

Morphological Studies On Some Digenetic Trematodes In Marine Fishes

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ABSTRACT

The present investigation was carried out on 441 marine fishes. They were represented as 64 Red porgy (*Pagrus pagrus*), 34 Mearge (*Argyrosomus regius*), 20 Sea bass (*Morone labrax*), 58 Red mullets (*Mullus surmuletus*), 29 Narrow-barred Spanish mackerel (*Scomberomorus commerson*), 100 Mediterranean sand smelt (*Atherina*), 43 Brushtooth lizasrdfish (*Saurida undosquamis*), 9 Kawakawa (*Euthynnus affinis*), 48 Sardinellas nei (*Sardinella spp.*), 36 Mediterranean horse mackerel (*Trachus mediterraneus*) were collected from Suez Canal area (Suez and Ismailia Provinces) during the period extended from April 2006 till March 2007. The total infection rate of trematodes was 32.65%. The highest prevalence rate of trematodes infection was recorded in *Atherina* 80% followed by *Argyrosomus regius* 61.76%, *Morone labrax* 55%, *Trachus mediterraneus* 33.33%, *Pagrus pagrus* 26.56% and *Scomberomorus commerson* 10.34% while, *Mullus surmuletus*, *Saurida undosquamis*, *Euthynnus affinis* and *Sardinella spp.* were free from infection with trematode parasites. Five species of the trematodes belonging to family Hemiuridae (*Erilepturus lemeriensis*, *Lecithocladium excisum*, *Allostomachicolina secundus*, *Lethadena profunda* and *Dinosoma rubrum*) three species belonging to family Opcoelidae (*Podocotyle parupenai*, *Podocotyle angulata* and *Cainocreadoides serran*i) and one species belonging to family Opistholebetidae (*Propychnadenoids secundus*). The morphological characteres of the isolated nine species of trematodes were described.

INTRODUCTION

Fish is considered as one of the most promising source for cheap, easily digestible and palatable animal protein of high biological value due to its content of nearly all essential amino acids necessary for human health (1).

Fish are wild animals so people have little or no control over their environment, this makes it difficult to avoid an occasional encounter with a naturally occurring parasitic worm (2).

In Egypt, most studies of fish parasitic diseases have been conducted on freshwater fishes. On the other hand, little studies were performed on the marine fishes (3-11). So it is important to throw the light on parasites of marine fishes in Egypt, concerning their prevalence, taxonomy and morphology.

MATERIAL AND METHODS

The trematodes described in this paper were collected from marine fishes obtained

from Suez Canal area (Suez and Ismailia Provinces) during the period extended from April 2006 till March 2007. The collected trematodes were fixed in 10% formal saline under the slight pressure of a cover glass for 24 hours, and then the specimens were stored in 5% formalin over night. The collected worms washed several times in tap water and transferred to distilled water for 30-60 minutes. After that they were stained with acetic acid alum carmine, dehydrated in graded series of ethyl alcohol, cleared with clove oil, then xylene and mounted in Canada balsam (6,12).

RESULTS

Examination of 441 marine fishes at Suez Canal area (Suez and Ismailia Provinces) during the period extended from April 2006 till March 2007; They were represented as 64 *Pagrus pagrus*, 34 *Argyrosomus regius*, 20 *Morone labrax*, 58 *Mullus surmuletus*, 29 *Scomberomorus commerson*, 100 *Atherina*, 43 *Saurida undosquamis*, 9 *Euthynnus affinis*, 48

Sardinella spp. and 36 *Trachus mediterraneus*. They revealed that 32.65% were infected with trematodes. The highest prevalence rate of trematodes infection was recorded in *Atherina* 80% followed by *Argyrosomus regius* 61.76%, *Morone labrax* 55%, *Trachus mediterraneus* 33.33%, *Pagrus pagrus* 26.56% and *Scomberomorus commerson* 10.34% while, *Mullus surmuletus*, *Saurida undosquamis*, *Euthynnus affinis* and *Sardinella spp.* were free from infection with trematode parasites. Taxonomy and morphological description of the detected parasites will be denoted as follow:-

Phylum: Platyhelminthe

Gegenabaur, 1859.

Class: Trematoda

Rudolphi, 1808.

Order: Digenea

Van Benden, 1858.

Family: Hemiuridae

1- Genus: *Erilepturus*

Erilepturus lemeriensis Tubangui and Masilungan, 1935.

