Re-description of *Durinemella elongata* Andrássy 2009, and *Uniqaxonchium megaspiculatum* Dhanam & Jairajpuri 1998 (Nematoda: Belondiroidea) with emended generic diagnosis

Sumit Kumar[1, 2]*, Wasim Ahmad[2]

Abstract - The population of *Durinemella elongata* and *Uniqaxonchium megaspiculatum* were isolated from the soil samples collected from Western Ghats of India. We compared our isolated specimens with the original description of both the species. The inconsistences in morphology, morphometrics, and some errors in the original description of these species encouraged us to re-describe them. The newly recorded specimen of *Durinemella elongata* showed a thin sheath surrounding the expanded part of the pharynx without spiral bands, which was not mentioned in original description. Additionally, we noted cheilostom with a weak basket-like structure in our specimens, instead of cuticularized refractive elements around oral aperture described originally. Other key characteristics include a cylindrical, tongue-like cardia with the intestine attached at its posterior tip, amphidelphic female genital system, slender and arcuate spicules, 3-4 widely spaced ventromedian supplement, and a long, filiform whip-like tail. *Uniqaxonchium megaspiculatum* is also re-described with new morphological and morphometics data, along with SEM and LM photographs. It is characterised by an offset lip region, a fusiform odontostyle, pharynx long with its posterior expanded part separated by a deep constriction from the anterior slender part; female genital system mono-opishthodelphic, vagina more than corresponding body diameter deep, highly inclined posteriad. Male with long slender, arcuate spicules, 4-7 ventromedian supplements, along with a short, hemispheroid tail, similar in sexes. Based on this new morphological and morphometrics data, we have emended the generic diagnosis for both the genera *Durinemella* and *Uniqaxonchium*, providing detailed description for their type species.

Key words: belondirid, description, *Duriella*, nematode, taxonomy.

Riassunto - Ri-descrizione di *Durinemella elongata* Andrássy 2009 e di *Uniqaxonchium megaspiculatum* Dhanam & Jairajpuri 1998 (Nematoda: Belondiroidea) con diagnosi generica emendata.

Le popolazioni di *Durinemella elongata* e *Uniqaxonchium megaspiculatum* sono state isolate da campioni di suolo raccolti nei Ghati Occidentali dell'India. Abbiamo confrontato i nostri esemplari isolati con la descrizione originale di entrambe le specie. Le incongruenze nella morfologia, nella morfometria e alcuni errori presenti nella descrizione originale di queste specie ci hanno spinto a ridescriverle. Il nuovo esemplare registrato di *Durinemella elongata* ha mostrato una sottile guaina che circonda la parte espansa della faringe, priva di bande spirali, caratteristica non menzionata nella descrizione originale. Inoltre, nei nostri esemplari abbiamo osservato un cheilostoma con una debole struttura a cestello, invece degli elementi cuticolarizzati rifrangenti attorno all'apertura orale descritti originariamente. Altre caratteristiche chiave includono una cardia cilindrica, simile a una lingua, con l'intestino attaccato alla sua estremità posteriore, un sistema genitale femminile anfidelfo, spicole sottili e arcuate, 3-4 supplementi ventromediani ampiamente distanziati e una coda lunga, filiforme, simile a una frusta. *Uniqaxonchium megaspiculatum* viene anch'esso ridescritto con nuovi dati morfologici e morfometrici, accompagnati da fotografie al SEM e al LM. È caratterizzato da una regione labiale distinta, un odontostilo fusiforme, una faringe lunga con la sua parte posteriore espansa separata da una profonda costrizione dalla parte anteriore sottile; sistema genitale femminile mono-opistodelfo, vagina più profonda del diametro corporeo corrispondente e fortemente inclinata posteriormente. Il maschio presenta spicole lunghe, sottili e arcuate, 4-7 supplementi ventromediani, insieme a una coda corta, emisferoide, simile in entrambi i sessi. Sulla base di questi nuovi dati morfologici e morfometrici, abbiamo emendato la diagnosi generica per entrambi i generi *Durinemella* e *Uniqaxonchium*, fornendo una descrizione dettagliata delle rispettive specie tipo.

Parole chiave: belondiridi, descrizione, *Duriella*, nematodo, tassonomia.

[1] Department of Life Sciences, Jaypee University Anoopshahr, Bulandshahr-203390, India.
[2] Nematode Biodiversity Research Lab, Department of Zoology, Aligarh Muslim University, Aligarh-202002, India.

* Corresponding author: sumitchandra.20@gmail.com

© 2026 Sumit Kumar, Wasim Ahmad

Received for publication: 23 July 2025
Accepted for publication: 19 May 2026
Online publication: 5 November 2026

INTRODUCTION

Durinemella elongata Andrássy 2009, and *Uniqaxonchium megaspiculatum* Dhanam & Jairajpuri 1998 (Dorylaimida: Belondiroidea), were both described from Malnad Tracts of Karnataka, in the Western Ghats. In their study, Dhanam & Jairajpuri (1998) proposed a new genus *Duriella* for *D. elongata*. Additionally, they established the subgenus *Uniqaxonchium* under the genus *Axonchium* Cobb 1920, with *U. megaspiculatum* as the type species. They differentiate *Uniqaxonchium* from *Phallaxonchium* Jairajpuri & Dhanachand 1978 and *Axonchium* Cobb 1920 on the basis of its long slender highly inclined posteriad vagina surrounded by well-developed musculature, and long and bulky spicules. Andrássy (2009) rejected the subgeneric grouping of *Axonchium* and raised the subgenus *Uniqaxonchium* to generic rank. Naz & Ahmad (2012), Peña-Santiago *et al*.

