Research Article

New and Known Species of Predacious Nematodes of Pakistan

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Abstract | During the survey of predacious nematode of Pakistan two new species and eight new records of the following species were recovered. *Mylonchulus musae* n. sp., collected from the rhizophoric soil of *Musa paradisiaca* L. in Karachi Sindh, *Discolaimus tabacum* n. sp., from the roots of *Nicotiana tabacum* L. in Manshera, KP, *Discolaimus conicus* Siddiqi, 2005 from the roots of *Saccharum officinarum* L. in Mirpurkhas, Sindh, *Discolaimus laksi* Khan and Laha, 1982 from soil around the roots of *Gossypium hirsutum* L. in Sargodha, Punjab, *Discolaimus omanensis* Siddiqi, 2005 from roots of *Mangifera indica* L., in Faisalabad, Punjab, *Discolaimus paratenax* Siddiqi, 2005 from decaying matter in Peshawar, KP, *Dorylaimoides micoletzkii* (de Man, 1921) Thorne and Swanger, 1936 from soil around the roots of *Vitis vinefera* L. in Quetta, Balochistan, *Sectonema ventralis* Thorne,1930 from roots of *Prunus persica* L. in Peshawar, KP, *Ironus terranovus* Ebsary, 1985 from soil around the roots of *Musa paradisiacal* L. in Nawabshah, Sindh and *Seinura oswegoensis* (Van der Linde, 1938) Goodey, 1960 from the roots of *Oryza sativa* L. in Nawabshah, Sindh. Morphological and morphometric details, description illustrations, along with the photomicrographs are given.

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Introduction

An extensive survey was conducted in various parts of the country to investigate the fauna of predacious nematodes. Soil and root samples were collected from different host and localities of Pakistan. Among them two new and eight known species have been encountered that belong to the orders, Mononchida, Dorylaimida, Enoplida, and Aphelenchida. The order Dorylaimida includes seven species while one each species of the orders Mononchida, Enoplida and Aphelenchida are described and redescribed here in.

Materials and Methods

Nematodes were extracted from soil samples by Cobb's wet sieving and decanting methods (Cobb, 1918), followed by the modified Baermann funnel technique (Baermann, 1917). Specimens were fixed with a hot 4% formaldehyde solution and processed to anhydrous glycerin by Seinhorst's method (Seinhorst,

1959). Measurements were taken directly using an ocular micrometer. de Man's (1884) formula was used for denoting the dimensions of the nematodes. Line drawings were made using Nikon Eclipse E400 microscope equipped with Normarski DK accessories. Photomicrographs were made with Nikon DS-Fil digital camera. Photomicrographs were edited by Adobe Photoshop.

Mylonchulus musae n. sp.
(Figures 1A-E, 11A-D)

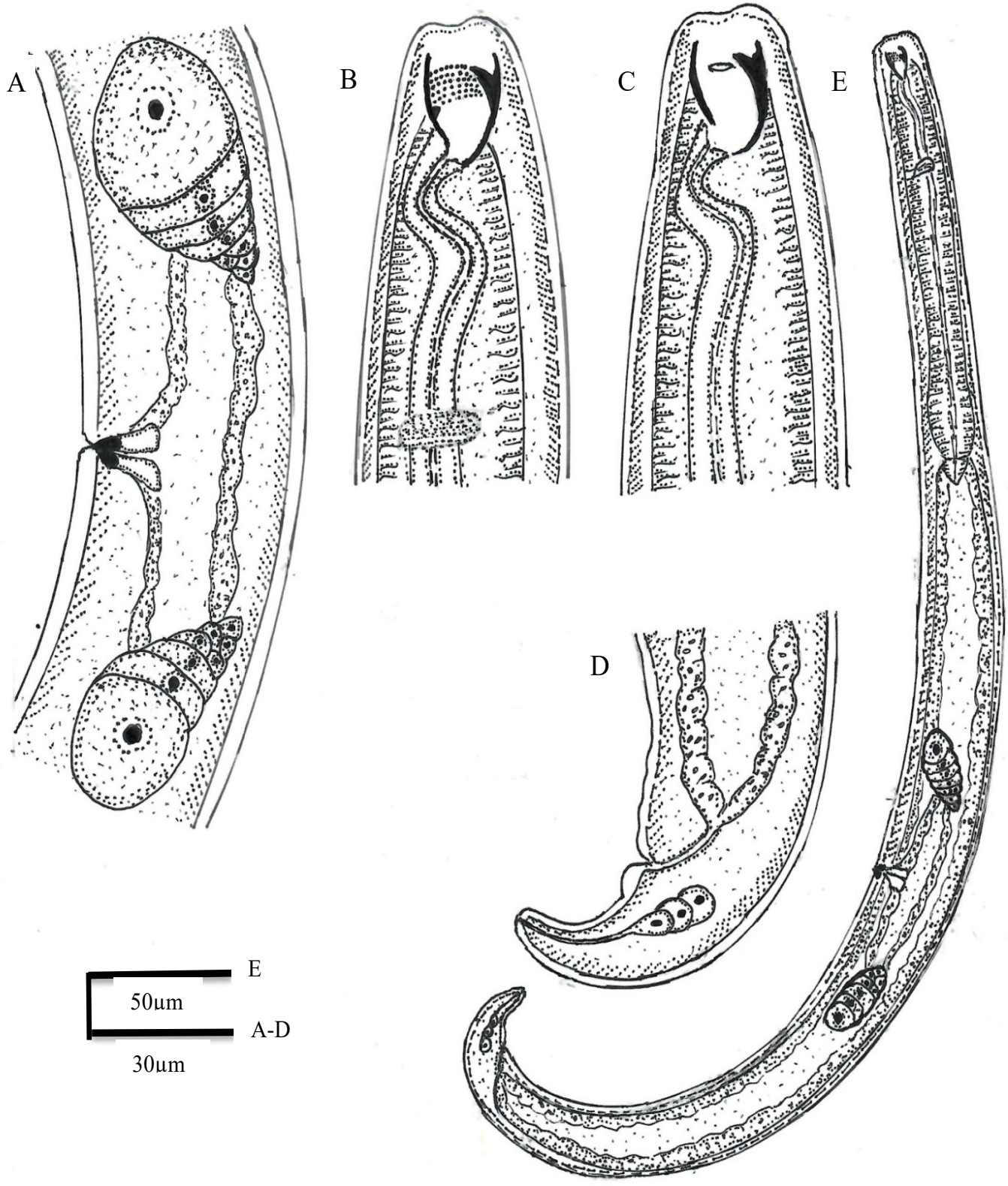

Figure 1: *Mylonchulus musae n. sp. Female: A, reproductive system; B, anterior region; C, anterior region showing amphid; D, tail region and E, whole body.*

Measurements: Table 1

Table 1: *Morphometric data of Mylonchulus musae n. sp. All measurements are in µm except L and in the form: Mean ± SD (range).*

Characters	Holotype female	Paratype female (n=10)	
		Mean±SD	Range
L	0.65	0.72±0.006	0.65-0.85
a	16.3	16.8 ± 2.61	14-21.4
b	2.8	3.1 ± 0.23	2.8-3.4
c	21.8	25.3 ± 2.71	22-28
c'	1.0	1.08 ± 0.09	1.0-1.2
V	58.3	58.6 ± 0.41	58-59.2
G_1	12.2	11.8 ± 1.06	10.2-13.5
G_2	10.6	10.4 ± 0.89	8.9-12.0
Lip region width	20	21.8 ± 1.48	20-24
Buccal cavity length	23	22.3 ± 0.89	21-23.5
Buccal cavity width	13	13.6 ± 0.32	13-14
Dorsal tooth from the base of buccal cavity	17	17.60±0.41	17-18
Doral tooth apex as % from base of buccal cavity	77.2	78.5 ± 2.24	74.4-83
Amphid position to anterior end	8	8.63 ± 0.38	8-9
Amphid aperture diameter	4	3.72 ± 0.38	3-4
Nerve ring from anterior end	64	67.6 ± 2.58	64-72
Oesophageal length	230	228.5± 17.21	200-258
Body diameter at neck base	38	38.35±0.37	38-39
Body diameter at mid-body	40	46.3±4.83	40-52
Body diameter at anus	25	25.1±0.67	24-26
Rectum length	18	18.5±0.37	18-19
Tail length	25	27.6±1.77	25-30
Tail length as % of total body length	3.8	3.7±0.24	3.5-4.4

Description

Female: Body small to medium size. C-shaped when relaxed, tapering slightly towards extremities. Cuticle smooth under light microscopy, 1-3 µm thick at mid body. Lateral chords about 1/4th of the total body width. Lip region continuous with neck having six lips bearing 6+4 papillae 20-24 µm wide and 6-8 µm high or width of the lip region more than three times the lip height. Amphidal aperture oval 3-4 µm wide or about on fourth of the width of buccal cavity, located posteriorly at 8-10 µm from anterior end of body. Buccal cavity goblet shaped, upper region wider than the lower and strongly tapering at the base with thick, heavily cuticularized vertical walls, 1.5-2 µm diameter. Dorsal tooth massive 6-6.7 µm wide, situated in anterior half of buccal cavity, its apex 16-18 µm or 76-81% of buccal cavity length from its base and directed forward, opposed by 6-7 regular transverse rows of denticles arranged in parallel. Subventral teeth present at 10-12 µm from stoma base. A pair of foramina present at base of buccal cavity. Oesophagus long, muscular, esophageal glands obscure. Nerve ring at 27-32.7% of neck length. Excretory pore situated behind the nerve ring. Oesophago-intestinial junction non- tuberculate.

Distinct cone shaped cardia, surrounded by intestinal tissue. Female genital system amphidelphic, vulva transverse, vaginal occupies 1/6 of the relative body diameter with small cuticularized drop shaped pieces about 3-4 µm long and 2-3 µm wide. Each genital branch consists of a reflexed ovary with 8-10 oocytes. Sphincter absent at oviduct-uterus junction, anterior ovary larger than posterior. Rectum 0.6-0.7 times anal body diameter. Tail short conoid, ventrally arcuate, about one anal body diameter in length. Caudal glands three, prominent, arranged in tandem spinneret terminal.

Male: Not found.

Type habitat and locality: Specimens were collected from soil around roots of banana (*Musa paradisiaca* L.) at Karachi, Sindh, Pakistan

Type specimens: Slides containing holotype and paratype have been deposited in the Nematode Collection of National Nematological Research Centre, University of Karachi, Karachi, Pakistan.

Etymology: The species is named after its host banana (*Musa paradisiaca* L.) from where it was collected.

Diagnosis and relationship: *Mylonchulus musae* n. sp., is characterized by its small to medium size body 0.65-0.85mm long, head region continuous; buccal cavity medium size 22-24x13-14 µm; 6-7 rasp like denticles; tail 25-30 µm long; caudal glands arranged in tandem, spinneret terminal. In the key of species of *Mylonchulus* as given by Ahmed and Jairajpuri (2010), *Mylonchulus musae* n. sp., comes close to *Mylonchulus striatus* (Thorne,1924; Schneider, 1939) and *M. orbitus* (Jensen and Mulvey 1968) but differs from former in having smaller body length (L=0.65-0.85

vs 1.1-1.6) mm, in lower values of a, b and c ratios (a=13-16 vs 22-36; b=2.8-3.4 vs 3.4-4.0,c= 21.8-28.6 vs 40-71); in more anteriorly located vulva (V=58-59 vs 63-66%) and having distinct spinneret vs spinneret rather indistinct. From *M. orbitus* it differs in having smaller body length (L=0.65-0.85vs1.0-1.5) mm, in lower values of a and c ratios (a=13-16 vs 24-30, c= 21.8-28.6 vs 39-46); in more anteriorly located vulva (V=58-59 vs 60-65%). It also close to *Mylonchulus curvicaudatus* Mulvey and Jensen, 1967 in c' value and in vulva percentage, but differs from it in having smaller body length (L=0.65-0.85 VS 1.0-1.2) mm, in lower values of 'a' and 'c' ratios (a=13-16 vs 22-26; c= 21.8-28.8 vs 36-41); in number of rasp-like denticles (6-7 vs 5-6 rows); in the nature of caudal glands (in tandem vs slightly grouped and large). *Mylonchulus curvicaudatus* was also reported from Singapore. The new species *M. musae* differs from these specimens having smaller body length (0.65-0.85 vs 0.94-1.07) mm, in lower values of a and c ratios (a=13-16vs 24-25; c=22- 28 vs 35.2-37): in smaller stoma length and width (21-23.5-vs 26-27x13-14 vs 15-17) µm; amphid aperture (3-4 vs 5) µm wide and in the opening of spinneret (terminal vs slightly dorsal).

