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A QUALITATIVE AND QUANTITATIVE SURVEY ON THE HELMINTH PARASITES OF FISHES FROM THE ASWAN HIGH DAM LAKE IN EGYPT*

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ABSTRACT

The present investigation is concerned with a helminthological survey of 19 species of fish collected along different seasons from the Aswan High Dam Lake in the southernmost part of Egypt. 615 out of 850 fish (72.4%) are positive for helminth infections. The positive hosts are infected with one or more helminthic groups. The incidence of infections arranged in their order frequency is 26.6% for trematodes, 24.8% for acanthocephala, 22.6% for nematodes, 11.7% for cestodes and 0.1% for aspidocotyleans. The incidence of infection in male and female fish is almost nearly equal except in *Lates niloticus* where a certain species of nematodes is found in females but not in males. Digenetic trematodes, aspidocotyleans and acanthocephala are identified to the generic level and their incidence determined in various fish species. The incidence of single and simultaneous double infections with trematode genera are also determined to investigate the possible interactions between members of the parasitic fauna in their respective hosts. The incidence and intensity of fish infections with some trematodes and acanthocephala are studied throughout the range of their age to determine the effect of age on the characteristics of these infections.

INTRODUCTION

It is widely accepted that qualitative and quantitative deficiencies of animal proteins could be corrected by an overall development of fish resources both in marine and other aquatic environments. The development of fish resources could be enhanced by the proper study of different aspects of fish biology, including fish parasitology (Williams, 1967).

In Egypt, particular attention is given to the development of fisheries to alleviate the pressing demands on animal proteins by the rapidly increasing population. Egyptian fisheries include mainly those of the Red Sea and the Mediterranean Sea territorial waters, the River Nile and the Aswan High Dam Lake in Upper Egypt. This lake, being one of the largest man-made lakes in Africa (coming only next to Lake Volta in Ghana) is selected as the site of the present investigation which is concerned with a general helminthological study of the parasitic fauna of fishes of the lake. At present, fish production from the lake forms a significant proportion of the Egyptian inland fisheries.

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The characteristics of Lake Nasser and its fish fauna and productivity are outlined in a comprehensive review by Abdel-Latif (1974) which can be briefly summarised as follows:

The lake has been created by the construction of the Aswan High Dam in the southernmost part of Egypt and extends beyond the Second Cataract in the Sudan. It started in 1964 when storage began and reached a level of about 168 metres above sea level in 1971, the maximum level of storage being 183 metres above sea level. It lies in the subtropical region with hot summer climate and extends in a desert area with mountains and vast plains of varying heights being nearly restricted to the edge of the lake which therefore has a unique situation and is thus different from other African man-made lakes where plenty of vegetation is prevalent.

The length of the lake is about 480 kms (about 300 km for Lake Nasser in Arab Republic of Egypt and 180 km for Lake Nubia in the Sudan). The full reservoir is situated between the Aswan High Dam and the Second Cataract (Dal), between $23^{0}58'$ - $20^{0}27'$ north latitudes and $30^{0}07'$ - $33^{0}15'$ east longitudes (Fig. 1).

The lake has characteristically numerous side branches, locally called 'Khors' which constitute about 75% of the total area of the reservoir. There are 85 important khors, 48 on the eastern side and 37 on the western side, which proved to be good fishing grounds. The total volume of the lake is about 157 Km^3 (Lake Nasser 130 Km^3 and Lake Nubia 27 Km^3). There is a seasonal fluctuation in the water level in the lake according to the amount of water gained and the discharge during different seasons.

The entire reservoir lies in an extremely arid environment. Occasional showers may happen in any period of the year, but there may be occasional heavy rains. The mean relative humidity recorded at Aswan is 13% in May-June and rises to 36% in December and falls off in the successive months. The mean monthly ambient temperature is around $34^{0}C$ during June to August, but the lowest temperature of $15.8^{0}C$ is recorded in January. The cool season lasts from December to February, the mean air temperature for this period is $16.5^{0}C$. The hot weather prevails from April to October and the mean temperature for this period is $31.1^{0}C$. The temperature rapidly rises in February-March and declines steadily during November.