OPEN ACCESS
BY-NC
pagepress

(2014b), Varela-Benavides & Peña-Santiago (2017, 2018), Nguyen & Peña-Santiago (2018), and Kumar & Ahmad (2023) describe several species of the family Belondiridae Thorne 1939 as per Andrássy (2009) grouping. The genus *Duriella* is closely related to *Qudsiella* Jairajpuri 1967, and *Paraqudsiella* Siddiqi 1981. Dhanam & Jairajpuri (1998) differentiated the genus *Duriella* from *Qudsiella* primarily by its longer body, expanded part of pharynx without a spiral muscular sheath, and a non-attenuated odontostyle. In comparison to *Paraqudsiella*, *Duriella* was distinguished by its longer body, amphidelphic female genital system, and a very long whip-like tail. As *Duriella* is a primary homonym (*Duriella* Row 1911 (Demospongiae)), Andrássy (2009) emended its name to *Durinemella* and classified it under the subfamily Swangeriinae Jairajpuri 1964.

During 2016-2019, we sampled several populations of the belondirids group from the Western Ghats of India. Detailed analysis allowed their identification as *Durinemella elongata* and *Uniqaxonchium megaspiculatum*. The re-description of both species was supplemented with new morphological details obtained using digital Differential Interference Contrast (DIC) microscopy. The study of these specimens also provided the opportunity to emend the generic diagnosis and to incorporate new morphological characters into the species description.

MATERIALS AND METHODS

Nematode extraction and LM study

Soil samples were collected from different localities of the Western Ghats of India. Nematodes were extracted using the sieving and decantation method described by Cobb (1918) with a modified Baermann funnel technique. Isolated specimens were fixed in 4% formaldehyde, dehydrated in anhydrous glycerin following the method described by Siddiqi (1964), and then mounted on glass slides sealed with paraffin.

Measurements of the nematodes were taken using an Olympus BX 51 light microscope and photographed using a "Nikon Eclipse 80i" microscope equipped with digital camera. Raw photographs were processed using Adobe Photoshop 7.0. Morphometrics of the spicules were taken as per Peña-Santiago *et al*. (2014a), Loof & Coomans (1970) formula was followed for the measurements of the position of pharyngeal glands and their nuclei.

Scanning Electron Microscopy (SEM) study

Some specimens preserved in glycerin were selected for observation with a SEM, dehydrated specimens were rehydrated in glycerol-alcohol rehydrated series (7G:3A, 5G:5A, 3G:7A) to 30% ethanol, each for 20 minutes, and then specimens were transferred into distilled water. After rehydration, the specimens were fixed in glutaraldehyde in 0.05 M sodium phosphate buffer (pH=6.8) for overnight, dehydrated in graded ethanol series (30, 50, 70, 80, 90, 95, and 100% for 30 minutes each step). Dehydrated specimens were dried using a Critical Point Dryer (Leica-EM CPD300), coated with gold in a sputter coater (JEOL-JFC-1600). Specimens were observed and photographed in a Scanning Electron Microscope (JEOL JSM-65 10LV).

RESULTS

Durinemella elongata (Dhanam & Jairajpuri 1998) Andrássy 2009

= *Duriella elongata* Dhanam & Jairajpuri 1998
(Fig. 1)

Material examined: One female and one male in good state of preservation.

Measurements: See Tab. 1.

Description: Body slightly curved ventrad upon fixation, 2.0 mm (female), 1.88 mm (male) long. Cuticle with fine transverse striations, about 1µm thick at anterior, 2 µm thick on mid-body and tail (female). Lateral chords 6 µm wide, about one-fifth (18%) of mid-body diameter with indistinct glandular bodies in female, lateral chords indistinct in male. Lateral, dorsal and ventral body pores indistinct.

Lip region hemispheroid, continuous with body, 1.8 (female), 2.0 (male) times as wide as high or about one-fourth (22% female) to one-third (30% male) of body diameter at neck base. Labial and cephalic papillae not raised, cheilostom with a weak basket-like structure appearing in lateral view (Fig. 1A). Amphids fovea cup-shaped, their aperture about 0.7 times the lip region diameter (female). Odontostyle short, about 0.5 times the lip region diameter long with narrow lumen and aperture about one-third of its length (female) (Fig. 1A). Guiding ring single, weakly developed, at 0.6 times the lip region diameter from anterior end (female). Odontophore linear, more than twice the odontostyle length (female). Nerve ring encircling the anterior slender part of pharynx at 49% (female), 48% (male) of neck length from anterior end. The anterior slender part of the pharynx poorly muscular, expanded part of pharynx 4.9 (female), 4.2 (male) times as long as wide, or 2.2 (female), 2.3 (male) times longer than body diameter at neck base, occupying about 33 % (female), 32% (male) of total neck length, enclosed in a very thin sheath without spiral bands (fig. 1C). Only dorsal and one subventral pharyngeal gland nucleus visible: DO = 71.5; DN = 74.4; DO-DN = 2.9; S1N1 = 85 (female). Cardia cylindrical, tongue-like with intestine attached to its posterior end (Fig. 1C), 3.4 times as long as wide, occupying about one-half (53%) of corresponding body diameter (female).

Female: Genital system amphidelphic, both branches almost equally developed (Figs. 1E-F). Ovaries reflexed, not reaching oviduct-uterus junction, measuring 78 µm (anterior), and 64 µm long (posterior), with squamous shaped oocytes arranged a single row except near tip. Oviduct joining ovary subterminally, anterior 110 µm or 3.2 times and posterior 100 µm or 2.9 times the mid-body diameter long, consisting of a slender part with prismatic cells and a slightly wider *pars dilatata*; oviduct-uterus junction marked with sphincter. Uterus simple tube, anterior 67 µm or 2.0 times, and posterior 67 µm or 2.0 times the corresponding body diameter

