

Cestodes of the Genus *Cephalobothrium* Shipley and Hornel, 1906 (Lecanicephaliidae), with Description of *C. ghardagense* n. sp. and *C. taeniurai* n. sp. from the Red Sea Fishes

M. M. RAMADAN

(Received for publication; March 19, 1985)

Key words: *Cephalobothrium*, cestodes from Red Sea fishes

Introduction

Shipley and Hornel (1906) established the genus *Cephalobothrium* with *C. aetobatidis* from *Aetobatis narinaris* in Ceylon as a type species, a Lecanicephaliid cestodes mainly characterized by having a circular scolex, without tentacles, anterior region of scolex represented by a large circular sucker and bearing four equidistant suckers. Proglottids somewhat craspedote, wider than long, with exception of last six or seven, which are longer than wide. Shipley and Hornel (1906) and Yamaguti (1959) mentioned nothing about the morphology or anatomy of the mature proglottids.

Perrenoud (1931) redescribed *Cephalobothrium abruptum* Southwell (1911) and *C. variable* Southwell (1911) from *Pteroplatea micrura* in Ceylon waters as a type of the genus *Hexacanalix* Perrenoud, 1931. However, Yamaguti (1959) and Wardle and McLeod (1968) accepted Perrenoud's view and reported that *Cephalobothrium aetobatidis* represents the only species of the genus *Cephalobothrium* (cited from Wardle and McLeod, 1968).

Chincholikar and Shinde (1977) added without description *Cephalobothrium subhpradhi* from an unnamed marine fish in India. They stated only with no details that *C. subhpradhi* differs from earlier known species in a number of morphological characters.

Another two species were described from Pakistan; these included *Cephalobothrium pteroplateai* Zaida and Khan, 1976 from *Pteroplatea micrura* and *C. gymnurai* Zaida and Khan, 1976 from *Gymnura* sp.

Materials and Methods

The identification of the fishes as well as the methods followed in the collection, fixation and staining of cestodes are described elsewhere (Saoud *et al.*, 1982). Drawing are made to the scale using a camera lucida. Measurements are in millimetres, unless stated otherwise.

During the present investigation, two species belonging to the genus *Cephalobothrium* were collected from the intestine of male bony fish *Scarus bicolor* caught in August, 1976 and from the spiral intestine of female cartilaginous fish *Taeniura lymma* caught in February, 1977 caught from the shores of Al-Ghardaga, Red Sea. These species are different from the known species of the genus and are accordingly considered as new species.

Descriptions

1-*Cephalobothrium ghardagense* n. sp. (Fig. 1.)

The description based on one complete specimen collected from *Scarus bicolor* locally called "Beydi".

The entire worm consists of scolex and strobila. It measures 13.32 in total length and 0.85 in maximum breadth attained at the mature proglottids region.

Department of Biology, Faculty of Education, Ain Shams University, Cairo, Egypt.