The Zooplankton population of the lake is mainly represented by limnoplankton forms including Copepoda, Cladocera and Rotifera. In spite of the richness of the Zooplankton populations, their grazing effect on the Phytoplankton (mainly blue green algae) is negligible due to the dense growth of the latter.

The fish fauna of the lake is rich; Abdel-Latif (1974) recorded 57 species belonging to 15 families. The total fish landings of the lake increased from 750 tons in 1966 to 6716 tons in 1971.

MATERIALS AND METHODS

The present investigation was carried out from 1974 - 1976, along different seasons, once every 3 months. Most fishes were caught by floating gill nets (Sakarota), trammel nets (Duk) and sunken-gill nets (Kobok) by special arrangement with Aswan Regional Planning Authority. On very few occasions certain species of fish were brought from the fish market platform at Aswan on the lake.

All fishes were examined as soon as possible after catching. Brief notes were made on the identification of host, its sex, age, measurements, weight, date of collection, locality, ... etc. The body surface, fins, gills, body cavity, gut, liver, heart, kidneys and eye-orbit were examined for helminth parasites; a hand lens or binocular dissecting microscope being used for the

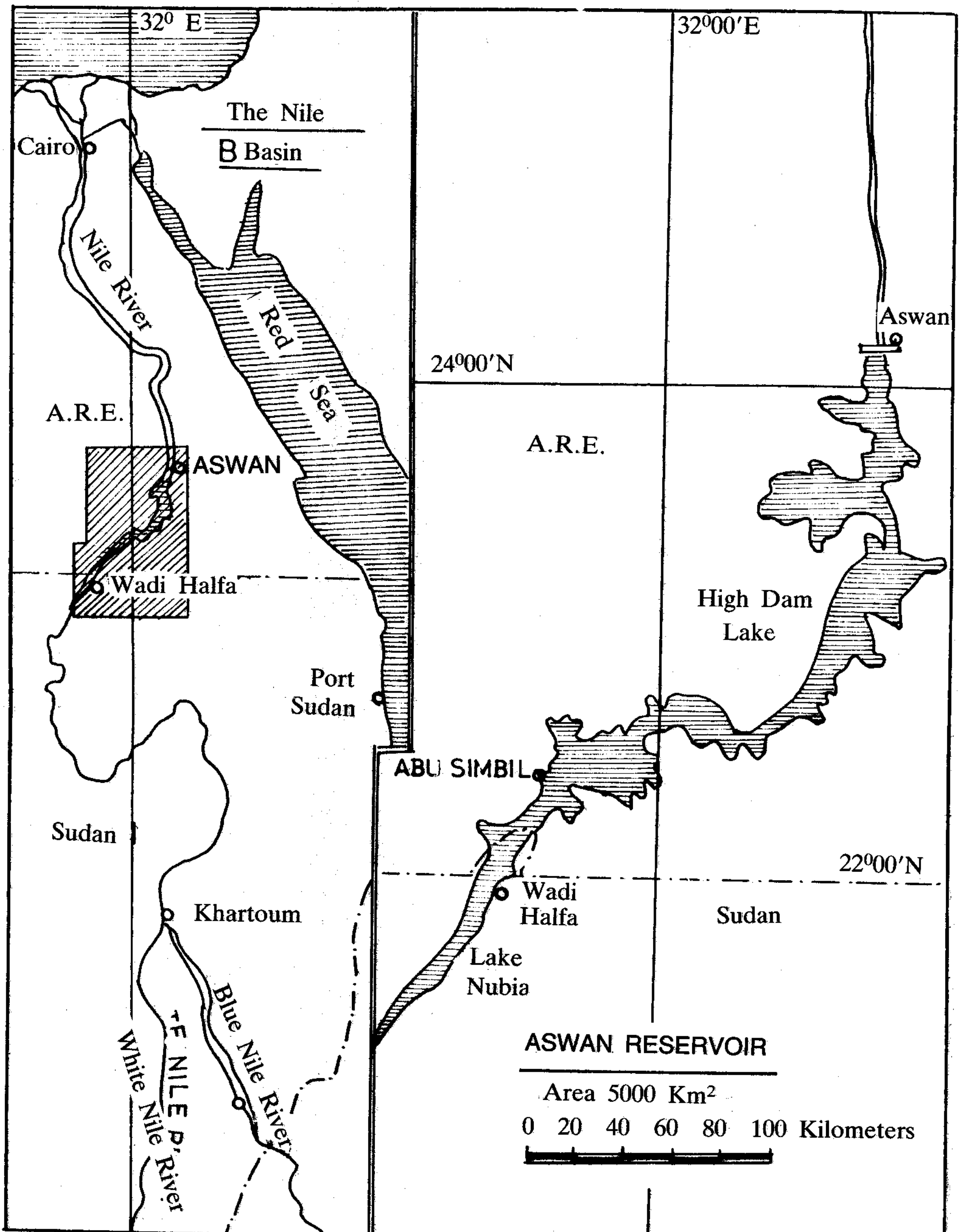

Fig. 1. The Aswan High Dam Lake in Upper Egypt and Northern Sudan

examination. Collected material were washed, relaxed and fixed. Trematodes and cestodes were fixed in 70% alcohol and 5% formalin. Fixation of acanthocephala was done using Ristroph's fixative (Weesner, 1968). In the staining of trematodes, cestodes and acanthocephala, Alum carmine, Grenacher's alum carmine, Gower's carmine and acetocarmine were used.

RESULTS AND DISCUSSION

I. Incidence of Helminth Parasites

Altogether 850 fish belonging to 19 species, 14 genera and eleven families are examined for helminth parasites during the present investigation. Results are shown in Table (1) and can be summarized as follows:

1. **General Incidence:** 615 fish out of 850 (72.4%) are positive for helminth infections. The positive hosts are infected with one or more groups of trematodes, cestodes, aspidocotyleans, nematodes and acanthocephala. Incidence of different groups arranged in their order of frequency is 26.6% for trematodes, 24.8% for acanthocephala, 22.6% for nematodes, 11.7% for cestodes and 0.1% for aspidocotyleans.

2. **Trematode Infections:** Digenetic trematodes have been reported in eight host species, belonging to five genera. These hosts are *Barbus bynni, Bagrus bayad, B. docmac, Synodontis schall, S. serratus* and *Tetraodon fahaka.* One type of metacercaria was found in *Tilapia nilotica* and T. galilaea. Amongst infected fish, the highest incidence of digenetic trematodes is recorded in *Bagrus bayad* (88.9%) while the lowest is found in *Tilapia nilotica* (33.3%).

3. **Cestode infections:** Cestodes are recorded from *Barbus bynni, Clarias lazera* and *Malopterurus electricus*. The highest incidence is found in *Malopterurus electricus* (96%) while the lowest is found in *Clarias lazera* (5%).

4. **Aspidocotylean infections:** These parasites are very rarely seen, being only recorded in one *Synodontis schall,* with an incidence of 0.1%.

5. **Nematode infections:** These are recorded from eight species belonging to five genera. The positive hosts include: *Labeo horie, L. coubie, Synodontis schall* and *S. serratus, Lates niloticus, Tilapia nilotica* and *T. galileae* and *Hydrocyon forskalii.* The highest incidence of nematodes is found in *Labeo horie* (75.0%) and the lowest in *Lates niloticus* (10.0%).

6. **Acanthocephala infections:** These helminth parasites are reported from seven species of fish, belonging to five genera. The fish hosts are: *Clarias lazera, Bagrus bayad, B. docmac, Lates niloticus, Tilapia galilaea, T. nilotica* and *Tetraodon fahaka.* The highest incidence of acanthocephala is found in *Tilapia nilotica* (96.7%) and the lowest in *Clarias lazera* (10.0%).