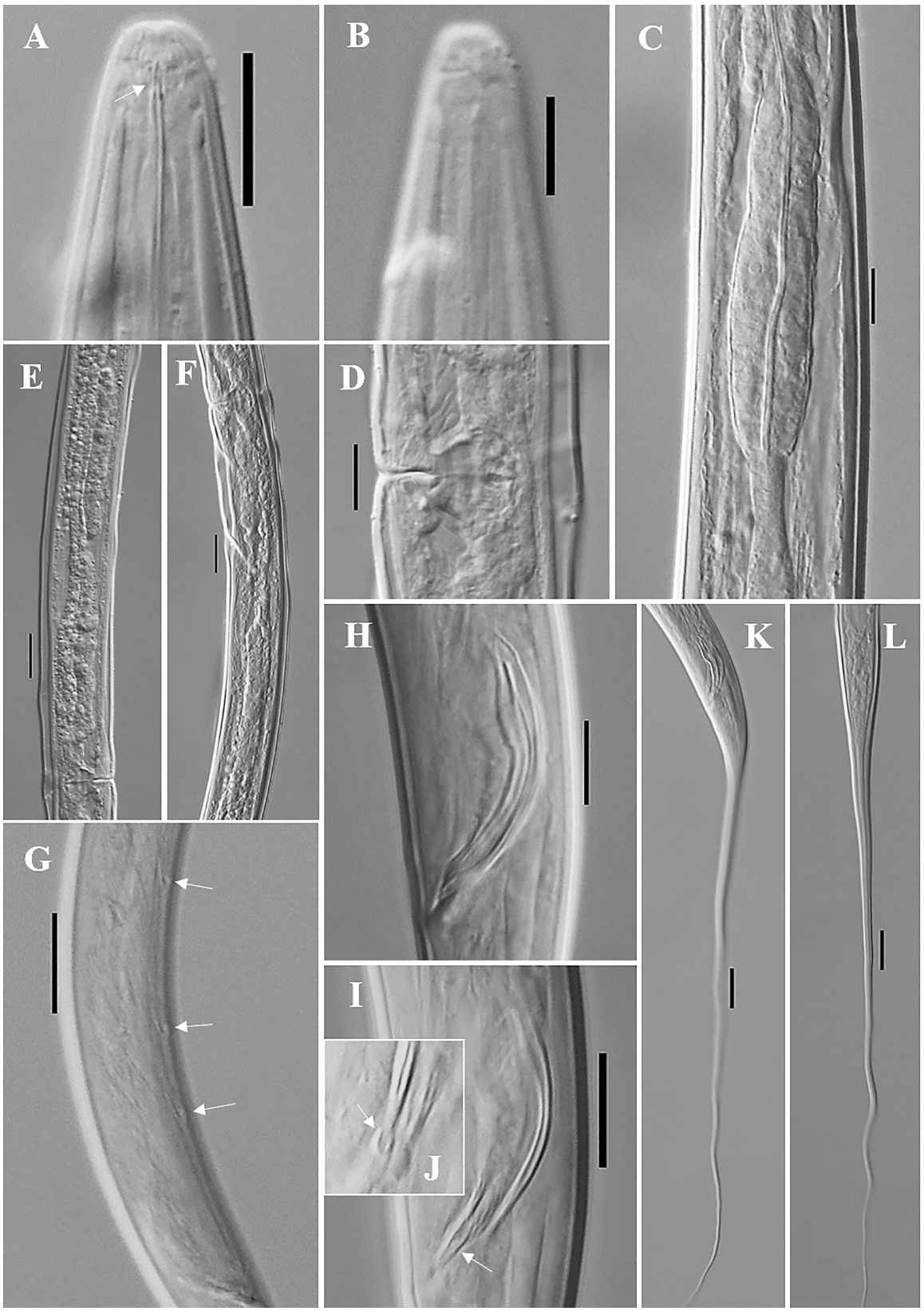


Fig. 1 - *Durinemella elongata* **(**Dhanam & Jairajpuri 1998) Andrássy 2009. A) Anterior region; B) Anterior end showing amphid; C) Expanded part of pharynx; D) Vulva; E-F) Female genital system; G) Ventromedian supplements; H) Spicule; I-J) Lateral guiding pieces, arrow showing proximal end; J) Arrow showing proximal end; K) Male posterior end; L) Female posterior end (Scale bars: A-D and G-J = 10 µm; E, F, K and L = 20 µm). / A) Regione anteriore; B) Estremità anteriore con anfidio; C) Parte espansa della faringe; D) Vulva; E-F) Apparato genitale femminile; G) Supplementi ventromediali; H) Spicola; I-J) Elementi guida laterali, dove la freccia indica l'estremità prossimale; J) Freccia indicante l'estremità prossimale; K) Estremità posteriore del maschio; L) Estremità posteriore della femmina (Barre di scala: A-D e G-J = 10 µm; E, F, K e L = 20 µm).

long; mostly containing oval- shaped sperms. Vulva transverse (Fig. 1D). Vagina extending inwards about two-thirds (65%) of corresponding body diameter; *pars proximalis vaginae* slightly longer than wide, 6 5 µm, with rounded walls, surrounded by circular muscles; *pars refringens* absent; *pars distalis* 7 µm with rounded walls. Prerectum 3.7 and rectum 1.3 times the anal body diameter long. Tail long filiform (Fig. 1L). Caudal pores two on each side.

Male: Similar to female in general morphology, except for posterior region being more curved ventrally. Genital system diorchic, with oppositely outstretched testes. In additional to the ad-cloacal pair, located at about 8 µm from cloacal aperture, there are three ventromedian supplements

Tab. 1 - Measurements of *Durinemella elongata* and *Uniqaxonchium megaspiculatum*. All the measurements in µm except L in mm and in the form: mean ± s.d. (range). / Misure di *Durinemella elongata* e *Uniqaxonchium megaspiculatum*. Tutte le misure sono in µm, tranne L, in mm, nella forma: media ± s.d. (intervallo).

