PART I

1. Phyllobothriidae
2. Balanobothriidae
3. Ptychobothriidae
4. Anoplocephalidae
5. Dilepididae
6. Davaineidae.
Eucestoda Wardle, McLeod and Radinovsky, 1974
Tetraphyllidea Ceras, 1863
Phyllobothriidae Braun, 1900
Anthobothrium Beneden, 1850
A. bombayensis n. sp.

**Description**

Ten cestodes were collected from the spiral intestine of a marine fish, *Carcharias acutus* in the month of March, 1973 at Bombay, West Coast of India.

The scolex is almost quadrangular, with 4 petal-like bothridia. The scolex measures 0.59 in length and 0.67 in breadth whereas the bothridia measure 0.43 in length and 0.25 in breadth. The bothridia are almost triangular, elongated and almost separate from each other. A long neck is present, measuring 0.38 in length and 0.13 in breadth.

The mature proglottids are numerous, longer than broad, almost 2 times longer than broad, and measure 0.77 in length and 0.43 in breadth. The testes are 65-70 in number, in the central medulla, preovarian, round in shape, in two lateral fields, in four rows, upto cirrus pouch and in a single field, anterior to the cirrus pouch,
plate 2

Anthobothrium bombayensis n. sp.

Figs. A. Scolex
    B. Mature segments
    C. Last segment of the worm.
small in size, bounded laterally by longitudinal excretory canals and measure 0.02 in diameter. The cirrus pouch is large, oval in shape, submarginal in position, at one third from the anterior margin of the proglottid and opens into an oval genital atrium, which is submarginal in position, containing within a wide, convoluted cirrus, measuring 0.12 in length and 0.07 in breadth. The cirrus measures 0.12 in length and 0.02 in breadth. The vas deferens is wide, short and measures 0.04 in length and 0.03 in breadth.

The ovary is bilobed, each lobe oval, with many short, blunt scini, poral lobe large, anterior in position, extending beyond the longitudinal excretory canal whereas the aporal lobe is smaller in size, posterior in position, near the posterior margin of the segment. The ovary measures 0.11 in length and 0.27 in breadth. The vagina is a thin tube, opening anterior to the cirrus pouch, of even width throughout, arises from genital pore, runs straight or slightly oblique in position, extends up to the centre of the segment, takes a curve, turns posteriorly, runs in the centre of the segments, reaches up to the shell gland and measures 0.58 in length and 0.01 in breadth. The vitellaria are granular.

The posterior mature segments are also longer
than broad, almost three and half times longer than broad, cylindrical, pointed towards posterior end and measure 1.63 to 1.76 in length and 0.46 to 0.51 in breadth.

The testes in these segments are oval, in two lateral fields, in almost four rows upto cirrus pouch region and in a single field, anterior to it, which measure 0.04 in diameter. The cirrus pouch is very big, oval in shape, broader at the distal end, extends upto the centre of the segment and measures 0.23 in length and 0.13 in breadth.

The ovary is H-shaped, bilobed, each lobe extending antero-posteriorly, with small, short, blunt acini, situated near the posterior margin of the segment, measuring 0.25 to 0.28 in length and 0.20 in breadth. The vitellaris are granular.

No gravid segments were available.

Discussion

The genus Anthobothrium is erected by Beneden in 1850. Later on 30 species are added to this genus. After going through the literature, the present worm comes closer to A. hickmani Crowcroft and A. granulatum Subhapradha in the shape of the scolex and coiled vas deferens.
1. The worm under discussion is having neck whereas the same is absent in *A. crenulatum*.

2. In having 65-70 testes, it differs from *A. hickmani* (60 testes) and from *A. crenulatum* (16-21 testes).

3. In the present form the ovary is H-shaped whereas the same in *A. hickmani* is U-shaped.

4. In the present cestode, vitellaria are granular whereas the same in *A. crenulatum* are follicular.

5. In the present form genital pores are unilateral whereas the same in *A. hickmani* and *A. crenulatum* are irregularly alternate.

On the basis of these differences it is considered as a new species and the name *A. bombayensis* n. sp. is proposed, after locality.

<table>
<thead>
<tr>
<th>Type species</th>
<th><em>A. bombayensis</em> n. sp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host</td>
<td><em>Carcharias acutus</em></td>
</tr>
<tr>
<td>Habitat</td>
<td>Spiral valve</td>
</tr>
<tr>
<td>Locality</td>
<td>Bombay, Maharashtra, India</td>
</tr>
<tr>
<td>Date of collection</td>
<td>March 20, 1978</td>
</tr>
</tbody>
</table>
Eucestoda Wardle, McLeod and Radinovsky, 1974
Lecanicephalidea Baylis, 1920
Balanobothriidae Pintner, 1923
Balanobothrium Hornell, 1912
B. thapari n. sp.

Introduction

The genus Balanobothrium was established by Hornell (1912) with its type species B. tenax from Stegostoma tigrinum at Ceylon, Bay of Bengal and pearl Banks and also from Trygon walga. Southwell (1925) recorded B. parvum from Galeocerdo arcticus in Ceylon. Yamaguti (1954) described B. stegostomatis from Stegostomatis tigrinum Macassar Celebes. Jadhav and Shinde (1979) reported B. versavalensis from Rhinobatus typus in India. The present communication deals with B. thapari n. sp. from the spiral valve of Rhinobatus typus at Bombay.

Description

Four worms were collected from the spiral valve of Rhinobatus typus Bennett, at Bombay in the month of March, 1977. The worms are short in length and thick in size.
Plate 3

Balanobothrium thapari n. sp.

Figs. A. Scolex
    B. Hooks
    C. Mature segment.
The scolex is almost circular with few constrictions at the peripheral margin and measures 0.59 in length and 0.72 in breadth. Four accessory suckers are in front of each bothridium, oval in shape, transversely elongated and measure 0.05 in length and 0.10 in breadth with each pair of bifurcated hooks. The hooks are two pronged, unequal in length, having short but broad handle. Inner prong shorter than the outer one which is broad and long. The hooks measure 0.11 in length, whereas the handle is 0.02 x 0.04, inner prong 0.05 x 0.005, outer prong 0.09 x 0.007 in length and breadth. It consists of a long neck which measures 0.31 x 0.20 in length and breadth.

Mature segments are longer than broad, measure 1.07 x 0.99 in length and breadth. The testes are oval or rounded in shape, 140-145 (142) in number, arranged in two fields, preovarian, medullary and measure 0.03 in diameter. The cirrus pouch is oval and elongated, at the centre of the segments and measures 0.45 x 0.25 in length and breadth. Spines are present on the cirrus. The vas deferens is short one and measures 0.23 x 0.04 in length and breadth.

The ovary is bilobed with numerous short, broad and oval acini, situated near the posterior margin of the
segment, occupying approximately in almost all the width of the segment and extending laterally upto the corticcular region, measures 0.15 x 0.74 in length and breadth. The vagina is a straight tube, starts from the genital pore, where the cirrus pouch and the vagina open through a common genital pore, lies anterior to the cirrus pouch, extend upto the centre of the segment, takes a curve vertically, joins the shell gland and measures 0.99 x 0.03 in length and breadth. The shell gland is rounded in shape, situated anterior to the isthmus of the ovary and measures 0.05 x 0.04 in length and breadth.

The genital pores are marginal, oval, just posterior to the middle of the segment, irregularly alternate and measure 0.16 in diameter. The uterus is tubular, starts from the shell gland, reaches beyond the cirrus pouch and measures 0.78 x 0.03 in length and breadth.