II. INCIDENCE OF HELMINTH PARASITES IN MALE AND FEMALE FISH

The data presented in Table (1) has been subjected to close analysis in order to determine the difference between the incidence of helminths in male and female fish. The results obtained are given in Table (2) and summarized as follows:

The total incidence of infection in male and female fish is almost nearly equal being 96.1% and 89.2% respectively. There are no significant differences in the incidence of different helminth groups in both sexes of fish, the only exception to that rule is *Lates niloticus* where certain nematodes are found in females but not males. In this case, a certain species of nematodes is found in the ovaries of the fish but never in the testes.

Table (1)
Incidence of Trematodes, Cestodes, Aspidocotylea, Nematodes and Acanthocephala in Fishes.

FISH	No. Examined	Infections											
		Positive		Trematodes		Cestodes		Aspido-cotylea		Nematodes		Acantho_cephala	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Labeo horie	40	30	75.0	0	0	0	0	0	0	30	75.0	0	0
Labeo coubie	20	14	70.0	0	0	0	0	0	0	14	70.0	0	0
Barbus bynni	60	55	91.7	32	53.3	50	83.3	0	0	0	0	0	0
Clarias lazera	20	3	15.0	0	0	1	5.0	0	0	0	0	2	10.0
Schilbe mystus	25	0	0	0	0	0	0	0	0	0	0	0	0
Bagrus bayad	45	45	100.0	40	88.9	0	0	0	0	0	0	5	11.1
Bagrus docmac	15	15	100.0	13	86.7	0	0	0	0	0	0	2	13.3
Chrysichthys auratus	20	0	0	0	0	0	0	0	0	0	0	0	0
Synodontis schall	50	45	90.0	27	54.0	0	0	1	2.0	32	64.0	0	0
Synodontis serratus	10	7	70.0	6	60.0	0	0	0	0	3	30.0	0	0
Malopterurus electricus	50	48	96.0	0	0	48	96.0	0	0	0	0	0	0
Lates niloticus	100	100	100.0	0	0	0	0	0	0	10	10.0	95	95.0
Tilapia nilotica	60	58	96.7	20*	33.3*	0	0	0	0	10	16.7	58	96.7
Tilapia galilaea	40	40	100.0	25*	62.5*	0	0	0	0	8	20.0	40	100.0
Tetraodon fahaka	75	70	93.3	63	84.0	0	0	0	0	0	0	9	12.0
Mormyrus kannume	50	0	0	0	0	0	0	0	0	0	0	0	0
Mormyrus cachive	50	0	0	0	0	0	0	0	0	0	0	0	0
Hydrocyon forskalii	100	85	85.0	0	0	0	0	0	0	85	85.0	0	0
Alestes dentex	20	0	0	0	0	0	0	0	0	0	0	0	0
Total	**850**	**615**	**72.4**	**226**	**26.6**	**99**	**11.7**	**1**	**0.1**	**192**	**22.6**	**211**	**24.8**

