

A NEW SPECIES OF *TYLENCHORHYNCHUS* WITH COMMENTS ON *GEOCENAMUS RUGOSUS* (THORNE AND MALEK 1968) BREZESKI 1991 FROM SINDH

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Tylenchorhynchus fatimae sp.n was collected around the roots of coconut field, Malir and coconut plants from PCSIR campus, Karachi is described and illustrated. *T. fatimae* sp.n comes close to *T. brassicae* (Siddiqi 1961), *T. tuberosus* (Zarina and Maqbool 1994), *T. tritici* (Golden *et al* 1969) and *T. rubustoides* (Thorne and Malek 1968) but differs in stylet length, general shape of the body and DGO. *Geocenamus rugosus* (Thorne and Malek 1968) Brezeski 1991 is reported for the first time from Pakistan are listed. Measurements of *Geocenamus rugosus* are given from paratype and rest of the measurements from illustration are mentioned in Table 1.

Key words: Coconut, Nematodes, *Tylenchorhynchus fatimae* sp.n.

Introduction

The genus *Tylenchorhynchus* was established by Cobb (1913) when he discovered that *T. cylindricus* was found in soil from reclaimed coastal swamp lands in Southern California. In his excellent review of the genus *Tylenchorhynchus*, Allen established its taxonomic criteria in 1955. Golden *et al* (1987) raised the subfamily *Tylenchorhynchinae* (Eliava 1964) to family rank and provided a key to the six genera included at that time. Hooper (1978) discussed the history of the genus. In describing four new *Tylenchorhynchus* species Sturhan (1966) recognized 73 valid species in the genus and indicated 10 additional forms as species inquirendae. By 1970, 96 species were described. Most of the species included under *Tylenchorhynchus* have now been placed in new genera by different workers. The most important characteristic used in distinguishing these genera is the number of lines, ranging from three to six, in the lateral field. *Tylenchorhynchus* now contains those species having four lines in the lateral field. Tarjan (1973) gave a valuable key and a table of diagnostic data on species. Siddiqi and Jairajpuri (1982) proposed resurrection of the subgenus *Bitylenchus* (Filipjev 1934) under the genus *Tylenchorhynchus* and Jairajpuri (1982) gave a key to 16 species of the subgenus *Bitylenchus*. By 1984, 79 species of *Tylenchorhynchus* were described.

Here one new species of *Tylenchorhynchus* is described from Pakistan. Comments are added on *Geocenamus rugosus* which was previously described by Siddiqi (1963), who then put his

genus into *Merlinius* (1970) and later he kept his genus into *Scutylenchus* as *S. rugosus* (1979). Whereas, Brezeski (1991) later on, after a comprehensive studies placed this genus into *Geocenamus* as *G. rugosus* (1991). We have studied the specimens collected from Sindh, Pakistan and reported it.

Materials and Methods

The soil samples were collected around the roots of various Date Palm trees in PCSIR Campus and later soil samples were also taken from coconut farms, Malir. These samples were brought to the laboratory and kept at 5°C in incubator. These were processed by following Cobbs sieving and gravity method (Cobbs 1918) and later modified by Baermann's method. Nematodes were collected under stereoscopic binocular, relaxed by gentle heat and processed by slow method of glycerin according to Thorne (1961) and mounted in anhydrous glycerin and sealed with zut cement. Illustrations were made with the help of Camera Lucida attachment.

*Tylenchorhynchus fatimae*** n.sp. (Fig 1)

- Holotype female L=0.6 mm; a=37.2; b=5.32; c=15.2; c'=2.4; V=54.6
Paratype females L=0.57-0.65 (0.61±1.78)mm; a=27.3-34.2 (30.75±4.8); b=5.2-6.5 (5.85±0.91); c=13.5-16.8 (15.15±2.3); c'=2.48-3.2 (2.84±0.5); V=54-56.4% (55.2±1.2); spear=14.6-14.8 (14.7±0.1)µm
Paratype male L=0.62-0.64 (0.63±1.4)mm; a=35-38 (36.7±2.4); b=4.2-5.5 (4.85±0.56); c=14.4-15.2 (14.8±0.56); T=64.2-67

*Author for correspondence. **Name of the species is given in the memory of Miss Nighat Fatima, who lived for Nematology and died for Nematology.