***Discolaimus tabacum* n. sp.**
(Figures 2A-H, 12A-H)

Measurements: Table 2

Description

Female: Body cylindrical, about 0.9-1.1mm long, slightly arcuate upon fixation, maximum width 28-32µm. Cuticle two to three layered, 2-2.5µm thick at anterior region 1.5-2 µm at mid body and 2-3µm on tail. Cuticle striae fine, indistinct. Lateral hypodermal chords about one-third of body width with (77-100) distinct glandular bodies on each side, 38-55 occurring from anterior end to vulva, and 39-45 from vulva to tail end. Cephalic region well off set by a constriction, distinctly wider than adjacent body, 0.53-0.54 time as wide as body diameter at pharyngeal base or 3.4-4.0 times as wide as high. Amphidial fovea stirrup shaped its aperture slit like 3-5µm or about 0.1-0.2 times width at lip region. Odontostyle straight, sclerotized with distinct lumen 15-16µm or 0.93-0.94 times head width long, its aperture 53-59% of its length, base bifurcate, odontophore rod like with wide lumen 18-20 µm or 1.2-1.25 times the odontostyle length its wall not thickened at base. Stylet guiding ring weakly sclerotized, single, wide, 5-6 µm from anterior end. Nerve ring situated at 29.4-35% of neck length. Pharynx consisting of slender muscular anterior portion with a swelling surrounding the base of odontophore crossed by nerve ring at 75-82µm from anterior end of body. Basal expanded part of

Table 2: *Morphometric data of Discolaimus tabacum n. sp. All measurements are in µm except L and in the form Mean ± SD (range).*

Characters	Holotype female	Paratype female (n=10)		Male (n=1)
		Mean±SD	Range	
L	10.92	1088.5±65.7	994-1190	1096
a	39	36.2±2.53	33.1-39.6	40.5
b	4.7	4.3±0.38	3.5-4.7	4.7
c	47.4	504.8	41.4-57.7	54.8
c'	1.1	1.06±0.65	1.0-1.2	0.9
V%	52.1	51.63.73	42.8-55.4	-
G1	10.4	9.91.2	8.2-12.1	-
G2	9.1	8.50.62	7.7-9.5	-
Lip region diameter	17	16.3±0.48	16-17	16
Lip region height	4	4.5±0.5	4-5	4
Amphid aperture	4	4±0.5	3-5	4
Odontostyle length	16	15.62±0.48	15-16	16
Odontophore length	19	19.5±0.86	18-20	18
Guiding ring from anterior end	5	6.1±0.59	5-7	5
Nerve ring from anterior end	75	78.75±4.2	75-82	80
Pharyngeal length	228	247.6±23.5	212-278	230
Expanded part of pharynx	114	134.5±18.9	108-159	122
Cardial length	10	9.7±1.1	8-12	8
Body diameter at base of oesophagus	30.5	30.37±0.48	30-31	27
Body diameter at mid-body	30	30±1	28-32	27
Body diameter at anus	20	20±0	20-20	22
Anterior genital branch	110	107.7±10.4	90-128	-
Posterior genital branch	90	93.5±6.4	80-100	-
Vaginal depth	12	12.1±1.26	10-14	-
Vulva from anterior end	520	561±40.2	494-606	-
Prerectum length	18	19±1.41	16-20	-
Rectum length	16	16.3±1.9	14-19	-
Tail length	22	21.6±1.31	20-24	20

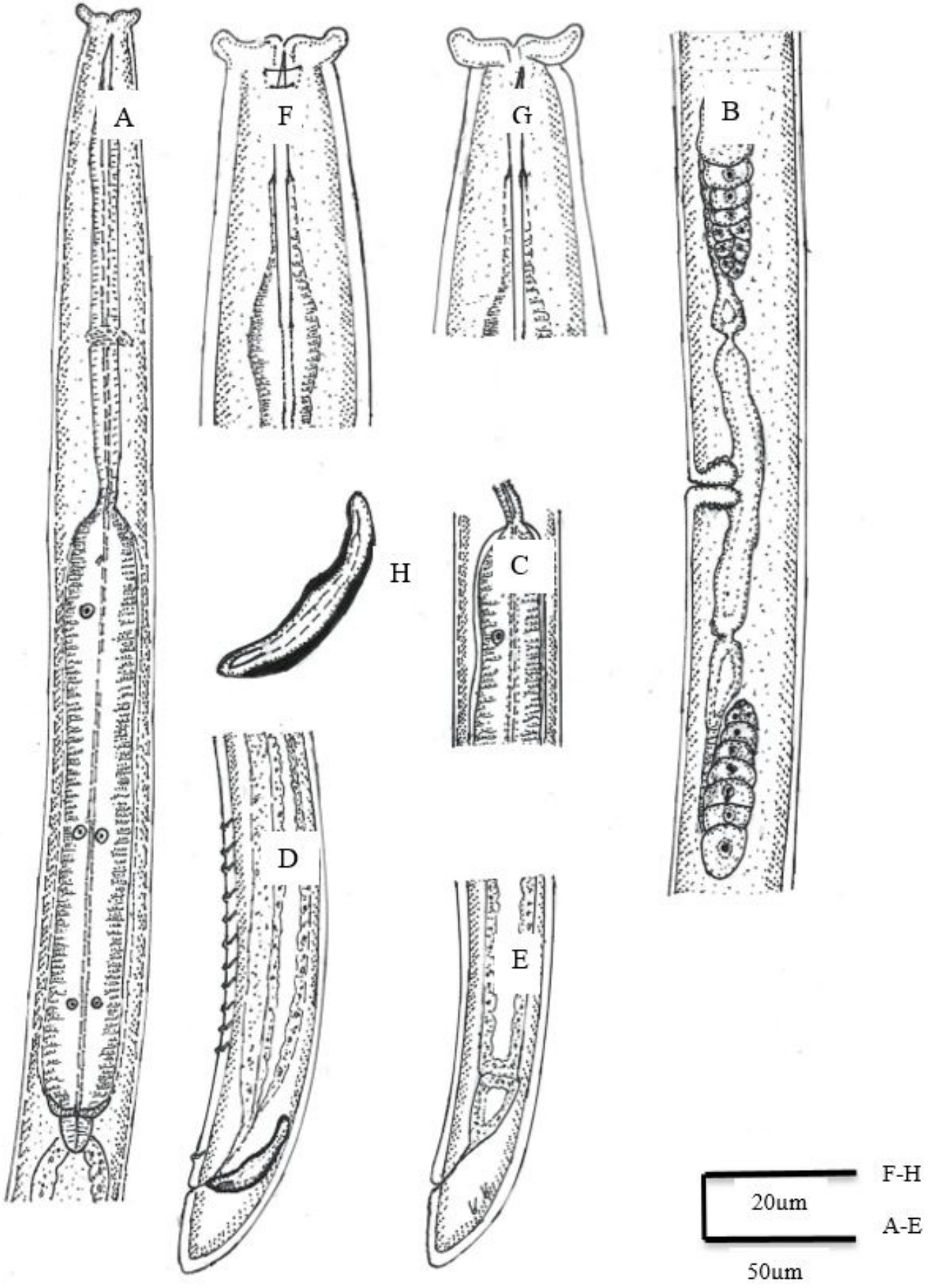

Figure 2: *Discolaimus tabacum n. sp. Female: A, Oesophageal region; B, Reproductive system; F, Anterior region; C, Anterior end of oesophageal bulb showing constriction; E, Tail region; Male: G, Anterior region; H, Spicules; D, Tail region showing supplements.*

pharynx off set from slender part by a constriction 6.6-8.8 times as long as wide, 4-5 times as long as the body diameter at neck base and starting at 50.9-57% of the total neck length. Dorsal oesphageal gland orifice 14-16µm from anterior end of enlarged part of oesophagus, nuclous of gland 10-14µm behind D0. Orifices of anterior SV1 50-60µm behind it. Orifice of posterior subventral glands 28-30µm anterior to base of oesophagus a little behind gland nuclei. A distinct single sheath of tissue visible on basal enlarged part of pharynx. Cardia large round to conoid almost as wide as long (8-10 x 8-12µm), enveloped by intestinal tissue. Intestine with wide lumen, oesophagus-vulva distance 217-362µm. Genital system didelphic, amphidelphic. Ovaries reflexed, relatively short, 9-12 oocytes arranged in a single row except near germinal cell, sphincter valve between uterus and oviduct present. Spermatozoa observed in genital system. Vulva a transverse slit vagina extending in wards about one third of corresponding body diameter. Prerectum quite short without prerectal sac about one anal body width long. Rectum 0.7-0.9 time the anal body width. Tail convex-conoid to a small rounded terminus, inner protoplasmic core also convex conoid with pointed terminus. Two pairs of lateral caudal pores present.

Male: Body ventrally arcuate, more curved in posterior region. Lateral chord about one fourth of body width. Head saucer shaped, 16 µm in diameter. Odontostyle aperture about 50% of its length. Nerve ring 80 µm from anterior end of body. Oesophageal bulb 122x17µm or 53% of oesophageal length. Testes paired, dorylaimoid. Paired preanal papillae 6µm anterior to cloacal aperture, a series of 11 ventromedian supplementary papillae present, beginging at 36 µm and extending to 90 µm from cloacal aperture. Spicules paired, slightly arcuate ventrally, cephalated, 29 µm long. Lateral guiding pieces rod like 4µm long.

Type habitat and locality: Specimens were collected from soil around roots of tobacco (*Nicotiana tabacum* L.) at Karachi, Sindh Pakistan

Type specimens: Slides containing holotype and paratype have been deposited in the Nematode Collection of National Nematological Research Centre, University of Karachi, Karachi, Pakistan.

Etymology: The species is named after its host tobacco (*Nicotiana tabacum* L.) from where it was collected.

Diagnosis and relationships: *Discolaimus tabacum* n. sp., is characterized by its small body size and slender body (0.99-1.19 mm; a=33.1-39.6); Odontostyle 0.8-1.0 times the lip region diameter in length; aperture 50-53% of its length; oesophagus with a conspicuous sheath in the basal expanded part of oesophagus, occupying 47-59% of the total neck length; tail short (c'=1.1-1.2), dorsally convex conoid to a small rounded terminus, short prerectum and the presence of male. Based on morphological measurements given by Wu *et al*. (2016) the new species come close to *D. conicus* (Siddiqi, 2005) but differs in having a smaller body length (0.9-1.1 vs 1.25-1.43 mm), in smaller a ratio (33-39 vs 39-45), base of odontostyle (bifurcate vs smooth). Nerve ring located more anteriorly (80-82 vs 90-95 µm), lip width (16-17 vs 18-19.5 µm), amphid width (3-5 vs 6-7 µm) smaller neck length (262-278 vs 345-365 µm); a more anterior vulva (494-600 vs 710-780 µm).

