

**REPORT ON A COLLECTION OF PARASITIC NEMATODES
FROM THE KAIMUR WILD LIFE SANCTUARY, ROHTAS
AND BHABUA DISTRICTS, BIHAR, INDIA, ALONGWITH
THE DESCRIPTIONS OF FIVE NEW SPECIES**

S. R. DEY SARKAR

Zoological Survey of India, M-Block, New Alipore, Calcutta 700 053, India

INTRODUCTION

A faunistic survey was under taken by Shri A. K. Poddar of this survey to the conservation areas of the Kaimur Wild Life Sanctuary (Rohtas and Bhabua districts), Bihar in November, 1997. The present author was also included in the party, in the course of which a small collection of nematode alongwith some other helminth parasites were recovered from the collected hosts. The other groups of helminth parasite are not dealt here. The collection though small, has produced a number of properly authenticated records of nematode parasites of vertebrate hosts from the Kaimur Wild Life Sanctuary, Bihar.

It includes 21 species contained in 20 genera belonging to 17 families and 4 orders. Sixteen among these are fairly well known and the remaining five species are new. Detailed description of the species excepting a few is avoided.

All measurements are in millimeters.

**LIST OF NEMATODES RECORDED FROM VERTIBRATE HOSTS OF KAIMUR
WILD LIFE SANSTUARY, BIHAR**

I. Order ENOPLIDA

Superfamily TRICHINELLOIDEA

1. Family TRICHURIDAE (Ransom, 1911) Railliet, 1915

Genus 1. *Trichuris* Roederer, 1761

1. *Trichuris globulosa* (V. Linstow, 1901) Ransom, 1911

Host : Goat.

II. Order ASCARIDIDA

Superfamily 1. COSMOCERCOIDEA

2. Family COSMOCERCIDAE (Railliet, 1916) Travassos, 1925

Subfamily COSMOCERCINAE Railliet, 1916

Genus 2. *Oxysomatium* Railliet & Henry, 19162. *Oxysomatium macintoshii* (Stewart, 1914) Karve, 1927*Host* : Toad (*Bufo melanostictus*).

Superfamily 2. HETERAKOIDEA

3. Family HETERAKIDAE Railliet & Henry, 1912

Subfamily HETERAKINAE Inglis, 1967

Genus 3. *Heterakis* Dujardin, 18453. *Heterakis spumosa* Schneider, 1866*Host* : *Rattus rattus*.

4. Family ASCARIDIIDAE Travassos, 1919

Genus 4. *Ascaridida* Dujardin, 18454. *Ascaridia galli* (Schrank, 1788) Freeborn, 1923*Host* : Fowl.

Superfamily 3. SUBULUROIDEA

5. Family SUBULURIDAE (Travassos, 1914) Yorke & Maplestone, 1926

Subfamily SUBULURINAE Travassos, 1914

Genus 5. *Subulura* Molin, 1860Subgenus *Subulura* Molin, 18605. *Subulura (Subulura) turdoideae* Soota & Dey Sarkar, 1981*Host* : Indian Rollar (*Coracias benghalensis*).6. *Subulura (Subulura)* sp.*Host* : Night Jar (*Caprimulgus* sp.).

Superfamily 4. SEURATOIDEA

6. Family SEURATIDAE (Hall, 1916) Railliet, 1916

Subfamily SEURATINAE Hall, 1916

Genus 6. *Seuratum* Hall, 19167. *Seuratum indicum* sp. n.*Host* : Greater Yellow Bat (*Scotophilus heathi heathi*).

7. Family QUIMPERIIDAE Baylis, 1930
 Subfamily QUIMPERIINAE Gendre, 1928
 Genus 7. *Paragendria* Baylis, 1939

8. *Paragendria* sp.

Host : *Wallago attu*.

- III. Order SPIRURIDA
 Superfamily 1. SPIRUROIDEA
 8. Family SPIROCERCIDAE (Chitwood & Wehr, 1932 subfam.)
 Chabaud, 1975
 Subfamily SPIROCERCINAE Chitwood & Wehr, 1932
 Genus 8. *Cylicospirura* Vevers, 1922
 Subgenus *Gastronodus* (Singh, 1934 gen.) Chabaud, 1975

9. *Cylicospirura (Gastornodus) stresseni* (Singh, 1934)

Host : House Shrew (*Suncus murinus caeruleus*).

- Superfamily 2. PHYSALOPTEROIDEA
 9. Family PHYSALOPTERIDAE (Railliet, 1893) Leiper, 1908
 Subfamily PHYSALOPTERINAE Railliet, 1893
 Genus 9. *Pseudophysloptera* Baylis, 1934

10. *Pseudophysloptera scotophili* sp. n.

Host : Greater Yellow Bat (*Scotophilus heathi heathi*).

- Superfamily 3. HABRONEMATODEA
 10. Family HABRONEMATIDAE (Chitwood & Wehr, 1932)
 Ivaschkin, 1961
 Subfamily (1) HABRONEMATINAE Chitwood & Wehr, 1932
 Genus 10. *Habronema* Diesing, 1861

11. *Habronema imbricatum* Maplestone, 1930

Host : Spotted Owlet (*Athene brama*).

- Subfamily (2) HISTOCEPHALINAE Gendre, 1922
 Genus 11. *Hadjelia* Seurat, 1916

12. *Hadjelia* sp.

Host : Indian Rollar (*Coracias bengalensis*).

Superfamily 4. THELAZIOIDEA

11. Family THELAZIIDAE Skrjabin, 1915

Subfamily THELAZIINAE (Skrjabin, 1915 fam.) Baylis &
Daubney, 1926Genus 12. *Thelazia* Bosc, 1819Subgenus *Thelaziella* Travassos, 191813. *Thelazia (Thelaziella) kaimurensis* sp. n.*Host* : Night Jar (*Caprimulgus* sp.).

Superfamily 5. ACUARIOIDEA

12. Family ACUARIIDAE Seurat, 1913

Subfamily ACUARIINAE Railliet, Henry & Sissoff, 1912

Genus 13. *Acuaria* Bremser, 181114. *Acuaria anthuris* (Rudolphi, 1819) Railliet, Henry & Sissoff, 1912*Host* : Tree Pie (*Dendrocitta vagabonda*).Genus 14. *Echinuria* Soloviev, 191215. *Echinuria* sp.*Host* : Brown Shrike (*Lanius cristatus*).

Superfamily 6. DRACUNCULOIDEA

13. Family MICROPLEURIDAE

(Baylis & Daubney, 1926 subfam.) Travassos, 1960

Genus 15. *Micropleura* Linstow, 190616. *Micropleura helicospicula* sp. n.*Host* : Marsh Crocodile (*Crocodylus palustris*).