Host: *Argyrosomus regius*

Habitat: Stomach

Fig. A

Description: The body was elongate, narrow, cylindrical and not plicated with ecsoma posteriorly. The body measured 5.7 – 8.1 mm long and 0.94 – 1.48 mm wide. Ecsoma length was 0.98–1.2mm. The oral sucker was anteriorly situated and sub-terminal, small and measured 0.26 – 0.47 mm long and 0.19 – 0.36 mm wide. The prepharynx was absent, the pharynx was well developed and measured 0.78 – 1.52 mm in diameter, followed by very short oesophagus. The intestinal caeca were simple extending back till the end of ecsoma. The ventral sucker was large, well developed, nearly spherical, situated at about the middle of the body length and measured 0.63 – 0.79 mm in diameter. The testes were ovoid and lay obliquely postacetabular within the intercecal space. The anterior testis measures 0.21 – 0.32mm long and 0.22 – 0.29 mm wide and the posterior one measures 0.22 – 0.35 mm long and 0.19 – 0.3 mm wide. The ovary was smooth, nearly median and post-testicular in situation and measured 0.18 -0.26 mm long

and 0.15 – 0.18 mm wide. The uterus was coiled extending backward and enter ecsoma, then directed anteriorly to the genital pore. The common genital pore was posterior to the pharynx. The vitellaria lie directly behind the ovary and consisted of seven digitiform lobes divided into three and four on each side. The worm was characterized by the presence of weak excretory arms uniting at the dorsal side of the pharynx. The eggs smooth, ovoid, yellowish in colour and measured 19 - 24 × 9 - 12 μ.

2-Genus: *Lecithocladium*

Lecithocladium excisum Rudolphi, 1819 & Lühe, 1901.

Host: *Trachus mediterraneus*

Habitat: Intestine.

Fig. B

Description: The body was elongated, and distinguished into two regions, soma and ecsoma. The soma was longer than the ecsoma. The total body length was measured 6.37– 8.98 mm long and 0.71 – 0.81mm wide. The oral sucker was terminal, cup-shaped, larger in size than ventral one and measured 0.64 – 0.79 mm long and 0.73 – 0.85 mm wide. The pharynx was elongated, muscular and measured 0.61 – 0.74 mm long and 0.63 – 0.8 mm wide. The oesophagus was very short and the intestinal caeca were terminating near the posterior end of the body. Acetabulum was prominent near the anterior extremity and measured 0.49 -0.63 mm long and 0.51– 0.6 mm wide. Testes were tandem, situated anterior to mid-body. The anterior testis measured 0.2 – 0.36 mm long and 0.15– 0.28mm wide, while the posterior one measured 0.19-0.34 mm long and 0.11 – 0.25 mm wide. The ovary was oval in shape, situated post-testicular and measured 0.14– 0.31mm in diameter. The vitellaria were post-ovarian consisting of seven long winding tubules, the uterus was extending into tail which measured 2.3–5.1 mm in length. The eggs were numerous and small in size. The excretory pore was terminal.

3-Genus: *Allostomachicolina*

Allostomachicolina secundus Srivastava, 1937.

Host: *Morone labrax*

Habitat: Stomach

Fig. C

Description: The body was long, subcylindrical, muscular and it measured 7.9 - 12.4 mm long and 0.61- 0.94 mm wide. The oral sucker was well developed, subterminal, rounded and measured 0.28 - 0.65 mm in length and 0.26 - 0.62 mm in width, prepharynx was very short. The pharynx was ovoid and measured 0.095 - 0.17 mm and 0.083 - 0.15. The oesophagus was short and the intestinal ceca were terminating to posterior extremity. Acetabulum located anteriorly, protuberant, muscular and measured 0.69-0.71 × 0.58 - 0.44 mm. The testes were smooth, ovoid, and nearly tandem in position, the anterior testis measured 0.32-0.39 × 0.27- 0.29 mm, while the posterior testis measured 0.29- 0.3 × 0.24 - 0.27 mm. The ovary was coarsely lobed, situated anteriolateral to anterior testis and measured 0.26 - 0.29 × 0.19 - 0.22 mm. The uterus winding largely in intercecal field and occupying most of the body. The vitellaria were well developed composed of large numerous follicles which overlapping caeca. Eggs were oval in shape, yellowish in colour and it measured 59 - 62 × 32 - 45 μ.