*Metacercaria

Table (2)
Incidence of Helminth Parasites in Male and Female Fishes

FISH	No. Ex.		Number Infected				Helminth Parasites																			
			M		F		Trematodes				Aspidocotylea				Cestodes				Nematodes				Acanthocephala			
	M	F					M		F		M		F		M		F		M		F		M		F	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Labeo horie	22	18	18	81.8	12	66.7	0	0	0	0	0	0	0	0	0	0	0	0	16	72.7	14	77.8	0	0	0	0
Labeo coubie	13	7	9	69.2	4	57.1	0	0	0	0	0	0	0	0	0	0	0	0	10	76.9	4	57.1	0	0	0	0
Barbus bynni	35	25	32	91.4	23	92.0	18	51.4	14	56.0	0	0	0	0	30	85.7	20	80.0	0	0	0	0	0	0	0	0
Clarias lazera	11	9	2	18.2	1	11.1	0	0	0	0	0	0	0	0	1	9.1	0	0	0	0	0	0	1	9.1	1	11.1
Bagrus bayad	25	20	25	100.0	20	100.0	20	80.0	20	100.0	0	0	0	0	0	0	0	0	0	0	0	0	3	12.0	2	10.0
Bagrus docmac	9	6	9	100.0	6	100.0	8	88.9	5	83.3	0	0	0	0	0	0	0	0	0	0	0	0	2	22.2	0	0
Synodontis schall	27	23	25	92.6	20	86.9	16	59.3	11	47.8	0	0	1	4.3	0	0	17	73.9	15	55.6	0	0	0	0	0	0
Synodontis serratus	4	6	3	75.0	4	66.7	2	50.0	4	66.7	0	0	0	0	0	0	0	0	2	50.0	1	16.7	0	0	0	0
Malopterurus electricus	30	20	29	96.7	19	95.0	0	0	0	0	0	0	0	0	29	96.7	19	95.0	0	0	0	0	0	0	0	0
Lates niloticus	34	66	34	100.0	66	100.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	15.2	30	88.2	65	98.5
Tilapia nilotica	20	40	18	90.0	40	100.0	5	25.0	15	37.5	0	0	0	0	0	0	0	0	3	15.0	7	17.5	18	90.0	40	100.0
Tilapia galilaea	16	24	16	100.0	24	100.0	9*	56.3	11*	45.8	0	0	0	0	0	0	0	0	3	18.8	5	20.8	16	100.0	24	100.0
Tetraodon fahaka	46	29	43	93.5	27	93.1	40	86.9	23	79.3	0	0	0	0	0	0	0	0	0	0	0	0	6	13.0	3	10.4
Hydrocyon forskalii	40	60	36	90.0	49	81.7	0		0	0	0	0	0	0	0	0	0	0	36	90.0	49	81.7	0	0	0	0
Total	**332**	**353**	**299**	**90.1**	**315**	**89.2**	**118**	**35.5**	**103**	**29.2**	**0**	**0**	**1**	**0.28**	**60**	**18.1**	**56**	**15.9**	**85**	**25.6**	**90**	**25.5**	**76**	**22.9**	**135**	**38.2**

*Metacercaria M = Male. F = Female. No. Ex. = Number Examined.

Table (3)
Incidence of Trematode and Aspidocotylean Genera in Infected Fish

FISH	Total number infected	Trematode genera														Aspidocotylea	
		Astiotrema		*Acanthostomum*		*Halplorchoides*		*Basidiodiscus*		*Sandonia*		*Allocreadium*		*Clinostomum* (Metacercaria)		*Aspidogaster*	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Barbus bynni	55	0	0	0	0	0	0	0	0	0	0	32	58.2	0	0	0	0
Bagrus bayad	40	0	0	35	87.5	40	100.0	0	0	0	0	0	0	0	0	0	0
Bagrus docmac	13	0	0	10	76.9	13	100.0	0	0	0	0	0	0	0	0	0	0
Synodontis schall	28	0	0	0	0	0	0	27	96.4	27	96.4	0	0	0	0	1	3.6
Synodontis serratus	6	0	0	0	0	0	0	6	100.0	6	100.0	0	0	0	0	0	0
Tetraodon fahaka	63	63	100.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tilapia nilotica	20	0	0	0	0	0	0	0	0	0	0	0	0	20	100.0	0	0
Tilapia galilaea	25	0	0	0	0	0	0	0	0	0	0	0	0	25	100.0	0	0

III. **Incidence of Digenetic Trematode and Aspidocotylean Genera in Infected Fish**

The digenetic trematodes and aspidocotyleans collected from different hosts during the present study have been identified to the generic level, and the incidence of the various genera are shown in Table (3) and summarized as follows:

A. Digenetic Trematode Infections

1. *Astiotrema Infections:* This genus is recorded only from *Tetraodon fahaka:* without a single exception all helminthologically positive fish are infected with this genus of trematodes.

