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Prevalence of *Giardia duodenalis* in dogs from Alba County

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Abstract: *Giardia duodenalis* is a flagellated protozoan with a cosmopolitan distribution, responsible for giardiasis, a gastrointestinal parasitic disease affecting both humans and animals. This study aimed to determine the prevalence of *Giardia* infection in dogs within Alba County, Romania, and to identify potential epidemiological risk factors associated with infestation. A total of 110 mixed-breed dogs, both owned and stray, from rural and urban areas were included in the study conducted between May 2023 and May 2024. Fecal samples were collected and analyzed using Lugol's iodine staining, flotation, and rapid antigen detection tests. Epidemiological data such as age, sex, and origin were recorded and analyzed. Results showed a giardiasis prevalence of 56.36% among the tested dogs. Infection rates were highest in dogs under 6 months of age, suggesting age-related susceptibility. No significant differences were observed between sexes, though slightly higher positivity was noted in females. A comparable prevalence was identified between rural and urban populations, indicating widespread environmental contamination. The presence of genotypes A and B of *G. duodenalis*, known for their zoonotic potential, underscores the importance of canine populations as reservoirs for human infection. The study emphasizes the importance of routine diagnostic testing and deworming programs in both owned and stray dogs, as well as the need for public awareness regarding the zoonotic potential of giardiasis. Preventive measures, including improved sanitation, responsible pet ownership, and environmental hygiene, are essential to reduce the transmission risk in endemic areas.

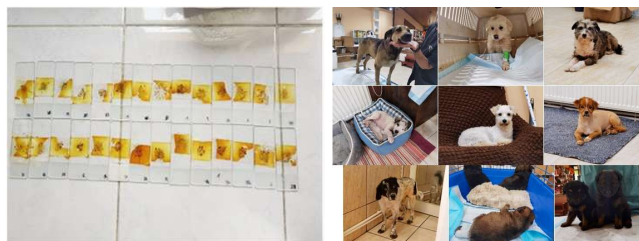
Keywords: *Giardia duodenalis*, Lugol's iodine, flagellated, rapid tests, dogs.

• Introduction

Giardiasis is caused by the protozoan *Giardia duodenalis* (also referred to as *Giardia lamblia* or *Giardia intestinalis*). Infected animals excrete cysts into freshwater environments, where the cysts are immediately infectious and can remain viable for weeks or even months. *Giardia* exhibits two distinct morphological forms: the trophozoite (replicative stage) and the cyst (environmentally resistant and infectious stage). Trophozoites measure 9–20 µm by 5–15 µm and have a pear-shaped body with a broad, rounded anterior end. They are binucleated cells possessing four pairs of flagella, curved median bodies, and a ventral adhesive disc (cytostome) used for attachment. Giardiasis continues to affect millions of people worldwide and holds particular significance in developing countries and socioeconomically disadvantaged areas. Up-to-date epidemiological data on giardiasis are therefore essential for designing effective control and prevention strategies to reduce the risk of infection and protect public health. The severity of the disease depends on factors such as host development, nutritional status, and immunity, as well as the virulence factors of the parasite. Although macroscopic intestinal lesions are rarely observed, microscopic changes—such as villous atrophy and cuboidal enterocytes—may be reported.

• Material and method

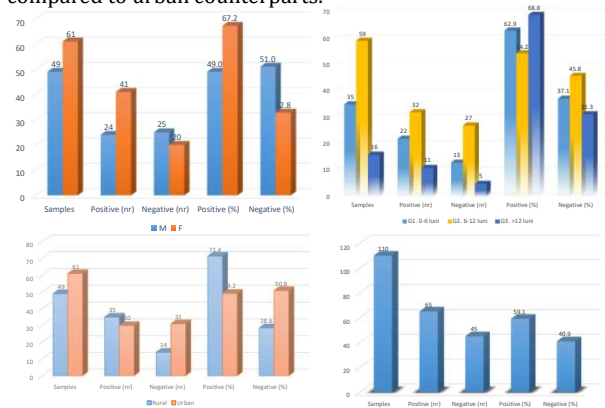
This study, conducted from May 2023 to May 2024, analyzed 110 mixed-breed dogs from both urban and rural areas, focusing on gastrointestinal clinical symptoms. Dogs ranged in age from 3 months to 2 years and were grouped into three age categories to assess age-related parasitism correlations.



Group 1 included 35 dogs (0–6 months), Group 2 had 42 dogs (6–12 months), and Group 3 had 13 dogs (over 12 months). The sample included 61 females and 49 males, with 49 dogs from rural and 61 from urban settings. Fecal samples were collected and tested for parasites, with positive samples preserved in potassium dichromate.

• Results and discussions

Out of 110 dogs tested, 59.1% (65 dogs) were positive for *Giardia* spp. infestation. No statistically significant differences were observed in infection rates based on sex or age group (0–6 months, 6–12 months, over 12 months), despite literature suggesting increased risk in dogs under 6 months. However, a significant association was found between infestation and the dogs' area of origin, with rural dogs showing higher prevalence compared to urban counterparts.



Flotation-based coproscopic examination identified *Isoospora/Cystoisospora* oocysts and nematode eggs, including *Ancylostoma/Uncinaria* spp., in 22.72% of samples (25/110). Concurrent infections (polyparasitism) involving *Giardia* spp. and other parasites were found in 12.72% of cases (14/110). Compared to a 2022 study by Șandor, which reported a 24.2% prevalence of *Giardia intestinalis* in cats and dogs in Timiș County, the present study shows a higher prevalence. The earlier study also confirmed age under 6 months as a risk factor in dogs, which was not statistically supported in this study. Surveillance data on giardiasis in Timiș County has been available primarily due to Sorescu's research, with data collected until 2014.



• Conclusions

The overall prevalence of *Giardia intestinalis* infestation among dogs with digestive disorders included in the study conducted in Alba County was 59.1%.

No statistically significant differences were observed between *Giardia* positivity and the epidemiological factors of age and sex in the animals examined.

Origin from rural environments was identified as a risk factor for *Giardia* infestation in the studied dog population from Alba County.