

**Sudan University of Science and Technology
College of Graduate Studies**

**Prevalence of intestinal parasites in Algitanah locality
((White Nile State**

(السودانية للعلوم والتكنولوجيا) كلية الدراسات العليا كلية العلوم الطبية

**A dissertation Submitted in Partial Fulfillment of the Requirement of
M.Sc. Degree in Medical Parasitology**

**By:
Makkawi Mohammed Modawi**

:Supervisor

Dr. Zahir Abbas Hilmi

2009

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال الله تعالى

فُلْ لَوْ كَانَ إِلْبَحْرُ مَدَادًا لِكَلِمَاتِ رَبِّي لَنَفَدَ
الْبَحْرُ قَبْلَ أَنْ تَنْفَدَ كَلِمَاتُ رَبِّي وَلَوْ جِئْنَا
بِمِثْلِهِ مَدَادًا

صدق الله العظيم

سورة الكهف آية 109

Dedication

----- To

.My dear parents

----- To

.My wife and sons whom I love so much

----- To

.My brothers and sisters

----- To

.My teachers, friends and colleagues

Acknowledgement

Thank you my God, for giving me the ability to bring this research to light.

My great thanks to Dr. Zahir Abbas Hilmi, my supervisor for his support. I am really grateful to him.

I extend my appreciation to the staff of the department of parasitology in Ribat university.

I also extend my gratitude's to the students with their help in the research specimens were obtained.

My gratitude is extended to our colleagues who helped me in collecting the samples.

I thank everybody who contributed to the success of this work, my relatives and my friends especially Galal Abbas who gave me more than I need.

My thanks are also due to Mr. Gassim who patiently dealt with me and helped a lot in analyzing the data.

Abstract

This study was conducted on school children in Algitanah locality, White Nile State. In this study, 288 faecal samples were collected from students (158 males and 130 females). The stool samples were processed by using formal ether concentration and direct wet preparation techniques.

The results revealed that 198 (68.8%) of school children were infected with intestinal parasites. six different parasites have been detected in this study and their prevalence was as follows: *Entamoeba coli* (44%), *Entamoeba histolytica* (28.7%), *Giardia lamblia* (18.2%), *Hymenolepis nana* (8.5%), *Enterobius vermicularis* (0.3%) and *Schistosoma mansoni* (0.3%). This study revealed that infection with intestinal protozoa (62.5%) was higher than infection with intestinal helminthes (6.3%).

The results showed that the prevalence rates of intestinal parasites among males and females were almost similar (69.6% and 67.6% respectively). ($P > 0.05$). Also, the results showed that there is no variation in infection rates among different age groups of school children. ($P > 0.05$).

The study demonstrated that the prevalence rate of the single infection was higher than the prevalence rate of the mixed infection (39.6% and 29.1% respectively).

The study proved that there was an obvious difference of the detection rates of the two techniques used, formal ether concentration and direct wet mount (68.8% and 54.4% respectively). ($P < 0.05$).

Contents

Topic	Page
Dedication	II
Acknowledgment	III
Abstract in English	IV
Abstract in Arabic	V
Table of contents	VI
List of tables	IX
List of figures	X
List of appendices	XI
Chapter one : Introduction & literature review	
1.1. General introduction	1
1.2. Intestinal protozoa	3
1.2.1. Amoebae	4
1.2.1.1. <i>Entamoeba histolytica</i>	4
1.2.2. Intestinal flagellates	6
1.2.2.1. <i>Giardia lamblia</i>	6
1.2.3 .Intestinal ciliates	7
1.2.3.1 <i>Balantidium coli</i>	7
1.2.4. Cryptosporidiosis	8
1.3. Intestinal helminthes	8
1.3.1Classes of helminthes	8
1.3.2 Intestinal nematodes	9
1.3.2.1 <i>Trichuris trichiura</i>	9
1.3.2.2 <i>Strongyloides stercoralis</i>	10
1.3.2.3 <i>Ascaris lumbricoides</i>	10
1.3.2.4. Hook worms	10
1.3.2.5. <i>Enterobius vermicularis</i>	11
1.3.3. Intestinal cestodes	11
1.3.3.1. <i>Taenia saginata</i> and <i>Taenia solium</i>	11
1.3.3.2. <i>Hymenolepis nana</i>	12
1.3.4. Intestinal trematodes	12
1.3.4.1 <i>Schistosoma mansoni</i>	12
1.3.4.2 <i>Fasciola hepatica</i>	13
1.4. Geographical distribution of intestinal parasites	13
1.4.1. Africa	13

