

Platyhelminthes parasites of fish of economic importance from Diamond Harbour, West Bengal

Anindita Ghosh, Shuvajit Chakrabarti and Jasmine Purushothaman*

Zoological Survey of India, New Alipore, Kolkata - 700053, India; jasbose@gmail.com

Abstract

The present study deals with the comprehensive account of the Platyhelminthes parasites of fish of economic importance from Diamond Harbour coast of West Bengal. 38 species belonging to 28 genera under 17 families of trematode parasites and 5 species belonging to 4 genera of 3 families of Acanthocephalan parasites from fish hosts have also been reported. This study shows that the rate of platyhelminthes parasitic infection in the fish is less in winter than in comparison to other seasons.

Keywords: Acanthocephala, Diamond Harbour, Fish, Parasite, Platyhelminthes, Trematoda, West Bengal

Introduction

Diamond Harbour lies on the eastern bank of River Hooghly where the river meets the Bay of Bengal and is located in South 24 Parganas district, the gateway to the places like Kakdwip, Namkhana, Bakkhali and Nischintapur. The fish have been collected from areas in and around Diamond Harbour, Nischintapur, Kakdwip and Namkhana.

Our present study is on trematodes and acanthocephala of fish of economic importance from Diamond Harbour. This project has been undertaken to make a detailed study on that. 38 species under 28 genera and 17 families of trematode parasites and 5 species under 4 genera and 3 families of Acanthocephala parasites from fish Hosts have been described in the present study.

Material and Methods

Parasites are collected by dissecting the fish and are kept in normal saline for relaxation. They are then kept on slides with the help of a dropper or fine brush and covered with a coverslip. The threaded slide is then kept in 70% alcohol for fixation of parasites. After fixation the parasites are kept in vial in 70% alcohol for preparation of permanent slides. They are then stained with alcoholic borax carmine stain. Acid alcohol is used

for differentiation.. The properly stained materials are then undergone through gradation of alcohols (80%, 90%, 96% & 100%) cleaned in clove oil and mounted in Canada Balsam The specimens are identified under the compound microscope (Model Leica DM 1000) and identification is based on the standard works of Bray, Gibson and Jones (2008).

Systematic Index

Class: TREMATODA

Order: PLAGIORCHIIDA

Family: HEMIURIDAE

Subfamily: LECITHOCHIRIINAE

Genus: *Lecithochirium* Lühe, 1901

1. *Lecithochirium polynemi* Chauhan, 1945

Subfamily: APHANURINAE

Genus: *Aphanurus* Looss, 1907

2. *Aphanurus stossichi* (Monticelli, 1891) Looss, 1907

Genus: *Aphanuroides* Nagaty & Abdel-Aal, 1962

3. *Aphanuroides lethrini* Nagaty & Abdel- Aal, 1962

Subfamily: ELLYTROPHALLINAE Skrjabin and Guschanskaja, 1954

Genus: *Lecithocladium* Luhe, 1901

4. *Lecithocladium excisum* (Rudolphi, 1819) Luhe, 1901

* Author for correspondence

5. *Lecithocladium piscicola* (Srivastava, 1935) Pritchard, 1960

6. *Lecithocladium glandulum* Chauhan, 1945

Subfamily: DINURINAE

Genus: *Uterovesiculurus* Skrjabin & Guschanskaja, 1954

7. *Uterovesiculurus hamati* (Yamaguti, 1934) Skrjabin & Guschanskaja, 1954

8. *Uterovesiculurus platycephali* (Yamaguti, 1954) Skrjabin & Guschanskaja, 1954

Genus: *Allostomachicola* Yamaguti, 1958

9. *Allostomachicola secundus* (Srivastava, 1939) Yamaguti, 1958

Subfamily: STOMACHICOLINAE

Genus: *Stomachicola* Yamaguti, 1934

10. *Stomachicola muraenesocis* Yamaguti, 1934

Family: LEPOCREADIIDAE

Subfamily: LEPOCREADIINAE

Genus: *Lepocreadioides* Yamaguti, 1936

11. *Lepocreadioides indicum* Srivastava, 1941

Subfamily: DIPLOPROCTODAEINAE

Genus: *Bianium* Stunkard, 1930

12. *Bianium plicatum* (Linton, 1928) Stunkard, 1930

Family: ACANTHOCOLPIDAE

Genus: *Acanthocolpus* Lühe, 1906

13. *Acanthocolpus liodoris* Luhe, 1906

Genus: *Stephanostomum* Looss, 1899

14. *Stephanostomum bicoronatum* (Stossich, 1883) Fuhrmann, 1928

15. *Stephanostomum orientalis* (Srivastava, 1939) Madhavi, 1976

Family: MONORCHIIDAE

Subfamily: LASIOTOCINAE

Genus: *Genelopa* Linton, 1910

16. *Genelopa bychowskii* Zhukov, 1977

Subfamily: ASYMPHYLORINAE

Genus: *Asymphylodora* Looss, 1890

17. *Asymphylodora kedarai* Srivastava, 1951

Family: OPECOELIDAE

Subfamily: Opecoelinae Stunkard, 1931

Genus: *Paradactylostomum* Zhukov, 1972

18. *Paradactylostomum indicum* Zhukov, 1972

19. *Paradactylostomum tenuoides* Zhukov, 1972

Genus: *Opegaster* Ozaki, 1928

20. *Opegaster beliyai* Pande, 1937

Subfamily: PLAGIOPORINAE

Genus: *Neopodocotyle* Dayal, 1950

21. *Neopodocotyle indica* Dayal, 1950

Family: LECITHASTERIDAE

Subfamily: LECITHASTERINAE

Genus: *Aponurus* Looss, 1907

22. *Aponurus breviformes* Srivastava, 1939

Family: ALLOCREADIIDAE

Subfamily: ALLOCREADIINAE

Genus: *Allocreadium* Looss, 1900

23. *Allocreadium chilikai* (Chatterjee, 1956) Madhvi, 1978

24. *Allocreadium heteropneustusius* Agrawal, 1964

25. *Allocreadium mehrai* Gupta, 1958

Family: MACRODEROIDIDAE

Subfamily: MACRODEROIDINAE

Genus: *Macrolecithus* Hasegawa & Ozaki, 1926

26. *Macrolecithus indicus* Gupta & Agrawal, 1967

Family: AZYGIIDAE

Genus: *Azygia* Looss, 1899

27. *Azygia angusticauda* (Stafford, 1904) Manter, 1926

Family: PLAGIORCHIIDAE

Subfamily: ASTIOTREMATINAE

Genus: *Astiotrema* Looss, 1899

28. *Astiotrema reniferum* (Looss, 1898) Looss, 1900

29. *Astiotrema dassia* Dayal, 1938

Family: *Lecithodendriidae*

Subfamily: Pleurogeninae

Genus: *Pleurogenoides* Travassos, 1921

30. *Pleurogenoides pabdai* (Pande, 1937) Kaw, 1944

Family: FAUSTULIDAE

Genus: *Faustula* Poche, 1926

31. *Faustula gangetica* (Srivastava, 1935) Yamaguti, 1958

32. *Faustula brevichrus* (Srivastava, 1935) Yamaguti, 1958

Family: FELLODISTOMIDAE

Genus: *Monascus* Looss, 1907

33. *Monascus trilobatus* (Bilquees, 1973) Hafeezullah, 1984

Order: OPISTHORCHIIDA

Family: HETEROPHYIDAE

Subfamily: HAPLORCHIINAE

Genus: *Haplorchoides* Chen, 1949

34. *Haplorchoides attenuatus* (Srivastava, 1935) Chen, 1949

35. *Haplorchoides piscicola* (Srivastava, 1935) Chen, 1949

Family: CRYPTOGONIMIDAE

Genus: *Orientodiploproctodaeum* Bhutta & Khan, 1970

36. *Orientodiploproctodaeum diacanthi* Bhutta & Khan, 1970

Order: STRIGEATIDA

Family: CLINOSTOMATIDAE

Genus: *Clinostomum* Leidy, 1856

37. *Clinostomum complanatum* (Rudolphi, 1814) Braun, 1899

Order: STRIGEATA

Family: ISOPARORCHIIDAE

Genus: *Isoparorchis* Southwell, 1913

38. *Isoparorchis hypselobagri* (Billet, 1838) Ejsmont, 1932

Phylum: ACANTHOCEPHALA

Class: PALAECANTHOCEPHALA

Order: ECHINORHYNCHIDA

Family: POMPHORHYNCHIDAE

Genus: *Longicollum* Yamaguti, 1935

1. *Longicollum indicus* Gupta & Gupta, 1971

Family: RHADINORHYNCHIDAE

Genus: *Raorhynchus* Tripathi, 1959

2. *Raorhynchus polynemi* Tripathi, 1959

Class: EOACANTHOCEPHALA

Order: GYRACANTHOCEPHALA

Family: QUADRIGYRIDAE

Genus: *Pallisentis* Van Cleave, 1928

3. *Pallisentis colisai* Sarkar, 1954

4. *Pallisentis ophiocephali* (Thapar, 1930) Baylis, 1933

Genus: *Acanthosentis* Verma & Dutta, 1929

5. *Acanthosentis antespinus* Verma & Dutta, 1929

Systematic Account

Class: TREMATODA

Family: HEMIURIDAE

Subfamily: LECITHOCHIRIINAE

Genus: *Lecithochirium* Luhe, 1901

1. *Lecithochirium polynemi* Chauhan, 1945

1945. *Lecithochirium polynemi* Chauhan, *Proc. Ind. Acad. Sci. B* 21 (3): 163

1999. *L. polynemi*: Hafeezullah & Dutta, *Fauna of West Bengal* (Part 11): 133-222

Material examined: Nil

Host: *Harpodon nehereus* (Hamilton, 1822); *location*: stomach; *locality*: Bakkhali, West Bengal.

