African Research Review

An International Multi-Disciplinary Journal, Ethiopia
Vol. 4 (3a) July, 2010
ISSN 1994-9057 (Print) ISSN 2070-0083 (Online)

Survey of Gastro-Intestinal Parasites of Chimpanzees and Drill Monkeys in Drill Ranch, Calabar, Cross River State-Nigeria *(Pp.334-340)*

Akpan, P. A. **-** Department of Biological Sciences, Cross River State Universtiy of Technology Calabar-Nigeria

Abraham, J. T. **-** Department of Biological Sciences, Cross River State Universtiy of Technology Calabar-Nigeria
E-mail: pastorabra@yahoo.com

Ekwetiong, P. O. **-** Department of Biological Sciences, Cross River State Universtiy of Technology Calabar-Nigeria

Abstract
An investigation of the prevalence of gastrointestinal parasites in chimpanzees and drill monkeys in Drill ranch Calabar, cross river state, Nigeria was carried out. A total of 300 faecal specimens were collected from chimpanzees and drill monkeys respectively, processed and examined microscopically. Parasites, their developmental stages and prevalence, recovered from drill monkeys were; Strongyloides sp, larvae, 66 (22%), Prosther sp, ova, 48 (16%), Entamoeba sp, larval, 120 (40%), Necator sp, eggs, 33 (11%) and Hymenolepis sp, segment, 30(11%). From chimpazees, Strongyloides sp, larvae, 33(11%), Entamoeba sp, larval, 198(66%), Dipylidium sp, segments, 27(9%) and Hymenolepis sp, segment, 33 (11%) were recovered. Though no sign or symptom of infection was observed, the

investigation confirmed the presence of parasites in these primates and call for regular checkup and application of control measures to avoid endemicity.

Introduction

Gastrointestinal parasites are known in human and non human primates. Annelids, helminths, and protozoa have parasite representatives in man, apes and monkeys. However, regular health services such as hygienic and deworming measures have had to low prevalence of helminths infection in non-human primates (Gomez *et al;* 1996, Verwaijet *et al;* 2003). Protozoa parasite such *Entamoeba histolytica, Gardia sp, Cryptosporidium sp* and *Balantidium coli* are frequently reported in non-human primate, apes and monkeys. (Levecke, 2007).

Gastrointestinal parasites in non-human primates are regarded as major causes of gastro-enterittis, watery diarrhea, haemorrhage, dysentery and extra-intestinal infection such as liver absecess and even death. E*ntamoeba histolytica* causes intestinal and extra-intestinal amebiasis, Balantidium is intestinal parasitic protozoa in man while Gardiasis caused by *Gardia sp* and Crytosporoshosis caused by *Cryptosporidium sp* are known as causes for failure of young animals to thrive.

Considering the health significance of *Entamoeba histolytica, Garodia sp* and *Cryptosporidium sp* in man, their zootic involvement in non human primate and man should be highly considered. The findings in this study will enable us to make recommendation to the management of the drill ranch to safe guard the health and well being of these animals and their attendance.

Materials and Methods

The Drill Ranch in Calabar, Cross River State, Nigeria, was founded by a Non-Governmental Organization (NGO), Pandrillus, to promote the survival of a much endangered African Primate, the Drill Monkeys. Pandrillus' main activity is the rehabilitation and breeding of these primates.

Pandrillus also provides a home for orphaned chimpanzees. From the Drill Ranch, offspring of these primates are sent to other conservatory establishments in Nigeria.

Sampling Techniques

Fresh faecal specimens collected from five (5) chimpanzees and eight (8) monkeys into sterile screw-capped labeled bottles each containing 20ml normal saline, and were taken to the laboratory immediately for processing and examination.

Direct Wet Mounts or Simple Technique
A small portion of faeces, about the size of a pea, was mixed with two drops of physiological saline (0.85%) on a clean microscope slide, cover slipped and first examine unstained. Following this an iodine stain was prepared and examined.

Double Wet Smear Technique
A drop of saturate saline was placed in the centre of one half of a microscope slide, and a drop of iodine stain was placed on the other half.

A small faecal sample was then spread evenly through the drops of iodine stain and saturated saline. It was then carefully cover-slipped and viewed under 100 magnification (10x) and 400 magnification (40x). Hunter (6).

Centrifugal Floatation Technique
A small portion (4 grams) of the faeces was placed in a 250ml beaker. The beaker was one fourth ($^1/_4$) filed with tap water and mixed thoroughly. The suspension was strained through a wire gauge into 50ml centrifuge tube and centrifuged at 1,500 revolutions per minute (rpm) for one minute. The supernatant was carefully removed. With a capillary tube, a portion of the top layer of sediment as well as from bottom layer were removed to a 3 x 2 inch microscope slide, covered with a 22mm square cover slip, sealed and examined.

Results
One hundred and ninety eight (198) of the 300 specimen collected from chimpanzees were positive with parasites; while 120 specimen of the 300 specimen collected from drill monkeys were positive with parasites.

Parasites recovered were at various developmental stages. Parasites and their developmental stages recovered from chimpanzees include; *Strongyloides sp* (larvae), *Entamoeba sp*, (larval), *Dipylidium sp*, (segments) and *Hymenolepis sp*, (segment). The number of positive specimens and their percentage prevalence were 33 (11%), 198 (66%), 27 (9%) and 33 (11%), respectively.

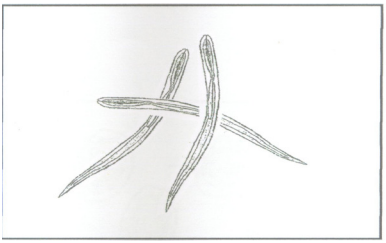
From drill monkeys, *Strongyloides sp* (larvae), *Prosther sp*, (ova), Entamoeba *sp*, (larvae), *Necator sp,* (eggs) and *Hymenolepis sp*, (segments) were recovered. The number of positive specimen and prevalence of each of the parasites were 66(22 %), 48 (16%), 120 (40%), 33 (11%) and 30 (10%) respectively.

