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A GENERAL SURVEY OF THE HELMINTH PARASITES INFECTING THE COMMON FISHES IN SOME INLAND WATER IN EGYPT

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ABSTRACT

1200 fish belonging to 10 genera and 12 species at six different localities of inland water in Egypt were investigated for the incidence and prevalence of helminth parasites. All species of the fish examined were positively infected. Out of the fish examined 880 fish have been found to harbour one or more species of helminth parasites.

The infection rate reached 73.33%. The incidence of helminth infections of fishes in the six localities were 88%, 75.33%, 72.66%, 68.66%, 59% and 41% in Lake Nasser, Lake Edku, Maryut fish farm, Lake Qarun, Al-Rasswa fish farm and Barseek fish farm respectively.

The relative incidence of infections in the fishes reported with encysted metacercariae, Monogenea, Digenea, cestodes, nematodes and Acanthocephala were 81.33%, 0.58, 47.41%, 6.75%, 16.33% and 5.41% respectively. Out of the digenetic trematodes surveyed one genus and eight species from both Mugil cephalus and Mugil capito were found to be new. These include : Neosaccocoelium aegyptiacus n.gen., n.sp.; Saccocoelium portsaidensis n.sp.; Saccacoelium Saudi n. sp.; Saccocoelioides elgindyi n.sp.; Haploporus loossi n.sp.; Unisacus elnaffari n.sp.; Dicrogaster maryutensis n.sp.; Haplosplanchnus edkuensis n.sp. and Bucephalus nagatyi n.sp.. Also some helminth parasites were recorded from new hosts for the first time in Egypt.

INTRODUCTION

The study of fish parasites in Egypt has received a good deal of attention. Many workers have carried out surveys and records on the trematodes of Red Sea fishes (Nagaty, 1937, 1957 and 1973; Saoud, 1963; Ramadan, 1984 a,b and Saoud & Ramadan 1985).

Fischthal and Kuntz published a series of papers between 1959 and 1963 on the helminth parasites of freshwater fishes from Egypt. The parasites of freshwater fishes in Egypt have been studied by Ebaid (1967 and 1974); Imam (1971); Imam *et al.* (1979, 1984); El-Naffar (1970 and 1986). El-Naffar and Saoud (1974) and El-Naffar and El-Shahawi (1986).

Further studies in Egypt have been reported by various parasitologists including Moravec (1974, 1976 and 1977) on helminth parasites of Nile fishes; Wannas (1977) and Hassan (1980) on helminth parasites of fishes from Lake Nasser; Mohammed (1978) on certain blood and helminth parasites of Silurid fishes from the Nile; Sahlab (1982) on the enteric helminth parasites of fish from Lake Manzala and Abu Al-Hag (1985) on the trematode parasites of freshwater fishes in Sharkiya, Egypt. Moreover, Al-Bassel (1987) on the helminth parasites of some fish from Fayoum Governorate; Negm El-Din (1987) on the internal parasites of fish in Delta-Nile and Abu El-Ez (1988) on some intestinal parasites of freshwater fishes in Egypt. The present work included different areas, habitats and species of fish to fulfill the gaps in the previous studies. Also the present investigation will help in extending our knowledge about the parasitic founa of fishes in Egypt and opens the field to study the life cycles and the effects of these parasites on their hosts.

MATERIALS AND METHODS

MATERIALS :

A total of 1200 fish were collected from six different localities of inland water in Egypt. These localities are distributed all over the country and included three different lakes (Qarun, Edku and Nasser) and three different governmental fish farms (Al-Rasswa, Maryut and Barseek) lying in Port-Said, Alexandria and Behera Governorates respectively. Both Lakes Qarun and Al-Rasswa fish farm were selected as saline water habitat. Lake Edku and both Maryut and Barseek fish farms were selected as brackish water habitat. Finally,

Lake Nasser was selected as fresh-water habitat. The numbers of fish examined were 400, 300, 150, 150, 100 and 100 caught from Lake Nasser, Lake Qarun, Lake Edku, Maryut fish farm, Al-Rasswa fish farm and Barseek fish farm respectively. These fishes have an economic importance as a common food, belonging to 10 genera and 12 species (1200 for helminth parasites and 150 from them for encysted metacercariae). These included 350 *Mugil cephalus* and 350 *Mugil capito* caught from Lake Qarun, Lake Edku and fish farms (Maryut. Barseek and Al-Rasswa); 50 *Morone labrax* and 50 *Tilapia nilotica* caught from Lake Edku and Maryut fish farm respectively; finally 50 from each fish species : *Tilapia galilaea, Clarias lazera, Bagrus bayad, Barbus bynni, Lates niloticus, Synodontis schall, Schilbe mystus* and *Mormyrus kannume* caught from Lake Nasser.

