

# Epidemiology of Intestinal Parasite Illnesses in Dog Housed in Animal Shelters

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## Abstract

Determine the incidence of intestinal parasite infections in 101 dogs living in a Veracruz, Mexico animal shelter, and look into any general traits of the dogs that might be linked to infections. Fecal samples from the dogs were centrifuge-flotated using Sheather's sucrose and zinc sulphate flotation media to perform a parasitological study. Additionally, the hematocrit of each sample of canine blood was measured of the 101 dogs examined, 99 (98.0%) had intestinal parasites. Approximately five distinct intestinal parasites were found in 89 dogs (88.1%), including *Ancylostoma caninum*, *Giardia canis*, *Uncinaria stenocephala*, *Trichuris vulpis*, and *Strongyloides canis*. *Giardia* infection was connected with early age and multivariate analysis revealed that Lack of rabies vaccination and early age were linked to *ancylostoma*; lack of rabies vaccine was linked to *strongyloides*. Infections with *Trichuris* and *Uncinaria* were not linked to the variables examined. The tested dogs had a significant frequency of intestinal parasites. This shows that intestinal parasite contamination of the environment is very high. Dogs in this area should be protected from intestinal parasite infection with preventative and treatment approaches.

**Keywords:** Intestinal Parasites; Infection; Prevalence; Shelter

## Introduction

Included among the nematode, cestode, trematode, and protozoa species that cause major morbidity and mortality in dogs are intestinal parasites. The harmful effects of intestinal parasites can be made worse by co-infection with other infections. Understanding the epidemiology of intestinal parasites in dogs has immediate health advantages in addition to being important for public health because certain species are zoonotic. Some canine intestinal zoonoses that affect humans can be very burdensome. Millions of people around the world are infected with canine geohelminths [1]. Application of the One Health concept has been promoted to enhance the management of intestinal parasitic infections and reduce the risk of exposure for humans and dogs. The One Health concept is based on the collaborative work of many disciplines to help achieve optimal health for people, animals, and our environment.

There are over 700 million dogs worldwide. Due to their freedom to travel and their propensity for uncontrolled reproduction, it is estimated that 75% of them are stray animals. In many cultures, there is still a deep bond between humans and dogs. In Mexico, dogs are highly common as pets, although frequently they are left unattended. There are over 1.5 million stray canines in Mexico City alone [2]. Untreated infected canines serve as significant reservoirs. They would introduce intestinal parasites into the environment.

It is still unclear how common intestinal parasites are in dogs in Mexico. Studies have been done to determine how common intestinal parasites are in some regions of the nation. Investigations into the elements that contribute to infection are regional in nature [3]. Information about intestinal parasite epidemiology surveying dogs in animal shelters can provide information on local illnesses. The epidemiology of intestinal parasite infections in dogs in the Mexican state of Veracruz is not well understood. It has become possible to research the epidemiology of zoonotic diseases when dogs serve as reservoirs of the infectious agent thanks to access to shelters in the state. As a result, we aimed to identify the frequency of intestinal parasite infection and related traits in dogs at a nearby animal shelter [4].

## Materials and Method

The study involved 101 canines (*Canis familiaris*) from the municipal animal shelter in Medellin, Veracruz, Mexico. This municipality is a part of the Sotavento Region, which is situated in the heart of Veracruz and not far from the Gulf of Mexico (19°03' N, 96°09' W). The municipality is made up of rural settlements, and farming, rearing cattle, and fishing are its main economic pursuits. This area is 52 metres above sea level and has a mild, humid climate. Stray dogs are housed in the animal shelter. From February through May 2013, mornings were used for dog sampling [5]. The dwelling floor was used to gather fresh canine faeces samples, which were then placed inside plastic bags. Moreover, a blood each dog's sample was collected. The general characteristics of the dogs were recorded on a questionnaire, including age, sex, breed (pure and mixed), history of rabies vaccination, and contact with cats. Mebendazole was used to treat worms in December 2012. There was no information on the dogs' prior deworming procedures before being housed in the shelter. The animal refuge also temporarily homes cats in addition to dogs. The animal sanctuary doesn't house any other kinds of animals. The faecal and blood samples were delivered to the Veracruz State University's School of Veterinary Medicine's Parasitology Laboratory in Veracruz City for analysis [6].