Population	***Durinemella elongata***		***Uniqaxonchium megaspiculatum***	
Characters	Female	Male	Females	Males
n	1	1	5	8
L	1.88	2.0	1.5±0.1 (1.45 - 1.7)	1.6±0.1 (1.5 - 1.76)
a	55.3	72.3	55.5±4.0 (49 - 61)	61±2.8 (58 - 68)
b	9.1	10.2	3.5±0.3 (3.0 - 4.0)	3.6±0.4 (3.1 - 4.2)
c	5.6	6.8	74.5±3.9 (71 - 82)	84±6.3 (74 - 98)
c′	16.8	15.8	1.0±0.1 (0.9 - 1.1)	0.85±0.1 (0.8 - 0.9)
V	36.6	-	48.2±1.5 (47 - 51)	-
G1	9.6	-	7.9±1.2 (6.6 - 9.5)	-
G2	10.1	-	8.5±0.6 (8.0 - 9.6)	-
Body diam. at pharynx base	32	27	28.2±1.2 (27 - 30)	27.1±0.8 (26 - 28)
Body diam. at mid-body	34	28	28.2±1.2 (27 - 30)	26.8±0.9 (26 - 29)
Body diam. at anus/cloaca	20	19	20.8±0.7 (20 - 22)	22.5±1.8 (20 - 25)
Lip region diam.	7	8	7	7
Lip region height	4	4	3	3.7±0.3 (3.5 - 4)
Amphid aperture	5	-	4.5±0.2 (4 - 5)	5
Odontostyle length	3	-	7.4±0.5 (7 - 8)	7.1±0.2 (7 - 7.5)
Odontophore length	6	6	10.2±0.4 (10 - 11)	10.3±0.5 (10 - 11)
Guiding ring from ant. end	4	3	6	6.3±0.4 (6 - 7)
Nerve ring from ant. end	101	95	109.6±5.9 (103 - 120)	114.8±5.6 (105 - 125)
Neck length	207	198	448.8±18.6 (420 - 474)	456.6±39.1 (388 - 502)
Expanded part of pharynx	69	63	233.2±26.6 (200 - 278)	239.8±43.4 (179 - 294)
Cardia length	17	11	10.6±1.7 (8 - 13)	9.8±1.4 (7 - 11)
Anterior genital branch	190	-	124.2±18.9 (97 - 155)	-
Posterior genital branch	180	-	134.4±16.4 (118 - 165)	-
Vaginal depth	22	-	34±2.9 (31 - 38)	-
Vulva from ant. end	688	-	753.4±39.8 (689 - 796)	-
Prerectum length	73	87	241.8±26.4 (210 - 272)	269.3±29.3 (231 - 302)
Rectum length	26	36	28±1.9 (25 - 30)	33±2.9 (28 - 38)
Tail length	335	300	21±1.4 (19 - 23)	19.6±1.1 (18 - 21)
Spicules length	-	35	-	50.5±2.1 (46 - 53)
Lateral guiding pieces	-	7	-	11.1±0.6 (10 - 12)
Ventromedian supplements	-	3	-	4 - 7

(Fig. 1G), arranged above the range of spicules, first located at 38 µm from the adcloacal pair, second at 20 µm from the first, third at 34 µm from the second supplement. Copulatory muscles conspicuous. Spicules slender, arcuate (Fig. 1H); total length along the arc 1.06 times as long as chord, 8.7 times the maximum width or 1.8 times the body diameter at cloacal aperture. Curvature estimated about 132°. Dorsal contour regularly convex, and ventral contour concave, bearing distinct hump, located at 37% of spicules total length from its anterior end; head short, occupying 14.3% of spicules length; median piece simple, 29 times as long as wide and occupying about 25% of spicules maximum width; posterior tip 2 µm wide. Lateral guiding pieces with bifurcated proximal end (Fig. 1I), seven times as long as wide or about one-fifth of total spicules length. Prerectum 4.6 and rectum 1.9 times the cloacal body diameter long. Tail similar to female (Fig. 1K). Caudal pores two on each side.

Habitat and locality: From soil around the root of unidentified grasses from Ramanattukara, Kozhikode district, Kerala; coordinates 11°11'19.22" N 75°51'27.64" E; collected on November 17, 2016.

Remarks: Dhanam and Jairajpuri (1998) described this species from Karnataka, India based on three females and males, however, the description and the line drawings provided had shortcomings and hence it was proposed to redescribe this species providing good Light Microscope (LM) photographs. The present population conforms very well with the type description in general morphometrics except for having comparatively robust body in female (a = 55 *vs* 84 - 85). Dhanam and Jairajpuri (1998) in their original description mentioned presence of cuticularized refractive elements around oral aperture and amphids duplex, however, instead of cuticularized refractive elements around oral aperture, a weak basket-like structure in the cheilostom (Fig. 1A) somewhat similar to the one reported for the genus *Swangeria* Thorne, 1939 is discernible in the present specimens, although it is comparatively strong in the latter. The shape of amphid is also not correctly drawn in fig. 8H of the original description, currently, the amphid appears to be cup-shaped (Fig 1B). The original authors did not report the presence of sheath around expanded part of pharynx, however in the present specimens a thin sheath, though not spiral is distinctly discernible (Fig. 1C). The studied specimens have slightly shorter prerectum (3.7 *vs* 5 - 6 times anal body diameter long); shorter lateral guiding pieces (7 *vs* 9 - 10 µm) and fewer number of ventromedian supplements (3 *vs* 4). With the finding of new morphological features, it is imperative to emend the diagnosis of the genus which is being done in the following.

Genus *Durinemella* Andrássy 2009

= *Duriella* Dhanam & Jairajpuri 1998

Diagnosis: (**emended**) Medium sized (1.6-2.3 mm long) nematodes, slender, slightly curved ventrad upon fixation. Body cuticle with fine transverse striations. Lip region hemispheroid, amalgamated, and continuous with body; cheilostom with very weakly developed basket-like structure; labial and cephalic papillae not projecting above labial contour. Amphids cup-shaped, aperture narrower than fovea maximum width. Guiding ring weakly developed. Odontostyle short, with distinct lumen and aperture about one-third of its length. Odontophore rod-like. Posterior expanded part of pharynx spindle-shaped, enclosed by a thin sheath without spiral bands. Cardia elongate, cylindrical, tongue-like with intestine attached to its posterior tip. Female genital system amphidelphic. Vulva transverse, pre-equatorial. Male with slender, arcuate spicules; lateral guiding pieces small. Ventromedian supplement 3-4, widely spaced, arranged above the range of spicules. Tail long filiform, whip-like, similar in both sexes.