2. *Acanthostomum Infections:* This genus is recorded only from genus *Bagrus*. Its incidence in two infected *Bagrus* species, varies from 76.9% in *Bagrus docmac* to 87.5% in *Bagrus bayad.*

3. *Allocreadium Infections:* This genus is recorded only from *Barbus bynni,* its incidence reaching 58.2%.

4. *Haplorchoides Infections:* This genus is only found in the genus *Bagrus*. Without a single exception all infected fish of either *B. bayad* or *B. docmac* have this trematode genus.

5. *Basidiodiscus Infections:* This genus is only found in the genus *Synodontis*. Its incidence is high, varying from 96.4% in *S. schall* to 100% in *S. serratus.*

6. *Sandonia Infections:* This genus is only found in the genus *Synodontis,* with an incidence of 96.4% in *S. schall* and 100% in *S. serratus.*

7. *Clinostomum (metacercaria) Infections:* This metacercarial stage of the genus *Clinostomum* is only found in fishes of the genus *Tilapia*. All infected fish have this metacercarial stage.

B. Aspidocotylean Infections

Aspidogaster Infections:

An infection with this genus has been found only in one *Synodontis schall* out of 50 specimens examined.

IV. **The Incidence of Acanthocephalan Genera in Infected Fishes**

The acanthocephala collected from different hosts during the present study have been identified to the generic level, and the incidence of the various genera are shown in Table (4) and summarized as follows:

1. *Acanthosentes Infections*

This genus is only recorded from the genus *Tilapia;* all infected *T. nilotica* and *T. galilaea* have this genus of acanthocephala. The intensity of infection was at its maximum in summer and reached a minimum in winter. The number of parasites per fish ranged from 8-23 in summer, while the corresponding figure for winter was 3-7.

2. *Paragorgorhynchus Infections*

This genus is recorded from five species belonging to four genera including *Lates niloticus, Bagrus docmac, B. bayad, Tetraodon fahaka* and *Clarias lazera*. The highest incidence amongst infected fish is 95% in *Lates niloticus* while the lowest one is 11.1% in *Bagrus bayad,* 13.3% in

B. docmac and 12.8% in *Tetraodon fahaka.* The intensity of infection also varied in different genera of fishes, being 87-200 per fish in *Lates niloticus, 9-22 in Tetraodon fahaka,* 4-15 in *Bagrus bayad* and *B. docmac* and 4-7 in *Clarias lazera.*

The worms collected from *Lates niloticus* are larger than those from other hosts, also the number of eggs in female worms, used as indication of fertility, is highest in *Lates niloticus* in comparison with other hosts. This would indicate that *Lates niloticus* is a more favourable host of the genus *Paragorgorhynchus* than the other hosts.

Table (4)
Incidence of Acanthocephalan Genera in Infected Fish

Fish	Total No. Infected	Genera			
		Acanthosentes		*Paragorgorhynchus*	
		No.	%	No.	%
Clarias lazera	3	0	0	2	66.7
Bagrus bayad	45	0	0	5	11.1
Bagrus docmac	15	0	0	2	13.3
Lates niloticus	100	0	0	95	95.0
Tetraodon fahaka	70	0	0	9	12.9
Tilapia nilotica	58	58	100.0	0	0
Tilapia galilaea	40	40	100.0	0	0
Total	**331**	**98**	**29.6**	**113**	**34.1**

V. Single (Pure) and Simultaneous Double Infections With Two Trematode Genera

Our previous studies on digenetic trematodes of bats in Egypt indicated that there were some interactions between members of the parasitic fauna in these hosts. Infections with certain trematode genera were found to be antagonistic to infections with other genera. On the contrary, certain trematode genera occurred only in the presence of some other genera of parasites (Saoud and Ramadan, 1976).