The vitellaria are granular, in the corticcular region, extend from the anterior margin to the posterior one.

Discussion

The genus *Palamobothrium* is erected by Hornell, 1912 with its type species *Palamobothrium tenax*. Later on the following species are added to the genus.
1. *B. parvum* Southwell, 1925
2. *B. stegostomatis* Yamaguti, 1954

The worm under discussion is having scolex almost circular, with constrictions at peripheral margin, with 4 bothridia, elongated, oval in shape; 4 accessory suckers, each with a pair of bifurcated hooks; mature proglottids broader than long, testes 149-145, in two fields, pre-ovarian, medullary; cirrus pouch oval, elongated, in the centre of segment; ovary bilobed, with numerous short, broad, oval acini, extending transversely upto the width of segment; vagina thin tube, anterior to cirrus pouch; shell gland round, anterior to isthmus; genital pores marginal, oval, irregularly alternate, just posterior to the middle of the segment; uterus tubular, extend anteriorly, beyond the cirrus pouch and the vitellaria granular, in the cortical region.

1. The present cestode differs from *B. tenax* which is having scolex consisting of a bulbous, subconical head, encircled at the base by a cup like bothridial collar; neck very short, mature segments broader than long, testes 500, cirrus pouch oval, unarmed; vas deferens coiled inside the cirrus pouch, vagina in front of the cirrus pouch, shell gland small, postovarian, uterus rosette in shape and vitellaria granular.
2. The present worm differs from *B. parvum* which is having scolex globular, smaller; neck cylindrical, long; mature segments longer than broad, testes 110-140, cirrus pouch oval, spinose, vas deferens coiled inside the cirrus pouch, shell gland small, globular, preovarian, uterus a tube with lobulated walls and vitellaria in a single row.

3. The present form differs from *B. stegostomatis* in the absence of neck, mature segments almost squarish, testes not mentioned, cirrus pouch cylindrical, elongated; vas deferens coiled outside the cirrus pouch, vagina in front of cirrus pouch, shell gland at the centre of the isthmus, uterus coiled tube and vitellaria follicular, in 3-4 rows and subcorticular in position.

4. The present cestode differs from *B. veravalensis* which is having mature segments all broader than long; testes 150-170, preovarian, in a single field; cirrus pouch oval, elongated, at anterior one third; ovary bilobed, each lobe with short, broad, oval follicles, in posterior margin; vagina wide tube, anterior to cirrus pouch; genital pores submarginal, oval in shape, irregularly alternate; uterus is saccular, extends upto level of cirrus pouch; gravid segments broader than long and vitellaria follicular, in 2-3 rows.
Hence it is regarded as a new species and hence the name *B. thapari* n.sp. is proposed in honour of Dr. G.S. Thapar, who has contributed so much in our knowledge of Helminth parasites in India.

<table>
<thead>
<tr>
<th>Type species</th>
<th><em>B. thapari</em> n.sp.</th>
</tr>
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<tbody>
<tr>
<td>Host</td>
<td><em>Rhinobatus typus</em></td>
</tr>
<tr>
<td>Habitat</td>
<td>Spiral valve</td>
</tr>
<tr>
<td>Locality</td>
<td>Bombay, Maharashtra, India</td>
</tr>
<tr>
<td>Date of Collection</td>
<td>March 20, 1977.</td>
</tr>
</tbody>
</table>
Comparative chart showing the differentiating characters of the genus *Balanobothrium*, Hornell, 1912.

<table>
<thead>
<tr>
<th></th>
<th><em>Balanobothrium tenax</em> (Hornell, 1912)</th>
<th><em>B. pervum</em> (Southwell, 1925)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scolex</td>
<td>Consisting of a bulbous, sub-conical head, encircled at the base by a cup-like bothridial collar. 2.7 x 2.2 in length and breadth. Four minute suckers, each with a pair of compound hooks.</td>
<td>Globular, smaller, measures 210-250 μ in length and 200-250 μ in breadth. Four suckers and four pairs of compound hooks.</td>
</tr>
<tr>
<td>Neck</td>
<td>Very short, 3-4 mm in length.</td>
<td>Cylindrical, short 1.6 in length.</td>
</tr>
<tr>
<td>Mature segments.</td>
<td>Broader than long</td>
<td>Longer than broad.</td>
</tr>
<tr>
<td>Testes</td>
<td>500, globular, 60 μ in diameter, situated dorsally.</td>
<td>110-140, globular, 36 μ in diameter</td>
</tr>
<tr>
<td>Cirrus Pouch.</td>
<td>Oval, spines absent on cirrus.</td>
<td>Oval, cirrus spinoce</td>
</tr>
<tr>
<td>Vasdefereens.</td>
<td>Coiled inside the cirrus pouch</td>
<td>Coiled inside the cirrus pouch.</td>
</tr>
<tr>
<td>Vagina</td>
<td>Runs in front of the cirrus pouch, bends at right angles and turns backwards to the centre of the ovary.</td>
<td>From pore, runs in front of the cirrus pouch</td>
</tr>
</tbody>
</table>

Contd. .
<table>
<thead>
<tr>
<th><strong>Balanobothrium tenax</strong></th>
<th><strong>B. parvum</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Host</strong></td>
<td><strong>Stegostoma tigrinum</strong></td>
</tr>
<tr>
<td><strong>Small gland</strong></td>
<td>Small organ, lying posteriorly to the centre of the ovary</td>
</tr>
<tr>
<td><strong>Vitellaria</strong></td>
<td>Granular</td>
</tr>
<tr>
<td><strong>Uterus</strong></td>
<td>Rosette in shape arises in front of the ovary, runs anteriorly.</td>
</tr>
<tr>
<td>S. stegostomatis (Yamaguti, 1954)</td>
<td>B. veravalensis (Jadhav and Shinde, 1979)</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td><strong>Scolex</strong></td>
<td>Almost globular, 0.08 x 0.06 in length and breadth, four suckers, oval, each bear a pair of bifurcated compound hooks.</td>
</tr>
<tr>
<td><strong>Neck</strong></td>
<td>Absent</td>
</tr>
<tr>
<td><strong>Nasal segment</strong></td>
<td>Almost squarish</td>
</tr>
<tr>
<td><strong>Testes</strong></td>
<td>120-190</td>
</tr>
<tr>
<td><strong>Cirrus pouch</strong></td>
<td>Elongated and cylindrical</td>
</tr>
<tr>
<td><strong>Vas deferens</strong></td>
<td>Coiled outside the cirrus pouch.</td>
</tr>
<tr>
<td><strong>Vagina</strong></td>
<td>Runs in front of the cirrus pouch bends at right angles.</td>
</tr>
</tbody>
</table>

**Contd...**
<table>
<thead>
<tr>
<th><strong>S. steogostomatis</strong>&lt;br&gt;Yamaguti, 1954</th>
<th><strong>B. versavalensis</strong>&lt;br&gt;Jadhav and Shinde 1979</th>
<th><strong>B. theparsi</strong>&lt;br&gt;B. sp.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shell gland.</strong></td>
<td>Centre of the isthmus of the ovary.</td>
<td>Elongated and situated below the isthmus of the ovary.</td>
</tr>
<tr>
<td><strong>Vitellaria</strong>&lt;br&gt;Follicular sub-cortical, 3-4 rows in a line.</td>
<td>Follicular, 2-3 rows in cortical region</td>
<td>Granular, in the cortical region.</td>
</tr>
<tr>
<td><strong>Uterus</strong>&lt;br&gt;Coiled tube, anterior to the isthmus</td>
<td>Saccular, starts from the shell gland, reaches up to the level of the cirrus pouch.</td>
<td>Tubular, starts from the shell gland, reaches beyond the cirrus pouch.</td>
</tr>
<tr>
<td><strong>Host</strong>&lt;br&gt;Stegostoma tigrinum</td>
<td>Rhinobatus typus</td>
<td>Rhinobatus typus</td>
</tr>
</tbody>
</table>
A key to the species of the genus *Balanobothrium*