Diagnostic characters: Body elongated; acetabulum larger than oral sucker; testes postacetabular, oblique; receptaculum seminalis present; vitellaria immediately postovarian with two compact masses, one is having three and another is having four digitate lobes; excretory vesicle 'Y' shaped; excretory pore terminal.

Distribution: India: Maharashtra, West Bengal. *Elsewhere*: New Caledonia.

Subfamily: APHANURINAE

Genus: *Aphanurus* Looss, 1907

2. *Aphanurus stossichi* (Monticelli, 1891) Looss, 1907

Figure 1 (a)

1891. *Apoblema stossichi* Monticelli, *Atti. Acad. Sci. Torino*. 26: 501

1907. *Aphanurus stossichi* Looss, *Zool. Anz.* 31: (19-20): 591

1999. *A. stossichi*: Hafeezullah & Dutta, *Fauna of West Bengal* (Part 11): 133-222

Material examined: 3 examples; *Host*: *Setipinna phasa* (Hamilton, 1822); *location*: intestine; *locality*: Diamond Harbour, West Bengal; *collector*: S. Chakrabarti & party.

Diagnostic characters: Body small; oral sucker subterminal, smaller than acetabulum; acetabulum situated near anterior end of the body; intestinal caeca extends to posterior extremity; testes diagonal, postacetabular; ovary almost immediately posttesticular; uterine coils almost extend to posterior extremity; uterus extends upto the posterior end of the caeca; vitellaria large, single, present posterior to ovary; excretory arms large.

Distribution: India: Odisha, Uttar Pradesh, West Bengal. *Elsewhere:* Pakistan, Spain, Philippines, Black sea, Odessa Bay, Dniester estuary, Baltic.

Genus: *Aphanuroides* Nagaty & Abdel-Aal, 1962

3. *Aphanuroides lethrini* Nagaty & Abdel-Aal, 1962

Figure 1 (b)

1962. *Aphanuroides lethrini* Nagaty & Abdel-Aal, *J. Arab. Veter. Med. Ass.* **22** (3): 225-230

Material examined: 7 examples; Host: *Sphyraena obtusata* Cuvier, 1829; location: intestine; locality: Nischintapur, Diamond Harbour, West Bengal; collector: Jasmine, P. & party.

Diagnostic characters: Body elongated, small; oral sucker smaller than acetabulum; acetabulum near anterior extremity; testes tandem, situated at middle third of the body; ovary posttesticular; uterine coils extends upto the hind end of the body; vitellaria with two compact lobes.

Distribution: India: West Bengal. *Elsewhere:* Red sea

Remarks: This species has been newly recorded from Diamond Harbour.

Subfamily: ELLYTROPHALLINAE Skrjabin & Guschanskaja, 1954

Genus: *Lecithocladium* Luhe, 1901

4. *Lecithocladium excisum* (Rudolphi, 1819) Luhe, 1901

Figure 1 (c)

1819. *Distoma excisum* Rudolphi, *Berol.*: 411

1901. *Lecithocladium excisum* Luhe, *Zool. Anz.* **24**: 395

Material examined: 4 examples; Host: *Hilsa ilisha* (Hamilton, 1822); location: intestine; locality: Diamond Harbour, West Bengal; collector: S. Chakrabarti & party.

Diagnostic characters: Body tubular, elongated, ecsoma present, longer than somatic body; oral sucker larger than acetabulum; prepharynx absent; pharynx large, cylindrical; oesophagus short; testes tandem; ovary posttesticular, near posterior end of soma; vitellaria with seven long tubule like lobes, situated near posterior end of somatic body; uterine coil extends into ecsoma; excretory vesicle 'Y' shaped.

Distribution: India: Kerala, Maharashtra, Gujarat & West Bengal. *Elsewhere:* Mediterranean, Black sea, Atlantic, Baltic. Pacific, Sea of Japan, Putiatin Island, New Zealand

5. *Lecithocladium piscicola* (Srivastava, 1935) Manter & Pritchard, 1960

Figure 1 (d)

1935. *Clupenurus piscicola* Srivastava, *Z. Parasitenkd.* **8**: 135

1960. *Lecithocladium piscicola* Manter & Pritchard *Proc. Helm. Soc. Wash.* **27** (2): 168

Material examined: 1 example; Host: *Hilsa ilisha* (Hamilton, 1822); location: intestine; locality: Kakdwip, West Bengal; collector: Jasmine, P. & party.

Diagnostic characters: Body elongated with truncated anterior end; ecsoma present; oral sucker smaller than acetabulum; pharynx small, longer than its width; testes tandem, contiguous; ovary posttesticular, situated at the med region of the body; uterus extends into ecsoma; vitellaria with seven winding tubules; excretory vesicle 'Y' shaped.

Distribution: India: Uttar Pradesh, Odisha & West Bengal

Remarks: This species has been newly recorded from Diamond Harbour.

6. *Lecithocladium glandulum* Chauhan, 1945

Figure 2 (a)

1945. *Lecithocladium glandulum* Chauhan, *Proc. Ind. Acad. Sci.* **21**: 160-173

Material examined: 5 examples; Host: *Rachycentron canadum* (Linnaeus, 1766); location: intestine; locality: Diamond Harbour, West Bengal; collector: S. Chakrabarti & party.

Diagnostic characters: Body elongated; ecsoma present; ecsoma smaller than somatic body; oral sucker smaller than acetabulum; pharynx large, cylindrical; oesophagus short; testes diagonal, equatorial; ovary posttesticular, right in front of the ecsoma; vitellaria with seven winding tubules; excretory vesicle 'Y' shaped.

Distribution: India: Tamil Nadu, Maharashtra, West Bengal

Subfamily: DINURINAE

Genus: *Uterovesiculurus* Skrjabin & Guschanskaja, 1954

7. *Uterovesiculurus hamati* (Yamaguti, 1934) Skrjabin & Guschanskaja, 1954

Figure 2 (b)

1934. *Ectenurus hamati* Yamaguti, *Jap. J. Zool.* **5**(3): 249-541

1954. *Uterovesiculurus hamati* Skrjabin & Guschanskaja, *Izdat. Acad. Nauk. SSSR. Moskv.* 9: 656.

1999. *U. hamati*: Hafeezullah & Dutta, *Fauna of West Bengal* (Part 11): 133-222

Material examined: Nil

14 examples; Host: *Sillago panijus* (Hamilton, 1822); location: stomach; locality: Diamond Harbour, Bakkhali, West Bengal; collector: M. Hafeezullah.

Diagnostic characters: Body spindle shaped; maximum width at the testiculo- ovarian region. Oral sucker very small with a short dorsal preoral lip; intestinal caeca extends upto ecsoma; testes contiguous or slightly separated; seminal vesicle posterodorsal to acetabulum; ovary posttesticular, kidney shaped; vitellaria of seven tubular lobes; excretory vesicle 'Y' shaped.

Distribution: India: Andhra Pradesh, Tamilnadu, West Bengal. *Elsewhere*: Inland sea, Toyama Bay, Pacific coast of Japan

8. *Uterovesiculurus platycephali* (Yamaguti, 1934) Skrjabin & Guschanskaja, 1954

Figure 2 (c-d)

1934. *Ectenurus platycephali* Yamaguti, *Jap. J. Zool.* 5(3): 249-541

1954. *Uterovesiculurus platycephali* Skrjabin & Guschanskaja, *Izdat. Acad. Nauk. SSSR. Moskv.* 9: 656

Material examined: 4 examples; Host: *Platycephalus indicus* (Linnaeus, 1758); location: stomach; locality: Diamond Harbour, West Bengal; collector: S. Chakrabarti & party

Diagnostic characters: Body smooth, ecsoma well developed; acetabulum larger than oral sucker; intestinal caeca extends upto ecsoma; seminal vesicle dorsal to acetabulum; testes diagonal; ovary posttesticular, oval shaped; uterus extends from the level of acetabulum to the anterior level of ecsoma; excretory arms united in the forebody.

Distribution: India: West Bengal

Remarks: This species has been newly recorded from Diamond Harbour.