This phenomenon is studied in digenetic trematodes of freshwater fishes. The incidence of single and simultaneous double infections with trematode genera in different species of fish are determined and the results obtained are given in Tables (5) and (6). These results can be summarized as follows:

A. Single (Pure) Infections With One Genus of Trematodes:

The total incidence of pure infections with one genus of trematodes is almost twice that of double infections with two genera of trematodes, being 65.5% and 34.5%, respectively.

The lowest incidence with one genus of trematodes is recorded from *Bagrus bayad* (12.5%) and *B. docmac* (23.0%) while the other species of fish show an incidence of 100.0% in all cases.

Table (5)
Incidence of Single and Double Infections With Trematode Genera in Fishes

Fish	Total Number Infected	Infections			
		One Genus		Two Genera	
		No.	%	No.	%
Barbus bynni	32	32	100.0	0	0
Bagrus bayad	40	5	12.5	35	87.5
Bagrus docmac	13	3	23.0	10	76.9
Synodontis schall	27	0	0	27	100.0
Synodontis serratus	6	0	0	6	100.0
*Tilapia nilotica**	20	20	100.0	0	0
*Tilapia galilaea**	25	25	100.0	0	0
Tetraodon fahaka	63	63	100.0	0	0
Total	**226**	**148**	**65.5**	**78**	**34.5**

*Metacercaria

Pure infections with one trematode genus, recorded from five genera of fishes with eight species, are as follows:

1. Genus *Astiotrema:* The incidence of this genus in pure infections is very high (100%) in *Tetraodon fahaka.*

2. Genus *Haplorchoides:* The incidence of pure infections in this genus is low (12.5%) in *Bagrus bayad* and (23%) in *Bagrus docmac.*

3. Genus *Allocreadium:* The incidence of this genus in pure infections is 100% in *Barbus bynni.*

4. Genus *Clinostomum* (metacercaria): The metacercarial stage of genus *Clinostomum* is recorded in 100% of infected *Tilapia nilotica* and *T. galilaea.*

B. Simultaneous Infections With Two Genera of Trematodes

Simultaneous infections of some fishes with two genera of trematodes have been encountered in the present study.

The total incidence of two infection with trematode genera is 34.5%. These infections are recorded from two genera of fishes with four species. The following combinations of trematode genera have been found in such infections:

1. *Acanthostomum + Haplorchoides:*

The incidence of this combination is 76.9% in *Bagrus docmac* and 87.5% in *Bagrus bayad.* This

Table (6)
Incidence of Various Combinations of Trematode Genera in Fishes

Trematode genera	Infected fish															
	Barbus bynni		*Bagrus bayad*		*Bagrus docmac*		*Synodontis schall*		*Synodontis serratus*		*Tilapia nilotica*		*Tilapia galilaea*		*Tetraodon fahaka*	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Astiotrema only	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63	100.0
Acanthostomum only	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Haplorchoides only	0	0	5	12.5	3	23.0	0	0	0	0	0	0	0	0	0	0
Acanthostomum + *Haplorchoides*	0	0	35	87.5	10	76.9	0	0	0	0	0	0	0	0	0	0
Allocreadium only	32	100.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clinostomum (Metacercaria)	0	0	0	0	0	0	0	0	0	0	20	100.0	25	100.0	0	0
Basidiodiscus only	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sandonia only	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Basidiodiscus + *Sandonia*	0	0	0	0	0	0	27	100.0	6	100.0	0	0	0	0	0	0

combination is more commonly seen in young fishes than in the older ones.

2. *Basidiodiscus* + *Sandonia:*

This combination is recorded from all infections of *Synodontis schall* and *S. serratus*. In no single case either parasites is found alone in the infected host.

VI. **Dispersion of Parasites With the Age of Host**

Changes in the parasite fauna of a host with age have been studied by some workers, the length and weight of fish being used as indication of age (Elton, Ford and Baker 1931, Gorbunova 1936, Ackert, Edgar and Frick 1939, Frick and Ackert 1948, Sinha and Srivastava 1958, and Gray 1972.)

