

# Two new species of *Xiphinemella* Loos, 1950 (Nematoda : Dorylaimida) from India

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## SUMMARY

Two new species of *Xiphinemella* Loos, 1950 from India are described and figured. *Xiphinemella andrassyi* n. sp. has V = 44-47, prerectum about six anal body widths long, spicules = 37-42  $\mu\text{m}$  long and seven to nine ventromedian supplements. *Xiphinemella labiata* n. sp. has V = 51-59, prerectum about two anal body widths long, spicules = 29-32  $\mu\text{m}$  long and three or four ventromedian supplements. A key to the species of the genus is provided.

## RÉSUMÉ

*Deux nouvelles espèces de Xiphinemella Loos, 1950 (Nematoda : Dorylaimida) découvertes en Inde*

Deux nouvelles espèces de *Xiphinemella* Loos, 1950 récoltées en Inde sont décrites et illustrées. Elles ont les caractéristiques suivantes : *Xiphinemella andrassyi* n. sp. : V = 44-47, prerectum long d'environ six diamètres anaux, spicules longs de 37-42  $\mu\text{m}$ , sept à neuf suppléments ventromédians ; *Xiphinemella labiata* n. sp. : V = 51-59, prerectum long de deux diamètres anaux, spicules longs de 29-32  $\mu\text{m}$ , trois ou quatre suppléments ventromédians. Une clé des espèces du genre est proposée.

Loos (1949) proposed the genus *Taprobanus* with *T. ornatus* as its type species, under the subfamily Longidorinae Thorne, 1935 of the family Dorylaimidae de Man, 1876. He thought it to be closely related to the genus *Xiphinema* Cobb, 1913. The genus was characterized by the presence of a labial disc, sclerotization of stoma, long and attenuated odontostyle and an equally long odontophore flanged at base, an offset oesophageal bulb and cuticle with crenate longitudinal folds. In 1950, Loos replaced the name *Taprobanus* with a new name *Xiphinemella* because the former was pre-occupied. Goodey (1951) was the first to use the new combination *X. ornatum* (Loos, 1949). Chitwood (1957) added a second species *X. esseri* to this genus. Heyns (1963) erected a closely

related genus *Botalium* with *B. eversum* as its type, but Siddiqi (1966) synonymized it with *Xiphinemella*. Jairajpuri (1964) removed the genus from Longidorinae and placed it under a new subfamily Xiphinemellinae of the family Leptonchidae Thorne, 1935. Three more species were added to *Xiphinemella* ; *X. utahnemacea* Siddiqi & Husain, 1968 ; *X. caudata* Andrassy, 1970 ; and *X. fitulae* Luc, 1977.

Soil samples collected in India yielded two new species of *Xiphinemella*. Both are described below and a key to the species of the genus is provided.

Measurements were taken and observations made on specimens killed in hot 4 % formalin, dehydrated by the slow method and mounted in glycerine.

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**Xiphinemella andrassyi\* n. sp.**

(Fig. 1)

MEASUREMENTS

*Females (paratype; n = 4)* : L = 1.59-1.74 (1.66) mm ; a = 38-47 (41) ; b = 6.3-6.5 (6.4) ; c = 61-62 (61) ; c' = 0.8-0.9 ; V = 44-47 (45) ; G<sub>1</sub> = 13-14 (13) ; G<sub>2</sub> = 9-15 (12) ; odontostyle = 31-33 (32)  $\mu$ m ; odontophore = 29-31 (30)  $\mu$ m ; total stylet length = 60-64 (62)  $\mu$ m ; oesophagus = 248-269 (258)  $\mu$ m ; prerectum = 210  $\mu$ m ; rectum = 30-35 (32)  $\mu$ m ; tail = 26-28 (27)  $\mu$ m ; ABD = 31-33 (32)  $\mu$ m.

*Holotype (female)* : L = 1.80 mm ; a = 38 ; b = 6.6 ; c = 55 ; c' = 1.0 ; V = 46 ; G<sub>1</sub> = 14 ; G<sub>2</sub> = 15 ; odontostyle = 33  $\mu$ m ; odontophore = 31  $\mu$ m ; total stylet length = 64  $\mu$ m ; oesophagus = 269  $\mu$ m ; rectum = 32  $\mu$ m ; tail = 33  $\mu$ m ; ABD = 34  $\mu$ m.