4-Genus: *Lethadena*

Lethadena profunda

Host: *Atherina*

Habitat: Intestine

Fig. D

Description: The body was elongated and plicated with ecsoma posteriorly. It measured 2.01 - 2.04 mm long and 0.54 - 0.56 mm wide. Ecsoma length was 0.25- 0.27 mm. The oral sucker was anteriorly situated, subterminal and measured 0.15-0.17 × 0.13-0.14 mm, prepharynx was absent. The pharynx measured 0.04 - 0.05 mm in diameter. The oesophagus was measured 0.06-0.08 mm long. The acetabulum larger than oral one, muscular and measured 0.21-0.23 × 0.15-0.17 mm. The intestinal ceca were extending near to posterior of the body. The acetabulum was large, well developed and measured 0.21-0.24 × 0.16 - 0.18 mm. The testes were tandem, the anterior testis measured 0.22 - 0.24 × 0.15 - 0.16 mm

and the posterior testis was 0.19 - 0.21 × 0.16 - 0.18 mm. Ovary nearly median in middle third of body, was pretesticular in the right side and measured 0.15 - 0.17 × 0.11- 0.12 mm. The seminal vesicle was sac- like, posteriolateral to acetabulum and measured 0.39- 0.42 × 0.31 - 0.34 mm. The uterus was coiled extending backward but did not enter ecsoma. Genital pore was posterior to the bifurcation of the ceca. Eggs were numerous and measured 10 - 13 × 7- 9 μ.

5-Genus: *Dinosoma*

Dinosoma rubrum

Host: *Atherinidae*

Habitat: Intestine

Fig. E

Description: The body was small to medium sized and elongated but not plicated with ecsoma posteriorly. It measured 3.25 - 3.1 mm long and 0.34 - 0.37 mm wide. Ecsoma length was 0.74- 0.79 mm. The oral sucker was subterminal and measured 0.13- 0.15 × 0.11 - 0.13 mm, prepharynx was absent. The pharynx was well developed, muscular and measured 0.12-0.14 × 0.1 - 0.11 mm. The oesophagus was measured 0.07 - 0.08 mm long. The acetabulum larger than oral one, well developed and measured 0.27-0.29 × 0.23 - 0.25 mm. The intestinal ceca were simple, extending back till end of ecsoma and measured 0.29-0.32 × 0.2 - 0.29 mm. The two testes were rather similar, the anterior testis measured 0.34 - 0.29 × 0.28 - 0.17 mm and the posterior testis was 0.35 - 0.27 × 0.27 - 0.18 mm. The ovary was pretesticular in the middle and measured 0.27 - 0.31 × 0.25- 0.17 mm. The seminal vesicle was sac- like, posteriolateral to acetabulum and measured 0.42- 0.44 × 0.35 - 0.39 mm. The uterus was coiled extending backward but did not enter ecsoma. Genital pore was posterior to the pharynx. Eggs were numerous and measured 14 - 23 × 9 - 11 μ.

Family: *Opecoelidae*

Ozaki, 1925.

1-Genus: *Podocotyle*

Podocotyle

parupenai

Manter, 1963.

Host: *Pagrus pagrus*

Habitat: Intestine

Fig. F

Description: The body was smooth, nearly cylindrical and slightly rounded at posterior end. It measured 4 - 6.5 mm in length and 0.9 - 1.5 mm in width. The oral sucker was subterminal, slightly longer than broader and measured 0.24 - 0.29 × 0.22 - 0.26 mm. Prepharynx was very short and the pharynx was muscular, well developed and measured 0.14 - 0.19 × 0.13 - 0.17 mm. Esophagus was long and measured 0.7 - 0.11 mm in length. The intestinal ceca were terminating near posterior extremity.

Acetabulum protuberant and muscular wider than longer and measured 0.59 - 0.67 × 0.68 - 0.72 mm. The cirrus sac pre-acetabular almost straight and long extending back of acetabulum. The testes were ovoid, smooth, tandem in position, the anterior testis measured 0.27 - 0.31 × 0.23 - 0.25 mm and the posterior one measured 0.29 - 0.32 × 0.27 - 0.29 mm. The ovary was submedian immediately anteriolateral to anterior testis and measured 0.14 - 0.17 × 0.12 - 0.15 mm. The uterus occupied the area anterior to ovary and extending anterior to acetabulum. Vitellaria were well developed composed of large numerous follicles, over-lapping ceca, extending from posterior to acetabulum, interrupted by gonads and becoming more dense testicular. Eggs oval, yellowish in colour and measured 69 - 75 × 31 - 35 μ .

Genus: *Podocotyle*

Podocotyle angulata

Host: *Pagrus pagrus*

Habitat: Intestine.

