

FASCIOLIASIS AMONG LIVE AND SLAUGHTERED ANIMALS IN NINE CENTERS OF DAKAHLIA GOVERNORATE

By

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Abstract

Fascioliasis is an important zoonotic disease. Infected animals are the main source for human fascioliasis. Consequently, this work clarifies the status of animal fascioliasis in Dakahlia centers based on parasitological examination of cows, buffaloes, sheep and goats. The overall rates of infection were 12.31% 9.73%, 17.84% and 5.40% respectively. The mean eggs per gram stool were 22, 13.6, 148.3 and 8.6 for cows, buffaloes, sheep and goats. The mean numbers of *Fasciola* worms/liver/animal were 69.1 , 62.7 and 208.1 for cows, buffaloes and sheep respectively. The highly infected sheep was in Manzalla (23.07%), the lowest was in Mataria (6.35%). The highly infected cows was in Manzalla (20.9%), the lowest was in Sherbeen (9.43%). The highly infected buffaloes was in Manzalla (19.29%), the lowest was in Mit Ghamr (4.93%). The relatively highly infected goats was in Manzalla (12.5%) and the lowest was zero in Mit Ghamr. So, sheep are the main reservoir host for environmental

pollution and human fascioliasis. On the other hand, the overall partial condemnation of liver was 3.81 % (1997), 3.24% (1998), 2.66% (1999) and 2.64% (2000). Regarding the type of animal, it was 6.38 % in cows, 1.74% in buffaloes and 1.0% in sheep. It seems that sheep are most susceptible to fascioliasis treatment, followed by buffaloes and lastly cows. The epidemiological role of these farm animals as source for fascioliasis infection to animals and man was discussed.

Introduction

Generally speaking, fascioliasis tops all zoonotic parasites worldwide (WHO, 1995). Animal fascioliasis is known in Egypt since a long time (Gohar, 1934,35; Nagaty, 1942, Haiba and Selim, 1960; Selim et al., 1970; Kendall, 1974 and Soliman, 1998). Haridy et al. (1999) stated that fascioliasis as a zoonotic parasite is increasing in Egypt. Human fascioliasis was known as sporadic cases. In the last two decades, human infection have been increased and identified from several Egyptian governorates. Dakahlia is one of the highly infected governorates (Ali et al., 1974; El Shazly et al., 1991, 1995, 2001 and Motawea et al., 2001). No doubt, infected animals are the main source for human infection. Besides, the great economic losses of the livestock.

Consequently, the present objective was to study fascioliasis in live and slaughtered animals mainly cows, buffaloes, sheep and goats in the nine centers of Dakahlia governorate as a representative area of the Nile Delta.

Materials and Methods

Generally speaking, Dakahlia governorate with its nine centers (Fig. 1): Bilqas, Sherbeen, Dekarnis, Manzalla, Mataria, Talkha, Mansoura, Aga and Mit Ghamr (Fig. 1), is the largest agricultural district in the Nile Delta, if not in the Nile valley. The largest number of farm animals are present there. That is why it was selected to carry out the field and laboratory studies on animal fascioliasis.

Stool samples were collected fresh from each of cows, buffaloes, sheep, and goats, Each sample was kept in separate labeled plastic box, covered and transported immediately to the research laboratory to be examined for eggs of *Fasciola* species. The method adopted was essentially the same as given by Dennis et al. (1954), for qualitative analysis. Simply, a small sufficient amount of faeces was homogenized with 10% formaline. The mixture was then strained through a funnel with a sterile gauze into an analysis tube. It was allowed to stand for two hours at room temperature for sedimentation. The sediment was, then examined for *Fasciola* eggs.

For determination of the egg output in each animal type, randomly infected ten animals of each of cows, buffaloes, sheep and goats were examined quantitatively for eggs/gm (epg) according to the method of Cheriuyot and Jordan (1990). Simply, an amount of 3 gm of stool from each animal were mixed with 50 ml of 10% formalin. The final sediment was placed in Petri-dish (7 cm diameter) and examined under a stereo-microscope with 30 x magnification.

Also, a total of ten animals of each of slaughtered sheep, buffaloes and cows were randomly selected for studying the intensity of natural infection with hepatic fascioliasis. The liver and the corresponding bile ducts of each animal were macroscopically examined carefully for *Fasciola* worms. The recovered ones were individually identified and counted per animal.