*Males (paratype : n = 5)* : L = 1.67-1.90 (1.77) mm ; a = 42-45 (44) ; b = 6.5-6.8 (6.7) ; c = 52-60 (57) ; c' = 0.9-1.0 (0.9) ; T = 59-67 (63) ; odontostyle = 31-33 (31)  $\mu$ m ; odontophore = 29-30 (29)  $\mu$ m ; total stylet length = 60-63 (61)  $\mu$ m ; oesophagus = 244-287 (264)  $\mu$ m ; spicules = 37-42 (39)  $\mu$ m ; lateral guiding pieces = 13-14 (13)  $\mu$ m ; ventromedian supplements = 7-9 (8) ; tail = 29-33 (31)  $\mu$ m ; ABD = 33-36 (34)  $\mu$ m.

DESCRIPTION

*Female* : Body slightly ventrally curved upon fixation. Outer cuticle smooth, 2-3  $\mu$ m thick at mid-body and 5-7  $\mu$ m on tail ; inner cuticle wavy and coarsely striated. Radial elements abundantly present on entire body. Lateral chords prominent, about one-third of body width at mid-body. Lip region offset from body by a constriction, and provided with a labial disc. Lips large, rounded and non-amalgamated. Amphids cup-shaped, their apertures 8-9  $\mu$ m or about half of the lip region width. Odontostyle attenuated, about two lip region widths long. Basal guiding ring single, 28-30  $\mu$ m or at about two lip region widths from anterior end. Odontophore rod-like, slightly less than odontostyle length, flanged at base and with its inner core appearing lightly sclerotized. Nerve ring encircling the slender anterior part of oesophagus at 106-119  $\mu$ m from anterior end. Basal bulb measuring

55-60  $\mu$ m or 20-22 % of total oesophageal length. Cardia 8-10  $\mu$ m long. oesophageal gland nuclei and their orifices located as follows : DO = 81-82, DN = 83-84, DO-DN = 2.5-3.1, S<sub>1</sub>N<sub>1</sub> = 87-88, S<sub>1</sub>N<sub>2</sub> = 88-89, S<sub>2</sub>N = 93-94, S<sub>2</sub>O = 94-95. Reproductive system amphidelphic. Vulva a transverse slit, vagina thick-walled, extending about one third of corresponding body width. Sphincter present at oviduct-uterus junction. Ovary reflexed with twelve to sixteen oocytes. Prerectum about six anal body widths long. Rectum about one anal body width long. Tail short, conoid, bluntly rounded, about one anal body width long.

*Male* : Supplements an adanal pair and seven to nine irregularly spaced ventromedians. Spicules arcuate, about one anal body width long. Lateral guiding pieces about one-third of spicule length. Tail short, conoid and about one anal body width long.

TYPE HABITAT AND LOCALITY

Soil around the roots of unidentified forest trees from Ulsoore, Bangalore, Karnataka state, India ; collected in September 1980.

TYPE SPECIMENS

Holotype female and a paratype male on slide *Xiphinemella andrassyi* n. sp./1 ; other paratype males and females on slides *Xiphinemella andrassyi* n. sp./2-5 ; deposited in the nematode collection of Zoology Department, Aligarh Muslim University, Aligarh, India. A paratype female and two males deposited in the nematode collection of Commonwealth Institute of Parasitology, St. Albans, Herts, U.K.

DIFFERENTIAL DIAGNOSIS

*Xiphinemella andrassyi* n. sp. comes close to *X. esseri* Chitwood, 1957 ; *X. eversa* (Heyns, 1963) Siddiqi, 1966 and *X. utahnemacea* Siddiqi & Husain, 1968. From *X. esseri* it differs in having smaller body and smaller total stylet length (L = 2.2-3.5 mm and total stylet length = 72-75  $\mu$ m in *X. esseri*). From *X. eversa* it differs in having longer body, longer total stylet length, more posteriorly located single guiding ring, and in the anterior location of vulva (L = 1.25-1.37 mm, total stylet length = 41  $\mu$ m, guiding ring double and at about one lip region width from anterior end of body, V = 56 in *X. eversa*). From *X. utahnemacea* it differs in having poorly developed labial sclerotization, longer odontophore and oeso-

\* Named after Pr. I. Andrassy who has done valuable work on the taxonomy of soil nematodes.