(59.1±5.1); spicules=22.2-23.4
(22.8±0.8)µm; gubernaculum=11.5-12.2
(11.5±0.35) µm; spear=14.5-14.9
(14.7±0.2)µm

Description. Heat of the body relaxed nematode ventrally arcuate slightly. Cuticle marked by fine annulations, 1.2 µm thick near the mid body. Lip region prominent, broadly rounded, 3.2-3.6 µm in height and 6.2-6.6 µm wide; spear knobs 2.3-2.44 µm in breadth. Lateral field 4.4-4.5 µm wide in middle region of the body containing four lateral lines, outer incisures are crenate. Orifice of dorsal esophageal gland 2.4-2.6 µm behind spear base; body width at basal knobs 9.6-10.2 µm. Procorpus prominent, 34-35 µm in length and metacorpus prominent 9-10 µm with valve; Isthmus tubular, narrow, 24-33 µm long; nerve ring encircling isthmus in the middle. Excretory pore located at the distance of 88-92.5 µm from the anterior region. Hemizonids located just above a few annules anterior to distinct excretory pore. Basal oesophageal gland cylindrical 10-12 x 19-22 µm with prominent nucleus at the center; cardia conoid, 4.5-5.4 µm in length, vulva transverse, slit like and vulval opening covered by the lateral cuticular membrane, 9-11 µm long; oocytes arranged in a single row; spermathica prominent, 6-9 µm in diameter with rounded sperms. Posterior intestinal sac present. Tail subcylindrical, 43.5 µm in length bearing 35-40 annules; tail terminus smooth. Phasmids located anteriorly to the middle of the tail.

Male. Similar to female in general shape of the body. Spear 14.2 µm in length; spicules paired, cephalated with distal flanges, 21.5 µm long; gubernaculum and bursa typical of the genus with crenate margin enveloping tail.

Type locality. Collected from the soil around the roots of coconut palms, in PCSIR Campus, Karachi and also from the soil samples taken from coconut plants, Adil farms, Malir area.

Type slide. Holotype and paratype slides deposited in Nematological Collection, Food and Marine Resources Research Centre, PCSIR, Karachi.

Diagnosis. *Tylenchorhynchus fatimae* n.sp comes close to *T. brassicae* (Siddiqi 1961) in general shape of the body but differs in having smaller spear, anteriorly located vulva and presence of vulvular flap. Spicules in *T. fatimae* n.sp. 22-23.4 µm whereas in *T. brassicae* 23.6-25.3 µm. *T. fatimae* n.sp. looks apparently similar to *T. tuberosus* (Zarina and Maqbool 1994) in general body shape but differs in body length, small stylet (stylet in *T. fatimae* 14.4-14.8 µm. *T. tuberosus* 20-22 µm) *T. tuberosus* also differs from *T. fatimae* n.sp. in DGO (DGO in *T. tuberosus* 2.4-3.2 µm. *T. fatimae* 2.4-2.5 µm)

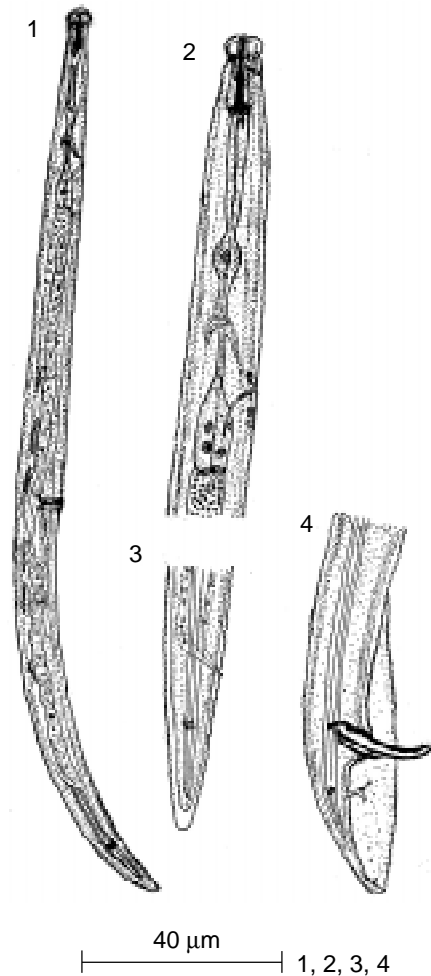


Fig 1. *Tylenchorhynchus fatimae* n. sp., 1=Fully body length; 2=Esophageal region; 3=Female tail and 4=Male tail.

T. fatimae is also similar to *T. tritici* (Golden *et al* 1987) in general shape of the body but differs in D.G.O length (DGO in *T. tritici* 2.1-2.5 µm. *T. fatimae* 2.4-2.5 µm). *T. fatimae* n.sp is also different from *T. tuberosus* in having well developed fasciculi (serpentine canals). Whereas small serpentine canals present in *T. tuberosus*, *T. fatimae* n.sp. also differs from *T. rubustoides* (Thorne and Malek 1968; Siddiqi 1986) in shape of the lip region, short stylet being 15-16 µm in *T. rubustoides* and 14.5-14.9 µm in *T. fatimae*.

