

# Description of *Paktylenchus tuberosus* gen. n., sp. n. (Nematoda: Tylenchinae) from Pakistan

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**Abstract:** *Paktylenchus tuberosus* gen.n., sp.n. is described and illustrated from soil around *Solanum tuberosum* from Kaghan Valley, Pakistan. *Paktylenchus* gen.n. can be distinguished from the most closely related genus, *Agelenchus* Andrassy, 1954, by the distinct longitudinal striae, three incisures in the lateral field, and absence of males. *Paktylenchus tuberosus* shows affinities to *Coslenchus* Siddiqi, 1978 but differs in having an oblique vagina-to-body axis and a prominent sunken vulva with vulval flaps. Four genera of the subfamily Tylenchinae are also discussed herein. **Key words:** taxonomy, Tylenchinae, *Paktylenchus*, new genus, new species.

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The species of subfamily Tylenchinae, having longitudinal cuticular ridges on the body, belong to the genera *Coslenchus* Siddiqi, 1978 (2), *Pleurotylenchus* Szczygiel, 1969 (3), and *Campbellenchus* Wouts, 1978 (4) while *Aglenchus* Andrassy, 1954 (1) lacks this character. *Pleurotylenchus*, without lines in the lateral fields, has 10 pointed longitudinal cuticular ridges on the body and a vulva covered by an anterior lip flap but with no lateral flaps. *Campbellenchus*, except in the anterior region of the body, lacks transverse annules and has a well-developed stylet. *Aglenchus* is characterized by having fine cuticular annules without longitudinal marking, lateral fields bearing four incisures, and a vagina oblique to the body axis. *Coslenchus* has coarse body cuticular annules, modified into longitudinal ridges (12-22) which in surface view show minute squares and rectangles due to intersections by the transverse striae, lateral fields with four or occasionally three incisures, and the vagina at right angle to the body axis.

In a continuing survey of nematodes in Pakistan, specimens were found having a combination of characters relating to the four genera mentioned above. These specimens bear distinct longitudinal striae and have a vagina oblique to the body axis. Since these specimens do not completely fit the characters of any of the present genera of the subfamily Tylenchinae, a new

genus in Tylenchinae is proposed to accommodate this new species.

## MATERIALS AND METHODS

From the soil collected around the roots of *Solanum tuberosum* (potato) from Kaghan Valley, Pakistan, specimens of Tylenchinae were found in abundance (200/50 g of soil). These were separated by differential screening, killed by gentle heat, and preserved in 3% formaldehyde and 2% glycerine. Specimens were also fixed in T.A.F. (formaline, triethanolamine, distilled water) and transferred to 1.25% glycerine solution containing traces of picric acid to facilitate observation of the stylet. Watch glasses containing nematodes in the solution were placed in an incubator at 55 C for slow dehydration for a week before nematodes were mounted in glycerine. Measurements and drawings were made with an ocular micrometer and a camera lucida.

## SYSTEMATICS

Genus: *Paktylenchus* gen.n.

Fig. 1 A-G

**Diagnosis:** Tylenchidae, subfamily Tylenchinae: Body small, not more than 1 mm, straight to ventrally arcuate, tapering anteriorly from base of esophagus and posteriorly behind vulva; cuticle coarsely annulated, with longitudinal striae 14-22. Due to intersection by transverse striae, the body surface exhibits distinct small square or rectangular block-like structures. Lateral field with three incisures forming two longitudinal bands of equal widths. Deirids prominent, on broken central incisures located at level of excretory pore. Phasmids

