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Gastrointestinal Parasites of the Gezira Goats: Central Sudan

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Abstract: In the present study 287 goats form the Gezira (Central State of the Sudan) at 3 different villages resembling two different types of location were examined parasitologically by faecal sedimentation and flotation techniques for the presence of gastrointestinal parasites. Generally 43.6% of the examined animals inflected a parasitical infection, this infection is significantly higher ($P<0.05$) within the goats from core (inner irrigated villages) 50.5% (32% from total) in comparison to those of road located villages 13.1% (11% from total). 8 parasite genera were reported from this experiment among them *Dicrocoelum* spp (5.6%) for the first time in the Sudanese goats, *Trichostrongyle* type of egg 18%. *Eimmeria ocyst* 17%, *Fasciola gigantica* 12.5%, *Monezia* spp 2.1%, *Schistosoma bovis* 2%, *Trichuris spp* 1.7% and *Paramphistomum* spp 0.7%. For the general parasitical infection there was no significant difference observed between wet and dry seasons, kids, youngs and olds, male and female goats. But some of these parasites had shown variation according to season or age factor if they were analyzed as individuals.

Key words: *Dicrocoelum, Eimmeria, Fasciola gigantica, Monezia, Paramphistomum, Schistosoma bovis, Trichostrogyle, Trichuris* epidemiology, Gezira-Sudan

Introduction

The incidence of parasitical disease varies greatly between areas depending on many factors such as level of agriculture, pasture management, barn management, grazing habits, micro and macro-climate of the environment, immunological and nutritional status of the host, present of intermediate hosts, vectors and the numbers of infected larvae and eggs in the environment present a meshwork of interacting variables which greatly confound even an understanding of epidemiological dynamics (Levine, 1963; Armour, 1980).

The Gezira Agricultural Scheme was estbalished in 1925 and used to be the greatest economical project for the Sudan (Sudan vertebral column) before the oild and petrolium exportation at 1997. This scheme was associated by elevation of water born disease such as malaria and schistosomiasis due to the presence of sustainable suitable media for the intermediate hosts (Humpherys, 1932; Stephenson, 1947; Fenwick *et al.*, 1981 and Babiker *et al.*, 1985).

Although concentrated efforts and comprehensive research was carried out in the Gezira for the control of human diseases (El Nagar, 1985 and Roper *et al.*, 1998) livestock situation is quite neglected. However, people in the Gezira rare the goats (which is the predominant animal there) only for milk production rarely slaughtering their goats only the kids in social festivals and celebrations. This study was carried out in the Northern part of the Gezira irrigated scheme, Central part of the Sudan, in order to highlight the important parasitical diseases could be excreted by goats and recontaminate the pasture and the factors that may affect the transmission of these parasitical disease.

Materials and Methods

Study area: This study was carried out at the northern part of the Gezira State, Hassahisa Province 130 kilometer South from Khartoum (Capital of Sudan). Fig. 1.

A total number of 287 goats were examined in study during the period Dec. 2001, Jan. and Feb. 2002 (dry and cold season) and Jun., July. and Aug. 2002 (wet and hot season). The study was carried out in three villages lie on the western bank of the Blue Nile. Two of them (Eldibaiba and Takala) have a central location in the irrigated area (core location which characterize by a large numbers of canals and stagnant water was found throughout the year, while Abushar has a peripheral location in the main road of Khartoum Wadmadani adjacent to the Blue Bile and characterize by less number of canals. The grazing system for all types of villages is semi closed the goats go to the pasture early in the morning and come back in the evening to be kept indoors through the night for milk production. In the first location they grace near canals whereas in the peripheral location they grace only beside the main river Blue Nile.