1. Bothridial collar present ... 2
   Bothridial collar absent ... 4

2. Neck present ... ... 3
   Neck absent ... ...  *B. ste Gastomatis*

3. Testes 110-140, vitellaria follicular, ovary 'U'
   shaped ... ...  *B. parvum*
   Testes 500, vitellaria granular, subcorticular, ovary bilobed, each lobe almost quadrangular in shape ...  *B. tenax*

4. Testes 160-170, vitellaria follicular, cortical, in 2-3 rows, ovary bilobed, each lobe with short, oval, broad follicles, extend upto sub-corticular region ...  *B. versavensis*
   Testes 140-145, vitellaria granular, cortical; ovary bilobed, lobes extend upto cortical region, each with numerous acini ... ...  *B. thespari n.sp.*
Cotyloidae Wardle, McLeod and Radinovsky, 1974
Pseudophyllidea Carus, 1863
Psychobothriidae Luhe, 1902
Circumoncobothrium Shinde, 1968
C. alii n. sp.

Introduction

The genus Circumoncobothrium was erected by Shinde (1968) from the intestine of a freshwater fish, Ophiocephalus leucopunctatus, as a type species C. ophiocephali. Chincholikar (1976) described two new species of this genus i.e. C. shindei from a freshwater fish, Mastacembellus armatus and C. bagariusi from a freshwater fish Bagarius sp. Shinde (1976) described C. khami from a freshwater fish, Ophiocephalus striatus. Later on JadHAV and Shinde (1976) added two new species of this genus viz., C. aurangabadensis and C. racii from a freshwater fish Mastacembellus armatus.

In the present communication Circumoncobothrium alii n.sp. is reported from Ophiocephalus gachua, Hamilton and Buchanan, from a freshwater fish at Aurangabad, India.
Description

Ten specimens of the cestode were collected from the intestine of a freshwater fish, *Ophioccephalus gachua* from Kham river near Aurangabad, in the month of October, 1973. The cestodes are fairly long, with numerous segments.

The scolex is almost quadrangular, elongated, narrow in the middle and broader at anterior and posterior ends and measures 1.37 to 1.40 in length and 0.33 to 0.49 in breadth. It bears a rostellum, at the anterior end, oval in shape, with convex margins, transversely elongated, armed with a single circle of large hooks, 38 in number. The rostellum measures 0.20 in length and 0.40 in width. The hooks straight, stout, wide in the middle and tapering at both ends, pointed distally, measuring 0.06 x 0.01 in length and width. The scolex bears two bothria, sac like, elongated, occupying the whole length and width of it and bothria measure 1.35 to 1.37 in length and 0.20 to 0.25 in width.

The neck is long and measures 0.25 x 0.33 in length and width respectively.

The mature proglottids are broader than long, roughly one and half times broader than long, with
straight lateral borders and measure 0.66 x 1.10. The
testes are 175 to 180 (178) in number, in two lateral
fields, almost encircling the ovary, leaving a gap
anterior and posterior to it, evenly distributed, extend
laterally, up to the corticular field, oval in shape and
measure 0.02 in diameter. The cirrus pouch is oval, in
the centre and in anterior half of the proglottid, obli-
quely situated, preovarian and measures 0.11 x 0.04. It
contains a thick, wide cirrus, which measures 0.10 x 0.01.
The ovary is bilobed, with a wide transverse isthmus, each
lobe oval, elongated antero-posteriorly, roughly 'H'
shaped in appearance, each lobe with 10-12 short, round
acini and measures 0.16 to 0.19 x 0.27. The ovary is
situated in the centre and in the posterior half of the
proglottid. The vagina is a straight, thin tube, starts
from genital pore, runs posteriorly, crosses isthmus,
reaches to the shell gland and measures 0.14 x 0.01. The
genital pores are preovarian, just anterior to the
middle of the proglottid, round in shape and measure
0.02 in diameter. The uterus is anterior to isthmus,
oval in shape, compact and measures 0.05 x 0.033. The
uterine pore is oval, near the anterior margin of the
proglottid, with thick border and measures 0.08 x 0.05.
The vitellaria are granular, narrow strip in width, in
corticular region and from anterior to posterior margin
of each segment.
Plate 4

*Circumoncocobothrium alii* n. sp.

Figs.  
A. Scolex  
B. Hooks  
C. Mature segment  
D. Gravid segment  
E. Eggs.
The gravid proglottids are wider than long, three times wider than long, with straight lateral borders, narrow anteriorly, wider posteriorly and measure 0.50 x 1.39.

The gonads, seen in gravid segments are as follows. The testes are 180 in number, oval, in two lateral fields and measure 0.02 in diameter. The cirrus pouch is pre-ovarian, large in size, obliquely situated, opening into a round genital atrium, situated towards ovary, oval and measures 0.10 x 0.04.

The ovary is bilobed, with long and wide isthmus, each lobe broad, oval, in posterior half, near posterior margin of the proglottid and measures 0.20 x 0.43. Each lobe with 10-12 short, big, round acini. The vagina wide, starts from genital pore, curved, reaches to shell gland and measures 0.18 x 0.01.

The uterus is saccular, obliquely situated, in anterior half of the proglottid, pre-ovarian, slightly reaching upto the left ovarian lobe and anterior margin of the proglottid, contain numerous eggs and measures 0.10 x 0.33. The eggs are oval, operculated and measure 0.02 x 0.04. The uterine pore oval, with thick border, inside the uterus, almost at one fourth, from the anterior margin of the proglottid.
Discussion

The genus *Circumoncobothrium* was established by Shinde, 1968. Later on the following species are added to this genus:

1. *C. ophioccephali* Shinde, 1968
2. *C. shindei* Chincholkar, 1976
3. *C. begariusi* Chincholkar, 1976
4. *C. khami* Shinde, 1976
5. *C. aurangabadensis* Jadhav and Shinde, 1976
6. *C. radii* Shinde and Jadhav, 1976

1. The worm under discussion is having scolex almost quadrangular, narrow in the middle and broad anteriorly and posteriorly; rostellum armed with a single circle of hooks, 38 in number; long neck, mature proglottids almost one and half times broader than long, testes 175-180, in two lateral fields, almost encircling the ovary; cirrus pouch oval, in the centre and anterior half of the proglottid; ovary bilobed, roughly 'H' shaped, lobes oval, with 10-12 short, round acini; vagina thin tube, posterior to cirrus pouch; genital pores round, pre-ovarian; uterine pores oval, near anterior margin of proglottid; gravid segments three times wider than long and vitellaria granular.
2. The present worm differs from *C. ophioccephali* which is having scolex broad in the middle and tapering at both ends, rostellar hooks 30, in a circle, presence of neck, testes 70-80, in two fields, ovarian lobes with 2-3 acini and vitellaria follicular.

3. The present cestode differs from *C. shindel* which is having scolex narrow anteriorly and broad posteriorly, rostellar hooks 49, in a circle; neck short, testes 260-275, ovarian lobes round and compact and granular vitellaria.

