

EUDORYLAIMUS ANDERSONI AND APORCELAIMELLUS SACCHARI N. SP. FROM PAKISTAN

HANIF AHMAD KHAN

PCSIR Laboratories Complex, Karachi-39

(Received June 13, 1989, revised October 19, 1989)

Eudorylaimus andersoni N. sp., *Aporcelaimellus sacchari* N. sp. are described and illustrated. *Eudorylaimus magestri* Andrassy [19] and *Aporcelaimellus taylora* Yeates [12] are reported for the first time from Pakistan. *Eudorylaimus andersoni* N. sp. differs from *E. silvaticus* (Brezeski [13]) in length of odontostyle and shape of the tail. *Eudorylaimus andersoni* N. sp. is variable from *E. diadenatus* (Thorne and Swanger [10]) Andrassy [2] in body length, shape and length of the tail, and differs from *E. cinctus* (Thorne and Swanger [10]) Andrassy [11] in shape of the lip region and amphids. *Eudorylaimus andersoni* is variable from *E. sabulophilus* Tjekema *et. al.* [14] in length of the odontostyle, shape of the amphids, and vulva percentage. *Aporcelaimellus sacchari* N. sp. differs from *A. capitatus*, (Thorne and Swanger [10]) Heyns [9] in the length of odontostyle, shape of the amphid and lateral chords. *Aporcelaimellus sacchari* N. sp. is also variable from *A. williamsi*, Heyns [9] in the shape of the tail and length of odontostyle. *Aporcelaimellus sacchari* N. sp. also differs from *A. krygeri* (Ditelvesen,) Heyns [9] in the location of the vulva and 'a' ratio.

Key words: *Eudorylaimus* N. sp and *Aporcelaimellus* N. sp.

Introduction

Early reports of work on free living nematodes in Pakistan are Akhtar [21] especially on *Dorylaimus*. Dujardin [4] proposed genus *Dorylaimus*. Andrassy [11] splitted the genus *Dorylaimus* and proposed a separate genus, *Eudorylaimus* for those species having short conoid or rounded tails in both sexes. The number of either species described as *Eudorylaimus* or transferred from other genera increased 238 till present day and *Eudorylaimus* became largest genera of free dwelling nematodes. The largest number of the species made the orientation with the genus almost very difficult to recognize the species. Akhtar [2] reported *Dorylaimus bastiani* Butschli [1] *D. granuleferus* Cobb [2] *D. biroi* Daday [3] *D. stagnalis* and *D. subsimilis* Dujardin [4] from Pakistan. *Dorylaimus bastiani* (Butschli [1]) was shifted into the genus *Mesodorylaimus* Andrassy, 1959, as *M. bastiani* Andrassy. *D. biroi* (Daday [3]) to *Mesodorylaimus* as *M. biroi*, (Daday [3]).

D. subsimilis Cobb [2] to genus *Aporcelaimellus* Heyns [4] as *Aporcelaimellus subsimilis* Andrassy [19] *Dorylaimus stagnalis* to *Mesodorylaimus stagnalis* (Dujardin [4]) Andrassy, [11] Siddiqi [20] shifted to genus *Laimydorus* (Dujardin [4]) Andrassy, [11] as *Laimydorus stagnalis* and later to *Prodorylaimus paragilis* (Andrassy [19]) Khan and Fatima [18]) reported *Aporcelaimellus goldeni* and *Aporcelaimellus obscurus* (Thorne and Swanger [10]) Heyns, [9] Khan and Saeed [5] reported *Eudorylaimus subjunctus* and *Eudorylaimus varians*. The present work adds two new species and two new records from Pakistan.

Material and Methods

Soil samples were mixed with water and the solution passed through fine sieves. The filtrate was collected into beakers and processed through improved Baermann's method. After 24 hrs. filtrate containing nematodes was collected into small beakers. Nematodes were relaxed by heat, fixed in 4% formalin and left in dilute glycerine. After evaporation of water, the nematodes were mounted in anhydrous glycerine with the help of a drawing tubes.

Eudorylaimus andersoni N. sp. Holotype female: L=1.1mm; a=27; b=4.3; c=25.6; c¹=1.6; V= 39.2; G¹ = 14.2; G² = 13.1; Odontostyle= 13.2 μm; Odontophore = 21 μm; tail length = 38 μm.

