

Ectoparasites of Stray Cats in Bangkok Metropolitan Areas, Thailand

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ABSTRACT

Ectoparasites are among the most common parasites in stray cats, which might represent potential reservoirs of external parasites to domestic cats, especially during mating season. The objective of this study was to determine the prevalence of ectoparasites in stray cats in Bangkok areas, particularly in monasteries. A total of 575 samples were collected from cats resided in monasteries of 50 districts of Bangkok areas, performed to identify parasitic stages, and examined under light microscopy. Overall prevalence of ectoparasites in stray cats was 95.8 %. The study revealed that the parasite burdens in 98% (49/50) of Bangkok areas. Saphan Sung district had the highest number (95.7%) of infestations among 50 districts. No significant differences were associated with sex. Cats between 3-5 years were highly infected with 97.3 %. *Ctenocephalides felis felis* (88.3%), *Felicola subrostratus* (4.2%), *Notoedres cati* (2.3%), *C. felis orientis* (2.1%) and *Xenopsylla cheopitidis* (0.4%) were found in stray cats. The high incidence of ectoparasitism in cats was due to the relative influence of behaviour and contaminated environment since these cats lived in the same environment as stray dogs. These results are indicative of the situation that stray cats were potential for some vector-borne diseases as same as stray dogs.

Key words: ectoparasites, stray cats, Bangkok areas

INTRODUCTION

Ectoparasites are usually considered as vexing disorders and do not attract much clinical attention. However, these infections can carry substantial morbidity and affect much of a population depending on the socio-economic environment. Ectoparasites are concerned as a common and important cause of pruritic and non-pruritic skin disorders in cats, as well as can transmit a variety of diseases and cause

hypersensitivity disorders in animals. They also may cause life-threatening anemia in young or debilitated animals (Araujo *et al.*, 1998).

The most common group of ectoparasites infesting cats are fleas. However, the flea infestation is less serious than the diseases they transmit since fleas can transmit some serious diseases such as bartonellosis (cat scratch diseases) to animals and humans. Tick infestations may be also observed in outdoor stray cats and can transmit a few diseases such as ehrlichiosis.

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In clinical cases, the source of infection is often unknown since arthropod vectors are overlooked.

Ectoparasites are vectors of zoonotic pathogens such as, Lyme disease, Powassan encephalitis, plague, Rocky Mountain spotted fever, trypanosomiasis, and tularemia (Nelder & Reeves, 2005). Some ectoparasitic arthropods are irritating pests of humans and domestic animals, regardless of their significance as vectors of disease. In developing countries, particularly in poor people, multiple parasitisms are frequently found in dog and cats such as scabies and lice infestation due to the increasing cost of living and unaffordable animal care.

In Bangkok, there are a huge number of stray cats and dogs roaming the streets, fresh open-market, public places and Buddhist monastery (Jittapalapong *et al.*, 2003). Stray cats and dogs are virtually the source of many zoonotic diseases such as rabies, cat-scratch disease, ehrlichiosis and toxoplasmosis and easily spread the diseases to house animals by contact. In Buddhist belief, a monastery is a sanctuary for animals since there is prohibited of killing any lives in a monastery and its vicinity. For this reason, the animal population in monasteries is rising and causing more public health concern including some zoonoses. Actually, no use of individual and environmental ectoparasite control were applied in stray cats in the monasteries and information regarding the current prevalence of feline ectoparasites is difficult to obtain. There has been no prior study assessing the full compliment of ectoparasites on stray cats in Bangkok areas. The ectoparasites found on these stray cats represent the distribution of ectoparasites among outdoor free-ranging stray cats.

The objective of this study was to determine the prevalence of ectoparasites in stray cats from monasteries of Bangkok with less Veterinary care and insecticide application.

MATERIALS AND METHODS

1. Study areas

Bangkok metropolitan areas are divided into 50 geographical districts. Each district has at least 1 monastery. Stray cats were defined as cats that lived in the monasteries without the real owner. They were fed by leftover food by monastery caretakers or monks. These animals are not consistently vaccinated or dewormed as animal health's requirement. However, they shared the environment with stray dogs in some monasteries.

Five hundred and seventy five samples of stray cats were examined and collected ectoparasites between March and August, 2005 from randomly sampling of 150 Buddhist monasteries in 50 districts of Bangkok metropolitan areas where stray cats are lived. All cats were thoroughly external examined by veterinarians and recorded for animal health.