4. The present form differs from *C. bagariusi* which is having scolex narrow anteriorly and broad posteriorly, rostellar hooks 55, in a circle, absence of neck, testes 275-285, in two lateral fields, ovarian lobes with 5-6 acini and vitellaria follicular, in 4-5 rows on each side.

5. This cestode differs from *C. khami* which is having scolex cylindrical, with even width through out, rostellar hooks 48, in a circle; absence of neck, testes 190-200, ovarian lobes rounded and vitellaria follicular, in a single row, on each side.

6. This worm differs from *C. aurangabadensis* which is having scolex broad in the middle and narrow at both ends, rostellar hooks 42, in a circle; short neck, testes
ovarian lobes with 3-4 acini and vitellaria granular.

7. This form differs from *C. racili* which is having scolex broad in the middle and narrow at both ends, rostellar hooks 46, in a circle; short neck, testes 210-215, ovarian lobes compact and vitellaria granular.

Hence it is regarded as a new species and the name *C. ali* n.sp. is proposed, in honour of Dr. S. Mehdi Ali, Ex. Professor, Zoology Department, Marathwada University, Aurangabad.

<table>
<thead>
<tr>
<th>Type species</th>
<th><em>C. ali</em> n.sp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host</td>
<td><em>Ophiocophalus gachua</em> Hamilton, Buchanan</td>
</tr>
<tr>
<td>Habitat</td>
<td>Intestine</td>
</tr>
<tr>
<td>Locality</td>
<td>Aurangabad, Maharashtra, India</td>
</tr>
<tr>
<td>Date of collection</td>
<td>October 20, 1978.</td>
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A chart showing the comparative account of different species of *Circumoncobothrium* Shinde, 1968

<table>
<thead>
<tr>
<th>Scolex</th>
<th><em>Circumoncobothrium ophioccephali</em> Shinde, 1968</th>
<th><em>Circumoncobothrium aurengabadensis</em> JadHAV and Shinde, 1976</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Distinct, length 0.81, breadth 0.51</td>
<td>Broad in middle and narrow at both ends, 1.68 x 0.91 in length and breadth respectively</td>
</tr>
<tr>
<td>Hooks</td>
<td>40, rod-shaped, larger 0.050 to 0.055 mm; smaller 0.024 to 0.048 in length</td>
<td>42, rod shaped, larger 0.35, smaller 0.12 in length</td>
</tr>
<tr>
<td>Neck</td>
<td>present</td>
<td>present</td>
</tr>
<tr>
<td>Mature segments</td>
<td>Broader than long, length 0.34 breadth 1.33</td>
<td>Broader than long, length 0.52 and breadth 2.11</td>
</tr>
<tr>
<td>Testes</td>
<td>Two lateral fields, 70 to 80, 0.02 to 0.03 in diameter</td>
<td>Scattered all over segment, 135-145 in number, 0.05 to 0.07 in diameter</td>
</tr>
<tr>
<td>Ovary</td>
<td>Single, conical mass to irregular shaped band. Thinner in the middle and expanded at lateral ends, lobes with 2-3 well-developed scini, situated near posterior border. Length 0.36 to 0.40.</td>
<td>Biloculated, each lobe with 3-4 acini, situated near posterior margin of the segment, length 0.38</td>
</tr>
<tr>
<td>Genital pore</td>
<td>Irregularly alternate</td>
<td>In posterior half of the segment</td>
</tr>
<tr>
<td>Vitellaria</td>
<td>Follicular, 14 to 15 rows on each side</td>
<td>Granular, near lateral margin</td>
</tr>
<tr>
<td>Host</td>
<td><em>Ophioccephalus leucopunctatus</em></td>
<td><em>Mastacembellus armatus</em></td>
</tr>
</tbody>
</table>
A chart showing the comparative account of different species of *Circumoncobothrium* Shinde, 1968

<table>
<thead>
<tr>
<th></th>
<th>C. racii</th>
<th>C. shindei</th>
<th>C. bagariusi</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Shinde and Jadhav, 1976</td>
<td>Shinde and Chinholikar, 1977</td>
<td>and Shinde, 1977</td>
</tr>
<tr>
<td>Scolex</td>
<td>Broad in middle and narrow at both ends, length 1.96, breadth 1.23. Two elongated cavities, one on each side of scolex and two oval highly muscular structures present.</td>
<td>Narrow anteriorly broad posteriorly, length 1.56, breadth 0.43 to 1.21.</td>
<td>Narrow anteriorly broad posteriorly, length 1.83, breadth 1.65.</td>
</tr>
<tr>
<td>Hooks</td>
<td>46, single crown, rod shaped, larger 0.053, smaller 0.067 in length.</td>
<td>49, rod shaped larger 0.073, smaller 0.007 in length.</td>
<td>55, rod shaped, larger 0.093, smaller 0.003 in length.</td>
</tr>
<tr>
<td>Neck</td>
<td>Present</td>
<td>Present</td>
<td>Absent</td>
</tr>
<tr>
<td>Mature segments</td>
<td>Broader than long, length 0.35-0.43 and breadth 0.035-0.050.</td>
<td>Broader than long, length 0.37 to 0.40, breadth 1.79 (Gravid segment broader than long).</td>
<td>Broader than long, length 0.23 to 0.34, breadth 2.12.</td>
</tr>
<tr>
<td>Testes</td>
<td>Rounded, arranged densely in two fields, 210-225 in number, measuring 0.127 to 0.147 in diameter.</td>
<td>Evenly distributed, 260-275 (273), 0.02 to 0.03 in diameter.</td>
<td>Two lateral fields, 275-285 (276), 0.04 to 0.07 in diameter.</td>
</tr>
</tbody>
</table>

Contd...
<table>
<thead>
<tr>
<th></th>
<th><em>C. raolii</em></th>
<th><em>C. shindei</em></th>
<th><em>C. bagarilus</em></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Shinde and</td>
<td>Shinde and</td>
<td>Chincholikar</td>
</tr>
<tr>
<td></td>
<td>Jedhav, 1976</td>
<td>Chincholikar,</td>
<td>and Shinde, 1977</td>
</tr>
<tr>
<td><strong>Ovary</strong></td>
<td>Ovary bilobed,</td>
<td>Bilobed, dumb-</td>
<td>Bilobed, in</td>
</tr>
<tr>
<td></td>
<td>situated almo-</td>
<td>bell shaped,</td>
<td>middle one</td>
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<tr>
<td></td>
<td>st near the</td>
<td>with long</td>
<td>third of seg-</td>
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<td></td>
<td>posterior mar-</td>
<td>isthmus lobes</td>
<td>ment, each</td>
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<td></td>
<td>gin of the</td>
<td>round and com-</td>
<td>lobe with</td>
</tr>
<tr>
<td></td>
<td>segment, length</td>
<td>pact, situated</td>
<td>5-6 globular</td>
</tr>
<tr>
<td></td>
<td>0.97 to 0.98.</td>
<td>in the centre</td>
<td>acini, length</td>
</tr>
<tr>
<td></td>
<td></td>
<td>of the seg-</td>
<td>0.70.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ment length 0.44 in mature and 0.77 in gravid segment.</td>
<td></td>
</tr>
<tr>
<td><strong>Genital pore</strong></td>
<td>In posterior half of the segment.</td>
<td>In anterior middle of segment.</td>
<td>In posterior half</td>
</tr>
<tr>
<td><strong>Vitellaria</strong></td>
<td>Raittekarutja, granular, present in lateral sides of the segment.</td>
<td>Granular</td>
<td>Larger follicles with irregular shape, 4-5 rows on each side.</td>
</tr>
<tr>
<td><strong>Host</strong></td>
<td><em>Mastacembellus armatus</em></td>
<td><em>Mastacembellus armatus</em></td>
<td><em>Bagarius sp.</em></td>
</tr>
</tbody>
</table>
A chart showing the comparative account of different species of *Circumoncobothrium* Shinde, 1968