Paratype females: (n=5. L=0.61 - 1.1 mm; (mean 0.85 ± standard deviation 0.34; a=(23-24.7)(25±33); b=3.3-4.4 (3.7 ± 0.56); c= 1.5-1.6 (1.45 ± 0.70); V=35.5 - 52 (43.5±9.8); G¹=13.6 ± 0.70; G² = 12.16 (14 ±2.8); Odontostyle = 10.4-12.9 μm (11.6 ± 1.7); Odontophore = 21-22 μm (21.4 ± 70); tail length = 47.2 - 49.4 μm ((48.3±1.5)

Description

Paratype females: Body greatly curved ventrally, particularly in the posterior third, when relaxed by gentle heat; body cylindrical, tapering anteriorly to oesophageal base; cuticle thick near the head region and in the middle of tail; sub-cuticle contains fine striations. Numerous dorsal pores present on the body, but inconspicuous in the neck

* Name of the species is given in the honour of Dr. R. V. Anderson, Biosystematic Research Centre, Canada in the recognition of his pioneer work on free living nematodes.

region. Lips prominent, truncate with conspicuous small labial papillae. Amphid stirrup shaped, $8.9 \mu\text{m}$ in breadth. Odontostyle $11.6 \mu\text{m}$ long with the aperture occupying 1/3rd of it's length; Odontophore $21.4 \mu\text{m}$ long. Oesophagus expands rapidly near middle of the body; nerve ring at a distance of $79.81 \mu\text{m}$ from the head. Oesophageal gland typical of the genus; Cardia elongate conoid, $7.8 \mu\text{m}$ long; intestinal cells prominent. Rectum a simple tube like structure, $54 \mu\text{m}$ in breadth; tail prominent with the lower portion subdigitate; caudal papillae obscure; vulva transverse slit like; vagina less than 1/2 of the body width. Gonads diadelphic, amphidelphic, ovaries reflexed with the oocytes in double rows.

Holotype Female: Body slightly curved as in paratype specimens. Cuticle smooth, $2.4 \mu\text{m}$ in thickness at the mid body, but near tail the thickness up to $3 \mu\text{m}$; amphids similar to paratype females, $7.3 \mu\text{m}$ in breadth; Odontostyle prominent and $13.2 \mu\text{m}$ long; Odontophore conspicuous and $21 \mu\text{m}$ long. Remaining of characters as in paratype females.

Differential diagnosis: *Eudorylaimus andersoni* N. sp. comes close to *E. silvaticus* (Brezeski [13]) in general shape of the body, but differs in shape of the amphids, length of odontostyle and shape of the tail. Odontostyle in *E. andersoni*

N. sp. is smaller than *E. silvaticus* (Brezeski [13]), amphids in *E. andersoni* are stirrup shaped and $3.7 \mu\text{m}$ in length whereas obscure in *E. silvaticus* *Eudorylaimus andersoni* is close to *E. diadematus* (Thorne and Swanger, Andrassy [11]) but differs from *E. andersoni* in vulva percentage and shape of the tail (*E. diadematus*: $L=1.4\text{mm}$; $a=23$; $b=4.3$; $c=25$; $V=50$; Odontostyle $18\mu\text{m}$ and body diameter= $28 \mu\text{m}$). Tail in *E. diadematus* is acute and convex dorsally whereas in *E. andersoni* tail tip is subdigitate; *E. andersoni* N. sp. is close to *Allodorylaimus diadematus* (Cobb in Thorne and Swanger [10]) but differs in shape of tail being conoid in *Allodorylaimus diadematus* Andrassy [19] *Eudorylaimus andersoni* N. sp. is also similar to *E. sabulophilus* Tjebkeme *et. al.* [14] but varies from it in the length of odontostyle, vulva percentage and in shape of the amphids (amphids in *E. andersoni* stirrup shaped and obscure in *E. sabulophilus*). *Eudorylaimus andersoni* is also variable from *E. parvus* (de man [22] andrassy [11]) in 'a' ratio being 23-25 v/s a longer body. *E. andersoni* is also comparable with *E. morbidus* loof [17] in shape of the lip region and odontostyle. Lips in *E. andersoni* are truncate and amalgamated in *E. morbidus*. Odontostyle in the former is thick and straight, while thin and curved in the latter.

Type, locality and Host: Collected from soil around the roots of sugarcane (*Saccharum officinarum*) field, shell, Purtagal.

Holotype slide: H/1023 and paratype slide H/1038 are in the collection of Nematology, Applied Biology and Marine Resources Research Centre, PCSIR Laboratories Complex Karachi.

Eudorylaimus magistri Andrassy [19]

Syn. *E. andrassvi* (Meyl, 1955) Andrassy, 1959.