Fig. G

Description: The body was oval, smooth, and rounded posteriorly. It measured 3.9-4.2 mm long and 0.96- 1.02 mm wide at acetabular level. Oral sucker subterminal, well developed and measured 0.31-0.34 × 0.19-0.22 mm. The prepharynx was very short. The pharynx was well-developed, muscular and measured 0.14-0.16×0.17-0.18 mm. The intestinal ceca were terminating near the posterior body margin extremity and covered by vitellaria. Acetabulum large, muscular, located in the anterior half of the body and measured 0.84 -

0.91×0.6 -0.67mm. The two testes were tandem in position and situated near the posterior end of the body, the anterior testis measured 0.24-0.3×0.2-0.22 mm and the posterior one measured 0.27-0.3×0.22-0.25mm. The cirrus sac was extended posteriorly to the acetabulum. The ovary was irregular in shape, lobulate (3-5 lobes), located anterior to the testes and measured 0.2-0.23 × 0.16-0.2 mm. The uterus occupied the area anterior to ovary and reaching anterior to acetabulum. Vitellaria were well developed, over-lapping ceca extend from pharynx till posterior end of the body. Eggs were oval, yellowish in colour and measured 54-58×37-51 μ .

2-Genus: *Cainocreadoides*

Cainocreadoides serrani

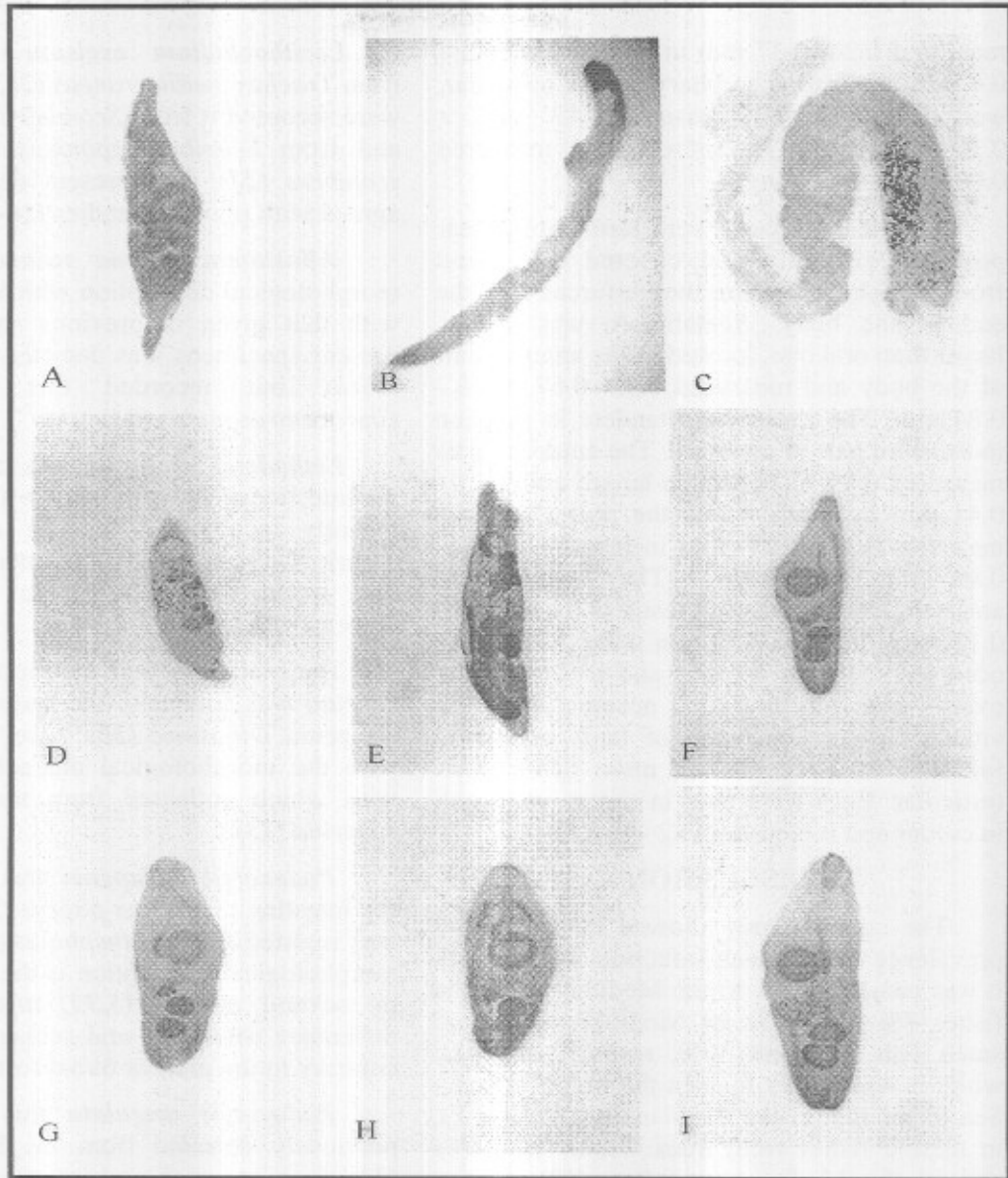
Nagaty, 1956.

