

OBSERVATIONS ON TWO LARVAL CESTODES FROM RED SEA FISHES AT JEDDAH , SAUDI ARABIA

NAJWA Y. ABU-ZINADA

Department of Zoology,
Girls College of Education, P. O. Box 9470,
Jeddah, 21413, Saudi Arabia.

Received : 29/ 12/ 1997

Accepted : 10/ 1/ 1998

SUMMARY

Examination of red sea fished at Jeddah revealed the presence of larval cestodes belonging to the trypanorhynchid cestode genera: **Grillotia Guiart, 1927**, and **Otobethrium Linton, 1890**. Cestodes of the former genus were found in the intestine of Roving Grouper (**Plectropomus maculatus, Bloch 1790**, locally known as El-Nagil) fishes, and those of the latter genus in cysts attached to the mesentry of Mahsena Emperor (**Lethrinus mahsena, Forsakal 1775**, locally known as El-Shuour fishes. The incidence and morphology of these two larval stages are discussed.

INTRODUCTION

The earliest studies on parasites of the Red Sea fishes were reported by Jagerskiold and Odhner (1901) and Wilson (1928) who collected crustacean parasites during the Swedish Zoological Expedition to the White Nile and Red Sea. Tronquist (1931) described a nematode, *Procamalanus sphaericonchus*, from both

Sermus and Tuthis spp. fishes from the Red Sea. Later on Nagaty (1937; 1948; 1956a; 1956b) and Nagaty and Abdel Aal (1969; 1972) recorded trematodes, while Abdel Hady et al., (1981) described trematodes and nematodes from Red Sea fishes. Banaja and coworkers (Banaja and Roshdy, 1979; Banaja et al., 1979) also observed larval stages of Trypanorynch cestoda from *Plectropomus maculatus* and studied the ultrastructure of the scolex of a Trypanorynchid plerocercus from that fish. Saoud and Hassan (1983) carried out a general survey on helminthic parasites of some elasmobranchs from Egyptian coastal waters of both the Mediterranean and Red seas.

The objective of this preliminary study was to identify parasites of Red Sea fishes caught from Saudi Arabian waters. This study was dictated by the importance and development of Red Sea fisheries and because fish are anticipated to play a major part as a source of animal protein for the growing population of Saudi Arabia.

MATERIALS AND METHODS

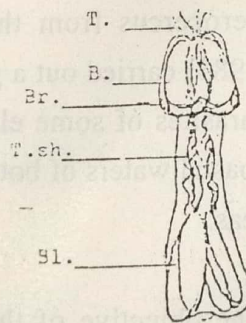
A total number of 85 fishes were examined for parasites. The fish spp. were identified using the key of Kluzinger (1984). Forty five fish, *Plectropomus maculatus* (known locally as El-Nagil; family Serranidae, Randall, 1983), and 40 fish :*Lethrinus mahsena* (known locally as El-Shuour, family Lethrinidae), were purchased from fishermen and fish markets in Jeddah. In the laboratory, the fish were parasitologically examined as soon as possible. Cysts attached to the guts of fish were collected and placed in normal saline. The gut of each fish was cut opened in a Petri dish filled with saline and examined for helminths. The detected parasites were thoroughly washed. Some of the collected parasites were flattened by gentle pressure then fixed in 10% formalin. Some of these flattened

specimens were stained with acetic acid and the remainder were preserved for investigation.

RESULTS

Out of the 45 fish of *Plectropomus maculatus* (El-Nagil) examined, 15 harboured plerocercoid of trypanorhynchial worms, corresponding infection rate of 33.3%. The recovered plerocercoids were identified as *Grillotia* (Guiart, 1927) according to Wardle and McLeod (1952) and Yamaguti (1959). The following description is based on 10 whole mounts measure 12-26 mm. x 1-1.25 mm. H 4.1-4.3 mm. long and has 4 bothridia posterior marginal notch, each one measure 0.45 mm. long. Pars vaginalis region of 2.5-2.8 mm. long, and has long, sinuous

Fig. 1



Otobothrium spp.
plerocercoid

Fig. 2



Grillotia spp.
plerocercoid

After Wardle & McLeod (1952)

B., = bothrium
T., = tentacle

B1., = bulbs
T. Sh., = tentacle sheata

Br., = bourrelette



Crillotia spp. holdfast



Otobothrium holdfast invaginated inside the cyst

sheaths. The tentacles are heteroacanthous, armed with obliquely half turns of principal hooks 4-6 in each half turn, increasing gradually in size from internal to external surface (Fig. 1).