Superfamily 7. DIPLOTRIAENOIDEA

14. Family DIPLOTRIAENIDAE

(Skrjabin, 1916 subfam.) Anderson, 1958

Subfamily DIPLOTRIAENINAE Skrjabin, 1916

Genus 16. *Diplotriaena* Railliet & Henry, 190917. *Diplotriaena tricuspis* (Fedchenko, 1874) Seurat, 1915*Host* : *Acridotheres tristis*.

Superfamily 8. APROCTOIDEA

15. Family APROCTOIDAE (Yorke & Maplestone, 1926)
Skrjabin & Schikhobalova, 1945

Subfamily APROCTINAE Yorke & Maplestone, 1926

Genus 17. *Pseudaprocta* Schikhobalova, 1930

18. *Pseuaprocta kaimurensis* sp. n.

Host : Indian Rollar (*Coracias benghalensis*).

IV. Order STRONGYLIDA

Superfamily STRONGYLOIDEA

16. Family CHABERTIIDAE (Popova, 1952 subfam.)
Lichtenfels, 1980

Subfamily OESOPHAGOSTOMINAE Railliet, 1916

Genus 18. *Oesophagostomum* Molin, 1861

Subgenus (1) *Oesophagostomum* Molin, 1861

19. *Oesophagostomum (O.) dentatum* (Rudophi, 1803) Molin, 1861

Host : Pig.

Subgenus (2). *Poteracrum* Railliet & Henry, 1913

20. *Oesophagostomum (P.) columbianum* (Curtice, 1890) Stossich, 1899

Host : Goat.

Superfamily 2. TRICHOSTRONGYLOIDEA

17. Family MOLINEIDAE (Skrjabin & Schulz, 1937 Subfam.)
Durette-Desset & Chabaud, 1977

Subfamily MOLINEINAE Skrjanbin & Schulz, 1937

Genus 19. *Oswaldocruzia* Travassos, 1917

21. *Oswaldocruzia goezei* Skrjabin & Schulz, 1952

Host : Toad (*Bufo melanostictus*).

SYSTEMATIC ACCOUNT

I. Order ENOPLIDA

Superfamily TRICHINELLOIDEA

1. Family TRICHURIDAE (Ransom, 1911) Railliet, 1915

Genus 1. *Trichuris* Roederer, 1761

Trichuris globulosa (V. Linstow, 1901) Ransom, 1911

Material : One male; host—domestic goat; location—intestine; locality—Adhaura, Bhabua district, Bihar; 13.xi.1997; coll. S. R. Dey Sarkar.

Remarks : This species is widely distributed in India as a common parasite of goat.

II. Order ASCARIDIDA

Superfamily (1) COSMOCERCOIDEA

2. Family COSMOCERCIDAE (Railliet, 1916) Travassos, 1925

Subfamily COSMOCERCINAE Railliet, 1916

Genus 2. *Oxysomatium* Railliet & Henry, 1916

Oxysomatium macintoshii (Stewart, 1914) Karve, 1927

Material : 2 males, 6 females; host—Toad (*Bufo melanostictus*); location—rectum; locality—Adhaura and Mundeswari Bhagwanpur, Bhabua district, Bihar; 20.xi.1997 and 23.xi.1997; coll. S. R. Dey Sarkar.

Remarks : This species is a common parasite of *Bufo*, *Rana*, *Hyla*, *Pelobates* etc. and widely distributed in India.

Superfamily (2) HETERAKOIDEA

3. Family HETERAKIDAE (Railliet & Henry, 1912)

Subfamily HETERAKINAE Inglis, 1967

Genus 3. *Heterakis* Dujardin, 1845

Heterakis spumosa Schneider, 1866

Material : 1 male, 2 females; host—*Rattus rattus*; location—rectum; locality—Adhaura, Bhabua district, Bihar; 16.xi.1997; coll. S. R. Dey Sarkar.

Remarks : This species has world-wide occurrence and has been reported from rats, mice and bandicoots, only excepting a stray record by Gupta (1960) from a cat which had probably just ingested a rodent infected by the parasite.

4. Family ASCARIDIIDAE Travassos, 1919

Genus 4. *Ascaridea* Dujardin, 1845

Ascaridia galli (Schrank, 1788) Freeborn, 1923

Material : One male, one female; host—domestic fowl; location—intestine; locality—Adhaura, Bhabua district, Bihar; 13.xi.1997; coll. S. R. Dey Sarkar.

Remarks : This species is widely distributed in India and abroad and has been reported from ducks, hens and rarely from cat.

Superfamily (3) SUBULUROIDEA

5. Family SUBULURIDAE (Travassos, 1914) Yorke and
Maplestone, 1926

Subfamily SUBULURINAE Travassos, 1914

Genus *Subulura* Molin, 1860

Subgenus *Subulura* Molin, 1860

Subulura (Subulura) turdoideae Soota and Dey Sarkar, 1981

Material : 2 males; Z.S.I. Reg. No. WN 814; host—Indian Rollar (*Coracias benghalensis*); location—caecum; locality—Adhaura, Bhabua district, Bihar; 13.xi.1997; coll. S. R. Dey Sarkar.

Description : Body slender, posterior end curved in the form of hook. Head small, buccal cavity minute, thick walled, three small teeth present at the base of the cavity. Cervical alae well developed, extending from the cephalic extremity to beyond the oesophageal bulb. Caudal alae narrow.

Male : Body 12.0–13.04 long, 0.26–0.29 wide; buccal capsule (0.032 × 0.024) in diameter; nerve ring 0.19–0.24 from the head end; oesophagus including bulb 1.17–1.20 long, bulb (0.176 × 0.144) in diameter; cervical alae broad, 1.84–1.92 long, 0.048 wide; sucker fan shaped, 0.43 from the cloaca; tail curved, ending in a long fine point, 0.32–0.34 long; spicules equal, similar, non-alate, pointed 0.80–0.83 long, gubernaculum 0.144 long, with a spur; caudal alae narrow; caudal papillae 9 pairs, 3 pairs preanal, one pair adanal and 5 pairs postanal in position, of the preanal papillae one pair in the sucker.

Female : Unknown.

Remarks : Soota and Dey Sarkar (1981) created *Subulura turdoideae* from the single male specimen obtained from *Turdoides striatus* from Monar, Patna district, Bihar. The present specimens agree in all the details with the earlier description of the species given by Soota and Dey Sarkar (1981) excepting the size of lateral cervical alae. The specimens, however, form a new host record.

2. *Subulura (Subulura) sp.*

Material : One female; Z.S.I. Reg. No. WN 815; host—Night Jar (*Caprimulgus sp.*); location—caeca; locality—Mundeswari Bhagwanpur, Bhabua district, Bihar; 24.xi.1997; coll. S. R. Dey Sarkar.

Description : Head small, without lips. Buccal cavity with three teeth at the base. Cervical alae narrow. Vulva Prominent, pre-equatorial in position.

Male : Absent.