Type and only species: *Durinemella elongata* (Dhanam & Jairajpuri 1998) Andrássy 2009

= *Duriella elongata* Dhanam & Jairajpuri 1998

Remarks: The genus *Durinemella* is very close to *Qudsiella* Jairajpuri 1967 with only difference in the shape of odontostyle and the expanded part of pharynx enclosed in thick spiral muscular sheath in *Qudsiella*, whereas a thin non-spiral sheath is present in *Durinemella*. The odontostyle is very fine, with its anterior half almost solid appearing in *Qudsiella* verses short odontostyle with distinct lumen and aperture in *Durinemella* (Fig. 1A). Additionally, the cheilistome has a weak basket-like structure in the present specimens of the *Durinemella* (Fig. 1A), while such a structure is absent in *Qudsiella*. However, in *Q. tropica* Ahmad & Naz 2010, also the odontostyle is short fusiform with distinct lumen and aperture. Therefore, the two main differences between *Qudsiella* and *Durinemella* are: first, *Qudsiella* possesses a thick spiral muscular sheath and lacks a basket-like structure in cheilostom; second, *Durinemella* has a weak basket structure in the cheilostom and a thin, non-spiral sheath. *Durinemella* also has some similarity with *Paraqudsiella* Siddiqi 1981 in nature of cardia (cylindrical, tongue-like with intestine attached to its posterior end), nature of the pharynx (posterior expanded part short and fusiform), and the long, filiform shape of the tail. However, it distinctly differs by its longer body (1.8-2.0 *vs* 0.5-0.6 mm), cephalic region with very weakly developed basket in cheilostom (*vs* cheilostomal basket absent), a slender and symmetrical odontostyle (*vs* asymmetrical with well distinct lumen), presence of a thin muscular sheath (*vs* absent), and an amphidelphic female genital system (*vs* opisthodelphic in *Paraqudsiella*).

Genus *Uniqaxonchium* Dhanam & Jairajpuri 1998

Diagnosis: (**emended**) Medium sized nematodes; body slender, slightly ventrally arcuate upon fixation. Body cuticle with fine transverse striations. Lip region offset by a constriction. Guiding ring single. Odontostyle fusiform. Odontophore simple rod-like. Anterior slender and posterior expanded part of pharynx separated by a deep constriction. Cardia bluntly conoid to rounded. Female genital system mono-opishthodelphic, anterior branch represented by a simple uterine sac. Vulva transverse, vagina more than corresponding body diameter deep, highly inclined posteriad, vaginal lumen narrow surrounded by well-developed circular muscles. Spicules long, arcuate and slender; lateral guiding pieces with bifid

distal end. Ventromedian supplements 4-7, irregularly spaced. Tail short, hemispheroid, similar in sexes.

Type and only species: *Uniqaxonchium megaspiculatum* Dhanam & Jairajpuri 1998 = *Axonchium* (*Uniqaxonchium*) *megaspiculatum* Dhanam & Jairajpuri 1998

Remarks: Dhanam & Jairajpuri (1998) proposed the subgenus *Uniqaxonchium* under the genus *Axonchium* with *U. megaspiculatum* as its type species. They differentiate it from *Phallaxonchium* Jairajpuri & Dhanachand 1978 and *Axonchium* Cobb 1920 on the basis of highly inclined posteriad, long slender vagina surrounded by well-developed musculature, and long and bulky spicules. Andrássy (2009) raised it to generic rank, and transferred *Axonchium dubium* Siddiqi 1995 (= *U. dubium* (Siddiqi 1995) Andrássy 2009) to this genus without giving any reason. Although, *A. dubium* have long and slender spicules which fits the generic diagnosis of *Uniqaxonchium* but the nature of its vagina which is only slightly bent posteriad with a comparatively wide lumen and extends only about one-half inward is quite different from the vagina in *Uniqaxonchium* which has a characteristically long and highly posteriorly inclined. Hence in our opinion *A. dubium* fits more suitably in *Axonchium* rather than *Uniqaxonchium*. The diagnosis of the genus was revised based on a newly collected population.

Uniqaxonchium megaspiculatum Dhanam & Jairajpuri 1998

= *Axonchium* (*Uniqaxonchium*) *megaspiculatum* Dhanam & Jairajpuri 1998
(Fig. 2)

Material examined: Five females and eight males, in good state of preservation.

Measurements: See Table 1.

Description: Body curve ventrad upon fixation, 1.45-1.7 (1.5-1.7 in males) mm long. Cuticle with fine transverse striations, about 1 µm thick at anterior region, 1-2 µm thick at mid-body and 3-4 µm (2-3 µm thick in males), on tail tip. Lateral chords 3.0-5.0 µm wide, about one-ninth to one-fifth (11-20%) of mid-body diameter (females and males); glandular bodies weakly developed in post-vulval region, 8-21 from vulva to anal region and one in caudal region, glandular bodies indistinct in males. Lateral, dorsal and ventral body pores indistinct.

Lip region offset by deep constriction, 2.3 (1.8-2.0 males) times as wide as high, or about one-fourth (23-26% (25-27% males) of body diameter at neck base. Under SEM (Fig. 2B); lips incompletely separate, outer and inner portion demarcated by slight depression, labial papillae appearing small button-like (females). Amphids fovea stirrup-shaped (Fig. 2C), their aperture about 0.6-0.7 times the lip region diameter, fusus just opposite or slightly posterior to the odontophore level (females and males). Guiding ring single, at 0.9 times the lip region diameter from anterior end (females and males). Odontostyle fusiform (Fig. 2A), 4.6-5.3 (4.6-7.0 males) times as long as wide, or 1.0-1.14 (1.0 males) times the lip region diameter long, its aperture occupying about one-third of its length. Odontophore simple, rod-like, 1.2-1.4 (1.3-1.6 males) times as long as odontostyle. Nerve ring encircling the anterior slender part of pharynx at 21-26 % (21-29 % males) of neck length from the anterior end. Anterior slender part of pharynx quite muscular, separated from the posterior expanded part by deep constriction. Expanded part of pharynx 12-16 (10-18 males) times as long as wide, or 7.1-9.2 (6.3-11 males) times longer than body diameter at neck base, occupying about one-half to three-fifths (48-59%) of total neck length, enclosed in a thick muscular sheath with straight bands (females and males). Only dorsal pharyngeal gland and its orifice visible: DO = 43.4-52.5 (43-57 males); DN = 44.3-53.6 (44-58 males); DO-DN = 0.8-1.1 (5-7 in males). Cardia oblong, 1.3-2.1 (1.2-1.8 males) times as long as wide, occupying about one-fourth to one-half (26-46%) (25-40% males) of the corresponding body diameter (Fig. 1E).