Out of the 40 fishes of *Lethrinus* sp. (El-Shuour) examined, 10 harboured encysted plerocercoids, corresponding to an infection rate of 30%. The cysts were identified as *Otobothrium* sp. (Wardle and McLeod, 1952; Yamaguti, 1959). Each cyst is oval or bean shaped, with short appendix. The cysts measure 6-13 mm. by 5-7 mm. Microscopical examination of whole mounts revealed the existence of invaginated holdfasts each provided with two filliform bothridia. On the external and free margin of each bothridium there is a bourrelette. Tentacles are invaginated and armed with hooks. Tentacles are shorter than their sheaths (Fig. 2).

DISCUSSION

Adult trypanorynchial cestodes are parasites of *Elasobridilis* (*Chondroichthysis*) like sharks, skates and rays. The present worms recovered from teleost fishes represent larval stages of trypanorynchid cestodes and illustrate the part that these teleost play a role in the food chain in the Red Sea. These larval stages, which were identified as *Grillotia* sp. and *Otobothrium* sp., are of interest since the only other records of a larval trypanorynchid cestode parasite in red sea fishes were those of Banaja et al., (1979) who recovered trypanorynchial larvae from *Plectropomus maculatus* from Red Sea in Saudi Arabia and Abdel Hady et al., (1981) who recorded *Nybelinia*

spp. from *Epinephalus fasciatus* from the Red Sea in Egypt.