Genus: ***Allostomachicola*** Yamaguti, 1958

9. *Allostomachicola secundus* (Srivastava, 1939) Yamaguti, 1958

Figure 3 (a-c)

1939. *Stomachicola secundus* Srivastava, *Ind. J. Vet. Sci. & Anim. Husb.* 9(1): 77-79

1958. *Allostomachicola secundus* Yamaguti *Pub. Seto. Marine Biol. Lab.* 6(3): 369-384

Material examined: 6 examples; Host: *Scomberomorus guttatus* (Bloch & Schneider, 1801); locality: Diamond Harbour, West Bengal; collector: Jasmine, P. & party.

Diagnostic characters: Body elongated, muscular; oral sucker subterminal with distinct preoral lobe; oesophagus short; acetabulum almost double of oral sucker; testes postacetabular, diagonal; seminal vesicle elongated, oval; ovary post testicular, reniform; uterus intercaecal; occupying most part of the ecsoma; vitellaria with seven lobes; excretory arms united anteriorly.

Distribution: India: Odisha, West Bengal. *Elsewhere*: Kuwait, Pakistan, Japan

Remarks: This species has been newly recorded from Diamond Harbour.

Subfamily: STOMACHICOLINAE

Genus: ***Stomachicola*** Yamaguti, 1934

10. *Stomachicola muraenesocis* Yamaguti, 1934

1934. *Stomachicola hamati* Yamaguti, *Jap. J. Zool.* 5(3): 249-541

1999. *S. muraenesocis*: Hafeezullah & Dutta, *Fauna of West Bengal* (Part 11): 133-222

Material examined: Nil. Host: *Muraenesox talabonoides* (Bleeker, 1853); location: stomach; location: Diamond Harbour, West Bengal

Diagnostic characters: Body smooth, highly contractile with a short somatic body and long ecsoma; oral sucker much smaller than acetabulum; acetabulum cephalad; testes postacetabular; ovary reniform, posttesticular; genital pore behind oral sucker; excretory vesicle 'V' shaped.

Distribution: India: West Bengal; all along east and west coasts of India. *Elsewhere:* Inland sea of Japan, South China sea.

Family: LEPOCREADIIDAE

Subfamily: LEPOCREADIINAE

Genus: *Lepocreadioides* Yamaguti, 1936

11. *Lepocreadioides indicum* Srivastava, 1941

Figure 3 (d)

1941. *Lepocreadioides indicum* Srivastava *Indian J. Vet. Sci.* **11**(1): 52

1999. *L. indicum*: Hafeezullah & Dutta, *Fauna of West Bengal* (Part 11): 133-222

Material examined: Nil 22 examples; Host: *Cynoglossus lida* (Bleeker, 1851); location: intestine; locality: Bakkhali, South 24 Parganas, West Bengal

Diagnostic characters: Body bluntly pointed at anterior end and broadly rounded in posterior end; acetabulum larger than oral sucker; cirrus sac club shaped; testes ovate, diagonal, genital pore very near to oral sucker; ovary pretesticular, postacetabular, three lobed; vitelline follicles lateral, extends upon caecal bifurcation.

Distribution: India: Odisha and Andhra Pradesh coasts, West Bengal. *Elsewhere:* Pakistan

Subfamily: DIPLOPROCTODAEINAE

Genus: *Bianium* Stunkard, 1930

12. *Bianium plicatum* (Linton, 1928) Stunkard, 1930

1928. *Psilostomum plicatum* Linton *Proc. U. S. nat. Mus.* **73**: 5

1930. *Bianium plicatum* Stunkard *Z. Parasit.* **3**: 713-725

1999. *B. plicatum*: Hafeezullah & Dutta, *Fauna of West Bengal* (Part 11): 133-222

Material examined: Nil. Host: *Torquigener oblongus* (Bloch, 1786); location; intestine; locality: Hooghly estuary, Diamond Harbour, West Bengal.

Diagnostic characters: Body linguiform, elongated; oral sucker subterminal; acetabulum smaller than oral sucker; anterior margin of the pharynx lobed; prepharynx indistinct; testes tandem, post equatorial; ovary pretesticular, multilobed; genital pore situated at the level of anterior margin of acetabulum; vitelline follicles extend upto acetabular level; excretory vessels tubular.

Distribution: India: Andhra Pradesh, Tamil Nadu & West Bengal. *Elsewhere:* American, Atlantic & Pacific.

Family: ACANTHOCOLPIDAE

Genus: *Acanthocolpus* Luhe, 1906

13. *Acanthocolpus liodorus* Luhe, 1906

Figure 3 (e)

1906. *Acanthocolpus liodorus* Luhe, *Ceylon Pearl Oys. Fish. Rep.* Pt. 5: 100

1999. *A. liodorus*: Hafeezullah & Dutta, *Fauna of West Bengal* (Part 11): 133-222

Material examined: Nil. Host: *Chirocentrus dorab* (Forsskal, 1775); location: intestine; locality: Hooghly estuary, West Bengal.

Diagnostic characters: Body cylindrical; oral sucker subterminal; acetabular peduncle present near anterior end; prepharynx long; oesophagus short; cirrus sac extends upto the anterior level of vitellaria; testes tandem, elongated; ovary pretesticular; genital pore near acetabular peduncle.

Distribution: India: Maharashtra, Gujarat, Odisha, Andhra Pradesh, Tamil Nadu, Kerala and West Bengal.

Genus: *Stephanostomum* Yamaguti, 1968

14. *Stephanostomum bicoronatum* (Stossich, 1883) Fuhrmann, 1928

1883. *Distomum bicoronatum* Stossich, *Boll. Coc. Adriat. Sc. Nat. Trieste*, **8**: 111-121

1928. *Stephanostomum bicoronatum* Fuhrmann, *Kuenthal's Handb. Zool.*: 104

1999. *S. bicoronatum*: Hafeezullah & Dutta, *Fauna of West Bengal* (Part 11): 133-222

Material examined: Nil. Hosts: *Otolithus biauritus* Cantor, 1849 & *Otolithus brunneus* Bleeker, 1851; location: intestine; locality: Hooghly estuary, Diamond Harbour, West Bengal.

Diagnostic characters: Body elongated, spined; oral sucker terminal with 30-33 circumural spines in two alternating rows; acetabulum at anterior third of the body; testes directly tandem, ellipsoidal; ovary pretesticular; vitellaria extend from middle of cirrus sac level to posterior end.

Distribution: India: Kerala, West Bengal. *Elsewhere:* East China sea, Japan

15. *Stephanostomum orientalis* (Srivastava, 1939) Madhavi, 1976

1939. *Acanthocolpus orientalis* Srivastava *Ind. J. Vet. Sci.* **9**: 215

1976. *Stephanostomum orientalis* Madhavi, *Riv. Parassit.* 37 (2-3): 116

Material examined: 3 examples; Host: *Wallago attu* (Bloch & Schneider, 1801); location: intestine; locality: Diamond Harbour, West Bengal.

Diagnostic characters: Body elongated; oral sucker funnel shaped, 32 circumural spines present in two alternating rings; acetabulum larger than oral sucker; prepharynx long; oesophagus short; testes tandem, ovary pretesticular; cirrus sac very long, extends upto the level of anterior portion of vitellaria; hermaphroditic duct present; vitelline follicles extends from the level of posterior end of cirrus sac to the posterior end of the body; excretory vesicle 'Y' shaped.

Distribution: India: Odisha, Andhra Pradesh, West Bengal.

Family: MONORCHIIDAE
Subfamily: LASIOTOCINAE
Genus: *Genelopa* Linton, 1910

16. *Genelopa bychowskii* Zhukov, 1977

1977. *Genelopa bychowskii* Zhukov, *Parazit. Len.* 27: 56

Material examined: Host: *Parastromateus niger* (Bloch, 1795); location: intestine; locality: Hooghly estuary, Diamond Harbour, West Bengal.

Diagnostic characters: Body fusiform; prepharynx present; acetabulum larger than oral sucker, prequatorial; oesophagus very long; testis single, in posterior half of the body; ovary pretesticular; cirrus sac very long extending much posterior to acetabulum; genital pore preacetabular.

Distribution: India: West Bengal

Subfamily: ASYMPHYLORINAE
Genus: *Asymphylogora* Looss, 1890

17. *Asymphylogora kedarai* Srivastava, 1951

Figure 4 (a)

1951. *Asymphylogora kedarai* Srivastava, *Ind. J. Helm.* 3(1): 7
1999. *A. kedarai*: Hafeezullah & Dutta, *Fauna of West Bengal* (Part 11): 133-222

Material examined: Host: *Puntius sophore* (Hamilton, 1822); location: intestine; locality: Kakdwip, South 24 Parganas, West Bengal.

Diagnostic characters: Body oval, preacetabular region spined; acetabulum equal or slightly larger than oral sucker; intestinal caeca extends upto anterior one third of testis; testis large, ovoid, situated in posterior third of body; genital pore submarginal, at level of caecal bifurcation; ovary pretesticular, spherical, contiguous to testes posteriorly; vitellaria extracaecal, extends from genital pore to posterior part of ovary; metraterm unspined; excretory pore terminal.