<table>
<thead>
<tr>
<th></th>
<th><em>Circumoncobothrium khatri</em> Shinde, 1977</th>
<th><em>Circumoncobothrium allii</em> n. sp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scolex</td>
<td>Cylindrical, with even width, apical disc separated by notch. Length 1.06 and breadth 0.38.</td>
<td>Almost elongated, quadrangular, narrow in the middle and broad at anterior and posterior ends, 1.37 to 1.40 x 0.33 to 0.49 in length and breadth respectively.</td>
</tr>
<tr>
<td>Hooks</td>
<td>43, lance-shaped, larger 0.065, smaller 0.007 in length.</td>
<td>33, wide in the middle and tapering at both ends measure 0.06 x 0.01 in length and breadth respectively.</td>
</tr>
<tr>
<td>Neck</td>
<td>Absent</td>
<td>Present</td>
</tr>
<tr>
<td>Mature segments</td>
<td>Squarish, length 1.04 and breadth 1.14</td>
<td>Broader than long, length 0.66 and breadth 1.10.</td>
</tr>
<tr>
<td>Testes</td>
<td>Evenly distributed, 190-200 (194), 0.04 to 0.05 in diameter</td>
<td>In two lateral fields, 175-180 (173) in number, 0.02 in diameter.</td>
</tr>
<tr>
<td>Ovary</td>
<td>Bilobed, each lobe compact, situated near posterior and centre of the segment, length 0.31.</td>
<td>Bilobed, with a wide transverse isthmus, each lobe oval, elongated antero-posteriorly, roughly &quot;W&quot; shaped in appearance, each lobe with 10-12 short, round, acini and measures 0.16 to 0.19 x 0.27 in length and breadth.</td>
</tr>
<tr>
<td>Genital pore</td>
<td>Middle of anterior half</td>
<td>Preovarian, just anterior to the middle of the proglottid.</td>
</tr>
<tr>
<td>Vitellaria</td>
<td>Single layer of round follicles near lateral margins.</td>
<td>Granular, conticular</td>
</tr>
<tr>
<td>Host</td>
<td><em>Ophioccephalus striatus</em></td>
<td><em>Ophioccephalus gachua</em></td>
</tr>
</tbody>
</table>
A key to the species of the genus **Circumoncobothrium**

1. Number of hooks below 50  ...  2
   Number of hooks above 50  ...  3

2. Neck present  ...  ...  4
   Neck absent  ...  ...  C. *khami*

3. Testes number below 100  ...  ...  C. *ophiocephali*
   Testes number above 100  ...  ...  C. *bagariusi*

4. Genital pore in anterior middle of the segment  ...  ...  C. *shindei*
   Genital pore in posterior half of the segment  ...  ...  5

5. Vitellaria granular
   Scolex almost quadrangular, broad in middle and tapering at both ends, measures 1.964 x 1.362  ...  ...  C. *racii*
   Scolex oval, spatulate, broad in middle and tapering at both ends, measures 1.68x0.91  ...  ...  C. *aurangabadensis*
   Scolex elongated quadrangular, narrow in middle and broad at both ends, measures 1.37 to 1.40 x 0.33 to 0.49  ...  ...  C. *alii* n. sp.
Eucestoda Wardle, McLeod and Radinovsky, 1974
Tetraphyllidea Carus, 1863
Phyllobothriidae Braun, 1900
Echeneibothrium Beneden, 1850
E. shindei n. sp.

**Description**

Eleven specimens of the cestodes were collected from the spiral intestine of *Trygon sephæn* at Bombay, in the month of March, 1973. The worms are very thin and short.

The scolex is distinct from the neck region, with four bothridia, appearing anteriorly, just like the petals of the opening flower and measures 0.51 in length and 0.64 in breadth. The bothridia are fusiform, broader in the middle and tapering at both the ends, with irregular margin, each with 13 loculii, from one tip to the other, formed by transverse septa, from one lateral margin to the other and measure 0.41 to 0.46 in length and 0.10 to 0.13 in breadth.

The neck is fairly long and measures 0.33 in length and 0.11 in breadth.

The mature segments are slightly longer than broad, imbricated, with posterior corners of the segments
plate 5

*Echinobothrium shinrei* n. sp.

Figs.  A. Scolex
      B. Mature segment
      C. Cirrus pouch.
projecting outside, roughly one and half times longer than broad and measure 0.61 to 0.66 in length and 0.46 to 0.61 in breadth.

The testes are 53 to 57 in number, oval in shape, roughly in two groups, one poral and another aporal in position, about 10 to 12 testes in aporal group, anterior to the cirrus pouch and measure 0.02 in diameter. The cirrus pouch is oval, extending transversely, upto one third of the segment, at one fifth from the anterior margin of the segment and measures 0.11 in length and 0.05 in breadth. The vas deferens is short and wide and measures 0.13 in length and 0.01 in breadth.

The ovary is a single mass, large in size, broad in the middle and tapering at both the lateral ends, poral lobe extending laterally upto the cortical region, with large, round, blunt follicles and measures 0.11 to 0.15 in length and 0.33 in breadth. The vagina is a wide tube, starts from the genital pore, runs straight and obliquely, upto the centre of the segment, takes a turn, and runs posteriorly, upto the shell gland and measures 0.48 in length and 0.01 in breadth. The shell gland is oval, elongated antero-posteriorly, in the centre of the ovary and measures 0.07 in length and 0.04 in breadth. The vitellaria are granular, in lateral fields, cortical in
position, from the anterior to the posterior margin of
the segment. The genital pores are oval in shape, sub-
marginal in position, at one fifth from the anterior margin
of the segment and measures 0.05 in length and 0.03 in
breadth and are irregularly alternate.

discussion

The genus *Echeneibothrium* is erected by Beneden
in 1850. Later on 38 species are added to this genus from
different parts of the world.

After going through the literature, the present
worm comes closer to *E. multiloculatum*, *E. williamsi* and
*E. megalosoma* Carvajol and Dailey (1975) after considering
the number of loculi in each bothridium.

1. The worm under discussion in having 13 loculi in
each bothridium differs from *E. multiloculatum* (20 loculi),
from *E. williamsi* (8 loculi) and from *E. megalosoma* (3
loculi).

2. In having 22 testes, it differs from *E.
multiloculatum* (17 testes), from *E. williamsi* (17 testes)
and from *E. megalosoma* (22 testes).

3. The cirrus in the present form is unarmed whereas
in *E. multiloculatum* and *E. williamsi* is armed.
4. The present worm is having compact ovary where as the same in all the above three species is H-shaped.

5. The worm under discussion is having granular vitellaria where as the same in all the above three species are follicular.

On the basis of these differences, it is considered as a new species and hence the name *E. shindei* n. sp. is proposed in honour of Dr. G. R. Shinde, Guide of the Author and Reader, Zoology Department, Maharashtra University, Aurangabad.

