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DETECTION OF ECTOPARASITES BETWEEN DOMESTICATED ANIMALS IN BASRAH CITY/ SOUTHERN IRAQ

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ABSTRACT

Arthropod ectoparasites have a major impact on husbandry, productivity and welfare of domestic animals. The current study were done with a total of (50) buffalo, (25) cow, (11)horses, (70) sheeps and (13) dogs. These animals were examined from Basrah veterinary hospital, veterinary clinical, domestic field animals, veterinary fields and house field. The ear, udder, brats, horns, legs, nick, tail, anus and genital pores, testes, per femoral region, perineum, per scapular, back and buttock were examined carefully for detection of any ectoparasites. The total percentage infection varied between 20% to 100%, while, A total number of isolated ectoparasites from the total infected animals was (89) divided into Rhipicephalus sp., Hyalomma sp., Haematopinus sp., Hippobosca sp., Boophilus sp.

INTRODUCTION

Arthropod ectoparasites have a major impact on husbandry, productivity and welfare of domestic animals (Colebrook &Wall, 2004). These obligate parasites live, feed and shelter on or just beneath the surface of their host's epidermis, hair or feathers (Marshall, 1981). As a result, skin and other subcutaneous tissues can be directly compromised by irritation, hypersensitivity, dermatosis and alopecia. The presence of salivary and fecal antigens from burrowing ectoparasites (ex. Sarcoptes) can result in significant hypersensitivity in some animals. Furthermore, Feeding activity of the ectoparasites may result in significant blood loss, secondary infestations, pruritus, excoriation and in some cases premature death, may also cause indirect harm including behavioral disturbances, such as increased frequency of rubbing or scratching, leading to reduced time in feeding (Newsletter, 2010). For cattle, less grazing and general disturbed behavior decreases production of meat or milk (Matthysse, 1946). In some cases, infected animals may resort to self-wounding, particularly when ectoparasites are present in high densities (Berriatua et al, 2001). Some ectoparasites may also act as vectors of viruses, rickettsia, bacteria, protozoa, cestodes and nematodes,

including vectors of zoonotic diseases in humans (Arends et al, 1990; Uilenberg, 1995; Raoult & Roux, 1997; Parola et al, 2005; Rehbein et al, 2003; Petney et al, 2007).

Various studies have reported ectoparasites on domestic animals in Thailand, including dogs (Sangvaranond, 1990; Sangvaranond et al, 2000; Nithikathkul et al, 2005) domestic cattle (Sangvaranond, 1988; Sarataphan et al, 1998) and chickens (Sangvaranond, 2003). Tanskul et al., (1983) and Ahantarig et al., (2008) have published checklists and summarized disease information regarding ticks in Thailand.

Tick bites can be irritating and/or painful. They also provide entry points for secondary bacterial invaders or screwworms. Heavy infestations can damage hides and may cause anemia, particularly when the animal is in poor condition. Rhipicephalus appendiculatus, the brown ear tick, damages the ears of cattle and other livestock, and some species of ticks cause tick paralysis. However, the most important risk with the introduction of exotic ticks is that they may carry the agents of exotic diseases. The greatest danger is when the tick acts as a biological vector, but pathogens carried mechanically can be introduced if they survive long enough (Newsletter, 2011).

Important tick species at risk for introduction into North America include: Amblyomma variegatum, Amblyomma hebraeum, Rhipicephalus microplus (formerly Boophilus microplus), Rhipicephalus annulatus (formerly Boophilus annulatus), Rhipicephalus appendiculatus and Ixodes ricinus.

Tick paralysis is a kind of disease associated with ticks. It is a disease of human and animals characterized by an acute ascending flaccid motor paralysis. The condition may terminate fatally unless the tick(s) are removed before respiratory paralysis occurs. Adult ticks, chiefly females, but sometimes nymphs, are responsible and ticks of the genus Ixodes are particularly associated with the condition but other genera especially Dermacentor andersoni are concerned. It has also been ascribed to infections with Ornithodorus lahorensis (Mihailov, 1957) and Argas persicus (Soulsby, 1982). In general, the degree f paralysis is proportional to the length of time the tick has been feeding and the number of tick attached. Electrophysiological investigations show an almost complete reversibility following removal of the ticks (Gothe & Kunze, 1974). Parasites can be detected oil the. external surfaces of the body by way of a thorough physical examination. Periodical exami-nation of the flock call help to detect ail early infestation and can help to prevent a larger flock outbreak. It is important to detect infestations early because of the restrictions oil treatments available for food-producing bit-cis. Moreover, many of the parasites have an

environmental component so treating the environment is also necessary for controlling infestations. Prevention and early detection are the keys to successful treatment and control of external parasites in poultry flocks. 'File most common external parasites seen in poultry are lice and mites

The terms "scabies" and mange are often used interchangeably, but are defined by the US Department of Agriculture in the following way:

Mange is any skin condition of man or animals associated with a mite; scabies is a particularly serious, debilitating, reportable mange condition. The causative organisms, mites, are minute arachnids related to the ticks and spiders.