Female : Body 26.6 long, 0.048 wide; buccal capsule (0.048 × 0.032) in diameter; nerve ring 0.4 from the head end; oesophagus including bulb 2.16 long; bulb (0.32 × 0.32) in diameter; narrow cervical alae extended upto 1.12 from the head; tail short, pointed, 0.32 long; valva at 3.8 from the anterior end, dividing the body length in ratio of 1 : 7; vagina short transverse, with ovijectors running anteriorly from it; eggs spherical (0.032 × 0.032) in diameter.

Remarks : In the absence of a male specimen, specific identification is not possible.

Superfamily (4) SEURATOIDEA

6. Family SEURATIDAE (Hall, 1916) Railliet, 1906

Subfamily SEURATINAE Hall, 1916

Genus 6. *Seuratum* Hall, 1916*Seuratum indicum* sp. n.

(Fig. 1. a, b, c and d)

Material : Holotype, one male, Z.S.I. Reg. No. WN 816; host—Greater Yellow Bat (*Scotophilus heathi heathi*); location—intestine; locality—Rohtas, Rohtas district, Bihar; 8.xi.1997; coll. S. R. Dey Sarkar.

Paratypes 2 mature females and 4 immature females; Z.S.I. Reg. No. WN 817; other particulars same as for the holotype.

Description : The worms are stout and coarse. The female is as much as 4.5 times longer than the male. Cuticle with longitudinal rows of spines. The body transversely striated; mouth with two lateral lips, each lip bearing a pair of large papillae. Buccal capsule short. Oesophagus short, undivided, slightly swollen at its anterior end, rest of the Oesophagus being club shaped. Tail conical in both sexes and terminating in cuticular spine. Caudal alae in male narrow.

Male : Body 4.8 long, 0.18 wide; nerve ring 0.16 from the head end; oesophagus 0.35 long, about 1/13-th of the entire body length; tail 0.11 long; caudal alae narrow; caudal papillae 11 pairs, 4 pairs preanal and 7 pairs postanal, of the postanal papillae one pair ventral in position; spiculs subequal 0.144 and 0.160 long, slightly curved; gubernaculum small, 0.032 long.

Female : Body 20.64–21.20 long, 0.32–0.37 wide; nerve ring 0.24–0.26 from the head; Oesophagus 1.30–1.44 long, about 1/15-th to 1/16-th of the entire length of the female body; tail 0.37–0.43 long, with a terminal spike; vulva prominent, 8.64–8.8 from the anterior end; uteri divergent, eggs thin shelled and subspherical.

The measurements given above are for the mature females only.

Remarks : The present species agrees with *Seuratum congolense* Sandground, 1937, an African species, in almost every respect excepting in the number and arrangement of caudal papillae, size of spicules and gubernaculum.

7. Family QUIMPERIIDAE Baylis, 1930

Subfamily QUIMPERIINAE Gendre, 1928

Genus 7. *Paragendria* Baylis, 1939*Paragendria* sp.

Material : One female; host—*Wallago attu*; location—intestine; locality—Rohtas, Rohtas district, Bihar; 8.xi.1997; coll. S. R. Dey Sarkar.

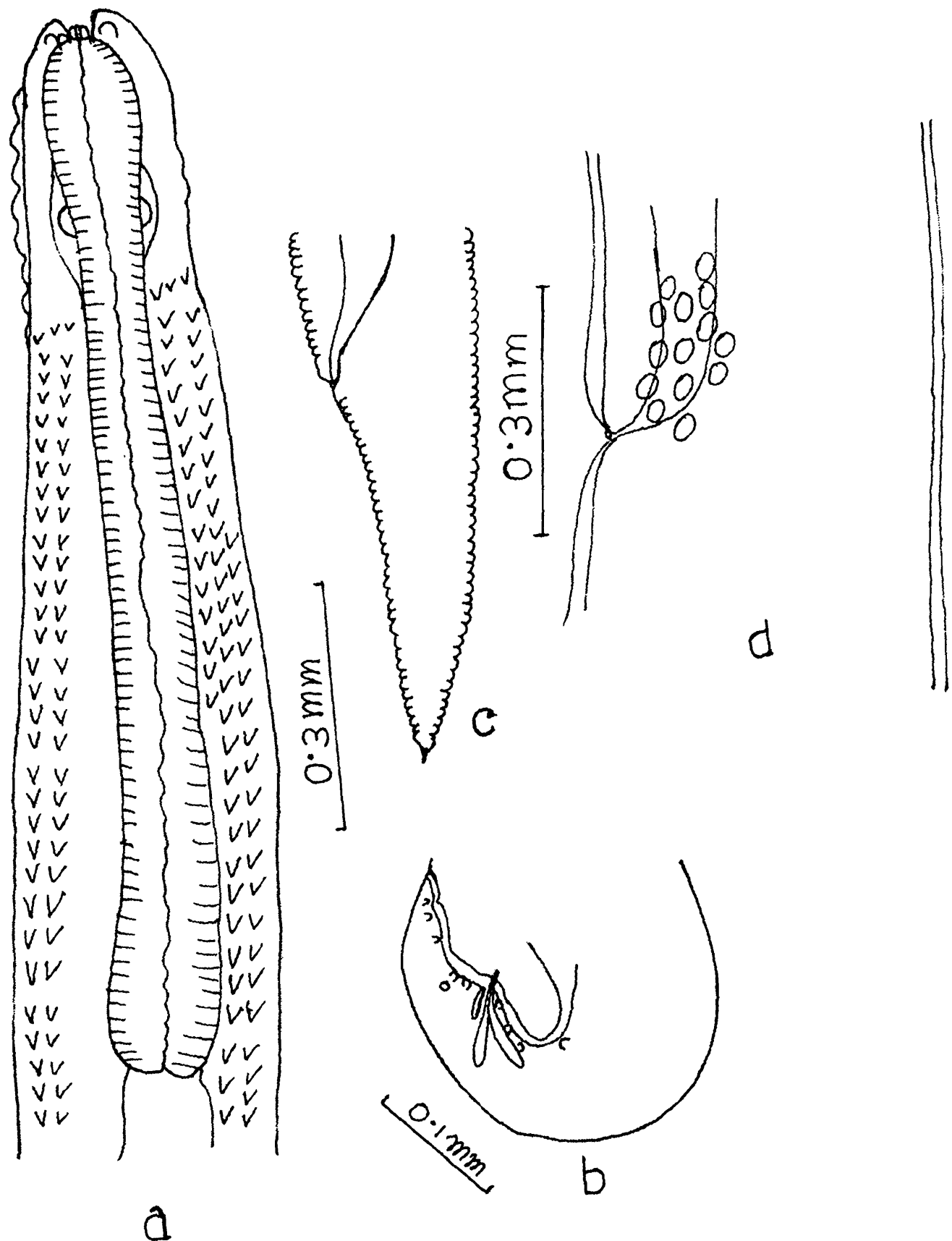


Fig. 1. *Seuratium indicum* sp. n. : (a) Anterior end of female. (b) Posterior end of male. (c) Posterior end of female. (d) Vulva of female.

