Insights on the Most Prevailing Digeneasis and Nematodiasis in Some Marine Fish in Ismailia Governorate

Eissa I.A.M.*, Radwa Gaafar, Mona Abdelwahab**, Amina Dessouki*** and Maather El-Lamie***

**Dept. of Fish diseases and Management, Fac. of Vet. Medecine, Suez Canal Univ.*

***Animal Health Research Institute, Ismailia branch.*

****Dept. of Pathology, Fac. of Vet. Medecine, Suez Canal Univ.*

Abstract:

A total of (400) marine fish of five species (100 of *Alepes djedaba*, 100 *Dicentrarchus labrax*, 100 *Argyrosomus regius*, 40 *Saurida undosquamis* and 60 *Siganus revulatus*) of different body weights and lengths were collected in different seasons from Ismailia Governorate from April 2018 to December 2019. The examined fish showed no pathognomonic clinical abnormalities and were apparenently normal. Some *Argyrosomus regius* infested with digenea showed abdominal distention, palness and emaciation. Affected *Dicentrarchus labrax* with digeneaniasis showed hemorrhagic areas on operculum, abrasion, ulcerations of fins and abdominal distention. On the other hand, liver was hemorrhagic and fatty in some examined *Argyrosomus regius*, slight marbling of gills with excessive mucus secretion, and slight abdominal bulging were also recorded. The total prevalence of digenean and nematode infestations was 18.75%. The highest percentage was in *Saurida undosquamis* 30% followed by *Dicentrarchus labrax* 20%, *Alepes djedaba* was 19%, 17% in *Argyrosomus regius* and then *Siganus revulatus* 11.66%. The histopathological alterations were recorded and discussed.

Key words: Marine fish, , *Erilepturus tiegsi, Erilepturus lemeriensis , Acanthostomum spinices , Sclerodistomum* sp, *Hysterothylacium aduncum, Procamallanus inopenatus.*

Introduction:

Today, with the knowledge that fish is an excellent, primary source of protein for human in many parts of the world, and this is especially true in most developing countries as it is the cheapest highly nutritious food products ***(Woo, 2006)*** , global seafood consumption is growing

gradually, as there are varieties of seafoods, including raw or undercooked fish dishes ***(Shamsi, 2019)***.

Fish parasitic diseases are a concern as they frequently cause the host's immune system to weaken, thus increasing their susceptibility to secondary infections, resulting in nutritional devaluation of fish and associated economic losses ***(Onyedineke et al., 2009).***

Helminthes are among the most important parasites, they include nematodes, trematodes, cestodes and acanthocephalans which affecting both wild and cultured marine fishes ***(Hussen et al., 2012).***

The clinical picture of infested fish with internal parasitic diseases showed no pathognomonic abnormalities on the external body surface except emaciation. Postmortem examination revealed anemic, enlarged and congested internal organs ***(Ibtsam, 2004).*** The infected fish by parasites have clinical signs as anemia, weakness, severe emaciation due to the absorption of a considerable quantity of nutritive substances from host through their body surfaces ***(Banerjee et al., 2017).*** Some infested fish showed sluggish movement, loss of condition with paler coloration and imbalanced swimming ***(Eissa et al., 2012).***

The present study was aimed to investigate the most prevailing digeneasis and nematodiasis affecting some marine species in Ismailia province and their clinical picture along with the total and seasonal prevalence of these diseases with recording the histopathological alterations due to them.

Material and Methods:

A. <u>Fish:</u>

A total of (400) marine fish of five species (100 of *Alepes djedaba,*100 *Dicentrarchus labrax,* 100 *Argyrosomus regius,* 40 *Saurida undosquamis* and 60 *Siganus revulatus*) of different body weights and lengths were collected in different seasons from Ismailia Governorate from April 2018 to December 2019. The fishes were obtained by the aid of fishermen and transported immediately in polyethylene bags containing 1/3 of its volume water where the remaining volume will be filled with air. Identification of marine fish species were according to ***Randall (1983)***.

B. <u>Clinical Examination:</u>

Firstly, body weights and total lengths of the examined fishes were documented, and then clinical examination was done on the live and freshly dead ones. Fish specimens were grossly examined for detection of any clinical abnormalities according to ***Amlacker (1970).***

C. Postmortem Examination:
Postmortem examination was performed according to ***Lucky (1977).***

D. Parasitological Examination :
Fish specimens was examined macroscopically and microscopically for the presence of internal parasites as soon as possible according to ***Noga (2010).***

E. Permanent Slides Preparations and Staining:
Digenetic trematodes: Adult fluke obtained from intestines and stomach were placed into test tubes containing distilled water and with vigorous shaking, worms were washed , relaxed and be ready for fixation by using 5% neutral buffered formalin for 24 hours, then preserved in vials containing 70% ethyl alcohol and stained with Semichon's acetocarmine according to ***Lucky (1977).***

Nematodes: Collected nematodes from stomach and intestine were washed in saline, then relaxed and fixed in hot alcohol-glycerin 5% until all alcohol evaporated and the specimen remained in nearly absolute glycerin and processed according to ***Meyer and Olsen (1992)***.