<table>
<thead>
<tr>
<th>Type species</th>
<th>E. shindei n. sp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host</td>
<td><em>Trygon emphus</em></td>
</tr>
<tr>
<td>Habitat</td>
<td>Spiral intestine</td>
</tr>
<tr>
<td>Locality</td>
<td>Bombay, Maharashtra, India</td>
</tr>
<tr>
<td>Date of collection</td>
<td>March 14, 1963.</td>
</tr>
</tbody>
</table>
Eucestoda Wardle, McLeod and Radinovsky, 1974
Tetraphyllida Carus, 1863
phyllobothriidae Braun, 1900
phyllobothrium Beneden, 1849
P. biacetabulatum Yamaguti, 1960

Description

Seven specimens of the cestode were collected from the spiral intestine of Trygon sephen, in the month of March, 1973 at Bombay. The worms are fairly long and thick.

The scolex is almost circular, with irregular and frilled margin, large in size and measures 0.57 in length and 0.32 to 0.92 in width. It bears 4 bothridia, oval, elongated, and measure 0.57 in length and 0.23 to 0.33 in breadth. There are four accessory suckers, one in front of each bothridium. The accessory suckers are of medium size, oval in shape and measure 0.09 in length and 0.13 in breadth. The neck is long and wide, measuring 0.31 x 0.23.

The mature segments are cylindrical, longer than broad, 5 to 6 times longer than broad, broader in the middle and tapering at both ends and measure 1.67 in length and 0.21 to 0.32 in breadth.
plate 6

Putlobothrium bicestabulatum Yamaguti, 1960

Figs. A. Scolex
       B. Mature segment.
The testes are 65 to 70 (67), oval in shape, in two lateral fields, each field in a single row, up to the cirrus pouch region and in a single field anterior to the cirrus pouch. The testes are preovarian, extending anteriorly, nearly up to the anterior margin of the segment and measure 0.41 in diameter. The cirrus pouch is oval, at one third from the anterior margin of the segment and measures 0.12 in length and 0.07 in breadth. The vas deferens is short, wide, with one to two coils and measures 0.12 in length and 0.02 in breadth.

The ovary is bilobed, H-shaped in appearance, each lobe extending antero-posteriorly and with numerous short, blunt acini, near the posterior margin of the segment, in the central medulla and measures 0.13 to 0.25 in length and 0.08 to 0.10 in breadth. The vagina is a wide tube, starts from the genital atrium, situated anterior and ventral to the cirrus pouch, opens anterior to it, extends transversely up to the centre of the segment, takes a turn, runs posteriorly, up to the shell gland and measures 0.33 in length and 0.03 in breadth. The ootype is almost round in shape, just posterior to the isthmus, overlapping right lobe of the ovary and measures 0.04 in diameter. The vitellaria are granular, in lateral fields, subcortical in position and from anterior to the posterior margin of
the proglottid. The genital pores are marginal, at one-
third from the anterior margin of the segment and irregu-
larly alternate.

Discussion

The genus *phyllobothrium* is established by
Beneden, 1849. These cestodes were collected from spiral
intestine of *Trygon sephens*. On closer examination they
turned out, to be the members of the genus *phyllobothrium*.

The present worms agree with *phyllobothrium*
*biscetabulatum* Yamaguti, 1960 with some additional chara-
cters which are as follows:

1. Mature segments are longer than broad in the
   present worm vs. tapering at both the ends.

2. Testes in the present worm are 65 to 70 vs. 18 to
   30.

3. Cirrus pouch oval vs. pyriform.

4. vitellaria granular vs. follicular.

The above noted characters are minor, hence it is
redescribed here as *P. biscetabulatum* Yamaguti, 1960
These worms are collected from *Trygon sephens* at Bombay.
<table>
<thead>
<tr>
<th>Type species</th>
<th><em>P. bicocotabulatum</em></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yamaguti, 1960</td>
</tr>
<tr>
<td>Host</td>
<td><em>Trygon sephe</em></td>
</tr>
<tr>
<td>Habitat</td>
<td>Spiral intestine</td>
</tr>
<tr>
<td>Locality</td>
<td>Bombay, Maharashtra, India</td>
</tr>
<tr>
<td>Date of collection</td>
<td>March 14, 1973.</td>
</tr>
</tbody>
</table>
Eucestoda Wardle, McLeod and Radinovsky, 1974
Anoplocephalidea Wardle, McLeod and Radinovsky, 1974
Anoplocephalidae Blanchard, 1891
Oochoristica Luhe, 1898
Q. truncata (Krabbe, 1879) Zschokke, 1904

Description

Numerous specimens of cestode were collected from the intestine of Lachesis gramineus at Aurangabad, Maharashtra, India, in the month of January 1978.

The scolex is almost quadrangular, wider than the width of neck and measures 1.17 to 1.25 x 1.25 to 1.45. It bears four, large, round suckers, equidistantly placed and measure 0.36 in diameter. The scolex is followed by a long neck which measures 0.71 x 0.10.

The mature proglottids are almost squarish, a little wider than long, with straight lateral borders and measure 1.22 x 1.50.

The testes are 45-50 (46), oval, in posterior half of the proglottid, in central medulla, in two lateral groups, 21 in aporal and 25 in poral group and measure 0.06 in diameter. The cirrus pouch is cylindrical, a
Cochoristica truncata (Krabbe, 1879)
Zschokke, 1905

Types:
A. Scolex
B. Mature segment
C. Eggs.
little broader in the middle and tapering at both ends, opening marginally, extending transversely up to one fourth of the proglottid and measures 0.39 x 0.04 to 0.08. The vas deferens is short but coiled and measures 0.42 x 0.008.

The ovary is bilobed, compact, with wide isthmus, obliquely situated, each lobe oval, with 3-5 short, round acini; situated in anterior half of the proglottid, in the centre of it and measures 0.32-0.52 x 0.47-0.54. The vagina is a thin tube, posterior to cirrus pouch, curved, reaches up to the shell gland and measures 0.92 x 0.02. The shell gland is small, round, postovarian and measures 0.04 in diameter.

The vitelline gland is a single mass, oval, broad anteriorly and tapering posteriorly and measures 0.19 x 0.12-0.21.

The genital pores are irregularly alternate, marginal, oval, at one fifth from the anterior margin of the proglottid and measure 0.09 x 0.04.

The gravid segments are broader than long occupied with saccular uterus, filled up by numerous eggs, oval in shape and measure 2.42-3.00 x 3.67-3.75. The eggs are with embryos with 3 pairs of hooks (conespheres) and measure 0.04 in diameter.
Discussion

On closer examination these worms proved to be *Oochoristica truncata* (Krabbe, 1879) Zschokke, 1905. The additional characters are as follows:

1. The scolex in the present worm is quadrangular, wider than neck with constrictions as against quadrangular, of the same width as of neck and without constrictions.

2. The testes are 45-50 (46), in two lateral groups as against 20-40 (39).

3. The ovary is bilobed, large, with short, round acini as against bilobed, small, with large, blunt acini.

4. The cirrus pouch is fusiform, extends much beyond the longitudinal excretory canal as against oval to quadrangular, extending a little beyond the longitudinal excretory canal.

As the characters are minor, it is redescribed here as *O. truncata* (Krabbe, 1879) Zschokke, 1905.

Type species *O. truncata* (Krabbe, 1879) Zschokke, 1905

Host *Lachesis gramineus*

Habitat Intestine

Locality Aurangabad, Maharashtra, India

Date of collection January 30, 1978.
Eucestoda Wardle, McLeod and Radinovsky, 1974
Anoplocephalidea Wardle, McLeod and Radinovsky, 1974
Anoplocephalidae Blanchard, 1891
Oochoristica Lube, 1898
Q. indica Mizra, 1945

Description

About 50 cestodes were collected from the intestine of Lechaeis gramineus, in the month of January, 1973 at Aurangabad, Maharashtra, India. On closer examination they turned out to be Q. indica Mizra, 1945. The worms are fairly long, having scolex, neck, immature, mature and gravid proglottids.