Distribution: India: Uttar Pradesh, West Bengal.

Family: OPECOELIDAE
Subfamily: OPECOELINAE

Genus: *Paradactylostomum* Zhukov, 1972

18. *Paradactylostomum indicum* Zhukov, 1972

1972. *Paradactylostomum indicum* Zhukov, *Parazit.* 6(4): 347
1999. *P. indicum*: Hafeezullah & Dutta, *Fauna of West Bengal* (Part 11): 133-222.

Material examined: Nil. Host: *Engraulis telara* (Hamilton, 1822); location: intestine; locality: Hooghly estuary, Diamond Harbour, West Bengal.

Diagnostic characters: Body pyriform; oral sucker terminal, acetabulum larger than oral sucker, prequatorial, cup-shaped; oesophagus very long; intestinal caeca cyclocael; testes tandem with lobed margin; ovary three lobed; ovary preacetabular, three lobed; uterus between acetabulum and ovary; vitellaria extend upto posterior end of the body.

Distribution: India: West Bengal

19. *Paradactylostomum tenuoides* Zhukov, 1972

1972. *Paradactylostomum tenuoides* Zhukov, *Parazit.* 6(4): 347

Material examined: Host: *Setipinna phasa* (Hamilton, 1822); location: intestine; locality: Diamond Harbour, West Bengal.

Diagnostic characters: Body elongated; oral sucker smaller than ventral sucker; intestinal caeca forms cyclocoel near the posterior end; cirrus sac absent; testes tandem, lobed; ovary lobed, pretesticular; vitellaria follicular, confined in hind body only; uterine coils situated between genital pore and ovary.

Distribution: India: West Bengal

Genus: *Opegaster* Ozaki, 1928

20. *Opegaster beliyai* Pande, 1937

Figure 4 (b)

1937. *Opegaster beliyai* Pande, *Proc. Natn. Acad. Sci.* 7(2): 111-115

Material examined: 1 example; Host: *Nandus nandus* (Hamilton, 1822); location: intestine; locality: Diamond Harbour, South 24 Parganas, West Bengal. Host: *Glossogobius giuris* (Hamilton, 1822), *Chanda nama* Hamilton, 1822, *Chanda ranga* Hamilton, 1822; location: intestine; locality: Diamond Harbour, South 24 Parganas, West Bengal.

Diagnostic characters: Body oval with pointed anterior end; oral sucker small; acetabulum large; prepharynx short; oesophagus long; testes tandem, transversely elongated; external seminal vesicle long, extends upto posterior margin of acetabulum; ovary pretesticular, transversely elongated and kidney shaped; vitellaria extends from the level of middle of oesophagus to posterior end of the body; excretory vesicle tubular.

Distribution: India: Uttar Pradesh, West Bengal.

Subfamily: PLAGIOPORINAE

Genus: *Neopodocotyle* Dayal, 1950

21. *Neopodocotyle indica* Dayal, 1950

Figure 4 (c)

1950. *Neopodocotyle indica* Dayal, *Ind. J. Helm.* 2(1): 6-8.

Material examined: 2 examples; Host: *Ompok bimaculatus* (Bloch, 1794); location: intestine; locality: Diamond Harbour, South 24 Parganas, West Bengal.

Diagnostic characters: Body elongated; oral sucker subterminal; prepharynx short; acetabulum at anterior half of the body; intestinal caeca blind; testes tandem; ovary pretesticular, separated from anterior testes by uterine coils; vitellaria follicular, restricted in hind body only; excretory vesicle tubular.

Distribution: India: Uttar Pradesh, West Bengal

Remarks: This species has been newly recorded from Diamond Harbour.

Family: LECITHASTERIDAE

Subfamily: LECITHASTERINAE

Genus: *Aponurus* Looss, 1907

22. *Aponurus breviformes* Srivastava, 1939

Figure 4 (d)

1939. *Aponurus breviformes* Srivastava, *Ind. J. Vet. Sci. & Anim. Husb.* 9(1): 31

Material examined: Host: *Hilsa ilisha* (Hamilton, 1822) & *Parastromateus niger* (Bloch, 1795); location: intestine; locality: Diamond Harbour, Kakdwip, South 24 Parganas, West Bengal.

Diagnostic characters: Body elongated, small; acetabulum larger than oral sucker, prequatorial; testes tandem; pars prostatica tubular; ovary posttesticular; uterus situated posterior to seminal vesicle; vitellaria seven lobed, situated posterior to ovary; excretory vesicle 'Y' shaped, excretory pore terminal.

Distribution: India: Odisha, West Bengal

Family: ALLOCREADIIDAE

Subfamily: ALLOCREADIINAE

Genus: *Allocreadium* Looss, 1900

23. *Allocreadium chilikai* (Chatterjee, 1956) Madhavi, 1978

Figure 5 (a)

1956. *Psilostomum chilikai* Chatterjee, *Indian J. Helm.* 8: 96-99

1978. *Allocreadium chilikai* Madhavi, *J. Helm.* 52: 58

1999. *A. chilikai*: Hafeezullah & Dutta, *Fauna of West Bengal* (Part 11): 133-222

Material examined: Nil. Host: *Colisa fasciata* (Bloch & Schneider, 1801); location: intestine; locality: Diamond Harbour, South 24 Parganas, West Bengal.

Diagnostic characters: Body elongated; oral sucker almost equal to acetabulum; prepharynx absent; oesophagus long; testes tandem, spherical, postequatorial; ovary pretesticular, spherical; cirrus sac flask shaped; vitellaria extends from the level of caecal bifurcation to posterior end of the body; uterine coils situated between acetabulum and anterior testis; excretory vesicle tubular.

Distribution: India: Odisha, Andhra Pradesh, Uttar Pradesh & West Bengal.

24. *Allocreadium heteropneustusius* Agrawal, 1964

Figure 5 (b)

1964. *Allocreadium heteropneustusius* Agrawal, *Ind. J. Helm.* **16**(2): 82-89

Material examined: 1 example; Host: *Heteropneustes fossilis* (Bloch, 1794); location: intestine; locality: Diamond Harbour, South 24 Parganas, West Bengal; collector: S. Chakrabarti & party.

Diagnostic characters: Body elongated; oral sucker larger than acetabulum; prepharynx absent; oesophagus short; cirrus sac flask shaped, slightly overlapping anterior part of acetabulum; testes tandem; ovary pretesticular, spherical; genital pore median, situated between the middle of acetabulum and caecal bifurcation; vitellaria follicular, extends from the level of ovary to posterior end of the body; excretory vesicle tubular.

Distribution: India: Uttar Pradesh, West Bengal.

25. *Allocreadium mehrai* Gupta, 1958

1958. *Allocreadium mehrai* Gupta, *Ind. J. Helm.* **8**(2): 103

1999. *A. mehrai*: Hafeezullah & Dutta, *Fauna of West Bengal* (Part 11): 133-222

Material examined: Nil. Host: *Rhynchobdella aculeata* (Bloch, 1786); location: intestine; locality: Diamond Harbour, South 24 Parganas, West Bengal.

Diagnostic characters: Body elongated; oral sucker subterminal; smaller than acetabulum; acetabulum cup shaped; situated near the anterior end of the body; prepharynx absent; oesophagus short; testes tandem, situated at the mid region of the body; ovary pretesticular, spherical; cirrus sac flask shaped; vitellaria follicular, extends from the level of anterior region of the ovary to posterior end of the body; excretory vesicle tubular.

Distribution: India: Madhya Pradesh, Uttar Pradesh & West Bengal

Family: MACRODEROIDIDAE

Subfamily: MACRODEROIDINAE

Genus: *Macrolecithus* Hasegawa & Ozaki, 1926

26. *Macrolecithus indicus* Gupta & Agrawal, 1967

1967. *Macrolecithus indicus* Gupta & Agrawal, *Proc. Helminth. Soc. Washington.* **34**(2): 156

1999. *M. indicus*: Hafeezullah & Dutta, *Fauna of West Bengal* (Part 11): 133-222

Material examined: Host: *Puntius sophore* (Hamilton, 1822); location: intestine; locality: Kakkdwip, South 24 Parganas, West Bengal.

Diagnostic characters: Body leaf like, elongated; oral sucker equal or slightly smaller than acetabulum; prepharynx short; testes oblique; ovary pretesticular; cirrus sac club shaped; receptaculum seminis large; vitelline follicles extends from the level of caecal bifurcation or pharynx to the posterior end of the body; metraterm present; excretory vesicle tubular.

Distribution: India: Uttar Pradesh, West Bengal

Family: AZYGIIDAE

Genus: *Azygia* Looss, 1899

27. *Azygia angusticauda* (Stafford, 1904) Manter, 1926

Figure 6 (a-c)

1904. *Mimodistomum angusticaudum* Stafford, *Zool. Anz.* **27** (16-17): 488

1926. *Azygia angusticauda* Manter, *Illioines Biol. Monogr.*, **10**(2): 186

Material examined: Six examples; Host: *Channa punctatus* (Bloch, 1793); location: intestine; locality: Diamond Harbour, South 24 Parganas, West Bengal. Host: *Chanda nama* (Hamilton, 1822); location: stomach; locality: Diamond Harbour, South 24 Parganas, West Bengal.