F. Histopathological Examination:
Small specimens from organs with macroscopic lesions (intestine, stomach, spleen and liver) were fixed in 10% neutral buffered formalin for 48 hrs., dehydrated in serial grades of ethyl alcohol (70, 80, 90 and 100%) for 1 hr., prepared and stained with Hematoxylin and Eosin (H&E) according to ***Roberts (2001).***

Results:

A. Clinical Examination:
Most of the examined fishes showed no pathognomonic clinical abnormalities and were apparently normal. Some *Argyrosomus regius* infested with digenetic trematodes showed abdominal distention, paleness and emaciation (**Figure 1-A)**. Moreover, *Dicentrarchus labrax* affected with digeneasis and nematodiasis showed inflammation, hemorrhages at the base of fins and emaciation **(Figure 1-B).** Some *Alepes djedaba* infested with digenetic trematodes showed emaciation and excessive mucus. While *Saurida undosquamis* infested with digeneans showed hemorrhages at fin bases with paleness in body color.

B. Postmortem Examination:
Infested *Argyrosomus regius* with digeneasis revealed hemorrhagic and fatty liver **(Fig 1-C and D)**, slight marbling of gills with excessive mucus secretions and slight abdominal bulging. While liver was pale in *Dicentrarchus labrax* infested with nematodes. While *Siganus*

revulatus infested with nematodes showed swelling and congestion of the intestinal wall which was distended with yellowish exudates and enlargement and congestion of spleen and liver. Infested *Saurida undosquamis* with digenean trematodes showed pale liver with petechial hemorrhage, enlargement and congestion of intestine as shown in **(Fig 1-E).**

C. Parasitological Examination:

C.1. Total prevalence of digeneasis and nematodiasis among the examined fishes:

As shown in **Figure 2,** the total prevalence was 18.75%; *Saurida undosquamis* recorded the highest prevalence (30%) and *Siganus revulatus* was the lowest (11.66%). Concerning digenean infestation, the total prevalence was 17.5%; Saurida *undosquamis* was the highest (30%) and *Siganus revulatus* was the lowest (6.66 %). Regarding nematode infestation, the total prevalence was 1.25%; 2% in *Dicentrarchus labrax* and 5% in *Siganus revulatus*. While *Alepes djedaba, Argyrosomus regius* and *Saurida undosquamis* didn't record any nematodiasis.

C.2. Seasonal prevalence of digeneasis and nematodiasis among the examined fishes:

As shown in **Figure 3** hot seasons recorded the highest prevalence for digeneasis in all examined fishes, it was the highest in *Saurida undosquamis* (40%) and the lowest in *Siganus revulatus* (10%). While cold seasons recorded the highest nematodeasis prevalence for *Siganus revulatus* (6.6%) only, although hot and cold seasons were equal in prevalence for *Dicentrarchus labrax* (2%).

D. Parasitological Findings:

D.1. Digenetic Trematodes:

Erilepturus tiegsi (Woolcock, 1935) was isolated from stomach of *Argyrosomus regius*. It is elongate, spindle shaped and somewhat flattened dorsoventrally. The base of the sinus sac is thick-walled and contains radial muscles; sinus organ is thick-walled with circular muscles; the atrium is separated from the sinus sac **(Figure 4-A).**

Erilepturus lemeriensis (Tubangui and Masilungan, 1935) was isolated from stomach of *Argyrosomus regius*. Body was smooth, elongated, narrow and cylindrical. Oral sucker is anteriorly situated and subterminal. Acetabulum is at the middle of the body. Pharynx is well developed and followed by short esophagus which is short and thin (**Figure 4-B)**.

Acanthostomum spinices (Loose, 1899) was isolated from intestine of *Dicentrarchus labrax*. It was medium sized body, long and spinulated. It has oral sucker terminal, which is

fingerbowl to funnel shaped, with a crown of spines. The prepharynx was long and in midway between two suckers. Its esophagus was short, bifurcating a little in front of acetabulum **(Figure 4-C)**.