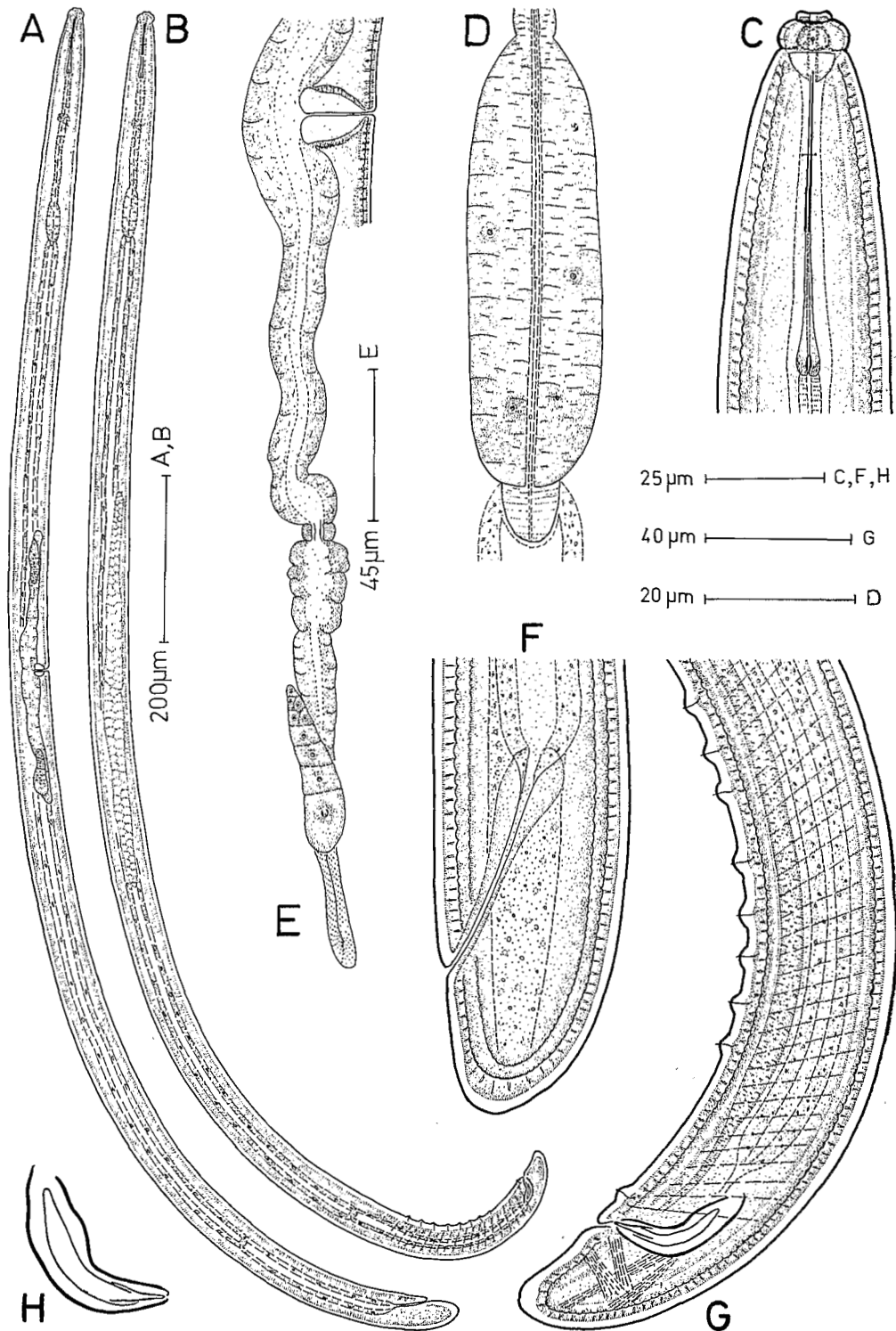


Fig. 1. *Xiphinemella andrassyi* n. sp. A : Entire female ; B : Entire male ; C : Anterior region ; D : Expanded part of oesophagus ; E : Female genital branch (posterior) ; F : Female posterior end ; G : Male posterior region ; H : spicule and lateral guiding piece.

phagus, in anterior location of vulva and in having a longer tail (labial sclerotization well developed, odontophore = 22  $\mu\text{m}$ , b = 7.4, V = 50 and c = 80 in *X. utahnemacea*).