(Nec: *E. andrassyi* Sapud. Tjebkema, Ferris = and Ferris, 1971). *Allodorylaimus ferrisorum*, Andrassy, 1986.

(Nec. *Eudorylaimus andrassyi* Apud Thorne, 1974)

0.0 , $L=1.41-1.49 \text{ mm}$ (mean $1.44 \pm .063$); $a=30.34$ (32 ± 2.82); $b=5.6-6$ (5.8 ± 0.28); $c=28-32.3$ (30.15 ± 3.04); $c^1=1.4-1.7$ (1.55 ± 0.21); $V=35-46.23$ (40.6 ± 7.99); $G^1=19.2-19.3$ ($19.25 \pm .070$); $G^2=17-19$ (18 ± 1.4); Odontostyle = $17.5-17.9 \mu\text{m}$ (17.6 ± 0.21); Odontophore = $26.4-27.6 \mu\text{m}$ (26.5 ± 0.84)

Remarks

Eudorylaimus megistri Andrassy [19] differs from the original description in body length, vulva percentage, shape of the amphids 'c' ratio 'c¹' ratio. The variation may be due to ecological conditions. The specimens were collected from the soil around the roots of sugarcane (*Saccharum officinarum* L.) from Ferozpur Road, Lahore.

Aporcelaimellus sacchari N. sp.

Holotype female: - $L=2.5\text{mm}$; $a=27$; $b=4$; $c=38.2$; $c^1=1.1$;

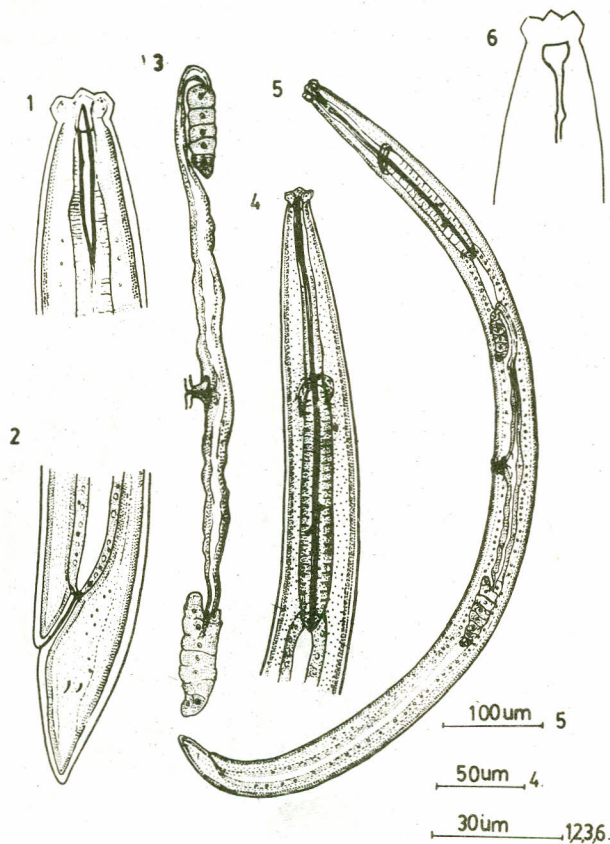


Fig 1. *Eudorylaimus andersoni* N. sp.

(1) Female head; (2) Female tail; (3) Female gonads; (4) Female head; (5) Entire female; (6) Amphids.