Sclerodistomum* sp. *(Looss, 1912) was isolated from intestine of *Saurida undosquamis***.** Body is delicate, a spinose, small in size, cuticle transversely folded, fore body slightly tapered. Oral sucker is sub terminal, and globular. Ventral sucker is prominent, situated at the end of the first third of the body **(Figure 4-D).**

D.2. Nematodes

Hysterothylacium aduncum (Rudolphi, 1802) was isolated from intestine of *Dicentrarchus labrax*. Body is elongated, tapering anteriorly and posteriorly. Three large lips are present at the anterior end; two large ventrolateral and one dorsal, the dorsal one is somewhat shorter. Lips are somewhat wider than the body; two large ventrolateral and one dorsal, the dorsal one is shorter **(Figure 5).**

***Procamallanus inopenatus* (Travassos, 1928)** was isolated from the mucosal scraping of the gastrointestinal tract of Siganus *revulatus*. It characterized by elongated body, larviparous, cup-shaped buccal capsule, which is devoid of cutting plated teeth, lancets or even spiral thickenings. Esophagus is cylindrical. The tail of the female narrows gradually. The male posterior end is strongly curved ventrally with 5 pre- anal papillae, and 4 pairs of post - anal papillae **(Figure 6).**

D. Histopathological Findings: In case of digenetic infestation of stomach of *Arygroromus regius*, stomach showed congestion of blood vessels, leukocytic infiltrations in both mucosa and submucosa with degeneration and necrosis of gastric mucosa and desquamation and erosion of epithelial lining. While in *Dicentrachus labrax* fish infested with digenea, stomach showed destruction, necrosis and sloughing of gastric mucosa along with submucosal and serosal congestion and leucocytic infiltrations. However, in case of digenetic infestation of *Saurida undosquamus*, stomach showed mechanical destruction of the gastric mucosa along with congestion and mild submucosal leucocytes infiltrations **(Figure 7)**.

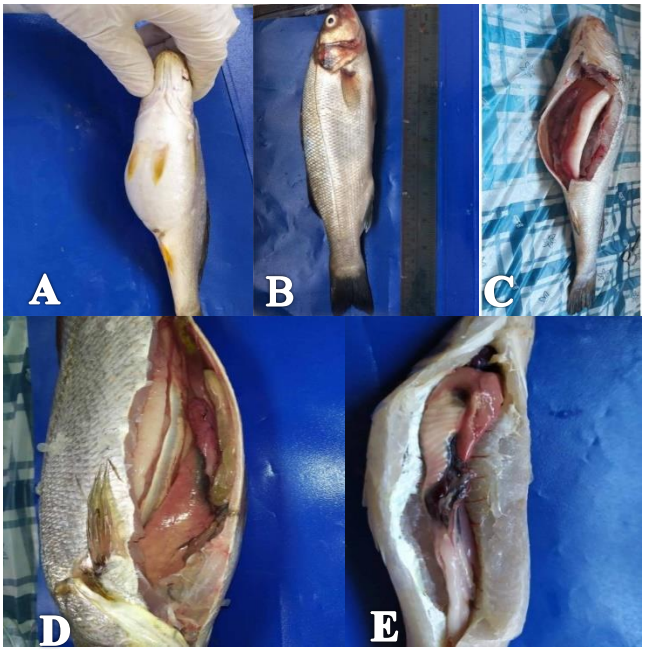

Figure (1) *Photograph of :A.Argyrosomus regius showing abdominal distention (arrow) and palness, B. Dicentrarchus labrax showing hemorrhages at the base of fins (arrow) ,C. Argyrosomus regius showing hemorrhagic and fatty liver (arrow), D. Argyrosomus regius showing hemorrhagic liver (arrow) with petechial hemorrhage in the intestine and E. Saurida undosquamis showing paleness of liver with petechial hemorrhage , enlargement and congestion of intestine (arrow).*

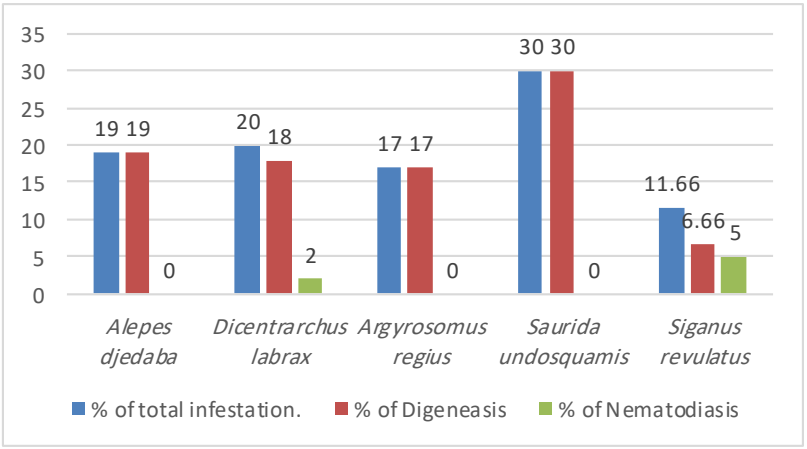

Fig (2): *Showing total prevalence of digeneasis and nematodiasis among the examined fishes.*