Female : Body 10.2 long; cervical papillae 0.6 from the anterior end; tail tapering, 0.28 long; vulve postequatorial, 6.2 from the anterior end.

Remarks : In the absence of males specific identification is not possible.

III. Order SPIRURIDA

Superfamily 1. SPIRUROIDEA

8. Family SPIROCERCIDAE (Chitwood & Wehr, 1932 subfam.)
Chabaud, 1975

Subfamily SPIROCERCINAE Chitwood & Wehr, 1932

Genus 8. *Cylicospirura* Vevers, 1922

Subgenus *Gastronodus* (Singh, 1934 gen.) Chabaud, 1975

Cylicospirura (Gastronodus) stresseni (Singh, 1934)

Material : One male, one female; host—House shrew (*Suncus murinus caerulescens*); location—stomach nodule; locality—Adhaura, Bhabua district, Bihar; 16.xi.1997; coll. S. R. Dey Sarkar.

Description : Male body 25.6 long, 0.56 wide; tail spiral; caudal alae well developed; caudal papillae 10 pairs pedunculated, 6 pairs preanal, 4 pairs postanal and an unpaired median preanal papilla, in addition 2 pairs minute sessile papillae near the tip of the tail; spicules unequal, dissimilar, longer 2.56 and shorter 0.64 long; gubernaculum 0.064 long.

Female : Body 26.5 long; vulva in the oesophageal region, 0.8 away from the head; tail subterminal.

Remarks : The specimens show slight differences from the earlier description of the species by Singh (1934), which however, are considered here as intraspecific variations. Earlier, the species has been reported from Hyderabad (Andhra Pradesh) (Singh, 1934) and West Champaran, Bihar (Dey Sarkar, 1998).

Superfamily 2. PHYSALOPTEROIDEA

9. Family PHYSALOPTERIDAE (Railliet, 1893) Leiper, 1908

Subfamily PHYSALOPTERINAE Railliet, 1893

Genus 9. *Pseudophysaloptera* Baylis, 1934

Pseudophysaloptera scotophili sp. n.

(Fig. 2. a, b, c and d)

Material : Holotype, one male; Z.S.I. Reg. No. WN 818; host—Greater Yellow Bat (*Scotophilus heathi heathi*); location—stomach; locality—Rohtas, Rohtas district, Bihar; 8.xi.1997; coll. S. R. Dey Sarkar.

Paratypes 3 males and 7 females; Z.S.I. Reg. No. WN 819; other details as for the holotype.

Description : Body stout, cuticle thick, wrinkled here and there. A less distinct cephalic collarete present. Mouth with two lateral lips, each lip provided with three teeth in the inner margin.

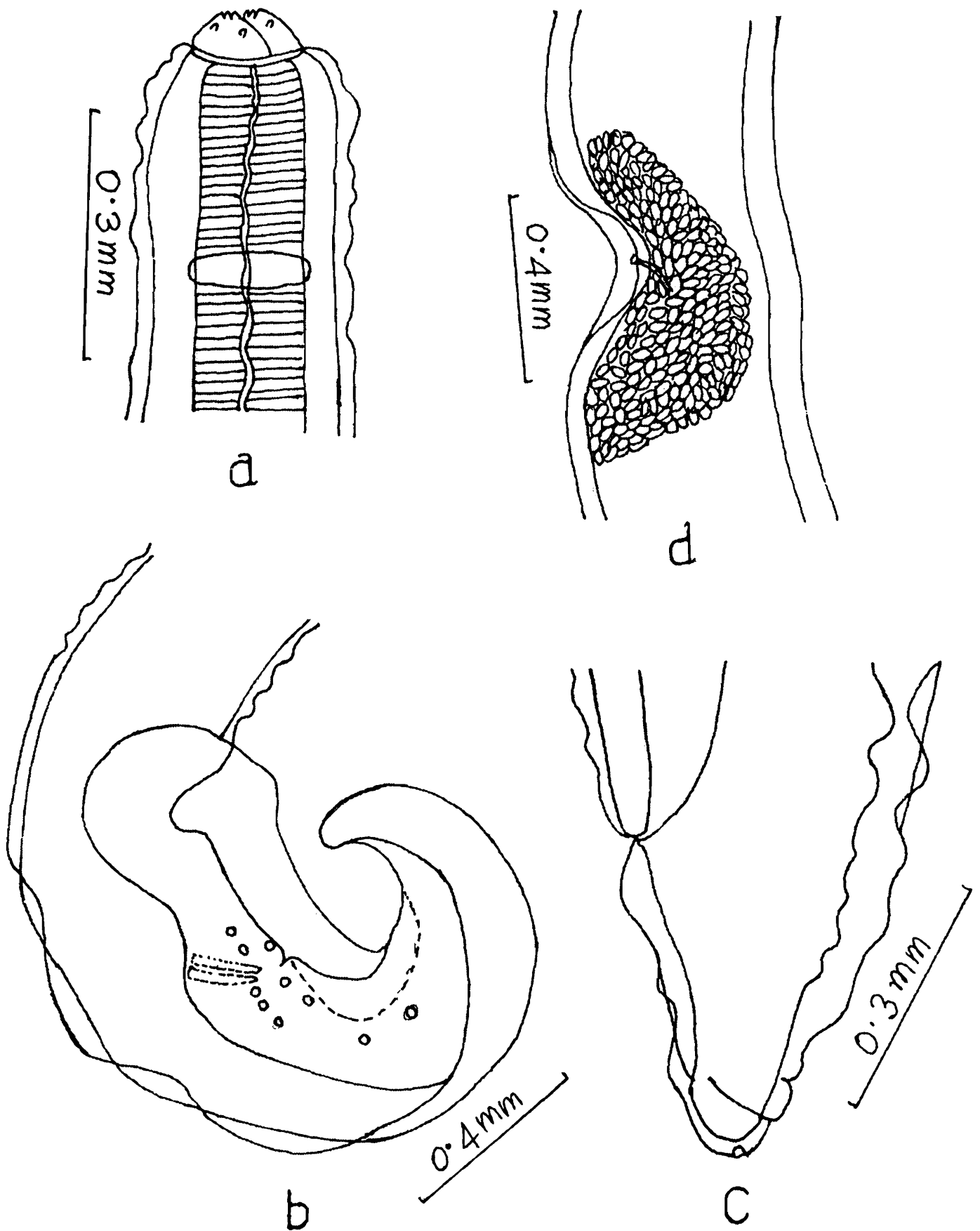


Fig. 2. *Pseudophysaloptera scotophili* sp. n. : (a) Anterior end of male. (b) Posterior end of male. (c) Posterior end of female. (d) Vulva of female.