Three varieties of mite infestation are grouped together under the term scabies: (Newsletter, 2010) psoroptic, or cornmon scabies, sarcoptic scabies, and chorioptic scabies. Demodex bovis a cattle follicle mite, and Psorergates bovis a cattle itch mite, are other mites that infest cattle, but are not included with the species considered by the term "scabies" mange or scab. When either psoroptic or sarcoptic mites are detected, the infested cattle are required by law to be quarantined and treated. Some states require chorioptic mites to be reported.

In Iraq for example there were some studies about detection of ectoparasites from cattle and domesticated animals; Al-Azizz et al., (2009) reported that from a total of (75) animal (caw, sheep and goat) from a central Th-Qar governorate slaughter house and isolated a(104) ectoparasites mostly ticks from different regions of examined animals bodies (ear, legs, neck, under femur, and udder) were founded and a later diagnostic characters showed that these ticks were related to the genus Rhipicephalus sp. and Hyalomma sp**.**

The aims of this study was to investigate the type and number of ectoparasites from domestic animals and cattle in Basrah city and find the correlation between the infestation and clinical signs to done an epidemiological map for these animals in Basrah city/ southern Iraq.

MATRIALS AND METHODS:

Samples:

A total of (50) buffalo, (25) cow, (11)horses, (70) sheeps and (13) dogs were examined under this study. These animals were examined from Basrah veterinary hospital, veterinary clinical, domestic field animals, veterinary fields and house field.

Isolated Ectoparasites:

The ear, udder, brist, horns, legs, nick, tail, anus and genital pores, testes, per femoral region, perineum, per scapular, back and buttock were examined carefully for detection of any

ectoparasites. When founded any of them using small brash rinsed with 70% alcohol and swap the region then using a forceps to removed it and fixed in 10% formalin or 70% ethyl alcohol.

Taxonomical finding:

All samples which isolated were mounted on slides with glycerin or lactophenol and done the taxonomical finding by using a standard key for taxonomy with dissecting microscope. All the data were recorded with a table and the samples were photo by camera digital.

RESULTES

The total examined of animals under this study was (169) animals divided into:(50) buffalo (30) male and (20) female, (25) cow (15) male, 910) female, (11)horses (6)male and (5) female, (70) sheeps (40) male and (30) female and (13) dogs (5) male and (8) female.

The percentage infection as shown in table (1) varied between 20% in female sheep to 100% in male dogs. The places which get animals was domestic field in buffalo examined, cow from veterinary hospital and domestic field, while, horses from house field, sheep from veterinary hospital**,** domestic field and house field and dogs from college cages**,** house field and domestic field.

The affected organ in infected buffalo was pre femoral region, perineum and back, while, in cow the udder, pre-scapular, back and perineum region was the most affected organs. In horses the affected organ was pre femoral region, ear and perineum region and in sheep buttock, ear, pre femoral region was the affected organs and in dogs ear and back was the most affected region.

The clinical signs which founded for each examined animals was: generally when checked the buffalos we had seen the following symptoms: the animals suffering from weakness, loss of appetite, nasal discharge, lacrimation, enlargement of lymph node, capillary engorgement and pale mucous membrane. But associated symptoms were some animals show respiratory symptoms, some case with dyspepsia. The examined cow founded that the animals suffering from loss of appetite, weakness, enlargement of lymph node, and constipation. But the associated symptoms was grinding of teeth, enlarged abdomen and pain. In horses the examined animals suffering from loss of appetite, weakness, emaciation and some case with haematuria, but associated symptoms: pain and nervous signs. Sheeps showed diarrhea, weakness, loss of appetite, enlargement of pre femoral lymph node and associated symptoms : some case aborted, prolapse**.** Dogs weakness and emaciation, and associated symptoms in

some case with surgical operation. A statistical analysis by using (spss, version 17 and ANOAS test) showed that there was no significant differences under $P \leq 0.05$ between the type of animals and sex and each factors as shown in (table 2).