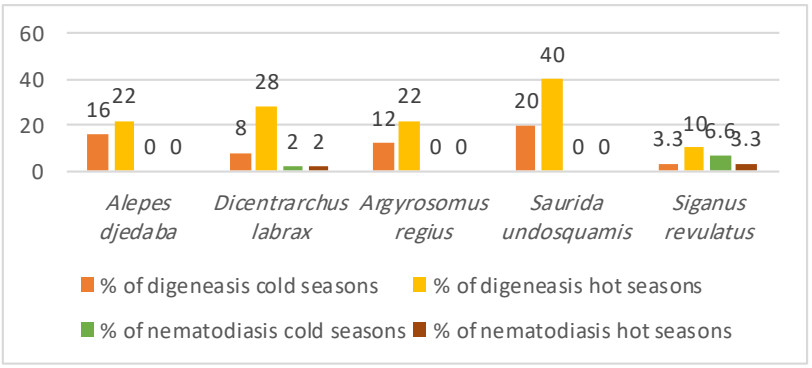

Fig (3): *Showing seasonal prevalence of digeneasis and nematodiasis among different examined fishes.*

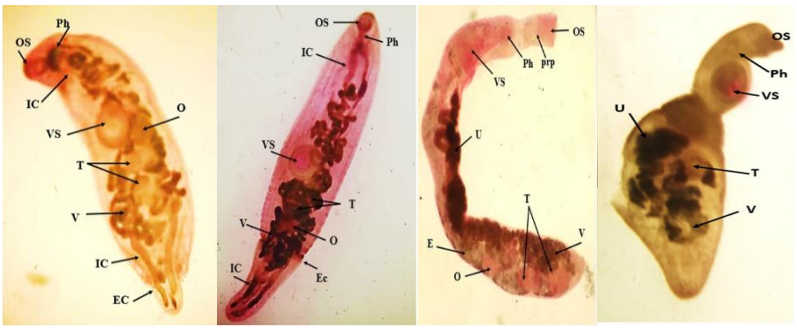

Fig. (4): *Photomicrograph of A. Erilepturus tiegsi (Woolcock, 1935), B. Erilepturus lemeriensis (Tubangui and Masilungan, 1935) , C. Acanthostomum spiniceps (Loose, 1899) D. Sclerodistomum sp. (Looss,1912) .stained with Semichon's acetocarmine OS: Oral sucker, Ph: Pharynx, Vs: Ventral sucker, U: uterus, V: Vitellaria, O: Ovary, T: testes , E: eggs , IC: intestinal caeca, EC: evaginated ecsoma, Prp: prepharynx*

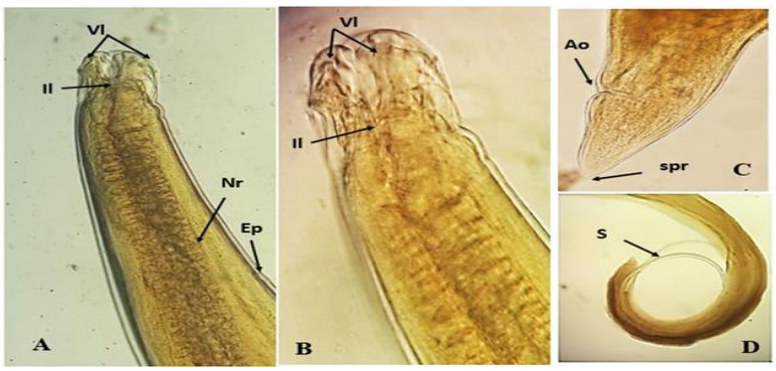

Fig. (5): *Photomicrograph of Hysterothylacium aduncum (Rudolphi 1802), A: anterior part, B: High magnifications of head region, C: female posterior end and D: male posterior part. Vl: ventrolateral lips, Il: interlabium, Ep: excretory pore, Nr: nerve ring, Ao: Anal opening, spr: spinose process, S: spicules.*