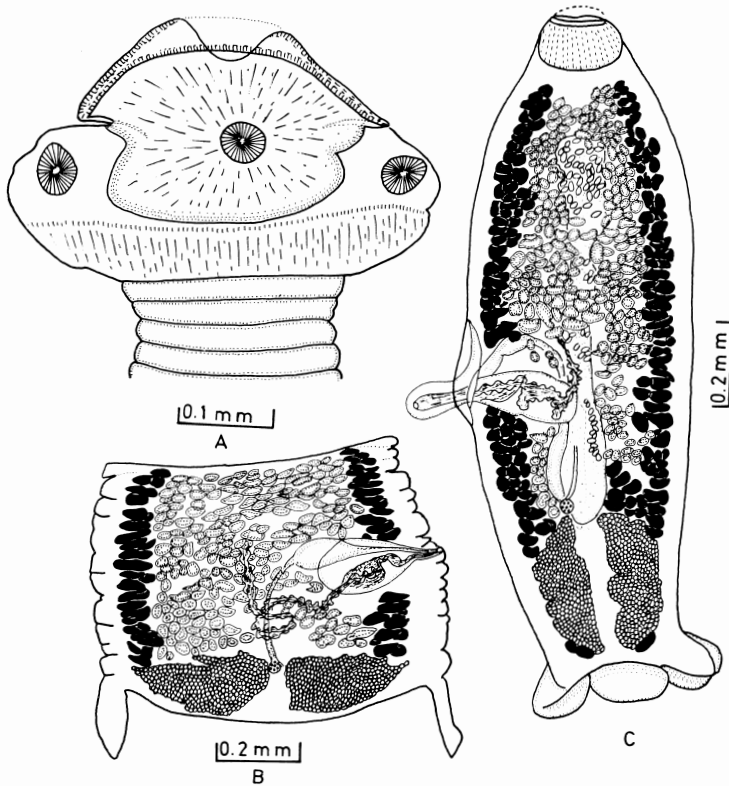


Fig. 1 *Cephalobothrium ghardagense* n. sp.

A-Scolex.

B-Mature proglottid, ventral view.

C-Gravid proglottid, ventral view.

The scolex is large and it measures 0.25 in length and 0.45 in maximum breadth. It consists of two portions, an apical part represented by a large central and measures 0.03 long and 0.30 wide and the posterior portion, cup-like shape, measures 0.06 in length and 0.45 breadth. The posterior part of the scolex bear four equal suckers with a diameter of 0.05.

Following the scolex is the peduncle and it measures 0.06 in length and 0.42 in breadth. Segmentation appears behind the peduncle. There are 38 proglottids. The anterior proglottids are crowded and much broader than long. A gradual increase in length is observed during the development of the genital organs. Mature proglottids are somewhat broader than long and measure 0.63 long and 0.85 wide. Mature proglottid length/breadth

ratio 0.75 : 1. The gravid proglottids are longer than broad, measuring 1.50 long and 0.58 wide.

Sexually mature segments harboured approximately 180-200 testes per proglottid occupying nearly the anterior three-fourth of the proglottid. Postvaginal testes are present. Testes are nearly oval in shape and measures 0.02-0.04 in diameter. There is a thick median convoluted seminal vesicle that opens into a pear-shaped cirrus pouch.

Cirrus pouch is clearly observed in middle proglottids. It is in the form of pear-shaped organ that opens on the genital atrium. It measures 0.30 long and 0.15 wide, the length/breadth ratio 2.00 : 1. The everted cirrus measures 0.25 in length. Genital atrium is situated at the middle of the lateral side and irregularly alternating. The vagina lies tow-

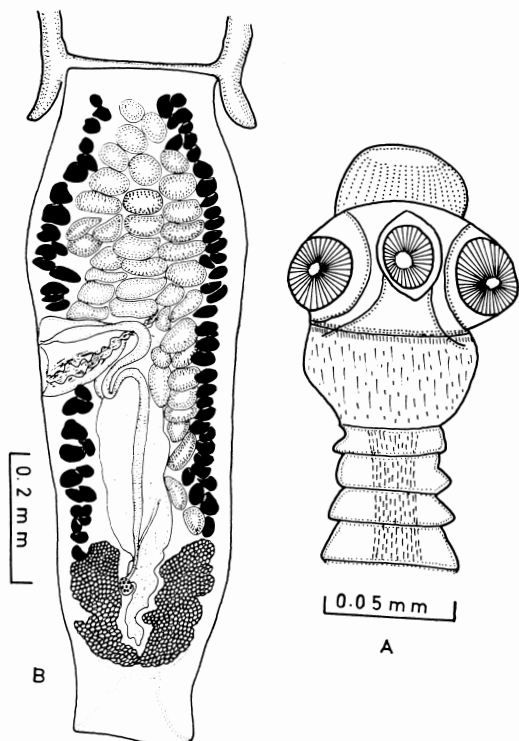


Fig. 2 *Cephalobothrium taeniurai* n. sp.

A-Scolex.

B-Mature proglottid, ventral view.

ards the lateral sides of the proglottids and slightly overlapped with the cirrus pouch. It opens with minute pore on the genital atrium, ventral to cirrus pouch's opening.

The uterus is in the form of a median tube, in posterior gravid proglottids, it extends along the median line passing between the testes and reaching the proximal end of the proglottid. Eggs are oval in shape, equal in size and measures $25\ \mu\text{m}$ long and $10\ \mu\text{m}$ wide.