Oesophagus indistinctly divided into two parts, anterior muscular and posterior glandular. Male tail coiled towards ventral side. Caudal alae wide, large, united together in front of the cloaca. Caudal papillae minute, sessile. Gubernaculum absent. Female body characteristically constricted venterolaterally where the vulva is located. Tail bluntly conical.

Male : Body 10.4–11.6 long, 0.4–0.48 wide; nerve ring 0.29–0.32 from the anterior end; oesophagus divided into two parts, anterior muscular and posterior glandular, entire oesophagus 2.96–3.44 long; tail ventrally bent 0.64–0.72 long, tip rounded; caudal alae well developed, caudal papillae minute, sessile, two pairs and a median preanal and four pairs postanal papillae clearly discernible; near the cloaca, a paired structure, somewhat resembling spicules present.

Female : Body 18.72–19.12 long, 0.72 wide; nerve ring 0.48–0.51 from the anterior end; oesophagus as in male, 3.76–4.08 long; tail conical, 0.35–0.40 long, tip blunt; with a knob like structure; vulve prequatorial, 8.0–9.2 from the anterior end; eggs small.

Remarks : Baylis (1934) established the genus *Pseudophysaloptera* with *P. sorisina* as its type species. Since then only two valid species viz. *P. formosana* (Yokogawa, 1922) Lincicome, 1948 and *P. riukiwana* Lincicome and McConnaughey, 1948, have been added under it from Insectivora : Soricidae.

The present specimens do not agree with any member of the genus *Pseudophysaloptera* in various body measurements and in the number and arrangement of caudal papillae. Therefore, it is regarded as a new species and incidentally *Scotophilus heathi heathi*, an aggressive Insectivorous bat (Chiroptera) forms the new host record.

Superfamily 3. HABRONEMATOIDEA

10. Family HABRONEMATIDAE (Chitwood & Wehr, 1932)
Ivaschkin, 1961

Subfamily (1) HABRONEMATINAE Chitwood & Wehr, 1932

Genus 10. *Habronema* Diesing, 1861

Habronema imbricatum Maplestone, 1930

Material : One male; host–Spotted Owlet (*Athene brama*); location–under horny layer of gizzard; locality–Adhaura, Bhabua district, Bihar; 13.xi.1997; coll. S. R. Dey Sarkar.

Remarks : Widely distributed in India.

Subfamily (2) HISTOCEPHALINAE Gendre, 1922

Genus 11. *Hadjelia* Seurat, 1916

Hadjelia sp.

Material : 2 immature females; host–Indian Rollar (*Coracias benghalensis*); location–under horny layer of gizzard; locality–Adhaura, Bhabua district, Bihar; 13.xi.1997; coll. S. R. Dey Sarkar.

Remarks : In the absence of a male specimen, specific identification is not possible.

Superfamily 4. THELAZIOIDEA

11. Family THELAZIIDAE Skrjabin, 1915

Subfamily THELAZIINAE (Skrjabin, 1915 fam.) Baylis and Daubney, 1926

Genus 12. *Thelazia* Bosc, 1819

Subgenus *Thelaziella* Travassos, 1918

Thelazia (Thelaziella) kaimurensis sp. n.

(Fig. 3. a, b and c)

Material : One female; Z.S.I. Reg. No. WN 820; host–Night Jar (*Caprimulgus* sp.); location–under nictitating membrane; locality–Mundeswari Bhagwanpur, Bhabua district, Bihar; 24.xi.1997; coll. S. R. Dey Sarkar.

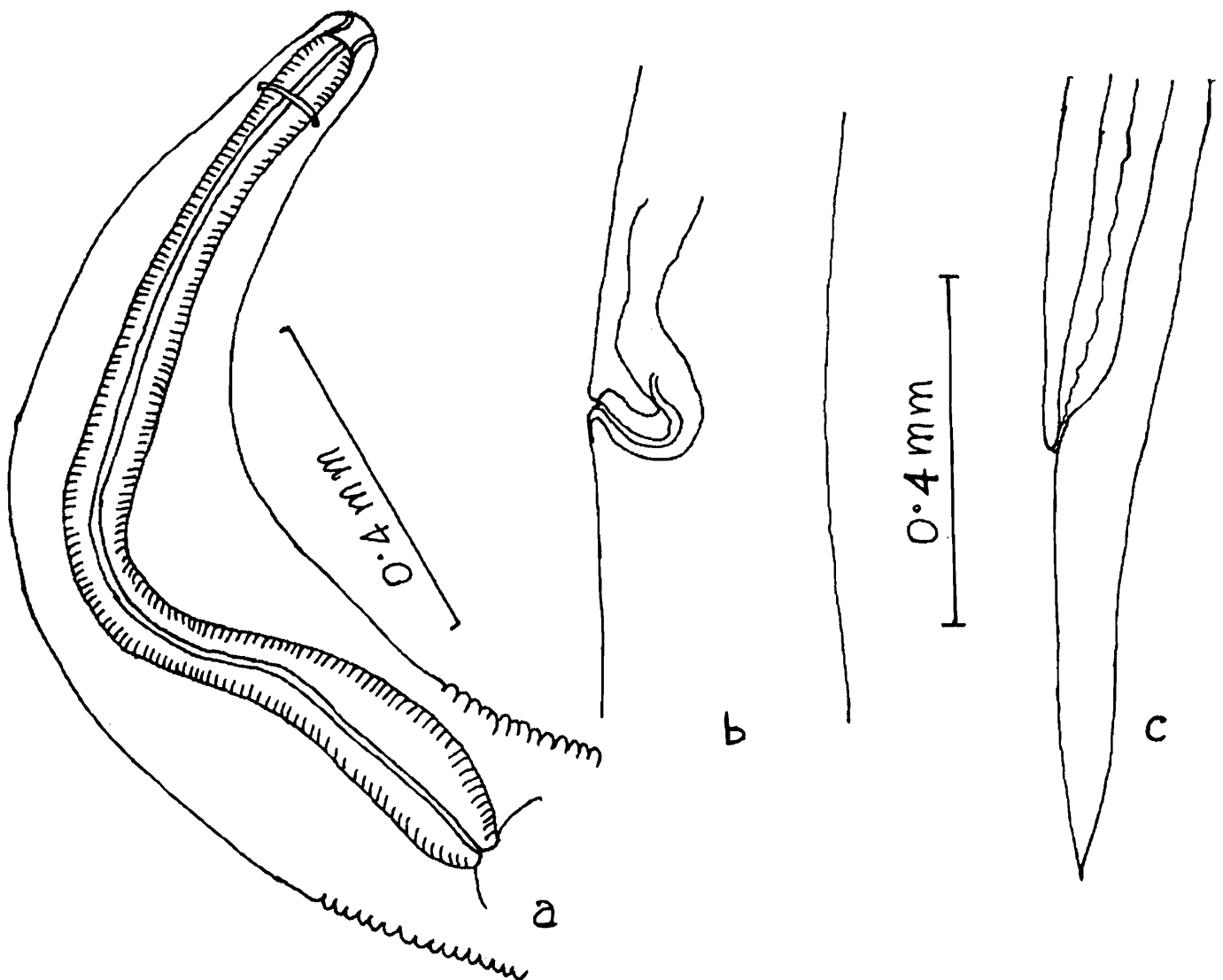


Fig. 3. *Thelazia (Thelaziella) kaimurensis* sp. n. : (a) Anterior end of female. (b) Vulva of female. (c) Posterior end of female.