Discolaimus omanensis Siddiqi, 2005
(Figures 3A-G, 13I-L)

Measurements: Table 3

Description

Female: Body cylindrical, about 1.16-1.28mm long, slightly arcuate upon fixation, maximum width 30-39µm. Cuticle two to three layered, 1-1.5µm thick at anterior region 2-2-2.5µm at mid body and 3-3.5µm on tail. Cuticle striae fine, indistinct. Lateral hypodermal chords about one-fourth of body width with (80-86) distinct glandular bodies on each side, 38-40 occurring from anterior end to vulva, and 42-46 from vulva to tail end. Cephalic region well off set by a constriction, distinctly wider than adjacent body, 0.5-0.52 time as wider as body diameter at pharyngeal base or 4-4.5 times as wide as high. Labial and cephalic papillae with clear innervation. Amphid stirrup shaped its aperture slit like 7-8µm or about 0.5-0.6 times of corresponding body width. Odontostyle straight, sclerotized with distinct lumen,16-17µm or 0.87-0.90 times head width long, its aperture 56.61-59.3% of its length, base bifurcate, odontophore rod like with wide lumen 20-28µmor 1.25-1.6 times the odontostyle length its wall not thickened at base. Stylet guiding ring weakly sclerotized, single wide, 6-7µm from anterior end. Nerve ring situated at 28-29% of neck length.

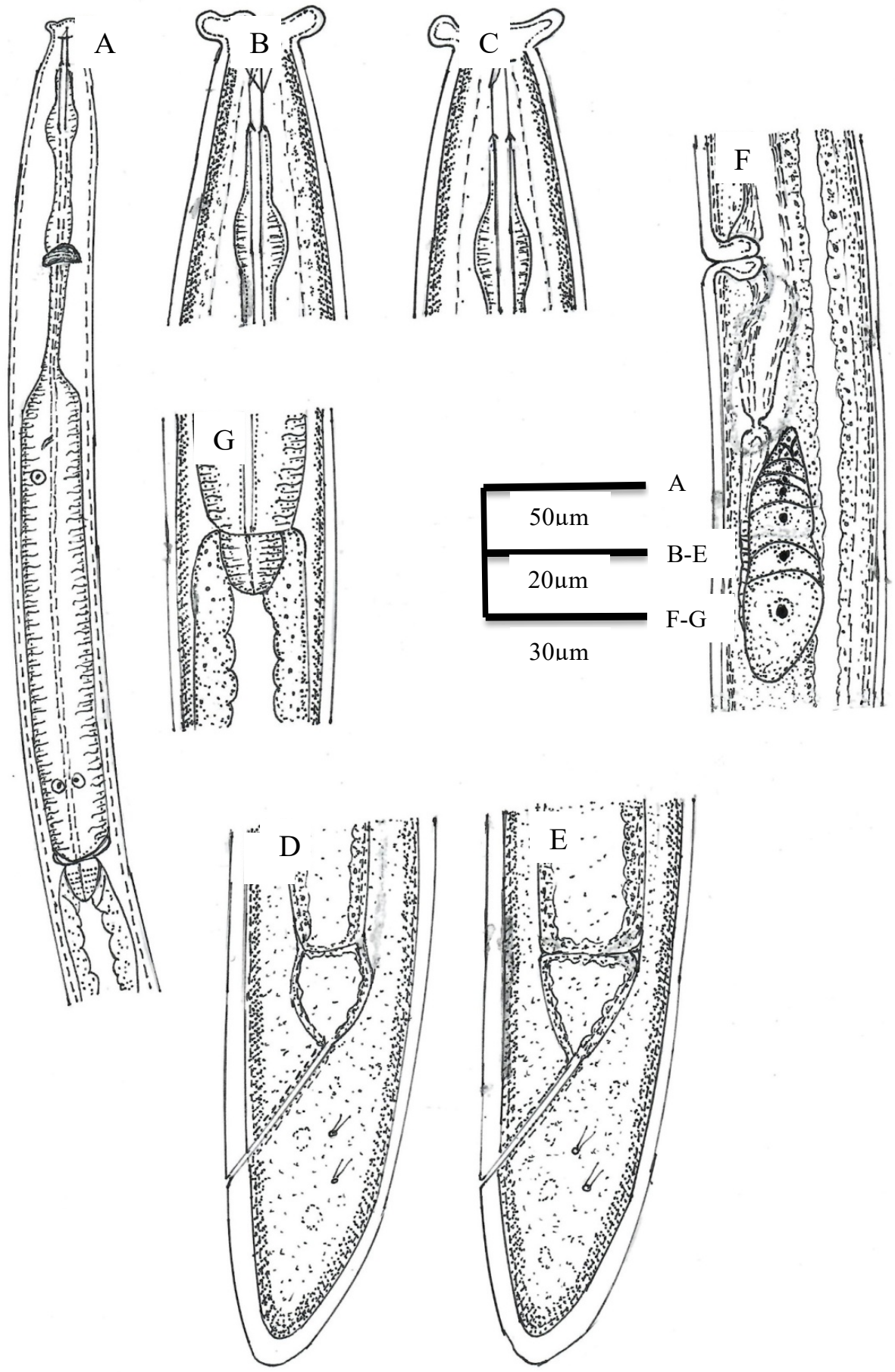

Figure 3: *Discolaimus omanensis Siddiqi, 2005. Female: A, Oesophageal region; B, Anterior region showing amphid; C, Anterior region; D, E, Tail region; F, Reproductive system; G, Cardial region.*

Table 3: *Morphometric data of Discolaimus omanensis* Siddiqi, 2005. *All measurements are in µm except L and in the form Mean±SD (range).*

Characters	Female (n=8)	
	Mean ± SD	Range
L	1.25 ±0.04	1.16-1.28
a	35.75±2.19	32.8-38.8
b	3.77±0.03	3.7-3.81
c	43.0±1.45	41.6-45.7
c‘	1.19±0.08	1.07-1.27
V	44.25±0.14	44.2-44.4
G_1	7.39±0.06	7.3-7.5
G_2	7.11±0.22	6.8-7.4
Lip region diameter	19.1±0.74	18-20
Lip region height	4.48±0.32	4-5
Amphid aperture	7.6±0.35	7-8
Odontostyle length	17.12±0.69	16-17
Odontophore length	25.21±2.44	20-28
Guiding ring from anterior end	6.57±0.35	6-7
Nerve ring from anterior end	92.83±1.95	90-95
Pharyngeal length	321.57±14.4	308-336
Expanded part of pharynx	184.85±8.35	174-198
Cardial length	15.21±0.77	14-16
Body width at base of oesophagus	37.11±0.70	36-38
Body width at mid body	30±3.04	30-39
Body width at anus	23.75±1.40	22-26
Anterior genital branch	91.07±2.21	88-94
Posterior genital branch	89.07±6.27	80-96
Vaginal depth	14.55±0.34	14-15
Vulva from anterior end	540.83±20.69	515-570
Prerectum	14.7±0.35	14-15
Rectum	25.61±0.35	25-26
Tail length	28.58±0.38	28-29

Pharynx consisting of slender musclar anterior portion with a double swelling surrounding the base of odontophore crossed by nerve ring at 90-95µm from anterior end of body. Basal expanded part of pharynx gradually enlarging into a muscular slender basal bulb 11-12 times as long as wide, 8.5-8.8 -5.7 times as long as the body diameter at neck base and starting at 56.4-58.9% of the total neck length. Dorsal oesphageal gland orifice 25-28µm from anterior end of enlarged part of oesophagus, nucleolus of gland 10-15µm behind D0. Orifice of posterior subventral glands 26-30µm anterior to base of oesophagus; a little behind gland nuclei. Cardia large round to conoid, almost as wide as long (10-12 x 14-16µm), enveloped by intestinal tissue. Intestine with wide lumen. Oesophagus-vulva distance 207-234µm. Genital system didelphic, amphidelphic. Ovaries reflexed, relatively short, 8-12 oocytes arranged in a single row except near germinal cell, sphincter valve between uterus and oviduct present. Vulva a transverse slit vagina extending inwards about one third of corresponding body diameter. Prerectum quite short with prerectal sac 0.57-0.63 times of less than one anal body width long. Rectum 1.0-1.13 time the anal body width. Tail convex-conoid to a small rounded terminus, inner protoplasmic core also convex-conoid with pointed terminus. Two pairs of lateral caudal pores present.

Male: Not found.

Remarks: Specimens found around the roots of mango (*Mangifera indica* L.) from Faisalabad, Punjab, Pakistan. The population of *D. omanensis* has general morphological and morphometrical characters corresponding to those of the type population (Siddiqi, 2005), except in odontostyle base bifurcate against smooth base.

Discolaimus conicus Siddiqi, 2005
(Figures 4A-H, 13A-D)

Measurements: Table 4

Description

Female: Body cylindrical, about 1.2-1.4mm long, slightly arcuate upon fixation, maximum width 30-34µm. Cuticle three to four layered, 2-2.5µm thick at anterior region 2-3 µm at mid body and on tail. Cuticle striae fine. Lateral hypodermal chords about one-fourth of body width. Cephalic region well off set by a constriction, distinctly wider than adjacent body, 0.55-0.62-time as wider as body diameter at pharyngeal base or 5.5- 6.3 times as wide as high. Cephalic region saucer-shaped with outer margin rounded 19-22µm in diameter. Amphid stirrup shaped its aperture slit like 6-7µm or about 0.2-0.31 times width at lip region. Odontostyle straight, sclerotized with distinct lumen, 18-20µm or 0.90-0.94 times head width long, its aperture 50-55% of its length. Odontophore rod like with wide lumen 27-30 µm or 1.5 times the ondotosytle length, its wall not thickened at base. Stylet guiding ring weakly sclerotized, single wide, 6-7µm from anterior end. Nerve ring situated at 25-28% of neck length.

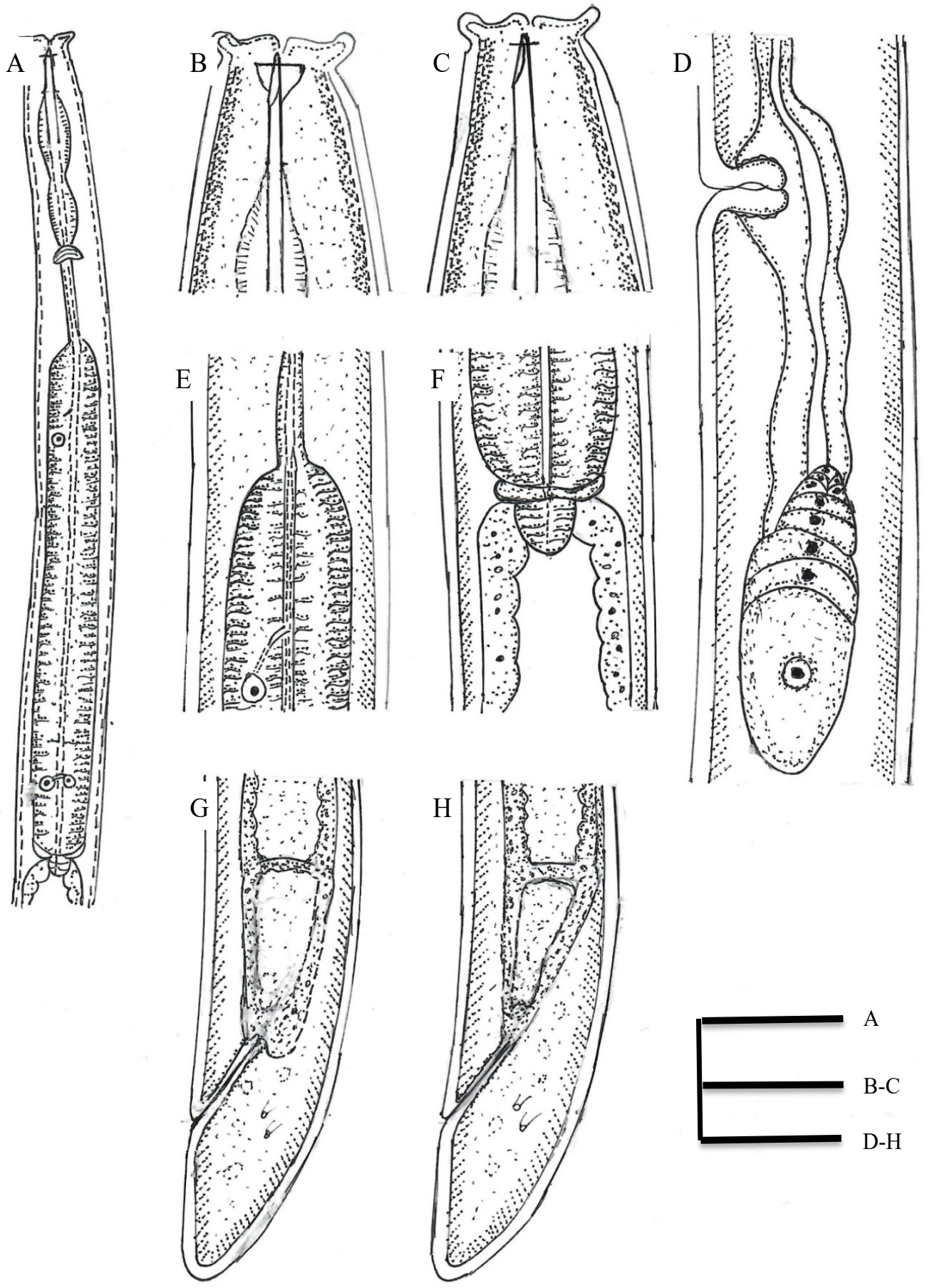

Figure 4: *Discolaimus conicus Siddiqi, 2005. Female: A, Oesophageal region; B, Anterior region showing amphid; C, Anterior region; D, Reproductive system; E and F, Anterior and posterior end of oesophageal bulb, respectively; G, H, Tail region.*