Diagnostic characters: Body elongated; oral sucker almost equal to acetabulum; prepharynx absent; pharynx small; oesophagus indistinct; testes oblique, transversely elongated; ovary pretesticular, transversely elongated, kidney shaped; uterus located in between ovary and acetabulum; vitelline follicles extends from the level of acetabulum to posterior end of the body; excretory vesicle 'Y' shaped.

Distribution: India: Uttar Pradesh, West Bengal. *Elsewhere:* North America

Family: PLAGIORCHIIDAE

Subfamily: ASTIOTREMATINAE

Genus: *Astiotrema* Looss, 1899

28. *Astiotrema reniferum* (Looss, 1898) Looss, 1900

Figure 6 (d)

1898, *Distoma reniferum* Looss, *Centralbl. Bakteriolog.* **23**(11): 4611900. *Astiotrema reniferum* Looss, *Zool. Jahrb. Abt. Syst.* **12** (5-6): 521-784

Material examined: One example; Host: *Clarias batrachus* (Linnaeus, 1758); location; intestine; locality: Diamond Harbour, South 24 Parganas, West Bengal. Host: *Clarias batrachus* (Linnaeus, 1758); location: intestine; locality: Kakdwip, South 24 Parganas, West Bengal.

Diagnostic characters: Body lanceolate, spined; oral sucker almost equal to acetabulum; prepharynx absent; oesophagus long; caecal bifurcation just anterior to acetabulum; testes oblique; ovary pretesticular, spherical; cirrus pouch claviform, extends upto anterior region of ovary; seminal receptacle present; vitelline follicles lateral, overlapping intestinal caeca; extends from the level of posterior margin of acetabulum to the level of posterior testes; uterine coil extends from acetabulum to posterior end of the body; excretory vesicle 'Y' shaped.

Distribution: India: Uttar Pradesh, Madhya Pradesh, Punjab, West Bengal. *Elsewhere:* Egypt

29. *Astiotrema dassia* Dayal, 19381938. *Astiotrema dassia* Dayal, *Proc. Ind. Acad. Sci.* **8**(1): 10-14

Material examined: Nil. 5 examples; Host: *Mystus vittatus* (Bloch, 1794); location: intestine; locality: Kakdwip, South 24 Parganas, West Bengal.

Diagnostic characters: Body spined, spatulate; acetabulum situated at the anterior third of the body; testes diagonal, lobed; ovary pretesticular; cirrus pouch elongated, claviform; uterus reaches upto posterior extremity; vitellaria extends into extracaecal field; excretory vesicle 'Y' shaped.

Distribution: India: Uttar Pradesh, West Bengal.

Family: LECITHODENDRIIDAE

Subfamily: PLEUROGENINAE

Genus: *Pleurogenoides* Travassos, 1921**30. *Pleurogenoides pabdai*** (Pande, 1937) Kaw, 19441937. *Pleurogenoides pabdai* Pande, *Nat. Acad. Sci. India*, **7**(2): 1111944. *Pleurogenoides pabdai* Kaw, *Proc. Ind. Acad. Sci. Sec. B* **18**: 1071999. *P. pabdai*: Hafeezullah & Dutta, *Fauna of West Bengal* (Part 11): 133-222

Material examined: Nil. Host: *Ompok bimaculatus* (Bloch, 1794); location; intestine; Locality, Diamond Harbour, South 24 Parganas, West Bengal.

Diagnostic characters: Body elliptical, posterior end bifid; oral sucker larger than acetabulum; oesophagus short; intestinal caeca extends upto anterior margin of testes; testes symmetrical, situated at either side of the acetabulum; ovary pretesticular, oval; cirrus pouch claviform; uterine coil situated between acetabulum and two testes; vitelline follicles in two bunches of 9-11 follicles, extends from the level of oral sucker to intestinal caeca; excretory vesicle 'Y' shaped.

Distribution: India: Uttar Pradesh, West Bengal.

Family: FAUSTULIDAE

Genus: *Faustula* Poche, 1926**31. *Faustula gangetica*** (Srivastava, 1935) Yamaguti, 1958 Figure 6 (e)1935. *Orientophorus gangeticus* Srivastava, *Parasit.* **27**(3): 3771958. *Faustula gangetica* Yamaguti, *Syst. Helm. Vol. I. The Dig. Trem. Vert. Interscience Publishers, New York*: 34

Material examined: 5 examples; Host: *Hilsa ilisha* (Hamilton, 1822); location: intestine; locality: Diamond Harbour, South 24 Parganas, West Bengal.

Diagnostic characters: Body oval, spined; oral sucker terminal, almost equal to acetabulum; oesophagus moderate; intestinal caeca extends upto equatorial level; testes symmetrical, at either side of the acetabulum; ovary pretesticular, lobed; cirrus sac flask shaped, extends upto the posterior margin of the acetabulum; genital pore median, situated posterior to intestinal caeca; vitelline follicles lateral, extends from the posterior margin of oesophagus to the level of posterior margin of ovary; uterus occupies the entire posttesticular region; excretory vesicle 'Y' shaped.

Distribution: India: Odisha, Tamil Nadu, Maharashtra, Gujarat & West Bengal.

32. *Faustula brevichrus* (Srivastava, 1935) Yamaguti, 19601935. *Orientophorus brevichrus* Srivastava, *Parasit.* **27**(3): 377

1958. *Faustula brevichrus* Yamaguti, *Syst. Helm.* Vol. I. *The Dig. Trem. Vert. Interscience Publishers, New York*: 34

Material examined: Host: *Hilsa ilisha* (Hamilton, 1822); location: intestine; locality: Diamond Harbour, South 24 Parganas, West Bengal; collector: Jasmine, P. & party

Diagnostic characters: Body oval, spined; oral sucker equal to acetabulum; oesophagus long; intestinal caeca extends beyond testes; testes symmetrical, at either side of the acetabulum; ovary pretesticular, lobed; cirrus sac flask shaped, overlaps acetabulum; genital pore almost at the level of intestinal bifurcation; vitelline follicles lateral; situated at the acetabular zone; uterus occupies entire hind region of the body; excretory vesicle 'Y' shaped.

Distribution: India: Uttar Pradesh, West Bengal.

Remarks: This species has been newly recorded from Diamond Harbour.

Family: FELLODISTOMIDAE

Genus: *Monascus* Looss, 1907

33. *Monascus trilobatus* (Bilquees, 1973) Hafeezullah, 1984

1973. *Karachitrema trilobata* Bilquees, *Acta. Parasit. Pol.* **21**: 327-334

1984. *Monascus trilobatus* Hafeezullah, *Bull. Zool. Surv. India* **6**: 209-218

Material examined: 3 examples; Host: *Stromateus sinensis* Forster, 1795; location: intestine; locality: Diamond Harbour, South 24 Parganas, West Bengal; collector: S. Chakrabarty & party

Diagnostic characters: Body elongated; oral sucker larger than acetabulum; prepharynx absent; intestinal caeca extends upto the posterior end of the body; testes tandem, postequatorial; ovary pretesticular, lobed; vitelline follicles extends from the level of acetabulum to the level of anterior testes; uterus extends from the hind end of acetabulum to almost posterior end of the body; excretory vesicle 'Y' shaped.

Distribution: India: West Bengal

Remarks: This species has been newly recorded from Diamond Harbour.

Order: OPISTHORCHIIDA

Family: HETEROPHYIDAE

Subfamily: HAPLORCHIINAE

Genus: *Haplorchoides* Chen, 1949

34. *Haplorchoides attenuatum* (Srivastava, 1935) Chen, 1949

Figure 7 (a)

1935. *Haplorchis attenuatum* Srivastava, *Proc. Natn. Acad. Sci. India*, **5**(1): 76

1949. *Haplorchoides attenuatum* Chen, *Ann. Trop. Med. Parasit.* **43**(3-4): 306

1999. *H. attenuatum*: Hafeezullah & Dutta, *Fauna of West Bengal* (Part 11): 133-222

Material examined: Host: *Mystus aor* (Hamilton, 1822); location: intestine; locality: Kakdwip, South 24 Parganas; West Bengal.

Diagnostic characters: Body spindle shaped, spined, attenuating at both the ends; acetabulum is embedded with a cirlet of 40- 48 rodlets; prepharynx very long; oesophagus shorter than prepharynx; intestinal caeca extends upto the level of testis; testis single; ovary pretesticular; vitelline follicles extends from the level of seminal receptacle the little front of hind end overlapping caeca; excretory vesicle 'Y' shaped.

Distribution: India: Uttar Pradesh, Andhra Pradesh, Assam & West Bengal.