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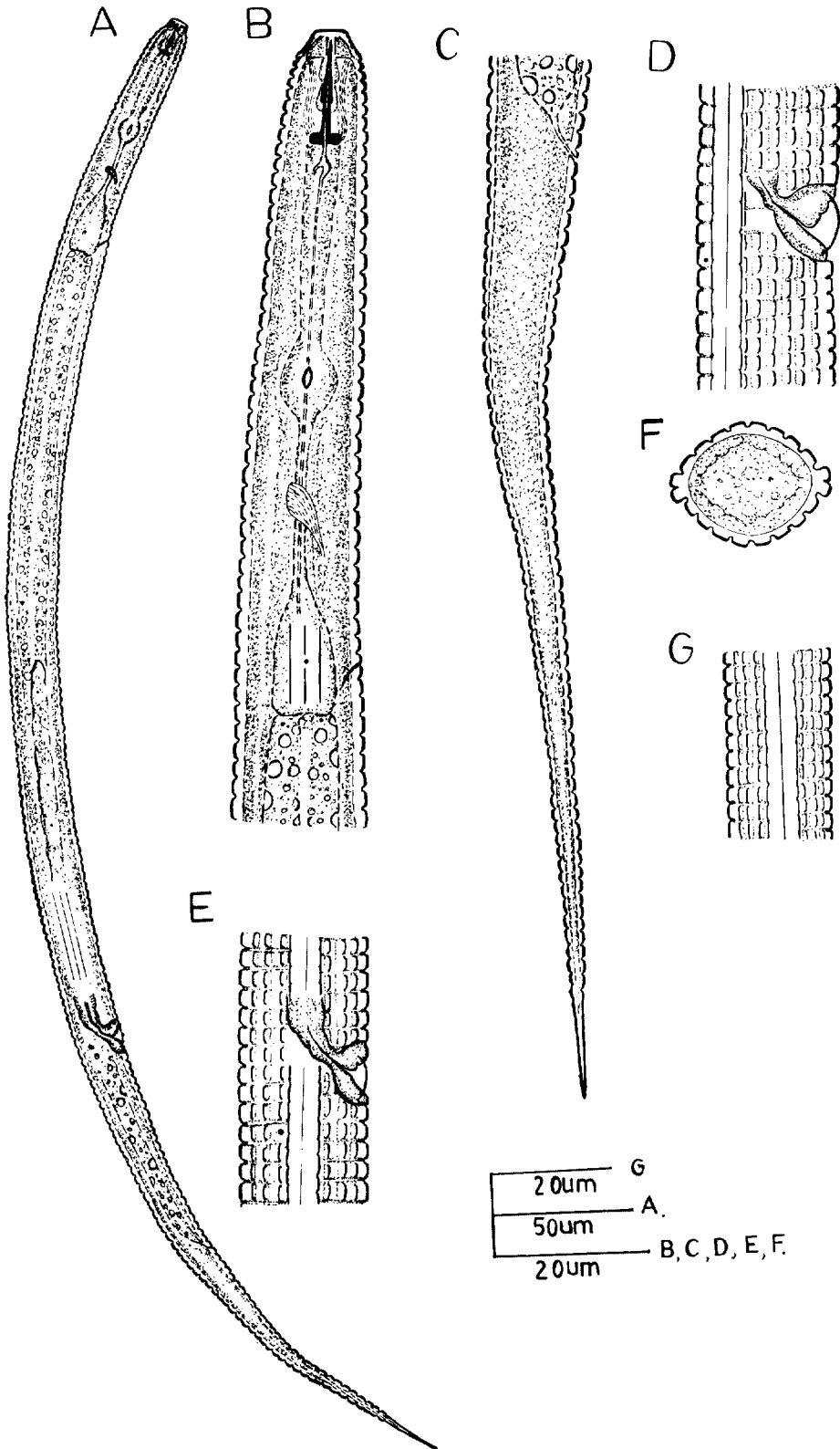


Fig. 1. *Paktylenchus tuberosus* gen.n., sp.n. females. A) General view. B) Esophageal region. C) Tail. D, E) Vulval region. F) Cross section through body at middle. G) Lateral view near vulval region.

opposite vulva and dorsal to lateral field. Cephalic region elevated, slightly narrower than the body, with indistinct striation. Stylet well-developed under  $13\ \mu\text{m}$  long with rounded knobs. Amphidial aperture small, longitudinal slit; cephalic framework sclerotized. Medium esophageal bulb ovate, strongly muscular, with conspicuous valvular apparatus, located slightly anterior to middle of esophagus.

Excretory duct distinct, opening at middle of basal esophageal bulb. Basal esophageal bulb elongated pyriform, not offset from intestine, cardia small. Vulva prominently transverse, depressed, forming distinct cavity in the body, post median. Vulval lips distinctly swollen, sclerotized, lateral vulval flap present. Vagina thickened, curved, anteriorly directed, oblique to the body axis. Female gonad monodelphic, outstretched, post vulval uterine sac absent. Tail elongate, filiform. Male unknown.

*Type and only species: Paktylenchus tuberosus* gen.n., sp.n.

*Relationship:* *Paktylenchus* n.gen. is morphologically similar to *Coslenchus* Siddiqi, 1978 (2) but differs in having strongly cuticularized vagina oblique to body axis and a prominent, sunken vulva with vulval flaps. It is also close to, but distinguished from, *Aglenchus* Andrassy, 1954 (1) by having distinct longitudinal striae on the body, three incisures in the lateral field, and absence of males. The name *Paktylenchus* is given after the country name, Pakistan.

