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A report on the Prevalence of *Eperythrozoon suis* in pigs of hilly region of Meghalaya

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ABSTRACT

The objective of the present study was to determine the prevalence of haemoparasites in the blood of pigs of hilly region of Meghalaya. A total of 112 nos. of blood samples of pigs from different age groups (<6 months (41 nos.), 6-12 months (39 nos.) and >12 months (32 nos.) were collected from different locations of Ri Bhoi district of Meghalaya. Blood smears were prepared and stained with Giemsa and Leishman stain. Examination of blood samples revealed 10.71% *Eperythrozoon suis* infections in pigs of hilly region of Meghalaya. Age wise, 17.07% and 12.82% infections were recorded in <6 months and 6-12 months old pigs, respectively. In pigs of >12 months, no infections were recorded.

1. Introduction

Animal husbandry is an important subsector of agriculture and pig rearing is one of the important livestock components of the tribal population of Meghalaya. Among the livestock population, pig (0.71 million) plays an important role in the livelihood of the tribal people of Meghalaya, accounting 1.69% (9.06 million) of the total livestock population (Livestock Census, 2019). Pig farming is a major source of income for the landless and marginal farmers which not only improve the livelihood of tribal farmers but also become a source of income at the time of financial crisis. Most of the people in this region are non-vegetarian and demand of pork meat is high in comparison to the supply. The consumption of pork is increasing due to per capita income, urbanization, changes in life style and food habit (Wright *et al.*, 2010). Hence, there is a huge opportunity to generate income through pig farming particularly for young and unemployed youth of this region.

Eperythrozoon suis is a rickettsial blood parasite which is transmitted by blood sucking arthropods (*Haematopinus suis*) and it either attaches to the surface of the red blood

cell or floats freely in the plasma (Kneier and Ristic, 1968). *Eperythrozoon suis* infections occur worldwide and are associated with weakness and anaemia in suckling and weaned pigs as well as reproductive disorders in sows. It attaches to the red blood cells, causes deformity and damage to the red blood cells of pigs (Zachary and Basgall, 1985). The size of the organism ranges from 0.8-1.0 μm (Smith, 1980). It was previously classified as a rickettsia on the basis of biological and morphological characteristics. However, now it is known to be a member of the order Mycoplasmatales based on molecular relatedness and phenotypic characteristics (Rikihisa *et al.*, 1997; Neimark *et al.*, 2001). Infections caused by them have a considerable impact on the economy of agricultural and livestock sectors (Wu *et al.*, 2006; Yuan *et al.*, 2009). The primary symptoms are closely related to haemolytic anaemia, which affects pigs of various ages and is sometimes fatal for young pigs (Henderson *et al.*, 1997; Hoelzle *et al.*, 2007). Since, no studies were done earlier to find out the prevalence of *Eperythrozoon suis* and other haemoparasites in the pigs of hilly region of Meghalaya. Therefore, the present study was designed to explore the prevalence of haemoparasites in pigs of hilly region of Meghalaya.

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2. Materials and Methods

Study area

The present study was conducted in the Ri Bhoi district of Meghalaya which occupies an area of 2378 km² and lies between 25°15' and 26°15' North latitudes and 91°45' and 92°15' East longitudes (https://en.wikipedia.org/wiki/Ri-Bhoi_district). It is bounded on the north by Kamrup district and on the East by Jaintia Hills and Karbi Anglong district of Assam and on the West by West Khasi Hills district. The district is characterized by rugged and irregular land surface. It includes a series of hill ranges which gradually slopped towards the north and finally joins the Brahmaputra valley.

Study method

A total of 112 nos. of blood samples of pigs suspected for haemoparasitic infections were collected from different locations of Ri Bhoi district during the year 2017-18. Blood samples (1-2ml) were collected in tubes containing EDTA (Ethylene diamine tetra acetic acid) as anticoagulant. The selected animals were categorized according to age viz. <6 months, 6-12 months and >12 months. A drop from each of the well mixed fresh blood sample was used to prepare blood smear and stained with Giemsa and Leishman stain (Soulsby, 1982). Stained blood smears were examined under microscope (100x) for presence of any haemoparasites. Failure to detect parasite in a smear after evaluating at least 500 oil immersion fields in 20-30 mins was declared as microscopically negative blood sample.

3. Results and Discussion

Microscopic examination of Giemsa stained blood smears revealed an overall prevalence of 10.71% *Eperythrozoon suis* infections in pigs of Ri Bhoi, Meghalaya (Table 1, Fig. 1). Age wise, 17.07% and 12.82% infections were recorded in <6 months and 6-12 months old pigs, respectively. In pigs of >12 months, no infections was recorded. Clinical symptoms of anorexia and fever were observed in most of the positive cases in pigs.

In the present study, 10.71% *E. suis* infection was recorded in pigs of Meghalaya which was in accordance with the findings of Patra *et al.* (2019). Earlier, 5% infection was reported from Japan (Watanabe *et al.*, 2012), 13.9% in Germany (Ritzmann *et al.*, 2009), 10.03% in wild boars in southwest Germany (Hoelzle *et al.*, 2010), 18.2% in Brazil (Guimaraes *et al.*, 2007), 7.80% in Nigeria (Gagman *et al.*, 2015) and 80% in Switzerland in sows (Guimaraes *et al.*, 2011). In the present study, highest infections was recorded in young pigs (<6 months) which was in agreement with the findings of Splitter, 1950. According to Splitter, 1950,

highest morbidity and mortality was recorded in the suckling pigs and in acute infections pigs may die in less than five days while in older animals death may be delayed or the animal may recover.

Clinical signs of anorexia and fever in pigs were observed in the present study which was in agreement with Kauffman, 1996 and Guimaraes *et al.* (2011). They also observed varying degrees of hemolytic anaemia, icterus (yellow belly), fever, anorexia and weakness in infected animals. Anaemia is the predominant clinical sign of *E. suis* infection in neonatal piglets. Young swine with no previous exposure are especially susceptible to primary infections which may be fatal if left untreated (Splitter, 1950). They are also capable of binding to the surface of erythrocytes and causes structural changes on these cells (Hoelzle, 2008). In piglets, it causes life threatening haemolytic anemia, general ill thrift and hypoglycemia which could lead to acute death (Stadler *et al.*, 2014). Infection in piglets immediately after birth prior to colostrum intake was also reported (Stadler *et al.*, 2019). Since, infection in pigs is mostly subclinical and sometime never reveals any symptoms at all. So, it is necessary to examine the blood samples of pigs regularly which are infested with *Haematopinus suis* or other arthropods for detection of any haemoparasites.

Figure 1. *Eperythrozoon suis* in blood smear of pig



Table 1. Prevalence of *Eperythrozoon suis* in pigs of Meghalaya

Age (months)	Sample examined	Sample positive
<6	41	7 (17.07%)
6-12	39	5 (12.82%)
>12	32	0
Total	112	12 (10.71%)

4. Conclusion

The present study revealed that there is prevalence of *E. suis* infections in young pigs of Meghalaya. Regular screening of blood samples should be done to prevent further spread of infection to the susceptible pigs.

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