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Short communication

Prevalence of zoonotic intestinal parasites in domestic and stray dogs in a rural area of Iran

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ABSTRACT

Certain zoonotic parasites are enteropathogens in dogs that cause serious human disease such as cystic echinococcosis, human alveolar echinococcosis, visceral larva migrans, and ocular larva migrans. This study investigated the prevalence of intestinal parasites in dogs in the Chenaran County, Razavi Khorasan Province, Iran. Sampling was carried out randomly in 17 villages from November 2009 to January 2010. Seventy-seven fecal samples from 28 domestic and 49 stray dogs were examined using sieving/flotation and modified Ziehl-Neelsen staining. Intestinal parasites were found in 51 of the 77 (66%) dogs most common being *Toxascaris leonina* (29%, 22/77), *Toxocara* spp. (25%, 19/77), *Eimeria* spp. (19%, 15/77), *Taenia*/*Echinococcus* spp. (18%, 14/77), *Sarcocystis* spp. (17%, 13/77), and *Dicrocoelium dendriticum* (14%, 11/77). Lower infection rates of parasites were observed for *Trichuris vulpis* (6%, 5/77), *Cryptosporidium* spp. (5%, 4/77), and *Physaloptera* spp. (3%, 2/77). Prevalence of infection by *Dipylidium caninum*, *Capillaria* spp., *Cystoisospora* spp., and hookworms was similar (1%, 1/77). This study is the first report of the prevalence of intestinal parasites of domestic and stray dogs in Chenaran County, Northeast Iran. The higher prevalence of zoonotic intestinal parasites such as *Toxascaris leonina, Toxocara* spp. and *Taenia*/*Echinococcus* spp. compared to other parasites indicates the need for control programs to minimize the risk of transmission of zoonotic disease, particularly cystic echinococcosis, alveolar echinococcosis, visceral larva migrans, and ocular larva migrans to people living in these areas.

1. Introduction

Dogs are reservoirs, carriers, and transmitters of several zoonotic intestinal parasites that are considered serious problems for humans (Xhaxhiu et al., 2011). Some dog intestinal parasites, e.g. *Echinococcus granulosus*, *Echinococcus multilocularis*, *Toxocara canis*, *Ancylostoma* spp., *Dipylidium caninum*, *Giardia* spp., and *Cryptosporidium* spp., through their oral–fecal transmission cycle, are a potential source of infection in humans and wild or domestic animals (Soriano et al., 2010). Infected domestic and stray dogs can contaminate the environment with helminth eggs and larvae as well as protozoan cysts and oocysts (Okoye et al., 2011).

A growing body of evidence suggests that in rural areas of Iran, human association with dogs potentially facilitates the transmission of zoonotic parasitic diseases of canine origin such as echinococcosis to humans (Eslami and Hosseini, 1998; Dalimi et al., 2006; Ranjbar-Bahadori et al., 2008; Harandi et al., 2011). In some rural areas for example, domestic dogs can be the definitive host, not

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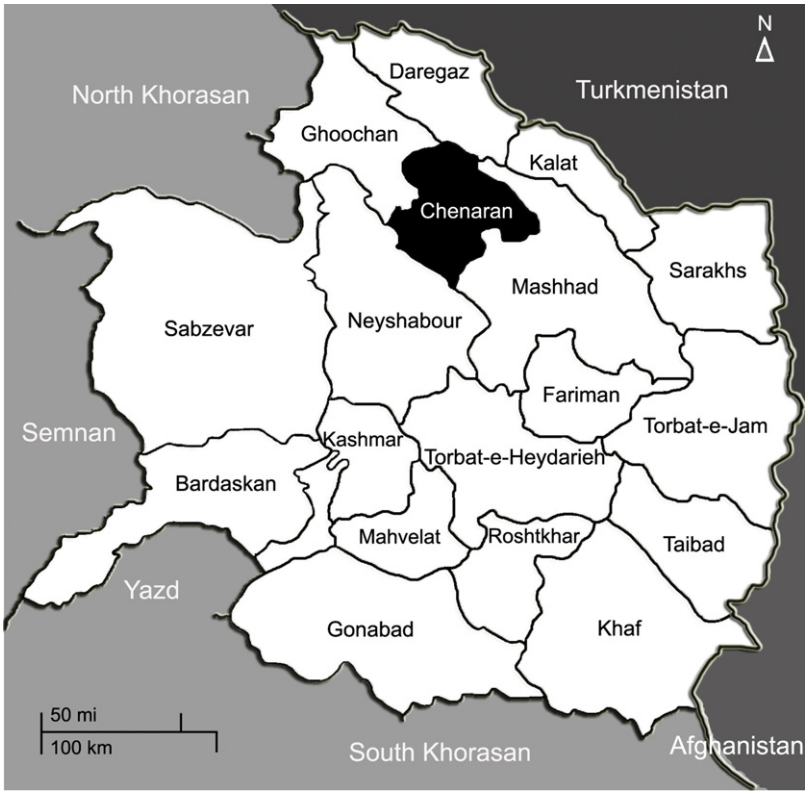

Fig. 1. Map of Razavi Khorasan Province showing Chenaran County where dog fecal samples were collected.

only for *E. granulosus*, but also for the potentially lethal *E. multilocularis* (Deplazes et al., 2004; Giraudoux et al., 2006). To reduce the risk of transfer of infection to humans, a control schedule based on periodic fecal examinations should be routinely performed by veterinarians to identify intestinal parasites in dogs and establish an anthelminthic treatment regime (Claerebout et al., 2009; Deplazes et al., 2011). The accurate identification of parasite infection in dogs provides epidemiological data concerning one of the main contaminants of the environment that increases the chance of transmission of the parasite and is important in developing control programs.

In addition to guard or shepherd dogs kept in homes, there is a large population of stray dogs that roam streets, gardens, and farms of rural Iran. This population of free-roaming dogs can present a serious problem for public health (Eslami and Hosseini, 1998; Ranjbar-Bahadori et al., 2008; Harandi et al., 2011). Information regarding prevalence of intestinal parasites, especially in dogs, is crucial to planning control programs for reducing the risk of possible transmission of zoonotic disease from dogs to humans and also to other animals. According to hospital reports more than one third of cystic echinococcosis cases in Iran (Nourjah et al., 2004; Rokni, 2009) and some other zoonotic diseases of canine origin, such as toxocariosis, were recorded in Razavi Khorasan Province, particularly from Chenaran County (unpublished data); however, no data concerning the prevalence of intestinal parasites in dogs of the Chenaran County have been published. Hence, the present study was carried out to determine the prevalence, especially of zoonotic parasites in domestic and stray dogs in rural areas of Chenaran County, Razavi Khorasan Province, Iran.

2. Materials and methods

2.1. Study area

This study was conducted in villages of Chenaran County of Razavi Khorasan Province, Northeast Iran (Fig. 1). Chenaran County is located between the Binalood Heights and the Hezar Masjed Mountains with an area about 2400 km^2 and a population of approximately 126,000 (Census, 2011). The capital of Chenaran County is Chenaran, which is surrounded by rural areas consisting chiefly of human habitation, gardens, farms, and moorland. In winter, the climate is variable; in some regions, weather is cold with average temperature of 4.1 °C and mean precipitation of 96 mm. Mountainous regions are snowy and freezing. In summer, the weather is mild and arid with average temperature of 23.9 °C and mean precipitation of 8.6 mm.

2.2. Sample collection

Fecal samples from seventy-seven domestic and stray dogs were collected from 17 villages of Chenaran County from November 2009 to January 2010. In Iran, there is no organisation for population control, and breeding of dogs

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