The annual records of the partial condemnation of infected livers in Dakahlia governmental abattoirs (1997 to 2000) was kindly provided by The Directorate of Veterinary Medicine, Dakahlia governorate.

Results

The results are shown in tables (1,2,3,4 & 5) and figures (1,2 3 & 4).

Table 1: Prevalence of fascioliasis in farm animals in the nine centers of Dakahlia governorate as indicated by stool examination (coprologic examination).

Center	Cows			Buffaloes			Sheep			Goats		
	Total	+ve	%	Total	+ve	%	Total	+ve	%	Total	+ve	%
Bitgas	80	10	12.5	44	5	11.36	37	7	18.91	19	1	5.26
Sherbeen	53	5	9.43	63	7	11.11	49	6	12.24	21	1	4.76
Dekarnis	36	4	11.1	33	3	9.09	41	5	12.19	25	2	8
Manzalla	43	9	20.9	57	11	19.29	65	15	23.07	16	2	12.5
Mataria	40	4	10	23	2	8.69	16	1	6.35	18	1	5.55
Talkha	54	8	14.81	75	8	10.66	44	10	22.72	24	1	4.16
Aga	71	7	9.85	92	7	7.60	47	9	19.14	21	1	4.76
Mansoura	47	6	12.76	56	4	7.14	36	8	22.22	19	1	5.26
Mit Ghamr	39	4	10.25	81	4	4.93	74	12	16.21	22	Zero	Zero
Total	463	57	12.31	524	51	9.73	409	73	17.84	185	10	5.40

Table 2 : Eggs per gram stool (epg) in ten animals of each of cows, buffaloes, sheep and goats

animals	Range	Eggs per gram stool of each animal										Mean
		1	2	3	4	5	6	7	8	9	10	
Cows	4-36	4	10	12	19	20	21	30	32	36	36	22
Buffaloes	3-21	3	3	11	11	15	16	18	19	19	21	13.6
Sheep	14-237	14	82	104	126	137	149	184	220	230	237	148.3
Goats	2-18	3	4	5	5	5	6	12	13	16	18	8.6

Table 3: Numbers of *Fasciola* worms /liver as demonstrated in the official abattoir in Mansoura City.

Type of Animals	Range	Numbers of <i>Fasciola</i> worms (mature & immature) per liver/animal										Mean
		1	2	3	4	5	6	7	8	9	10	
Cows	12-123	12	36	45	73	66	85	111	92	123	48	69.1
Buffaloes	6-104	6	43	52	70	55	93	78	83	104	43	62.7
Sheep	10-371	10	32	89	203	87	250	350	369	371	320	208.1

Table 4: The annual numbers of partial condemnation of fascioliasis infected livers in slaughtered animals from 1997-2000 in Dakahlia governmental abattoirs.

Animal Year	Cattle	Liver condemn.		Buffaloes	Liver condemn.		Sheep	Liver condemn.	
		No.	%		No	%		No.	%
1997	20665	1750	8.46	52430	1055	2.01	4939	174	3.52
1998	22479	1446	6.43	45529	899	1.97	4297	---	---
1999	19833	1080	5.44	35594	496	1.39	3687	---	---
2000	21580	1120	5.18	38126	541	1.43	3758	---	---
Total	84557	5396	6.38	171679	2991	1.74	16681	174	1.0

Table 5: The overall percentages of fascioliasis in slaughtered animals in Dakahlia governmental abattoirs from 1997 to 2000.

Year	Animal slaughtered	Liver condemnation	Condemnation percent
1997	78034	2979	3.81
1998	72305	2345	3.24
1999	59114	1576	2.66
2000	63464	1661	2.64
Total	272917	8561	3.14

Discussion

In the present study, farm animals (1581) from the nine centers of Dakahlia governorate were coprologically examined.

