

## IDENTIFICATION OF ECTOPARASITES FROM DOMESTIC PIGS OF RANGAMATI DISTRICT

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### Abstract

Ectoparasite infestations have direct and indirect negative impacts on its host. Ectoparasite fauna of pigs of Bangladesh is not well documented. Our objective was to detect the ectoparasite fauna among the pigs in Rangamati district of Bangladesh. We examined, 480 pigs from 104 households by close inspection and detected one species of louse (*e.g.*, *Haematopinus suis*), three species of ticks (*Amblyoma testudinarium*, *Haemaphysalis bispinosa*, and *Rhipicephalus sanguineus*), and one species of flea (*Ctenocephalides canis*). Pathology and economic losses due to the detected ectoparasites in Rangamati district need further investigation for the betterment of the local pig industry.

**Keywords:** Ectoparasites, Flea, Lice, Pig, Tick

### Introduction

Pig raising in Bangladesh is restricted to non-Muslim minority communities only and the total household pig population in Bangladesh was estimated as 3.26 million (BBS 2010). Almost all the pigs raised in Bangladesh are the Eurasian wild boar (*Sus scrofa*) except a few cross-bred pigs between native pigs and European pigs. Pigs play important roles as reservoirs of many zoonotic pathogens (Meng *et al.*, 2009). In Bangladesh, pigs are mostly reared in the semi-intensive system (Islam *et al.*, 2021), which probably favors the transmission of different diseases, including ectoparasites like lice, tick and mites. Ectoparasite infestation can cause discomfort due to itching and irritation in host animals which may result in irregular feeding and weight losses (Hiepe and Ribbeck, 1975) along with moderate to serious blood loss. Some ectoparasites of pigs like lice and ticks can transmit different protozoan, rickettsial and viral pathogens to the host (Scott, 1988; Liu and Bonnet, 2014). The geo-climatic condition of Bangladesh favors the survival, multiplication and transmission of different ectoparasites. Few previous studies have documented the parasites of pigs from different areas of Bangladesh (Islam *et al.*, 2006a; Islam *et al.*, 2006b). Unfortunately, pig farmers have very limited knowledge about ectoparasites affecting pigs and their harmful effects on their health and production performances. Furthermore, they are not familiar with the use of insecticides or acaricides, even, they have very limited access to veterinary services, which further

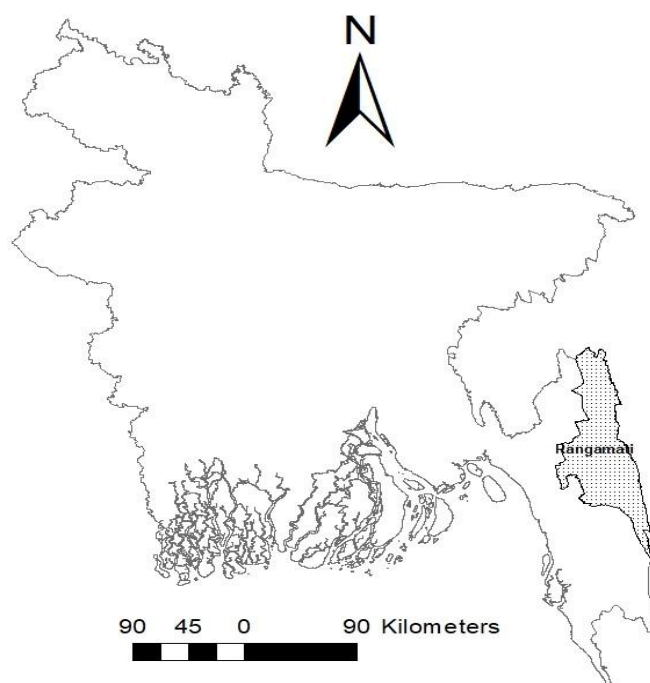
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worsen the situation (Islam *et al.*, 2021). Having knowledge about the parasitic fauna of the animal population of a geographic location is important to develop an effective control strategy. This study was conducted to detect the ectoparasite fauna among the pigs in Rangamati district of Bangladesh

### **Materials and Methods**

We examined 480 domestic pigs from 104 households in the Rangamati district during 2015 and 2016 (Fig. 1), located in the Southeastern hilly areas in Bangladesh. After restraining, we thoroughly examined pigs by parting the hair and close inspections and collected ticks, lice and fleas manually from different parts of the body. To collect mites, we made skin scrapings from the external ear and occasionally from other body parts where skin lesions were observed. We preserved ticks, lice, fleas and skin scrapings in 70% ethyl alcohol in labelled glass vials. Parasites were identified following the descriptions of Hoogstraal, (1956) and Soulsby, (1982) by preparing permanent slides following the procedures of Cable, (1957). Descriptive statistics was used to present the data which are in Table 1.