35. *Haplorchoides piscicola* (Srivastava, 1935) Chen, 1949

1935. *Haplorchis piscicola* Srivastava, *Proc. Natn. Acad. Sci. India*, **5**(1): 76

1949. *Haplorchoides piscicola* Chen, *Ann. Trop. Med. Parasit.* **43**(3-4): 306

1999. *H. piscicola*: Hafeezullah & Dutta, *Fauna of West Bengal* (Part 11): 133-222

Material examined: Host: *Mystus vittatus* (Bloch, 1794); location: intestine; locality Kakdwip, South 24 Parganas, West Bengal.

Diagnostic characters: Body oval; acetabulum is embedded with a cirlet of 36-40 rodlets; prepharynx very long, oesophagus shorter than prepharynx; intestinal caeca extends upto the level of testis; testis single, large; ovary pretesticular, vitelline follicles

extends from the level of ovary to the level of caecal end.

Distribution: India: Uttar Pradesh, Assam & West Bengal

Family: CRYPTOOGONIMIDAE

Genus: *Orientodiploproctodaeum* Bhutta & Khan, 1970

36. *Orientodiploproctodaeum diacanthi* Bhutta & Khan, 1970

1970. *Orientodiploproctodaeum diacanthi* Bhutta & Khan, *Pakistan J. Zool.* 2(2): 163-165

Material examined: 2 examples; Host: *Pseudosciaena diacanthus* (Lacepede, 1802); location: intestine; locality: Diamond Harbour, South 24 Parganas, West Bengal; collector: S. Chakrabarty & party

Diagnostic characters: Body oval; oral sucker terminal, surrounded by large collar; collar devoid of enlarged spines; prepharynx very short; oesophagus rudimentary; testes oblique, situated in mid hindbody; ovary lobed, pretesticular; uterine coils extends upto almost posterior end of the body; vitelline follicles forms two lateral groups, extends from the level of posterior testis to the anterior level of acetabulum.

Distribution: India: Puducherry, Kerala, West Bengal. *Elsewhere:* Pakistan

Order: STRIGEATIDA

Family: CLINOSTOMATIDAE

Genus: *Clinostomum* Leidy, 1856

37. *Clinostomum complanatum* (Rudolphi, 1819) Braun, 1899

Fig. 7 (b-c)

1819. *Distomum complanatum* Rudolphi, *Berol.* 811p

1899. *Clinostomum complanatum* Braun, *Zool. Anz.* 22: 484-493

Material examined: 4 examples; Host: *Colisa fasciata* (Bloch & Schneider, 1801); location: intestine; locality: Diamond Harbour, South 24 Parganas, West Bengal; collector: S. Chakrabarty & party

Diagnostic characters: Body linguiform, spined; oral sucker with collar like fold; pharynx absent; oesophagus with bulbous swollen at its posterior end; testes tandem, situated at the level of anterior third of the body; ovary intertesticular; genital pore at anterior to anterior testes;

vitellaria restricted to hind body; excretory vesicle 'V' shaped.

Distribution: India: Cosmopolitan. *Elsewhere:* Cosmopolitan

Order: STRIGEATA

Family: ISOPARORCHIIDAE

Genus: *Isoparorchis* Southwell, 1913

38. *Isoparorchis hypselobagri* (Billet, 1838) Ejsmont, 1932

1838. *Distomum hypselobagri* Billet, *Bull. Scient. France et Belg.* 28(2): 283

1932. *Isoparorchis hypselobagri* Ejsmont, *Ann. Parasit. Hum. Comp.* 10: 455

Material examined: 2 examples; Host: *Mystus cavasius* (Hamilton, 1822); location: intestine; locality: Diamond Harbour, South 24 Parganas, West Bengal; collector: S. Chakrabarty & party.

Diagnostic characters: Body elliptical, large; oral sucker subterminal, almost equal in size with acetabulum; prepharynx absent; oesophagus very short; testes symmetrical, situated at the either side of the acetabulum; ovary posttesticular; uterine coils form transverse loops; metraterm present; excretory vesicle 'Y' shaped.

Distribution: India: Assam, Maharashtra, Andhra Pradesh and West Bengal. *Elsewhere:* China, Japan and Siberia

Phylum ACANTHOCEPHALA

Class PALAECANTHOCEPHALA

Order ECHINORHYNCHIDA

Family: POMPHORHYNCHIDAE

Genus: *Longicollum* Yamaguti, 1935

1. *Longicollum indicus* Gupta & Gupta, 1971

1971. *Longicollum indicum* Gupta & Gupta, *Res. Bull. Punjab Univ.* 23(3/4): 417-420

Material examined: 6 examples; Host: *Strongylura strongylura* (van Hasselt, 1823); location: intestine; locality: Diamond Harbour, South 24 Parganas, West Bengal; collector: S. Chakrabarty & party.

Diagnostic characters: Body cylindrical; proboscis short, proboscis sheath provided with ganglion; testes contiguous.

Distribution: India: Kerala & West Bengal.

Remarks: This species has been newly recorded from Diamond Harbour.

Family: RHADINORHYNCHIDAE

Genus: *Raorhynchus* Tripathi, 1959

2. *Raorhynchus polynemi* Tripathi, 1959

1959. *Raorhynchus polynemi* Tripathi, *Rec. Ind. Mus.* **54**(1&2): 61-99

Material examined: 5 examples; Host: *Alectis indicus* (Ruppell, 1830); location: intestine; locality: Diamond Harbour, South 24 Parganas, West Bengal; collector: S. Chakrabarty & party.

Diagnostic characters: Body cylindrical, females are larger than males; curved dorsally; proboscis armed with 12 rows of 22-24 hooks, hooks on dorsal side smaller and more curved; proboscis sheath double walled, long; in male testes tandem, prequatorial; cement glands two, tubular.

Distribution: India: Odisha, Karnataka, Tamilnadu, Puducherry and West Bengal.

Remarks: This species has been newly recorded from Diamond Harbour.

Class: EOACANTHOCEPHALA

Order: GYRACANTHOCEPHALA

Family: QUADRIGYRIDAE

Genus: *Pallisentis* Sarkar, 1954

3. *Pallisentis colisai* Sarkar, 1954

1954. *Pallisentis colisai* Sarkar, *Rec, Ind. Mus.* **52**: 349-362

Material examined: 2 examples; Host: *Colisa fasciata* (Bloch & Schneider, 1801); location: intestine; locality: Diamond Harbour, South 24 Parganas, West Bengal; collector: S. Chakrabarty & party.

Diagnostic characters: Trunk with spines of 22 circles of 13-16 spines each; Proboscis provided with 4 circle of 10 hooks each; ganglion present near base of proboscis receptacle; In male testes oval, contiguous, cement gland long having 8-14 nuclei.

Distribution: India: Bihar, Andhra Pradesh, Tripura, Meghalaya and West Bengal.

Remarks: This species has been newly recorded from Diamond Harbour.

4. *Pallisentis ophiocephali* (Thapar, 1930) Baylis, 1933
1930. *Farzandia ophiocephali* Thapar, *Ann. Mag. Nat. Hist.* **10**: 443-449
1933. *Pallisentis ophiocephali* Baylis, *Ann. Mag. Nat. Hist.* **10**: 443-449

Material examined: 4 examples; Host: *Channa* sp.; location: intestine; locality: Diamond Harbour, South 24 Parganas, West Bengal; collector: S. Chakrabarty & party

Diagnostic characters: Collar of spines present in the trunk near anterior extremity; proboscis short, with 4 circles of each; anterior hooks broad, recurved; in male testes oval, contiguous; cement gland long with 20-30 nuclei, syncytial.

Distribution: India: Cosmopolitan.

Remarks: This species has been newly recorded from Diamond Harbour.

Genus: *Acanthosentis* Verma & Dutta, 1929

5. *Acanthosentis antespinus* Verma & Dutta, 1929

1929. *Acanthosentis antespinus* Verma & Dutta, *Ann. Trop. Med & Parasitol.*, **23**: 483-500

Material examined: Numerous examples; Host: *Mystus guchia* (Hamilton, 1822); locality: Diamond Harbour, West Bengal; collector: S. Chakrabarty & party. Host: *Catla catla* (Hamilton, 1822); locality: Diamond Harbour, West Bengal

Diagnostic characters: Proboscis armed with 3 circles having six hooks each; trunk spines in 30 circles; cement gland with 6-8 nuclei; syncytial.

Distribution: India: Uttar Pradesh, Odisha, Tamil Nadu and West Bengal

Discussion

The present work is a comprehensive account of all the Platyhelminthes parasites of fishes so far received and recorded from Diamond Harbour and its surrounding areas. Diagnostic characters, distribution of all the species from different locality of India as well as from abroad has been mentioned here as far as possible. Diagrams of most

of the species have been included here which will help in future studies. Five species of Acanthocephala has also been received after dissection of fish Hosts which has also been included here with the Diagnostic characters and diagram. 12 species of trematodes have been newly recorded from Diamond Harbour. It has been observed that the rate of infection is less in winter in comparison to summer and monsoon season. In all 38 Species under 28 genera under 17 families of trematodes and 5 species under 4 genera under 3 families of Acanthocephala have been studied here.