The ovary consists of two equal separated parts, posteriorly situated. Each part formed of several distinguished lobes, each lobe measures 0.35 long and 0.12 wide. A round shaped receptaculum seminis is found anterior to the ovary, towards right or left sides and measuring 0.01 in diameter. The vitellaria are in the form of two lateral bands of closely packed vitelline follicles extending laterally along the whole length of the proglottid, except at the region of the genital

atrium. Each band (in mature proglottids) is formed of one to two rows of transversely elongated oval vitelline follicles, numbering 30-55 and measures 0.04-0.07 in greater diameter.

Host: *Scarus bicolor*.

Location: Intestine.

Locality: Al-Ghardaga, Red Sea.

Holotype: Deposited in the Helminthological Collection, Zoology Department, Faculty of Science, Ain Shams University, No. 341.

2-Cephalobothrium taeniurai n. sp. (Fig. 2.)

The description based on two complete specimens collected from *Taeniura lymma* locally called "Abù Qurbag".

The whole length attained is 14.70-16.83, with a maximum breadth of 0.31-0.35 at the middle of mature proglottids.

The scolex is minute and measures. 0.08-0.11 long and 0.09-0.10 wide. It consists of two portions, an apical portion provided by central sucker and measures 0.03 long and 0.05 wide. The posterior portion squarish-like shape, measures 0.03-0.08 long and 0.03-0.09 wide and provided with four equal suckers with a diameter of 0.03.

Following the scolex is the peduncle and it measures 0.04 in length and 0.06-0.07 in breadth. Segmentation appears behind the peduncle. There are 29 proglottids. The anterior proglottids are crowded and much broader than long. A gradual increase in length is observed during the development of the genital organs. Mature proglottids are longer than broad and measures 0.76-0.98 long and 0.29-0.35 wide. Mature proglottid length/breadth ratio 0.28-3.10 : 1.

There are 35-40 testes per proglottid occupying nearly the anterior two-thirds of the proglottid. Post-vaginal testes are present. Testes are oval in shape and measures 0.04-0.07 in diameter. There is a thick median convoluted seminal vesicle that opens into the large cirrus pouch.

Cirrus pouch is large, oval in shape, lies nearly at the middle length of the proglottid. It measures 0.13 long and 0.09-0.11 wide. The length/breadth ratio being 1.18 : 1. Genital atrium is situated at the middle of the

lateral side and irregularly alternating. The vagina lies towards the lateral side of the proglottids and overlapped with the cirrus pouch.

The uterus is an elongated median blind-ended tube that extends to cirrus pouch level. No eggs recorded in the uterus. The ovary is bilobed and posteriorly situated. The two lobes joined together posteriorly. Ovary lobes are almost equal in length measuring 0.16–0.19 long and 0.08–0.09 wide. The receptaculum seminis is oval in shape, lies between the ovarian lobes and measures 0.02 in diameter.

The vitellaria are in the form of two lateral bands, extending laterally along the whole length of the proglottid, exception the ovary region. Each band is formed of one row of spherical to oval shaped vitelline follicles, numbering 33–39 and measures 0.02–0.04 in diameter.

Host: *Taeniura lymma*.

Location: Spiral intestine.

Locality: Al-Ghardaga, Red Sea.

Types: Deposited in the Helminthological Collection, Zoology Department, Faculty of Science, Ain Shams University, Nos. 342 (Holotype) and 343 (Paratype).

Discussion

For the differentiation between the species of *Cephalobothrium*, many aspects can be taken into consideration; scolex morphology and arrangement and number of testes, configuration of cirrus pouch, arrangement of vitelline glands, shape and position of ovary and the shape of mature proglottids.

Although no details are mentioned about the internal anatomy of *C. aetobatidis* except the morphology of the scolex. The two new species have different shapes of scolex, since *C. ghardagense* n. sp. with wide than long scolex and *C. taeniurai* n. sp. with long than wide scolex while its round in the type of the genus. Also the ratio of length to width in the last six segments are less than 1 in *C. ghardagense* n. sp. and about 3 : 1 in *C. taeniurai* n. sp. while its 1 : 1 or 2 : 1 in *C. aetobatidis*.

The two new species can be easily distinguished from *C. pteroplateai* and *C. gymnurai*

by a number of morphological characters mainly the number and arrangement of testes, since its 7 to 16 in the anterior half of the segment in *C. pteroplateai* and its 29 and centrally placed between the ovary and the anterior border of the segment in *C. gymnurai*.