Host: *Morone labrax*

Habitat: Intestine.

Fig. H

Description: The body was smooth, somewhat flattened dorso-ventrally, rounded anteriorly, nearly tapered posteriorly and measured 2.51 - 2.9 mm long and 0.67 - 0.73 mm as maximum width. The oral sucker was subterminal and measured 0.19× 0.21 mm in diameter, followed by elongated pharynx 0.2 - 0.22 mm long and 0.14-0.17 mm wide. The oesophagus was short bifurcated into simple ceca which terminate at the posterior part of the body. The acetabulum was large, well developed and situated just pre-equatorial and measured 0.38 - 0.41 mm long and 0.38 - 0.4 mm. The testes were incomplete overlapped each other, smooth situated at the posterior part of the body, the anterior testis measured 0.3-0.35 × 0.3-0.31 mm and the posterior one measured 0.29 - 0.3 × 0.27- 0.29 mm. The cirrus sac was claviform overlapped the anterior border of the acetabulum, the genital pore was median at the level of the intestinal bifurcation. The ovary was multi-lobed, with 4-7 lobes immediately pretesticular and measured 0.19 × 0.16 mm in diameter. Vitelline follicles extended from the posterior end of the body till the neck region. The uterus occupied the space between the ovary and the acetabulum, filled with oval golden yellow eggs 29 -37 × 21-26 μ .



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| A) <i>Erilepturus lemeriensis</i> (X 40) | B) <i>Lecithocladium excisum</i> (X 100) |
| C) <i>Allostomachicolina secundus</i> (X 40) | D) <i>Lethadena profunda</i> (X 100) |
| E) <i>Dinosoma rubrum</i> (X 40) | F) <i>Podocotyle parupenei</i> (X 40) |
| G) <i>Podocotyle angulata</i> (X 40) | H) <i>Cainocreadoides serrani</i> (X 40) |
| I) <i>Propycnadenoids secundus</i> (X 40) | |

Family: Opistholebetidae

Genus: *propycnadenoids*
Fischthal and kuntz, 1964.

Propycnadenoids
Hassanine, 1995.

Host: *Scomberomors commerson*

Habitat: Intestine.

Fig. I

Description: The body was elongated, flattened, and thick without spines and it measured 2.9 - 4.41 mm long and 1.31 - 1.5 mm wide. Numerous small parenchymal gland cells scattered in-between the oral and vitellaria. The oral sucker was well developed, subterminal, and nearly circular in shape and

secundus

measured 0.24- 0.37 mm in length and 0.36 – 0.4 mm in width. The pharynx was muscular, well developed and measured 0.13 -0.17 × 0.19 -0.22 mm. The oesophagus measured 0.02-0.03 mm in length.

The intestinal caeca were terminating near posterior extremity and covered by extend from oesophagus where they bifurcated to the end of the body. Acetabulum was strong, larger than oral one, located in the anterior half of the body and measured 0.52 -0.67 × 0.6 - 0.84 mm. The testes were tandem in position in the third part of the body. The anterior testis measured 0.29 -0.31 mm in length and 0.33 – 0.41 mm in width, while the posterior testis measures 0.31 - 0.37 mm in length and 0.4 - 0.48 mm in width. The ovary was anteriolateral to anterior testis and measured 0.11 mm long and 0.12 mm wide. The uterus occupied the area anterior and around to the ovary and reaching to acetabulum. The vitellaria were composed of large numerous follicles, which becoming more dense post-testicular. Eggs were oval in shape, yellowish in colour and it measured 32 -41 × 25 -28 μ .

