

A STUDY OF ECTOPARASITES OF *CANIS LUPUS FAMILIARIS* IN MUEANG DISTRICT, KHON KAEN, THAILAND

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Abstract. We studied ectoparasites found on *Canis lupus familiaris* sampled in five areas in Mueang district, Khon Kaen Province, Thailand. The prevalence of fleas and ticks as well as their density were determined in 100 dogs that did not receive treatments. A total number of 458 ectoparasites was found corresponding to two species: 25.8% *Ctenocephalides canis* and 74.2% *Rhipicephalus sanguineus*. *R. sanguineus* was the most abundant species, and *Ct. canis* was the only flea species found. The stages of *R. sanguineus* were larvae (5.3%), nymphs (29.1%) and adults (39.1% in male and 26.5% in female). The stages of *Ct. canis* were larvae (41.5%) and adults (58.5%). Both species were commonly found on domestic dogs in all areas of the study. *Ct. canis* was not present on domestic dogs in one sub-district. The prevalence rates of tick-harboring domestic dogs was 80% (*R. sanguineus*), and flea-harboring domestic dogs was 26% (*Ct. canis*).

INTRODUCTION

Arthropod ectoparasites are diverse and highly adapted to the domestic animals they inhabit. They may live permanently on their host, or they may occupy the host's residence and immediate environment, and visit the body of the host periodically. Arthropod ectoparasites are vectors of many important diseases in human (Service, 1996).

Ticks are arthropods in the Acari group and comprise 3 Families; Ixodidae (13 genera, 650 species), Argassidae (5 genera, 150 species) and Nuttallielidae (1 genera, 1 species). From 1961 to 1980, Tunskul and colleagues studied ticks in 47 provinces of Thailand. A total of 10 genera and 53 species were found: 8 genera and 49 species of hard ticks; 2 genera and 4 species of soft ticks (Tunskul *et al.*, 1983). Ectoparasites of cows and buffalo in Chiang Mai Province were identified as a total of 31 species of arthropods, and ticks (Arithchart, 1983). A strain of Langat virus (LGT), T-1674 was isolated from a pool of *Hemaphysalis papuna* that Thorell collected in the forest of Khao Yai National Park in Thailand. This was the first report of a natural infection of *Hemaphysalis* ticks with LGT

and of the isolation of this arbovirus in Thailand (Bancroft *et al.*, 1976).

Fleas are arthropods in the Siphonaptera group and comprise 4 Families (20 genera and 3,000 species) Important medical fleas include: *Xenopsylla cheopis* (Tropical rat flea), *Xenopsylla astia*, *Xenopsylla brasiliensis*, *Nosopsyllus fasciatus* (temperate rat flea), *Ctenocephalides canis* (dog flea), *Ctenocephalides felis* (cat flea), *Tunga penetrans* (chigger or jigger flea), *Pulex irritans* (human flea) (Pipitgool *et al.*, 1998). Dog fleas are tiny parasitic insects with the ability to make spectacular leaps of 35 cm or more. Flea bites are irritating to mammals and cause itching or rashes. Larvae are whitish and wormlike and pupate in cocoons in a manner similar to moths (Pipitgool *et al.*, 1998). Our study investigated the prevalence, density and species of ectoparasites of domestic dogs in 5 sub-districts of Mueang, Khon Kaen Province. The kind of infestation found in each host was determined and the intensity of natural infestation was estimated.

MATERIALS AND METHODS

This study was conducted 5 areas of Mueang district, Khon Kaen Province. The kind of infestation found in each host was determined and the intensity of natural infestation was estimated throughout the year 2004. Twenty domestic dogs, *Canis lupus familiaris*, in each area were examined for ectoparasites. Ectoparasites were collected by hand-removal from the ear, tail, neck and leg of domestic dogs during a

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15-minute period. The collected ectoparasites were fixed in 70% alcohol in a sample tube. The stages and species of ectoparasites, such as larva, nymph and adult were identified according to the method of Krantz (1978).

RESULTS

The prevalence and density of ectoparasites

Twenty-six dogs were found harboring *Ct. canis* and 81 dogs with *R. sanguineus*. The highest prevalence rates of *R. sanguineus* and *Ct. canis* harboring in *C. lupus familiaris* were 100% in Ban Ped and 50% in Mueang Khaw 2, respectively. No *Ct. canis* were found in Ban Ped area (Table 1).

A total of 458 ectoparasites were collected from 100 domestic dogs in the 5 surveyed areas. The highest numbers of *Ct. canis* harboring in *C. lupus familiaris* were 45 (38.1%) in Mueang Khaw 2 area and the numbers of *R. sanguineus* totaled 100 (29.4%) in Nai Mueang area. The lowest number of *Ct. canis* and *R. sanguineus* ectoparasites harboring in *C. lupus familiaris* were found in Ban Ped area (Table 1). The tick species found in this study was *Boophilus microplus*.