Female: Genital system mono-opisthodelphic (Fig. 2I). Anterior genital branch represented by a simple uterine sac, measuring 97-155 µm or 3.2-5.3 times the mid-body diameter long, and occupying about 6.6-9.5% of body length, containing spindle-shaped sperms. Posterior branch well developed; ovary reflexed, not reaching oviduct-uterus junction, measuring 30-69 µm long with squamous shaped oocytes arranged in a single row except near tip; oviduct joining ovary subterminally, measuring 42-65 µm or 1.5-2.3 times the mid-body diameter long, consisting of a long slender part with prismatic cells and a wider *pars dilatata* with distinct lumen; oviduct-uterus junction marked by a sphincter; uterus 55-97 µm or 1.8-3.4 times the mid-body diameter long, differentiated into a large proximal region with wide lumen, a narrow intermediate region, and a short spherical distal *pars dilatata* with clear lumen. Under SEM (Fig. 2H); vulva a large transverse slit, about 10 µm wide. Vagina highly bent posteriad (Figs. 2F-G), extending inwards about 1.1-1.4 times the corresponding body diameter, vaginal lumen narrow with thick walls, but not differentiated from body cuticle; *pars proximalis vaginae* 16-23 µm long, cylindroid surrounded by well-developed circular muscles, *pars refringens vaginae* absent; *pars distalis vaginae* 10-16 µm long and slender. Prerectum 10.0-13.6 and rectum 1.2-1.5 times the anal body diameter long. Tail hemispheroid (Figs. 2M-N), with 5 µm wide anal aperture. Caudal pores two on each side.

Male: Similar to female in general morphology, except for posterior region of the body being more curved ventrad. Genital system diorchic, with oppositely outstretched testes; sperms spindle-shaped, measuring 4-6 2 µm. In addition to the ad-cloacal pair, located at 6-7 µm from cloacal aperture, 4-7 irregularly spaced ventromedian supplements, beginning at 26-37 µm anterior to ad-cloacal pair or slightly posterior to the proximal end of the spicules. Copulatory muscles conspicuous, beginning from the posterior end of spicules and continues till the level of last supplements. Spicules arcuate (Figs. 2J-K), total length along the arc 1.0-1.1 times as long as chord, or 8.3-8.8 times the maximum width, and 2.0-2.5 times the body diameter at cloacal aperture. Curvature about 127˚-135˚. Dorsal contour regularly convex; ventral contour concave with weak hump, located at 15-24% of spicules total length from its anterior end; head slender