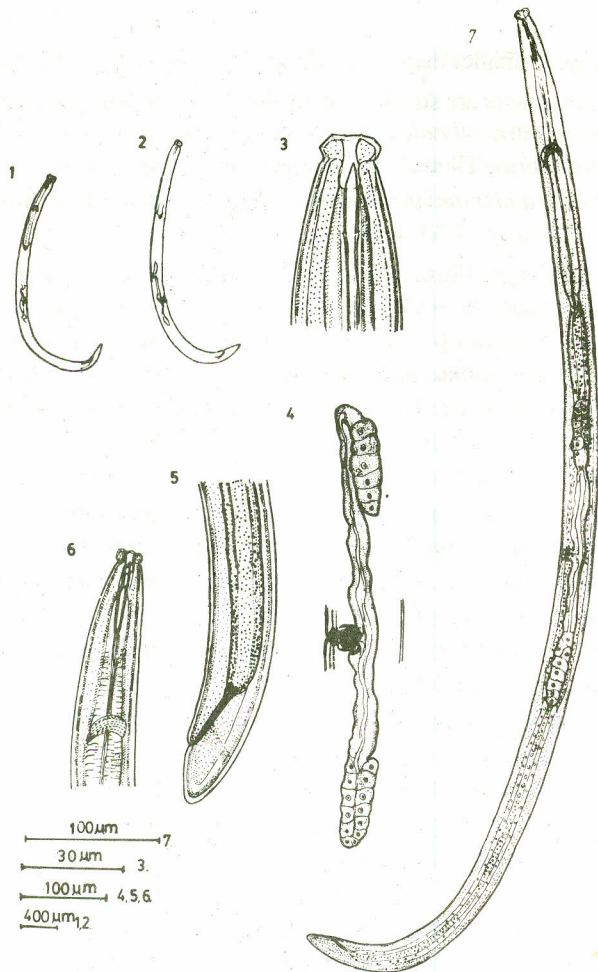


Fig 2. *Aporcelaimellus sachari* N. sp. (1, 2) Juvenile females; (3) Female head; (4) Female gonads; (5) Female tail; (6) Juvenile head; (7) Mature female.

$V=5G^1=18$; $G^2=19$; Odontostyle = 29; μm ; Odontophore = 36 μm ; tail length = 73 μm .

Paratype females: (n=5) L=2.5 - 2.6 mm (mean 2.55 ± 0.070); a=27 - 30 (28.5 ± 2.2 (38.7 ± 0.50)); $c^1=1.1 - 1.3$ ($1.2 \pm .14$); V=65 - 66.5 (65.5 ± 5.09); $G^1=13.1 - 14.2$ (13.5 ± 0.77); $G^2=12.16$ (14 ± 1.8); Odontostyle = 23 - 32 μm ($22.4 \pm .70$); Odontophore = 36.4 - 39 μm ($37.7 \pm .42$); tail length = 65 - 80 μm (72.4 ± 10.6).

Holotype female: Body of heat relaxed specimens somewhat curved. Female is similar to paratype females and differs only in length of odontophore. Ventral body pores inconspicuous. Cuticle of the tail and head approximately twice as thick as in the middle region. Location of vulva variable. Tail similar to paratype females. Two caudal pores clearly visible on tail.

Description.

Body slightly curved ventrally in posterior region, when fixed. Body diameter increases from lip base to oesophagus; lips slightly angular, 19.2 μm in breadth, well separated from each other.

Differential diagnosis: - *Aporcelaimella sachari* N. sp. comes close to *A. capitatus* (Thorne and Swanger [7], Heyns, [9] in general shape and body length, but differs in the length of odontostyle ($22.4 \pm .70$), shape of the amphids and lateral chords. *A. sachari* N. sp. comes close to *Aporcelaimellus williamsi* [9] in general shape of the body, but varies in the length of the odontostyle and shape of the tail.

Type, Locality and host: - Collected from the soil around the roots of sugarcane (*Saccharum officinarum* L.) Ferozpur Road, Lahore, Punjab.

Type of slides: - Holotype H/135 and Paratype H/137-139 in Nematological collection, Applied Biology and Marine Resources Research Centre, PCSIR Complex Karachi other slides examined: H/512 grass soil Aligarh, India.

Aporcelaimellus Taylori Yeates (20)

O O (n=3) L = 2.1 - 2.2 mm (mean $2.15 \pm$ standard deviation $.070$); a = 27.7 - 35 (31 ± 6.16); b = 3.8 - 3.9 ($3.85 \pm .56$); c = 34 - 34.8 ($34.8 \pm .56$); $c^1 = 1.2 - 1.3$ ($1.25 \pm .070$); V = 56 - 57.6 (56.6 ± 1.13); Odontostyle = 18.6 - 19.5 μm ($19.2 - 0.77$) Odontophore = 38.3 - 39.4 μm ($19.2 \pm .77$)
O (n=1) L = 2.3 mm; a = 35.9; b = 4.5; c = 54.5; $c^1 = 1.3$; T = 54.3; spicules = 39 μm ; odontostyle = 19.5 μm ; Odontophore = 39.8 μm .