Description : (Based on a single female) Mouth without lips, buccal capsule short with thin chitinized walls. Cervical alae absent. Body transversely striated, striations less prominent in the oesophageal region. Oesophagus undivided, cylindrical. Valva prominent, preequatorial in position. Ovijector short. Tail straight, relatively long, pointed.

Female : Body 8.2 long, 0.27 wide; buccal capsule 0.032 deep; nerve ring 0.19 from the head; oesophagus 1.2 long; vulva 3.7 away from the head, vagina anteriorly directed; tail straight, pointed, 0.48 long; eggs not found.

Remarks : The present parasite belongs to the genus *Thelazia* (*Thelaziella*) Travassos, 1918. It does not agree with any other species so far described under the genus *Thelazia* (*Thelaziella*) in the position of vulva and nature of the tail. Therefore, without a male specimen, the present author with the greatest hesitation treats his single female specimen as a new species.

Superfamily 5. ACUARIOIDEA

12. Family ACUARIIDAE Seurat, 1913

Subfamily ACUARIINAE Railliet, Henry & Sissoff, 1912

Genus 13. *Acuaria* Bremser, 1811

Acuaria anthuris (Rudolphi, 1819) Railliet, Henry & Sissoff, 1912

Material : One male, one female; Z.S.I. Reg. No. WN 821; host—Tree Pie (*Dendrocitta vagabonda*); location—under horny layer of gizzard; locality—Adhaura, Bhabua district, Bihar; 20.xi.1997; coll. S. R. Dey Sarkar.

Description : Body slender. Mouth with two simple lateral lips. Four cordons which are long, non-recurrent or anastomosing, originate from the margin of the mouth and extend posteriorly about 0.8 in male and 1.44 in female.

Male : Body 7.12 long, 0.144 wide, nerve ring 0.192 from the head; pharynx 0.016 long; cervical papilla at 0.27 from the anterior end; oesophagus divided into two parts, anterior glandular and posterior muscular, entire oesophagus 2.11 long; tail spirally coiled, caudal alae about 0.51 long and relatively broad; tail 0.27 long; caudal papillae 11 pairs, 4 pairs preanal and 7 pairs postanal in position; spicules subequal, similar, short and stout, 0.21 and 0.24 long.

Female : Body 17.28 long, 0.016 wide; nerve ring 0.27 from the head; pharynx 0.224 long; cervical papilla at 0.35 from anterior end; oesophagus as in male, 2.51 long; tail 0.21 long, tip rounded, tail papillae not observed; vulva at 7.57 from posterior end; eggs (0.016 × 0.112) in diameter.

Remarks : The present specimens show slight differences from the earlier descriptions of the species which, however, are considered here as intraspecific variations. Its occurrence in Tree Pie (*Dendrocitta vagabounda*) from Adhaura, Bihar, forms the first host and locality records.

Genus 14. *Echinuria* Soloviev, 1912

Echinuria sp.

Material : One female; host–Brown Shrike (*Lanius cristatus*); location–under horny layer of gizzard; locality–Adhaura, Bhabua district, Bihar; 14.xi.1997; coll. S. R. Dey Sarkar.

Remarks : In the absence of males specific identification is not possible.

Superfamily 6. DRACUNCULOIDEA

13. Family MICROPLEURIDAE (Baylis & Daubney, 1926 subfam.)
Travassos, 1960

Genus 15. *Micropleura* Linstow, 1906

Micropleura helicospicula sp. n.

(Fig. 4. a and b)

Material : Holotype one male, Z.S.I. Reg. No. WN 822; host–a juvenile Marsh Crocodile (*Crocodylus palustis*); location–intestine; locality–Mundeswari Bhagwanpur, Bhabua district, Bihar; 24.xi.1997; coll. S. R. Dey Sarkar.

Paratype one male, Z.S.I. Reg. No. WN 823; other particulars same as for the holotype.

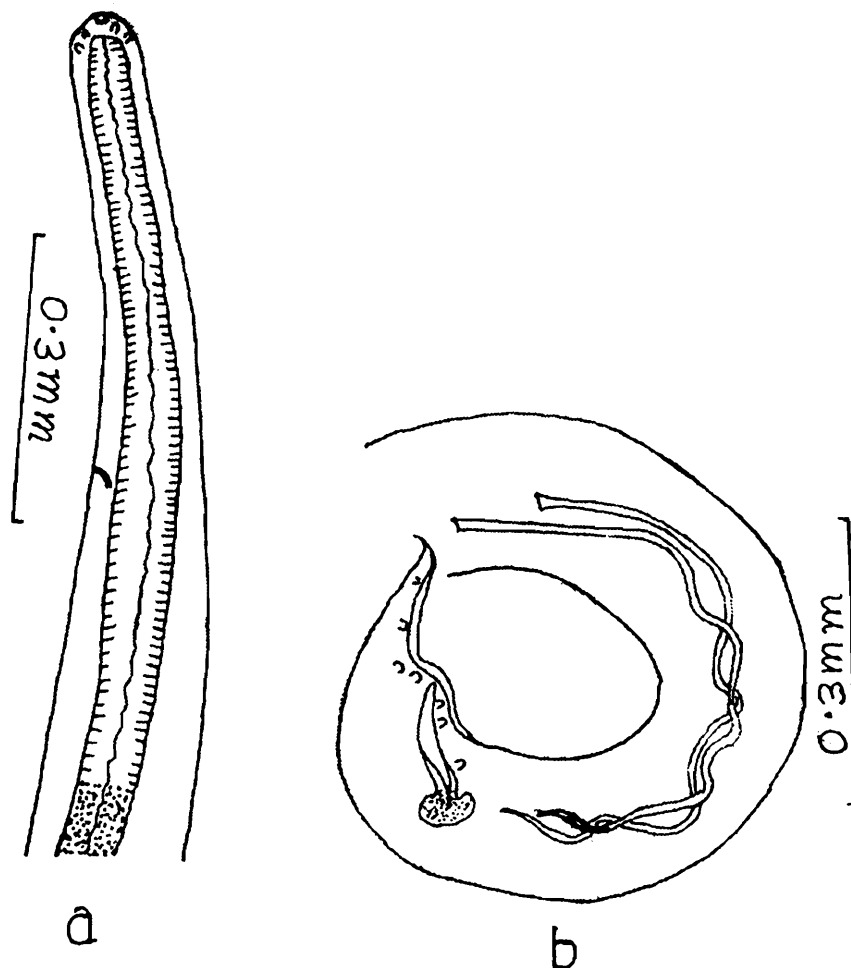


Fig. 4. *Micropleura helicospicula* sp. n. : (a) Anterior end of male. (b) Posterior end of male.