Table: (2) The statistical analysis by ANOAS test with no significant differences under $P \leq 0.05$.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.324	1	.324	.000	.984
Within Groups	6360.672	8	795.084		
Total	6360.996	9			

The isolated ectoparasites was ticks, mites and lice under this study and the characters and taxonomy as below:

Phylum: Arthropoda (=Euarthropoda) crustaceans, insects

Subphylum: Chelicerata horseshoe crabs

Class: Arachnida spiders, scorpions

Subclass: Acari mites, ticks

Superorder: Parasitiforms

Order: Ixodida

Family: Argasidae – Genus Ornithodoros

Family: Ixodidae

Genera: Dermacentor spp.; Ixodes spp.; Amblyomma spp.; Rhipicephalus spp.

From: National Center for Biotechnology Information, www.ncbi.nih.gov.

1- Rhipicephalus sp. with:

1. Unfestoons ticks.
2. Short pedipalps.
3. The respiratory pores was spiracle and long coma shape in male , short coma shape in female. As shown in (Figs. 1-9).

1- Hyalomma sp. with:

1- Eyes were founded.

2- Long pedipalps.

3- Festoons may be present or absent.

4- The respiratory pores coma shape in male and triangle shape in female.

5- Legs with banded. As shown in (Figs. 10-16).

2- Boophilus sp. with:

1- Short pedipalps

2- Eyes and festoons missed

3- The respiratory pores was oval or circular in male and as coma shape in female. As shown in (Figs. 17, 18).

1- Otobius megnini with:

1- long pedipalps

2- eyes and festoons were missed

3- the Capitulum Visible

4- Larval stages normally have 3 pairs of legs

5- Nymphs and adults have 4 pairs of legs

6- Head and thorax are fused (cephalothorax)

7- No wings

8- Mouthparts (palps, chelicerae and hypostome) are borne.

9- The respiratory pores was oval in male and circular in female. (Figs. 19, 20).

10-**Order Mallophaga (Chewing lice) with:**

1- Dorso-ventrally flattened and wingless

2- Head not pointed (somewhat broadened)

3- Mouthparts not stylet- like

4- Adapted for chewing

5- Thorax segmented

6- Legs not adapted for clinging. As shown in (Figs. 21, 22).

11-Hippobosca spp. of horses and dogs with:

1-winged initially

2- Flies to a new host where wings are lost

3- Piercing mouthparts

1- pedipalps may be located in grooves (hard to see). (Figs. 23, 24)

Fig (1): Rhipicephalus sp. (male) ventral view, isolated from sheep.

Fig (2): Rhipicephalus sp. (male) dorsal view, isolated from sheep.

Fig (3): Rhipicephalus sp. (male) ventral view, isolated from dog.

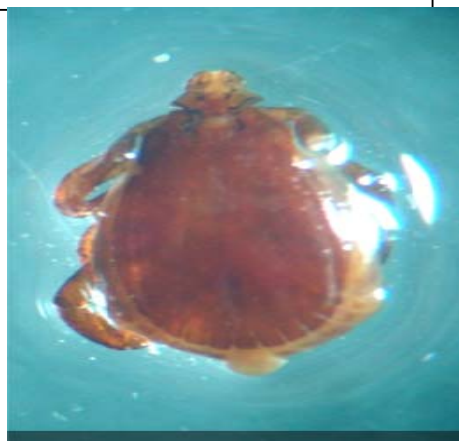

Fig (4): Rhipicephalus sp. (male) dorsal view, isolated from dog.

Fig (5): Rhipicephalus sp. (male) ventral view, isolated from cow.

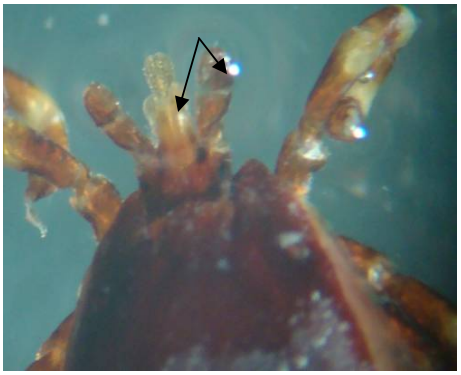

Fig (6): Rhipicephalus sp. (male) with pedipalps & hypostome in the anterior region, isolated from sheep.