METHODS :

The fishes were examined macroscopically and microscopically for helminth parasites as fresh as possible, often immediately after each catch then were dissected. A hand lens and a binocular dissecting microscope were used for the helminthological examination. The collected worms were cleaned with isotonic saline solution, then were allowed to relax between a slide and a thin glass slip. Acanthocephala were relaxed by chilling overnight. Some observations were made on fresh unstained material.

a) Fixation : Encysted metacercariae were fixed with a small part of the surrounding tissue, compressed between two glass slides, ligated by a thread. Some encysted metacercariae were excysted by dissecting fine needles under dissecting microscope. Both encysted and excysted trematode metacercariae were fixed in phosphate buffered formalin. The collected trematodes and cestodes were fixed in cold 70% alcohol, the nematodes in hot 70% alcohol, while the best fixative for monogenea was 5% formalin.

b) Staining : The trematodes were stained in acetic acid aluam carmine, cestodes in alum carmine, while Acanthocephala with aceto-carmine stain, but nematodes gave the best results without staining. Then the parasites were differentiated in acid alcohol, dehydrated and mounted in canada balsam. Measurements were taken from mounted specimens and all drawings were done by a camera lucida.

RESULTS AND DISCUSSION

I. The incidence of major groups of helminth parssites in fishes :

Table (1) illustrates the relative incidence of helminth parasites in all fishes examined during the present study. 880 fish (73.33%) were found to harbour one or more species of helminth parasites. The relative incidence of infection in the fishes examined with encysted metacercariae, Monogenea, Digenea, cestodes, nematodes and Acanthocephala were 81.33%, 0.85%, 47.41%, 6.75%, 16.33% and 5.41% respectively. Out of 150 fish examined belonging to *Tilapia galilaea, Clarias lazera* and *Schilbe mystus* from Lake Nasser only 122 (81.33%) were found infected with encysted metacercariae. monogenea infections were found only in *Tilapia nilotica* from fish farm Maryut, while Digenea infections were found in *Mugil* spp., *Claria lazera, Bagrus bayad, Synodontis schall, Schilbe mystus* and *Morone labrax*. Cestodes infections were restricted to *Clarias lazera, Barbus bynni, Synodontis schall* and *Mormyrus kannume*. All species of the fishes examined were found to harbour Nematoda specially in Lake Nasser except *Mugil* spp., and *Tilapia nilotica* which were free of nematodes parasites. Acanthocephalan infections were found in *Tilapia nilotica, T.galilaea, Mugil cephalus* and *Lates niloticus*. Table (2) shows a comparison of the incidence of infections with helminth parasites in freshwater fishes from different areas in Egypt, which were done by various investigators including the present one.

II. Incidence of helminth infections in fishes from different localities :

Table (3) shows a comparison between the general incidence of helminth infections in all fishes caught from different localities. In *Mugil cephalus* the highest incidence (94%) was recorded in Maryut fish farm and the lowest (36%) in Barseek fish farm, while the highest incidence of infections (100%) was recorded in *Mugil capito* from Maryut fish farm and the lowest (46%) in the same fish species from Barseek fish farm. The incidence of helminth infections is higher in *Tilapia galilaea* from Lake Nasser (100%) than in *Tilapia nilotica* from fish farm maryut (24%). The highest incidence of infections in Lake Nasser was

recorded in *Tilapia galilaea* and *Mormyrus kannume* (100%), while the lowest incidence was recorded in *Barbus bynni* (70%).

Table (4) gives a summary of the incidence of major groups of helminth infections in fishes of all localities. The following interesting observations are evident :

a) No monogenean infections were present in all fishes examined with the only exception of *Tilapia nilotica* from fish farm Maryut. The overall incidence of digenetic trematode infection is higher than the incidence of other groups of parasites in all fishes.

b) No cestodes or nematodes were present in *Mugil* spp., and Acanthocephala were present only in 4 species of fishes.

c) The highest incidence of cestode infections were recorded in *Mormyrus kannuma* and the lowest incidence were recorded in *Synodontis schall*. The highest incidence of nematode infections were recorded in *Tilapia galilaea* from Lake Nasser and lowest in *Morone labrax* from Lake Edku.

The point of view of the present study is that the above mentioned differences are reflections of the presence or absence of the respective intermediate hosts, as well as their relative population strengths related to the population density of fishes in the six localities. A similar view was expressed by Dogiel (1962) to explain certain differences, these differences were observed by him in the parasitic fauna of fish in some Lakes of the U.S.S.R.