A total of 463 cows from Bilqas, Sherbeen, Dekarnis, Manzalla, Mataria, Talkha, Mansoura, Aga and Mit Ghamr were examined. The fascioliasis infected rates were 12.5, 9.43, 11.1, 20.9, 10, 14.81, 12.76, 9.85 and 10.25% respectively. The overall rate of infection in cows was 57/463 or 12.31%. A total of 524 buffaloes examined showed positive percent of 11.36, 11.11, 9.09, 19.29, 8.69, 10.66, 7.14, 7.6 and 4.93 respectively. The overall rate of infection in the buffaloes was 51/524 or 9.73%. As to sheep, a total of 409 were examined. The positive

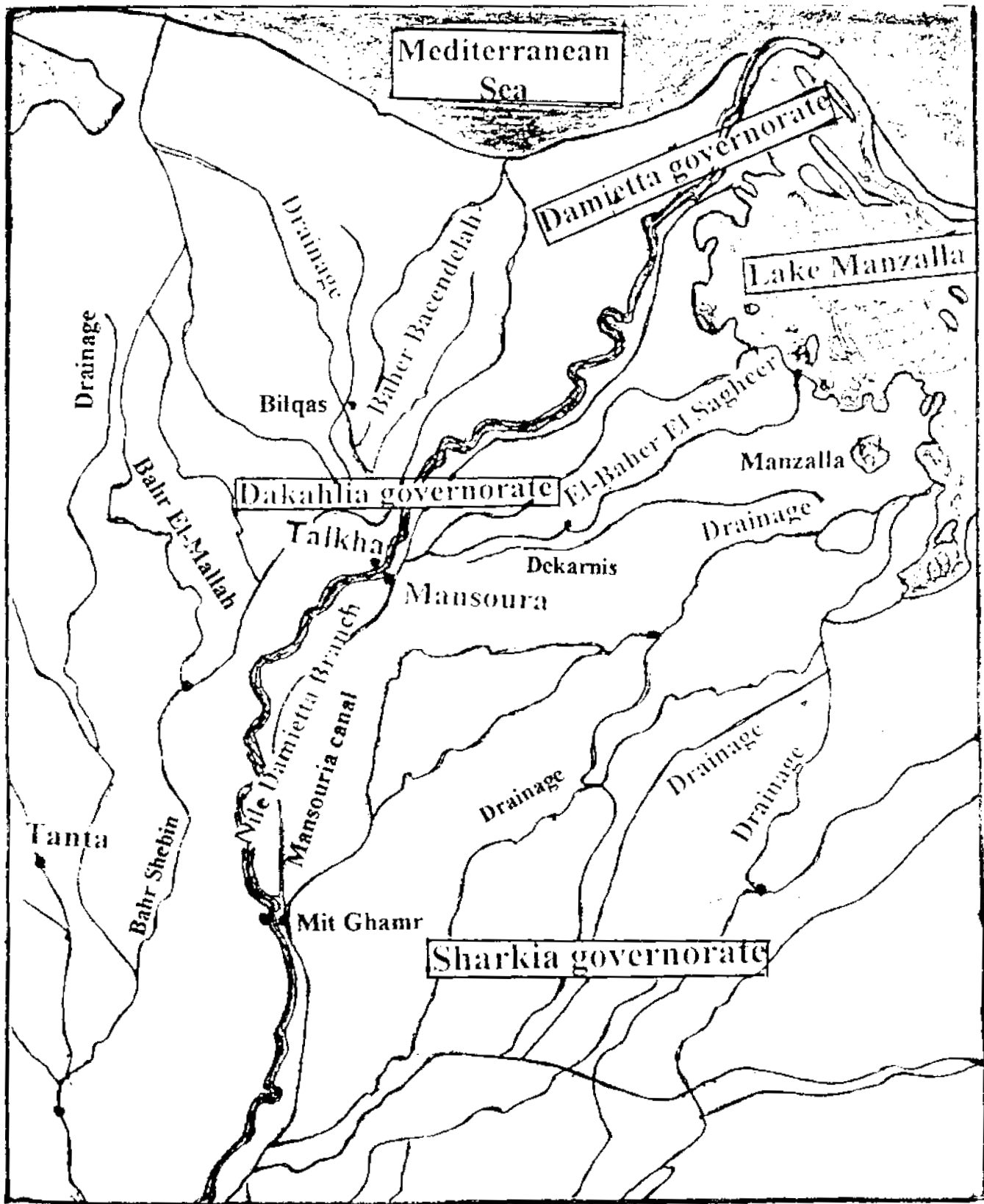


Fig. 1: A map showing the different centers examined in Dakahlia governorate.

rates were 18.91, 12.24, 12.19, 23.07, 6.35, 22.72, 22.22, 19.14 and 16.21% respectively. The overall rate of sheep infection was 73/409 or 17.84%. Regarding goats, 185 were examined. The positive rates were 5.26, 4.76, 8.0, 12.5, 5.55, 4.16, 5.25, 4.76 and 0.0% respectively. The overall rate of goats infection was 10/185 or 5.40%.