General Examination: Each goat was subjected for the following examination before sampling. Clinical abnormalities, physiological examination, health status,

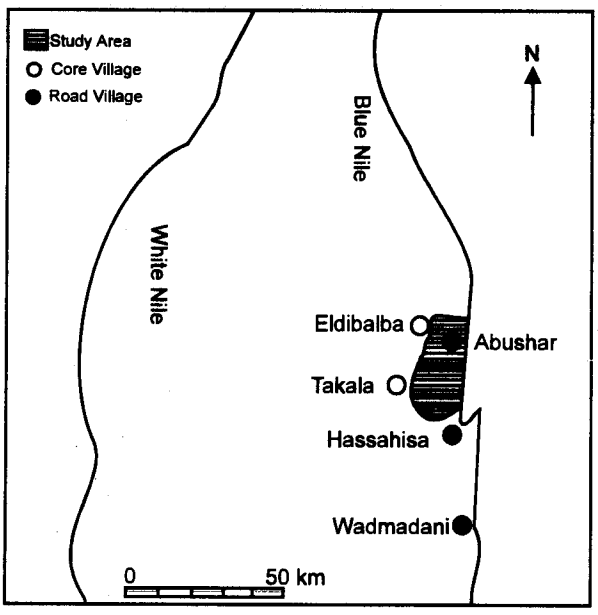

Fig. 1: Location Map of the Study Area

breed of the animal and sex. The determination of the age was done according to the dental information of King (1978) and divided into three group kids (1 >year), youngs (1-3 years) and olds (3<years).

Samples Collection and Examinatoin: Faecal samples were collected from the rectum of each individual goats in long plastic sacs and immediately placed in bottles of 10% formal saline 5:1 v/w, labeled and brought to the laboratory, followed by using faecal sedimentation and faecal floatation techniques for the same sample according to the methods mentioned in soulsbey (1982).

Data Analysis: The software computer program Epi 6 Microsoft Copy-right was used for the analysis. Chi square test was applied for significant difference at $P<0.05$ for all of the above mentioned epidemiological measurement parameters.

Results and Discussion

All the examined goats were Nubian local breed, there were 22 male from all examined goats 12 out of them were kids, 8 youngs for fertilization and 2 olds. From Table 1 the overall prevalence was 43.6%. This parasitical infection as generally was more significant in core areas ($P<0.05$) than outer orad villages, but we did'nt observed this significance in the other two factors (season and age) illustrated in the table above. *Trichostrogyle* type of egg was the more predominant parasitical infection (18%) among all the examined groups followed by coccidia (17%), *Fasciola gigantica* (12.5%), *Dicrocoelium* sp (5.6%). *Monezia* sp (2.1%), *Schistosoma bovis* (2%), *Trichuris* sp (1.7%) and *Paramphistomum* sp (0.7%) (Fig. 2).

Table 1: The distribution of parasitical infection for all examined animal during the study period

	Locations		Season		Age			Total
	Core	Road	winter	summer	Kids	Youngs	Olds	
Examined goats	184	103	146	141	52	81	154	287
Parasitically infected	93	32	58	67	18	38	69	125
Prevalence	50.4%	31.1%	39.7%	47.5%	34.6%	46.9%	44.8%	63.6%

Table 2: The prevalence of parasites according to the different animal locations

Parasite	Core	Roads
Eimeria ocyst	20%	13.2%
Dicrocoelium sp	7.6%	1.9%
Fasciola gigantica	14.6%	8.1%
Monezia sp	3.9%	1.1%
Paramiphistomum sp	1.1%	0%
Schistosoma bovis	3.2%	0%
Trichostrongyle egg	20%	14.6%
Trichuris sp	1.6%	1.9%

