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PJBS

ISSN 1028-8880

Pakistan Journal of Biological Sciences

ANSI*net*

Asian Network for Scientific Information
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan

***Ctenocephalides felis* in Dogs and Cats in Tandojam Region**

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Abstract: One hundred dogs and equal number of cats was examined in Tandojam town and its surroundings, with an object to record the flea infestation in these hosts. During this study, only one species of flea, i.e., *Ctenocephalides felis* was founding infesting both host animals. Pooled compilation of data revealed that 34% of dogs and 28% cats were infested. However, categorical compilation of results showed that in case of dogs, the higher rate of infestation (50%) was recorded in females than in males (10%). Similar trend was also found in cats, where 25% females were found infested as against 11.11% in males. The trend of female bias infestation was also observed down to the level of young population of animals under study. The rate of infestation was higher in female puppies (40%) than in male puppies (26.66%). It was also higher in female kitten (37.84%) than in male kitten (12.43%).

Key words: *Ctenocephalides felis*, dog flea, cat flea, ecto-parasite

INTRODUCTION

Fleas are one of the most common ectoparasites of companion animals and feed on the blood of their hosts. Fleas are responsible for the production and transmission of several diseases of humans and their pets. The flea that causes most of the problems is *Ctenocephalides felis*, the common cat flea. In one study it accounted for 92 to 99% of the fleas found on dogs and cats, respectively (Harman and Halliwell, 1987).

Fleas can be diagnosed on pet by finding the adult fleas, the flea dirt, or flea eggs on the skin. These can be seen most easily on the rump and the thinly-haired belly. Flea dirt is actually flea feces from digested blood. It looks black, but will appear red brown when smeared on a white paper. Flea eggs look like tiny, white sand grains. Adult fleas are small, brown and wingless, a little larger than the size of a pinhead. They move fast and can leap great distances. There are nearly 1600 species of fleas and parasitize many wild and domestic animals (Holland, 1949).

Flea eggs are oval, pearly white, non-sticky and about 0.5 mm in length. The egg hatches between 1 and 10 days of being deposited on the host and falling off into the environment, depending on the ambient temperature and humidity (ideal conditions are 70% relative humidity and 35°C (Dryden, 1989).

In dogs and cats, they cause Flea Allergy Dermatitis (FAD). The main thing that dog owners notice is scratching, chewing, licking, biting and other signs of pruritus. FAD patients usually have papules, crusts, salivary stains, excoriations and erythema in a wedge-shaped pattern over the lumbosacral region, caudal

thighs, proximal tail, ventral abdomen and around the umbilicus. With chronic itching the areas become alopecic, lichenified and hyperpigmented and the dog will develop an odor related to secondary infections with *Staphylococcus intermedius* and *Malassezia pachydermatis*.

A diagnosis of FAD is based on the age of onset of the pruritus, the distribution of the pruritus and clinical signs and the observation of fleas and/or flea feces. Many dogs who are allergic to the bite of a flea have very few fleas on them at any time because their excessive grooming activity removes the fleas. Some of those patients will have recurrent tapeworm (*Dipylidium caninum*) infestations from ingestion of the fleas. The diagnosis of FAD can be confirmed with an intra-dermal skin test with flea antigen.

In Pakistan, dogs and cats are not given due status of pet animals, hence little attention is paid towards their health and management. Therefore there is lack of data on flea infection in dogs and cat. The study was therefore conducted study the fauna of fleas infesting cats and dogs in Hyderabad-Pakistan, the spectrum of hosts each flea species infests, identify risk factors in the environment and management practices that favour flea infestation of cat and dog and describe the seasonal variation of infestation in canine host(s).

MATERIALS AND METHODS

Study area: The area comprised of Staff Residential Colony, Sindh Agriculture University, Tandojam, Tandojam city and its surroundings.

Table 1: Distribution of sample population

Host	Category	No. examined
Dog	Male adult	10
	Female adult	10
	Male puppies	30
	Female puppies	50
Cat	Male cat	09
	Female cat	40
	Male kittens	14
	Female kitten	37

Trapping and treatment of animals: Animals were handled simply with hands by giving some incentive in the form of milk and bread and checked by searching the body regions like the chest, legs and near the sphincter and the throat. One hundred dogs (10 adult male, 10 female, 30 male and 50 female puppies) and 100 cats (09 adult males, 40 adult females, 14 male kittens and 37 female kittens were observed for the presence of fleas (Table 1).