The centrifuge-flotation method was used to evaluate the dog faeces using Sheather's sucrose and zinc sulphate flotation media. Parasites were recognised based on morphological characteristics after samples were magnified 100 and 400 times under the microscope. Each

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sample of canine blood had its hematocrit measured. The Epi Info programme, version 7, and SPSS, version 15.0, were used to analyse the data. The Fisher's exact test and Pearson's Chi-square test were used to assess whether there were any significant distinctions in dichotomous variables between dogs with infections and dogs without illnesses. The relationship between infection and dog traits was examined using multivariable analysis and the Enter technique [7]. The multivariate analysis excluded variables with a value of zero. The statistical power was raised using this method. The Hosmer-Lemeshow goodness-of-fit test was used to evaluate the fitness of the regression model. A two-tailed P0.05 was regarded as statistically significant when calculating odds ratios (OR) and 95% confidence intervals (CI).

## Result

Dogs were sampled in accordance with the guidelines for good animal practises set forth by the Bioethics and Animal Welfare Commission of the Veracruz State University School of Veterinary Medicine. Additionally, the owner of the animal sanctuary gave his or her approval. This study provided evidence of the widespread presence of intestinal parasite diseases in dogs at a shelter in the Mexican state of Veracruz. There is an urgent public health risk of infection for staff members working in the animal shelter due to the zoonotic potential of some of the discovered intestinal parasites. Because of their crucial role in these circumstances and chance to further the One Health philosophy, veterinarians it may be possible to reduce the risk of infection in humans by reducing the intestinal parasites in dogs [8]. The circumstances at the shelter may also be a reflection of the prevalence of intestinal parasite infections in dogs in the research area, where the number of dogs is thought to be comparable to that in other regions of Mexico.

## Discussion

Over one parasite species was present in 74% of the affected canines. Among the studied dogs, *A. caninum* was the most common intestinal parasite (88.1%). This is a typical canine endoparasite in Mexico. *A. caninum* infection has been documented in Mexico City, Queretaro, and rural Yucatán, however at lower or comparable prevalence rates (23.0%–73.8%) as those documented here for dogs in Veracruz. The prevalence of *A. caninum* in stray dogs in Japan and Italy is relatively modest (1.9%–2.0%) compared to the infection rates in dogs in Mexico (1.9%–2.0%). According to studies on dogs in Brazil and Iran, the prevalence of *A. caninum* infection was 19.4% and 46.0%, respectively. Young pups and canines that had not had rabies vaccinations were linked to *A. caninum* infection in Veracruz. This result is comparable with findings from an earlier study conducted in the USA, where researchers discovered a link between *A. caninum* infection and 12-month-old dogs. The findings of a Cuban investigation, which revealed that [9], *caninum* infection was more common in elderly people, contrast with the link between young age and *A. caninum* infection that was discovered in our study.

The difference in age related with prevalence of *A. caninum* infection that can be detected between these studies may be due to different environmental factors. While rural stray dogs made up the majority of the shelter population observed here, urban stray dogs were

studied in Cuba. The current study's finding that *A. caninum* infection and absence of rabies vaccination are related highlights the necessity of implementing and putting into action health initiatives at animal shelters. It is typically unknown. How healthy the canines are when they arrive at Veracruz animal shelters. As shown in this and previous research, stray dogs frequently have many species of intestinal parasites. Nearly half (45.5%) of the dogs examined had *G. canis* infection. The prevalence found in this study is comparable to that found in dogs in Mexico City (51%), where *Giardia intestinalis* infection was reported to be prevalent. Contrasting with the comparatively low Seroprevalence of *G. canis* infection reported in other countries is the infection rate for dogs in Mexico. A research in Portugal found a prevalence of 7.4% in seemingly healthy dogs and 15.5% prevalence in dogs with gastrointestinal disease, whereas an Italian investigation found a Seroprevalence of 3.8% among owned dogs. In this article, we said that *G. canis* infection was linked to youth and mixed breed [10].

## Conclusion

In Germany, 52.5% of the dogs older than 12 weeks tested positive for *Giardia*, while young age was also discovered to be a factor in infection. According to our findings, young pups (0.5–1.0 years old) exhibited a high prevalence of *G. canis* infection (70.2%). Because mixed-breed animals likely receive different medical treatment than pure-bred animals, there is a relationship between *G. canis* infection and mixed-breed animals. Mixed-breed stray dogs are more common than purebred dogs, who are typically owned and receive superior care, such as deworming and access to clean food and water. As a result, stray mixed-breed dogs are more likely to consume contaminated waste and consume contaminated street water. It's possible that this condition made it easier to get other illnesses.

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