Table 4: *Morphometric data of Discolaimus conicus* Siddiqi, 2005. *All measurements are in µm except L and in the form Mean ± SD (range).*

Characters	Female (n=8)	
	Mean ± SD	Range
L	1.354 ±74.7	1.288-1.488
a	42.4±0.81	41.2-43.7
b	4.47±0.18	4.2-4.7
c	54.4±2.17	51.4-57.2
c‘	1.08±0.07	1.0-1.18
V	53.2±1.16	53.2-56
G_1	7.28±0.34	6.8-7.7
G_2	6.08± 0.08	6.0-6.2
Lip region diameter	20.0±1.32	19-22
Lip region height	3.57±o.34	3-4
Amphid aperture	6.58±0.31	6-7
Odontostyle length	16±3.80	18-20
Odontophore length	29±0.72	28-30
Guiding ring from ant. end	6.6±0.35	6-7
Nerve ring from anterior end	95.6±3.38	90-100
Pharyngeal length	354.37±2.11	351-357
Expanded part of pharynx	209.0±1.42	207-211
Cardial length	9.18±0.70	8-10
Body width at base of oesophagus	34.7±0.33	34-35
Body width at mid body	31.8±1.49	30-34
Body width at anus	25.6±0.34	25-26
Anterior genital branch	101.12±0.76	100-102
Posterior genital branch	82.9±4.10	80-90
Vaginal depth	13.4±0.38	13-14
Vulva from anterior end	775.8 ±22.4	740-808
Prerectum	30.41±3.4	30-33
Rectum	19.22±0.69	18-20
Tail length	26.6±0.37	26-27

Pharynx consisting of slender muscular anterior portion with two large swellings surrounding the base of odontophore. Basal expanded part of pharynx off set from slender part by a constriction 9.4-9.8% times as long as wide, 5-6 times as long as the body diameter at neck base and starting at 58-59-% of the total neck length. Dorsal oesophageal gland orifice 28-30µm from anterior end of enlarged part of oesophagus nucleolus of gland 20-22µm behind DO. Orifice of posterior subventral glands 28-30µm anterior to base of esophagus a little behind gland nuclei. Cardia large round to conoid almost as wide as long (8-10 x 8-12µm), enveloped by intestinal tissue. Intestine with wide lumen, Oesophagus-vulva distance 400-456 µm. Genital system didelphicamphidelphic. Ovaries reflexed, relatively short, 10-12 oocytes arranged in a single row except near germinal cell, sphincter valve between uterus and oviduct indistinct. Vulva a transverse slit vagina extending in wards about one third of corresponding body diameter. Prerectum short 1.2-1.26 anal body width long slightly extend over rectum dorsally. Rectum 0.6-0.7 or less than one anal body width. Tail conoid to slightly rounded terminus, with two pairs of lateral caudal pores.

Male: Not found.

Remarks: Specimens of *Discolaimus conicus* (Siddiqi, 2005) were collected from soil around the roots of sugarcane (*Saccaharum officinarum* L.) from Mirpurkhas, Sindh, Pakistan. Morphology and measurements of this population corresponds to the original description. However, it slightly differs in having a longer Odontostyle (18-20vs 16-17µm) in wider lip region (19-22 vs 18-19.5µm) and in more anterior stylet guiding ring (6 -7 vs 12µm).

Discolaimus laksi Khan and Laha, 1982
(Figures 5A-E, 13I-L)

Measurements: Table 5

Description

Female: Body cylindrical, about 1.078-1.114mm long, slightly arcuate upon fixation, maximum width 28-30µm. Cuticle two to three layered, 1-1.5µm thick at anterior region 2-2.2 µm at mid body and 2-3µm on tail. Cuticle striae fine, indistinct. Lateral hypodermal chords about one-third of body width with (130-132) distinct glandular bodies on each side, 67-68occurring from anterior end to vulva, and 63-64 from vulva to tail end. Cephalic region well off set by a constriction, distinctly wider than adjacent body, 0.66-0.69 time as wider as body diameter at pharyngeal base or 3.3-3.8 times as wide as high. Amphid stirrup shaped its aperture slit like 7-8µm or about 0.36- 0.4 times width at lip region. Odontostyle straight, sclerotized with distinct lumen 15-16µm or 0.7-0.8 times head width long, its aperture 46.6-50% of its length, base bifurcate, odontophore rod like with wide lumen 17-18µm or 0.9-0.91 times the ondotosytle length its wall not thickened at base. Stylet guiding ring weakly sclerotized, single wide, 5-6µm from anterior end. Nerve ring situated at 28.1-29.3% of neck length. Pharynxconsistingofslendermuscularanteriorportion with a swelling surrounding the base of odontophore

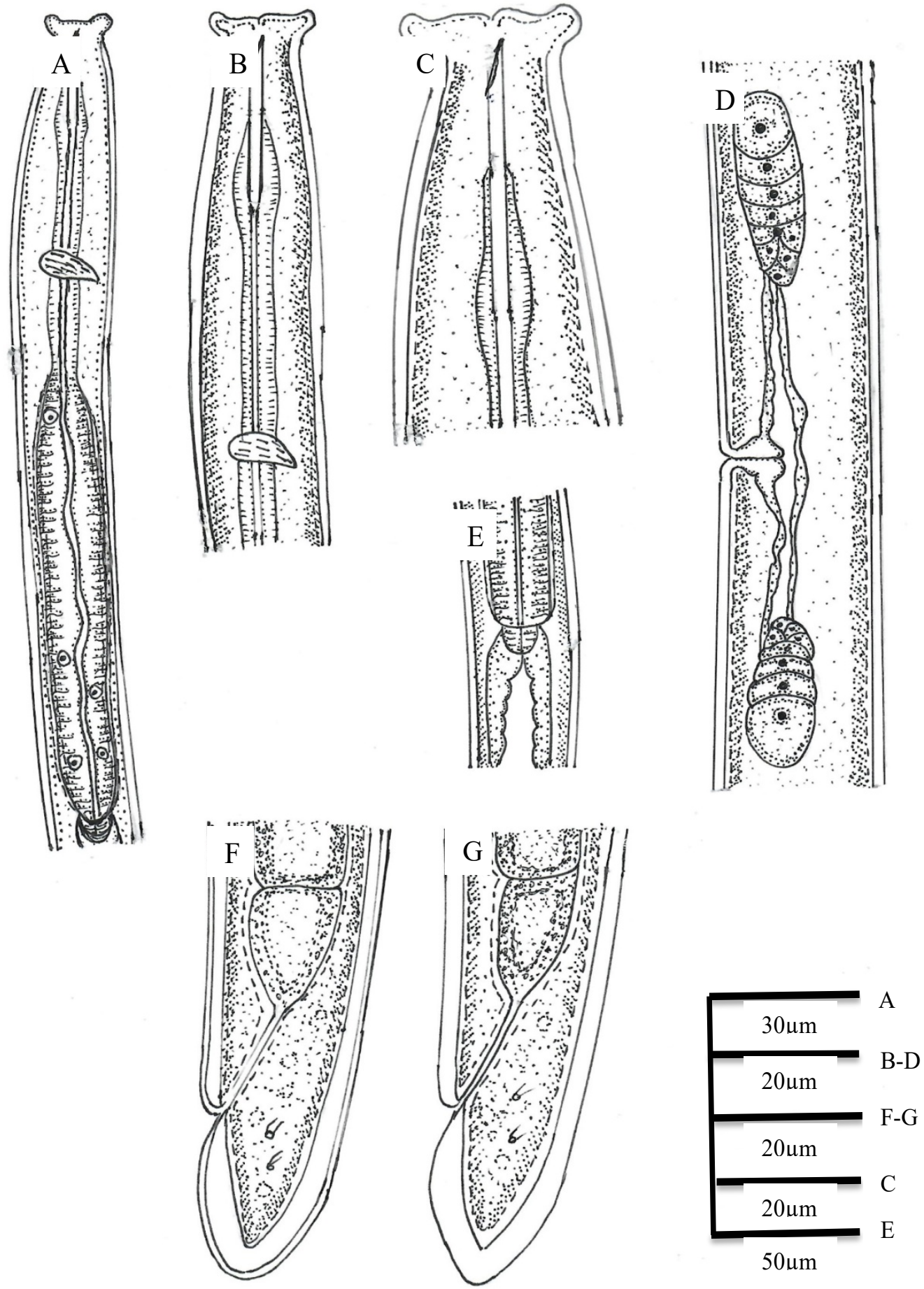

Figure 5: *Discolaimus laksi Khan and Laha, 1982. Female: A, Oesophageal region; B and C, Anterior region; D, Reproductive system; E, Cardial region; F and G, Tail region.*

Table 5: *Morphometric data of Discolaimus laksi Khan and Laha, 1982. All measurements are in µm except L and in the form Mean±SD (range).*

Characters	Female (n=8)	
	Mean ± SD	Range
L	1.095± 0.013	1.078-1.114
a	37.55±1.110	36-39.7
b	3.65±0.111	3.5-3.8
c	42.07±0.683	39.7-41.4
c‘	42.22±1.449	1.0-1.3
V	44.41±0.72	44.3-45.4
G1	55.86± 0.24	5.5-6.2
G2	4.93±0.211	4.6-5.2
Lip region diameter	19.5±0.5	19-20
Lip region height	5.5 ±0.5	5-6
Amphid aperture	7.5 ±0.5	7-8
Odontostyle length	15.5± 0.5	15-16
Odontophore length	15.65±0.32	17-18
Guiding ring from anterior end	5.7 ± 0.32	5-6
Nerve ring from anterior end	82 ± 1.58	80-84
Pharyngeal length	284.75±0.829	284-286
Expanded part of pharynx	158.75±0.77	158-160
Cardial length	8.75±0.829	8-10
Body width at base of oesophagus	28.625±0.9601	27.5-30
Body width at mid body	29.25± 0.829	28-30
Body width at anus	19.5 ±0.5	19-20
Anterior genital branch	66 ±3.57	60-70
Posterior genital branch	55.7±3.49	50-60
Vaginal depth	11.2 ±0.72	10-12
Vulva from anterior end	492.3± 1.31	490-495
Prerectum	21.1± 074	20-22
Rectum	20.5± 0.39	20-22
Tail length	27±0.707	26-28

crossed by nerve ring at 80-84µm from anterior end of body. Basal expanded part of pharynx off set from slender part by a constriction 10-10.5times as long as wide, 5.3-5.4 times as long as the body diameter at neck base and starting at 55.6-55.9% of the total neck length. Dorsaloesphageal gland orifice24-26µm from anterior end of enlarged part of oesophagus nucleolus of gland 28-30µm behind DO. Orifice of posterior subventral glands 28-30µm anterior to base of esophagus a little behind gland nuclei. A distinct double sheath of tissue visible on basal enlarge part of pharynx. Cardia large round to conoid almost as wide as long (10-11 x 8 -12 µm), enveloped by intestinal tissue. Intestine with wide lumen, oesophagus-vulva distance 204-206µm. Genital system didelphic amphidelphic. Ovaries reflexed, relatively short, 9-10 oocytes arranged in a single row except near germinal cell. Sphincter valve between uterus and oviduct indistinct. Vulva a transverse slit, vagina extending inwards about one half of corresponding body diameter. Prerectum quite short without prerectal sac; about one half anal body width long. Rectum 1.05-1.1 times the anal body width. Tail dorsally convex with a small rounded terminus. Two pairs of lateral caudal pores present.