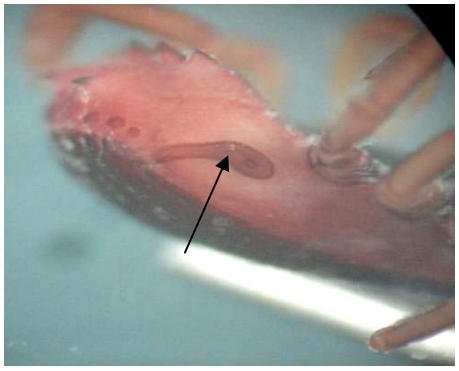

Fig (7): Rhipicephalus sp. (male) ventral view, isolated from cow focused the respiratory pores.

Fig (8): *Rhipicephalus sp.* (female) ventral view, isolated from buffalo. Focused the shape of respiratory pores (coma shape) .

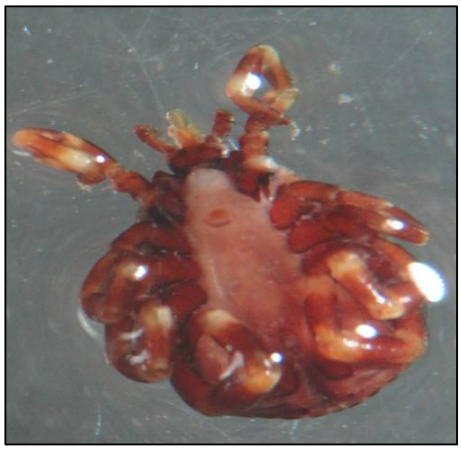

Fig (9): Rhipicephalus sp. (male) ventral view, isolated from buffalo.

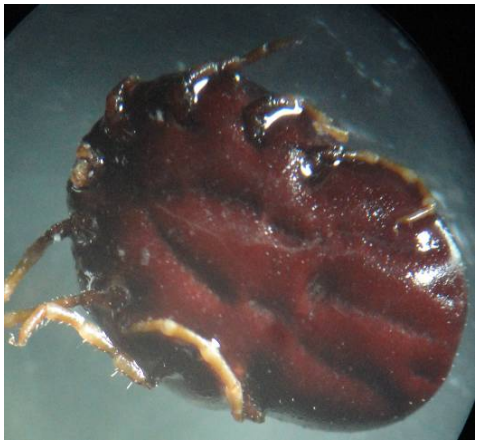

Fig (10): *Hyalomma sp.* (female) with dorsal view isolated from dog.

Fig (11): *Hyalomma sp.* (male) with dorsal view isolated from cow.

Fig (12): *Hyalomma sp.* (female) with ventral view isolated from cow.

Fig (13): Hyalomma sp. (male) with ventral view isolated from buffalo.

Fig (14): Hyalomma sp. (female) with dorsal view isolated from buffalo.

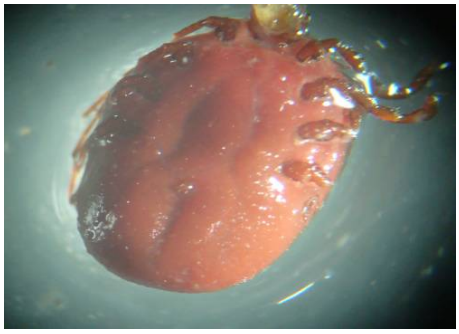

Fig (15): Hyalomma sp. (male) with ventral view isolated from dog. .

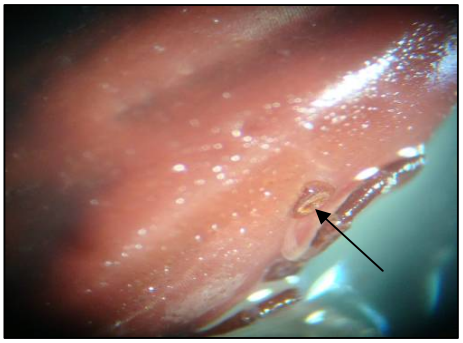

Fig (16): *Hyalomma sp.* (male) with dorsal view isolated from dog. Focused the respiratory pores.

Fig (17):*Boophilus sp.* ventral view, isolated from sheep anterior end

Fig (18):Boophilus sp. ventral view, isolated from sheep (spiracle like ball in shape)

Fig (19): Otobius megnini (female) ventral view, isolated from dog.