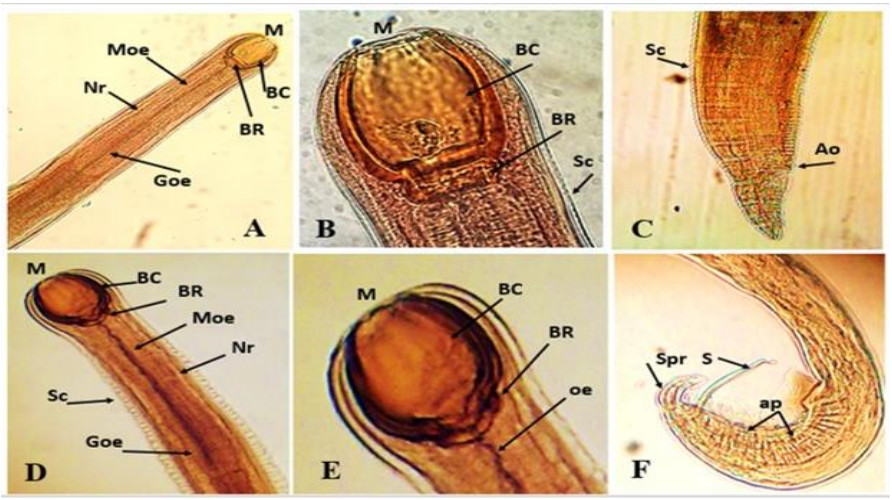

Fig. (6): *Photomicrograph of Procamallanus inopenatus (Travassos , 1928) A: Female anterior part, B: High magnifications of female Cephalic end and buccal capsule, C: female posterior end, D: male anterior part, E: High magnifications of male Cephalic end and F: male posterior end. M: mouth, BC: buccal capsule, BR: basal ring, Moe: muscular oesophagus, Nr: nerve ring, Goe: glandular oesophagus, Sc: Striated cuticle, Ao: anal opening, S: spicule, ap: anal papillae, Spr: spinose process.*

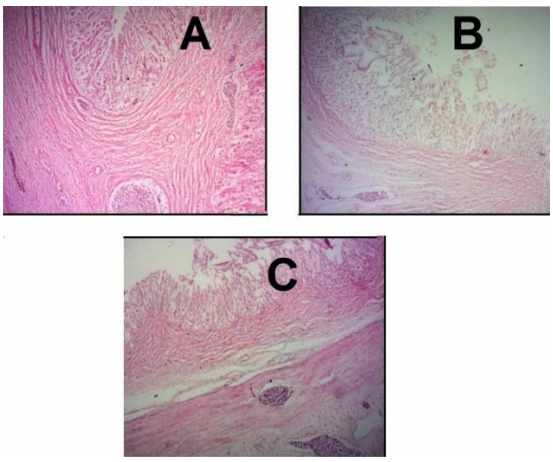

Fig (7): *Photomicrograph of: A. Arygroromus regius stomach showing congestion of blood vessels, leukocytic infiltrations in both mucosa and submucosa with degeneration and necrosis of gastric mucosa. (X 200). H&E, B. Saurida undosquamus stomach showing mechanical destruction of the gastric mucosa along with congestion and mild submucosal leucocytic infiltrations. (X 200). H&E and C. Dicentrachus labrax stomach showing destruction, necrosis and sloughing of gastric mucosa along with submucosal and serosal congestion and leucocytic infiltrations. (X 200). H&E.*

Discussion :

There were no pathognomonic clinical signs in the examined marine fishes and they were apparenently healthy. Some *Arygroromus regius* infested with digeneans showed abdominal distention, paleness and emaciation. Affected *Dicentrachus labrax* with digeneasis and nematodiasis showed inflammation, hemorrhagic fins and emaciation. These findings are at the same line with ***Rawia Adawy (2000) and Eissa (2002).*** Regarding postmortem examination, liver was hemorrhagic in some investigated *Dicentrachus labrax*, gills were slightly marbled with excessive mucus secretions and slight abdominal bulging, these are nearly similar to that reported by ***Eissa (2002), Maather El-lamie (2007) and Nashwa Mohamed (2010).***

Regarding the total prevalence among the examined fishes. It was 18.75 % . This result agreed with ***Eman Youssef and Derwa (2005)*** which was 15.7% and is lower than that obtained by ***Maather El- Lamie (2007), Nashwa Mohamed (2010), Heba Abdel-Mawla and Jihan Abo-Esa (2011)*** *and* ***Mohammed (2017)*** who recorded 56 % ,66.5 %, 53 % and 59% respectively. This may be attributed to the difference of the locality from which fish were obtained. Also endoparasites often are trophically transmitted, so variations in infection levels can be explained by interannual changes in host diet and availability of prey harboring infective stages ***(Santana et al., 2012).*** Seasonaly, hot seasons revealed the highest total prevalence (24.5%) and cold seasons showed (13%). This result agreed with **Mohammed (2017)** who found the highest prevalence of parasites were in summer and spring followed by autumn and winter in *Dicentrarchus labrax* and *Scomberomorus commerson* fishes. But disagreed with ***Maather El-lamie (2007)*** who recorded the highest prevalence in winter and ***Samah El-Shafey***