III. The incidence and distribution of helminth parasites in fishes from six localities :

The helminth parasites collected from fish in the six localities were identified to the generic level and their incidence in respective hosts are shown in Table (5).

It is worth mentioning that double and triple simultaneous infections with major groups of helminth parasites were reported in *Tilapia galilaea, Clarias lazera, Lates niloticus* and *Mormyrus kannume* from Lake Nasser, although only single infections were reported from the other infected fishes from the same lake. In *Mugil* spp., no single infection with helminth genera were recorded in Lakes Qarun and Edku and fish farm Maryut, but single infections were detected in both fish farms Al-Rasswa and Barseek. The following combinations of simultaneous double, triple and Quadruple infections have been illustrated in Tables (6) and (7). It has been always assumed that related hosts are infected with related members of the parasitocoenosis (Dogiel, 1962). The validity of this assumption had been studied in Red Sea fishes (Saoud and Ramadan, 1983).

IV. The intensity of helminth infections in various fishes :

The range between the lowest and the highest number of worms of each genus for all examined fish is shown in Table (8) and can be summarized as follows :

1- In both *Mugil* spp., the highest range of intensity of infection was recorded with the genus *Saccocoelium* (5-135), and the lowest with both general *Neosaccocoelium* n.ge. (1) and *Neoechinorphynchus* (1).

2- In both *Tilapia* spp., the highest range of the intensity of infection was recorded with the genus Gyrodactyius (10-50) and the lowest (3-8) with the genus *Acanthosentis*.

3- In *Syndontis schall* the highest range was recorded with the genus *Citharinella* (5-15) and the lowest with the genus Wenyonia (1).

4- In *Clarias lazara*, the range of the intensity of infections were (2-5), (1-5), (1-4), (1) and(1) with the genera *Polyonchobothrium, Procamallanus, Orientocreadium, Glossidium* and *Astiotrema* respectively.

5- In *Morone labrax*, the range of the intensity of infection was higher (7-13) with the genus *Acanthostonum* and lower (1) with both *Raphidascaris* and *Bucephalus*.

6- In *Bagrus bayad* the ranges of intensity of infection were (7-13) and (2-6) with the genera *Acanthostomum* and *Rhabdochona* respectively.

7- In *Mormyrus kannume* the highest range (4-13) was recorded with genus *Proteocephalus* and the lowest (1-3) with genus *Cucullanus*.

8- In *Lates niloticus*, the ranges of the intensity of infection were (1-7) and (1-3) with

the genera *Paragorgorhynchus* and *Cucullanus*, respectively.

9- In *Barbus bynni* the range of intensity of infection with *Bothriocephalus* was (10-22), and in *Schilbe mystus* the range of intensity of infection with *Haplorchoides* was (2-5).

10- *Contracaecum* larvae were found in all fishes examined from lake Nasser, their intensity of infections ranging between (1-25).

V. New species, hosts and localities recorded

a) New species :

One new genus and eight new species of digenetic trematodes are recorded for the first time from both *Mugil cephalus* and *Mugil capito* from different localities of saline and brackish inland water. These include: *Neosaccocoelium aegyptiacus* n.gen. n.sp.; *Saccocoelioides elgindyi* n.sp.; *Haploporus loossi* n.sp.; *Unisacus elnaffori* n.sp.; *Dicrogaster maryutensis* n.sp.; *Hoplosplanchnus edkuensis* n.sp.; and *Bucephalus nagatyi* n.sp.

b) New hosts and localities :

Haplosplanchnus otolithi Gupta and Ahmad, 1979 (Trematoda), *Gyrodactylus funduli* Hargis, 1955 (Monogenea) and *Raphidascaris* sp. Railliet and Henry, 1915 (Nematoda) are reported from new host for the first time in Egypt. The first from the intestine of *Mugil cephalus* caught from Barseek fish farm, the second from *Tilapia nilotica* caught from fish from Maryut, and the third from the intestine of *Marone labrax* caught from Lake Edku. Both trematodes *Glossidium pedatum* Looss, 1899; and *Acanthostomum spiniceps* Looss, 1900 are recorded from new hosts and localities in Egypt. The first from *Clarias lazera* caught from Lake Nasser and the second from *Morone labrax* caught from Lake Edku. Also the nematodes *Cucullanus barbi* Papermo, recorded from new hosts in Egypt. The first from *Lates niloticus* and *Mormyrus kannume* caught from Lake Nasser, and the second from *Clarias lazera, Bagrus bayad, Barbus bynni, Mormyrus Kannume* and *Synodontis schall* from Lake Nasser.