Strongyloides sp, *Entamoeba sp*, and *Hymenolepis sp*, occurred in both chimpanzees and drill monkeys with different prevalence (table 1). Figure 1, 2 and 3 illustrates prevalence of the parasites recovered from drill monkeys and chimpanzees and those parasites common to the two primates.

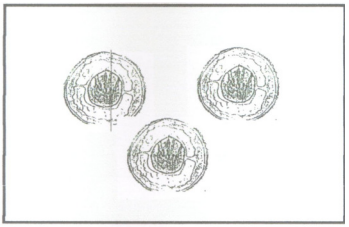
Table 1: Prevalence (%) of Parasite recovered from Drill Monkeys and Chimpanzees

Organism Examined	Number Examined	Total Number (%) Positive	Parasite Recovered	Developmental Stage of Parasite Recovered	Prevalence (%) of Parasites Recovered
Chimpanzees	300	199 (66%)	*Strongyloide sp*	Larvae	33 (11%)
			Eutamoeba sp	Larvae	198 (66%)
			Dipylidium sp	Segment	27 (9%)
			Hymenolepis sp	Segment	33 (11%)
Drill Monkeys	300	120 (40%)	*Strongyloide sp*	Larvae	66 (22%)
			Prosther sp	Ova	48 (16%)
			Eutamoweba sp	Larvae	120 (40%)
			Necator sp	Eggs	33 (11%)s
			Hymenolepis sp	Segments	

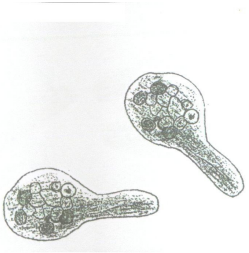
Strongyloides sp from Drill Monkey



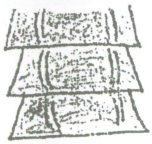
Hymenolepis Ovum from Drill monkeys



Egg of hook worm (Necator americanum) from Drill Monkey



Entamoeba histolytica from Chimpanzees and Drill Monkeys



Hymenolepis Segments from Chimpanzees and drill Monkeys

Gravid segment of Dipylidium Caninum from Chimpanzee

Discussion

Parasites recovered from chimpanzees and dill monkeys from Drill Ranch, Calabar, Cross River State, Nigeria have been previously described elsewhere (Levecke *et al*, 2007, Gomez, *et al;* 1996 and Munene *et al,* 1998) with different prevalence. The total number of positive samples observed in chimpanzees (1986(66%) and drill monkeys (120(40%) call for more application of control measures. For instance, *Entamoeba histolytica* with highest percentage prevalence in chimpanzees (198(66%) and drill monkeys (120(40%) may cause amebiasis if not immediately controlled. Severe

outbreak and mortality of organisms' infected *Entamoeba histolytica* are frequently reported (Loomis *et al* 1983 and Levecke *et al;* 2007)

The presence of segments of *Dipylindium sp* in chimpanzees and *Hymenolepis sp* in chimpanzees and drill monkeys is indicative of these organisms serving as defunctive host in addition to the presence of mature worms in their gastrointestinal tract. Cestodes the group to which these organisms belong are known to cause emaciation, weakness and in severe worm burden death (Chandler and Reed, 1961).

It was difficult to advance reasons for no manifestation of signs and symptoms of infection in the organisms examined. However, whatever could be suggested it may not be different from regular check up and treatment a condition which the officials of the Ranch have been advised to step up to completely eliminate the parasites or bring down their prevalence for better thriving of the primates.

References

Cable, R. M. (1977): An *illustrated laboratory manual of Parasitology, 5th Ed.* Burgress publishing company ninnesota 239-246.

Chandler A. C. and Reed C. P (1961): *Introduction to Parasitology, 10th Ed.* John Willey and Sons, Inc. London 631-640.

Gomez, M. S., M. Montoliu, I. Feliu, C., Monleon, A. Fermandez, J. Ensenat, C., 1996. Intestinal Parasitism, Protozoa and Helminths, in Primates at the Barcelona Zoo. *J. Med. Primatol 25,* 419-423.

Hubbert, W. T., Mucculoch, W. E. and Schnurenberger, P. R. (1975): *Diseases transmitted from animals to man.* Charles C. Thomas. Springfield Illionois U.S.A. 356 pp.

Levecke, B. Dorny, P. Geurden, I. Vercammen, F. and Vercruysse J. (2007): Gastrointestinal Protozoa in Non Human Primates of four zoological gardens in Belgium. *Veterinary Parasitology, 148*:236-246.

Loomis, M. R., Britt, J. O., A. P., Holshub, H. J., Howard, E. B., 1983. *Hepatic and Gastric Amebiasis in Black And White Colours Monkeys.* J. Am. Vet Med. Assoc. 183, 1188-1191.

Munene, E., Otsyulu, M., Mbaabu, D., Mutahi, W. T., Muriuki, S. M. K., (1998): Helminth and protozoan gastric-intestinal (GIT) parasites in captive and wild-trapped African non human primates. *Veterinary Parasitology. 78*, 1995-2201.

Sloss, M. N. (1978): Veterinary Chemical Parasitology, 4th Ed. 10Wa State.

Verweij, J. J., Vermeer, J., Brienon, E. A. T. Blotkamp, C. Lacijen decker, D., Van Lieshout, L. Polderman, A. M., 2003a. *Entamoeba histolytica* infections in captive primates, *Parasitol. Res. 90*, 100-103.