The scolex is small, not distinctly marked off from the neck region, measuring 0.35 x 0.31 in length and breadth respectively. It is almost quadrangular, having four large, round suckers, occupying major portion of the scolex. The suckers measure 0.13 in diameter. Rostellum is absent. The neck is long and measures 0.40 x 0.25.

The mature proglottids are almost square with straight lateral borders, measuring 1.04 to 1.18 x 1.15. The testes are 40-42, small, round, in a single field, postovarian, arranged in a crescent shape, near the
Plate 8

Oochoristica indica Mirza, 1945

Figs. A. Scolex
B. Mature segment
C. Cirrus pouch
D. Gravid segment
E. Eggs
F. Eggs with oncosphere.
posterior margin and in the posterior half of the proglottid and measure 0.05 in diameter. The cirrus pouch is fusiform, long, extending transversely up to one third of the proglottid, at one third from the anterior margin of proglottid and measures 0.25 x 0.05. It contains a cirrus, coiled and measures 0.39 x 0.009 to 0.015. The vas deferens is slightly coiled, extends beyond the ovary and measures 0.50 x 0.009.

The ovary is bilobed, each lobe roughly bean shaped with 3-9 short, blunt acini and measures 0.22 x 0.36 to 0.40, situated in the anterior half and in the centre of the proglottid. The vagina is a thin, narrow tube, posterior to the cirrus pouch, extends straight up to the centre of the proglottid, takes a curve, crosses the ovary, reaches to the shell gland and measures 0.76 x 0.02. The shell gland is almost oval, small in size, posterior to ovary and measures 0.064 x 0.096. The vitelline gland is roughly triangular, with 3 lobes, postovarian, in the posterior half and in the centre of the proglottid, measuring 0.12 x 0.10 to 0.24. The genital atrium is small, oval, measuring 0.14 x 0.06, are irregularly alternate and at one third from the anterior margin of the proglottid.

The gravid proglottids are a little longer than broad, with straight lateral borders, measuring 1.28 x 1.12,
filled up by saccular uterus, containing numerous eggs, from anterior to posterior margin of the proglottid and bounded laterally by longitudinal excretory canals. The oval to round eggs, measure 0.02 in diameter. The uterus breaks into numerous egg capsules, each containing a single egg, oncospheres with 3 pairs of hooks, are developed in the eggs.

Discussion

These worms on closer examination proved to be *G. indica* Mizra, 1945. It is having some additional characters, which are as follows:

1. The testes in the present worm are 40-42 vs. 30-36.

2. The cirrus pouch extends far beyond vs. extends a little beyond the longitudinal excretory canal.

3. The ovary bilobed, fan shaped, with short, blunt acini, lobes equal vs. bilobed, fan shaped, with long, separate acini and aporal lobe large.

4. The vitelline gland triangular, with 3 lobes vs. triangular but with 12-16 short, blunt acini.

5. The genital atrium small vs. large and muscular.
As the characters are minor, it is redescribed here as *O. indica* Mizra, 1945.

<table>
<thead>
<tr>
<th>Type species</th>
<th><em>O. indica</em> Mizra, 1945</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host</td>
<td><em>Lachesis gramineus</em></td>
</tr>
<tr>
<td>Habitat</td>
<td>Intestine</td>
</tr>
<tr>
<td>Locality</td>
<td>Aurangabad, Maharashtra, India</td>
</tr>
<tr>
<td>Date of collection</td>
<td>January 30, 1978</td>
</tr>
</tbody>
</table>
Eucestoda Wardle, McLeod and Radinovsky, 1974
Dilepididae Wardle, McLeod and Radinovsky, 1974
Dilepididae Railliet and Henry, 1909
Parvirostrum Fuhrmann, 1908
p. fuhrmanni n. sp.

Description

Ten specimens of cestode were collected from the intestine of *Micropus affinis* at Aurangabad, Maharashtra, India, in the month of April 1973.

The worms are thin, and long. The scolex oval, broad in the middle, tapering at both ends and measures 0.37 in length and 0.94 in width. It is bearing a rostellum, armed with two circles of hooks, short and long, 56 in number, 28 in each circle, oval in shape, broad anteriorly and tapering posteriorly and measures 0.06 x 0.01. The long hooks are having long handle and measure 0.04 in length whereas the short hooks are straight or curved and measure 0.02 in length. Four large, oval suckers, almost in a line present on scolex, measure 0.26 x 0.20.

The mature proglottids are broader than long almost 4 times broader than long, with lateral borders convex and posterior corners of segments projecting out and measure 0.31 x 1.12.
plate 9

Parvirostrum fuhrmanni n. sp.

Figs.  A. Scolex
       B. Hooks
       C. Mature segment
       D. Gravid segment.
The testes are round, 15 in number, in central medulla, in two lateral groups, 7 in poral and 8 in aporal group and measure 0.03 in diameter. The cirrus pouch is elongated, enlarged in the middle and tapering at both ends, extends transversely and obliquely placed, upto one fourth from the lateral margin and measures 0.23 x 0.03. It opens into the genital pore, situated in the submarginal region.

The ovary is bilobed, in the anterior half of the proglottid, slightly in aporal half, each lobe compact, with 3-4 large, round acini and measures 0.07 x 0.29. The vagina is a thin tube, posterior to the cirrus pouch, runs parallel to it, curves, reaches to the shell gland and measures 0.60 x 0.01. The shell gland is small, round posteroventral to the isthmus of ovary and measures 0.02 in diameter. The vitelline gland is oval, postovarian, compact and measures 0.05 in diameter.

The genital pores are submarginal, in the corticu-lar parenchyma, oval in shape, just anterior to the middle of the segments and measure 0.02 x 0.02. A pair of longitudinal excretory canals is present, one on each side and measures 0.02 in width.

The gravid segments are wider than long, almost two times wider, with straight or convex lateral borders, with posterior corners projecting outside and measure 0.45x1.20.
The uterus occupy almost the central medulla, a large sac, bounded laterally by longitudinal excretory canals and measures 0.36 x 0.77. The uterus is filled in by numerous eggs, round and measure 0.02 in diameter.

Discussion

The genus *parvirostrum* is established by Fuhrmann in 1908 with its type species *p. reticulatum* from *picolaptus fuscicapillus* in Brazil. Later on *p. magnisomum* is added to this genus by Southwell, 1930 from an unidentified vulture in India.

1. The systematic position of *p. magnisomum* has been the subject of debate amongst workers. Lopez-Neyra (1935) placed this species under *Taufikia*. Yamaguti (1959) retained it under *parvirostrum*. Dollfus (1963) and Capoor (1966) again followed Lopez-Neyra in placing it under *Taufikia*. Saxena S.K. (1968) placed *p. magnisomum* under *Neophronia melanotus* on the shape of mature and gravid proglottids, topography of organs therein, with variance of gland cells present around the genital ducts in the former and absent in the latter, in the poor development of *vesicula seminalis*, external in the latter and thus the species in question is designated by her as *Neophronia magnisomum* (Southwell, 1930) n.comb. (Syn. *Neophronia melanotus* Saxena, 1968). Hence the author agrees with
Saxena in placing *P. magnisomum* as *Neophronia magnisomum*.

