

(2005/4/6 2004/5/11)

Silurus

Contracaecum sp.

.L4 L3 L2

glanis

:

0.9×0.5

Histological Structure of the Cyst Wall of *Contracaecum* larva and the Histopathology in the Stomach of *Silurus glanis*

Mohammad S.A. Abdul Fraj

Zohair I. Ftohe

Department of Biology

College of Science

Mosul University

ABSTRACT

Larvae of *Contracaecum sp.* were found encysted in the stomach of *Silurus glanis* in three successive stages namely L2, L3 and L4. The cysts were white in color, elongated and their dimensions were 0.5×0.9 mm. In general, the wall consists of two layers, outer thick and inner thin layers. The outer one consists in turn of collagenous fibers intermingled with epithelial cells, fibroblasts, macrophages and lymphocytes. While the inner layer consist of collagenous fibers, few fibroblasts, lymphocytes and fibrocytes. The most important histological changes due to the infection with this larva is infiltration of inflammatory cells around the cyst and its cavity , which is represented by macrophages, nucleated cells and acidophils, and in same time occurrence of necrosis, and local aggregation of lymphocytes between the muscle bundles. Also, few pycnotic cells were observed and erythrocytes, macrophages and remnants of cells around the larval cuticle, and the presence of blood vessels surrounding the cyst. Furthermore, dwarfness of intestinal glands and destruction of the epithelial tissue were observed.

As regard the carbohydrate, the cyst walls reacted strongly positive with Periodic acid Schiff, Alcian blue and Best Carmine, while the cyst layer reacted negatively with Toludine blue.

Both cyst walls reacted positively with protein detecting technique including Mercury Bromophenol blue and Ninhydrin Schiff, with lipid detecting technique such as Aceton Sudan Black–B, Feulgen reaction, for detecting DNA, finally, strongly reacted by using Von Kossa technique.

Miller and) Aschelminthes

.(Harley, 1996

Ascarididea

Heterocheilidae

Esophageal cecum

Intestinal cecum

.....

Contracaecum *Contracaecum aduncum* :

Contracaecum osculum *multipapillatum*

.(Olsen, 1974)

.(Hoffman, 1967)

.(William, 1967)

Margolis (1970)

Contracaecum sp.

Pagrus

(1987) Rego Eiras

Anisakeis *pagrus*

Eustrongylides tubifex

Yellow perch (*Perca flavescens*)

.(Measures, 1988a)

(1999) Wittrock Walker

(1995) Nawab Al-Din Rahemo

Varicorhinus rutta

Contracaecum sp.

Aspius vorax

Spiroxys sp.

Contracaecum sp.

Cucullanid

(1995) Mohammad Rahemo

Garra rufa

Silurus glanis Linnaeus, 1757 (56)

2000 1999

Phosphate buffer saline

pH 7.0

(%10)

.Bouin's fluid

(7-5)

Ehrlich's Haematoxyline – Eosin Phloxine –

:

Alcian Periodic Schiff (PAS) –

Best's Carmine pH 2.5 pH 1.0 Blue (AB)

.Toluidine Blue (TB) technique (BC)

.Mercury Bromophenol Blue (MBB)

.Aceton Sudan Black-B (ASB-B) –

) Feulgen Reaction (FR)

Von Kossa (VK) .(Pearse, 1985

.(Luna, 1968)

(2-1)

L4 L3 L2

Shamsuddin et al., 1971; Habash, 1977; Mhaisen, 1980; Rahemo and)

.....

Mhaisen (1980) .(Nawab Al-Din, 1995

L2

(1995) Nawab Al-Din Rahemo

L4 L3

.(Olsen, 1974)

.(Burse, 1982, 1986; Eiras and Rego, 1987; Joy et al., 1996)

Measures (1988 a, b) Joy et al. (1996)

.Eiras and Rego (1987)

.(Margolis, 1970)

:

(2-1)

.(1995) Nawab Al-Din Rahemo

Proteoglycans

T. spiralis

(1994)

Pauw

Proteoglycans

(Eiras and Rego, 1987; McAllister et al., 1993; Rahemo and Mohammad, 1995)

Bursey, 1986; Measures, 1988 a, b; Goldbreg and Bursey, 1989; Joy et)

(al., 1996

.(Joy et al., 1996)

:

Measures (1988b) McAllister et al. (1993)

.Bursey (1982)

Measures (1988b)

Rahemo and Nawab Al-Din .(Tizzard, 1986; Roitt et al., 1998)

(1995)

(1994)

Goldberg

.....