So, the highly infected type of animals were the sheep (17.84%), followed by cows (12.31%), buffaloes (9.73%) and lastly, goats (5.40%). Soliman (1998) mentioned the percentage of infection was 59.5 for cattle and buffaloes, and 78.0 for sheep. No doubt, sheep are the most important livestock in dissemination and spreading of fascioliasis to man and animals (Muro et al., 1993; Hillyer et al., 1996 and Haridy et al., 1999). Sheep are known to live indoors with their owners or very close to them. They are more or less pet animals and the owners' children always play with them. Besides, they move here and there for feeding. A farmer can have one or two cows or buffaloes, but many sheep (Fig. 2).

Again, the highest infection rate of sheep was in Manzalla (23.07%) and the lowest was in Mataria (6.35%). In cows, the highest infection rate was in Manzalla (20.9%) and the lowest was in Sherbeen (9.43%). In buffaloes, the highest infection rate was also, in Manzalla (19.29%) and the lowest was in Mit Ghamr (4.93%). Fascioliasis infected goats was sporadic, however, the highest was in Manzalla (12.5%) and the lowest was zero in Mit Ghamr. So, the highest animal fascioliasis was in Manzalla. This is not surprising. No doubt, lake Manzalla plays a considerable contribution in the epidemiology of animal fascioliasis as well as of human fascioliasis.

Regarding the mean number of eggs per gram in ten of each type, a great variation was seen. In sheep, it was 148.3 (14-237), in cows 22 (4-36), in buffaloes 13.6 (3-21) and in goats 8.6 (2-18). Again, sheep pass the largest numbers of *Fasciola* eggs, followed by cows, buffaloes and lastly goats. Boray (1982) in an endemic area in Bolivia, reported that the number of eggs output per day in sheep ranged from 8000-25100. Mas-Coma (1998) in an endemic area in Latin America, reported that the number of eggs per gram stool in sheep was about

1000 or more. This also adds another point for incrimination of sheep in pollution and spreading of fascioliasis infection.

Examination of livers of slaughtered animals, showed the mean number of *Fasciola* worms per livers of ten animals to be 208.1 in sheep, 69.1 in cows and 62.7 in buffaloes. It was not available to examine slaughtered goats at the time of this study.

The partial condemnation of fascioliasis infected livers varies in Dakahlia governmental abattoirs. In the year 1997, it was 8.46%, 2.01% and 3.52% for cows, buffaloes and sheep. In the year 1998, it was 6.43%, 1.97% and 0.0% respectively. In the year 1999, it was 5.44%, 1.39% and again 0.0% respectively. In the year 2000, it was 5.18%, 1.43% and 0.0% respectively. The overall percentage of liver condemnation in the four years was 6.38, 1.74 and 1.0 for cows (Fig. 3), buffaloes and sheep (Fig. 4) respectively. The highest condemnation was in cows' livers, followed by buffaloes and the least was in sheep.

So, it seems that sheep are more susceptible to the massive treatment carried out by the Egyptian Ministry of Agriculture, followed by buffaloes and that cows are more or less somewhat resistant to such a treatment. However, in Egypt, legally it is forbidden to slaughter female sheep less than five years old. In the present study, the sheep examined in coprologic surveys were old ones, subjected to multi-infections. Those examined in the slaughterhouses were all male sheep of one-year old, with relatively little chance to acquire fascioliasis infection.

Lastly, the overall fascioliasis infected farm animals in Dakahlia governorate was 3.81% in 1997, 3.24% in 1998, 2.66% in 1999 and 2.64 in 2000.

Soliman (1998) mentioned that in a field survey on 1988, by the Ministry of Agriculture, the prevalence rates were 3-60% in cattle and buffaloes, and 21-78% in sheep in the different regions, with the highest rates in irrigated areas.

In conclusion, none can forget the role played by the farm animals, particularly sheep in the dissemination and spreading of fascioliasis infection. This is especially true in a governorate like Dakahlia which represents the typical rural and urban models.

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