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PREVALENCE AND IDENTIFICATION OF GASTROINTESTINAL NEMATODES IN DOMESTIC CATS FROM MAKASSAR CITY: PUBLIC HEALTH IMPLICATIONS

Prevalensi dan Identifikasi Nematoda Gastrointestinal pada Kucing Peliharaan di Kota Makassar: Implikasi Kesehatan Masyarakat

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Abstract

Domestic cats (*Felis catus*) have become increasingly popular companion animals worldwide, yet remain vulnerable to helminth infections with zoonotic potential. This study aimed to identify gastrointestinal nematodes infecting pet cats in Makassar City, Indonesia. Seventy-nine fecal samples were collected from veterinary clinics across Makassar and analyzed using direct smear and flotation techniques. Results revealed a 7.5% (6/79) prevalence of nematode infections, comprising *Toxocara* sp. (5.1%, 4/79) and *Ancylostoma* sp. (2.5%, 2/79). Both species pose significant zoonotic risks to human health. These findings underscore the necessity of regular anthelmintic treatment and owner education programs to control parasitic infections in urban pet cats and mitigate public health hazards.

Keywords: Toxocariasis, hookworm, pet cats, zoonosis

Abstrak

Kucing domestik (*Felis catus*) telah menjadi hewan peliharaan yang semakin populer di seluruh dunia, namun tetap rentan terhadap infeksi cacing dengan potensi zoonosis. Penelitian ini bertujuan mengidentifikasi nematoda gastrointestinal yang menginfeksi kucing peliharaan di Kota Makassar, Indonesia. Sebanyak 79 sampel feses dikumpulkan dari klinik hewan di berbagai wilayah Makassar dan dianalisis menggunakan metode apusan langsung dan flotasi. Hasil menunjukkan prevalensi infeksi nematoda sebesar 7,5% (6/79), terdiri dari Toxocara sp. (5,1%, 4/79) dan Ancylostoma sp. (2,5%, 2/79). Kedua spesies ini memiliki risiko zoonosis yang signifikan bagi kesehatan manusia. Temuan ini menegaskan pentingnya pemberian obat cacing secara rutin dan program edukasi pemilik untuk mengendalikan infeksi parasit pada kucing peliharaan perkotaan serta mengurangi bahaya kesehatan masyarakat.

Kata kunci: Toxocariasis, hookworm, kucing peliharaan, zoonosis

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INTRODUCTION

Cats are popular pets worldwide, including in Indonesia. However, their presence is not without the risk of gastrointestinal parasitic infections, particularly helminths. These parasitic worms not only affect the health of the animal but also carry potential zoonotic threats to humans. Helminth infections in cats may cause various clinical symptoms such as reduced appetite, weight loss, diarrhea, and vomiting. Furthermore, some helminths have significant zoonotic potential, such as *Toxocara cati* and *Ancylostoma* spp., which can infect humans through direct or indirect contact with infected cats or their environments (Phosuk et al., 2013)

Cases of helminthic infection in cats have been reported in several regions of Indonesia, such as Jakarta, Bogor, Depok, Tangerang, and Bekasi, showing infection rates of *Toxocara* sp. (37.9%), *Ancylostoma* sp. (22.6%), *Uncinaria* sp. (25.4%), *Strongyloides* sp. (3.1%), *Diphyllobothrium* sp. (2%), and *Dipylidium* sp. (0.6%) out of 354 stray and owned cat samples (Sawitri et al., 2024). In Yogyakarta, *Toxocara* sp. (50%) and *Ancylostoma* sp. (36.73%) were found in 215 cat samples from veterinary clinics (Widiyono, Rusmihayati, Purnamaningsih, & Sahara, 2023). Similarly, in Bogor, hookworms (11.11%), *Toxocara* spp. (38.01%), and *Dipylidium caninum* (4.68%) were detected from 171 cat samples (Ridwan, Sudarnika, Dewi, & Budiono, 2023). A study conducted by Subrata et al. (2017) examined the prevalence of intestinal worms in free-range domestic cats in Bali. The findings revealed that *Toxocara* sp. was the most common parasite, affecting 71.43% of the cats, followed by *Ancylostoma* sp. at 37.59%. *Cestoda* sp. was detected in 19.55% of the cats, while *Capillaria* sp. had the lowest prevalence at just 0.75%. These results highlight the high occurrence of parasitic infections, particularly *Toxocara* and *Ancylostoma*, among cats, emphasizing the need for effective deworming strategies and improved veterinary care.