(2016) who found the highest prevalence in autumn followed by spring then winter and lowest in summer.Total prevalence of digenetic trematodes was 17.5% . These results were more than the results obtained by ***Rehab Qorany (2020)*** who revealed 7.34% from (*Dicentrarchus labrax, Dicentrarchus Punctatus and Sparus aurata*). Total prevalence of nematodiasis in this study was 1.25%. This agreed with ***Cavallero et al. (2019)*** and ***Rehab Qorany (2020)*** results who found 1.1 % and 0.7% respectively. Regarding seasonal prevalence of digeneasis, it was high in spring and summer and low in autumn and winter. These findings was agreed with ***Mona Khattab (1990)*** and ***Eissa et al. (2010)*** who found that the peak was during summer and spring and the lowest in winter. But disagree with ***Reda Hassanine (2000)***, ***Amal Atwa (2006)*** and ***Eissa et al. (2013)*** as they was recorded the highest prevalence in winter and the lowest in spring. These variations may be attributed to the difference in study areas. Concerning nematode infestation , the total prevalence was 1.25% . While the seasonal prevalence of nematodes was higher in autumn and winter than in spring and summer . This result is nearly the same of that obtained by ***Eissa et al. (2017)*** as they recorded 8% in autumn, 0% in winter, 4% in spring and 0% in summer. And agreed with ***Rehab Qorany (2020)*** who recorded the highest prevalence in autumn (3.57%) among some examined marine fishes and 0% in the other seasons .

Parasitologogical findings revealed a digenean parasite had the same morphological featured documented by ***Manter (1969)*** *and* ***Walaa El-Ekiaby (2009)***, so it is *Erilepturus tiegsi* and *Erilepturus lemeriensis*. Parasitologogical finding revealed a digenean parasite had the same morphological featured documented by ***El-Shahawi and Al-Bassel (1992), Fernandes et al. (2002) and Attia et al. (2018)***, so it is *Acanthostomum spinices*. Parasitologogical finding revealed a digenean parasite had the same morphological featured documented by ***Rania Taha and Ramadan (2018)***, so it is *Sclerodistomum* sp. Parasitologogical finding revealed a nematode parasite had the same morphological featured documented by ***Heba Abdel-Mawla*** *and* ***Jihan Abo –Esa (2011), Nada and Abd El-Ghany (2011)*** *and* ***Attia et al. (2018)***, so it is *Hysterothylacium aduncum*. Parasitologogical finding revealed a nematode parasite had the same morphological featured documented by ***Nashwa Mohamed (2010)*** and ***Heba***

Abdel-Mawla and Jihan Abo-Esa (2011), so it is *Procamallanus inopenatus* .

Concerning different histopathological changes in stomach of fishes affected with digenean infestations; congestion of blood vessels, leukocytic infiltrations in both mucosa and submucosa with degeneration and necrosis of gastric mucosa, desquamation and erosions of epithelial linning were recorded . These results were in agreement with that obtained by ***Heba Abdel-Mawla (2005), Aktar (2008) and Samah El-Shafey (2016).***

References: -

Aktar Y. (2008): Feeding habits and nematode parasites of some fishes of Karachi coast. Ph. D. Thesis. Jinnah University for women for fulfillment.

Amal Atwa, A.M. (2006): Studies on some prevailing internal parasitic diseases in catfish (*Clarias gariepinus*). M. V. Sc. Thesis Fish Dis. &Management, Fac. of Vet. Med Suez Canal Univ.

Amlacker (1970): Textbook of fish diseases. T.F.H.Publ., Neatune city, New Jersy, 117-135.

Attia, A.A.; Eman Bazh, K.; Desouky, A.Y.; and Abo-Rawash, A.A. (2018): Metazoan parasite fauna of wild sea bass; *Dicentrarchus labrax* in Egypt, Life Science Journal, 15(**6**): 48-59.

Banerjee, P.; Basu, S.; Modak, K. B. (2017): First report of three metazoan gut parasites of live fishes from West Bengal, India. Proc. of zool. Soc., 10(**2**): 17-24.

Cavallero, .S. ; El Sherif, R. A.; Pizzarelli, .A. ;El Fitur, A.A.; El Showhdi, M., Benmosa, F. and D'Amelio, S. (2019): Occurrence of Anisakis and Hysterothylacium Nematodes in Atlantic Chub Mackerels from Libyan Coasts , Helminthologia, 56(**4**): 347–352.

Eissa, I.A.M. (2002): Parasitic fish diseases in Egypt. Dar El - Nada El-Arabia Publishing, 32 Abd El-Khalik Tharwat St. Cairo, Egypt.