REFERENCES

- Abdel Hady, O. K. Imam, E. A. and Tawfik, M. A. (1981): Some studies on helminth parasites of fishes from the Red Sea. M. V. Sc., thesis, Cairo University, Egypt.
- Banaja, A. A. and Roshdy, M. A. (1979): Scanning electron microscopy of the scolex of a Trypanorynchid cestode in the fish, *Plectropomus maculatus* (Bloch) (Trypanorhyncha). Bull. Fac. Sci. King Abdulaziz Univ., 3: 29-35.
- Banaja, A. A., Roshdy, M. A., Ghandour, A. M. and El-Hadi, A. A. (1979): Observations on larval stages of a Trypanorynch cestode in the fish, *Plectropomus maculatus* (Bloch) from the Red Sea. Bull. King Abdulaziz Univ., 3: 9-18.
- Jagerskiold, L. and Odhner, I. (1901): Results of Zoological expedition to Egypt and White Sea. Upsala (Cited by Wilson, 1928).
- Kluzinger, C. B. (1984): Die Fische des roten Meeres. Stuttgart, Germany.
- Nagaty, H. F. (1937): Trematodes of fishes from the Red Sea. Part I. Studies on family Bucephalidae. Fac. M. Sc. No. 12, The Egyptian University, Cairo.
- Nagaty, H. F. (1948): Trematodes of fishes from the Red Sea. Part 4, On some new and known forms with testis. Parasitol., 34 (5), 355-363.
- Nagaty, H. F. (1956a): Trematodes of fishes from the Red Sea. Part 6. On five distomes including one new and four new species. Studies from the Dept. Zoology, University of Nebraska, U. S. A. No. 284. Parasitol. 42 (2), 15-25.
- Nagaty, H. F. (1956b): Trematodes of fishes from the Red Sea. Two Cyliauchenids and three Allocybaenids including four new species. Parasit. 42 (5), 523-535.
- Nagaty, H. F. and Abdel Aal, T. M. (1969): Trematodes of fishes from the Red Sea. Part 7. Parasit. 42 (5), 535-545.
- Nagaty, H. F. (1979): Trematodes of fishes from the Red Sea. Part 8. Parasit. 42 (5), 545-555.
- Nagaty, H. F. (1981): Trematodes of fishes from the Red Sea. Part 9. Parasit. 42 (5), 555-565.
- Nagaty, H. F. (1982): Trematodes of fishes from the Red Sea. Part 10. Parasit. 42 (5), 565-575.
- Nagaty, H. F. (1983): Trematodes of fishes from the Red Sea. Part 11. Parasit. 42 (5), 575-585.
- Nagaty, H. F. (1984): Trematodes of fishes from the Red Sea. Part 12. Parasit. 42 (5), 585-595.
- Nagaty, H. F. (1985): Trematodes of fishes from the Red Sea. Part 13. Parasit. 42 (5), 595-605.
- Nagaty, H. F. (1986): Trematodes of fishes from the Red Sea. Part 14. Parasit. 42 (5), 605-615.
- Nagaty, H. F. (1987): Trematodes of fishes from the Red Sea. Part 15. Parasit. 42 (5), 615-625.
- Nagaty, H. F. (1988): Trematodes of fishes from the Red Sea. Part 16. Parasit. 42 (5), 625-635.
- Nagaty, H. F. (1989): Trematodes of fishes from the Red Sea. Part 17. Parasit. 42 (5), 635-645.
- Nagaty, H. F. (1990): Trematodes of fishes from the Red Sea. Part 18. Parasit. 42 (5), 645-655.
- Nagaty, H. F. (1991): Trematodes of fishes from the Red Sea. Part 19. Parasit. 42 (5), 655-665.
- Nagaty, H. F. (1992): Trematodes of fishes from the Red Sea. Part 20. Parasit. 42 (5), 665-675.
- Nagaty, H. F. (1993): Trematodes of fishes from the Red Sea. Part 21. Parasit. 42 (5), 675-685.
- Nagaty, H. F. (1994): Trematodes of fishes from the Red Sea. Part 22. Parasit. 42 (5), 685-695.
- Nagaty, H. F. (1995): Trematodes of fishes from the Red Sea. Part 23. Parasit. 42 (5), 695-705.
- Nagaty, H. F. (1996): Trematodes of fishes from the Red Sea. Part 24. Parasit. 42 (5), 705-715.
- Nagaty, H. F. (1997): Trematodes of fishes from the Red Sea. Part 25. Parasit. 42 (5), 715-725.
- Nagaty, H. F. (1998): Trematodes of fishes from the Red Sea. Part 26. Parasit. 42 (5), 725-735.
- Nagaty, H. F. (1999): Trematodes of fishes from the Red Sea. Part 27. Parasit. 42 (5), 735-745.
- Nagaty, H. F. (2000): Trematodes of fishes from the Red Sea. Part 28. Parasit. 42 (5), 745-755.
- Nagaty, H. F. (2001): Trematodes of fishes from the Red Sea. Part 29. Parasit. 42 (5), 755-765.
- Nagaty, H. F. (2002): Trematodes of fishes from the Red Sea. Part 30. Parasit. 42 (5), 765-775.
- Nagaty, H. F. (2003): Trematodes of fishes from the Red Sea. Part 31. Parasit. 42 (5), 775-785.
- Nagaty, H. F. (2004): Trematodes of fishes from the Red Sea. Part 32. Parasit. 42 (5), 785-795.
- Nagaty, H. F. (2005): Trematodes of fishes from the Red Sea. Part 33. Parasit. 42 (5), 795-805.
- Nagaty, H. F. (2006): Trematodes of fishes from the Red Sea. Part 34. Parasit. 42 (5), 805-815.
- Nagaty, H. F. (2007): Trematodes of fishes from the Red Sea. Part 35. Parasit. 42 (5), 815-825.
- Nagaty, H. F. (2008): Trematodes of fishes from the Red Sea. Part 36. Parasit. 42 (5), 825-835.
- Nagaty, H. F. (2009): Trematodes of fishes from the Red Sea. Part 37. Parasit. 42 (5), 835-845.
- Nagaty, H. F. (2010): Trematodes of fishes from the Red Sea. Part 38. Parasit. 42 (5), 845-855.
- Nagaty, H. F. (2011): Trematodes of fishes from the Red Sea. Part 39. Parasit. 42 (5), 855-865.
- Nagaty, H. F. (2012): Trematodes of fishes from the Red Sea. Part 40. Parasit. 42 (5), 865-875.
- Nagaty, H. F. (2013): Trematodes of fishes from the Red Sea. Part 41. Parasit. 42 (5), 875-885.
- Nagaty, H. F. (2014): Trematodes of fishes from the Red Sea. Part 42. Parasit. 42 (5), 885-895.
- Nagaty, H. F. (2015): Trematodes of fishes from the Red Sea. Part 43. Parasit. 42 (5), 895-905.
- Nagaty, H. F. (2016): Trematodes of fishes from the Red Sea. Part 44. Parasit. 42 (5), 905-915.
- Nagaty, H. F. (2017): Trematodes of fishes from the Red Sea. Part 45. Parasit. 42 (5), 915-925.
- Nagaty, H. F. (2018): Trematodes of fishes from the Red Sea. Part 46. Parasit. 42 (5), 925-935.
- Nagaty, H. F. (2019): Trematodes of fishes from the Red Sea. Part 47. Parasit. 42 (5), 935-945.
- Nagaty, H. F. (2020): Trematodes of fishes from the Red Sea. Part 48. Parasit. 42 (5), 945-955.
- Nagaty, H. F. (2021): Trematodes of fishes from the Red Sea. Part 49. Parasit. 42 (5), 955-965.
- Nagaty, H. F. (2022): Trematodes of fishes from the Red Sea. Part 50. Parasit. 42 (5), 965-975.
- Nagaty, H. F. (2023): Trematodes of fishes from the Red Sea. Part 51. Parasit. 42 (5), 975-985.
- Nagaty, H. F. (2024): Trematodes of fishes from the Red Sea. Part 52. Parasit. 42 (5), 985-995.
- Nagaty, H. F. (2025): Trematodes of fishes from the Red Sea. Part 53. Parasit. 42 (5), 995-1005.