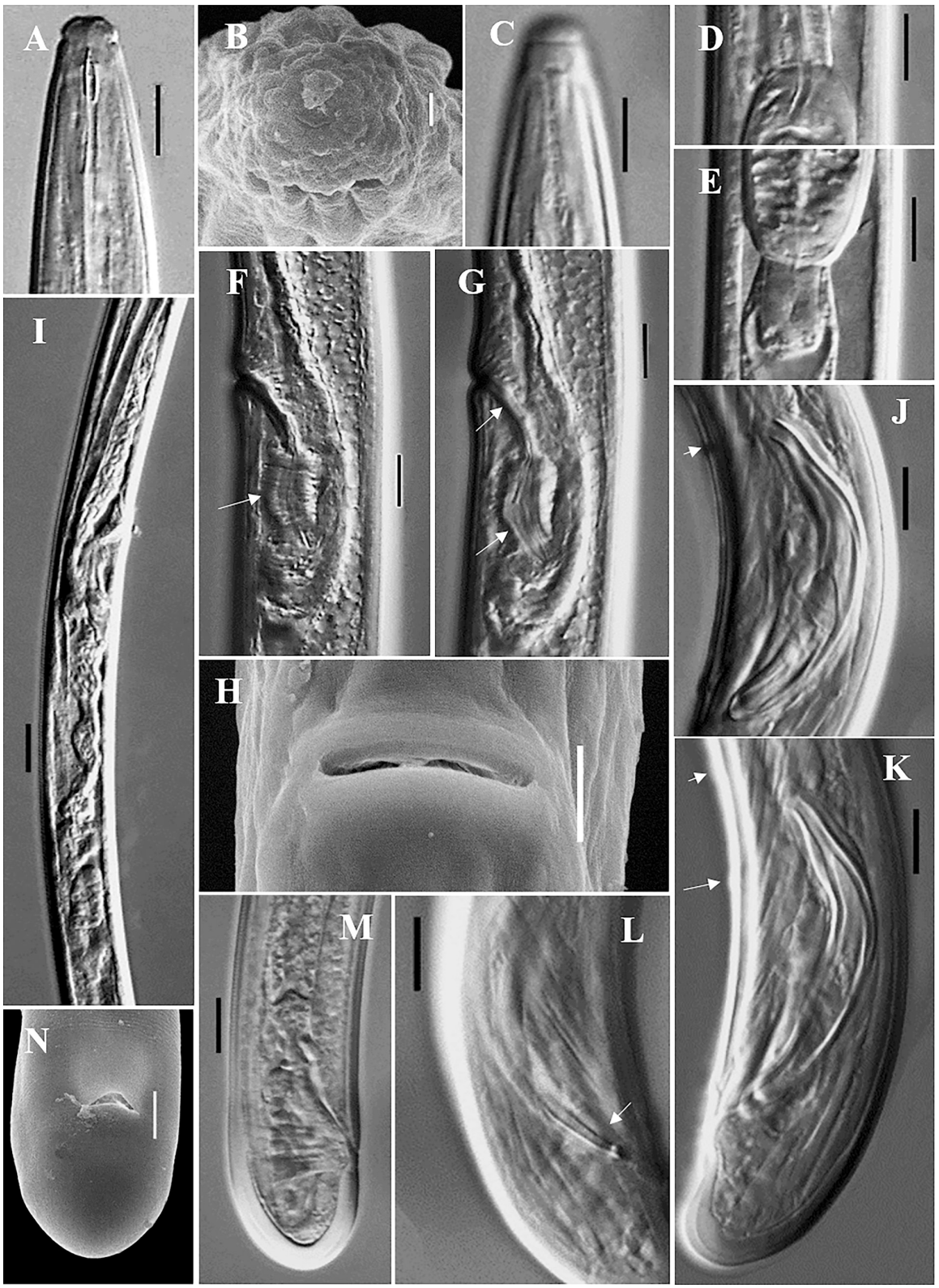


Fig. 2 - Uniqaxonchium megaspiculatum (Dhanam & Jairajpuri 1998). A) Anterior region; B) Lip region in front view (SEM); C) Anterior end showing amphid; D) Junction between two part of the pharynx; E) Cardia; F) Arrow showing circular muscles around vagina; G) Arrow showing vagina; H) Vulva in ventral view (SEM); I) Female genital system; J and K) Male posterior region, and arrow showing first ventromedian supplement; L) Lateral guiding pieces; M) Female posterior end; N) Tail and anal opening in ventral view; SEM (Scale bars: A, C-G and J-M = 10 µm; B = 1 µm; H and N = 5 µm; I = 20 µm). / A) Regione anteriore; B) Regione labiale in vista frontale (SEM); C) Estremità anteriore che mostra l'anfidio; D) Giunzione tra le due parti della faringe; E) Cardia; F) Freccia indicante i muscoli circolari attorno alla vagina; G) Freccia indicante la vagina; H) Vulva in vista ventrale (SEM); I) Apparato genitale femminile; J e K) Regione posteriore del maschio e freccia indicante il primo supplemento ventromediale; L) Elementi di guida laterali; M) Estremità posteriore della femmina; N) Coda e apertura anale in vista ventrale; SEM (Barre di scala: A, C-G e J-M = 10 µm; B = 1 µm; H e N = 5 µm; I = 20 µm).

and slightly curved, 5.0-10 µm long, and occupying about 10-19 % of spicules total length; median piece simple, 10-15 times as long as wide, and occupying about 50-66 % of spicules maximum width; posterior end 3-4 µm wide. Rod-like lateral guiding pieces with slightly bifid distal end (Fig. 2L), about 5-8 times as long as wide or about one-fifth to one-fourth of total spicules length. Prerectum very long, 11.5-12.6, and rectum 1.2-1.6 times the cloacal body diameter long. Tail similar to female except truncate terminus with deep depression on ventral side. Caudal pores two on each side.

Habitat and locality: From soil around the roots of unidentified shrubs with mix grasses near village Isloor (Sirsi), Uttara Kannada district, Karnataka, India; coordinates 14°67'7092" N 74°88'2016" E; collected on October 28, 2018.

Remarks: Dhanam & Jairajpuri (1998) described this species from Shigode, Karnataka, India as type of their newly proposed subgenus *Uniqaxonchium* under the genus *Axonchium*. Andrássy (2009) raised this subgenus to generic rank. The present population of *U. megaspiculatum* from Uttara Kannada, conforms well with the type population except for having slightly narrower lip region (7 *vs* 8 µm); the nature of lips (outer and inner lips demarcated by shallow depression *vs* prominently demarcated); amphids cup-shaped with aperture 0.6-0.7 times the lip region width (*vs* amphid stirrup shaped, equal to the lip region diameter as per fig 6B of original description); slightly longer anterior uterine sac (G1 = 6.6-9.5 *vs* 5-6); shorter prerectum in males (11.5-12.6 *vs* 13-16 times cloacal body diameter); slightly different shape of spicules and tail. These minor differences in the shape of lip region, amphid, the nature of vagina and shape of spicules and tail tip might be because the original author only provided the line drawings which can have individual errors. Since the present specimens are from the same area from where the original population was collected, the two populations are the same species.

DISCUSSION

The recent discovery of *Durinemella elongata* and *Uniqaxonchium megaspiculatum* in the Western Ghats of India has led to a re-description of these species and a discussion of notable issues concerning the genus. Dhanam & Jairajpuri (1998) established a new genus *Duriella* for the new species *D. elongata*, and a subgenus, *Uniqaxonchium*, under the genus *Axonchium* Cobb 1920, with *U. megaspiculatum* as its type species, found in Karnataka, a region of the Western Ghats.

Detailed morphological studies on these specimens have revealed additional characteristics that were not included in the original description (Dhanam & Jairajpuri 1998). Therefore, it is essential to re-examine these species from their type localities to verify their taxonomic validity. In the original description of the genus *Durinemella*, cuticularized refractive elements around the oral aperture were noted, and the shape of the amphid was incorrectly depicted. Additionally, the presence of a thin sheath surrounding the expanded part of the pharynx was not reported.

The present study documents previously unreported diagnostic features, including a weak cheilostomal basket-like structure, a characteristic already observed in the genus *Swangeria* Thorne 1939. Furthermore, our specimens show a thin, distinct sheath around the expanded part of the pharynx and cup-shaped amphid. As a result, we have revised the generic diagnosis to incorporate these new morphological features, particularly the sheath, which is a significant characteristic of the belondird nematodes.

The subgenus *Uniqaxonchium* features a highly posterior inclined slender vagina, distinguishing it from *Phallaxonchium* Jairajpuri & Dhanachand 1978 based on its vaginal characteristics. Andrássy (2009) elevated *Uniqaxonchium* to full genus status, designating *U. megaspiculatum* as its type species and transferring *Axonchium dubium* Siddiqi 1995 to this genus without providing justification. *U. dubium* is being retained back to *Axonchium* as explained above. The diagnoses of both the genera has been revised based on our additional morphological observations.