DISCUSSION

The current study showed that, the total prevalence of digenean infection was 32.65% it was nearly similar to the Mediterranean Sea fishes (8) and (13) in Mediterranean sand smelt fish 31.4 and 30%, respectively (13); while it was higher than in the Mediterranean Sea fishes (5), in the Arabian Gulf fishes(7), in marine fishes from Suez Canal Area (14) and in the Mediterranean Sea (10) fishes 16.47, 11.7, 6.68 and 8%, respectively and lower than in which they were 70.5, 49.2 and 61.3% (11,15,16).

Erilepturus lemeriensis it recorded from *Argyrosomus regius* (17) from the intestine of freshwater fish (5,10,18-21). The same species were obtained from *Epinephalus gigas*, *Lutjanus carponotatus*, *Lutianus bohar*, *Epinephaelus chlorostigma* and *Morone labrax*, respectively (5, 9-21). The present morphological feature was in agreement with previous several studies (5, 19-23).

Lecithocladium excisum was detected from *Trachus mediterraneus* (24,25), and they were recorded it from *Scomber japonicus* (26) and from *Scomber japonicus* and *Scomber scombrus* (27). The present description was agreed with previous studies (26-28).

Allostomachicolina secundus (29) had morphological description which was identical with that given in previous study (30). The present specimens was detected from *Morone labrax* but recorded this worm from *Chirocentrus nudus* (31).

Lethadena profunda was collected from the intestine of *Atherina* this result as has been recently recorded (13). The morphological description and nearly the measurements of this worm were similar to that recently reported (13,30).

The morphological description *Dinosoma rubrum* was similar to the main characters of the genus *Dinosoma* (30). Also, it was similar with the morphological characters coincided with which collected from the intestine of *Atherina* (13).

Podocotyle parupenei was isolated from the intestine of *Pagrus pagrus* (5,32), while it was isolated from *Epinephalus gigas* (9). The morphological description is the same as cited by several authors (5,32) and with minor difference where the oral sucker was round in contrary to the present ovoid form (9).

Podocotyle angulata this species was previously detected from the European eels (33), from stomach and intestine of flatfishes *Platichthys flesus* and *Solea vulgaris* (34) and from *Gasterosteus aculeatus* (35). (The three-spine stickleback) on contrary it was collected from the intestine of *Pagrus pagrus*. The description of these trematodes was similar (36). But only differ in number of ovary lobes which was 3-4 lobes where in the present specimens were 3-5 lobes (36).

Cainocreadoides serrani (37) the morphological features was with the same fluke previously described (20), while the shape of the anterior or the posterior ends which might be due to relaxation or fixation

and number of the ovary lobes which were 4-9, 4-5 and 4 respectively (5,37). It was also recorded from the intestine of *Morone labrax* (38); however, it was recorded it from the intestine of *Serranus species* and *Lethrinus nebulosus* (37), and detected from *Serranus louti* (4) and collected from the intestine of *Scomberomors commerson* (5).

Propychnadenoids secundus the present description is similar to that previously described (10,20). This specimens was detected from the intestine of *Scomberomors commerson*. However, it was recorded it from the intestine of *Acanthopagrus bifasciatus* (20) and detected it from the stomach and intestine of *Morone labrax* (10).

