The Sudan J. Vet. Res. (2001) **17:** 35-40
With 3 tables in the text. *www.sudanjvr.net*

Some Aspects of the Epidemiology of Bovine Fasciolosis in Northern Gazira and Khartoum State.

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ملخص البحث

تمت دراسة وبائية مرض الدودة الكبدية فى الجزء الشمالى من مشروع الجزيرة وجنوب ولاية الخرطوم ، أظهرت النتائج أن متوسط أعداد قوقع ليمينا فى المواقع الاربعة التى اجريت فيها الدراسة مختلفا ، وأن اعداد القواقع تزداد فى الصيف وموسم الامطار وتقل فى الشتاء. وأن معدل عدوى القواقع بطفيلي الدودة الكبدية يتراوح بين 17% و29% كما أن اعلى نسبة لاصابة القواقع سجلت فى مايو واقلها فى ديسمبر كما أن 30% من الابقار التى تم فحصها فى المنطقة مصابة بذلك الطفيلي(*Fasciola gigantica*).

Summary

A study on the epidemiology of fasciolosis was conducted in northern part of Gazira scheme and the south of Khartoum State. The results revealed that the average population of *lymnaea* snails was different in the four sites examined. The number of the snails increased during summer and rainy season and decreased during winter. The snail infection rate with *Fasciola* varied between 17% and 29%. The highest rate was recorded during May and the lowest during December. Thirty percent of the cattle examined in these areas were found to be infected with *Fasciola gigantica.*

Introduction

Fasciolosis is one of the most important helminth infections of cattle and sheep in the Sudan, causing significant morbidity with great economic losses (Karib, 1962; Haroun and Hussein, 1975).

Epidemiological studies on fasciolosis in some African countries showed a very high rate of transmission during the hot dry season (Coyle, 1956; Hammond, 1965; Silangwa, 1972; Mzembe and Chaudhryl, 1979; Schillhorn Van Veen, 1979). In Sudan, Abdel Razig (1984) reported that the infection rate of snails follow a seasonal pattern, with a peak in summer months. Mohammed Ali (1983) showed that the environmental conditions in hot summer were suitable for higher rates of transmission of fascioliosis in the White Nile areas.

Little information is available on the epidemiology of fasciolosis in Northern part of Gazira Scheme, which is irrigated by the Blue Nile, as investigations have mainly been concentrated on areas irrigated by the

White Nile. Animal health reports do indicate widespread of *Fasciola* infection in the bovine species from the region (Anon, 1998).

The aim of this study was to collect more information on the epidemiology of fasciolosis in Northern Gazira and Khartoum State. This could be done by studying the seasonal fluctuation of the intermidate host population, defining the transmission pattern and identifying other snail species of veterinary and medical importance that exists in the study area.

Materials and Methods

The study area:

This survey was conducted on the northern part of Gazira Scheme and the south of Khartoum State (Soba and El Masseed area, longitude 32. 3^0E – 33^0E and latitude 15.15° N – 15.35° N).

The majority of the people living in this area are farmers and many of them raise cattle and goats in their irrigated farms adopting the traditional way of management. The animals are watered exclusively and directly from the canals and they usually graze on the vegetation around the canal banks and canals aquatic vegetation.

Snail sampling:

Snail sampling was carried out at four sites namely Soba, El Bagair, El Hafeer and Kab El Gidad Schemes. The snails were collected from the small canals and ponds during both wet and dry seasons at monthly intervals. Snails collection from each site was done on the same day.

A standard scoop (30cm × 30cm) was used for snail collection. Ten scoopings were collected from each cattle drinking site. The number of lymnaea snails in each scoop was recorded and notes on any other sails were taken.

Snails collected from individual sites were put separately in plastic buckets and transferred to the laboratory for identification.

Determination of snail infection rate:

A total of 1701 *lymnaea* snails were dissected using stereomicroscope to detect any larval stages of digenetic trematodes, the larvae recorded were counted.

Fecal examination:

Three hundred and fifteen faecal samples were collected from dairy cows in the study area and examined for the presence of *Fasciola spp*. eggs.