1.4.1.1 Cameroon	13
1.4.1.2 Ghana	13
1.4.1.3. Somalia	13
1.4.1.4 Niger	14
1.4.1.5 Ethiopia	14
1.4.1.6. Zaire	15
1.4.1.7. Nigeria	15
1.4.1.8. Egypt	16
1.4.1.9. Sudan	16
1.5. Life cycle of intestinal protozoa	19
1.6. Life cycle of intestinal helminths	20
1.7. Epidemiology	20
1.8. Pathogenicity	21
1.8.1. Pathogenicity of intestinal protozoa	21
1.8.1.1. Intestinal amebiasis	21
1.8.1.2. Intestinal giardiasis	22
1.8.1.3. Pathogenicity of <i>Cryptosporidium parvum</i>	22
1.8.1.4. Pathogenicity of <i>Balantidium coli</i>	23
1.8.2. Pathology of trematodes	23
1.8.2.1. Pathogenicity of <i>Schistosoma mansoni</i>	23
1.8.3. Pathogenicity of nematodes	26
1.8.3.1 <i>Ascaris lumbricoides</i>	26
1.8.3.2. <i>Enterobius vermicularis</i>	26
1.8.3.3. Pathogenicity of <i>Strongyloides stercoralis</i>	27
1.8.3.4. Pathogenicity of hook worms	27
1.8.4. Pathogenicity of cestodes	27
1.8.4.1. <i>Taenia</i> species	28
1.8.4.2. <i>Hymenolepis nana</i>	28
1.9. Diagnosis	28
1.9.1. Microscopic examination	28
1.9.1.1. Saline wet mount	28
1.9.1.2 Iodine wet amount	28
1.9.1.3 Concentration techniques	28
1.9.1.4 Sedimentation technique	29
1.9.1.5 Floatation techniques	29
Objectives	30
Chapter two: Materials & methods	
2.1 Study design	31
2.2 Study area	31
2.3 Study duration	31
2.4 Study population	31
2.5 Sample collection	31
2.6. Techniques used	32

2.6.1 Direct wet preparation	32
2.6.2 Formal concentration technique	32
Chapter three: Results	33
Chapter four: Discussion	43
Conclusions	47
Recommendations	48
References	49
Appendices	56
Appendix 1	56
Appendix 2	57

List of tables

	Title	Pag e
1	The overall prevalence of intestinal parasitess among school children in Algitanah locality.	35
2	Comparison of the prevalence of intestinal parasites using direct wet preparation and formal-ether concentration technique.	36
3	The prevalence of intestinal parasites in the descending order of frequency.	37
4	The prevalence of mixed and single infection of intestinal parasites.	38
5	The prevalence of intestinal parasites in Algitanah locality according to gender.	39
6	The prevalence of intestinal parasite according to age groups.	40
7	The prevalence of intestinal parasites among villages under study in Algitanah locality	41
8	The prevalence of each parasite among villages under study in Algitanah locality.	42

List of figures

Figures	Title	Page
1	The overall prevalence rate of intestinal parasites among school children in Algitanah locality.	35
2	Comparison of the prevalence of intestinal parasites in direct wet preparation and formal-ether concentration technique.	36
3	The prevalence of intestinal parasites in the descending order of frequency.	37
4	The prevalence of mixed and single infection of intestinal parasites.	38
5	The prevalence of intestinal parasites in Algitanah locality according to gender	39
6	The prevalence of intestinal parasites according to age groups.	40
7	The prevalence of intestinal parasites among villages under study in Algitanah locality.	41

List of appendices

	Title	Page
Appendix 1	Requirements of direct wet preparation	57
Appendix 2	Requirements of concentration technique	58