The greatest concentration of C-18 fatty acids occur in the neutral lipid fraction; the C-20 fatty acids along with the C-12, C-14, and C-16 acids occurred in smaller amounts.

**Literature Cited**


Studies on the Genera *Calolaimus* Timm, *Galophinema* Siddiqi, *Qudsianema* Jairajpuri, and *Utahnema* Thorne (Nematoda: Leptonchidae), with Description of *U. gracile* n. sp.1

M. RafiQ Siddiqi

The genus *Calolaimus* Timm, 1964 was proposed as a new genus to accommodate *C. papillatus* Timm, 1964 while *Galophinema* Siddiqi, 1965 was proposed a few months later to contain *G. lenorum* Siddiqi, 1965. *Galophinema* is very similar to *Calolaimus* differing in the shape of the spear including extension, the vulva, and the occurrence of vaginal sclerotization. *Galophinema* has a tiny spear and sclerotized, rodlike spear extension not immediately differentiated from the spear; circular vulva and unsclerotized vagina. Examinations of specimens of *C. papillatus* kindly supplied by Timm have shown that the spear in this species is small and that the spear extension is sclerotized (Fig. 1E). As the shape of the vulva and the sclerotization of the vagina are not to be relied upon as of generic diagnostic value in Dorylaimoidea, *Galophinema* Siddiqi, 1965 is here regarded as a synonym of *Calolaimus* Timm, 1964.

**Diagnosis of Calolaimus (Amended):** Leptonchidae: Large-sized worms. Amphids cup or stirrup-shaped, with elongate-ellipsoidal ap-

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1 Contribution from the Section of Plant Pathology, Department of Botany, Aligarh Muslim University, Aligarh, U.P., India.
erture. Spear guiding ring large, simple, belt-like in appearance, situated near base of lip region. Spear small, irregular in outline, with minute aperture; its extension simple, sclerotized, somewhat flanged at base. Enlarged part of esophagus occupying about \( \frac{1}{3} \) or less the length of neck, with prominently thickened inner cuticle in anterior region (also in posterior region but less pronounced).

Female reproductive system paired, opposed; vulva circular or transverse slit, with or without sclerotization. Testes, spicules, and supplements dorylaimoid. Paired submedian papillae present on male tail. Lateral guiding pieces of spicules appearing constricted. Tail in the two sexes similar, elongate-tapering. Occurring in soil about plant roots in freshwater habitat.

**Type species:** *Calolaimus papillatus* Timm, 1964.


Jairajpuri (1965) proposed the genus *Qudsianema* in the family Leptonchidae to contain *Q. amabile* (specific name amended from *amabilis*), a nematode collected around the roots of “various plants” at Nainital (U.P.), India. The chief characters of the genus are the bibulbar appearance of the enlarged part of the esophagus and the spear extension being “strongly flanged appearing more muscular than cuticularized.” From the type locality of *Q. amabile*, the present author collected a few female individuals of a nematode identified as *Q. amabile*. However, in the present specimens the esophageal bulb is typically dorylaimid and the basal swellings of the spear extension are also dorylaimid, appearing more muscular than cuticularized (Fig. 1A, B). Dr. Andrassy of Budapest examined these specimens and identified them as belonging to the genus *Eudorylaimus*.

The bibulbar appearance of the enlarged part of the esophagus is often met with in occasional specimens of the Dorylaimidae. *Discolaimus discocephalus* Tulaganov, 1949 carries a prominent isthmus in the middle of the enlarged part of the esophagus (Tulaganov, 1949). In Jairajpuri (1965), Figure 1B shows a median depression (not constriction) in the enlarged part of the esophagus, while in Figure 1E this depression is not as marked and the overall picture is typically dorylaimid. Such a condition of the esophagus may be attributed either to the faulty techniques of killing, fixing or dehydrating the specimens, or to the destruction of the muscular elements at a particular region resulting in the collapse of the boundary tissues. Hence it is concluded that this character does not carry any diagnostic value. *Qudsianema* Jairajpuri, 1965 and *Qudsiane-matinae* Jairajpuri, 1965 are, therefore, proposed as synonyms of *Eudorylaimus* Andràssy, 1959 and Dorylaiminae (de Man, 1876) Filipjev, 1918 respectively. *Qudsianema amabile* Jairajpuri, 1965 thus becomes *Eudorylaimus amabilis* (Jairajpuri, 1965) n. comb.