2. Ectoparasite samples

Ectoparasite and skin scraping samples were collected from stray cats living in Buddhist monasteries from each district. Samples were put in plastic bags, marked according to monastery, district, and date of collection and kept in 70% alcohol until processing, which was carried out within a month. The ages of the cats ranged from 3 months to 10 years, however the history of these animals was not known. Demographic data including breed, age, and gender were collected for all cats.

3. Parasitological procedure

After alcohol preservation, samples were clean by water and immersed in 5% potassium hydroxide (KOH) with a slightly warm for 10-15 minutes. Transfer the samples to 35% acid alcohol for 5 min. to adjust the pH on samples. Dehydrate the sample by using series of alcohol from 50, 60, 70, 80, 90, 95 and 100% (absolute) with 5 min.

each. Make the sample transparency by xylene for 5 min. Mount by permount and leave it dry before examination via stereo microscope.

RESULTS

1. Prevalence of ectoparasites

Overall prevalence of ectoparasites in stray cats was 95.8 %. No significant differences were associated with sex. Cats between 3-5 years were highly infected for 97.3%. *Ctenocephalides felis felis*, *Felicola subrostratus*, *Notoedres cati*, *Ctenocephalides felis orientis* and *Xeopsylla cheopitis* were the most prevalent external parasites in stray cats (table1 and figure 1).

2. Distribution of ectoparasites in Bangkok areas

The result indicated that the ectoparasite burden in 98 % (47/50) of stray cats in Bangkok areas. Saphan Sung district had the highest number (95.7 %) of infestations among 50 districts.

DISCUSSION

The study has found that the level of ectoparasites in stray cats in Bangkok metropolitan

areas was tremendously high. The findings confirmed an evidence that external parasites are now the main problems affecting stray cats in Bangkok. Most cats in Thailand are raised either outdoors or both outdoors and indoors. Since infected stray cats are capable of carrying ectoparasites into public places (Jittapalapong *et al.*, 2003), healthy animals and humans may get infested due to the contaminated environment. Moreover, environmental conditions can affect the proliferation and survival of ectoparasites. For example, flea larvae development occurs in protected microhabitats that combine moderate temperature and high relative humidity. In Thailand, the temperature and humidity are enhancing the life cycle of all ectoparasites and assisting them more survival in the environment. This study also reinforces the role of stray cats as one of the potential sources of zoonotic parasites transmission to humans in Bangkok.

The age of the cat was found to be an important factor associated with parasitic infections. Cats between 3 and 5 year old were more likely to be parasitized than the others. The current study also found the close relationship among cats and dogs significantly influenced the prevalence of parasitic infection.

Table 1 Factors associated with ectoparasite infections of stray cats in Bangkok.

Factors	Category	Number of examined	Number of positive (%)
Age	Less than 3 years	355	340 (95.8)
	3-5 years	182	177 (97.3)
	More than 5 years	38	34 (89.5)
Sex	Females	332	323 (56.1)
	Males	243	228 (39.7)
Districts		50	49 (94)
Type of Infections	Mixed		9 (1.6)
	Single		542 (94.3)
Type of ectoparasites	<i>Ctenocephalides felis felis</i>		508 (88.3)
	<i>Felicola subrostratus</i>		24 (4.2)
	<i>Notoedres cati</i>		13 (2.3)
	<i>Cenocephalides felis orientis</i>		12 (2.1)
	<i>Xeopsylla cheopitis</i>		2 (0.4)