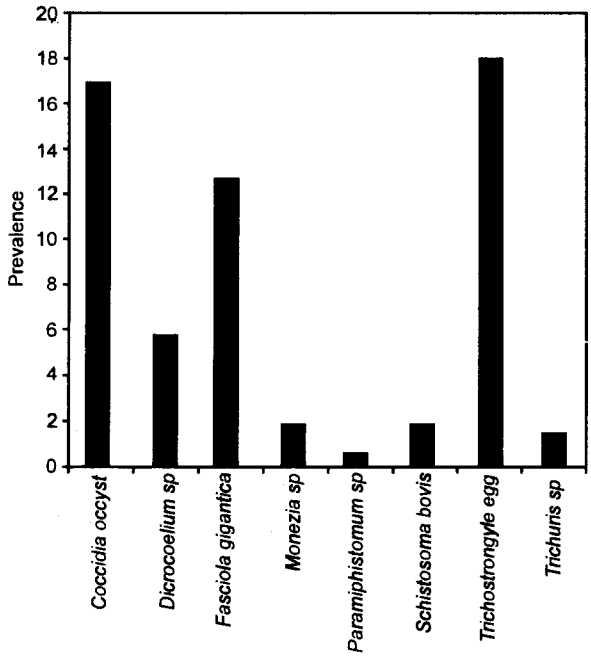

Fig. 2: Prevalence of parastic infection during the study period

Table 2: The prevalence of parasites according to the different animal location

Parasite	Winter	Summer
Eimeria ocyst	20%	13.2%
Dicrocoelium sp	7.6%	1.9%
Fasciola gigantica	14.6%	8.1%
Monezia sp	3.9%	1.1%
Paramiphistomum sp	1.1%	0%
Schistosoma bovis	3.2%	0%
Trichostrongyle egg	20%	14.6%
Trichuris sp	1.6%	1.9%

Table 3: The prevalence of parasites according to the different seasons

Parasite	Winter	Summer
Eimeria ocyst	8.9%	25.5%
Dicrocoelium sp	6.8%	4.3%
Fasciola gigantica	15%	9.9%
Monezia sp	2.1%	2.1%
Paramiphistomum sp	0%	1.1%
Schistosoma bovis	3.4%	0.7%
Trichostrongyle egg	11.6%	25.5%
Trichuris sp	2.1%	1.4%

From Table 2, Most of the parasitical diseases were affected significantly to their location ($P<0.05$) except for the *Trichuris* sp. From Table (3) most of the prevalent diseases in summer was from *Trichostrongly*

Table 4: Breakdown of different parasitical infection according to the age of the goats

Parasite	Kids %(age)	Youngs %(age)	Old % (age)	Total Prevalence % (age)
Eimeria ocyst	15	21	15.6	17
Dicrocoelium sp	13	4.6	3.2	5.6
Fasciola gigantica	1.9	12.3	16.2	12.5
Monezia sp	1.9	2.5	2	2.1
Paramiphistomum sp	0	1.7	0.6	0.7
Schistosoma bovis	1.9	2.5	1.9	2
Trichostrongyle egg	13	18.5	20	18
Trichuris sp	0	1.2	2.6	1.7

and *Eimeria* spp, whereas *Fasciola, Schistosoma* and *Dicrocoeliun* are highly prevalent in winter. Table 4 revealed that *Fasciola* was significant affected by the age of the goat ($P<0.05$) the disease is more prevalent in the old goats while the vise versa observed in *Dicrocoelium*.

Out of all infected goats (125) 2 revealed mix infection with four different parasites, 10 had shown triple infection, 32 double infection and 81 single parasitical infection.

From the above results we can observe that, the parasitical infection was go high in inner irrigated area (core) comparing to the peripheral areas, that is may be due to the presence of numerous numbers of canals containing stagnmnant water through out the year hence the intermediatte host for indirect live cycle parasite mainly snails) were highly dominant. The previous studies had shown that snails were strongly distributed throughout these canals (Fenwick, *et al.*, 1981and William and Hunter, 1968. The goats of the peripheral areas located at the main road Khartoum and Wadmedani rarely contact with the canals they grace a round the river bank and fed commonly in their houses.

The *Trichostongyle* and coccidia are commonly associated with rainy season, this results agree with information of Blood and Henderson 1983; Connor, *et al.*, 1990. The trematodal infectiosn except *Paramphistomum* were more prevalent in winter. The factor of the age was weakly affect the parasitical prevalence except for *Fasciola* in case of old goats that may be due to their exposure to contaminated water and pasture and parasite also need a time of migration inside the host and to give the evidence of infection through the faecal deposited egg, whereas the vise versa occurs in *Dicrocoelium* so possible to suggest the disease may be associated with animal immune system after several exposure to the infection.

These results can be considered additional new information about goats parasitical diseases situation in

the Sudan as generally and specially for this neglected area (the northern part of the Gezira). A comprehensive studies for investigation the different parasitical species within each of the above-mentioned parasite general individually and strategic method of treatment and eradication are highly recommended.

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