***Xiphinemella labiata* n. sp.**

(Fig. 2)

MEASUREMENTS

*Females* (paratype; n = 3) : L = 1.44-1.85 (1.64) mm ; a = 37-42 (39) ; b = 5.1-6.7 (6.1) ; c = 58-64 (60) ; c' = 0.8-0.9 (0.9) ; V = 51-54 (52) ; G<sub>1</sub> = 12-16 (14) ; G<sub>2</sub> = 12-19 (15) ; odontostyle = 31-35 (34)  $\mu\text{m}$  ; odontophore = 29-30 (29)  $\mu\text{m}$  ; total stylet length = 61-64 (62)  $\mu\text{m}$  ; oesophagus = 247-278 (267)  $\mu\text{m}$  ; prerectum = 58  $\mu\text{m}$  ; rectum = 25-29 (28)  $\mu\text{m}$  ; tail = 25-29 (27)  $\mu\text{m}$  ; ABD = 29-35 (32)  $\mu\text{m}$ .

*Males* (paratype; n = 5) : L = 1.31-2.13 (1.66) mm ; a = 36-51 (41) ; b = 5.6-7.3 (6.2) ; c = 53-73 (61) ; c' = 0.8-1.0 (0.9) ; T = 48-63 (57) ; odontostyle = 30-35 (33)  $\mu\text{m}$  ; odontophore = 29-30 (29)  $\mu\text{m}$  ; total stylet length = 58-64 (62)  $\mu\text{m}$  ; oesophagus = 200-290 (264)  $\mu\text{m}$  ; spicules = 29-32 (30)  $\mu\text{m}$  ; lateral guiding pieces = 9-10 (9)  $\mu\text{m}$  ; ventromedian supplements = 3-4 ; prerectum = 186-218 (198)  $\mu\text{m}$  ; rectum = 28-44 (33)  $\mu\text{m}$  ; tail = 25-29 (27)  $\mu\text{m}$  ; ABD = 28-32 (30)  $\mu\text{m}$ .

*Holotype* (female) : L = 1.55 mm ; a = 38 ; b = 6.3 ; c = 67 ; c' = 0.8 ; V = 59 ; G<sub>1</sub> = 16 ; G<sub>2</sub> = 18 ; odontostyle = 32  $\mu\text{m}$  ; odontophore = 32  $\mu\text{m}$  ; total stylet length = 64  $\mu\text{m}$  ; oesophagus = 244  $\mu\text{m}$  ; pre-rectum = 73  $\mu\text{m}$  ; rectum = 22  $\mu\text{m}$  ; tail = 23  $\mu\text{m}$  ; ABD = 30  $\mu\text{m}$ .

DESCRIPTION

*Female* : Body slightly ventrally curved upon fixation. Outer cuticle smooth, 2-3  $\mu\text{m}$  thick at mid-body and 5-6  $\mu\text{m}$  on tail ; inner cuticle wavy and coarsely striated. Radial elements abundantly present on the entire body. Lateral chords prominent about one-third of body width at mid-body. Lip region offset from body by a deep constriction and provided with a well developed labial disc. Lips rounded, raised and sharply separated from each other. Amphids cup-shaped, their apertures 5-7  $\mu\text{m}$  or about half of the lip region width. Odontostyle attenuated, about three lip region widths long. Basal guiding ring single, 29-30  $\mu\text{m}$  or at about two lip region widths from