Geocenamus (Thorne and Malek 1968) Brezeski 1991. **Diagnosis (amended).** Belonolaimidae. Body length 0.5-1.1 µm. Lateral field with six distinct incisures, although additional lines may be present. Longitudinal body striations are either present or absent. Deridis may or may not be present opposite to excretory pore in four incisures of the lateral field. Labial region continues with body contour or set-off to varying degree. Labial disc rounded, hexagonal or slightly

laterally elongated. Lateral sectors of labial region may be somewhat smaller than dorsal and ventral sectors. Anterior head annuli is divided into six sectors by longitudinal ridges (not observed in *G. varianius*). Stylet thin to robust, length of known species vary from 9-132 μm , cone is seldom larger than 55-60% of total stylet length. Dorsal esophageal gland orifice 1-3 μm posterior to stylet knob. Oesophagus off-set from intestine. Female tail cylindrical to conical, c' usually 2-4, thickened terminal cuticle not pronounced. Male spicules are without distinct velum. Gubernaculum, epiptygma and hypotygma are present.

Type species. Geocenamus tenuidens (Thorne and Malek 1968; Brezeski 1991).

Syn. *Tylenchorhynchus polonicus* Syczyziel 1970.

Syn. *Merlinius polonicus* (Syczyziel 1970) Tarjan 1973.

Syn. *Geocenamus polonicus* (Syczyziel 1970) Sturhan 1981.

***Geocenamus rugosus* (Thorne & Malek 1968) Brezeski, 1991 (Fig 2)**

5 OO L=0.70-0.82 (0.76 \pm 2.6) μm ; a=25.6-30.2 (27.9 \pm 3.2); b=5.3-5.6 (5.45 \pm 0.21); c=13.3-18.2 (15.75 \pm 3.46); c'=2.2-2.5 (2.35 \pm 0.21); V=53-56 (54.5 \pm 2.12); stylet=21-27 (24 \pm 4.2) μm ; nerve ring=90-110 μm ; lip width=13-14.7 (13.85 \pm 1.2), Male not found.

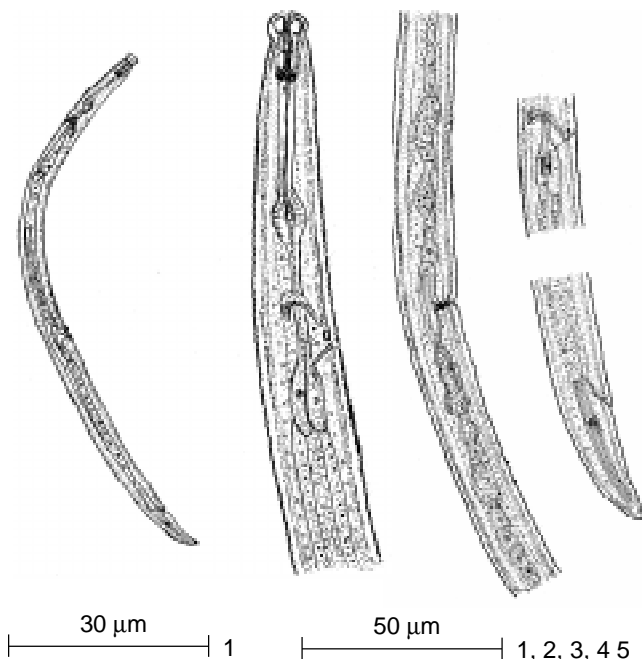


Fig 2. *Geocenamus rugosus*; 1=Fully body length; 2=Esophageal region; 3=Vulval region; 4=Esophageal gland and 5=Tail region.

Comments

Body slightly arcuate after relaxing by gentle heat, annulations of body prominent, lateral field marked with six distinct incisures, the outer most crenate. Lip width with 5-7 annules, set-off by deep constriction. Internal framework of head moderately developed, lip width (13.85 \pm 1.2) μm , stylet 21-27 (24 \pm 4.2) μm long, stylet knobs 4-4.5 (4.25 \pm 0.35) μm diameter on anterior face. Oesophagus tapering to a narrow tube where it attaches to the median bulb. Excretory pore are 110-113 μm from anterior region or opposite to anterior of the basal bulb. Cardia somewhat discoid. Intestine is packed with large and dark granules. Female reproductive system diadelphic and amphidelphic outstretched, vulva prominent. Female tail composed of 16-24 annules of equal width. Tail slightly conoid, tapering to a smooth blunt end, phasmid somewhat variable in position. (This is the first record of this specie from Pakistan).