Dogiel (1961) suggested that in the majority of cases both the numbers and diversity of parasites increased with the age of the fish, especially those parasites with a direct life cycle. A similar situation is found within bird populations. Gray (1972) and Croll (1973) reported that, the parasite populations in birds depend on age and sex of their hosts.

Kennedy, (1975) reported that the incidence and the level of infection of many species of parasites increased with the age of the host. Change in age, however, often also means a change in structure, behaviour or diet of host, and so also a change in the probability of infection. That changes in host structure are responsible for changes in the infection are shown in the protozoon *Myxosoma cerebralis*. This species is only able to infect cartilage, and so its incidence declines in older rainbow trout fishes as ossification progresses. Similarly, the incidence of parasites that live in the Bursa fabricii of birds also decline with age of host. In contrast, *Trypanosoma equiperdum* is transmitted during coitus, and so only occurs in mature animals.

In the present investigation, some parasites showed a significant dispersion relation throughout the age of their hosts, including the incidence and intensity of infection. These results can be summarized as follows:

1. The incidence and intensity of infection with the acanthocephalan genus *Paragorgorhynchus* Golvan, 1957 in *Lates niloticus* increase with the age of fish.

2. Also, the incidence and intensity of infection with the acanthocephalan *Acanthosentis* Verma and Datta (1929) in *Tilapia nilotica* and *T. galilaea* increase with age of the fish.

3. The incidence and intensity of infection with trematodes of sub-genus *Acanthostomum (Atrophocaecum)* Bhalerao, 1940 in *Bagrus bayad* and *B. docmac* decrease with the age of fish.

4. The incidence of genus *Haplorchoides* Chen, 1949, is almost constant throughout the age of fishes of genus *Bagrus,* but the intensity of infection decreases with the increase of age. The same result is obtained with trematodes of genus *Astiotrema* Looss, 1900 from *Tetraodon fahaka.*

5. The infection of fishes: *Bagrus bayad, B. docmac, Tetraodon fahaka* and *Clarias lazera* with acanthocephala of the genus *Paragorgorhynchus* Golvan, 1957 is only recorded from older fish, no young fish are infected.

6. The incidence and intensity of infection with nematodes increase with age in *Hydrocyon forskalii.*

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تقص نوعي وكمي للديدان الطفيلية في أسماك
بحيرة السد العالي في مصر

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أجريت الدراسة الحالية للتعرف على الديدان الطفيلية في تسعة عشر نوع من الأسماك التى جمعت من بحيرة السد العالي في جنوب مصر . ومن ٨٥٠ سمكة تم فحصها تبين أن ٦١٥ منها مصابة بمجموعة أو أكثر من الديدان الطفيلية التابعة لطوائف التريماتودا والسستودا والنماتودا وشوكية الرأس (أكانثوسيفالا) والأسبيدوكوتيليا . وعندما رتبت نسب اصابة الأسماك على أساس تنازلى تبين أن ٢٦,٦٪ مصابة بالتريماتودا ، ٢٤,٨٪ مصابة بالأكانثوسيفالا ، ٢٢,٦٪ مصابة بالنماتودا ، ١١,٧٪ مصابة بالسستودا ، ١,٠٪ مصابة بالاسبيدوكوتيليا .

كما تبين أن نسب الأصابة متشابهة تقريبا في ذكور واناث الأسماك فيما عدا سمك البياض الذي سجل باناثه نوع معين من ديدان النماتودا التى لم تشاهد أبدا في الذكور .

وقد عرفت ديدان التريماتودا والاسبيدوكوتيليا والأكانثوسيفالا على مستوى الجنس ، وحددت نسبة وشدة اصابة الأسماك بكل منها ، كما حددت نسب الأصابة في كل من الأصابات الفردية النقية والمزدوجة بهدف التعرف على احتمالات تفاعل مختلف مكونات الفونة الطفيلية في تلك العوائل ، كما درس المؤلفان تأثير عمر العائل على نسب وشدة اصابة الأسماك ببعض الديدان الطفيلية .