anterior end. Odontophore rod-like, slightly less than odontostyle length, flanged at base and with inner core appearing prominently sclerotized. Nerve ring encircles the anterior slender part of oesophagus at 102-116  $\mu\text{m}$  from anterior end. Basal bulb measuring 69-80  $\mu\text{m}$  or 25-30 % of total oesophageal length. Cardia 9-13  $\mu\text{m}$  long. oesophageal gland nuclei and their orifices located as follows : DO = 75-77, DN = 77-79, DO-DN = 2.5-2.8, S<sub>1</sub>N<sub>1</sub> = 82-84, S<sub>1</sub>N<sub>2</sub> = 84-89, S<sub>2</sub>N = 96-97, S<sub>2</sub>O = 96-98. Reproductive system amphidelphic. Vulva a transverse slit, vagina thick-walled, extending about one third of corresponding body width. Sphincter present at oviduct-uterus junction. Ovary reflexed with ten to fifteen oocytes. Prerectum 1.8-2.4 anal body widths long. Rectum about one anal body width long. Tail short, conoid, bluntly rounded less than one anal body width long.

*Male* : Supplements : an adanal pair and three or four irregularly spaced ventromedians. Spicules arcuate about one anal body width long. Lateral guiding pieces about one-fourth of spicules length. Tail short, conoid, about one anal body width long and with two caudal pores on each side.

TYPE HABITAT AND LOCALITY

Soil around roots of ferns from Shillong peak, Meghalaya state, India ; collected in June 1981.

TYPE SPECIMENS

Holotype female and a paratype male on slide *Xiphinemella labiata* n. sp./1 ; paratype males and females on slides *Xiphinemella labiata* n. sp./2-5 ; deposited in nematode collection of Zoology Department, Aligarh Muslim University, Aligarh, India. A paratype female and a male deposited in the nematode collection of Commonwealth Institute of Parasitology, St. Albans, Herts, U.K.

DIFFERENTIAL DIAGNOSIS

*Xiphinemella labiata* n. sp. comes close to *X. utahnemacea* Siddiqi & Husain, 1968 and *X. andrassyi* n. sp. but differs from the former in having a longer total stylet length, oesophagus and tail and in the presence of males (total stylet length = 52  $\mu\text{m}$ , b = 7.5, c = 80 and males absent in *X. utahnemacea*). From *X. andrassyi* n. sp. it differs in the shape of lip region, in having sharply demarcated lips, more prominently sclerotized flanges at base of odontophore, smaller amphidial apertures, longer oesophageal bulb, posteriorly located vulva, smaller pre-

