COMMON PARASITIC INFECTIONS IN CATS AND DOGS DIAGNOSED IN VETERINARY RESEARCH INSTITUTE, MALAYSIA FROM 2014 TO 2018

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ABSTRACT. A study was carried out on the presence of parasites in cats and dogs based on samples received in the Veterinary Research Institute (VRI) Ipoh, Perak from 2014 to 2018. From 186 samples (cases, n=97) suspected for parasitic infection, it was found that 37.63% samples were reported positive for various parasites such as helminths, protozoa and ectoparasite. Samples of faeces, blood and skin scrapings from dogs were the most common samples submitted for diagnosis. Faecal samples showed positive for *Toxocara* sp. and *Ancylostoma* sp., which are incidentally also zoonotic gastro intestinal parasites affecting humans. Samples from cats indicated the presence of helminths from faecal samples, ectoparasites from skin samples and protozoa from blood samples. Regular animal health checks are important to ensure that these infections do not spread to coexisting animals and humans as most of these samples were from pets.

Keywords: parasitic infection, cats, dogs, pets, zoonotic

INTRODUCTION

Companion animals, particularly dogs and cats, act as reservoir hosts for several species of gastrointestinal protozoa and helminths that can spread to humans (Wichit R. *et.al.*, 2014). These parasites include *Toxocara canis, T. cati, Ancylostoma caninum, A. ceylanicum, A. braziliense, Trichuris vulpis, Strongyloides* sp., *Dipylidium caninum, Echinococcus granulosus, Taenia taeniaeformis, Spirometra mansoni, Giardia duodenalis, Cryptosporidium* sp., *Toxoplasma gondii, Sarcocystis* sp., *Entamoeba histolytica, Balantidium coli,* and *Blastocystis* sp. (Holyoake, 2008; Palmer *et al.*, 2008).

According to the Veterinary Research Institute Annual Reports, there are several types of blood parasites commonly found in Malaysian pet cats and dogs, such as *Babesia gibsoni*, microfilaria (*Dirofilaria immitis*), *Ehrlichia canis, Babesia canis,* and *Hepatozoan* canis. Other than microscopic detection of parasites in peripheral blood smears, diagnosis can be by serological tests, flow cytometry and polymerase chain reaction (PCR) (Nalumba *et al.*, 2011).

Most pet owners are not concerned about the health status, unless there are

clinical signs of disease and do not routinely present their pets for parasite screening, probably due to the lack of awareness of the risks posed by parasite infections on their pets as well as their own. Most parasitic infections do not show physical symptoms but may harbour the parasites which may cause harm silently, such as anemia, blockages in the heart or inflammation in the lungs which can endanger the life of the pets. As pets share a common environment with their owners, it is important to determine the common parasites that infest pets to create the awareness for the public and establish policies to address the control of the parasites for the benefit of humans. Thus this assessment of common parasite infections diagnosed in the Parasitology and Haematology Laboratory of VRI, Ipoh, is critical and may give clear insights as to the type and species of parasites found in dogs and cats, some of which may be zoonotic in nature. Information of these common infections is crucial in designing control programmes and providing advisory services for clients with pets which may be associating with strays or other wildlife in this vicinity, which in turn propagates the life cycle of these parasites and causes continuous infections in animals and humans

MATERIALS AND METHODS

Animals and Samples

Samples of faeces, blood and skin scraping from cats and dogs were received in VRI from the year 2014 to 2018 for various laboratory testing, as it was suspected of parasitic infections. A total of 186 samples from 97 cases (whereby each case submission may comprise of several samples) were examined. All tests related to parasitic disease diagnosis was conducted according to standard protocols (OIE, 2019) in the Parasitology and Haematology Laboratory of VRI.

Laboratory Test

Faecal samples were screened microscopically by floatation method using a saturated sodium chloride solution to identify helminth eggs. Blood samples were collected in the EDTA tubes and the samples were subjected to thin blood smear examination and buffy coat examination (Premaalatha B. *et al.*, 2018). Skin scrapings and tick specimens were examined microscopically and identified according to keys (Hopla *et al.*, 1994). Organ samples such as spleen were examined by impression smear to detect blood protozoa in the tissues (Christopher *et al.,* 1992).