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TABLE (1)

THE RELATIVE INCIDENCE OF HELMINTH PARASITES IN ALL FISHES EXAMINED

Fishes	Total Ex. No.	Total infected		Trematodes						Cestodes		Nematodes		Acanthocephala	
				Encys. meta.		Monogenea		Digenea							
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Mugil cephalus	350	232	66.28	(-)	0	-	0	232	66.28	-	0	-	0	3	0.85
Mugil cápito	350	255	72.85	(-)	0	-	0	255	72.85	-	0	-	0	-	0
Tilapia nilotica	50	12	24	(-)	0	7	14	-	0	-	0	-	0	5	10
Tilapia galilaea *	50	50	100	35	70	-	0	-	0	-	0	50	100	31	62
Clarias lazera *	50	46	92	46	92	-	0	16	32	11	22	30	60	-	0
Bagrus bayad	50	39	78	(-)	0	-	0	26	52	-	0	13	26	-	0
Barbus bynni	50	35	70	(-)	0	-	0	-	0	26	52	9	18	-	0
Lates niloticus	50	49	98	(-)	0	-	0	-	0	-	0	36	72	26	52
Synodontis schall	50	42	84	(-)	0	-	0	7	14	1	2	34	68	-	0
Schilbe mystus *	50	41	82	41	82	-	0	5	10	-	0	2	4	-	0
Mormyrus kannume	50	50	100	(-)	0	-	0	-	0	43	86	21	42	-	0
Morone labrax	50	29	58	(-)	0	-	0	28	56	-	0	1	2	-	0
Total	1200	880	73.33	122	81.33	7	0.58	569	47.41	81	6.75	196	16.33	65	5.41

* Only three species of fishes examined for encysted metacercariae .

A COMPARISON BETWEEN THE RESULTS OF 9 DIFFERENT SURVEYS ON THE INCIDENCE OF HELMINTH PARASITES IN FRESH WATER FISHES FROM VARIOUS AREAS IN EGYPT

TABLE (2)

Fishes	Authors	Localities	Total Ex.	Positive		Monogenea		Digenea		Cestodes		Nematodes		Acanthocephala	
			No.	No.	%	No.	%	No.	%	No.	%	No	%	No.	%
Tilapia galilaea	Wannas, 1977	Lake Nasser	40	40	100	-	0	25	62.5	---	0	0	20	40	100
	Hassan , 1980	Lake Nasser	200	100	50	-	0	-	0	-	0	22	46	06	43
	Abu Al-Hag, 1985	Nile in Sharkiya	10	-	0	-	0	-	0	-	0	-	0	-	0
	Al-Bassel , 1987	Lake Wadi Al-Raiyan	18	4	22.2	-	0	-	0	-	0	-	0	4	22.2
	Present work	Lake Nasser	50	50	100	-	0	-	0	-	0	50	100	31	62
Clarias lazera	Wannes , 1977	Lake Nasser	20	3	15	-	0	-	0	1	5	-	0	2	10
	Mohammed , 1978	Nile Near Cairo	24	20	81.3	-	0	20	81.3	-	0	-	0	-	0
	Hassan, 1980	Lake Nasser	50	41	82	-	0	22	44	31	62	3	6	-	0
	Sahlab , 1982	Lake Manzala	66	45	68.1	-	0	20	30.3	10	15.15	15	22.72	-	0
	Abu Al-Hag , 1985	Nile in Sharkiya	86	59	68.6	-	0	49	56.9	5	12.7	5	12.7	-	0
	Al-Bassel, 1987	Lake Wadi Al-Raiyan	86	15	17.4	-	0	15	17.4	-	0	-	0	-	0
	Negm El-Din,1987	Nile in Delta	166	142	85.5	-	0	137	82.5	27	16.26	67	40.36	-	0
	Abu El-Ez, 1988	Nile in Giza	111	99	89.19	-	0	84	75.68	36	32.43	44	39.64	-	0
	Present work	Lake Nasser	50	46	92	-	0	16	32	11	22	30	60	-	0
Bagrus bayad	Wannas , 1977	Lake Nasser	45	45	100	-	0	40	88.8	-	0	-	0	5	11.1
	Hassan, 1980	Lake Nasser	150	110	73.3	-	0	100	66.6	-	0	64	42.6	-	0
	Sahlab, 1982	Lake Manzala	72	20	27.7	-	0	20	27.7	-	0	-	0	-	0
	Abu Al-Haq, 1985	Nile in Sharkiya	225	206	80.7	-	0	206	80.7	-	0	-	0	-	0
	Al Bassel , 1987	Lake Wadi Al-Raiyan	30	7	23.3	-	0	7	23.3	-	0	-	0	-	0
	Negm El-Din, 1987	Nile in Delta	73	53	72.6	-	0	51	69.86	-	0	11	15.07	-	0
	Abu El-Ez, 1988	Nile in Giza	101	75	74.2	-	0	72	71.29	-	0	13	12.87	-	0
	Presnt work	Lake Nasser	50	39	78	-	0	26	52	-	0	13	26	-	0
Barbus bynni	Wannas, 1977	Lake Nasser	60	55	91.6	-	0	32	53	50	83.3	-	0	-	0
	Hassan , 1980	Lake Nasser	100	66	66	-	0	38	38	54	54	7	7	-	0
	Abu Al-Hag, 1985	Nile in Sharkiya	10	2	20	-	0	-	0	-	0	2	20	-	0
	Al-Bassel, 1987	Lake Wadi Al-Raiyan	30	4	13.3	-	0	-	0	4	13.3	-	0	-	0
	Present work	Lake Nasser	50	35	70	-	0	-	0	26	52	9	18	-	0
Tilapia nitotica	Wannas , 1977	Lake Nasser	60	58	96.6	-	0	20	33.3	-	0	10	16.6	58	96.6
	Hassan, 1980	Lake Nasser	300	140	46.6	-	0	-	0	-	0	117	39	137	45.6
	Sahlab , 1982	Lake Manzala	111	48	43.2	-	0	-	0	-	0	-	0	48	43.2
	Abu Al-Hag ,1985	Nile in Sharkiya	20	1	5	-	0	1	5	-	0	-	0	-	0
	Al-Bassel , 1987	Lake Wadi Al-Raiyan	124	40	32,2	-	0	-	0	-	0	-	0	40	32.2
	Negm El-Din, 1987	Nile in Delta	232	81	34.9	-	0	-	0	-	0	-	0	81	34.9
	Present work	Fish farm Maryut	50	12	24	7	14	-	0	-	0	-	0	5	10
Synodontis schall	Abu El-Ez, 1988	Nile in Giza	72	45	62.5	-	0	35	48.61	30	41.67	6	8.33	-	0
	Present work	Lake Nasser	50	42	84	-	0	7	14	1	2	34	68	-	0
Lates niloticus	Abu El-Ez, 1988	Nile in Giza	87	56	64.37	-	0	-	0	-	0	21	24.14	44	50.57
	Present work	Lake Nasser	50	49	98	-	0	-	0	-	0	36	72	26	52