The position of the genus *Utahnema* Thorne, 1939, has been uncertain since its inception. Thorne (1939) regarded it a genus of uncertain position under Dorylaimidae. Baker (1962) followed Thorne (loc. cit.) while Clark (1961) and Goodey (1963) placed it along with *Xiphinema* and *Longidorus* under Tylencholaiminae of Dorylaimidae.

In a collection made in Tunisia by Mr. K. F. Brown of the Shell International Chemical Co., London, were a few female and juvenile individuals almost identical with *Utahnema tenuidens* Thorne, 1939, the type and the only species of the genus. Nonetheless, the differently shaped head and esophageal enlargement help in differentiating this species from *U. tenuidens*. A detailed examination of these specimens revealed that the species belonged to the family Leptonchidae Thorne, 1935 in being meromyarian and having undulated loose cuticle, fewer lateral body pores, small esophageal enlargement, oligocytous intestine, and small offset head. Dr. Juan Heyns of Pretoria, South Africa also examined these specimens and found them to be true leptonchids. The present species is very similar but differs from *U. tenuidens*, and is described here as a new species of *Utahnema* and the genus placed under Leptonchidae.

The position of the genus *Utahnema* within the family Leptonchidae merits some com-
Fig. 2. A–F. *Utahnema gracile* n. sp. A. Amphidial system. B. Tail end of female. C. Head end of female. D. Female. E. Esophageal enlargement and esophago-intestinal valve. F. Vulva and vagina.
ments. In this family, the genera also with an attenuated spear are Leptonchus Cobb, 1920; Proleptonchus Lordello, 1955; Doryschota Thorne, 1964; Oostenbrinkella Jairajpuri, 1965 and Xiphinemella Loos, 1950 (Syn. Botalium Heyns, 1963, n. syn. This conclusion is drawn after comparing the specimens of the type species, Botalium eversum, with a Xiphinemella species from South India. Botalium eversum, therefore, is redesignated as Xiphinemella eversum (Heyns, 1963) n. comb.). According to the classification proposed by Jairajpuri (1964, 1964a), the first three of these belong to the subfamily Leptonchidae, the fourth to the Tylencholaimellinae, while the last one to the Xiphinemellinae. This scheme is based on the structure of the spear extension—simple in Leptonchidae, knobbed in Tylencholaimellinae, and flanged at base in Xiphinemellinae.

Utahnema, a relative of Xiphinemella by virtue of possessing elongate, rodlike spear extension cannot justifiably be put within Xiphinemellinae as it lacks flanges at the base of the spear extension. The present author feels that both these genera are not far removed from Leptonchus to permit the erection of a separate subfamily as the basic character of the spear extension is very divergent in the leptonchid genera (other characters of the subfamily, presence of a labial disc and more numerous supplementary papillae in male are also shared by the members of the Leptonchidae). It is, therefore, proposed that Xiphinemellinae be regarded a synonym of Leptonchidae and Utahnema be placed near Xiphinemella within Leptonchidae.

Utahnema gracile n. sp.

(Fig. 2, A–F)

**Measurements:** Females (4): L = 0.60–0.72 mm; a = 24–30; b = 3.7–4.0; c = 25–33; V = 50–54%; spear = 21–23 μ; spear extension = 15–18 μ.

Holotype (Female): L = 0.72 mm; a = 30; b = 4; c = 33; V = 52.5%.