2. The worm under discussion resembles *P. reticulatum* in the shape and size of scolex, postellum with two circles of hooks and vagina posterior to the cirrus pouch but differs from the same in the size of rostellum (large with 56 hooks, in two circles, of two types vs. small hooks, in two circles), in the structure of mature proglottids (4 times broader than long, imbricated vs. almost 3 times broader than long and not imbricated), in number and position of testes (15, 7 poral, 8 aporal, each group central vs. 12, 6 poral, 6 aporal, each group in posterior half of the proglottid), in the structure of the cirrus pouch (long, fusiform, extend transversely, upto 1/4 of the segment vs. short, oval), in the structure and position of ovary (bilobed, each lobe with 3-4 large, round acini, slightly aporal and in anterior half vs. bilobed, small, each lobe compact, slightly poral and in posterior half of the proglottid), in the structure and position of vagina (thin tube, posterior to cirrus pouch vs. thin tube, posterior to cirrus pouch but forms receptaculum seminis) and in the position of the genital pores (submarginal and just anterior to the middle of the lateral margin vs. marginal and at one third from the anterior margin of the segment).
The above noted distinct characters justify the recognition of the present cestode as a new species and hence the name *P. fuhrmanni* n.sp. is proposed after Fuhrmann, who erected this genus in 1903.

<table>
<thead>
<tr>
<th>Type species</th>
<th><em>P. fuhrmanni</em> n.sp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host</td>
<td><em>Microspus affinis</em></td>
</tr>
<tr>
<td>Habitat</td>
<td>Intestine</td>
</tr>
<tr>
<td>Locality</td>
<td>Aurangabad, Maharashtra, India</td>
</tr>
<tr>
<td>Date of collection</td>
<td>April 20, 1973.</td>
</tr>
</tbody>
</table>
A chart showing characters of species of *parvirostrum*

Fuhrmann, 1908

<table>
<thead>
<tr>
<th>Character</th>
<th><em>P. reticulatum</em></th>
<th><em>P. fuhrmanni</em> n. sp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rostellum</td>
<td>Small, with 2 circles of hooks</td>
<td>Large, 56 hooks, in 2 circles, of 2 types.</td>
</tr>
<tr>
<td>Mature segments</td>
<td>3 times broader than long, not imbricated</td>
<td>4 times broader than long, imbricated</td>
</tr>
<tr>
<td>Testes</td>
<td>12, 6 oral, 6 aporal, each group in posterior half of segment</td>
<td>15, 7 oral, 3 aporal, each group central</td>
</tr>
<tr>
<td>Cirrus pouch</td>
<td>Short, oval</td>
<td>Long, fusiform</td>
</tr>
<tr>
<td>Ovary</td>
<td>Bilobed, small, each lobe compact, oral, in posterior half</td>
<td>Bilobed, each lobe with 3-4 large, round acini, aporal, in anterior half.</td>
</tr>
<tr>
<td>Receptaculum seminis</td>
<td>Present</td>
<td>Absent</td>
</tr>
<tr>
<td>Genital pores</td>
<td>Marginal, at 1/3 from anterior margin of segment</td>
<td>Submarginal, just anterior to the middle of lateral margin</td>
</tr>
<tr>
<td>Host</td>
<td><em>picolaptes fusciocspillus</em> Brazil.</td>
<td><em>Micropus affinis</em> Aurangabad, India.</td>
</tr>
</tbody>
</table>
Eucestoda Wardle, McLeod and Radinovsky, 1974
Davaineidea Wardle, McLeod and Radinovsky, 1974
Davaineidae Braun, 1900
Raillietina (Raillietina) Fuhrmann, 1920
R. (R.) quadristesticulata Moghe, 1925

description

Numerous specimens ofcestode were collected from the intestine of Amaurognis phoenicurus phoenicurus at Khultabad, district Aurangabad, Maharashtra, India in the month of January, 1978.

The scolex is oval, broad anteriorly and tapering posteriorly, elongated antero-posteriorly and measures 0.24 in length and 0.15-0.18 in width. It bears an armed rostellum, armed with a single row of small, curved hooks, oval in shape, transversely elongated and measures 0.005 in length and 0.003 in width. It also bears four suckers, oval, two near each other, forming two pairs, with thick margin, with 4-5 rows of small spines on sucker margins and measure 0.003 in length and 0.001 in width.

The neck is long.
plate 10

Raillietina (Raillietina) quadristesticulata
Moghé, 1925

Figs.  A. Scolex
       B. Mature segment
       C. Gravid segment.
The mature proglottids are broader than long, almost 3 times broader than long, with posterior corners projecting outwards and measure 0.29–0.37 in length and 0.92 in width.

The testes are 6 in number, small to medium in size, in a group, aporal in position and measure 0.02 to 0.03 in diameter. The cirrus pouch is oval, broad in the middle, tapering at both ends, obliquely situated, opening in the middle of the proglottid and measures 0.13 in length and 0.05 in width.

The ovary is small, bilobed, each lobe compact, poral lobe with 2–3 short, blunt acini, in the centre of the proglottid and measures 0.06 in length and 0.15 in breadth. The vagina is a thin tube, postero-central to cirrus pouch, runs straight up to one third of the proglottid, enlarges into a receptaculum seminis takes a turn and reaches to the shell gland and measures 0.25 in length and 0.01 in width. The receptaculum seminis is oval and measures 0.08 in length and 0.03 in width. The shell gland is round, posterior to isthmus and measures 0.06 in diameter. The vitelline gland is almost round, postovarian and measures 0.05 x 0.07 in length and breadth respectively.
The genital pores are unilateral, submarginal in position, oval in shape and measure 0.02 in length and 0.01 in width.

The gravid proglottids are almost square, narrow anteriorly and broader posteriorly, with posterior corners projecting outside and measure 0.79-0.37 in length and 0.79 to 1.12 in width. The uterus breaks into 20 uterine capsules, oval in shape, in central medulla occupy most of the region of proglottid, measure 0.12-0.17 in length and 0.10-0.13 in width. Each uterine capsule contains 7-15 eggs and measure 0.02 to 0.03 in diameter.

**Discussion**

On closer examination the worm under discussion proved to be *Raillietina (Raillietina) quadritesticulata* Moghe, 1925. It is having some additional characters, which are as follows:

1. The present worm is having 90-100 rostellar hooks, in a single circle and 4-5 rows of spines on the sucker margins as against 180 rostellar hooks, in a double circle and 5 rows of spines on sucker margins.

2. The testes are 6, aporal, as against 4 testes, 3 aporal and 1 posterior to the vitelline gland.
3. The ovary is bilobed, lobes compact, paral lobe with 2-3 short, blunt acini as against a single mass and lobulated with 10-12 acini.

4. The receptaculum seminis away from the ovary as against near the ovary.

5. The vitelline gland is large, central, compact as against smaller, slightly paral lobe with 4-5 large, round acini.

As the characters are minor it is redescribed here as *Raillietina* (*Raillietina*) *quadritesticulata* Moghe, 1925

<table>
<thead>
<tr>
<th>Type species</th>
<th><em>Raillietina</em> (<em>Raillietina</em>) <em>quadritesticulata</em> Moghe, 1925</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host</td>
<td><em>Amaurornis phoenicurus</em></td>
</tr>
<tr>
<td>Habitat</td>
<td>Intestine</td>
</tr>
<tr>
<td>Locality</td>
<td><em>Khultabad, Aurangabad,</em> <em>Maharashtra State, India.</em></td>
</tr>
<tr>
<td>Date of collection</td>
<td>January 3, 1973.</td>
</tr>
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</table>