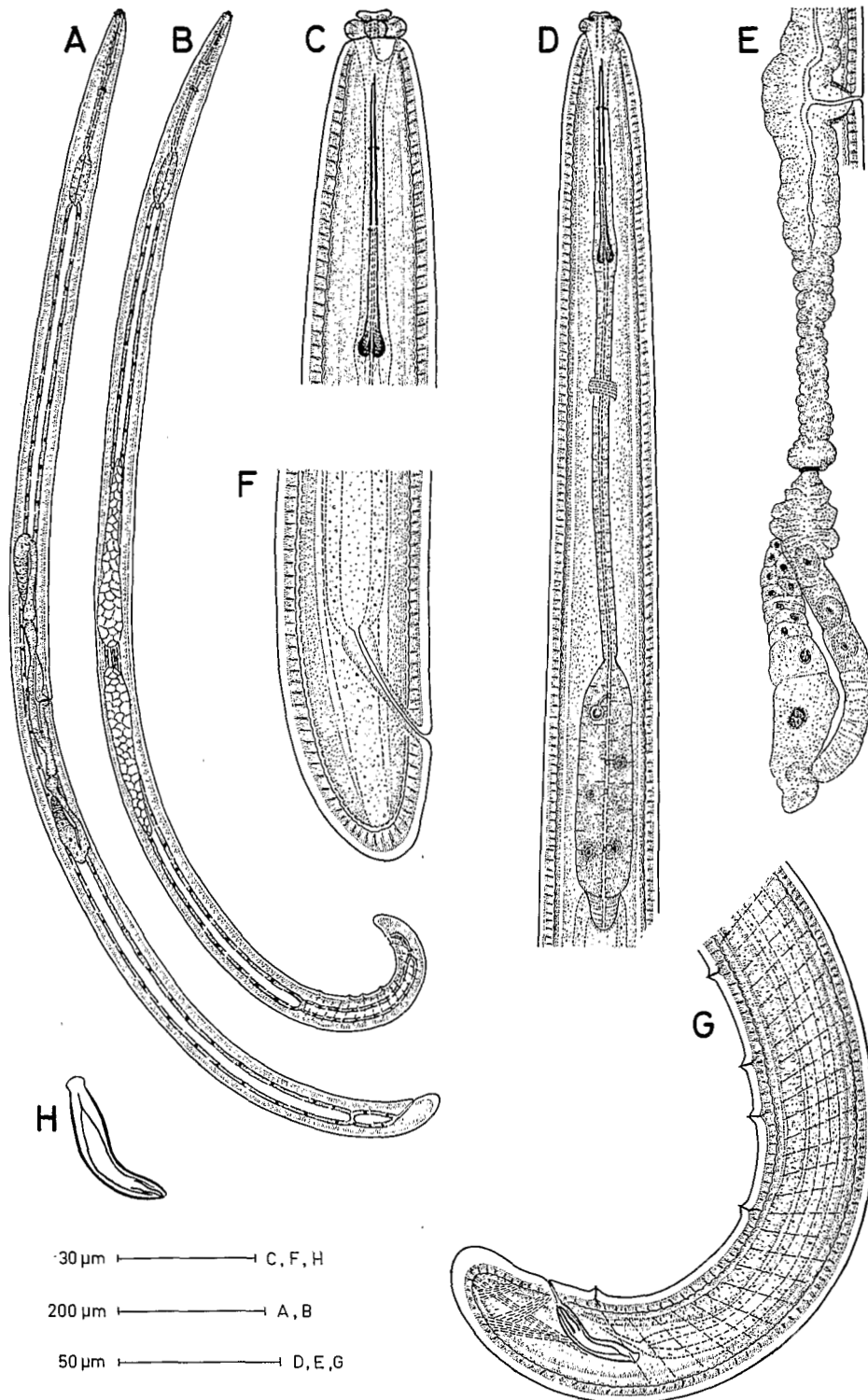


Fig. 2. *Xiphinemella labiata* n. sp. A : Entire female ; B : Entire male ; C : Anterior region ; D : Oesophageal region ; E : Female genital branch (posterior) ; F : Female posterior end ; G : Male posterior region ; H : spicule and lateral guiding piece.

rectum, shorter and differently shaped spicules and in the lesser number of ventromedian supplements.

— Vulva post-equatorial ( $V = 51-59$ ); spicules 29-32  $\mu\text{m}$  long; ventromedian supplements 3 or 4 . . . . .  
 . . . . . *labiata* n. sp.

Key to species of *Xiphinemella*

1. Body about 2 mm long . . . . . 2  
    Body less than 2 mm long . . . . . 3
2. Sclerotization of stoma prominent; total stylet length 82-93  $\mu\text{m}$ , guiding ring double . . . . .  
    . . . . . *ornata* (Loos, 1949) Goodey, 1951
- Sclerotization of stoma not prominent; total stylet length 72-75  $\mu\text{m}$ , guiding ring single . . . . .  
    . . . . . *esseri* Chitwood, 1957
3. Total stylet length more than 70  $\mu\text{m}$  . . . . .  
    . . . . . *fitulae* Luc, 1977
- Total stylet length less than 70  $\mu\text{m}$  . . . . . 4
4. Total stylet length less than 60  $\mu\text{m}$  . . . . . 5  
    — Total stylet length more than 60  $\mu\text{m}$  . . . . . 7
5. Total stylet length 41  $\mu\text{m}$ , guiding ring double . . . . .  
    . . . . . *eversa* (Heyns, 1963) Siddiqi, 1966
- Total stylet length more than 50  $\mu\text{m}$ , guiding ring single . . . . . 6
6. Body 1.6 mm long; tail small and rounded ( $c = 80$ ). . . . .  
    . . . . . *utahnemacea* Siddiqi & Husain, 1968
- Body 1.2 mm long, tail long and conoid ( $c = 33$ ) . . . . .  
    . . . . . *caudata* Andr assy, 1970
7. Vulva pre-equatorial ( $V = 44-47$ ); spicules 37-42  $\mu\text{m}$  long; ventromedian supplements 7-9 . . . . .  
    . . . . . *andrassyi* n. sp.

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