Data Analysis

A laboratory information management systems software (Laboratory Information Management Systems, Quantum Beez Sdn Bhd) was used to generate all reports for each test. The data specific for cats and dogs was pulled out from the database. The data on total number of samples, type of samples, species, breeds and age for five consecutive years (2014-2018), was derived from laboratory annual reports. Descriptive analysis was used for contrasting the occurrence of the parasitic infection annually among animal species, gender and breed

using Statistical Package for Social Science (SPSS Inc., Chicago IL, USA).

RESULTS AND DISCUSSION

Table 1 shows the results obtained from laboratory tests conducted on the samples. The total number of specimens received differs annually as the laboratory data used in this study were based on the cases and samples submitted to VRI by field veterinarians, small animal veterinarians, pet owners and researchers. A total of 97 cases comprising of 186 samples from cats and dogs from year 2014 to 2018 were screened for parasitic infection from where 70 isolations of parasites were reported as shown in Table 1. The isolations were identified and classified according to sample type and type of parasitic infection as shown in Table 2 and Figure 1.

The total number of cats received for testing was 58 samples during the years 2014 to 2018 and it was found that 24 samples were positive for parasites. No cat samples were received in 2015 and 2016. The most

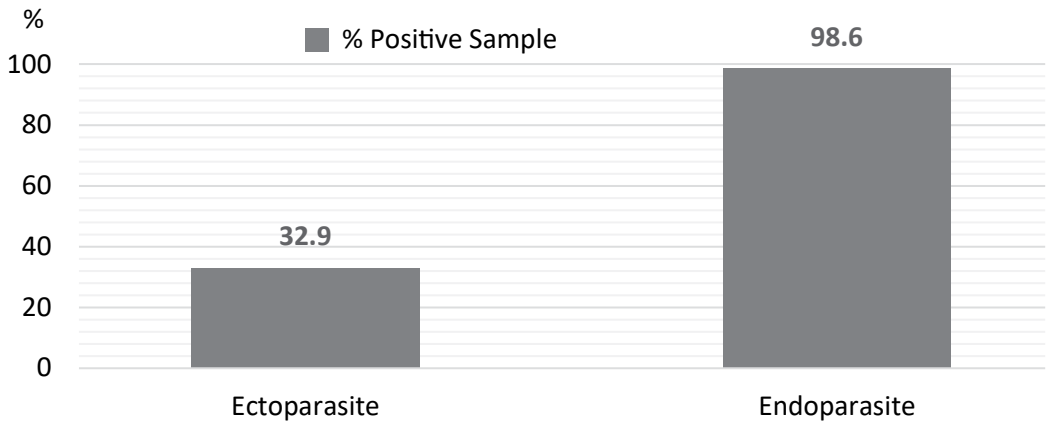

Figure 1. Number of positive sample diagnosed from total samples submitted with respect to ectoparasitism and endoparasitism

Table 1. Common parasites diagnosed from dogs and cats submitted to VRI from 2014 -2018

Year	Positive for parasites / Total number of sample tested (%)			
	Cats		Dogs	
2014	2/7	(0.29)	15/72	(0.01)
2015	-	-	28/34	(0.82)
2016	-	-	3/8	(0.38)
2017	3/4	(0.76)	0/9	0
2018	19/47	(0.02)	0/5	0

Note: Percentage is calculated by dividing total positive samples for parasites with total number of sample tested and times 100.

