners, as transmission can occur in unclean, humid environments and due to the free-roaming habits of cats outside their owners' supervision.

## MATERIAL and METHOD

### Research Materials

This study was conducted from September 28, 2022 to December 2, 2022, at the Animal Health and Disease Laboratory of the Payakumbuh State Agricultural Polytechnic. Examinations were performed on 50 cats by collecting fecal samples from local cats kept by the community in Harau District. The equipment used in this study included digital scales, beakers, strainers, centrifuge tubes, a centrifuge, test tube racks, droppers, object glasses, cover glasses, a microscope, markers, ziplock plastic bags (sample bags), sample spoons, labels, and tissue. The materials used were fecal samples from local pet cats, 4% formalin, distilled water, and a saturated salt solution.

### Collection of Fecal Samples

Fecal samples were collected from local cats kept by the community in Harau District. A total of 50 samples were

obtained from all nagari (villages) in Harau District, which consists of 11 nagari: 1. Nagari Taram, 2. Nagari Bukik Limbuku, 3. Nagari Pilubang, 4. Nagari Batu Balang, 5. Nagari Koto Tuo, 6. Nagari Lubuak Batingkok, 7. Nagari Gurun, 8. Nagari Sarilamak, 9. Nagari Tarantang, 10. Nagari Solok Bio-Bio, 11. Nagari Harau.

Fecal samples were collected from fresh excrement using a sample spoon. The collected feces were placed in a sample plastic bag and preserved with 4% formalin until fully submerged (Sucitrayani, et al., 2014). Each sample was labeled with the collection date, location name, and sample code. The collected samples were transported to the Animal Health and Disease Laboratory of the Payakumbuh State Agricultural Polytechnic for examination.

### Fecal Sample Examination

Fecal samples were examined using the flotation method, which utilizes a solution with a higher specific gravity than protozoa, allowing the protozoa to float to the surface (Sucitrayani, et al., 2014). The flotation method involved taking approximately 2 grams of feces, placing it in a beaker, and mixing it with a small amount of distilled water until homogenized. The mixture was then filtered using filter paper and transferred into a centrifuge tube until  $\frac{3}{4}$  full. The tube was centrifuged at 1,500 rpm for 5 minutes. The supernatant was discarded, and a saturated NaCl solution was added until the volume reached  $\frac{3}{4}$  of the tube. The mixture was stirred until homogeneous and centrifuged again at 1,500 rpm for 5 minutes. The tube was placed upright in a test tube rack, and additional saturated NaCl solution was added dropwise until the surface formed a convex meniscus. The sample was left undisturbed for 3 minutes before an object glass was placed on the convex liquid surface. The slide was then examined under a microscope at 40x magnification. A sample was considered positive if protozoa were observed. Prevalence was calculated using the formula (positive results/total samples)  $\times$  100% (Hastutiek, et al., 2019). The obtained results were analyzed based on gender, age, and protozoa

## RESULTS

### Protozoan Prevalence

The examination of fecal samples from domestic cats kept in Harau District revealed a protozoan prevalence of 14% (Table 1). Two types of protozoa were identified in the positive samples: *Isospora* spp. and *Toxoplasma gondii* (Figure 1). Table 1 shows that two protozoan species, *Isospora* spp. and *Toxoplasma gondii*, were found in the fecal samples of domestic cats. The prevalence of *Isospora* spp. in domestic cat feces in Harau District was 10%. Another protozoan detected was *Toxoplasma gondii*, with a prevalence of 8% in fecal samples from domestic cats (Table 1). Based on sex (Table 2), 2 out of 19 male cat samples were positive for protozoa, yielding a prevalence of 10.5%, while 5 out of 31 female cat samples were positive, with a prevalence of 16.1%. The prevalence of protozoan infection based on cat gender is shown in Table 2, while the prevalence based on cat age is presented in Table 3.

**Table 1.** Prevalence of Gastrointestinal Protozoa in Domestic Cats in Harau District

Sample	Protozoan Type		
	<i>Isospora</i> spp.	<i>Toxoplasma gondii</i>	Double infection
Fecal samples from domestic cats (50 samples)	5	4	2
Prevalence of infection type (%)	10	8	4
Total prevalence (%)	14		

**Table 2.** Percentage of Gastrointestinal Protozoan Infections by Cat Sex in Harau District

	Gender		Amount
	Male	Female	
Sample Count (Individuals)	19	31	50
Positive (+)	2	5	7
Percentage (%)	10,5	16,1	14

**Table3.** Percentage of Gastrointestinal Protozoan Infections by Cat Age in Harau District

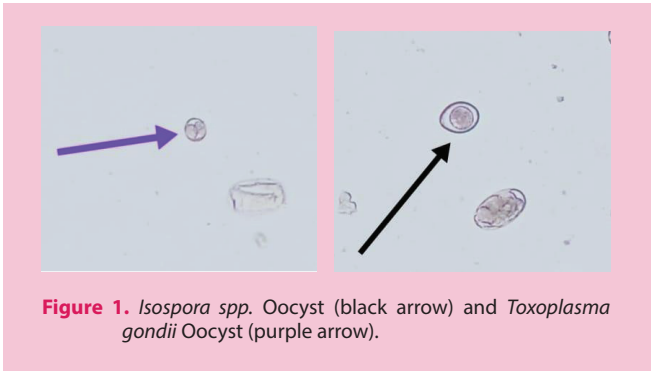
	Age Group			Amount
	Kitten (1-7 months)	Junior (7 months-2 years)	Adult (2-6 years)	
Sample Count (Individuals)	5	40	5	50
Positive (+)	1	6	-	7
Percentage (%)	20	15	-	14