Moreover, *C. ghardagense* n. sp. can be easily distinguished from *C. taeniurai* n. sp. by scolex size, testes number, size and distribution of the vitellaria, and shape and extension of the ovarian lobes.

The present author believes that all the above differences are sufficient to designate *Cephalobothrium ghardagense* and *Cephalobothrium taeniurai* as a new species. The present descriptions of these two species represent the first record of the genus *Cephalobothrium* in Red Sea.

On the light of the present descriptions of the two new species of the genus *Cephalobothrium* the generic diagnosis can be amended as follows: "Scolex circular; anterior region represented by a large central sucker which may be evaginated as a dome like projection; posterior region cuplike, bearing four equidistant suckers. Neck short or absent. Peduncle present. Proglottids somewhat craspedote, wider than long, with exception of last six or seven, which are square to twice as long as wide. Testes numerous; filling entire intervacular field anterior to ovary. Cirrus pouch globular to pyriform, extending halfway across proglottids. Genital pore irregularly alternating. Ovary two-winged; each wing compact or lobulated. Vitelline follicles extending in two lateral rows anterior to ovary, some follicles may lie behind the ovary; uterus median, occupying most of proglottids length anterior to ovary. Vagina running behind or front of cirrus pouch. Parasitic in marine fishes".

Summary

Cephalobothrium ghardagense n. sp. from *Scarus bicolor* and *C. taeniurai* n. sp. from *Taeniura lymma* are described from the Red Sea fishes. The two new species are compared with other congeneric species, and the diagnostic features of the genus are amended.

The present descriptions of the two new species represents the first record of the genus *Cephalobothrium* in Red Sea.

Acknowledgements

The author gratefully acknowledges the guidance and useful comments of Prof. Dr. Mary H. Pritchard, Professor of Parasitology, H. W. Manter Laboratory, University of Nebraska, U. S. A. and Prof. Dr. M. F. A. Saoud, Professor of Parasitology, Faculty of Science, Ain Shams University. Thanks are also due to the Marine Biological Station at Al-Ghardaga, Red Sea, for sincere help in collection and identification of fishes.

References

- 1) Chincholikar, L. N. and Shinde, G. B. (1977): On *Cephalobothrium subhapradhi* sp. n. (cestoda: Lecanicephaliidae Braun, 1900) from a marine fish at Ratnagiri Maharashtra, India. (Abstract) in All-India Symposium on helminthology, Srinagar, 8-11 August, 1977.
- 2) Saoud, M. F. A., Ramadan, M. M. and Hassan, S. H. (1982): On *Echinobothrium helmymohamedi* n. sp. (Cestoda: Diphyllidea); a parasite of the sting ray *Taeniura lymma* from the Red Sea. J. Egypt. Soc. Parasit., 12, 199-207.
- 3) Shipley, A. E. and Hornel, J. (1906): Report on cestode and nematode parasites from marine fishes of Ceylon. Rep. Ceylon Mar. Biol. Lab., 5, 43-96.
- 4) Southwell, T. (1911): Description of nine new species of cestode parasites including two new genera from marine fishes of Ceylon. Rep. Ceylon Mar. Biol. Lab., 18, 216-225.
- 5) Wardle, R. A. and McLeod, J. A. (1968): The zoology of tapeworms. University of Manitoba, winnipeg, Canada, 780 pp.
- 6) Yamaguti, S. (1959): Systema helminthum Vol. II. Cestodes of vertebrates. Interscience Publishers. New York, 860 pp.
- 7) Zaida, D. A. and Khan, D. (1976): Cestodes of fishes from Pakistan. Biologia, Pakistan, 22, 157-179.

紅海産魚類の条虫類の2新種, *Cephalobothrium ghardagense*, *C. taeniurai* (Lecanicephaliidae) および同属の考察

M. M. RAMADAN

(Department of Biology, Faculty of Education, Ain Shams University, Cairo, Egypt)

紅海産魚類のブダイの類から *Cephalobothrium ghardagense* を, マダラエイの類から *C. taeniurai* をそれぞれ得て新種として記載した。
これらの2新種を *Cephalobothrium* 属と近縁な属及び

種と比較し, 従来同属の属徴として不充分であった内部構造などについて補足した。

本報告は *Cephalobothrium* 属が紅海から得られた最初のものである。