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RE-DESCRIPTION AND MORPHOLOGICAL CHARACTERIZATION OF *SCLERODISTOMUM AEGYPTIACA* (*DIGENEA:* SCLERODISTOMIDAE) INFECTING THE FISH *BOOPS BOOPS*: A NEW LOCALITY AND HOST RECORD IN EGYPT

By
NESREEN S. SALEH[1*] AND SAMIR A. TAHA[2]
Department of Zoology, Faculty of Arts & Sciences Al-Wahat, Benghazi University, Libya[1] and Department of Zoology, Faculty of Science, Zagazig University, Egypt[2]
([*]Correspondence: nesreensaeed1984@gmail.com)

Abstract

During the present investigation, a total of 569 fish specimens belonging to *Boops boops*, were collected from 2020 from the coasts water Alexandria City, Mediterranean Sea, Egypt. The collected fishs were dissected and examined for the presence of helminthes parasites. A total of 232/ 569 (40.83%) were found naturally infected with trematode parasites. The rate of infection was 16 (6.03%) fish. The recovered parasite species were collected and identified by applying light microscopic examinations. So, this study was the re-description of *Sclerodistomum aegyptiaca* in new host (*Boops boops*) from Alexandria coastal area. Morphological and diagnostic morphometric characterizations showed some differences between the present species and other related species detected previously.

Key words: Alexandria, *Sclerodistomum aegyptiaca,* New locality, New host

Introduction

Fish are the most significant hosts for zoonotic parasites, primarily helminthes (Amer, 2014). The majority of fish are parasitized, and not only act as hosts for various parasites but also as carriers of numerous larval parasites that have an impact on the health, growth, and survival of fish (Moyo *et al,* 2009).

Food-borne parasitic infections have been recognized as an important public health problem, with a considerable economic impact in terms of morbidity and healthcare costs worldwide (Abdel-Gaber *et al,* 2018). Fish-born zoonotic trematodes are transmitted by fish and fish products, and pose a major public health problem (Hung *et al,* 2015). Fish represent a good source of quality protein, and fishing is a valuable source of food and employment in developing countries (Laetsch *et al,* 2012). Various diseases including parasitic infections, pose a threat to fish cultivation (Abdel- Ghaffar *et al,* 2015). In aquatic systems parasites play an important role in the ecology of coastal and marine ecosystems as well as in mariculture **(**Abdel-Gaber *et al,* 2015). Fish-borne liver and intestinal flukes are pathogens but a positive impact on public health worldwide (Khalil *et al,* 2014). Wild freshwater fishes are important intermediate hosts for fish borne trematodes (Labony *et al,* 2020).

Helminthes result in financial losses by reducing the production of aquatic resources, reducing fish growth, increasing fish susceptibility to other infections, and increasing mortality rates (Blaha and Katafano, 2020).

Parasites are receiving increasing attention as their diversity and prevalence emerges in some countries (Abdel-Ghaffar *et al,* 2012). Trematode parasites are considered as one of the major invariably endo-parasitic taxa of helminthes (Pichelin and Cribb, 2001). However, study of fish parasitology is one of the more interesting branches for many researchers all over the world especially for the marine fishes, either for the internal or external parasites (Al-Jahdalli, 2010).

Materials and Methods

Fish: A total number of 569 Fish *Boops boops* were collected from Alexandria Coastal area, Mediterranean Sea over the fishing time of the year 2020. A total of 232 fish were identi-

fied, of which 16 (6.9%) were trematode infected.

Examination: Fish were dissected out, the gastro-intestinal tract, and gall bladder were examined. Also, stomach was separated from the intestinal, and each was examined separately by a fine scissor and left in a Petri-dish containing normal saline solution (0.8%) for a few minutes. Mucosa were carefully scraped by a fine brush and examined by a dissecting monocular binocular microscope.

Microscopy examination: Detected trematodes were stretched between two slides, fixed in 70% ethanol, stained in alum carmine, cleared in clove oil and mounted in Canada balsam. The drawings were done by camera Lucida and measurements were done by an ocular micrometer and calibrated by a stage micrometer. All measurements were in millimeters unless otherwise given.

Results

Trematode isolated from of *B. boobs* stomach was identified *Sclerodistomum aegyptiaca* (Hemiuroidea: Sclerodistomidae), and descriptive morphology was based on 16 parasites.

Body stout, elongate, pear-shaped with broad diameter at posterior half, provided with transverse wrinkled cuticle, size varied from 0.628-0.821(0.721) x0.227-0.26 (0.244). Ratio length to width 2.77-3.09:1. Oral sucker sub-terminal, fairly round in shape, measures 0.039-0.051 (0.042) x 0.054-0.066 (0.059). Ventral sucker almost round, larger than oral one, 0.051-0.08(0.063) x 0.092-0.114(0.105), about 0.117-0.138 from body anterior extremity, led to a very short pre-pharynx 0.009-0.013(0.10). Pharynx muscular, measures 0.031-0.035 (0.033) x 0.28-0.30 (0.285). Then a very short esophagus 0.031-0.35 (0.33) in length, with bifurcates into two intestinal caeca end blindly very close to body posterior extremity.