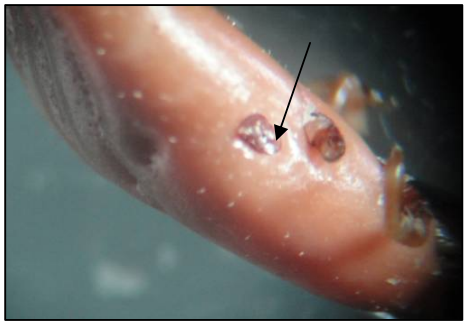

Fig (20): Otobius megnini (female) ventral view, isolated from dog. Focused the shape of respiratory pores.

Fig (21): *Haematopinus sp.* (male and female) dorsal view, isolated from cow.

Fig (22): Haematopinus sp. (male and female) ventral view, isolated from dogs.

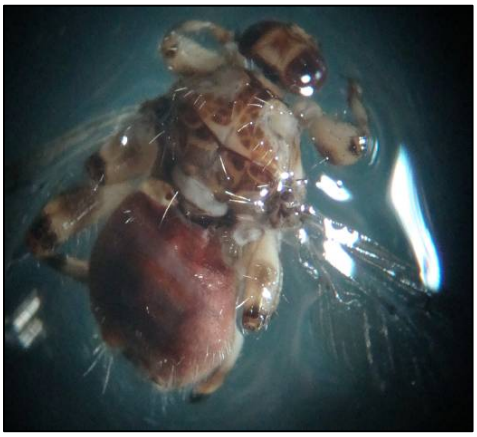

Fig (23): Hippobosca sp. (male) dorsal view, isolated from dog.

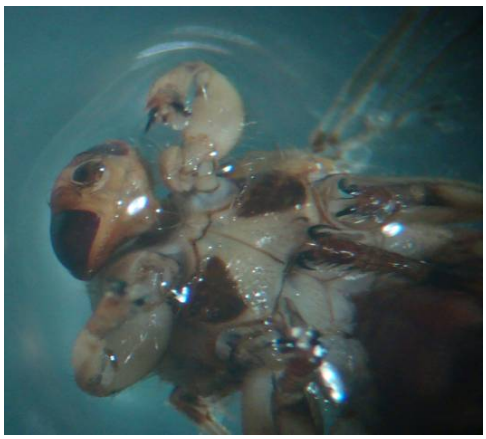

Fig (24): Hippobosca sp. (male) ventral view, isolated from dog.

A total number of isolated ectoparasites from the total infected animals was (89) divided into Rhipicephalus sp., Hyalomma sp., Haematopinus sp., Hippobosca sp., Boophilus sp. as shown in table (3) and the high number was Rhipicephalus sp. (27), while, the high number of infected animals with ectoparasites was dog (29). A statistical analysis by ANOVAS test showed a high significant differences between the types of ectoparasites which isolated from different animals under $P \leq 0.05$ (0.029) (table, 4), while, there was no significant differences between the type of animals which examined under this study and the type or number of infection under $P \leq 0.05$ (0.451) (table, 5).

Table (3): The type of ectoparasites isolated from each type of animals.

Animal	**Ticks**				**Lice**	**Myiasis**	**total**
	Rhipicephalus sp.	Hyalomma sp.	Boophilus sp.	Otobius sp.	Haematopinus sp.,	Hippobosca sp.	
Cow	6	7	4	3	6	--	26
Sheep	8	2	5	--	--	--	15
Buffalo	3	5	3	--	--	--	11
Dog	8	9	5	2	3	2	29
Horse	2	1	4	--	--	1	8
Total	27	24	21	5	9	3	89

Table (4): The statistical analysis by ANOAS test with a significant differences under $P \leq 0.05$.

ANOVA

VAR00001

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	51.210	2	25.605	4.080	.029
Within Groups	156.897	25	6.276		
Total	208.107	27			

Table (5): The statistical analysis by ANOAS test with no significant differences under $P \leq 0.05$.

ANOVA

VAR0001

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	125.800	4	31.450	.953	.451
Within Groups	792.200	24	33.008		
Total	918.000	28			

DISCUSSION

Tick and tick borne diseases should be reemphasized to public and health sectors since there are 6 genera and 23 species of Ixodidae ticks infesting livestock. It should be noted that ticks must be detached as soon as possible, since their detachment is curative. The detachment should be performed by a fine pincer holding the nearest part of tick body to the attachment site (i.e. mouth part of tick) and pull it out by several attempts followed by a sudden tight one (Al-Azizz et. al.,2009).