**Description:** Body almost straight when relaxed. Cuticle apparently in two layers, marked by fine transverse striae, wavy as in leptonchids. Amphids stirrup-shaped, about half as wide as head. Head set off from body by a constriction, 10 μ wide and about half as much high; six amalgamated lips give the head a slightly hexagonal outlook. Spear elongate-cylindrical, with a small aperture, about twice head width. Spear extension simple, rodlike, shorter than spear. Spear guiding ring single, about a head width from anterior end. Esophagus a cylindrical muscular tube, expanding in its posterior ½ to form a cylindroid bulb, about ½ as wide as body; three gland nuclei seen (Fig. 2E). Esophago-intestinal valve large, rounded, ½ as wide as body. Nerve ring a little behind middle of esophagus. Intestine oligocytous, with wide lumen and few granules in its cells.

Vulva a transverse slit, with slightly raised lips; its dilator muscles forming an X-shaped pattern when seen from ventral side. Vagina extending about halfway into body, not sclerotized (Fig. 2F). Gonads paired, symmetrically opposed, with flexure at oviduct, each ovary with a few oocytes (Fig. 2D). Pre-rectum about three body widths long. Rectum about as long as tail. Tail dorsally convex-conoid to a rounded terminus, about 1½ times anal body width, slightly subdigitate (Fig. 2B). Two pairs of caudal pores present.

Male not found.

**Type Habitat and Locality:** Collected from soil around roots of almond trees near Tunis-Sausse Road, about 76 km from Tunis, Tunisia.

**Type Material:** Holotype deposited in the nematode collection of the Plant Pathology Section, Aligarh Muslim University, Aligarh, U.P., India; three females in author's personal collection.

**Relationship:** Utahnema gracile n. sp. differs from U. tenuidens Thorne, 1939, the only species in the genus, in having a more slender body (a = 17 in U. tenuidens), a differently shaped head (lips projecting forward to form a dome-shaped elevation bearing oral opening in U. tenuidens), a less attenuated front end of esophagus, a longer and unconstricted esophageal enlargement, a larger cardia, a shorter neck, and vulva more anterior.

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Xiphinema macrostylum n. sp. (Nematoda: Longidoridae)

R. P. Esser1

In April 1960, root samples from banana (Musa × paradisiaca L. var. sapientum, Kuntze) and associated soil from Guayaquil, Ecuador, were examined for nematodes. Banana production in the sample site had been sharply reduced. Plants in the affected area were stunted or killed. Nonmarketable or no banana bunches at all comprised production from the affected area. Division of Plant Industry plant pathologists isolated Fusarium oxysporum Schlecht. ex Fr. from the rhizome, fruit stalk, and leaf sheath tissue of affected plants taken from the site of the malady.

Nematode examination revealed Helicotylenchus microlobus, Perry, 1959, in very large numbers; Meloidogyne sp., Trichodorus nanus, Allen, 1957, in moderate numbers; and a few Radopholus similis (Cobb, 1893) Thorne, 1949. In addition a moderate number of a previously undescribed species of Xiphinema were found the description of which follows.

Xiphinema macrostylum n. sp. (Fig. 1, A–H). 162 q; Length 2.34 (2.15–2.48) mm; a = 28 (24–33); b = 4.6 (4–6); c = 48 (41–71); V = 43 (39–51). Total stylet length 278 μ (257–294).

FEMALE (HOLOTYPE): Length 2.36 mm; a = 27; b = 4.2; c = 46; V = 44. Total stylet length 294 μ.

FEMALE DESCRIPTION: Body elongate, obese tail bluntly conoid 35–55 μ long, tail/anal body diameter 0.6–0.7 μ. Cervical region tapered, lip region not set off. Amphids distinct laterally (Fig. 1, A). Minute fibrils seen in the sensillae pouches. In an en face view the oral aperture is ragged in appearance, roughly rectangular in shape. A slightly raised hexagon comprises the circumoral elevation. Six lips present, one papilla present on the apical portion of each lip in the internal circle. Two papillae like structures present on the basal portion of the subventral and subdorsal lips in the external circle. A previously undescribed flaplike structure extends over the amphid on either side of the head. This structure, herein named “amphial shield,” arises near the basal part of the lateral lips extending to the

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