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ARTICLE

Survey of Haemoparasites of Pigs in Major Pig Markets/Farms in Makurdi Metropolis

OGBAJE, C.I.[1]*, MBATSORUN, T.I.[1] and VICTOR, I.[2]

[1]Department of Veterinary Parasitology and Entomology, College of Veterinary Medicine, University of Agriculture P.M.B. 2373, Makurdi, [2]Department of Veterinary Medicine College of Veterinary Medicine University of Agriculture P.M.B. 2373, Makurdi, Benue State, Nigeria.*Corresponding author: e-mail address: igochechriso@yahoo.co.uk , Tel.: +234 803 529 5570

ABSTRACT

A survey of haemoparasites of pigs was conducted in major pig's farms (Logo 1 and North Bank) and abattoirs (Wurukum, Railway and High Level) with in Makurdi metropolis, the Benue state capital, Nigeria. Three hundred and fifty one (351) blood samples were collected from adult pigs and were analyzed in the parasitology laboratory of Veterinary Teaching Hospital of University of Agriculture, Makurdi, using haematocrit centrifuge and thin blood smear techniques. Results showed that 7.98% pigs were positive for two haemoparasites, *Eperythrozoon spp* and *Babesia spp*. The prevalent rates of the *Eperythrozoon spp* and the *Babesia spp* were 18(5.12%) and 6(1.70%) respectively. There was significant difference (P 0.05) in the PCV of the infected and uninfected pigs. There was no significance difference (P 0.05) between sexes in the prevalence rate of haemoparasites infections in the pigs. There is a need for further similar study using more sensitive diagnostic techniques.

Key words: Haemoparasites, *Eperythrozoon* spp, *Babesia* spp, Prevalence rate, Pig, PCV.

INTRODUCTION

Pigs have been domesticated as a source of food, leather and similar products since ancient times (Pam *et al*., 2013). The swine industry has witnessed an unprecedented increase in pig production and consumption over the past decade and this situation is likely to continue. This positive development means an increase in provision of animal protein for human consumption, employment generation, poverty reduction, contribution to the nation gross domestic product and general economic growth (Nwanta, *et al*., 2011; Pam *et al*., 2013). For many years, pigs have been identified as important reservoir hosts for African trypanosomes, especially *T. gambiense*, causative agent of sleeping sickness in West and Central Africa (Abenga and Lawal, 2005; Waiswa, 2005).

In Nigeria, pig population stands at 5.1 million (FAO, 2002), and the supply of pork for human consumption has expanded, compared to the supply of other meat (Nwanta *et al*., 2011).
Haemoparasites such as *Babesia* and *Eperythrozoon* and *Trypanosoma* species are usually found in pigs (Urquhart *et al*., 1988; Nwoha *et al*., 2013). Dipeolu, *et al*. (1982) reported

80% prevalence rate of Haemoparasites (*Babesia* and *Eperythrozoon* species) of local and exotic pigs in Ibadan. Trypanosomosis is also a parasitic disease that is a major constraint to pig production in Nigeria (Eyo *et al*., 2014). Natural infections of pigs with trypanosomes have been reported in many parts of Nigeria (Onah, 1991; Omeke and Onuora, 1992; Omotainse*, et al*., 2000; Eyo *et al*., 2014). African animal trypanosomosis is most important in cattle but can cause serious losses in pigs, camels, goats and sheep (Suliman, 1989; Eyo *et al*., 2014). The evolution of trypanosomosis varies widely according to the *Trypanosoma* species involved and animal breed affected. Trypanosomosis caused by *Trypanosoma simiae* in pigs usually assumes a highly acute form leading to rapid death, in an improved pig breed (FAO, 1994). Swine babesiosis has been reported in several parts of the world (Guo *et al*., 1997; Ademola and Onyiche, 2013). However, porcine babesiosis remains an overlooked and neglected disease (Zobba, 2011).

This study was designed to determine the prevalence of haemoparasites of pigs and their effect on the Packed Cell Volume of pigs infected in Makurdi metropolis.

Study Area

The study was conducted between February, 2013 to January, 2014 in Makurdi Metropolis. Makurdi, the capital of Benue state is located in north central Nigeria along the Benue river bank. The town lies on latitude 7° 44' 0" N and longitude (8°32'0"E). Makurdi has guinea Savannah type of vegetation. Makurdi has a population of about 4, 253, 641 people (NBS, 2010).

The town has a tropical sub-humid climate, with two distinct seasons, wet and dry seasons. The wet season is between April and October (7 months). However, there is, usually one or more heavy out-of-season's rains in January, February or March from East-west line squalls. The total annual rainfall ranges between 1,200 mm and 1,500 mm. Makurdi records average maximum and minimum daily temperatures of 35°C and 21°C during rainy season and 37°C and 16°C during dry season respectively (Omudu, *et al*., 2007).

Sample collection

Based on the prevalent rate of 36.84% reported by Pam *et al*., 2013, from neighbouring Plateau state, the number of samples collected was determined using the formula of Thrusfield (1997), $N= Z^2PQ/d^2$. Where N= no of samples to collect, Z= A constant degree of freedom, P= Percentage of published prevalence, Q= (1-P), D = Confidence interval designated as 0.05.

A total of three hundred and fifty one (351) pigs comprising of 101 males and 250 females were randomly sampled and examined. About 2 ml of blood was collected from the anterior vena cava of each of the pig using 5 ml syringe and 18 G needle. The blood sample was immediately transferred to sample bottle containing EDTA and transported in ice pack to Department of Veterinary Parasitology and Entomology laboratory of Veterinary Teaching Hospital annex, University of Agriculture, Makurdi where they were examined for haemoparasites using haematocrit centrifugation technique and thin blood smears as described by Woo, (1970).