Male: Not found.

Remarks: Specimens of *D. laksi* were collected from Sargodha, Punjab Pakistan around the roots of cotton (*Gossypium hirsutum* L.). Measurements and descriptions correspond with those of (Khan and Laha, 1982). The only difference was found in a ratio (36-39.7vs 25.3-36.8) and more anteriorly located vulva (44.3-45.4 vs 48-57).

Discolaimus paratenax Siddiqi, 2005
(Figures 6A-H, 14A-D)

Measurements: Table 6

Description

Female: Body cylindrical, about 1.1-1.2mm long, slightly arcuate upon fixation, maximum width 27-31µm. Cuticle two to three layered, 1-1.4µm thick at anterior region 2 µm at mid body and 2-3µm on tail. Cuticle striae fine, indistinct. Lateral hypodermal chords about one-fifth of body width with (100-115) distinct glandular bodies on each side, 45-55 occurring from anterior end to vulva, and 55-60 from vulva to tail end. Cephalic region well off set by a constriction, distinctly wider than adjacent body, 0.55-0.57 time as wider as body diameter at pharyngeal base or 4.0-4.2 times as wide as high. Labial and cephalic papillae with clear innervation. Amphid stirrup shaped its aperture slit like 6-8µm or about 0.4-0.5 times width at lip region. Odontostyle straight, sclerotized with distinct lumen, 15-17µm or 1.0-1.0 times head width long, its aperture 46-47% of its length, base not furcate, odontophore rod like with wide lumen 26-28 µm or 1.6-1.7 times the ondotosytle lengthits wall not thickened at base. Stylet guiding ring weakly sclerotized, single wide, 4-5µm from anterior end. Nerve ring situated at 28.5-30% of neck length. Pharynx consisting of slender muscular anterior portion with double swellings surrounding the base of odontophore crossed by nerve ring at 80-90µm from

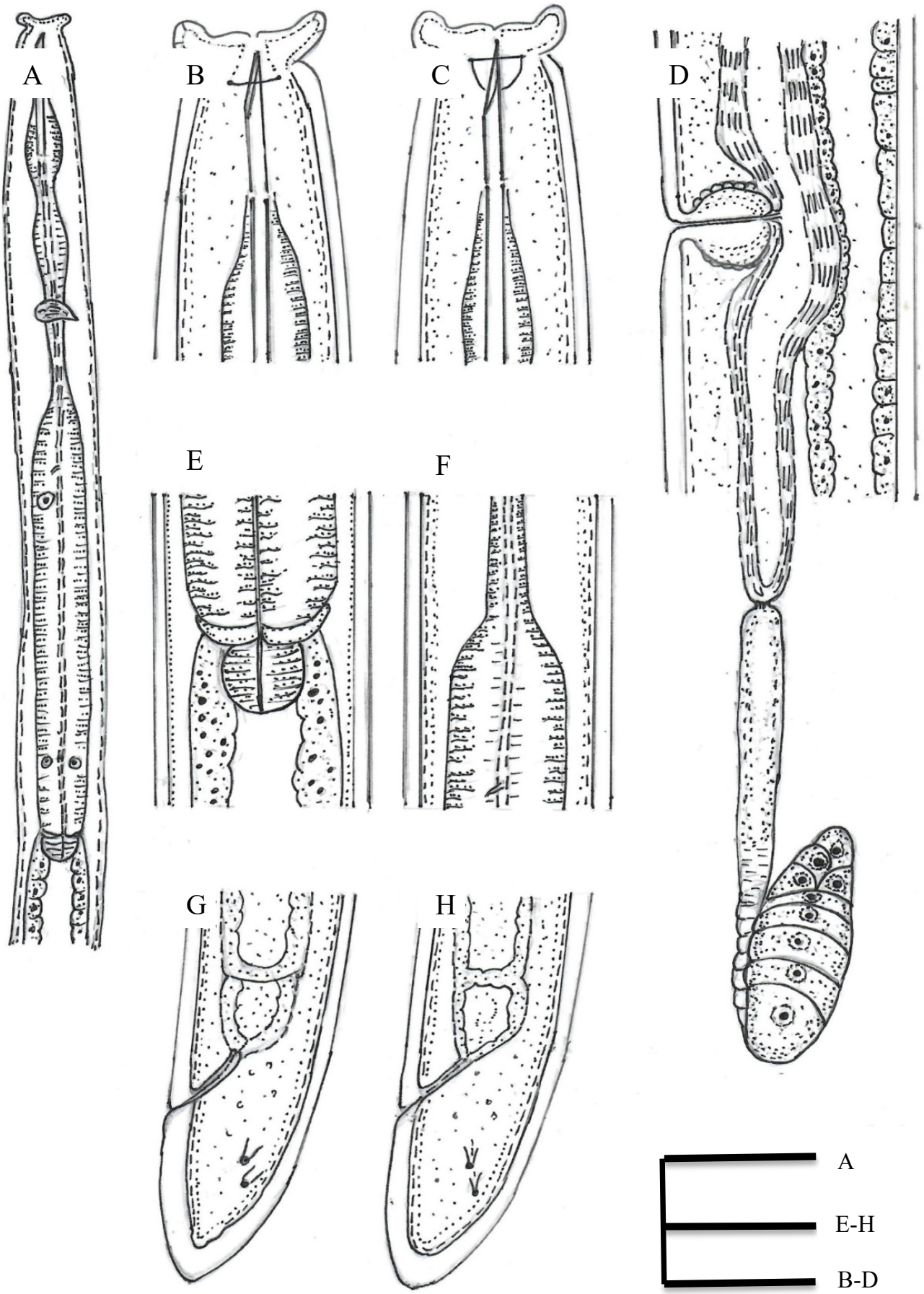

Figure 6: *Discolaimus paratenaxs* Siddiqi, 2005. *Female: A, Oesophageal region; B, Anterior region; C, Anterior region showing amphid; D, Reproductive system; E and F, Posterior and anterior end of oesophageal bulb, respectively; G and H, Tail region.*

Table 6: *Morphometric data of Discolaimus paratenax* Siddiqi, 2005. *All measurements are in µm except L and in the form Mean±SD (range).*

Characters	Female (n=8)	
	Mean ± SD	Range
L	1162±29.11	1120-1200
a	41.06±1.96	39.3-43.8
b	3.9±0.047	3.9-4.0
c	48.8±1.405	47.5-50.8
c‘	1.31±0.044	1.26-1.3
V	51.5±1.22	50-53
G_1	8.37±0.09	8.4-8.5
G_2	8.17± 0.01	8.1-8.3
Lip region diameter	15.6±0.47	15-16
Lip region height	3.8±0.23	3.5-4
Amphid aperture	6.6±0.94	6-8
Odontostyle length	16±0.816	15-17
Odontophore length	26.9±0.75	26-28
Guiding ring from anterior end	4±5	4-5
Nerve ring from anterior end	74.6±4.10	80-90
Pharyngeal length	281±0.816	280-300
Expanded part of pharynx	151.5±0.5	150-152
Cardial length	10.52±0.37	10-11
Body width at base of oesophagus	27.54±0.41	27-28
Body width at mid body	25.6±0.47	27-31
Body width at anus	18.23±0.20	18-18.5
Anterior genital branch	96.3±1.24	95-98
Posterior genital branch	96±0.816	95-97
Vaginal depth	12±13	12-13
Vulva from anterior end	604.28±26.51	565-630
Prerectum	9.66±0.38	9-10
Rectum	11±0.816	10-12
Tail length	23.6±0.47	23-24

anterior end of body. Basal part of pharynx gradually expanding posteriorly, 8.3-8.4-times as long as wide, 5.4-5.5 times as long as the body diameter at neck base and starting at 50.6-53.6-% of the total neck length. Dorsal oesphageal gland orifice 22-25µm from anterior end of enlarged part of oesophagus. Orifice of posterior subventral glands 24-25µm anterior to base of esophagus a little behind gland nuclei. A less conspicuous sheath of tissue visible on basal enlarged part of pharynx. Cardia large round to conoid almost as wide as long (10x10µm), enveloped by intestinal tissue. Intestine with wide lumen, oesophagus-vulva distance 217-362µm. Genital system didelphic, amphidelphic. Ovaries reflexed, relatively short, 7-10 oocytes arranged in a single row except near germinal cell. Sphincter valve between uterus and oviduct present. Vulva a transverse slit vagina extending in wards about one half of corresponding body diameter. Prerectum quite short without prerectal sac about one half anal body width long. Rectum 0.5-0.6 time the anal body width. Tail dorsally convex to a small rounded terminus, inner protoplasmic core subdigitate. Two pairs of lateral caudal pores present.

Male: Not found.

Remarks: *Discolaimus paratenax* (Siddiqi, 2005) has been found from decaying matter of Peshawar, KP, Pakistan. The present specimens confirm to the original description given by (Siddiqi, 2005).

***Dorylaimoides micoletzkyi* (**De Man, 1921**)** Thorne and Swanger, 1936
(Figures 7A-G, 14E-H)

Measurements: Table 7

Description

Female: Medium sized nematodes, 1.0-1.1mm long. Body cylindrical, slightly tapering towards both extremities, but more so towards posteriorly. Habitus ventrally curved. Outer cutical thin with fine transverse striations; Inner cutical thicker than the outer one, thicker in the caudal region. Lateral chord narrow occupying 35.7-41.33% of the mid body width. Lateral pores obscure. Lip region set off by constriction with rounded contour, twice as wide as high and one third of the body diameter at pharyngeal base. Lips amalgamated, inner part slightly elevated. Labial and cephalic papillae visible, but not obstructing the head contour. Amphid cup-shaped, opening at level of the head constriction and occupying 50-62.5% of the head diameter. Stoma a truncate cone. Odontostyle as long as or slightly longer than lip width. Odontophore typical of the genus. Guiding ring simple and distinct. The anterior end of pharynx is slender and muscular and a cylindrical basal bulb about three times as long as wide and occupying more than one third of the total neck length. The two parts of the pharynx are separated by a shallow constriction. Pharyngeal gland nuclei usually obscure. Cardia conoid to round surrounded by the intestinal tissue. Nerve ring located at 41-46% of the total neck length. Genital system didelphic, amphidelphic. Paired gonads reflexed opposed often not reaching the oviduct uterus junction. Sphincter present at the oviduct uterus junction. Anterior and posterior genital branch