The number of ectoparasitic stages

Among 118 *Ct. canis* collected, 49 were larvae and 69 were adults. The stages of *R. sanguineus* infested dogs were larvae (18), nymph (99) and collected adults (223). The highest number of larva and adult stages of *Ct. canis* in Mueang Khaw 1 and Mueang Khaw 2 were 25 and 29, respectively. The highest number of *Rhipicephalus sanguineus* larvae, nymphs and adults in Sira, Sira, and Nai Muang were 12, 43, and 72, respectively (Table 2). The stages of *R. sanguineus* were larvae (5.3%), nymphs (29.1%) and adults (39.1% in males and 26.5% females). The stages of *Ct. canis*

were: larvae (41.5%) and adults(58.5%).

DISCUSSION

From our survey, both fleas and ticks lived on the bodies of domestic dogs. The highest prevalence rates of *R. sanguineus* and *Ct. canis* harboring in *C. lupus familiaris* were found in the Ban Ped (100%) and Muang Khaw 2 (50%) areas. No *Ct. canis* were found in the Ban Ped area. *R. sanguineus* was the most abundant species, and *Ct. canis* was the only flea species found. This may be due to the dogs surveyed being exclusively rural animals. Both species were commonly present on domestic dogs in all areas of the study. From this study, the differences in the prevalence of ticks and fleas in each domestic dog may be due to the differences in animal immunity or the different areas of prevalence and density of ticks and fleas. These differences might be due to the dissimilar temperature and/or moisture in each area that affect the growth and reproduction of ectoparasites.

In 2002, we surveyed ticks in domestic animals for three seasons in three districts of Samut Prakan Province, Thailand. Ticks were found in all study areas and in 4 kinds of domestic animals; the highest rate (46%) was obtained in *Canis lusus familiaris* (Nithikathkul *et al*, 2002).

A comparative study of ectoparasitic infestation of different breeds of dogs was performed in four veterinary clinics in Nigeria in 1983. Of a total of 820 dogs examined, 246 (30.0%) were infected by ticks, 226 (27.6%) by lice, 212 (25.8%) by fleas and 109 (13.3%) by mites. The species of ectoparasites identified and their prevalence rates were: *R. sanguineus* (19.5%), *Otobius megnini* (10.5%), *Ct. canis* (25.8%), *Demodex canis* (13.3%) (Ugochukwu and Nnadozie, 1985). In another study, a total of 344

Table 1
Number of dogs which harbored ectoparasites and number of ectoparasites collected in the 5 areas.

Area	Number (%) of dogs harboring ectoparasites		Number of ectoparasites (%) collected		
	<i>Ct. canis</i>	<i>R. sanguineus</i>	<i>Ct. canis</i>	<i>R. sanguineus</i>	Total
Nai Mueang	4 (2)	16 (80)	11 (9.3)	100 (29.4)	111 (24.2)
Si Ra	7 (3.5)	16 (80)	25 (21.2)	84 (24.7)	109 (23.8)
Mueang Khaw 1	5 (2.5)	16 (80)	37 (31.4)	63 (18.5)	100 (21.8)
Ban Ped	0 (0)	20 (100)	0 (0)	38 (11.2)	38 (8.3)
Mueang Khaw 2	10 (50)	13 (65)	45 (38.1)	55 (16.2)	100 (21.8)
Total	26 (26)	81 (81)	118 (100)	340 (100)	458 (100)

Table 2
Number of ectoparasites harbored on domestic dogs, per area, by stage of development

Area	Number of ectoparasites stages harbored on domestic dogs				
	<i>Ct. canis</i>		<i>R. sanguineus</i>		
	Larva	Adult	Larva	Nymph	Adult
Nai Muang	7	4	5	23	72
Si Ra	1	24	12	43	29
Muang Khaw 1	25	12	0	10	53
Ban Ped	0	0	0	11	27
Muang Khaw 2	16	29	1	12	42
Total	49 (41.5%)	69 (58.5%)	18 (5.3%)	99 (29.1%)	223 (65.6%)

dogs belonging to people in resource-poor communities in North West Province, South Africa, were examined for ectoparasites, it was estimated that the dogs harbored 14,724 ixodid ticks belonging to 6 species, 1,028 fleas belonging to 2 species, and 26 lice. *Haemaphysalis leachi* accounted for 420 and *R. sanguineus* for 14,226 of the ticks. Pure infestations of *H. leachi* were present in 14 dogs and of *R. sanguineus* in 172 dogs (Bryson *et al*, 2000).

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