Eissa, I. A. M.; Badran, A. F.; Sohair, Y. M. and Heba, I. A. (2010): Entero-parasitic infestation and the associated pathological lesions in *Clarias gariepinus* at Ismailia Province, Journal of Agri. And Vet Sci., Qassim University, 3 (**1**): 21-32.

Eissa, G.; Greenbaum, R.L. and Mawritz, M.B. (2012): Bottom line mentality as antecedent of social under mining and the moderating roles of core self-evaluation and conscientiousness. Journal of Applied Psychology, 97 (**2**): 343-350.

Eissa, I. A. M; Viola, H. Z.; Nadia, G. M.; Mona S. Z. and Aboyadak, I. M. (2013): Gut

digeneaiasis in African catfish *Clarias gariepinus* with estimating the efficacy of some anthelmintics, Life Science Journal, 10(**3**): 57-64.

Eissa, I. A. M; Maather El-Lamie, M.M.; Salah, M. A., Nahla sallam, H. and Hassan, R.A. (2017): Studies on the Prevailing Parasitic Diseases in Some Marine Fishes, EVMSPJ: 13-25.

El-Shahawi, G. A. Z. and Al-Bassel, D. A. (1992): A general survey of the helminth parasites infecting common fishes in some inland water in Egypt. Proc. Zool. Soc. Egypt, 23: 227-241.

Eman Youssef, M. and Derwa, H.I. (2005): Roundy and spiny headed worms' infection among some marine fishes in Ismailia Province, Egypt Vet. Med. Soc. Paras. J., 2(**2**): 438-444.

Fernandes, B. M. M.; Pinto, R. M. and Cohen, S. C (2002): Report on Two Species of Digenea From Marine Fishes in Brazil. Braz. J. Biol., 62(**3**): 459-462.

Heba Abdel-Mawla, I. (2005): Studies on the enteric Parasitic diseases among some cultured and wild fish, Ph. D. Thesis, Faculty of Vet. Med. (Dept of Fish Diseases and Management), Suez Canal University.

Heba Abdel-Mawla, I. and Jihan Abo-Esa, F.K. (2011): The Most Common Parasitic Diseases In *Siganus Revulatus* In Suez Canal Area . Proc. 29 th Arab Vet. med. Congress, J. Egypt. Vet. Med. Assoc,71 (**1**): 257-270.

Hussen, A.; Tefera, M. and Asrate, S. (2012): Gastrointestinal helminth parasites of *Claris gariepinus* (catfish) in Lake Hawassa Ethiopia. Scientific Journal of Animal Science, 1(**4**):131-136.

Ibtsam, E. B.E.D. (2004): Studies on some prevailing parasitic diseases among cultured Tilapia fish. Ph. D. Thesis, Fac. Vet. Med., Suez Canal University**.**

Lucky Z. (1977): Methods for the diagnosis of fish diseases American Publishing Co., Pvt. Ltd., New Delhi, Bombay Calcutta and New York.

Maather El- Lamie, M. M. (2007): Studies on the parasitic diseases in some marine fish. Ph.D. Thesis Fac. of Vet. Med. Suez. Canal Univ.

Manter Harold, W. (1969): Some Digenetic Trematodes of Marine Fishes of New Caledonia. The Helminthological Society of Washington, 36 (**2**): 195 -199.

Mohammed, R.A.H. (2017): Studies on the Prevailing Parasitic Diseases in Some Marine Fishes. Master. D. Thesis, Fish Farming and Technology Institute, Suez Canal Univ. Suez. Canal Univ.

Mona Khattab, H. (1990): Some studies on Platyhelminthes infesting some freshwater fishes

in Egypt. M. V. Sc. Thesis., (Parasitology) Faculty of Veterinary medicine, Alexandria University.

Meyer, C.M. and Olson, W.C. (1992): Essentials of Parasitology W.M.C. brown publishers, USA.

Nada, M. S. M. and Abd El-Ghany, A. M. (2011): Anisakid nematodes in marine fishes, Journal of American Science, 7(**9**): 1000-1005.

Nashwa Mohamed, A.S. (2010): Studies on diseases caused by nematodes on Some marine fish. M.V. SC. Thesis, Fac. Vet, Med. Suez Canal University.

Noga, E.J. (2010): Fish Diseases, Diagnosis and Treatment. 3rd Edition, Iwa State University, Press, Ames.

Onyedineke N. E. U. ; Obi, P. U. Ofoegbu and Ukogo, I. (2009) : Helminth parasites of some fresh water fish from River Niger at Illushi, Edo State, Nigeria. J. Am. Sci., 6 : 16-21.