Collection of fleas: The fur of the animals was carefully brushed and examined for fleas. The fleas thus recovered were collected and preserved in 70% ethanol and placed in numbered vials.

Permanent mount: In laboratory, the fleas were taken from the ethanol solution and transferred to 10% KOH solution for 24 h. On next day, fleas were removed from caustic solution and placed in cold water for an hour and then transferred to a watch-glass containing distilled water, mixed with a drop of glacial acetic acid in it for about 30 min. From the acidulated water, fleas were taken to a distilled water container, dehydrated by passing them through increasing strength of alcohol with the help of alcohol series. Specimens were left for 5 min in each of 30, 50, 70, 90 and 100%, respectively (Hopkins and Rothschild, 1953). The flea were cleared in clove oil, washed with xylene and mounted on slide with the help of Canada balsam as suggested by Stark (1966).

Identification of fleas: A detailed examination of permanent slides was made with binocular dissecting microscope. For identification, the help was sought from keys as described by Soulsby (1982).

RESULTS

The entire research was based on random sampling of 100 animals each from dog and cat. No choice was made with particular reference of male and female. The percentages were calculated from sample examined for particular category of host. During this study, only one species of flea i.e., *Ctenocephalides felis* was found infesting both the dogs and cats. The identification of the species was made on following characters as

Table 2: Infestation rate of *Ctenocephalides felis* in dogs and cats

Host	No. examined	No. infested	Percentage
Dogs	100	34	34
Cats	100	28	28

Table 3: Rate of infestation in adult dog and cat (male and female)

Category	No. examined	No. infested	Percentage
Male dog	10	01	10.00
Female dog	10	05	50.00
Male cat	09	01	11.11
Female cat	40	10	25.00

The percentages were calculated from sample examined for particular category of host

Table 4: Rate of infestation in dogs and cats (both sex and age)

Host	Category	No. examined	No. infested	Percentage
Dog	Male adult	10	01	10.00
	Female adult	30	05	50.00
	Male puppies	10	08	26.66
	Female puppies	50	20	40.00
Cat	Male adult	09	01	11.11
	Female adult	40	10	25.00
	Male Kitten	14	03	21.43
	Female kitten	37	14	37.84

Percentages were calculated from sample examined for particular category of host

Table 5: Rate of infestation in puppies and kittens (male and female)

Category	No. examined	No. infested	Percentage
Male puppies	30	08	26.66
Female puppies	50	20	40.00
Male kitten	14	03	21.43
Female kitten	37	14	37.84

by Soulsby (1982). These include (i) laterally compressed body (ii) wingless (iii) highly chitinous (iv) mostly leaping and (v) blood sucking. The most important single character that makes this species different from other fleas is the comb of eight spines on head and sixteen spines in pronotal comb.

Table 2 reveals that out of 100 dogs and equal number of cats examined, 34 and 28% dogs and cats were respectively infested with *C. felis*. Results in Table 3 show the rate of infestation in both sex groups of dogs and cats examined during this study. According to Table 3, the rate of infestation was higher (50%) in female and lower (10%) in male dogs. Whereas, the rate of infestation in female cats was higher (25%) than male (11.11%).

According to Table 4, the flea infestation in dogs was 10, 50, 26 and 40% in adult males, adult females, male puppies and female puppies, respectively. This table also shows that, out of 100 cats examined, 11.11, 25, 21.43 and 37.84% rates of infestations were recorded in male cat, female cat, male kitten and female kitten, respectively. Table 4 also reveals the higher rate of infestation in female population when compared with male.

Table 5 reveals that female population of both hosts had higher rate of infestation (40 and 37.84%) in puppies and kittens, respectively. When compared with males in which 26.66 and 21.43% rates of infestations were recorded in puppies and kittens, respectively.

Table 6: Rate of infestation in male adult dog and puppies and male cat and kittens

Category	No. examined	No. infested	Percentage
Male adult dog	10	01	10.00
male puppies	30	08	26.66
Male adult cat	09	01	11.11
Male kittens	14	03	21.43

The percentages were calculated from sample examined for particular category of host

Table 7: Rate of infestation in female adult dog and puppies and female cat and kittens

Category	No. examined	No. infested	Percentage
Female dog	10	05	50.00
Female puppies	50	20	40.00
Female cat	40	10	25.00
Female kitten	37	14	37.84

Table 8: Rate of infestation of puppies, dogs, kitten and cat

Category	No. examined	No. infested	Percentage
Puppies	80	28	35.00
Dogs	20	06	30.00
Kitten	51	17	33.33
Cat	49	11	22.44

The percentages were calculated from sample examined for particular category of host

According to Table 6, puppies and kittens were more infested (26.66 and 21.43%), than adult dogs and cats in which rates of infestation were 10 and 11.11%, respectively.