Statistical Analysis

The results obtained were analyzed using descriptive statistics; the prevalence (P) of the infections were calculated using the formula P=d/n. where N= positive cases/ Total number of samples examined as described by Thrusfeild, (2005). The prevalence of the infections was expressed

in percentage. The packed cell volume (PCV) was analyzed using ANOVA and the means separated with Duncan's multiple range tests.

RESULTS

The overall prevalence rate of the haemoparasites of pigs in Makurdi Metropolis within the study period is shown on Table 1(7.98%). Out of 351 animals examined, 6(1.70%) were positive for *Babesia spp* while 18(5.12%) were positive for *Eperythrozoon spp*. The same table 1 shows the prevalence in relation to sex. Of the 351 pigs examined, 2(1.36%) males and 4(1.95%) females were positive of *Babesia spp* while 5(3.42%) males and 13(6.34%) females were infected with *Eperythrozoon spp* respectively. The table also shows the mean Packed Cell Volume in relation to the type of infections. Out of the 24(6.88%) positive samples, 6(21.43%) were single infection of *Babesia spp* with value of mean Packed Cell Volume of 36.5% while 18(64.29%) were single infection of *Eperythrozoon spp* with mean Packed Cell Volume value of 21.8%. Those with multiple infections of *Babesia spp* and *Eperythrozoon spp* were 4(14.29%) with mean Packed Cell Volume of 24.7%.

The mean Packed Cell Volume of both positive and negative pigs in relation to sex is shown in table 2. The mean Packed Cell Volume of the positive males 5(3.42%) and females 19(9.26%) were 22.6% and 17.3% respectively. However, the overall total numbers of positive samples were 24(6.83%).

TABLE I: OVERALL PREVALENCE OF HAEMOPARASITES OF PIGS IN RELATION TO SEX AND THE EFFECT ON PACKED CELL VOLUME (PCV) OF INFECTED PIGS IN MAKURDI METROPOLIS

Total No of Samples Examined	Type of Parasite present	Total No of positive male	Total No of positive female	Total No of positive Samples	Mean PCV (%)	Percentage positive Samples
351	*Babesia spp*	2(1.36)	4(1.95)	6	36.5	1.70
	Eperythrozoon spp	5(3.42)	13(6.34)	18	21.8	5.12
	Babesia spp + Eperythrozoon spp	1(0.28)	3(0.85)	4	24.7	16.66
	Total	**8(5.06)**	**20(9.14)**	**28**	**83**	**23.48**

Key: M=Total number of male pigs, F= Total number of female pigs,

TABLE II: : MEAN VALUES OF PACKED CELL VOLUME OF POSITIVE AND NEGATIVE SAMPLES IN RELATION TO SEX

Haemoparasite status	Male (M=146)			Female (F=205)			Total No	%
	No	%	PCV	No	%	PCV		
Positive	5	3.42	22.6	19	9.26	17.3	24	6.83
Negative	141	96.5	32.8	186	90.7	32.8	327	93.16
Total	146	41.5		205	58.4		351= N	

Key: M=Total number of male pigs, F= Total number of fe male pigs, N= Total number of samples and animals examined.

DISCUSSION

This study shows that *Eperythrozoon spp* and *Babesia spp* are the two major haemoparasites of pigs kept under intensive and semi-intensive system in Makurdi. The results obtained from the study revealed relatively low prevalence rate (7.98%) when compared with what was reported by other authors from different parts of the country. Dipeolu *et al.* (1982) reported prevalence rate of 80% in local pigs at Ibadan, Pam *et al.* (2013) reported prevalence rate of 37.42% in pigs at Langtang North LGA of Plateau state.

However, the relative low prevalence rate observed in this study may be as a result of good management system by the farmers and improved Veterinary services in Makurdi compared to those other places. The study also revealed that those with single *Eperythrozoon* infection (21.8%) have lower Packed Cell Volume (PCV) than those with single *Babesia* infection (36.5%) and the female pigs (17.3%) recorded lower Packed Cell Volume (PCV) than the male, probably because of the breeding stress in addition to the parasitic infection. It was also observed that more females 20(9.14) were infected than the males. This finding agrees with Ademola and Onyiche, (2013) and Nwoha *et al*., (2013). This is because more females were sampled than the males since many farmers keep more females animals for production than males and also female animals experience more physiological stress from things like breeding and lactation for sowsthan their male counterpart. These factors predispose females to stress induced diseases than the male animals. .

In conclusion, the study has established the existence of both *Eperythrozoon spp* and *Babesia spp* in pigs in Makurdi. It also showed that the most prevalent haemoparasites of pigs in Makurdi Metropolis is *Eperythrozoon spp* 18(5.12%), followed by *Babesia spp* 6(1.70%). Despite the high incidence of porcine trypanosomosis reported from different parts of this country (Agu and Bajeh, 1986; Onah, 1991; Omeke and Onuora, 1992; Omotainse*, et al*., 2000; Ademola and Onyiche, 2013; Eyo *et al*., 2014), there was no single case encountered in this study.

Effective haemoparasites control will play a major role in increasing the productivity of pigs farming in Makurdi. Though some of the pigs were looking physically or apparently healthy without any clinical manifestation, but were harbouring haemoparasites which may have affected their performance, thus decreasing their productivity.

We recommend that more work should be done in this area of study using more sensitive diagnostic techniques in combination with vector survey at different seasons and different places to generate more data on the prevalence of the swine haemoparasites in Benue State. Also there should be aggressive public enlightment on the importance of tick control to reduce the incidence of haemoparasites of domestic animals in Nigeria.

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