Remarks. G. rugosus (Brezeski 1991) is similar to *G. quettensis* (Maqbool *et al* 1984) in body shape but differs in stylet length (*G. rugosus* 24 \pm 4.2 μm , *G. quettensis* 21 μm), in the length of excretory pore from anterior region and also differs in tail annulations (*G. rugosus* 16-24 μm , *G. quettensis* 24-30 μm). *G. rugosus* similar to *G. baluchiensis* (Maqbool *et al* 1985) in body shape but differs in c' value (*G. rugosus* 2.35 \pm 0.21 μm , *G. baluchiensis* 3.0 \pm 0.05 μm) and in stylet length (*G. rugosus* 24 \pm 4.2 μm , *G. baluchiensis* 17 \pm 0.4 μm). It also differs in length of excretory pore (*G. rugosus* 110-113 μm , *G. baluchiensis* 90-95 μm). *G. rugosus* similar to *G. niazae* (Maqbool *et al* 1983) in body shape but differs in stylet length (*G. rugosus* 21-27 μm , *G. niazae* 14-16 μm) and also in tail annuli (*G. rugosus* 16-24, 45-52 in numbers).

Other species

- G. adakensis* (Bernard 1985) Brezeski 1991
- G. baluchiensis* (Maqbool *et al* 1985) Brezeski 1991
- G. bravaricus* (Bavaricus 1966; Siddiqi 1970) Brezeski 1991
- G. brevidens* (Allen 1955; Siddiqi 1970) Brezeski 1991
- G. koreanus* (Choi and Geraert 1971) Brezeski 1991
- G. niazae* (Maqbool *et al* 1988) Brezeski 1991
- G. nanus* (Allen 1955; Siddiqi 1970) Brezeski 1991
- G. quadarifer* (Andrassy 1954) Brezeski 1991
- G. quettensis* (Maqbool *et al* 1984) Brezeski 1991
- G. rugosus* (Siddiqi 1963) Brezeski 1991
- G. siddiqii* (Mulk 1978) Brezeski 1991
- G. sobolevi* (Mukhina 1970) Brezeski 1991
- G. stegus* (Thorne and Malek 1968) Brezeski 1991
- G. thomasi* (Skwiriz 1984) Brezeski 1991
- G. tetylus* (Anderson and Ebsary 1982) Brezeski 1991
- G. variabilis* (Shahalina 1983) Brezeski 1991
- G. varians* (Thorne and Malek 1968) Brezeski 1991

***Geocenamus koreanus* (Choi and Geraert 1971)
Brezeski 1991 (Fig 3)**

5 OO L=0.86-0.95 (0.905±0.056)mm; a=37-38.5 (37.75±1.06); b=7.2-8.6 (7.9±0.98); c=12-13.6 (12.8±1.13); c'=3.4-4 (3.7±0.42); V=68-69 (68.5±0.7); stylet=21.5-26.1 (23.8±3.25)µm
Male not found

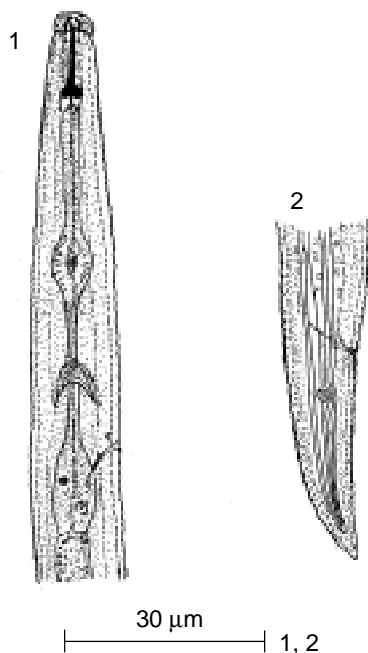


Fig 3. *Geocenamus koreanus*; 1=Anterior region, 2=Tail region.

Comments

Body cylindroid, curved ventrally after killing by gentle heat; cuticle annulated, annules in shape of small blocks. Head set-off slightly with six incisures. Cephalic frame work slightly sclerotized; amphidial aperture pore like 2.3-2.4 (2.35 ± 0.07) µm in length. Mouth aperture encircled by hexaradiate sclerotizations. Stylet 25.4 µm long, stylet knobs flattened anteriorly. Dorsal gland opening about 2.1 µm from the base of stylet knobs. Median oesophageal bulb, 12 µm in diameter. Excretory pore located opposite the end of terminal bulb; hemizonid inconspicuous. Rectum short, about half of the anal body width long. Reproductive system diadelphic amphidelphic, vulva transverse slit, symmetrical, spermatheca conspicuous but sperms not seen. Anterior end of the intestine with wide lumen. Rectum short, less than half of the anal body diameter. Tail coarsely annulated towards tip, subcylindrical; tail terminus blunt. Phasmid located in anterior third of tail. The species are reported for the first time in Pakistan. Present species coincide with original measurements.

Locality and hosts. Collected the soil around the roots of wheat, (*Triticum vulgare*), Malakundh Agency and some unknown grasses.

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