:

:

(3) (PAS)

-

ATPase

(4) pH 2.5 pH 1.0 (AB)

(5) (BC)

(TB)

Richards, 1984; Qing et al.,)

(1999) Wittrock Walker

(1988, 1992; Walker and Wittrock, 1999

:

(6)

.(Richards, 1984; Qing et al., 1998, 1992)

(NS) -

NH₂

.(Cheng, 1986)

:

(8) (ASB-B) -

(Miller and Harley, 1996)

(Chandra et al., 1985; 2001)

.(1999) Wattrock Walker

:(DNA)

(FR)

(9)

.(Mader, 1998)

:()

(10) (VK)

.Hall (1993)

Cheng Hall (1993)

(1986)

.....

: *S. glanis* :(1)

.44X (HEP) (E) (Sh) (L) (Cy)

: :(2)

(Sh) (L) (Il) (Ol) (Cy)

(Sml) (Ct) (Ic)

.217X (HEP)

(Cy) : :(3)

.44X - (L)

(Cy) : : (4)
.44X 2.5 (L)
(Cy) : : (5)
.44X (L)
(Cy) : : (6)
.44X (L)

.....

-

:(7)

.44X

-

:(8)

.44X

:(9)

.108X

.44X

:(10)

- Bursey, C.R., 1982. *Eustrongylides tubifex* (Nitzsch) encystment in an American eel *Anuilla rostrata* (Le sueur). Journal of Fish Biology, Vol. 21, pp.443-447.
- Bursey, C.R., 1986. Histological aspects of natural *Eustrongylides* infection of the northern water snake, *Nerodia sipedon*. Journal of Wildlife Diseases, Vol. 22, No. 4, pp.527-532.
- Chandra, K.J., Hanumantha, K.R. and Shyamasundari, K., 1985. Observation on the histology and histochemistry of *Penterocphalus plerocercoid* (Pseudophyllidae: Cestoda). Proceeding of Indian Academy of Sciences, Vol. 94, No. 1, pp.11-19.
- Cheng, T.C., 1986. General Parasitology. Academic press. Inc. Orland, Florida and London.
- Eiras, J.C. and Rego, A.A., 1987. The histopathology of *Scomber japonicus* infection by *Nematobothrium scombri* (Trematoda:Didymozoidae) and of larval anisakid nematode infection in the liver of *Pagrus pagrus*. Medical Institute of Oswaldo.
- Goldberg, S.R. and Bursey, C.R., 1988. Larval nematodes (*Ascarops* sp., Spirurida, Spirocercidae) in liver granulomata of the western fence lizard, *Sceloporus occidentalis* (Iguanidae). Journal of Wildlife Diseases, Vol. 24, No. 3, pp.568-571.
- Goldberg, S.R., Bursey, C.R. and Holshuh, H.J., 1994. *Phyocephalus* sp. (Spiruridea, Spirocercidae) larvae in stomach granulomas of blue spiny lizard, *Sceloporus serrifer* (Phrynosomaidiae) from Texas. Journal of Wildlife Diseases, Vol. 30, No. 2, pp.274-276 .
- Habash, A.H., 1977. Ecology and biological studies on the larval nematode, *Contracaecum* sp. a parasite of the fishes in Basrah, Iraq. M.Sc. thesis, University of Basrah.
- Hall, B.K., 1993. Experimental infection of yellow perch (*Perca flavescens*) with *Apophallus brevis* (Digenea, Heterophyidae) parasite invasion, encystment and ossicle development. Canadian Journal of Zoology, Vol. 71, No. 9, pp.1886-1894.
- Hoffman, G.L., 1967. Parasites of North American Freshwater Fishes. University of California Press.
- Joy, J.E., Walker, E.M., Koh, S.G., Bentley, J.M. and Crank, A.G., 1996. Intrahepatic larval nematode infection in the northern spring peeper, *Pseudacris cruifer cruifer* (Anura : Hylidae) in West Virginia. Journal of Wildlife Diseases, Vol. 32, No. 2, pp.340-343.
- Luna, S.S., 1988. Biology. Sixth Edition, McGraw-Hill Publishers, England.
- Margolis, L., 1970. Nematode diseases of marine fishes. A symposium of diseases of fishes and shellfishes. [S.F. Snieszko, ed.] American fisheries Society, Special Publication, Vol. 5, pp.198-208.