Although data on helminthic infection prevalence in various regions of Indonesia are available, specific information on Makassar remains limited. As one of Indonesia's major cities with a considerable pet cat population, Makassar may face similar risks. Therefore, studying helminthic infections in pet cats in Makassar is important. The findings of this research are expected to provide valuable insights for cat owners, veterinary practitioners, and policymakers in preventing and controlling worm infections in cats and mitigating zoonotic risks to humans

RESEARCH METHODS

Ethical Considerations for the Use of Experimental Animals

No experimental animals were used in this study. The samples consisted of naturally excreted cat feces, and no direct intervention or manipulation was conducted on the animals

Object of Study

The samples in this study were feces from pet cats. A total of 79 fecal samples were collected from pet cats at several veterinary clinics in Makassar City in June 2023. The clinics from which the samples were collected were located in various areas across Makassar City.

Research Design

This study is a descriptive study with a laboratory-based approach. The fecal samples were obtained from pet cats at veterinary clinics. The samples were subsequently examined in the laboratory using the direct smear and flotation methods

Research Variables

The variables used in this study included the independent variable, which was the type of pet cat, and the dependent variable, which was the species of nematode worms identified

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Data Collection Methods

Five grams of fresh feces were collected using a wooden spatula and placed into collection tubes containing 10 ml of 10% formalin. The tubes were labeled with the animal's identification, shaken thoroughly to ensure proper contact between the sample and the preservative, and stored in a cool box. Samples were then transported to the laboratory for examination. Direct smear method conducted with a small amount of feces placed on a microscope slide using a toothpick. A drop of distilled water was added and mixed thoroughly. The mixture was stained with Lugol's iodine and examined under a microscope (Levine, 1985). The flotation test was also performed by mixed 3 gram of feces with 50 ml of flotation solution, stirred until homogeneous, and filtered through a tea strainer. The filtrate was transferred to a test tube and filled until a convex meniscus formed. A coverslip was placed on top of the tube and left for 5 minutes. The coverslip was then lifted and placed on a microscope slide for examination (Hansen & Perry, 1994).

Data Analysis

Descriptive analysis was used to present the results in the form of tables and figures.

RESULT AND DISCUSSION

Results

A total of 79 fecal samples from pet cats were collected from seven veterinary clinics across Makassar. Six cats (7.5%) tested positive for helminth infections. The worms identified belong to the Nematoda class: *Toxocara* sp. (5%) and *Ancylostoma* sp. (2.5%), as shown in Table 1. The prevalence of parasitic worm infections in pet cats in Makassar City was relatively low. This figure is lower compared to the prevalence of nematode infections in pet cats in Yogyakarta, which was reported at approximately 80.93% (Widiyono et al., 2023). The nematode species *Toxocara* sp. and *Ancylostoma* sp. are the most commonly found parasites infecting pet cats (Widiyono et al., 2023;Ridwan et al., 2023). The low prevalence of *Toxocara* sp. and *Ancylostoma* sp. in this study is in line with the findings of Sawitri et al. (2024), who reported prevalences of 7.6% and 4.2%, respectively, in pet cats from the Jakarta, Bogor, Depok, Tangerang, and Bekasi areas. However, these figures contrast with those reported by Widiyono et al. (2023)who observed significantly higher prevalences of *Toxocara* sp. (50%) and *Ancylostoma* sp. (36.73%).