Testes diagonally, at body median third, anterior one measures 0.061-0.076 (0.068) x 0.022-0.038(0.034), posterior 0.0072-0.087 (0.083) x 0.034-0.044 (0.039). Cirrus pouch long, tubular dorsal to ventral sucker, extends posteriorly, measures 0.250-0.265 (0.256), with a tubular seminal vesicle, and pars prostatic surrounds by prostate gloved cells.

Ovary oval posterior to testes, measures 0.081-0.095 (0.088) x 0.037-0.041 (0.039). Genital pore on median line on intestinal bifurcation. Uterus extend to near posterior extremity contains numerous small eggs, measure 22-24 x 13-16µm, occupying all space of hind body intercaecal. Vitellaria divided into several long slender winding tubules on each side of hind body and confluent posterior to testes.

Details were given in tables (1) and figure (1).

Table 1: Measurements (in millimeters) of present specimen and that of Taha and Ramadan, 2017:

Characters	present study *(Sclerodistomum aegyptiaca)*	Taha and Ramadan, 2017
Body length	o.628-0.821(0.721)	1.6-1.9
Body width	0.227-0.265(0.244)	0.13- 0.2
Oral sucker	0.039-0.051(0.042) x 0.054-0.066(0.059)	0.17-0.175 x 0.13-0.19
Ventral sucker	0.051-0.082(0.063) x 0.092-0.114(0.105)	0.21-0.26 x 0.22-0.25
Pharynx	0.031-00.35(0.33)	0.18- 0.2
Oesophagus	0.031- 0.35(0.33)	0.6- 0.75
Anterior testis	0.061-0.076(0.068) x 0.022-0.038(0.034)	0.187-0.2 x 0.15-0.16
Posterior testis	0.072-0.087(0.083) x 0.034-0.044(0.039)	0.19-0.23 x 0.14-0.15
Cirrus sac	0.250-0.265(0.256)	----------
Genital atrium	----------	0.17-0.174 x 0.09-0.095
Ovary	0.081-0.095(0.088) x 0.037-0.04(0.039)	0.16- 0.18
Eggs	22-24 x 13- 16µm	27-29 x 13.6-17µm
Position of the genital pore	Directly anterior to acetabulum	Anterior to acetabulum
Host	*Boops boops*	*Saurida undosquamis*
Locality	Alexandria Mediterranean coastal water	The Suez Gulf, Red Sea Egypt
Location	Isolated from stomach	Isolated from intestine

Discussion

Parasites have an essential role in marine ecosystem by affecting population dynamics of their hosts (Rohde, 1993).

The present species have all characteristic features of the genus *Sclerodistomum*, species of *aegyptiaca* and new recorded with 16 (6.03%) in stomach of *Boobs boobs*. This disagreed with Taha and Ramadan (2017), who reported that *Saurida undosquamis* naturally infected with *Sclerodistomum aegyptiaca* isolated from intestine with 120 (50%) that collected from the Suez Gulf, Red Sea. However, the present species morphology resembles the previous rerecorded species, but with less dimension of the body parts.

In the present study, body length and width was 0.721-0.244 respectively, which differed with Taha and Ramadan (2017) who reported that length and width ratio was 12.3-9.5.

In the present study, oral sucker was subterminal globular, pharynx was muscular and very short esophagus, which agreed with Taha and Ramadan (2017). Also, the present ventral sucker was round in shape, situated at body anterior extremity, which disagreed with Taha and Ramadan (2017), who found that the ventral sucker was prominent situated at the first third body end. Besides, the present testes were oval, placed at the median third of body, and the genital pore lies on the median line on the intestinal bifurcation. but Taha and Ramadan (2017) found testes was oval and tandem, post-acetabula at the mid body, and that the genital pore was situated anterior to acetabulum between the intestinal caeca very near to acetabulum.

In the present study, the vitellaria follicular were slender, directly behind the testes then extend posteriorly to end at the level of the intestinal caeca. This disagreed with Taha and Ramadan (2017) they found that the vitellaria follicular were situated on both sides of the posterior half of the body extending posteriorly to anterior part of posterior testes, and formed of several long slender winding tubules.

In the present study, oval ovary lies posterior to testes. This agreed with Taha and Ramadan (2017) who found that ovary in hind body near to posterior extremity than acetabulum.

Conclusion

The present authors considered that *Sclerodistomum aegyptiaca* was first record in *Boops Boops* with a new locality at Alexandria coastal area.

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Explanation of figure

Fig. 1: Camera Lucida of *Sclerodistomum aegyptiaca* Oral sucker (OS), pharynx (PH), esophagus (ES), ventral sucker (VS), intestinal caeca (IC), two testes (T), cirrus sac (CS), ovary (OV), uterus (U), vitelline follicles (VF), Egg (E) and genital pore (GP).