TABLE (3)

A COMPARISON BETWEEN THE INCIDENCE OF INFECTIONS IN ALL FISHES CAUGHT FROM DIFFERENT LOCALITIES

Fishes	Localities	Habitat	Total examined	Total infected	
			No.	No.	%
Mugil cephalus	Lake Qarun	Saline water	150	98	65.33
	Lake Edku	Brackish water	50	41	82
	Fish farm Maryut	Brackish water	50	47	94
	Fish farm Al-Rasswa	Saline water	50	28	56
	Fish farm Barseek	Brackish water	50	18	36
Mugil capito	Lake Qarun	Saline water	150	108	72
	Lake Edku	Brackish water	50	43	86
	Fish farm Maryut	Brackish water	50	50	100
	Fish farm Al-Rasswa	Saline water	50	31	62
	Fish farm Barseek	Brackish water	50	23	46
Tilapia nilotica	Fish farm Maryut	Brackish water	50	12	24
Tilapia galilaea	Lake Nasser	Fresh water	50	50	100
Clarias lazera	Lake Nasser	Fresh water	50	46	92
Bagrus bayad	Lake Nasser	Fresh water	50	39	78
Barbus bynni	Lake Nasser	Fresh water	50	35	70
Lates niloticus	Lake Nasser	Fresh water	50	49	98
Syncdontis schall	Lake Nasser	Fresh water	50	42	84
Schilbe mystus	Lake Nasser	Fresh water	50	41	82
Mormyrus kannume	Lake Nasser	Fresh water	50	50	100
Morone labrax	Lake Edku	Barckish water	50	29	58
Total			1200	860	73.33

TABLE (4)