Acknowledgements

Authors are thankful to Director, Zoological Survey of India for providing all sorts of facilities and help to conduct the programme. They are also thankful to Dr. S. S. Mishra, Scientist C, Zoological Survey of India for the identification of fish Hosts. Thanks are also due to Sri Gopal Chandra Dey and Vijay Kumar Singh who has helped a lot in survey tour.

References

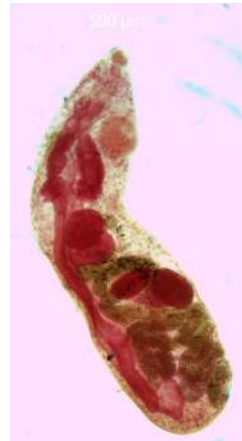
- Agrawal, V. 1964. On some new trematodes from freshwater fishes of Lucknow. *Ind. J. Helm.*, **16**(2): 82-99.
- Baylis, H.A. 1933. On some parasitic worms from Java with Remarks on the Acanthocephalan genus *Pallisentis*. *Ann. Mag. Nat. Hist.*, **10**: 559-573.
- Bhutta, M.S. & Khan, D. 1970. A new subfamily of fish Trematodes. *Pakistan J. Zool.*, **2**(2): 163-165.
- Billet, A. 1898. Notes sur la faune du Haut-Tonkin. II. Sur quelques distomes. *Bull. Sci. France et Belg.*, **28**(2): 283-309.
- Bilquees, F.M. 1973. Marine fish trematodes from West Pakistan. XIII. (Allocreadiidae and Hemiuridae) including a new genus *Karachitrema* gen. n. *Acta. Parasit. Pol.*, **21**: 327-334.
- Braun, M. 1899. Über *Clinostomum* Leidy. *Zool., Anz.* **22**: 489-493.
- Braun, M. 1899. Eine neue *Clinostomum*- art aus *Ardea purpurea*. *Boll. Mus. Zool. Ed Anat. Comp. Univ. Torino*, **14**: 1-3.
- Bray, R.A., Gibson, D & Jones, A. 2008. Keys to the Trematoda. Vol. (1-3). *Cabi. Inter. & Nat. Hist. Mus. London*.
- Chatterjee, P.N. 1956. On a new species of the genus *Psilostomum* Looss, 1899. *Ind. J. Helm.*, **8**(1): 96-99.
- Chauhan, B.S. 1945. Trematodes from Indian marine fishes. Part IV. On some trematodes of the family Hemiuridae Luhe, 1901, with descriptions of six new forms. *Proc. Ind. Acad. Sci.*, **21**: 160-173.
- Chen, H.T. 1949. Systematic consideration of some heterophyid trematodes in the subfamilies Haplorchiinae and Stellantchasmae. *Ann. Trop. Med. Par.*, **43** (3-4): 304-312.
- Dayal, J. 1938. On a new species of the genus *Astiotrema* Looss, 1901, from the intestine of a freshwater fish, *Clarias batrachus* from Lucknow. *Proc. Ind. Acad. Sc.*, **8** (1): 10-14.
- Dayal, J. 1950. Trematode parasites of Indian fishes, Part III. Two new trematode of family Allocreadiidae from fresh water fishes of India. *Ind. J. Helm.*, **2**(1): 6-8.
- Ejsmont, L. 1932. Note sur le genre *Isoparorchis*. *Ann. Par.*, **10**(5): 453-547.
- Fuhrmann, O. 1928. Trematoda. *Kükenthal's Handb. Zool.* 171 pp.
- Gupta, N.K. & Gupta, K. 1971. *Longicollum indicum* n. sp. an acanthocephalan parasite of a marine fish, *Tylosurus strongylurus* from Ernakulum. *Res. Bull. Punjab Univ. Sci.*, **21** (3/4): 507-510.
- Gupta, S.P. & Agrawal, V. 1967. A trematode, *Macrolecithus indicus* n. sp. from the intestine of a freshwater fish *Puntius sophore* (Ham.) from Lucknow, India. *Proc. Helm. Soc. Wash.* **34**(2): 156-158
- Gupta, S.P. 1958. Two new trematodes of the family Allocreadiidae from the freshwater fishes of U. P. *Ind. J. Helm.*, **8**(2): 100-106.
- Hafeezullah, M. 1984. On the status of some digenetic trematodes of marine fishes of India. *Bull. Zool. Surv. India.*, **6**: 209-218.
- Hafeezullah, M. & Dutta, I.B. 1999. Digenetic trematodes of Fishes. *Fauna of West Bengal*. (Part 11). *State Fauna Series*, **3**: 133-222.
- Kaw, B.L. 1944. Studies on the helminth parasites of Kashmir Pt. II. On two new trematodes of the subfamily Pleurogenetinae Looss, 1899, with a review of the genus *Pleurogenes*, Looss, 1896. *Proc. Indian Acad Sci. Sec. B.*, **18**(5): 97-108.
- Linton, E. 1928. Notes on trematode parasites of birds. *Proc. U. S. Nat. Mus.*, **73**: 1-36.
- Looss, A. 1896. Notizen zur Helminthologie Aegyptens. *Ctbl. Bakt.*, **21**(24-25): 913-916.
- Looss, A. 1898. Quelques observations a propos de la note: Forme nove etc. De entozoi d'Egitto de Mr. Le docteur Sonsino dans Ce Journal. 1896. *Eentralbl. Bakt.*, **23**(11): 453-461.
- Looss, A. 1900. Weitere Beitrage zur Kenntnis der Trematodenfauna Aegyptens, zugleich Versuch einer natülichen Gliederung des Genus *Distomum* Retzius. *Zool. Jahrb. Syst.*, **12**: 521-784.
- Looss, A. 1907 a. Beitrage zur Systematik der Distomen. Zur Kenntnis der Familie Hemiuridae. *Zool. Jahrb. Syst.*, **26** (1): 63-180.
- Looss, A. 1907 b. Zur Kenntniss der Distomen familie Hemiuridae. *Zool. Anz.* (19-20): 591.
- Lühe, M. 1901. Über Hemiuriden. *Zool. Anz.*, **24**: 394-403, 473-488.
- Lühe, M. 1906. Trematode parasites of marine fishes of Ceylon. *Ceyl. Pearl Oyster Fish Rep. Pt.*, **5**: 97-108.