Table 2. List of parasitic infection diagnosed in the Parasitology and Haematology laboratory according to type of samples received in VRI from 2014-2018

Type of parasite found in samples tested			
Faecal	**Skin**	**Blood**	**Organ**
Ancylostoma ova	Rhipicephalus sanguineus	Ehrlichia canis	Hepatozoon canis
Toxocara canis ova	Rhipicephalus microplus	Dirofilaria immitis larvae	Dirofilaria immitis adult
Toxocara cati ova			
Trichuris egg			
Strongyloides egg			
Spirocerca egg			

number of samples received was in 2018 due to the increased capacity of surveillance and research programmes conducted. The total number of dog samples received was 128 from 2014 to 2018 from where 46 samples were diagnosed positive for parasites. There were no positive dog samples tested in 2017 and 2018. Overall, 41.4% of cat and 35.9% of dog samples tested were positive for various parasites. The common parasite found in cat samples were eggs of *Ancylostoma* sp. *and Spirocerca* sp. in faeces, and in dog samples were blood protozoan *E. canis*, hookworm ova namely *Ancylostoma* sp. in faeces and common dog ticks *Rhipicephalus sp.* on the skin.

In general, most of the parasitic infections diagnosed were from the category of blood protozoa (50.7%), followed by helminthiasis (45.2%). Samples received were from mixed breeds of dogs and cats, of various ages and sex.

Today, most parasitic infections can be controlled and prevented. However, most owners of animals may not be fully aware of the suitable measures to safeguard their animals and their families from infections. The measures that need to be taken into consideration are, for example, hygienic practices in the handling of pets. Particularly crucial is faecal cleaning and disposal, since most intestinal worms are spread through the accidental ingestion of worm eggs or larvae. In addition, personal hygiene should also be emphasised, that is, washing hands after handling animals. Pets should be regularly groomed so that any signs of infection, especially ectoparasite infestation, can be noted and dealt with immediately.

The information from this study is important to identify the common parasite infections in pets and this will in turn raise the awareness needed to alert pet owners on the prevalence of zoonotic infections. As some of these infections are not clinically visible, pet owners may miss the infection until it is too late and the infection has become chronic, which may need long-term treatment and may affect co-existing pets and humans. Public awareness should also be instilled as parasitic infections may

emerge from stray and wild animals living in the vicinity.

Parasites are generally transmitted when an animal accidentally ingests contaminated soil, water, faeces or food containing parasite eggs or spores. Ectoparasites such as fleas can transmit the tapeworm *Dipylidium caninum* in dogs, when accidentally eaten. Mosquitoes can transmit heartworm *Dirofilaria immitis* from dog to dog. From the data of this study, *D. immitis* was diagnosed in dogs. It can be considered as an important pathogen since Malaysia is the mosquito vector in abundance (Dhaliwal G.K., 1988).

In this report, the prevalence of canine dirofilariasis was 42.0% and 10.0% within the stray dog and owned dog populations, respectively. Parasites can lead to malnutrition, weight loss, diarrhoea, anaemia and vomiting because they consume essential nutrients in the blood and gastrointestinal tract. Erwanas *et al.* (2014) found that 76% of stray dogs and 16% of pet dogs had ecto- and endoparasite infections namely toxocariasis, giardiasis, hookworm infection and mange due to *Demodex* spp. This further emphasises the importance of good hygiene and the need to control stray dog and cat populations as they harbour zoonotic parasites that not only cause disease in pets but also in humans.

CONCLUSION

This analysis for data from 2014 to 2018 shows that there are parasitic infections in pets especially in dogs and cats, that can be dangerous to humans too. Although the number of samples submitted to VRI for diagnosis from pet dogs and cats is limited, it shows the presence of parasite infections in pets. Therefore, close attention is needed by pet owners on the status of health of pets and awareness of common parasitic infections to ensure that it does not spread harm to humans, as the pet's keeper. Further studies, with more samples and with a detailed panel of tests including serological and molecular tests are needed to elucidate parasitic infections in pets.

The study also has indicated the importance of monitoring the health profile of pets. The parasites reported in this study are considered to be a potential risk to humans as it causes zoonotic transmission. The health effects of an animal infected from parasites can range from minor irritation to severe circumstances and can be deadly if not treated. Regular animal health checks are important to ensure that the infection does not spread to co-existing animals and humans especially among animal handlers. This data opens the door to more opportunities for studies about the common parasites of pets and strays in Malaysia.

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