A COMPARISON BETWEEN THE INCIDENCE OF HELMINTH PARASITES IN FISHES FROM DIFFERENT LOCALITIES

Fishes	Localities	Trematodes		Cestodes	Nematodes	Acantho-cephala
		Monogenea %	Digenea %	%	%	%
Mugil cephalus	Lake Qarun	0	65.33	0	0	0
	Lake Edku	0	82	0	0	6
	Fish farm Maryut	0	94	0	0	0
	Fish farm Al-Rasswa	0	56	0	0	0
	Fish farm Barseek	0	36	0	0	0
Mugil capito	Lake Qarun	0	72	0	0	0
	Lake Edku	0	86	0	0	0
	Fish farm Maryut	0	100	0	0	0
	Fish farm Al-Rasswa	0	62	0	0	0
	Fish farm Barseek	0	46	0	0	0
Tilapia nilotica	Fish farm Maryut	14	0	0	0	10
Tilapia galilaea	Lake Nasser	0	0	0	100	62
Clarias lazera	Lake Nasser	0	32	22	60	0
Bagrus bayad	Lake Nasser	0	52	0	26	0
Barbus bynni	Lake Nasser	0	0	52	18	0
Lates niloticus	Lake Nasser	0	0	0	72	52
Synodontis schall	Lake Nasser	0	14	2	68	0
Schilbe mystus	Lake Nasser	o	10	o	4	0
Mormyrus kannume	Lake Nasser	0	0	86	42	0
Morone labrax	Lake Edku	0	56	0	2	0

TABLE (5)

A COMPARISON BETWEEN THE INCIDENCE OF HELMINTH GENERA IN FISHES FROM SIX LOCALITIES

Fishes	Localities	Examined No.	Infected No.	Infected %	Helminth parasites genera
Mugil cephalus	Lake Qarun	150	98	65.33	Saccocoelium (T)
			39	26	Lecithobotrys (T)
			53	35.33	Haploporus (T)
			98	65.33	Haplosplanchnus (T)
	Lake Edku	50	41	82	Saccocoelium (T)
			8	16	Dicrogaster (T)
			41	82	Haplosplanchnus (T)
			3	6	Neoechinorhynchus (A)
	Fish farm Maryut	50	47	94	Saccocoelium (T)
			5	10	Saccocoelioides (T)
			40	80	Dicrogaster (T)
			47	94	Haplosplanchnus (T)
	Fish farm Al-Rasswa	50	28	56	Saccocoelium (T)
			20	40	Saccocoelioides (T)
			18	36	Haplosplanchnus (T)
	Fish farm Barseek	50	11	22	Saccocoelium (T)
			5	10	Dicrogaster (T)
			2	4	Haplosplanchnus (T)
Mugil capito	Lake Qarun	150	108	72	Saccocoelium (T)
			45	30	Lecithobotrys (T)
			66	44	Haploporus (T)
			5	3.33	Unisaccus (T)
			3	2	Neosaccocoelium n.gen.(T)
			108	72	Haplosplanchnus (T)
	Lake Edku	50	43	86	Saccocoelium (T)
			10	20	Saccocoelioides (T)
			13	26	Dicrogaster (T)
			43	86	Haplosplanchnus (T)
	Fish farm Maryut	50	50	100	Saccocoelium (T)
			8	16	Saccocoelioides (T)
			12	24	Dicrogaster (T)
			50	100	Haplosplanchnus (T)
	Fish farm Al-Rasswa	50	31	62	Saccocoelium (T)
			3	6	Saccocoelioides (T)
			21	42	Haplosplanchnus (T)
	Fish farm Barseek	50	15	30	Saccocoelium (T)
			5	10	Dicrogaster (T)
			3	6	Haplosplanchnus (T)
Tilapia nilotica	Fish farm Maryut	50	7	14	Gyrodactylus (M)
			5	10	Acanthosentis (A)
Tilapia galilaea	Lake Nasser	50	50	100	Contracaecum (N.L)
			31	62	Acanthosentis (A)
Clarias lazera	Lake Nasser	50	1	2	Astiotrema (T)
			1	2	Glossidium (T)
			14	28	Orientocreadium (T)
			11	22	Polyonchobothrium (C)
			27	54	Contracaecum (N.L.)
			3	6	Procamallanus (N)

TABLE (5) Continued

Fishes	Localities	Examined No.	Infected Fish No	%	Helminth parasites Genera
Bagrus bayad	Lake Nasser	50	26	52	Acanthostomum (T)
			9	18	Contracaecum (N.L.)
			4	8	Rhabdochona (N)
Barbus bynni	Lake Nasser	50	26	52	Bothriocephalus (C)
			9	18	Contracaecum (N)
Lates niloticus	Lake Nasser	50	33	66	Contracaecum (N.L.)
			3	6	Cucullanus (N)
			26	52	Paragorgorhynchus (A)
Synodontis schall	Lake Nasser	50	7	14	Sandonia (T)
			1	2	Wenyonia (C)
			27	54	Citharinella (N)
			7	14	Contracaecum (N.L.)
Schilbe mystus	Lake Nasser	50	5	10	Haplorchoides (T)
			2	4	Contracaecum (N.L.)
Mormyrus kannume	Lake Nasser	50	43	86	Proteocephalus (C)
			5	10	Cucullanus (N)
			16	32	Contracaecum (N.L.)
Morone labrax	Lake Edku	50	1	2	Bucephalus (T)
			27	54	Acanthostomum (T)
			1	2	Raphidascaris (N)