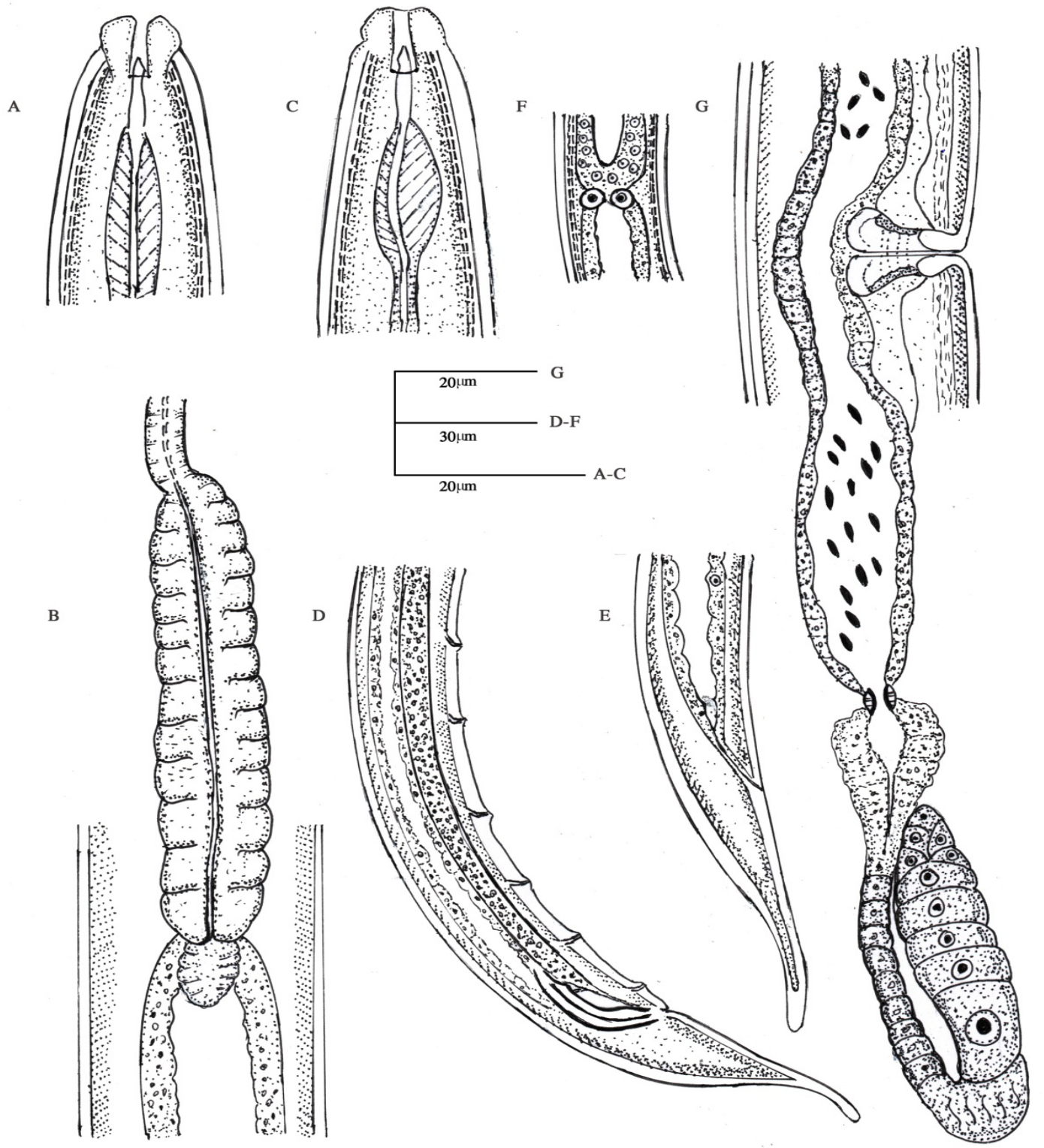

Figure 7: *Dorylaimoides micoletzkii (de Man, 1921)* Thorne and Swanger, 1936. *Female: A, Anterior region; B, Oesophageal bulb; E, Tail region; F, Intestine-prerectum junction; G, Reproductive system; Male: C, Anterior region; D, Tail region showing supplements.*

equally developed about 4.1 and 3.7 body diameter long, respectively, usually containing sperms. Vagina cylindrical, vulva a transverse slit. Uteri with sperms; ovaries symmetrical. Prerectum 5.5-6.2 anal body width long. Intestine-Prerectum junction guarded by the three cells. Rectum 0.6-0.7 anal body width long. Tail elongate with finely rounded terminus tapering gradually, its terminal part slightly dorsally bent, or sometimes rather straight, hyaline portion of tail 34-40 um long. Two pairs of caudal pores; one lateral and other subdorsal.

Table 7: *Morphometrics of Dorylaimoides micoletzekyi (de Man, 1921; Thorne and Swanger, 1936). All measurements are in µm and in the form: mean ± SD (range).*

Characters	Pakistani specimens		Siddiqi, 1964	
	Female (n=8) Mean ± SD (Range)	Male (n=5) Mean ± SD (Range)	Female	Male
L	1113±57.3 (1018-1166)	1117.2±46.2 (1064-1198)	1.0-1.2	0.95-1.06
a	37.7±1.72 (35.4-40.3)	47.9-4±.48 (39.9-53.2)	36-43	40-46
b	6.6±1.24 (5.3-8.2)	5.98-0±538 (5.2-6.8)	5.4-6.0	4.9-5.9
c	19.6±1.02 (17.5-21.0)	24.6±2.3 (21.2-28.5)	16-20	14-16
c'	2.8±0.31 (2.4-3.4)	2.18±0.21 (1.9-2.5)	4.5	-
V%	44.4±1.75 (42.0-48.1)	-	40-43	-
Lip region diameter	7.5±0.40 (7-8)	7.4±0.37 (7-8)	-	-
Lip region height	3.8±0.24 (3.5-4)	5±0.70 (4-6)	-	-
Odontostyle length	10.8±0.74 (10-12)	10.9±0.8 (10-12)	-	-
Guiding ring from anterior end	6.4±0.37 (6-7)	7±0.70 (6-8)	-	-
Nerve ring from anterior end	79±6.16 (70-90)	92±10.2 80-110	-	-
Pharyngeal length	180±7.79 (170-194)	187.2±9.3 (176-202)	-	-
Cardial length	6.8±0.74 (6-8)	6.6±0.37 6-7	-	-
Body width at base of oesophagus	25±0.81 (24-26)	24.5±0.74 23-25	-	-
Body width at mid body	30.25±1.40 (28-32)	24.4±2.05 (22-28)	-	-
Body width at anus	18.8±0.62 (18-20)	19.7±1.53 (18-22)	-	-
Prerectum	116±9.03 (100-126)	150±7.07 140-160	100	-
Rectum	13.0±0.67 (12-14)	35.4±3.55 30-40	-	-
Tail length	55.3±2.64 (50-58)	46.6±3.26 (41-50)	> 45	-
Spicules	-	28.4±1.49 (26-30)	-	29-30
Ventromedium supplements	-	4-5	-	5-6

Male: Similar to female in general morphology but more ventrally curved in posterior region. Genital system diorchic. Testes opposed, paired. In addition to the adanal pair, a series of four to five regularly spaced ventromedium supplements is present, the first within the range of the spicules. Spicules stout curved 26-30µm or 1.3-1.4 anal body diameter long. Lateral guiding piece short 8-10um long. Sperm round to spindle shaped. Rectum short, joining the ejaculatory duct at the level of the anterior end of the

spicules. Tail shape similar to female.

Remarks: The description and morphometric data are based on specimens collected from soil around the roots of banana (*Musa paradisiacal* L.) in Karachi, Sindh, Pakistan. Measurements and morphological characters are quite similar to those given by (de Man, 1921; Thorne and Swanger,1936).

Sectonema ventralis Thorne, 1930
(Figures 8A-F, 14I-L)

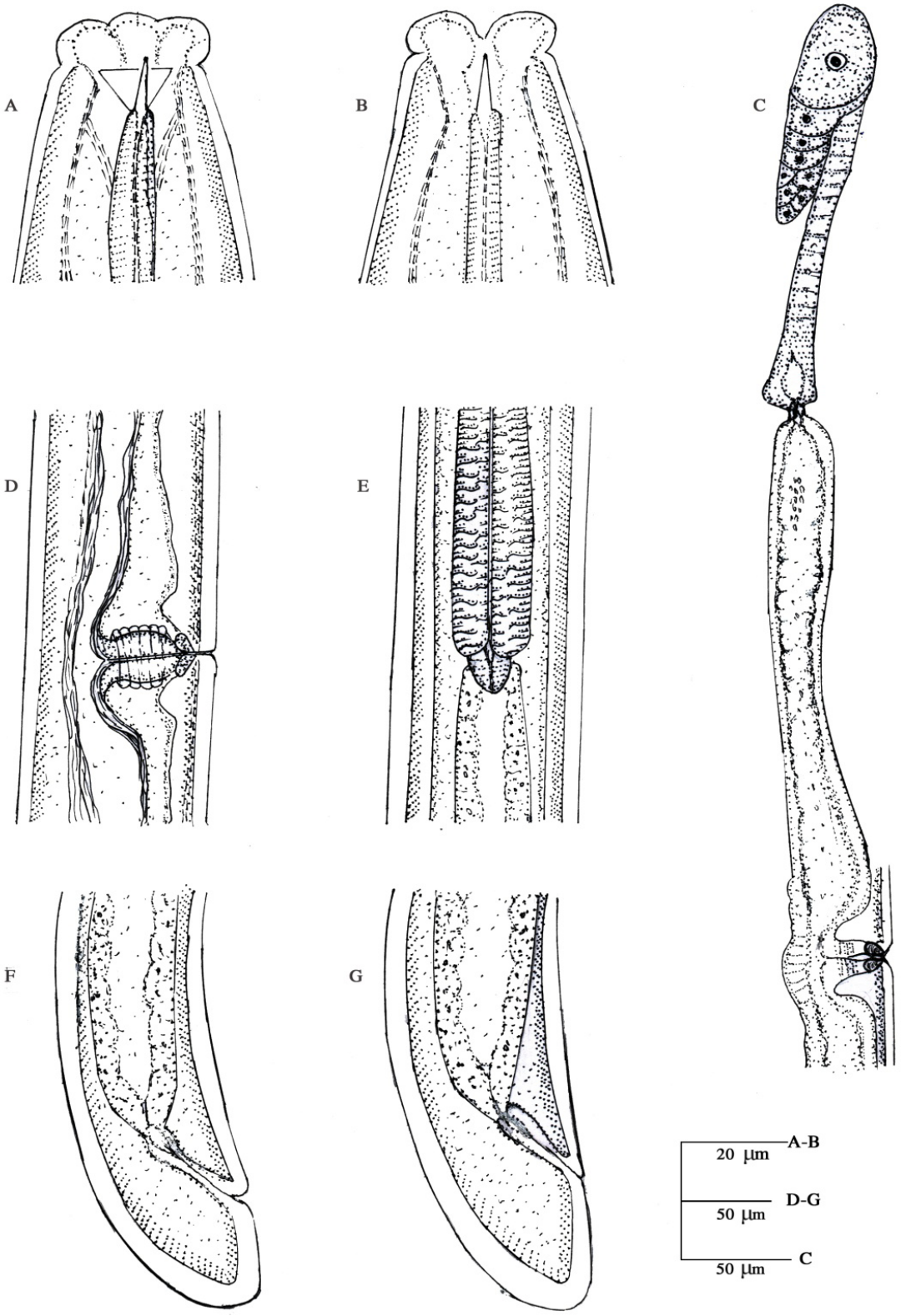

Figure 8: *Sectonema ventralis Thorne, 1930. Female: A, Anterior region showing amphid; B, Anterior region; C, Reproductive system; D, Vulval region; E, Cardial region; F and G, Tail region.*

Measurements: Table 8

Table 8: *Morphometric data of Sectonema ventralis Thorne, 1930. All measurements are in µm except L and in the form Mean ± SD (range).*