Description : Body filiform, cuticle smooth. Anterior end tapering. Two lateral and four submedian head papillae present. Oral opening minute. Oesophagus clearly divided into two parts of same width.

Female : Absent.

Male : Body 7.04–9.84 long, 0.13–0.19 wide; oesophagus clearly divided into anterior muscular and posterior glandular portion, muscular oesophagus 0.8–1.12 and glandular portion 1.12–1.28 long, entire oesophagus 2.08–2.24 long; nerve ring not clear; excretory pore 0.48 from the head; caudal end spirally coiled; tail tapering, ending in a sharp point, measuring 0.14–0.16 long; caudal alae narrow, present on both sides; caudal papillae 7 pairs, 3 pre-anal and 4 postanal in position; spicules similar, equal, very slender, twisted throughout their distal halves and ending in fine points, 0.74–0.80 long; gubernaculum well chitinized, measuring 0.128–0.144 long.

Remarks : The present species comes closer to *Micropleura vivipara* V. Linstow, 1906 in body length and in number and arrangement of caudal papillae, but differ from it in having longer spicules, which are helical throughout their distal halves, longer gubernaculum and also in possessing caudal alae on both sides which is single in *M. vivipara*.

Superfamily 7. DIPLOTRIAENOIDEA

14. Family DIPLOTRIAENIDAE (Skrjabin, 1916 subfam.)
Anderson, 1958

Subfamily DIPLOTRIAENINAE Skrjabin, 1916

Genus 16. *Diplotriaena* Railliet & Henry, 1909

Diplotriaena tricuspis (Fedchenko, 1874) Seurat, 1915

Material : 2 females; host—*Acridotheres tristis*; location—body cavity; locality—Adhaura, Bhabua district, Bihar; 20.xi.1997; coll. S. R. Dey Sarkar.

Remarks : This species has already been dealt with in detail by Baylis, (1939) and several other workers; hence detailed description is avoided. Widely distributed in India.

Superfamily 8. APROCTOIDEA

15. Family APROCTOIDAE (Yorke & Maplestone, 1926)
Skrjabin & Schikhobalova, 1945

Subfamily APROCTINAE Yorke & Maplestone, 1926

Genus 17. *Pseudaprocta* Schikhobalova, 1930

Pseudaprocta kaimurensis sp. n.

(Fig. 5. a, b and c)

Material : Holotype, one male, Z.S.I. Reg. No. WN 824; host—Indian Rollar (*Coracias benghalensis*); location—Body cavity; locality—Adhaura, Bhabua district, Bihar; 13.xi.1997; coll. S. R. Dey Sarkar.

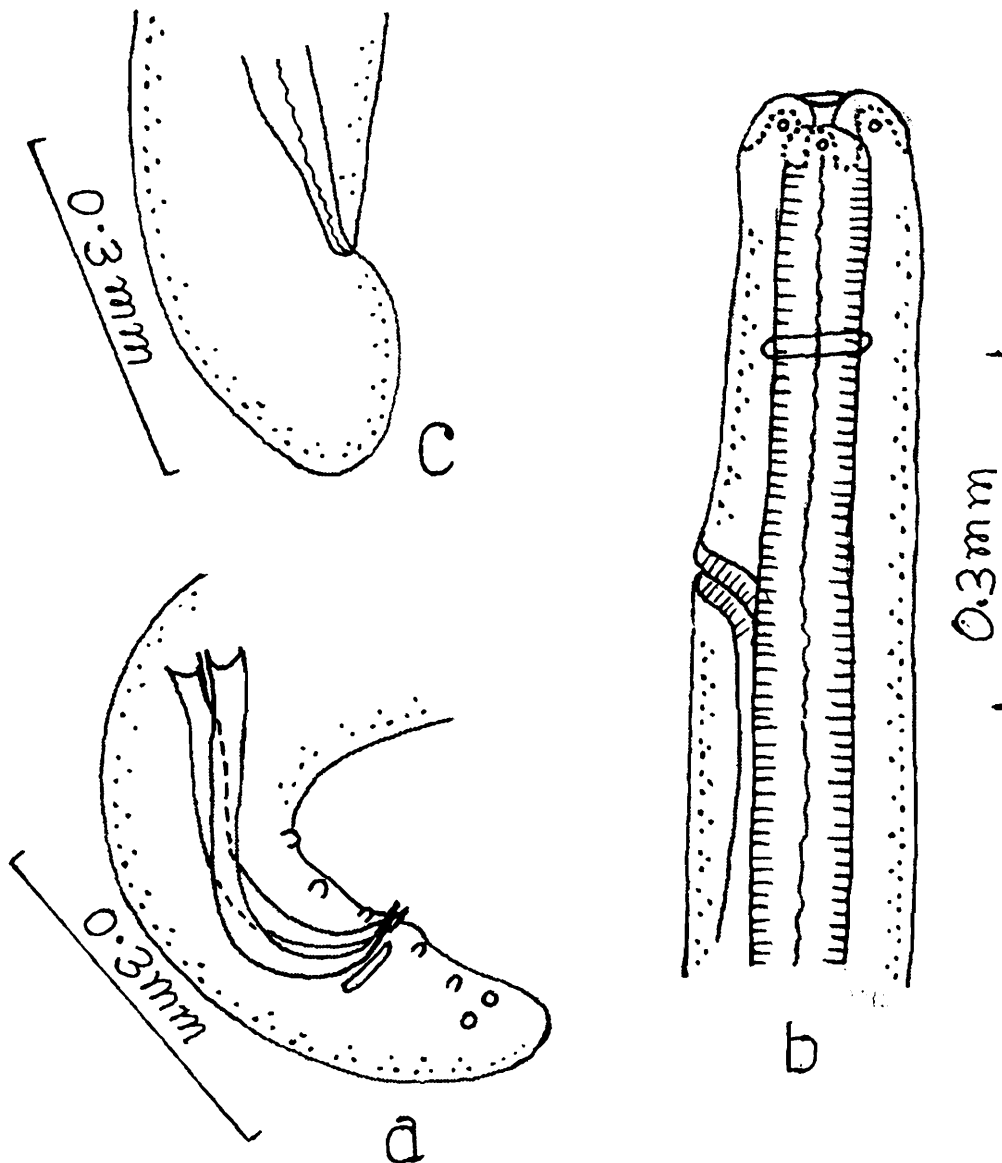


Fig. 5. *Pseudaprocta kaimurensis* sp. n. : (a) Posterior end of male. (b) Anterior end of female, showing vulva. (c) Posterior end of female.