(M) Monogenea

(T) Trematoda

(C) Cestoda

(N) Nematoda

(N.L) Nematode larvae

(A) Acanthocephala

TABLE (6)

A COMPARISON BETWEEN SINGLE , DOUBLE , TRIPLE AND QUADRUPLE HELMINTH INFECTIONS IN ALL FISHES EXAMINED

Fishes	Localities	Single		Double		Triple		Quadruple	
		No.	%	No.	%	No.	%	No.	%
Mugil cephalus	Lake Qarun	--	0	6	4	92	61.33	--	0
	Lake Edku	--	0	30	60	11	22	--	0
	Fish farm Maryut	--	0	7	14	35	70	5	10
	Fish farm Al-Rasswa	8	16	2	4	18	36	--	0
	Fish farm Barseek	18	36	--	0	--	0	--	0
Mugil capito	Lake Qarun	--	0	42	28	13	8	53	35.33
	Lake Edku	-	0	30	60	3	6	10	20
	Fish farm Maryut	-	0	38	76	4	8	8	16
	Fish farm Al-Rasswa	10	20	18	36	3	6	--	0
	Fish farm Barseek	23	46	--	0	--	0	--	0
Tilapia nilotica	Fish farm Maryut	12	24	--	0	--	0	--	0
Tilapia galilaea	Lake Nasser	19	38	31	62	--	0	--	0
Clarias lazera	Lake Nasser	18	36	3	6	11	22	--	0
Bagrus bayad	Lake Nasser	39	78	--	0	--	0	--	0
Barbus bynni	Lake Nasser	35	70	--	0	--	0	--	0
Lates niloticus	Lake Nasser	36	72	13	26	--	0	--	0
Synodontis schall	Lake Nasser	42	84	--	0	--	0	--	0
Schilbe mystus	Lake Nasser	7	14	--	0	--	0	--	0
Mormyrus kannume	Lake Nasser	36	72	14	28	--	0	--	0
Morone labrax	Lake Edku	29	58	--	0	-	0	--	0

TABLE (7)

THE INCIDENCE OF DOUBLE, TRIPLE, AND QUADRUPLE INFECTIONS OF HELMINTH GENERA IN FISHES

Fishes	Localities	Combinations of helminth genera	Infected Fish No.	Infected Fish %
Mugil cephalus	Lake Qarun	Saccocoelium + Haplosplanchnus	6	4
		Saccocoelium + Haplosplanchnus + Haploporus	53	35.33
		Saccocoelium + Haplosplanchnus + Lecithobotrys	39	26
	Lake Edku	Saccocoelium + Haplosplanchnus	30	60
		Saccocoelium + Haplosplanchnus + Neoechinorhynchus	3	6
		Saccocoelium + Haplosplanchnus + Dicrogaster	8	16
	Fish farm Maryut	Saccocoelium + Haplosplanchnus	7	14
		Saccocoelium + Haplosplanchnus + Dicrogaster	35	70
		Saccocoelium + Haplosplanchnus + Dicrogaster + Saccocoelioides	5	10
	Fish farm Al-Rasswa	Saccocoelium + Saccocoelioides	2	4
		Saccocoelium + Haplosplanchnus + Saccocelioides	18	36
Mugil capito	Lake Qarun	Saccocoelium + Haplosplanchnus	42	28
		Saccocoelium + Haplosplanchnus + Haploporus	13	8.66
		Saccocoelium + Haplosplanchnus + Haploporus + Neosaccocoelium n. gen.	3	2
		Saccocoelium + Haplosplanchnus + Haploporus + Unisaccus	5	3
		Saccocoelium + Haplosplanchnus + Haploporus + Lecithobotrys	45	30
	Lake Edku	Saccocoelium + Haplosplanchnus	30	60
		Saccocoelium + Haplosplanchnus + Dicrogaster	3	6
		Saccocoelium + Haplosplanchnus + Dicrogaster + Saccocoelioides	10	20
	Fish farm Maryut	Saccocoelium + Haplosplanchnus	38	76
		Saccocoelium + Haplosplanchnus + Dicrogaster	4	8
		Saccocoelium + Haplosplanchnus + Dicrogaster + Soccocoelioides	8	16
	Fish farm Al-Rasswa	Saccocoelium + Haplosplanchnus	18	36
		Saccocoelium + Haplosplanchnus + Saccocoelioides	3	6
Tilapia galilaea	Lake Nasser	Contracaecum larvae + Acanthosentis	31	62
Clarias lazera	Lake Nasser	Orientocreadium + Contracaecum larvae	3	6
		Orientocreadium + Contracaecum larvae + Polyonchobothroum	11	22
Lates niloticus	Lake Nasser	Paragorgorhynchus + Contracaecum larvae	13	26
Mormyrus kannume	Lake Nasser	Proteocephalus + Contracaecum larvae	14	28