Characters	Female (n=5)	
	Mean±SD	Range
L	8.19±1.36	6.4-10
a	68.0±9.5	58.5-83.3
b	6.58±0.90	5.5-8.1
c	135.2±11.2	121.6-151.6
c'	0.705±0.05	0.62-0.76
V%	51.2±5.85	41.3-56.2
Tooth	13.25±0.43	13-14
G_1	6.23±0.82	5.0-7.4
G_2	7.71±1.12	6.0-9.0
Lip region diameter	29.3±0.94	28-30
Lip region height	10.3±1.24	9-12
Nerve ring from anterior end	236.4 ± 2.7	232-240
Oesophageal length	1232.7±65.8	1160-1340
Cardial length	6.8 ± 1.3	5.1-8.5
Cardial width	9.1 ± 0.62	8.5-10
Body width at base of oesophagus	121.5 ± 13.7	135-10.5
Body width at mid body	121.2 ± 8.9	110-130
Body width at anus	84.6±4.10	80-90
Anterior genital branch	505± 5	480-500
Posterior genital branch	590±10	580-600
Prerectum	300 ± 14.1	280-320
Rectum region	58.3±2.35	60-70
Tail length	60.25±6.17	50-66

Description

Female: Body large slender, ventrally curved when relaxed, more strongly in posterior half. Cuticle 10-12 µm thick at mid body 14-16 µm on tail, finely striated. Lateral hypodermal chord 48-50 µm wide, occupying 38.4-43.6% of the mid body width. Labial region strongly offset by a deep constriction, 0.3-0.4 times as wide as high. Lips separated with distinct papillae. Amphid large stirrup shaped, about 35-46% head width, at the level of cephalic region. Stoma wide, with dorylaimoide odontostyle. Mural tooth length 0.4-0.5 times lip region width. Oesophagus very muscular throughout. Nerve ring situated at 17-20% of neck length from anterior end. Cardia conoid rounded. Genital system didelphic, amphidelphic with both branches almost equally and well developed, the anterior 480-500 long or 5.0-7.4% of body length, and the posterior 580-600 long or 6.0-9.0% of body length. Ovaries well developed, variably sized, reflexed, not reaching the oviduct-uterus junction. Oviduct-uterus junction marked by a sphincture. Uterus a long simple tube like structure. Vagina cylindrical occupying more than half of the corresponding body width. Vulva a transverse slit. Pars refringent vaginae consisting of two triangular to drop shaped sclerotized pieces. Prerectum 3.5-3.6 rectum 0.75-0.77 times anal body diameter long. Tail shorter than anal body width, rounded to a hemispherical terminus with two pairs of lateral body pores.

Male: Not found.

Remarks: *Sectonema ventralis* was described by (Thorne, 1930) from cultivated field of Utah, US. During present studies this species was collected from roots of peach (*Prunus persica* L.) in Peshawar, KP, Pakistan, correspond well with the description given by (Thorne, 1930).

Ironus terranovus Ebsary, 1985
(Figures 9A-F, 15A-D)

Measurements: Table 9

Description

Female: Body ventrally curved upon heat relaxation, it assumes a ventrally curved posture, almost C shaped, long and slender 28-32µm wide at mid body. The cuticle is very thin, smooth. Lip region 14-15um, set off with slight constriction, 6-7µm high lips hardly separated with six small papillae, cephalic setae four, short, about 1/6 labial diameter long. Amphid aperture nearly as wide as one third corresponding body width. Biocrystals in body cavity absent. Body at posterior end of pharynxtwo times as wide as head. Stoma tubular, well sclerotized 70-75 µm long and 2.5-2.8µm wide, 26-28 times as long as wide, occupying 26-27% of total pharyngeal length. Three teeth curved, claw like located in the widened anterior end of stoma. Pharynx cylindrical, muscular, gradually widened posteriorly, comprising 15-16% of the body length excluding tail. Cardiaconoid-hemispheroid. Genital system didelphic, amphidelphic with reflexed ovaries. Each genital branch 8.0-8.8 body width long or occupying 12-14% of body length. Vulva a transverse slit, lips not protruded, without sclerotized structure, vagina thin, 8-10 µm long, as long as or slightly less half a corresponding body width. Uterus-oviduct junction with a weak sphincter. Uterine egg occurring in one

female, very large 170 x 24µm, 7 times larger than wide. Egg shell thick. Prerectum indistinct. Rectum 1.1-1.4 times the anal body width long. Tail long, 25-31% of total body length, first conoid at its base then slightly narrowing into filiform.

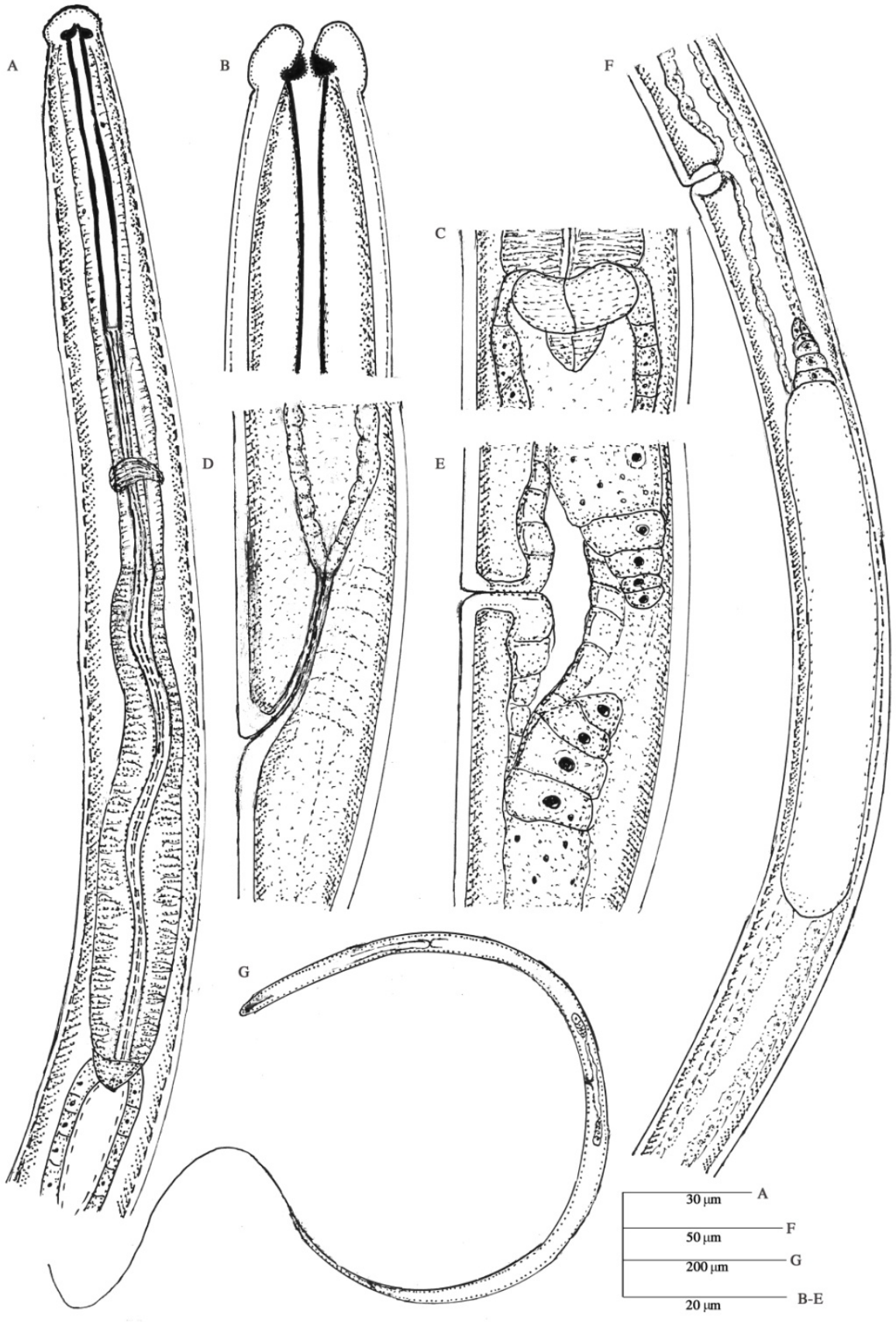

Figure 9: *Ironus terranovus Ebsary, 1985. Female: A, Oesophageal region; B, Anterior region; C, Cardial region; D, Rectum; E, Vulval region; F, Reproductive system; G, Whole body.*

Table 9: *Morphometric data of Ironus terranovus Ebsary, 1985. All measurements are in µm except L and in the form Mean ± SD (range).*

Characters	Female (n=10)	
	Mean ± SD	Range
L	1.75±0.09	1.6-1.9
a	58.8±4.1	50-66.5
b	6.4±0.39	6-7.2
c	3.4±0.16	3.2-3.7
c'	26.5±3.00	21-31
V	40.5±1.45	38-42.7
G_1	8.2±1.66	6-11
G_2	11±2.7	7-16
Lip region diameter	14.5±0.3	14-15
Lip region height	6.6±0.34	6-7
Stoma length	71.9±2.37	70-75
Pharynx length	270.6 ± 11.6	255-285
Nerve ring	117±5.6	110-125
Body diameter at base of esophagus	29±0.89	28-30
Body diameter at mid body	28 ± 1.41	28-32
Body diameter at anus	18.9±2.15	17.5-20
Vulva-anus distance	587±42.5	520-650
Rectum	21.2±0.74	20-22
Tail length	491.8±9.6	400-590

Male: Not found.

Remarks: *Ironus terranovus* collected from soil around the roots of banana *(Musa paradisiacal* L.) in Nawabshah, Sindh Pakistan. The present specimens correspond well to those given by (Ebsary, 1985), but it differs in smaller body and lip width (L=1.6-1.9 vs 2.9-3.4mm; lip width=14-15 vs 17-18µm); short stoma and smaller tail length (stoma=70-75 vs 102-110 µm; tail=400-590 vs 780-1060µm).

***Seinura oswegoensis* (Van de Linde, 1938)** Goodey, 1960
(Figures 10A-F, 15E-G)

Measurements: Table 10

Description
Female: Body slender ventrally curved upon fixation, tapering at both ends, more to the posterior. Cuticle finally annulated. Lateral field obscure. Head distinctly offset from body contour by a constriction, 3-4µm high and 6-8µm wide. Stylet 18-20µm long with wide lumen comprising a shaft without swelling, conus about one half or less of its length. Procorpus cylindrical metacorpus (medium bulb) oval with glandular part occupying about 1/2- 1/3 of anterior region. Excretory pore either adjacent or anterior to metacorpus. Nerve ring is about 70-80µm from anterior end surrounding pharyngeal glands. Reproductive tracts consist of an ovary, oviduct, spermatheca with sperms, uterus, vagina and post uterine sac. Anus distinct. Tail conical uniformly narrowing to a filiform terminus.

Table 10: *Morphometric data of Seinura oswegoensis (Van der Linde, 1938)* Goodey, 1960. *All measurements are in µm except L and in the form Mean ± SD (range).*

Characters	Female (n=6)	
	Mean± SD	Range
L	580.8 ± 22.7	552-600
a	27.76 ± 2.06	25-30
b	3.2 ± 0.41	6.4-8.1
b'	7.2 ± 0.52	2.9-4.0
c	12.416 ± 1.71	11-14
c'	3.94 ± 0.22	3.5-4.1
V%	77.7 ±.41	76-79.2
Stylet	20 ± 1.26	18-20
Lip width	8.2 ± 0.97	6-8
Lip height	2.4 ± 0.48	3-4
Medium bulb width	12.4 ± 3.87	10-12
Medium bulb length	19.4 ± 1.2	18-20
Max. body width	20.6 ± 1.2	20-23
Anal body width	12.8 ±1.16	11-14
Tail length	49.6 ± 4.02	45-54
Anterior at base of medium bulb	74.8 ± 2.63	70-77
Nerve ring	82.6 ± 1.85	80
Excretory pore	66.2 ± 3.37	60-70
Post uterine sac (PUS)	10.4 ± 0.8	10-12

Male: Not found

Remarks: This species was first described by (Van der Linde, 1938) Goodey, 1960. *Sinura oswegoensis* was reported for the first time from Pakistan around the roots of curry leaves from Landhi, Karachi, Sindh Pakistan. Our specimens closely agrees with most of the measurement and morphological characters as given by (Van de Linde, 1938; Goodey, 1960) with some differences in posteriorly located vulva (76-79.2 vs 67-74%) and in small tail length (45-54vs 56-80 µm).