Discussion

Helminth infections in pet cats may result from environmental exposure, especially when cats roam outdoors. Another contributing factor is the irregular administration of anthelmintics. Regular deworming is essential in preventing helminth infections in pet cats (Beugnet et al., 2022). The low prevalence observed in this study may be attributed to the fact that the cats sampled were indoor pets with limited exposure to external environments. This contrasts with stray cats, which are more frequently exposed to contaminated surroundings and other infected cats. This observation aligns with Sawitri et al. (2024), who reported that pet cats have a lower risk of worm infections than unowned cats. Stray cats also have more frequent contact with other cats, making them more susceptible to infection.

Toxocara sp. is a commonly parasite that found in cats. Infection occurs when cats ingest soil or food contaminated with infective eggs. The eggs hatch in the small intestine, and the larvae migrate to organs such as the liver and lungs before returning to the small intestine to mature (Bruschi, 2022).This larval migration may lead to symptoms like diarrhea, vomiting, coughing, and pneumonia (Overgaauw & van Knapen, 2013). Toxocara is zoonotic and can infect humans. In humans, migrating larvae may reach the eyes, muscles, or liver, a condition known

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as Visceral Larva Migrans. However, these larvae do not develop into adult worms (Wu & Bowman, 2020).

Ancylostoma sp., a common hookworm species in tropical regions, thrives in warm and humid climates like Indonesia (Ridwan et al., 2023). Untreated infections in cats can cause anemia, weight loss, diarrhea, vomiting, and even death. Humans typically infected with *Ancylostoma* through skin contact with contaminated soil, often by walking barefoot. The larvae can penetrate the skin, causing red, raised lesions known as Cutaneous Larva Migrans (Loukas & Prociv, 2001)

Several preventive measures can reduce the risk of helminth infection in cats, including maintaining proper sanitation and limiting outdoor access to pets. Cats allowed to roam outdoors have a higher risk of infection compared to indoor cats (Nijsse, Ploeger, Wagenaar, & Mughini-Gras, 2016). Routine anthelmintic treatment is also necessary. However, some owners either do not deworm their cats or do so irregularly. To prevent infections, it is recommended to deworm cats at least four times a year (ESCCAP, 2010). Administering anthelmintic treatment to pet cats is essential in preventing parasitic worm infections. This practice also minimizes the risk of zoonotic transmission of helminthic diseases to humans, particularly those caused by *Toxocara* sp. and *Ancylostoma* sp.

The nematode species identified in this study, *Toxocara* sp. and *Ancylostoma* sp., pose significant zoonotic risks to human populations. *Toxocara* can cause visceral larva migrans and ocular larva migrans in humans, particularly children exposed to contaminated soil, while *Ancylostoma* may lead to cutaneous larva migrans (Bowman, 2021; Loukas & Prociv, 2001). Urban environments like Makassar, where close human-cat contact occurs, are particularly vulnerable to transmission. The low prevalence (7.5%) found in this study may underestimate true infection rates, as asymptomatic carriers and environmental contamination persist.

Prevention requires a One Health approach: mandatory regular deworming of cats (especially kittens), public education on hygiene practices (e.g., handwashing after handling cats/sand), and municipal-level sanitation improvements to reduce egg contamination in public spaces. Our findings suggest that while current infection rates are moderate, the zoonotic potential demands proactive surveillance and community engagement to mitigate outbreaks

CONCLUSION AND SUGGESTION

Conclusion

This study found that 7.5% of pet cats in Makassar were infected with Toxocara sp. or Ancylostoma sp., two types of worms that can also spread to humans. While this number seems low—possibly because many pet cats stay indoors or get deworming treatment—these infections still pose a health risk. To protect both cats and people, owners should deworm their pets regularly, practice good hygiene (like handwashing), and keep outdoor areas clean. Even a small percentage of infected cats can lead to human cases, so awareness and prevention remain important.

Suggestion

Further research is recommended to explore related topics and expand the current findings, particularly regarding environmental contamination and owner practices in pet care.

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Table

Tabel 1. Prevalence of Roundworm Infections in Cats

Roundworm	Positive	
	Total	Percentage
Toxocara sp	4	5%
Ancylostoma sp	2	2.5%
Total	6	7.5%

Figure

Figure 1. Helminth egg (A) *Ancylostoma* sp. dan (B) *Toxocara* sp,