- Madhavi, R. 1976. Digenetic trematodes from marine fishes of Waltair coasts, Bay of Bengal. Family Acanthocolpidae. *Riv. Parassit.*, **37** (2-3): 116-128.
- Madhavi, R. 1978. Life history of *Allocreadium fasciatusi* Kakaji, 1969 (Trematoda: Allocreadiidae) from the freshwater fish *Apocheilus melastigma* McClelland. *J. Helm.*, **52**: 51-59.
- Manter, H. W. 1926. Some North American fish trematodes. *Illin, Biol. Monogr.*, **10** (2): 127-264.
- Manter H. W. & Pritchard, M. H. 1960. Some hemiurid trematodes from Hawaiian fishes. *Proc. Helm. Soc. Wash.*, **27** (1): 87-102.
- Manter H. W. & Pritchard, M. H. 1960. Additional hemiurid trematodes from Hawaiian fishes. *Proc. Helm. Soc. Wash.*, **27**(2): 165-180.
- Monticelli, F. S. 1891. Osservazioni intorno ad alcune Forme del Gen. *Apoblema*, Dujard. *Atti. Acad. Sci. Torino*, vol. **26**, pp. 501.
- Nagaty, H.F. and Abdel-Aal, T.M. 1962. Trematodes of fishes from Red Sea. XIII. On three new hemiurid species. *J. Arab. Veter. Med. Ass.*, **22**(3): 225-230.
- Nagaty, H.F. and Abdel-Aal, T.M. 1962. Trematodes of fishes from Red Sea. XIV. On three new hemiurid species including a new genus. *J. Arab. Veter. Med. Ass.*, **22**(3): 231-237.
- Pande, B.P. 1937. Two new fish trematodes from Allahabad. *Proc. Nat. Acad. Sc. India*, **7**(2): 111-115.
- Rudolphi, C.A. 1819. Entozoorum synopsis cui accedunt mantissa duplex et indices locupletissimi. *Berol.*, 811 pp.
- Sarkar, H.L. 1954. On a new acanthocephalan, *Pallisentis colisai*, from the fish *Colisa fasciatus* with a note on *Acanthogyrus acanthogyrus* Thapar, from the fish *Labeo rohita*. *Rec. Ind. Mus.*, **52**(2/4): 349-362.
- Skrjabin, K.I. & Guschanskaja, L.H. 1954. Trematodes of Animals & Man. *Izdat. Acad. Nauk. SSSR. Moskv.*, **9**, pp. 656.
- Srivastava, H.D. 1935. New parasites of the genus *Orientophorus*, n.g. (Fellodistomidae) from an Indian freshwater fish, *Clupea ilisha*. *Parasit.*, **27** (3): 374-382.
- Srivastava, H.D. 1935. Studies on the family Heterophyidae Odhner, 1914. Part II. Four new parasites of the genus *Haplorchis* Looss, 1899 from Indian freshwater fishes with a review of the genus. *Proc. Acad. Sci. India.*, **5**(1): 75-85.
- Srivastava, H.D. 1935. New hemiurids from Indian freshwater fishes. II. A rare parasite of the subfamily Dinurinae from *Clupea ilisha*. *Z. Par.*, (1): 135-138.
- Srivastava, H.D. 1939. Two new trematodes of the genus *Aponurus* Looss, 1907 (subfamily: Lecithasterinae). *Ind. J. Vet. Sc. & Anim. Husb.*, **9**(1): 31-35.
- Srivastava, H.D. 1939. A new parasite- *Stomachicola secundus* of the subfamily Dinurinae Looss, 1907. *Ind. J. Vet. Sci. & Anim. Husb.* **9**(1): 77-79
- Srivastava, H.D. 1939. Three new parasites of the genus *Acanthocolpus* Lühe, 1906. (Family: Acanthocolpidae) *Ind. J. Vet. Sci.*, **9**(2): 213- 216.
- Srivastava, H.D. 1941. New Allocreadiids (Trematoda) from Indian marine food fishes. *Ind. J. Vet. Sci.*, **11**(1): 52-54.
- Srivastava, N.N. 1951. A new trematode, *Asymphylogora kedarai* n.sp. of the family Monorchidae Odhner, 1911. *Ind. J. Helm.*, **3**(1): 7-12.
- Stafford, J. 1904. Trematodes from Canadian fishes. *Zool. Anz.* **27**(19-17): 481-495; *Zool. Ctbl.*, **13**(1-2): 42-43.
- Stossich, M. 1883. Brani di elmintologia tergestine. *Boll. Soc. Adriat. Sc. Nat.*, **8**: 111-121.
- Stunkard, H.W. 1930. Further observation on the occurrence of anal openings in digenetic trematodes. *Z. Parasit.*, **3**: 713-725.
- Thapar, G.S. 1930. On *Farzandia*, a new genus of *Acanthocephalid* worms, from the intestine of *Ophiocephalus mauius*. *Ann. Mag. Nat. Hist. Ser.*, **10**(6): 76.
- Tripathy, Y.R. 1959. Studies on parasites of Indian fishes, 5, Acanthocephala. *Rec. Ind. Mus.*, **54** (1/2): 61-99.
- Verma, S.C. & Datta, M.N. 1929. Acanthocephala from Northern India. 1, A new genus *Acanthosentis* from a Calcutta fish. *Ann. Trop. Med. Parasit.*, **23**(4): 483-496.
- Yamaguti, S. 1934. Studies on helminth fauna of Japan. 2. Trematodes of Fishes. *Jap. J. Zool.*, **5**(3): 249-541.
- Yamaguti, S. 1958. Systema Helminthum Vol. 1. The digenetic trematodes of vertebrates. *Interscience.*, New York. 1575pp.
- Yamaguti, S. 1958. Studies on Helminth Fauna of Japan. Trematodes of fishes, XI. *Public. Seto. Marine Biol. Lab.*, **6**(3): 369-384.
- Zhukov, E. V. 1972. New General of Trematodes from marine Fishes of India. *Parazit*, **6**(4): 346-350.
- Zhukov, E. V. 1977. A study of Trematodes of Indian Marine Fishes. *Parazit. Sb. Len.*, **27**: 51-79.

PLATE 1



(a) *Aphanurus stossichi* (Monticelli, 1891) Looss, 1907



(b) *Aphanuroides lethrini* Nagaty & Abdel-Aal, 1962



(c) *Lecithocladium excisum* (Rudolphi, 1819) Luhe, 1901



(d) *Lecithocladium piscicola* (Srivastava, 1935) Pritchard, 1960

PLATE 2



(a) *Lecithocladium glandulum* Chauhan, 1945



(b) *Uterovesiculurus hamati* (Yamaguti, 1934) Skrjabin & Guschanskaja, 1954



(Anterior part)



(Posterior part)

(c-d). *Uterovesiculurus platycephali* (Yamaguti, 1934) Skrjabin & Guschanskaja, 1954

PLATE 3

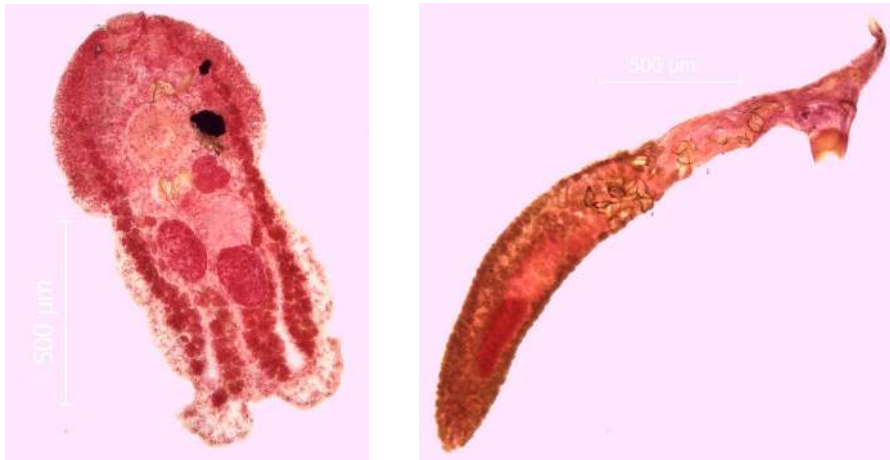


(a). (Anterior part)

(b). (Mid body)

(c). (Posterior part)

Allostomachicola secundus (Srivastava, 1939) Yamaguti, 1958



(d)

(e)

Lepocreadioides indicum Srivastava, 1941 *Acanthocolpus liodorus* Lühe, 1906

PLATE 4



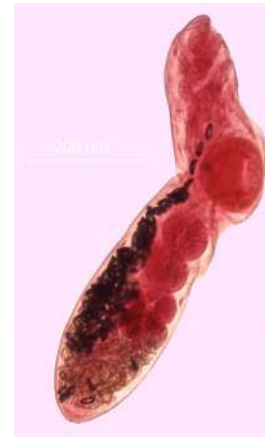
(a). *Asymphyrodora kedarai* Srivastava, 1951



(b). *Opegaster beliyai* Pandey, 1937



(c). *Neopodocotyle indica* Dayal, 1950



(d). *Aponurus breviformes* Srivastava, 1930

PLATE 5



(a). *Allocreadium chilikai* (Chatterjee, 1956) Madhavi, 1978



(b). *Allocreadium heteropneustusius* Agrawal, 1964

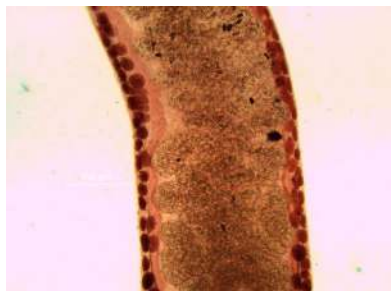


(c). *Allocreadium mehrai* Gupta, 1956

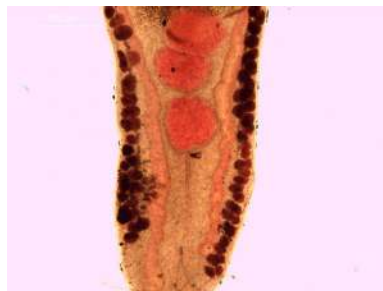
PLATE 6



(a). (Anterior part)

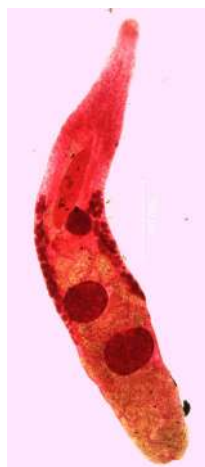


(b). (Mid body)

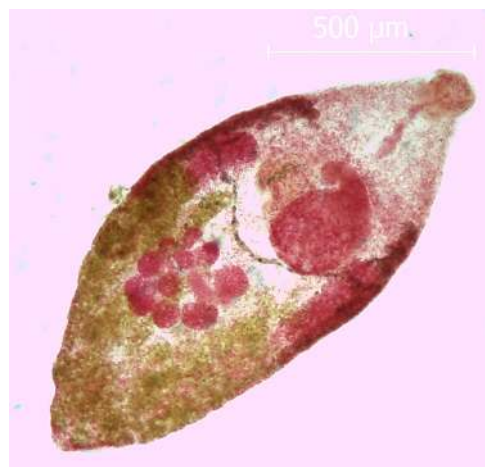


(c). (Posterior part)

Azygia angusticauda (Stafford, 1904) Manter, 1926



(d). *Astiotrema reniferum* (Looss, 1898) Looss, 1900



(e). *Faustula gangetica* (Srivastava, 1935) Yamaguti, 1958

PLATE 7



(a). *Haplorchoides attenuatum*
(Srivastava, 1935) Chen, 1949



(b). (Anterior part)



(c). (Posterior part)

Clinosomum complanatum (Rudolphi, 1814) Braun, 1899