

## PARASITES AND ASSOCIATED CHANGES IN PACKED CELL VOLUME OF HORSES (*Equus caballus*) IN THE SEMI-ARID ZONE, NORTH-EASTERN NIGERIA

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### ABSTRACT

*A comparative study on the internal and external parasites and the associated changes in the packed cell volume of horses from a rural community (Bama) and an urban Centre (Maiduguri) in the semi-arid zone of North-eastern Nigeria was evaluated through routine clinical and laboratory examinations. Blood and external parasites were not encountered in any of the 18 horses. Four (22.2 %) of the horses were noticed to be shedding the ova of intestinal parasites in their faeces during the study period. Gastrodiscus aegyptiacus (16.7 %) and strongyle (5.6 %) eggs were recovered from the horses. Infection was more common in rural (50 %) than urban (14.3 %) horses. In both locations, infected horses had higher Packed Cell Volume (PCV) ( $31.3 \pm 5.3$ ) than uninfected ones ( $30.4 \pm 3.6$ ). Irrespective of infection status, horses at Maiduguri had higher PCV than their counterparts at Bama. The results suggest that horses in the semi-arid zone of North-eastern Nigeria had moderately low prevalence of infection with gastro-intestinal parasites and that those at the urban location were relatively better cared for than their rural counterparts.*

**Keywords:** Parasites, Horses, Packed cell volume, Semi-arid, Nigeria

### INTRODUCTION

Horses have been closely associated with man from ancient time. They are used as means of transportation for riders, for drawing carriages, delivery vans and pulling agricultural implements, for recreational purposes like polo and racing and for research and development purposes. They may also be slaughtered for meat. In North-eastern Nigeria, the Mounted Troop Police train them to withstand loud noises, bangs and flag waving and thus use them for crowd control, land surveillance and border patrol. Furthermore, in this region, especially the Muslim dominated towns, horses are used for ceremonial purposes such as durbar, religious and traditional festivals.

Horses suffer from a variety of parasitic infections especially helminthiasis that could result in anaemia, diarrhoea of sudden onset, hypoalbuminaemia, unthriftiness, reduced reproductive and work performance and in some cases death (Soulsby, 1982). The prevalence of these infections and the associated changes in the clinical and haematological parameters of the animals have been extensively studied and reported from many countries (Graber, 1970; Keenan, 1979; Lekeux *et al.*, 1991; Reilly, 1993). However, apart from the reports of Okon (1976) and Nwosu *et al.* (1990) on the prevalence of equine helminths at Ibadan and Maiduguri respectively, information is scarce on the parasitic infections and the associated changes in the clinical and haematological parameters of horses in Nigeria.

The Mounted Troop of the Borno State

Command, Nigeria Police Force maintains some horses in both Maiduguri and Bama districts. This paper reports on the parasitic infections and associated changes in the packed cell volume of the horses maintained in the semi-arid zone of North-eastern Nigeria.

### MATERIALS AND METHODS

**Horses:** The horses used in this study were owned and maintained by the Mounted Troop, Nigeria Police Force, Borno State Command. The horses were stabled at two locations, Maiduguri and Bama, in the semi-arid zone of North-eastern Nigeria. Maiduguri is the capital and largest urban centre in Borno State while Bama is a rural community located about 65 kilometres east of Maiduguri. The horses were usually grazed in open fields with occasional supplementation with crop residues during the few months of the rainy season but were permanently stabled and fed with hand-cut grass and crop residues during the dry season.

**Sampling:** The horses were routinely examined individually for both internal and external parasites and signs of their presence (Hassan and Hassan, 2003). All external parasites seen were collected and preserved in labelled bottles containing 10 % formalin. Skin scrapings were collected from mange-like lesions into clean Petri dishes. Blood samples were collected from the jugular vein, using a hypodermic syringe fitted with an 18-gauge needle, into sample bottles with ethylene diamine tetra-acetic acid (EDTA) as anti-coagulant.

**Table 1: Prevalence of intestinal parasites among horses examined in North-eastern Nigeria**

	Location of horses		All locations
	Bama	Maiduguri	
Number examined	4	14	18
Number (%) infected	2 (50)	2 (14.3)	4 (22.2)
<i>G. aegyptiacus</i> ova	1 (25)	2 (14.3)	3 (16.7)
Strongyle ova	1 (25)	0	1 (5.6)

**Table 2: Packed cell volume (Mean  $\pm$  S. D.) of infected and uninfected horses examined in North-eastern Nigeria**

Location of horses	Infected	Uninfected	All animals
Bama	29 $\pm$ 1.4	28.5 $\pm$ 0.7	28.8 $\pm$ 1.0
Maiduguri	33.5 $\pm$ 7.8	30.7 $\pm$ 3.8	31.1 $\pm$ 4.3
All locations	31.3 $\pm$ 5.3	30.4 $\pm$ 3.6	30.6 $\pm$ 3.9

Faecal samples were taken directly from the rectum into appropriately labelled sample bottles.