**Fig. 1.** Study site

### **Results and Discussion**

To determine the occurrence of ectoparasites in pigs in the hilly areas in Bangladesh, we examined 480 pigs from 104 households. Among 104 households surveyed, 89 had local pigs and 15 have cross-bred pigs. Eighty-one farms had 1-5 pigs and 23 households had at least six or more pigs. Ten households were raising pigs

following the scavenging system, 91 following semi-intensive system and only three following intensive system. Scavenging and semi-intensive systems are used to reduce the inputs and maximize the outputs. While examining, we detected one species of louse: *Haematopinus suis* (Fig. 2) three species of ticks: *Amblyoma testudinarium* (Fig. 3), *Haemaphysalis bispinosa* (Fig. 4), and *Rhipicephalus sanguineus* (Fig. 5), and one species of a flea: *Ctenocephalides canis* (Fig. 6). of the parasite detected, the louse *H. suis* was the highest in both local (90%) and cross-bred pigs (93%). However, ticks such as *A. testudinarium* (11%), *H. bispinosa* (5%), and *R. sanguineus* (3%), were present only in local pigs. On the other hand, the flea, *C. canis* was detected both in local (2%) and cross-bred pigs (7%). *H. suis* and *A. testudinarium* were present in both type of households having 1-5 pigs and at least 6 or more pigs. *H. suis* was present among all types of households, however, the highest infestation rate was detected in the intensive system (100%) (Table 1).

**Table 1.** Ectoparasite in different categories of the households

Parameters	Louse, Number (%)		Tick, Number (%)		Flea, Number (%)
	<i>Haematopinus suis</i>	<i>Amblyoma testudinarium</i>	<i>Haemaphysalis bispinosa</i>	<i>Rhipicephalus sanguineus</i>	<i>Ctenocephalides canis</i>
<b>Breed (Number)</b>					
Local (89)	80 (90)	10 (11)	4 (5)	3 (3)	2 (2)
Cross-bred (15)	14 (93)	0	0	0	1 (7)
<b>Number of pigs (Number)</b>					
1-5 (81)	73 (90)	7 (9)	4 (5)	3 (4)	3 (4)
6> (23)	21 (91)	3 (13)	0	0	0
<b>Rearing system (Number)</b>					
Scavenging (10)	7 (70)	4 (40)	1 (10)	0	0
Semi-intensive (91)	84 (92)	6 (7)	3 (3)	3 (3)	3 (3)
Intensive (3)	3 (100)	0	0	0	0

*H. suis* or hog louse, a common ectoparasite of pigs with global distribution (Damriyasa et al., 2004; Nsoso et al., 2006; Mannathoko and Modise, 2006), has been reported to infest pigs of any age group and any health status (Damriyasa et al., 2004). Higher infestation in pigs with *H. suis* is usually seen in the farms with higher stock density and in pigs having poor body condition, which also indicates, frequent access to forage outside (Damriyasa et al., 2004). A previous study has reported the prevalence of *H. suis* among domestic pigs of Bangladesh (Islam et al., 2006a). *H. suis* can mechanically transmit swine pox and African swine fever to pigs (Doster, 1995; Sanchez and Badiola, 1966).



**Fig. 2.** *H. suis* at 40X magnification



**Fig. 3.** *A. testudinarium* at 40X magnification



**Fig. 4.** *H. bispinosa* at 40X magnification



**Fig. 5.** *R. sanguineus* at 40X magnification



**Fig. 6.** *C. canis* at 40X magnification

*H. suis* can carry and spread *Mycoplasma suis*, which causes porcine infectious anemia among pigs (Prullage *et al.*, 1993). On the other hand, *A. testudinarium* has been reported to infest and feed on livestock and even humans from different countries (Nakamura-Uchiyama *et al.*, 2015; Yamauchi *et al.*, 2012). A previous study from Bangladesh has also documented the prevalence of *A. testudinarium* among both cattle and pigs (Islam *et al.*, 2006b). Forest areas in the highlands probably provide ideal habitat for *A. testudinarium*, as this tick is distributed more in the arboreal areas of different Asian countries (Hoogstraal *et al.*, 1972). *A. testudinarium* can transmit *Ehrlichia chaffeensis* and *Rickettsia tamurae* to humans (Cao *et al.*, 2000; Imaoka *et al.*, 2011).

*H. bispinosa* commonly infests ruminants of Bangladesh and is more prevalent in the central part of the country. A previous study from Bangladesh has reported *H. bispinosa* from goats, cattle and buffaloes (Islam *et al.*, 2006b). It is a three-host tick and vector of theileriosis, a protozoan disease of the ruminants. Probably this is the first report from Bangladesh of this parasite in pigs. *R. sanguineus* mainly infests dogs and is commonly known as brown dog tick, however, it has also been reported to infest cattle and goats (Islam *et al.*, 2006b) in Bangladesh. It is a three-host tick and acts as a vector of babesiosis, ehrlichiosis, and Q-fever. *C. canis* popularly known as dog flea, infest both wild and domestic canids around the globe (Durden *et al.*, 2005) and has been reported from dogs, cats, rabbits, rats, gray foxes, red foxes, woodchucks, and humans as well (Fox, 1940). This ectoparasite can act as the intermediate host for the tapeworm *Dipylidium caninum*, and the nematode, *Acanthocheilonema reconditum* (Durden and Hinkle, 2009). In Bangladesh, street dogs and free-roaming cats are very common and probably pigs acquired the flea from either from dog or cat.

## Conclusion

Taken together, pigs of Rangamati district were found to be infected with different species of ectoparasites. Pathogenicity, disease transmission and economic losses of the detected ectoparasites in its pig hosts in Rangamati district need further investigation to develop a control strategy for reducing the burden of these parasites.

## Conflicts of Interest

The authors declare no conflicts of interest regarding publication of this paper.

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