TABLE (8)

THE INTENSITY OF HELMINTH INFECTIONS IN VARIOUS FISHES

Helminth genera	Hosts	Intensity of infe Range
Trematode genera :		
Gyrodactylus	Tilapia nilatica	10 - 50
Sacococoelium	Mugil capito, M . cephalus	5 - 135
Haplosplanchnus	Mugil capito, M . cephalus	12 - 85
Saccocoelioides	Mugil capito, M . cephalus	2 - 8
Dicrogaster	Mugil capito, M . cephalus	3 - 12
Haploporus	Mugil capito, M . cephalus	15 - 43
Lecithobotrys	Mugil capito, M . cephalus	9 - 29
Unisaccus	Mugil capito	1 - 3
Neosaccocoelium n.gen.	Mugil capito	1
Orientocreadium	Clarias lazera	1 - 4
Glossidium	Clarias lazera	1
Astiotrema	Clarias lazera	1
Acanthostomum	Bagrus Bayad , Morone labrax	7 - 13
Sandonia	Synodontis schall	2 - 4
Haplorchoides	Schilbe mystus	2 - 5
Bucephalus	Morone labrax	1
Cestode genera :		
Polyonchobothrium	Clarias lazera	2 - 5
Bothriocephalus	Barbus byuni	10 - 22
Wenyonia	Synodontis schall	1
Proteocephalus	Mormyrus kannume	4 - 13
Nematode genera :		
Contracaecum larvae	All fishes examind from Lake Nasser	1 - 25
Procamallanus	Clarias lazera	1 - 5
Rhabdochona	Bagrus bayad	2 - 6
Cucullanus	Lates niloticus, Mormyrus kannume	1 - 3
Citharinella	Synodontis schall	5 - 15
Raphidascaris	Morone labrax	1
Acanthocephala genera :		
Acanthosentis	Tilapia nilotica , T. galilaea	3 - 8
Paragorgorhynchus	Lates niloticus	1 - 7
Neoechinorhynchus	Mugil cephalus	1

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حصر الديدان الطفيلية التى تصيب الأسماك الشائعة فى بعض مناطق المياة الداخلية فى مصر

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تم حصر الديدان الطفيلية ونسبة اصابتها وانتشارها فى ١٢٠٠ سمكه تنتمى الى ١٠ أجناس و١٢ نوع من ستة مناطق مختلفة من المياه الداخلية فى مصر , وقد سجلت اصابة جميع أنواع الأسماك بالديدان الطفيلية .

وجد أن ٨٨٠ سمكة من الأسماك التى تم فحصها بنسبة (٧٣ر٣٣٪) تأوى نوع واحد أو أكثر من الطفيليات , وكانت نسبة اصابة الأسماك بالديدان الطفيلية فى المناطق الست هى : ٨٨٪ , ٧٥ر٣٣٪, ٧٢ر٦٦٪, ٦٨ر٦٦٪, ٥٩٪ و ٤١٪ فى أسماك بحيرة ناصر , بحيرة أدكو , مزرعة مريوط السمكية , بحيرة قارون , مزرعة السوة , ومزرعة برسيق على التوالى .

كانت نسبة الاصابة فى الأسماك التى تم فحصها بكل من الميناسركاريا والمتحوصلة , التريماتودا وحيدة الجيل , التريماتودا ثنائية الأجيال , السستودا النيماتودا والاكانثوسفالا هى : ٨١ر٣٣٪, ٥٨٪، ٤٧ر٤١٪, ٧٥ر٦٪, ٣٣ر١٦٪, ٤١ر٥٪ على التوالى .

وجد جنس واحد جديد بالاضافة الى ثمانية أنواع جديده من التريماتودا ثنائية الأجيال لأول مره وذلك فى أسماك البورى الأصيل والطوبار , والجنس الجديد هو : نيوساكوسيليم ايجيبتياكس , والأنواع الجديده تشمل : ساكوسيليم بورسعيدينيس , ساكوسيليم سعودى , ساكوسيلويدز الجندى, هابلوبورسى لوسى , يونساكس النفارى , دكروجاستر مريوتينسس , هابلوسبلانكس أدكونيسس وبيوسيفالسم نجاتى . كما سجلت بعض الديدان الطفيلية من عوائل سمكية جديدة لأول مرة فى مصر .