fishes from the Red Sea. Part 18. On two new and one known Allocreadiid species. J. Egypt. Vet. Med. Ass. 29(1, 2), 1-4.

Nagaty, H. F. and Abdel Aal, T. M. (1972): Trematodes of fishes from Red Sea. Part 20. On four Monorchids including a new genus and three new species. J. Egypt. Vet. Med. Ass. 23 (3,4), 206-213.

Randall, J. E. (1983): Red Sea Fishes., Immel Publishing, Lond., U. K. I.

Soud, M. F. A. and Hassan, S. H. (1983): A general survey on the helminth parasites of some elasmobranchs from the Egyptian coastal waters of the Mediterranean and the Red Sea. Bull. Fac. Sci., 7: 70-81.

Trongquist, N. (1931): Die nematoden Familien Cucullanidae und Camallandiae. Goteb Knngl. Vet. Och. Vett. Smah. Handl. Ser. B 2 (3), 441 pp.

Wardle, R. A. and McLeod, S. J. (1952): The Zoology of Tape Worms University of Minnesota Press, Minneapolis, U. S. A.

Wilson, C. B. (1928): Parasitic copepods from the White Nile and Red Sea. Res. Swed. Zool. Exp. to Egypt White Nile, 1901, V. Upsala.

Yamaguti, S. (1959): Systema Helminthum. Vol. II. The Cestodes of Vertebrates. Interscience Publ. N. Y., U. S. A.

SUMMARY

Three thousand day old chicks (Cobb) were divided into two groups and reared identically. The first group (high energy-treatment) was fed a starter diet (24% CP, 3300 Kcal/kg ME) then a grower diet (21% CP, 3100 Kcal/kg ME) followed by a finisher diet (19% CP, 3100 Kcal/kg ME). 2% Ultrabond was added to adjust water levels of energy. The second group (conventional energy control) was fed a starter diet (24% CP, 2900 Kcal/kg ME) then a grower diet (21% CP, 2800 Kcal/kg ME) and a finisher diet (19% CP, 2800 Kcal/kg ME). Body weight was significantly higher in birds fed high energy diet and the feed conversion ratio was significantly lower than the control group. The pH of the high energy treatment remained stable pH throughout the experiment and optimum moisture content indicating good quality litter. The susceptibility of the material immunity for both ND and IBD was not affected by the dietary treatment. The non specific immune response to

SNBCs was significantly higher in birds fed high energy ration, also the sterilization index of lymphocyte transformation was significantly increased as compared with those of the conventional energy treatment.

INTRODUCTION

Broiler chickens have traditionally been fed relatively high energy diets because, in addition to promoting efficient feed utilization, it is the opinion that this type of diet maximizes growth rate (Leeson and Summers, 1991). Another reason a blend of vegetable oil and animal fat is commonly added to poultry diets to reduce feed costs. Lubricant pelleted diets, increase the dietary energy and improve the utilization of metabolizable energy calories and protein.

Broilers receiving high energy diet had a lower feed conversion and feed intake than birds receiving normal energy level diet (Lytle and