This study, by redescribing both species with diagnostic characters that allow for clear differentiation from closely related species, resolves previous taxonomic ambiguities. Besides, this re-description provides an updated diagnostic framework that will facilitate accurate identification and will also aid in future taxonomic, ecological, and systematic research.

Acknowledgements

The authors are thankful to the Chairman, Department of Zoology for providing necessary laboratory facilities during the sample collection. The first author also thanks the University Grants Commission, Govt. of India for the support and assistance under UGC-RGNF programme.

REFERENCES

Ahmad W. & Naz T., 2010 – Description of new and known species of the rare nematode genera *Qudsiella* Jairajpuri, 1967 and *Swangeria* Thorne, 1939 (Belondiridae: Dorylaimida). *Nematology*, 12 (6): 877-890. <https://doi.org/10.1163/138855410X494152>

Andrássy I., 2009 – Free-living nematodes of Hungary (Nematoda errantia). Vol. III. Pedozoologica Hungarica No. 5. *Hungarian Natural History Museum*.

Cobb N.A., 1918 – Estimating the nema population of the soil, with special reference to the sugar-beet and root-gall nemas, *Heterodera schachtii* Schmidt and *Heterodera radicicola* (Greef) Müller, and with a description of *Tylencholaimus aequalis* n. sp. *United States Department of Agriculture, Bureau of Plant Industry*, *Agriculture Technical Circular*, 1.

Cobb N.A., 1920 – One hundred new nemas. *Contributions to the Science of Nematology*, 9: 217-343.

Dhanam M. & Jairajpuri M.S., 1998 – New belondirid nematodes: two new genera, two new subgenera and seven new species from Malnad tracts of Karnataka, India. *International Journal of Nematology*, 8 (2): 193-213. <https://library.wur.nl/WebQuery/titel/2091520>

Jairajpuri M.S., 1964 – Studies on Nygellidae n. fam. and Belondiridae Thorne, 1939 (Nematoda: Dorylaimoidea) with description of ten new species from India. *Proceedings of the Helminthological Society of Washington*, 31 (2): 173-187. <http://science.peru.edu/COPA/ProcHelmSocWash_V31_N2_1964I.pdf>

Jairajpuri M.S., 1967 – *Qudsiella gracilis* n. gen, n. sp. (Nematode: Dorylaimida) from Andamans, India. *Nematologica*, 12: 587-590. <https://doi.org/10.1163/187529266X00437>

Jairajpuri M.S. & Dhanachand Ch., 1978 – Some studies on Axonchiinae (Belondiridae) from Manipur, India. *Indian Journal of Nematology*, 8: 127-151.

Kumar S. & Ahmad W., 2023 – Six new and four known species of the genus *Axonchium* Cobb, 1920 (Nematoda: Dorylaimida: Belondiroidea) from Western Ghats of India. *European Journal of Taxonomy*, 857: 1-56. <https://doi.org/10.5852/ejt.2023.857.2039>

Loof P.A.A. & Coomans A., 1970 – On the development and location of the oesophageal gland nuclei in the Dorylaimina. *Proceedings of the IX International Nematology Symposium,* Warsaw, 1967: 79-161.

Naz T. & Ahmad W., 2012 – Description of two new and five known species of the genus *Axonchium* Cobb, 1920 (Nematoda: Dorylamida) from India with diagnostic compendia and keys to species of the genera *Axonchium* and *Syncheilaxonchium* Coomans & Nair, 1975. *Zootaxa*, 3264 (1): 1-37. <https://doi.org/10.11646/zootaxa.3264.1.1>

Nguyen T.A.D. & Peña-Santiago R., 2018 – Two new species of the genus *Metaxonchium* Coomans Nair, 1975 (Nematoda, Dorylaimida, Belondiridae) from Vietnam. *Zootaxa*, 4415 (1): 150-160. <https://doi.org/10.11646/zootaxa.4415.1.7>

Peña-Santiago R., Abolafia J. & Álvarez-Ortega S., 2014a – New proposal for a detailed description of the dorylaim spicule (Nematoda: Dorylaimida). *Nematology*, 16 (9): 1091-1095. <https://doi.org/10.1163/15685411-00002834>

Peña-Santiago R., Niknam G., Álvarez-Ortega S. & Jabbari H., 2014b – *Metaxonchium persicum* sp. n. from Iran (Nematoda, Dorylaimida, Belondiridae), with an updated taxonomy of the genus. *Zootaxa*, 3785 (4): 501-517. <doi.org/10.11646/zootaxa.3785.4.1>

Siddiqi M.R., 1964 – Four new species in the family Belondiridae (Nematoda: Dorylaimida). *Labdev Journal Science and Technology*, 2: 37-41. <https://www.cabidigitallibrary.org/doi/full/10.5555/19670800773>

Siddiqi M.R., 1981 – Six new genera of dorylaimid nematodes. *Nematoligica*, 27: 397-421. <https://doi.org/10.1163/187529281X00403>

Siddiqi M.R., 1995 – Nematodes of tropical rainforests, seven new genera and forty two new species of dorylaims. *Afro-Asian Journal of Nematology*, 5: 72-109.

Thorne G., 1939 – A monograph of the nematodes of the superfamily Dorylaimoidea. *Capita Zoologica*, 8.

Varela-Benavides I. & Peña-Santiago R., 2017 – *Metaxonchium toroense* n. sp. (Nematoda, Dorylaimida, Belondiridae) from Costa Rica, with the first molecular study of a representative of the genus. *Journal of Helminthology*, 93 (1): 100-108. <https://doi.org/10.1017/S0022149X17001134 >

Varela-Benavides I. & Peña-Santiago R., 2018 – Two new species of the genus *Metaxonchium* Coomans & Nair 1975 (Nematoda, Dorylaimida, Belondiridae) from Costa Rica, with new insights in the phylogeny of the family Belondiridae. *Zoologischer Anzeiger*, 277: 1-11. <https://doi.org/10.1016/j.jcz.2018.06.007>