According to Table 7, female population of dogs had 2 fold higher rate of infestation 50% against female cats 25%. This table also reveals that female puppies had higher rate of infestation (40%) when compared with female kittens (37.84%).

Table 8 show that puppies were more susceptible than dogs showing 35 and 30% rates of infestation, respectively. Whereas the kitten were more susceptible than cats showing 33.33 and 22.44% rates of infestation, respectively.

DISCUSSION

The aim of present study was focused to record the rate of infestation of fleas both in dogs and cats. The compilation of results revealed that in area of study, only one species of fleas i.e., *Ctenocephalides felis* was found in both the hosts. *Ctenocephalides canis* (which was not reported throughout study) is generally restricted to dogs and related species, but it has not yet completely emerged as cosmopolitan species (Hopkins and Rothschild, 1953). This may be the reason that *C. canis* was not seen infesting dogs in the area under study. On the other side, *C. felis* has become completely a cosmopolitan species and is found parasitizing both dogs and cats on high levels (Pratt and Stark, 1973). Present findings are

agreement with Pratt and Stark (1973) as *C. felis* was found infesting both the above mentioned hosts.

During present study, the higher rate of infestations of *C. felis* were recorded in dogs (34%) than cats (28%) (Table 2). Ismail (1982), Omar (1985) and Koutinas (1995), recorded 65, 63.8 and 95% infestation of *C. felis* in dogs. However, Kalkofen (1974) reported 80% of dog infested with *C. felis*. Kalkofen further reported that dogs were the referred hosts. The findings of present study are in agreement with Kalkofen (1974) in terms of rending of higher rate of infestation in dogs.

The rate of infestation widely varies from country to country and area to area, principally depending on climatic conditions and awareness towards control of fleas in dogs and cats. In country like Pakistan, cats are generally kept as pets and dogs have not yet been given this status due to certain religious bindings. However, the fact is that, the attention is not paid towards prevention and cure of cats in general and that of dogs in particular. That may be a reason why the rate of infestation is little higher in dogs (34%) than cats (28%) (Table 2).

During present studies it was found that, the rate of infestation was lower in male dogs (both adult and puppies) when compared with female (both adult and puppies) (Table 3). Higher rate of infestation was seen in male puppies (26.6% than male adult dogs (10%). However, this trend was seen changed in case of female adult dog which had higher rate of infestation (50%) when compared with (40%) in puppies of the same sex (Table 4).

In case of cat host, female cats had 25% rate of infestation against 11.11% in male cats (Table 4). The comparison of male kitten with female kitten showed higher rate of infestation in female kitten (37.84%) against 21.43% in male Kitten (Table 4). It was seen that female kitten were more susceptible to flea infestation (37.84%) and adult cats of same sex were less susceptible having only 25% rate of infestation. When the data regarding comparison of male adult cat with male kitten was computed, it was seen that male kittens were more susceptible with 21.43% rate of infestation against 11.11% in male adult cat (Table 4).

From Table 8 it is apparent that the rate of infestation was higher in puppies and kitten (35 and 33.33%, respectively) when compared with adult dogs and cats (30 and 2.44%), respectively. These findings are in agreement with Ismail (1982). They also reported higher rates of infestation in kitten than cats and puppies than dogs. They further calculated ratio of males to female was 1:1.25 in all location of Jordan. The reason for higher rates of infestation in puppies and kitten may be because their skin coat is little softer and facilitate the fleas to easy

penetrate their mouth parts for sucking blood from host body. However, towards the female cat population, the factors behind heavy infestation need to be investigated.

As already mentioned, *C. felis* are principally a cat infesting ecto-parasite, but during present study, dogs were seen more infested (Table 2). Present findings are in agreement with those of Kalkofen (1974) who recorded higher number of dogs infested with *C. felis* though it is principally known as cat flea. This shows that *C. felis* is not strictly host specific species. This may be due to fact that *C. felis* has completely emerged as cosmopolitan species.

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