REFERENCES

1. Harford, W. and Arlene, J. (1994): Parasitic worms of fish. Taylor & Francis Ltd. London.
2. Overstreet, R. M. (1993): In pathology of marine and estuarine organisms. Couch, J. A. and Fournie, J. W. (ed.), Parasitic diseases of fishes and their relationship with toxicants and other environmental factors. Adv. in Fish. Sci. 73.
3. Abdel-Hady, O. K. (1981): Comparative studies on some parasitic infection of fishes in fresh and polluted water sources. Ph. D. Thesis, (Parasitology). Fac. Vet. Med., Suez Canal Univ.
4. Abu El-Hag, S. T. (1990): Studies on the helminth parasites of some fishes from The Red Sea. Ph. D. Thesis, Fac. Sci., Zagazig Univ.
5. Raef, A. M. (1990): Some studies on the helminth parasites of marine fish. M. V. Sc. Thesis (Parasitology), Fac. Vet. Med., Zagazig Univ.
6. Raef, A. M. (1994): Role of marine fish in transmission of some parasites to animals and birds. Ph. D. Thesis (Parasitology), Fac. Vet. Med., Zagazig Univ.
7. Karadousha, M. M. (1991): Studies on parasites of some economically important fishes from Arabian Gulf region. Ph. D. Thesis, Zoology Dept., Fac. Sci., Suez Canal Univ.
8. Abd El-Rahman, A. E. M. (1995): Studies on the helminth parasites of some fishes from the Mediterranean Sea. M. Sc. Thesis, Fac. Sci., Zool. Dep., Zagazig Univ.
9. Tadros, S. W. A. (2004): Morphological and immunological studies on the helminth parasites transmitting between fish and birds Port Said Province. Ph. D. Thesis, (Parasitology), Fac. Vet. Med., Suez Canal Univ.
10. El-Lamie, M. M. M. (2007): Studies on parasitic diseases in some marine fishes. Ph. D. Thesis, Fish diseases and management Dept., Fac., Vet. Med., Suez Canal Univ.
11. El-Ashram, A. M. M. and Shagar, G.E. (2008): Studies on enteric parasitic diseases caused by prevailing helminthes among some marine fishes from the Red Sea. Abbassa Int. j. Aqua. (1b):415-444.
12. Beaver, P. C.; Jung, R. C. and Cupp, E. W. (1984): Clinical Parasitology 9th edition. Philadelphia: Lea and Febiger.
13. Amer, O. H.; El-Ashram A. M. M. and Shagar G. I. A. (2007): Studies on internal parasitic helminthes among wild Mediterranean sand smelt (*Atherina*) with a special reference to *Ligula intestinalis* infection in Egypt. Egypt. J. Aquat. Biol. & fish., Vol. 11, No. 3:723-735.
14. Youssef, E. M. and Derwa, H. I. (2005): Digenetic trematodes from some marine fishes from Suez canal area. Egypt. Vet. Med. Soc. J. 2(2) 346-353.
15. Alves, D. R., Luque, J. L. and Abdallah, V. D. (2003): Metazoan parasites of Chub mackerel, *Scomber japonicus* Houuttuyn (Osteichthyes: Scombridae), from the coastal zone of the State of Rio de Janeiro, Brazil. Revisla-Brasileria-de-Parasitologia-Veterinaria; 12(4):164-170.
16. Tavares, L. E. R., Bicudo, A. J. A. and Luque, J. L. (2004): Metazoan parasites of

- needlefish *Tylosurus acus* (Lacepede, 1803) (Osteichthyes: Belonidae) from the coastal zone of the State of Rio de Janeiro, Brazil. *Revisla-Brasileria-de-Parasitologia-Veterinaria*; 13(1):36-40.
17. **Tubangui, M. A. and Masilungan V. A. (1935):** Trematodes parasites of Philippine Vertebrates, VII : Additional records of new species. *Phil. J. Sci.*, 58 (4) 435-445.
18. **Tubangui, M. A. and Masilungan V. A. (1944):** Some trematode parasites of fishes in the collection of University of Philippines. *Phil. J. Sci.*, 76 (3) 57-65.
19. **Bray, R. A.; Cribb, T. H. and Barker S. C. (1993):** Hemuridae (Digenea) from marine fishes of the Great Barrier Reef, Queensland, Australia. *Sys. Phraseology*; 25 (1): 37-62.
20. **Hassanine, R. M. (1995):** Taxonomic and biological studies on some parasitic helminthes of certain fish species from the coasts of Southern Sinai (Red Sea). Ph. D. Thesis, Marine Science Dept., Fac. of Sci., Suez Canal Univ.
21. **Al-Mathal, E. M. (2001):** Six digenetic trematodes infecting the hamour fish (*Epinephelus chlorostigma*) in the Arabian Gulf, Saudi Arabia. *J. Egypt Soc. Parasitol.*; 31 (3):953-60.
22. **Manter, H. W. (1940):** Digenetic trematodes of fishes from Galapagos Island and the neighboring Pacific. *Rept. Allam. Hancock Pacific exp.*, 2 (14) 325-467.
23. **Manter, H. W. (1947):** Digenetic trematodes of marine fishes of Tortugas Florida. *Amer. Middle. Nat.*, 38 (2) 257-416.
24. **Rudolphi, C. A. (1819)** Entozoorum synopsis cuiusmodi mantissa duplex et indices locupletissimi. Berolini, X+811p.
25. **Lühe, M. (1901):** Über *Monostomum orbiculare*. *Ctbl. Bakt.* 30, 166. 177.
26. **Cisse, M. and Belghytic, D. (2005):** Helminths parasites of Chub mackerel *Scomber japonicus* (Houttuyn, 1782) from the harbour of Mehdiya-Kenitra (Atlantic Coast of Morocco). *Journal of Aquatic Sciences* Vol. 20, No. (1) 63-67.
27. **Ahmed, A. M. A. (2007):** Parasites of some imported fish. M. V. Sc. Thesis (Parasitology), Fac. Vet. Med., Zagazig Univ.
28. **Williams, E. H. and Bunkley-Williams, L. (1996):** Parasites of Offshore Big Game fishes of Puerto Rico and the Western Atlantic. Marine Science Dept. and Biology Dept., Puerto Rico Univ., Mayaguez PR, 383p.
29. **Srivastara, H. D. (1937):** New allocreadiids (Trematoda) from Indian marine food fishes. Part III. *Pedunculacetabulum, Pedicellata* n. sp. from the gut of *Chiloscyllium indicum* *Proc. 24th Indian Sci. Conger.*, 298.
30. **Yamaguti, S. (1958):** Systema Helminthum, Vol. I. The Digenetic Trematodes of Vertebrates. Part I and II. Interscience Publications, New York.
31. **Nahhas, F. M. and Sey, O. (2002):** Digenetic trematodes of marine fishes off the Coast of Kuwait, Arabian Gulf (Superfamily: Hemiuroidea). *Acta Zoologica Academiae Scientiarum Hungaricae* 48(1), pp.1.
32. **Manter, H. W. (1963):** Studies on digenetic trematodes of fish of Fiji III. Families: Lepocreasiidae, Opistholebetidae and Opicoelidae. *J. Parasit.*, 49: 99-113.
33. **Outeiral, S.; Álvarez, F.; Paniagua, E.; Leiro, J.; Sanmartin, M. L. (2001):** Digenetic parasites of the European eel from estuaries in North-West Spain. *Helminthologica*, 38,2:85-92.
34. **Alvarez, F.; Iglesias, R.; Paramá, A. I.; Leiro, J.; Sanmartin, M. L. (2002):** Abdominal macroparasites of commercially important flatfishes (Teleostei: Scophthalmidae,