Results

Snail population studies:

The results showed that the abundance of lymnaea snails was apparently different in the four sites examined. These snails were present almost throughout the seasons of the year at El Bagair and El Hafeer canals. The number of snails scooped increased during the summer and rainy seasons (April–Augest) from 40 to 482 and decreased to a minimum of 30–14 during the cold months, when the canals were cleaned from the weeds and water was at its highest level. However, snails appeared during the rainy season at Soba and were seldom present at Kab El Gidad (Table1). Five genera of snails were identified during the survey, ie *Lymnaea, Bulinus, Melanoides, Cleopatra* and *Biomphalaria.*

The lowest number of snails scooped (296) was recorded from Kab El Gidad and the highest (1196) from El Bagair. The dominant snails genera collected from El Bagair, Soba and Kab El Gidad were *lymnaea, Melanoides* and *Cleopatera,* respectively (Table 2).

The snail infection rate:

One thousand seven hundreds and one *Lymnaea natalensis* snails were examined. The infection rate varied between 17% and 29% the highest infection rate was recorded during May and the lowest during December (Table 3). Laboratory examination revealed that snails harboured different developmental stages, ie, sporocysts with immature rediae, rediae with immture cerceriae and rediae that shed *Fasciola* cercariae. *Lymnaea natalensis* was also found harbouring, larval stages of another trematode; a biforked-tailed cercariae of schistosomes.

Faecal examination revealed that 105 (30%) of the samples examined contained *Fasciola gigantica* eggs.

Discussion

The results of this epidemiological investigation showed that *Lymnaea natalensis*, the intermediate host of *Fasciola gigantica,* is a very common snail in the north of Gazira and the south of Khartoum State. This corresponds well with the high prevalence of fasciolosis in these areas. The faecal sample survey showed that the infection rate was 30%. Similar high rates of infections with fasciolosis have been reported from other parts of the Sudan with different ecosystems, for instance Mohammed Ali (1983) reported 40% infection rate in the

Table 1: seasonal variation in *Lymnaea* snail population collected from sampling sites at Khartoum State and Northern Gazira (March 1997-Feb. 1998).

The Location	March 97	April 97	May 97	June 97	July 97	Aug. 97	Sept. 97	Oct. 97	Nov. 97	Dec. 97	Jan. 98	Feb. 98	Total
Soba	6	10	12	30	96	52	0	0	32	8	6	0	**252**
El Bagair	8	40	60	98	486	156	0	16	80	42	30	0	**1016**
El Hafear	14	34	60	134	154	12	0	0	34	14	0	0	**456**
Kab El Gidad	16	20	30	6	0	0	0	0	34	0	0	0	**106**
	44	104	162	268	736	220	0	16	180	64	36	0	**1830**
	578				**972**				**280**				

Table 2: Total number of *lymnaea* snails compared to other snail genera collected from sampling sites at Khartoum State and Northern Gazira.

Locality	*Lymnaea*	**Cleopatera**	*Melanoides*	*Bulinus*	*Biomphalaria*	*Total number of snails*	*Percentage %*
Soba	252	20	270	22	27	291	42%
El Bagair	1016	98	34	20	28	1196	84.9%
El Hafear	456	70	24	16	12	578	78.8%
Kab ElGidad	106	124	23	17	26	296	35.8%
	1830	**312**	**351**	**75**	**93**	**2661**	

White Nile area while Abdel Razig (1984) reported 37.4% in Western Darfur.

The snail population density and the snail infection rates in this part of Gazira irrigated lands appeared to follow a seasonal pattern when more intense transmission tends to occur during the hot months. This is more likely consequent upon seasonality of the irrigation.

There was a great intensity of final host animals around the drinking sites during the dry seasons and due to the absence of natural pastures, animals were forced to graze *Fasciola* encysted *cercariae* contaminated plants around the canal banks.

Table 3: Seasonal variations in *Lymnaea* snails infection rate.

Time of the investigation	Number of snails examined	Infected snails (%)
March – May	458	29%
June – August	972	25%
November- December	280	17%
Total examined	**1710**	**23.7%**

Animals resident in the investigated sites depend on the canals exclusively for drinking. Consequently, this situation increased the rate of infection in both snails and animals; these findings agree with those obtained from similar epidemiological studies that were carried out in many African countries where high rate of transmission during the hot dry seasons was observed. Such were encountered in Zambia (Silangwa, 1972), Tanganykia (Hammond, 1965), Uganda (Coyle, 1956) and Malawi (Mzembe and Chaudhryl, 1975). All these studies have indicated that animals are at greater risk of infection when they graze river margins and flooded marshy areas during the dry season.

Acknowledgements

The authors wish to thank the Director General, Animal Resources Research Corporation for permission to publish this article.

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