Paratype, one female, Z.S.I. Reg. No. WN 825; other particulars same as for the holotype.

Description : Body stout, slightly tapering towards extremities. Head round, with delicate lobed cordons between cephalic papillae. Buccal cavity minute. Cuticle smooth, without bosses in both sexes. Oesophagus short and undivided. Spicules of male similar and subequal, gubernaculum present.

Male : Body 14.4 long, 0.4 wide; nerve ring 0.144 from the anterior end; oesophagus undivided, 0.56 long; tail spirally rolled, 0.144 long, with rounded tip; spicules similar, subequal, stout, curved in the form of a hook, measuring 0.30 and 0.32 in length; gubernaculum 0.056 long; caudal alae absent; caudal papillae 7 pairs, 3 pairs preanal and 4 pairs postanal in position.

Female : Body 28.08 long, 0.51 wide; nerve ring 0.24 from the head; oesophagus as in male, 0.64 long, vulva prominent, at 0.4 from the head; tail tip rounded, without any papilla near the tip, 0.18 long; eggs (0.016 × 0.032) in diameter.

Remarks : The present species comes closer to *Pseudaprocta gubernacularia* Schikhobalova, 1930, in the presence of subequal spicules and gubernaculum in the male. But differs from it in relative body measurements, size of spiculae, number and arrangement of caudal papillae and in the absence of subterminal tail papilla in the female.

Therefore, the present species is regarded as different from all known forms under the genus *Pseudaprocta* Schikhobalova, 1930 and is named *Pseudaprocta kaimurensis* sp. n.

IV. Order STRONGYLIDA

Superfamily STRONGYLOIDEA

16. Family CHABERTIIDAE (Popova, 1952 subfam.)
Lichtenfels, 1980

Subfamily OESOPHAGOSTOMINAE Railliet, 1916

Genus 18. *Oesophagostomum* Molin, 1861

Subgenus (1) *Oesophagostomum* Molin, 1861

Oesophagostomum (Oesophagostomum) dentatum (Rudolphi, 1803) Molin, 1861

Material : 2 males, 2 females; host—domestic pig; location—intestine; locality—Adhaura, Bhabua district, Bihar; 15.xi.1997; coll. S. R. Dey Sarkar.

Remarks : Widely distributed in India. Cosmopolitan.

Subgenus (2) *Proteracrum* Railliet & Henry, 1913

Oesophagostomum (Proteracrum) columbianum (Curtice, 1890) Stossich, 1899

Material : One male; host—domestic goat; location—intestine; locality—Adhaura, Bhabua district, Bihar; 16.xi.1997; coll. S. R. Dey Sarkar.

Remarks : Widely distributed in India. Cosmopolitan.

Superfamily 2 TRICHOSTRONGYLOIDEA

17. Family MOLINEIDAE (Skrjabin & Schulz, 1937 subfam.)
Durette-Desset and Chabaud, 1977

Subfamily MOLINEINAE Skrjabin and Schulz, 1937

Genus 19. *Oswaldocruzia* Travassos, 1917

Oswaldocruzia goezei Skrjabin & Schulz, 1952

Material : One male, 3 females; host—Toad (*Bufo melanostictus*); location—intestine; locality—Mundeswari Bhagwanpur, Bhabua district, Bihar; 23.xi.1997; coll. S. R. Dey Sarkar.

Remarks : Widely distributed in India, Asia and Europe.

SUMMARY

This report deals with the parasitic nematodes collected from vertebrate hosts in the Kaimur Wild Life Sanctuaru (Rohtas and Bhabua districts), Bihar. It includes 21 species belonging to 19 genera and 17 families of which 5 species are new to science and the remaining 16 species are fairly well known.

ACKNOWLEDGEMENTS

The author is thankful to the Director, Zoological Survey of India, Kolkata, for giving Laboratory facilities during this work. The author is also thankful to Shri A. K. Poddar and Shri T. P. Bhattacharyya, Assistant Zoologist, of this Survey for taking pains in collecting the hosts. Finally, I wish to acknowledge Dr. Amalendu Chatterjee, Scientist-D, Officer in Charge and other members of the Nematelminthes Section, Zoological Survey of India, for their co-operation and help.

REFERENCES

- Baylis, H. A. 1934. On a collection of Cestodes and Nematodes from small mammals in Tanganyika Territory. *Ann. Mag. nat. Hist.* (10), **13** : 539-554.
- Baylis, H. A. 1936. Nematoda. I (Ascaroidea and Strongyloidea). *Fauna of British India including Ceylon and Burma*. Taylor and Francis, London : 408 pp.
- Baylis, H. A. 1939. Nematoda. II (Filarioidea, Dictophymoidea and Trichinelloidea). *Fauna of British India including Ceylon and Burma*. Taylor and Francis, London : 274 pp.
- Baylis, H. A. 1944. Notes on some parasitic nematodes. *Ann. Mag. nat. Hist.* (11), **11** : 793-804.
- Cram, E. B. 1927. Bird parasites of the nematode Suborder Strongylata, Ascaridata and Spirurata. *Bull. U.S. nat. Mus.* (140) : 465 pp.
- Dey Sarkar, S. R. 1998. Fauna of Valmiki Tiger Reserve. Parasitic Nematodes. Fauna of Conservation Areas. No. **10**. *zool. Surv. India* : 79-84.
- Hall, M. C. 1916. Nematode parasites of mammals of the orders Rodentia, Lagomorpha and Hyracoidea. *Proc. U.S. nat. Mus.*, Washigton. **50** : 258 pp.
- Lincicome, D. R. 1948. A note on the nematode genus *Pseudophysaloptera*. *J. Parasit.*, **43**(5) : 452 p.
- Lincicome, D. R. and McConnaughey, B. H. 1948. A new nematode of the genus *Pseudophysaloptera* from an Okinawan Shrew. *Pacific Science*, **2**(4) : 239-242.
- Sandground, J. H. 1937. Three new parasitic nematodes from Belgian Congo. *Rev. zool. e Bot. Afric.* **29**(3) : 230-236.

- Shikhobalova, N. P. 1930. Sur une nouvelle filaire d'oiseaux *Pseudaprocta qubernacularia* n.g., n. sp. *Annls Parasit. him comp.*, **8**(6) : 624-627.
- Skrjabin, K. I., Shikhobalova, N. P. and Schulz, R. S. 1954. Essential of Nematology. III. Trichostrongylids of Animals and Man. *Academy of Sciences of the USSR*, Moscow.
- Soota, T. D. and Dey Sarkar, S. R. 1981. On some nematodes parasitic in vertebrate hosts from Bihar, India. *Rec. zool. Surv. India*, **78** : 121-127.
- Yamaguti, S. 1961. *Systema Helminthum*. III. The nematodes of vertebrates Pt. I & II : 1261 pp. Interscience Publishers Inc. New York.