*Paktylenchus tuberosus* gen.n., sp.n.

*Paratypes* (40 females): L = 0.51–0.58 (0.54) mm; a = 31.7–33.9 (31.8); b = 4.4–6.3 (5.8); c = 4.3–5.4 (4.7); c' = 9.5–12.5 (10.8); V = 63.4–65.7 (64.5); stylet = 12.4–14.2 (13.6)  $\mu\text{m}$ ; number of annules from anterior end to excretory pore (R ex) = 35–36 (35); number of annules from posterior end to anus (R an) = 47–58 (51); number of annules from posterior to vulva (RV) = 81–90 (85); number of annules from vulva to anus (R Van) = 33–35 (34).

*Holotype* (female): L = 0.576 mm; a = 38.8; b = 6.1; c = 5.2; c' = 9.1; V = 64; stylet = 13.5  $\mu\text{m}$  R ex = 36; R an = 54; R Van = 34; R V = 88.

*Description of females:* Body straight to

slightly arcuate ventrally, gradually tapering posterior to vulva, forming filiform tail; body width 16–17  $\mu\text{m}$  at midbody. Cuticle thick; transverse; annules very prominent, 3.2–3.5  $\mu\text{m}$  wide at midbody. Cephalic region slightly narrower than adjacent body, truncate, elevated, 6.3  $\mu\text{m}$  wide and 3.5  $\mu\text{m}$  high, with 3–4 indistinct annules; cephalic framework lightly sclerotized.

Longitudinal striae of cuticle begin at base of stylet knobs, 8 + 8 + lateral fields. Lateral fields 4  $\mu\text{m}$  wide, with three evenly spaced lines forming two bands. Stylet strong, with well-developed, rounded basal knobs about 4  $\mu\text{m}$  across; conus equal to size of shaft. Orifice of dorsal esophageal gland 1.5–2.0  $\mu\text{m}$  just behind the stylet knobs. Esophagus 90–100  $\mu\text{m}$  long, extending over 43–47 annules. Procorpus cylindrical, 4.0–5.0  $\mu\text{m}$  wide. Median bulb located approximately in middle of esophagus, well developed, muscular, oval, 9.0  $\times$  12.0  $\mu\text{m}$ , with strongly developed valvular apparatus. Isthmus narrow, about 1.5–2.0  $\mu\text{m}$  wide. Basal bulb pyriform, approximately 20.0  $\times$  9.0  $\mu\text{m}$ . Cardia discoid. Dorsal gland nucleus near the middle of basal bulb. Excretory duct prominent, opening 80–85  $\mu\text{m}$  from anterior end, near middle of basal bulb. Hemizonid one body annule long, 1–2 annules anterior to excretory pore. Deirid distinct, located between a break of middle incisure in the lateral field, at level of excretory pore.

Female gonads 126–130  $\mu\text{m}$  long, or about  $\frac{1}{4}$  of body length. Vulva transverse, sunk in large shallow cavity of body contour, located 321–366  $\mu\text{m}$ , or 142 annules, from anterior end. Outer and inner vulval lips extended and thick, 8  $\times$  4  $\mu\text{m}$ ; lateral vulval flap 6.5  $\mu\text{m}$  long. Vagina oblique to body axis, cuticularized, extending inward and forward as distinct curve. Post vulval sac absent. Spermatheca small, thickened, 8  $\times$  8  $\mu\text{m}$ , nonfunctional with no spermatozoa, located 20–24  $\mu\text{m}$  anterior to vulva. Ovary single, short outstretched. Oocytes arranged in a multiple rows, terminating 106–110  $\mu\text{m}$  from spermatheca. Vulva-anus distance 87–90  $\mu\text{m}$ ; 32–35 (34) annules between vulva and anus. Phasmids dorso-sublateral just opposite the vulva. Tail 126–132  $\mu\text{m}$  long, tapering behind anus filiform; ratio of tail length to anal body width =

11.4  $\mu\text{m}$ .

*Type host and locality*: Soil around the roots of *Solanum tuberosum* from Kaghan Valley, N.W.F.P., Pakistan.

*Holotype*: Female collected 15 September 1981 by the author. Slide No. NRC/828 deposited in the National Collection at NRC, University of Karachi, Pakistan.

*Paratypes*: 40 females, (same data as holotype) deposited as follows: Slides NRC-828-835 (33 females) NRC Collection, University of Karachi; Slide NRC-836 (6 females) USDA Nematode Collection, Beltsville, Maryland, USA.

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