**Examination of Samples:** Skin scrapings were placed in a test tube containing 10 % potassium hydroxide solution and gradually brought to boil (100°C) for 3 minutes in a water bath to remove excess tissue material. The test tube was allowed to cool and the content centrifuged for 2 minutes at 2,000 revolutions per minute. The supernatant solution was decanted and the sediment placed on a slide and examined microscopically (MAFF, 1977). Wet Blood mounts and Giemsa stained thin and thick blood smears were routinely prepared and examined microscopically for parasites (Schalm *et al.*, 1975). Packed cell volume was determined using the microhaematocrit method (Schalm *et al.*, 1975). Faecal samples were examined using the direct smear; sedimentation method and flotation technique employing saturated sodium chloride solution as the floating medium (MAFF, 1977). All the parasites recovered were identified using standard parasitological criteria (Soulsby, 1982).

## RESULTS

Blood and external parasites were not encountered in the horses examined during the study. However, out of the 18 horses examined, 4 (22.2 %) were shedding the ova of intestinal parasites in their faeces (Table 1). Two helminth egg types, *Gastrodiscus aegyptiacus* (16.7 %) and strongyle species (5.6 %) were recovered during the study.

Horses located at Bama were more commonly infected (50 %) than those at Maiduguri (14.3 %). The animals located at Maiduguri had higher PCV (31.1  $\pm$  4.3) than those at Bama (30.6  $\pm$  3.9) irrespective of their infection status (Table 2). In general, infected horses (Bama and Maiduguri) had relatively higher PCV than their uninfected counterparts.

## DISCUSSION

The results of this study showed that horses owned by the Borno State Police Command were generally not parasitised by blood and ecto-parasites during the

period of the study. This observation may be due to an efficient management programme including the availability of adequate veterinary attention and regular and effective grooming of the animals. However, although the horses were stable animals, they usually grazed freely during the rainy season, thus accounting for the *Gastrodiscus* and strongyle egg types recovered during the study.

In earlier studies, Ajayi and Ajayi (1983) recorded respective prevalence of 26.2 % and 52.5 % for *Gastrodiscus* and strongyle species from 61 horses examined at the Jos Plateau while Okon, (1976) reported that 91.3 % of 138 horses grazed on natural pastures in Ibadan had strongyle eggs in their faeces. The results of the present study were generally lower probably due to climatic differences between the study areas. Jos Plateau and Ibadan are generally more humid and thus more favourable for the development and survival of preparasitic stages of equine helminths in the environment compared to the semi-arid nature of the present study area. Similarly, the results of the present study were lower than the 2.04 % and 23.81 % respectively reported by Nwosu *et al.* (1990) for *Gastrodiscus* and strongyle eggs in an earlier study in the same study area probably because the present animals were better cared for when compared to the market horses examined in the earlier study.

The horses located at Maiduguri were generally less commonly parasitised than those at Bama probably due to the fact that the former animals were better cared for than the later. Bama is a rural area and also only a Divisional Headquarters whereas Maiduguri is the State capital and Headquarters of the Borno State Police Command. It is therefore possible that animals located at the Command Headquarters would receive better care and veterinary attention than those located elsewhere in the State. Nwosu *et al.* (1990) in an earlier study reported that horses in urban centres were significantly less commonly infected with parasites (24.49 %) than their counterparts in rural communities (73.47 %).

The above observations may also account for the generally higher PCV levels observed in Maiduguri horses compared to their counterparts in Bama. Ironically, the infected horses maintained

higher PCV levels than their uninfected counterparts at both Maiduguri and Bama. The reason for this observation is not immediately apparent although Soulsby (1982) noted that as a result of acquired immunity to re-infection, some adult horses carry heavy worm burdens without manifesting any clinical or pathogenic effects.

In conclusion, therefore, the results of this study have shown that horses at Bama and Maiduguri in the semi-arid zone of North-eastern Nigeria harbour similar parasite species but at relatively low prevalence. Also, horses located at the urban centre were relatively less infected than those in the rural community. Furthermore, the infected horses had comparatively higher PCV levels than their uninfected counterparts.

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