Body diameter increases from lip-base to oesophagus; lips slightly angular, 16.2 μm in breadth, well separated from each other and set off from the body by deep constructions; lip papillae not protruding; cuticle with fine annulations, thickness of the Cuticle 2 - 2.3 μm from head to tail. Amphid funnel shaped, 14 μm wide on opening odontostyle 22.3 μm

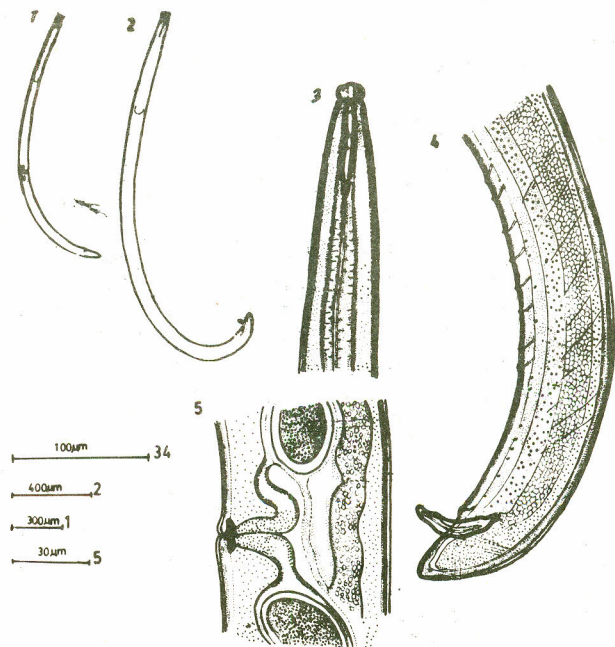


Fig 3. *Aporcelaimellus taylori* (1) Female; (2) male; (3) Female head; (4) Male tail; (5) Female gonads.

long with large aperture, approximately more than 1/2 of the length of the odontostyle; odontophore smooth, 36.4 µm long, conspicuous and plicate. Oesophagus prominent, enlarges gradually; enlargement begins at less than 50% of the Oesophageal length. Nerve ring 130 µm from anterior end; cardial disc prominent, 30.5 µm wide; intestinal cells in conspicuous, rectum 97 µm long; prerectum longer than rectum; Gonads diadelphic, amphidelphic; vulva transvers slit; vulval labia with hemispherical sclerotized pieces. Tail relatively short conoid with bluntly rounded tip. Two caudal papillae clearly visible.

Remarks.

The nematodes are similar to the original description except there is slight variation in 'C' ratio and length of odontophore. This is the first record of *Aporcelaimellus taylori* Yeates, [12], from Pakistan.

Acknowledgement. The author is gratefully indebted to Dr. B.A. Ebsary, Biosystematics Research Centre, Canada, for critically reviewing the manuscript.

References

1. O. Butschli, *Nova Acta Acad. Nat Curios.*, **36** (5), 1 (1873).
2. N.A. Cobb, *Madey Men*, Vol. Linn. Soc. N.S. Wales (1893) p.p. 252-308.
3. J. Daday *Zoologica Stuttgart*, **18**, 1 (1899).
4. M. Dujardin *Historis naturelle des helminthes oesophores intestinaux*, Paris 1-654 (1845).
5. H.A. Khan and M. Saeed, *Bangladesh J. Zool.*, **14** (2), 125 (1986).
6. P.A.A. Loof, *Nematologica*, **15**, 253 (1969).
7. G.S. Thorne, *Dakota, State University. Agric. Exp. Stan. Tech. Bull.* **41**, 120 (1974).
8. H.A. Khan and I. Fatima, *Proc. I. Pak. Cong. Zool.*, **B**, 382 (1980).
9. J. Heyns, *Report S. Afr. Dept. Agric. Tech. Ser. Ent. Memo.* **10** (1965).
10. G. A. Thorne, and S. Swanger, *Gapita. Zool.* **6** (4), 1 (1936).
11. I. Andrassy and T. Acta *Zool. Acad., Sci. Hung.* **5** (3-4), 191 (1959).
12. G.W. Yeates, *Newealand J. Sci.*, **10**, 752 (1967).
13. N. W. Brezeski, *Bull. Acad. Pllonisa Sci. C1; II* **8** (6), 261 (1965).
14. P.T. Tjepkema, V.R. Ferris and J.M. Ferris, *Purdu Univ. Res. Bull. No. 32*. 1-52 (1971).
15. K.S. Darekar and E. Khan, *Indian J. Nematol. S*, 190 (1978).
16. M.S. Jairajpuri and A. Siddiqui, *Proc. Helminth. Soc. Washington*, **31** (1), 1 (1964).
17. P.A.A. Loof, *Nematologica*, **10**, 201 (1964).
18. J.S. Heyns, *Afr. Agri. Sci.* **6**, 289 (1963).
19. I. Andrassy, *Opacula Zoologica*, **22**, 3 (1986).
20. M.R. Siddiqi, *Nematologica*, **15**, 81 (1969)
21. S.A. Akhtar, *Agric. Pakistan*, **13** (1), 64 (1962).