Ticks can be distinguished from mites by: 1-Size

• Ticks – large

• Mites - small

2- Mouthparts

• Ticks - well developed hypostome

• Mites - poorly developed hypostome with no teeth

The majority of ectoparasites collected along the Thai-Myanmar Border are those commonly found in Thailand. Eleven species of arthropod parasites were collected from 4 different host species representing carnivores (dogs and cats), a galliform bird (chickens) and an artioclacylid (cattle). No attempts were made to collect acarines (other than metastigmatid ticks) from skin, fur or feathers. Rhipicephalus sanguineus and Heterodoxus spiniger are predominantly found on domestic dogs, a finding supported by Sangvaranond (1990) in a survey of ectoparasites (lice and ticks) on domesticated dogs and cats from 19 provinces in Thailand and in a survey by Beaucournu et al (2001) in Lao PDR. of the two flea species, C. fells orients was found only on domestic dogs and Ctenocephalides fells was confined to cats; both were found in high Under this study there was a variation between the number of infected animals and type of ectoparasites and number of each type of ectoparasites. This is because of the region and season for study that effect for each one.

The prevalence similar to the findings by Sangvaranond (1990). By the other hand Sangvaranond (1990) surveyed fleas from dogs and cats from 15 Thai provinces finding a greater diversity of species on hosts: C. fells orients, C. fells and C. canis on dogs and both C. fells and C. fells orients on cats. Beaucournu et al (2001) found C. fells and C. fells orients on dogs in neighboring Lao PDR. Ctenocephalides cams is rarely found on domestic dogs in Thailand (Sangvaranond et al, 2000). Echidnophaga gallinacea (stick tight flea) was the only

ectoparasites found on more than one species of host. This flea is primarily a pest of domestic poultry, but may also parasitize cats, dogs, rabbits and humans (Wall and Shearer, 1997).
Sarataphan et al (1998) surveyed ticks in cattle and buffaloes in 25 provinces of Thailand and found the cattle tick, Rhipicephalis microplus, was the dominant tick with an extensive distribution. Likewise, a high percentage of cattle were parasitized by this tick species in our survey. Rhipicephalus sangunieus, like its namesake (brown dog tick) was found only on dogs.

A report for the first time the presence of Solenopotes capillatus (little blue cattle louse) in Thailand. This species is commonly found on cattle in Europe, Australia and in many areas of the eastern and southeastern United States (Matthysse, 1946; Price and Graham, 1997). Sangvaranond (1988) examined lice from domestic cattle and buffaloes located in 18 provinces in central, eastern, northeastern and southern Thailand and identified only three species of sucking lice: Haematopinus eurysternus, Haematopinus quadripertusus and Linognathus vituli, only one of which was found in this study (L. vituli, the long-nosed cattle louse).

Menopon gallinae (chicken shaft louse) was the dominant chewing louse on domestic chickens, followed by Liperus carponis (chicken wing louse). The flea, E. gallinacea and Goniodes dissimilis (chicken louse) were also collected from chickens. Sangvaranond (2003) reported that M. gallinae is a dominant species in many provinces of Thailand, followed by L. carponis. E. gallinacea is a common flea of chickens in northeastern Thailand. However, other species of ectoparasites on domesticated chickens were not found in this study compared to (Sangvaranond, 2003) differences that may likely be attributed to the relatively same sample size and limited geographical range of our study. The zoonotic potential for disease transmission and infestation (eg, dermatitis) by some ectoparasites species are of human public health interest (Marshall, 1981) . The cat flea is a known vector of Rickettsia fells (Parola et al, 2005) and is associated with cat scratch disease caused by Bartonella henselae. The common dog tick, Rhipicephalus sanguineus is reported to be a vector for Rickettsia conorii, an agent of spotted fever Ricktessioses in humans (Raoult et al., 1997). Other ticks in the area capable of harboring Ehrlichia spp, Anoplasma spp, and Rickettsia spp make it important that these arthropods be controlled (Parola et al., 2003).

CONCLUSION

1. 1-The clinical signs which founded under this study may be as a result for the infection with high amount of ectoparasites or by another infection.
2. 2-To prevent economic damage caused by ectoparasites infestation and transmission of pathogens to domestic animals and humans, veterinarians should advise animal owners to pay closer attention to animal health and welfare and be aware of zoonotic diseases associated with some ectoparasites. A better understanding of the diversity and distribution of ectoparasites on domestic animals in Thailand can help direct efforts to control these parasites.
3. 3-The important for studying ectoparasites because transmitted disease (viral, bacteria and parasites) and cause many signs and irritation which effects on animals and their health and survival.

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