- McAllister, C.T., Goldberg, S.R. and Holshuh, H.J., 1993. *Spiroxys contorta* (Nematoda: Spirurida) in gastric granulomas of *Apalone spinifera pallida* (Reptilia:Testudin). Journal of Wildlife Diseases, Vol. 29, No. 3, pp.509-511.
- Measures, L.N., 1988a. Epizootiology, Pathology and description of *Eustrongylides tubifex* (nematoda:Dioctophymatoidea) in fish. Canadian Journal of Zoology, Vol. 66, pp.2212-2222.
- Measures, L.N., 1988b. The development and pathogenesis of *Eustrongylides tubifex* (Nematoda:Dioctophymatoidea) in piscivorous birds. Canadian Journal of Zoology, Vol. 66, pp.2223-2232.
- Mhaisen, F.T., 1980. Fish parasitology in Iraq. Basrah Nat. Hist. Mus. Publ. No. 3:36 + IX pls.
- Miller, A. and Harley, J.P., 1996. Zoology. Third Edition, WCB/McGraw-Hill Company, New York.
- Olsen, O.W., 1974. Animal Parasites: Their life Cycles and Ecology, Third Edition. University Park Press, Baltimore.
- Pauw, M.K., Filipiak, M.B., Gabryel, P. and Gustowska, L., 1994. Contribution of muscle cell of formation of capsule around *Trichinella spiralis* larva. Ultrastructural studies. Wiadomosci Parazytologiczne, Vol.40, No. 4, pp.369-374.
- Pearse, A.G.E., 1985. Histochemistry. Theoretical and Applied. Fourth Edition, Vol.2, Analytical Technology. Churchill-Livingstone. Edinburgh.
- Qing, Y.Y., Wei, Z.C., Tong, W.J., Jie, C.J. and Lin, Z.W., 1990. Further observation on the histology and histochemistry of development *Echinococcus granulosus* cyst in NIH mice. Endemic Disease Bulletin, Vol. 2, No. 3, pp.43-46.
- Qing, Y.Y., Wei, Z.C., Tong, W.J., 1992. Observation on the histology and histochemistry of secondary *Echinococcus granulosus* cysts. Endemic Disease Bulletin, Vol. 3, No. 5, pp.17-20.
- Rahemo, Z.I.F. and Mohammad, M.S.A., 1995. The histopathology of the larval Cucullanid nematode in the heart of *Carra rufa* Heckel. Acta Parasitologica Turcica, Vol. 19, No. 1, pp.144-150.
- Rahemo, Z.I.F. and Nawab Al-Din, F.M., 1995. The histopathology caused by two nematode larvae in two species of fishes. Acta Parasitologica Turcica, Vol. 19, No. 4, pp.571-575.
- Richards, K.S., 1984. *Echinococcus granulosus* equinus: The histochemistry of the laminated layer of the hydatid cyst. Folia Histochemica et Cytobiologica, Vol. 22, No. 1, pp.21-32.
- Roitt, I., Brostoff, J. and Male, D., 1988. Immunology. Mosby International Ltd. UK.
- Shamsuddin, M., Nadir, I.A. and Al-Azzawi, M.J., 1971. Parasites of common fishes from Iraq with special reference to larval form of *Contracaecum* (nematoda:Heterocheilidae). Bulletin of Biological Research Center, Baghdad, Vol. 5, pp.66-78.
- Tizzard, I., 1986. Veterinary Immunology. An Introduction. W.B. Saunders Co., St. Lois: pp.241-247.
- Walker, D.J. and Wittrock, D.D., 1999. Histochemistry and ultrastructure of the metacercarial cyst of *Cryptogonimus chyli* (Trematoda:Cryptogonimidae). Journal of Helminthological Society, Washington, Vol. 66, No. 1, pp.82-86.
- Williams, H.H., 1967. Helminth diseases of fish. Helminthological, Abstracts, Vol. 36, pp.261-295.