DISCUSSION

The prevalence of gastrointestinal protozoan infection in domestic cats in Harau District was lower than that found in pet cats in Denpasar, which was 22.5% (Sucitrayani, et al., 2014). The presence of protozoan infections in cats is associated with inadequate hygiene practices in cat care and living conditions. Cats often eat freely without concern for the cleanliness of their feeding areas. Generally, in Harau District, cat owners provide food directly on the floor or in unclean containers, increasing the risk of contamination by parasite-carrying agents that can lead to protozoan infections in the digestive tract. Protozoa can spread through contaminated food and water containing infectious stages such as trophozoites, cysts, or oocysts. Additionally, the cats' lifestyles suggest a higher likelihood of protozoan infection due to their exposure to unhygienic environments while foraging for food (Sucitrayani, et al., 2014).

In Harau District, domestic cats are typically allowed to roam freely day and night, although some are kept in cages or confined indoors. One common behavior of free-ranging pet cats is playing in the dirt, rolling on the ground, and scratching the soil. Scratching the ground can be a potential factor exposing them to infectious stages of protozoa, making them more susceptible to infection (Adams, 2003). Another contributing factor to protozoan infection in cats is the owner's management practices. When pet cats are left to roam freely without supervision, the incidence of protozoan infections tends to be higher (Afiyah, 2015).

A study conducted in Denpasar found *Isospora* spp. in 8 out of 35 cat fecal samples, with a prevalence of 22.85% (Ginting, et al., 2015). The oocysts of *Isospora* spp. are characterized by their round to oval shape containing sporonts (Putrawan, et al., 2004). Poor cat husbandry practices can contribute to



*Isospora* spp. infection due to oocyst exposure (Mesquita, et al., 2022). *Toxoplasma gondii*, with a prevalence of 8% in fecal samples from found on domestic cats in Harau District. This differs from the higher *Toxoplasma gondii* prevalence in pet cats in Kupang City, which reached 23% (Wuri, et al., 2022). In contrast, a study in Ternate City found *Toxoplasma gondii* in 0% of the 17 tested pet cat fecal samples (Rahman and Nur, 2022). Similarly, a study in traditional markets in Sawahan District, Surabaya, found no *Toxoplasma gondii* oocysts in domestic cat feces, likely due to the absence of bradyzoite sources (Sasmita, et al., 2019).

Based on sex (Table 2), 2 out of 19 male cat samples were positive for protozoa, yielding a prevalence of 10.5%, while 5 out of 31 female cat samples were positive, with a prevalence of 16.1%. The higher prevalence in female cats contrasts with findings in Denpasar, where male cats had a higher prevalence of protozoan infection (28.1%) compared to female cats (18.6%) (Mesquita, et al., 2022). Parasitic infections in the digestive tract can be influenced by sex, as male cats tend to be more susceptible than females. This difference is related to higher estrogen levels in female cats, which stimulate the Reticuloendothelial System (RES) to produce antibodies against gastrointestinal parasites (Natasya, et al., 2021). The prevalence of protozoan infection based on age (Table 3) showed that kittens (1-7 months) had the highest infection rate at 20%, followed by juvenile cats (7 months-2 years) at 15%. No protozoan infections were found in adult cats (2-6 years). According to Pagati (2018), protozoan infection prevalence in the gastrointestinal tract is influenced by age, with younger cats being more susceptible due to their under-developed immune systems. Older cats have stronger immune defenses against infectious agents. Kittens still rely on their mothers' milk, which may transmit protozoa. Afiyah (2015) stated that protozoan transmission in kittens can occur through contaminated maternal milk.

CONCLUSION

This study identified a 14% prevalence of digestive tract protozoa in local cats in Harau District, with *Isospora* spp. and *Toxoplasma gondii* being the predominant species. The highest infection rates were observed in kittens, followed by juveniles, with no infections found in adult cats aged 2–6 years. Female cats showed a higher prevalence compared to males. These findings highlight the presence and distribution patterns of protozoal infections in local feline populations,

indicate the necessity for implementing preventive strategies tailored to age and sex demographics.

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## CONFLICT of INTEREST

The authors declare that there are no conflicts of interest with any of the parties involved in this study.

## FUNDING INFORMATION

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## ETHICAL APPROVAL

This research activity did not require ethical approval.

## AUTHORS' CONTRIBUTIONS

The concept and research design were developed by MAR and YSA. Data collection was carried out by MAR and YSA. Data analysis and interpretation were conducted by MAR, YSA, EZ and RS. Manuscript writing was done by MAR and YSA, while manuscript revision was completed by MAR, YSA and EZ, with additional contributions from RS.

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