Randall, J. (1983): Red Sea Reeffish. Dai Nippon printing Co. Tokyo. Edit. Janet Mac. Lennan. IMMEL Publishing, London :192.

Rania Taha, G. and Ramadan, M.M. (2018): Scanning Electron Microscope of *Sclerodistomum aegyptiaca* n. sp. (Digenea, Sclerodistomidae) from the Marine Fish *Saurida undosquamis* from the Suez Gulf, Red Sea, Egypt. Egyptian Journal of Aquatic Biology & Fisheries, 21(**4**): 85 - 95.

Rawia Adawy, S. M. (2000): Studies on the parasitic diseases of some freshwater fishes in Dakahlia Governorate, Ph.D. Thesis, Fac. Vet. Med., Cairo Univ.

Rehab Qorany. A. (2020): Molecular Studies on Diagnosis of Some Parasitic Diseases in Seabream and Seabass fishes. Ph.D. Thesis, Fac. Vet. Med. (Dept. of Fish Diseases and Management), Suez Canal Univ.

Reda Hassanine, R.S. (2000): On two digenetic trematodes (Family: Hemiuridae Looss, 1899) from some fish in the Gulf of Aqaba, with a discussion on the validity of their genera. Journal-Egyptian German Society of Zoology, 33(**D**): 45-56.

Roberts, R.J. (2001): Fish pathology, 3rd ed. W.B. Saunders, Philadelphia, PA.

Samah El-Shafey (2016): Studies on parasitic diseases among some marine fishes with reference to multi-factorial causes in Port-Said Governorate. M. V. Sc. Thesis, Fac. of Vet. Med. Suez Canal Univ.

Santana-Piñeros, A.M.; Pech, D. and Vidal-Martínez, V.M. (2012): Spatial structure of the helminth parasite communities of the tonguefish, *Symphurus plagiusa*, from the Campechecoast, southern

Mexico, International Journal for Parasitology, 42(**10**): 911–920.

Shamsi, S. (2019): Parasite loss or parasite gain? Story of Contracaecum nematodes in antipodean waters. Parasite Epidemiol, (87): 30-33.

Walaa El-Ekiaby, T. D. (2009): Light and electron microscope studies on certain parasites of some marine fishes, Thesis submitted for the degree of Doctor of Philosophy of Science, Fac. Of Sci., Zagazig Univ.

Woo, P.T.K. (2006): Fish Diseases and Disorders, Volume 1: Protozoan and Metazoan Infections. 2nd Edition, CABI, U.K.

نظرة ثاقبة على الاصابة بديدان الدايجينيا و النيماتودا في بعض الأسماك البحرية في محافظة الإسماعيلية

اسماعيل عبد المنعم عيسي *, مآثر منير اللمعي* ,مني محمد عبد الوهاب* * ,هبة عبد المولي, امينة الدسوقي ***, رضوي جعفر**.**

قسم امراض الأسماك ورعايتها _كلية الطب البيطري _جامعة قناة السويس.

***قسم امراض الأسماك _معهد بحوث الصحة الحيوانية _معمل فرعي الإسماعيلية.*

****قسم الباثولوجي _كلية الطب البيطري _جامعة قناة السويس .*

تم فحص 400 سمكة بحرية من خمس أنواع (100من اللاشتيه ، 100من القاروص ، 100من اللوت ، 40 من المكرونة و 60 من السيجان) تم جمعها بشكل عشوائي من محافظة الإسماعيلية في مواسم مختلفة في الفترة من ابريل 2018 حتي ديسمبر 2019 بأحجام وأوزان مختلفة. أسفر الفحص الاكلينيكي للاسماك المصابة بالطفيليات المختلفة عن عدم وجود علامة مرضية مميزة . بعض أسماك االلوت المصابة بالدايجينيا أظهرت تضخم في منطقة البطن وشحوب وتعاني من الهزال . اما بعض اسماك القاروص المصابة بالدايجينيا تعاني من نزف علي الغشاء الخيشومي وسحجات وتقرحات علي الزعانف و تضخم في منطقة البطن. أسفر الفحص الداخلي في سمكة اللوت المصابة بالدايجينا عن وجود نزيف في الكبد وتراكم دهون وتهتك في الخياشيم مع زيادة إفراز المخاط وانتفاخ طفيف في البطن . كانت النسبة الكلية للإصابة 18.75٪. وكانت أعلى نسبة في المكرونة (30%) ، يليها القاروص (20%) ، ثم اللاشتية (19%) ، ثم (17%) في اللوت ، ثم السيجان (11.66%). كما تم دراسة التغيرات الهستوباثولوجية لهذه الأسماك المصابة .