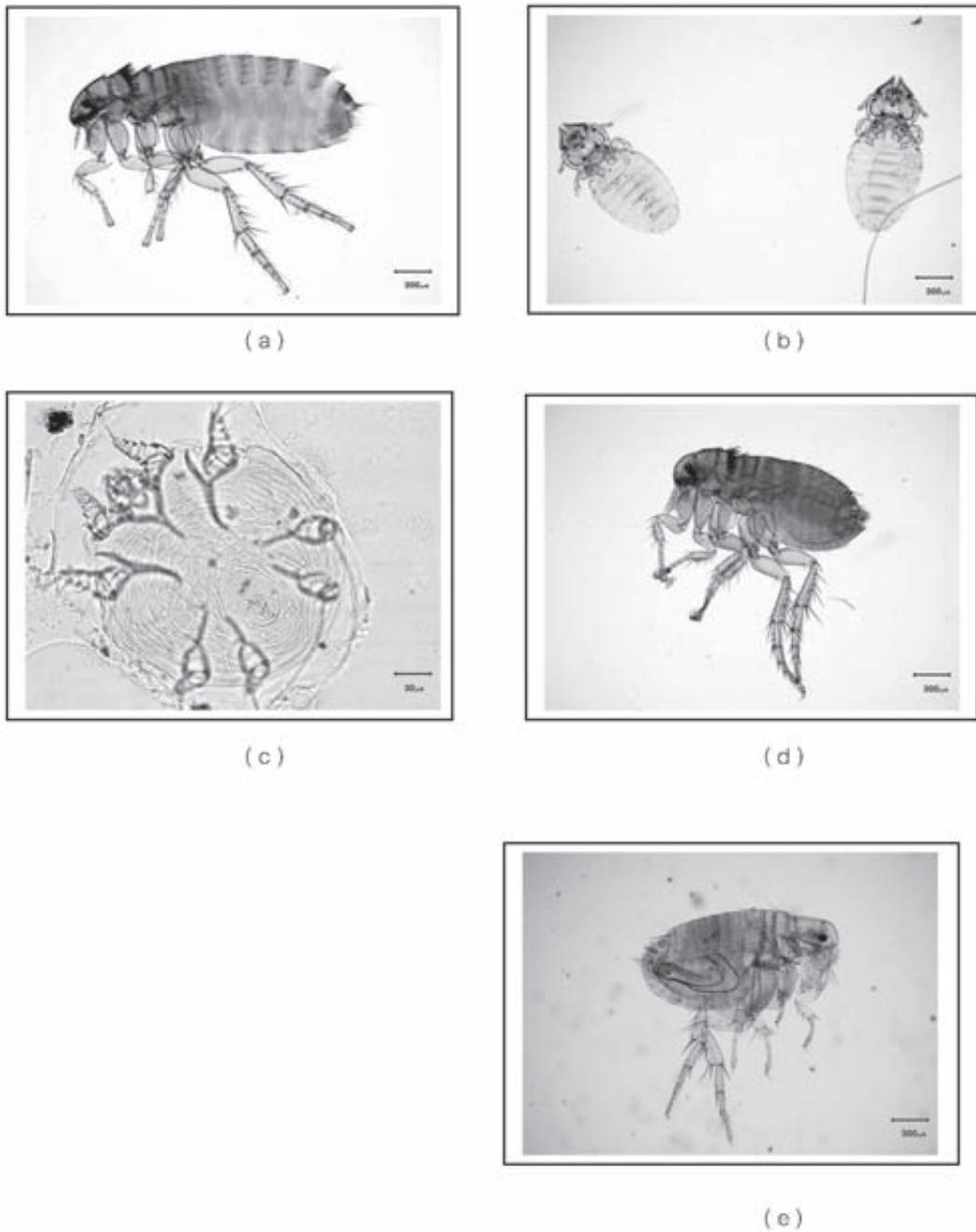


Figure 1 The picture of ectoparasites found in stray cats of Bangkok areas including (a) *Ctenocephalides felis felis* (100x); (b) *Felicola subrostratus* (100x) ; (c) *Notoedres cati* (400x) ; (d) *C. felis orientis* (100x) and (e) *Xenopsylla cheopitis* (100x)

Ctenocephalides felis felis is known to be the most common ectoparasite of cats. These findings are similar to those obtained in previous studies (Akucewich *et al.*, 2002). In this study, it was the most frequent species of arthropods (88.3%). This is important since *C. felis felis* has a role as a biological vector of many pathogens in humans (Nelder & Reeves, 2005). Therefore, optimal care must be taken to diminish the risk of pest infection to animals and humans. The high prevalent ectoparasites found in this study must serve as a warning sign to public health agencies, veterinarians and nearby people. Veterinarians in practice are often the only source of information about zoonoses for pet owners. Education has an important role to play in reducing the prevalence of infections with potentially zoonotic parasites in pets and their owners. It is important that methods for prevention and control of the parasites be implied and executed in order to reduce the environmental contamination with infective eggs and larvae.

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