- Pleuronectidae, Soleidae) in northwest Spain (ICES IXa). Aquaculture 213:31-53.
35. *Peddle, J. C. (2004):* Biodiversity and community ecology of the parasites of the three-spine stickleback, *Gasterosteus aculeatus*, in the southern Gulf of St. Lawrence. M. V. Sc. Thesis, Fac. Sci., New Brunswick Univ.
36. *Jones, A.; Bray, R. A. and Gibson, D. I. (2005):* Keys to trematoda. Volume 2. CABI Publishing, London U.K.523pp.
37. *Nagaty, H. F. (1956):* Trematodes of fishes from the Red Sea. Part 7 on two Gyliachenids and three Allocreadids including four new species. J. Parasitol., 42 (5): 523-527.
38. *Mahmoud, N. E. (1990):* Some studies on the helminth parasites of marine water fishes in Suez Canal Area. M. V. Sc. Thesis, (Parasitology).

الملخص العربي

دراسات مورفولوجية على بعض أنواع التريماتودا ثنائية العائل في بعض الأسماك البحرية

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المعمل المركزي لبحوث الثروة السمكية - مركز البحوث الزراعية - وزارة الزراعة**

أجريت هذه الدراسة على عدد 441 من الأسماك البحرية (64 مورجان، 34 لوت، 20 قاروص، 58 بربوني، 29 دراك، 100 بساريا، 34 مكرونة، 9 بلاميطة، 38 سردين، 36 باغة) حيث تم تجميع العينات من منطقة قناة السويس (محافظة السويس و الأسماعيلية) في الفترة منذ أبريل 2006 حتى مارس 2007.

وأوضحت الدراسة أن نسبة الإصابة العامة بالديدان المفلطحة كانت 32,65% حيث سجلت أعلى معدل إصابة في أسماك البساريا، اللوت، القاروص، الباغة، المورجان و الدراك بنسبة (80، 76، 61، 55، 33، 33، 26، 56 و 10، 34%) على التوالي بينما كانت الأسماك الأخرى خالية من الإصابة.

و قد تم تصنيف هذه الديدان و وجد انها كالنحو الآتي :-

- خمسة أنواع تنتمي لعائلة هيموريدي (ايريلبترس لميرنسس، ليسيثوكلاديم اكسيريم، الوستوماكولينا سيكاندس، ليتادينا بروفيندا، دينوسوما ريبيرام).

- ثلاثة أنواع تنتمي لعائلة أوكيوليدي (بودوكوتيل بريبي، بودوكوتيل انجيلواتا، كياتوكريديديس سيراني).

- نوع ينتمي لعائلة أوثوليبيتيدي (برويكنادينويدس سيكاندس).