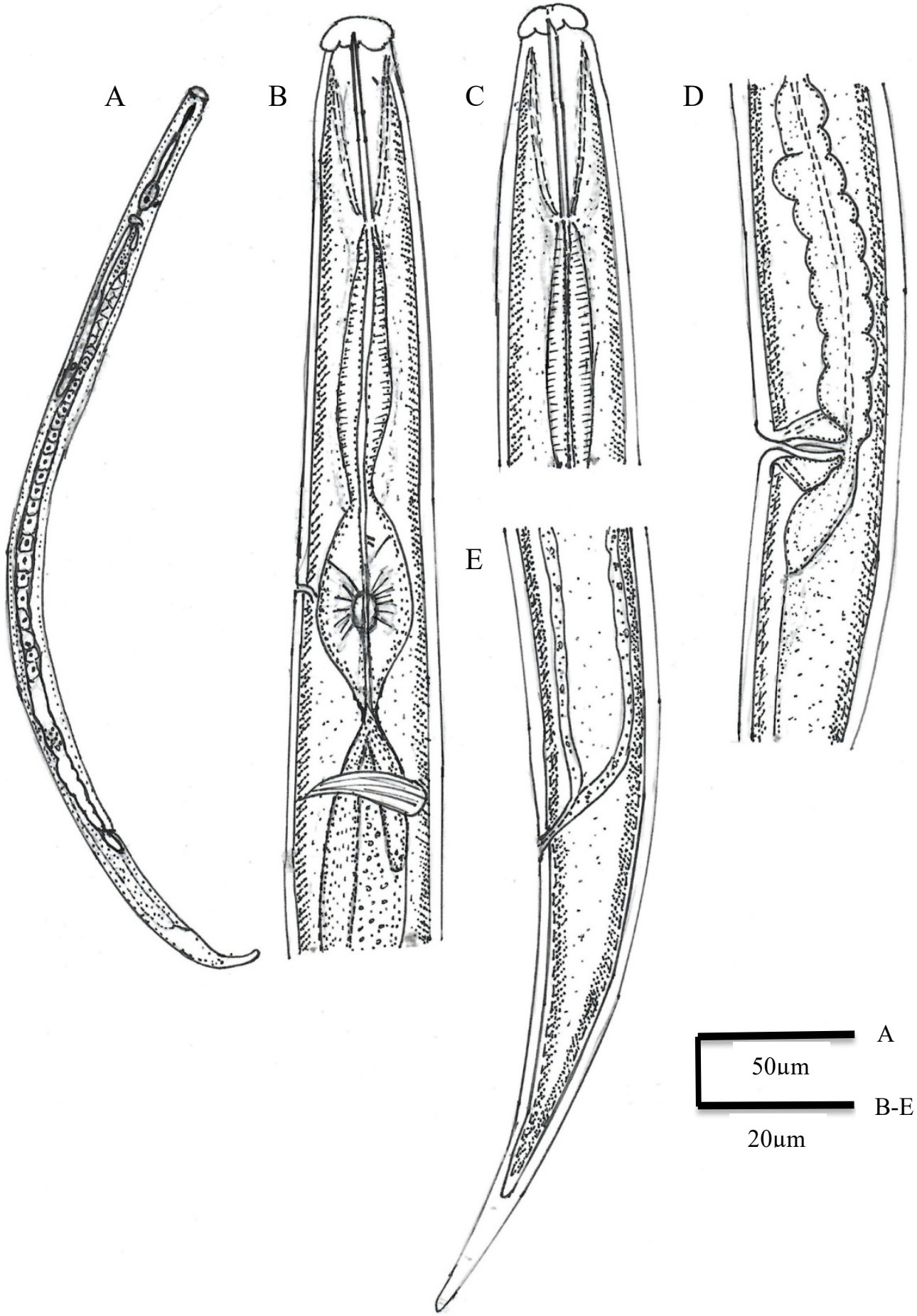

Figure 10: *Seinura oswegoensis (Van der Linde, 1938)* Goodey, 1960. *Female: A, Whole body; B and C, Anterior region; D, Reproductive system; E, Tail region.*

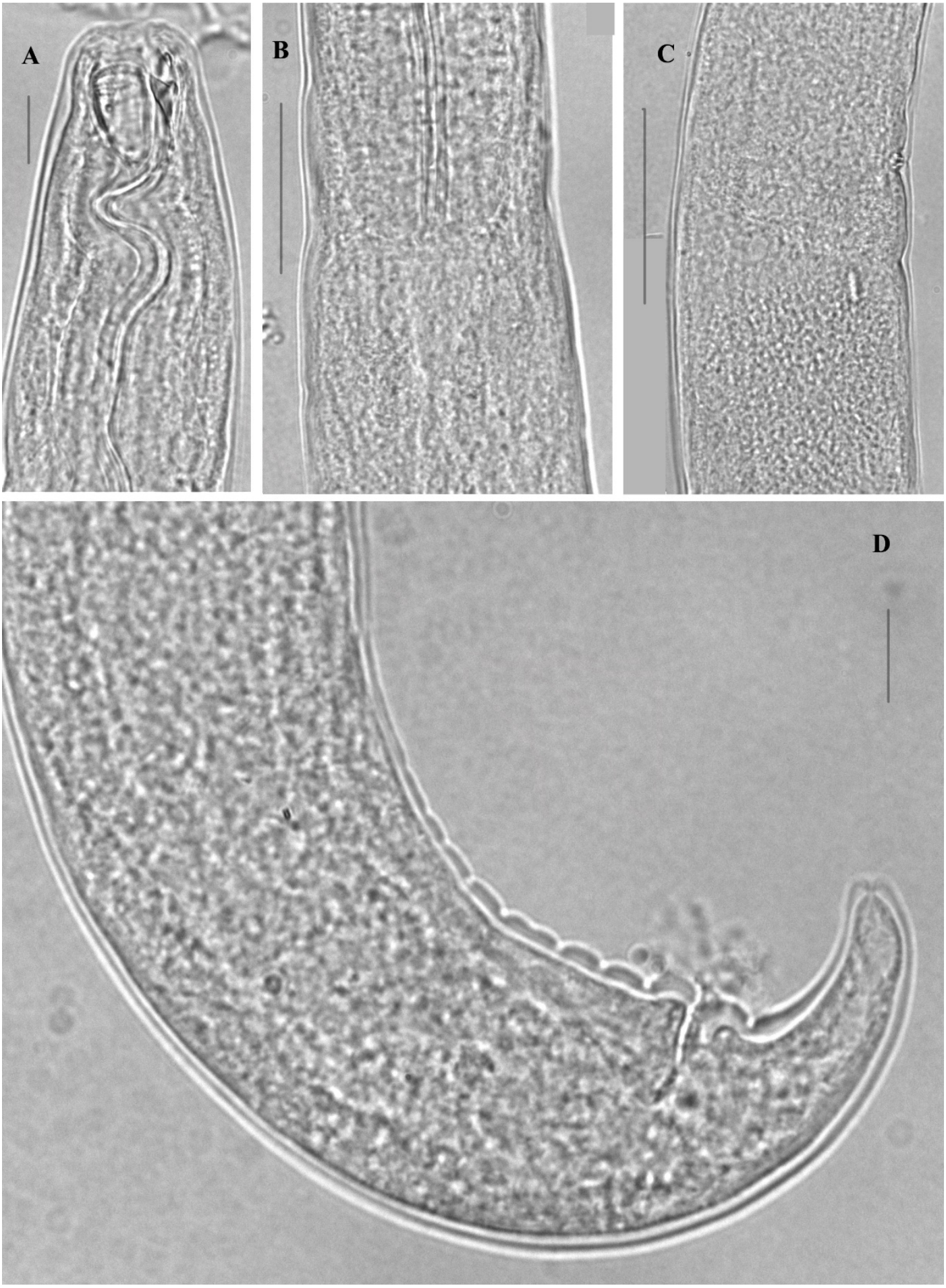

Figure 11: *A-D Mylonchulus musae n. sp.*

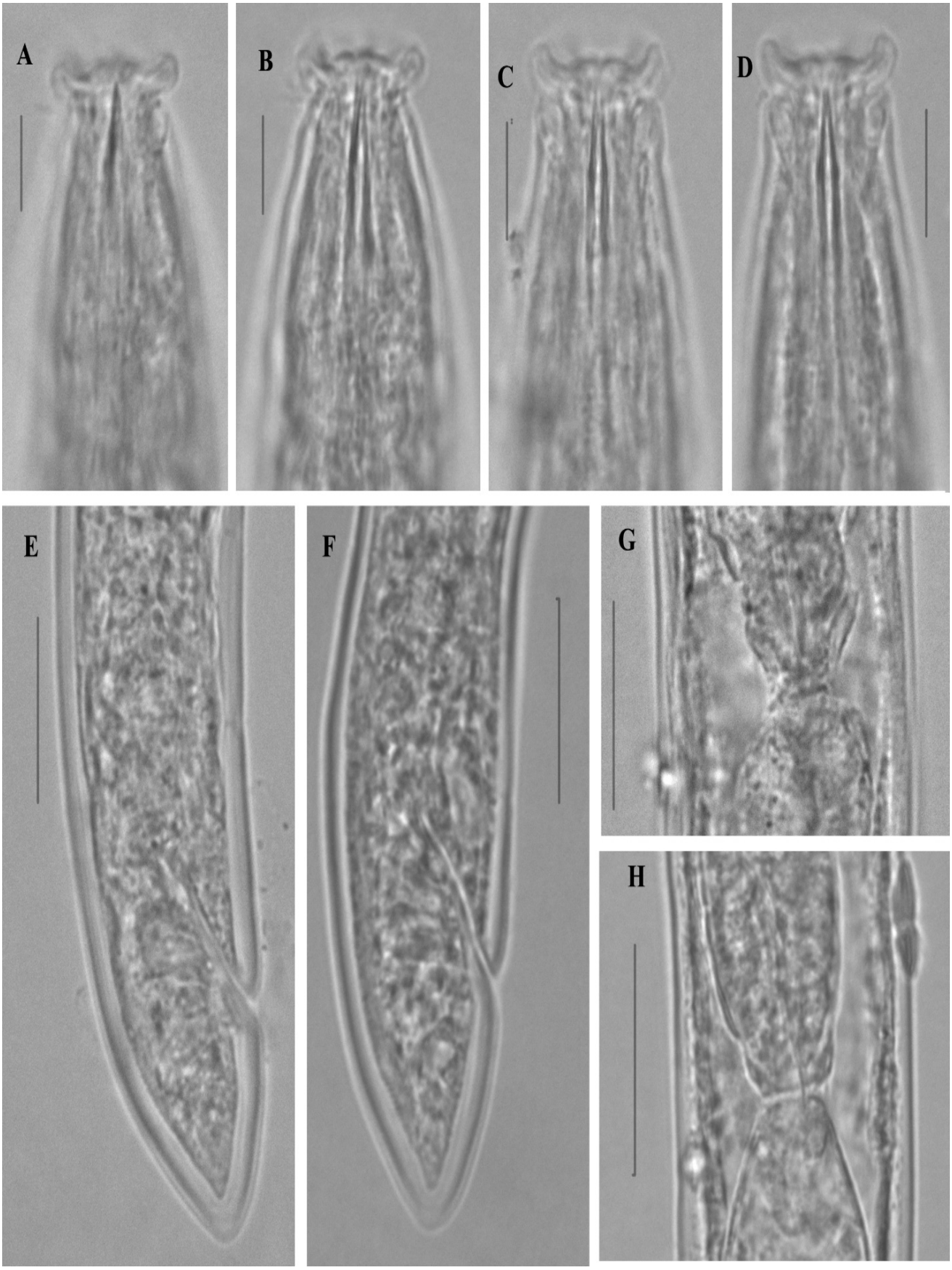

Figure 12: *A-H Discolaimus tabacum n. sp.*

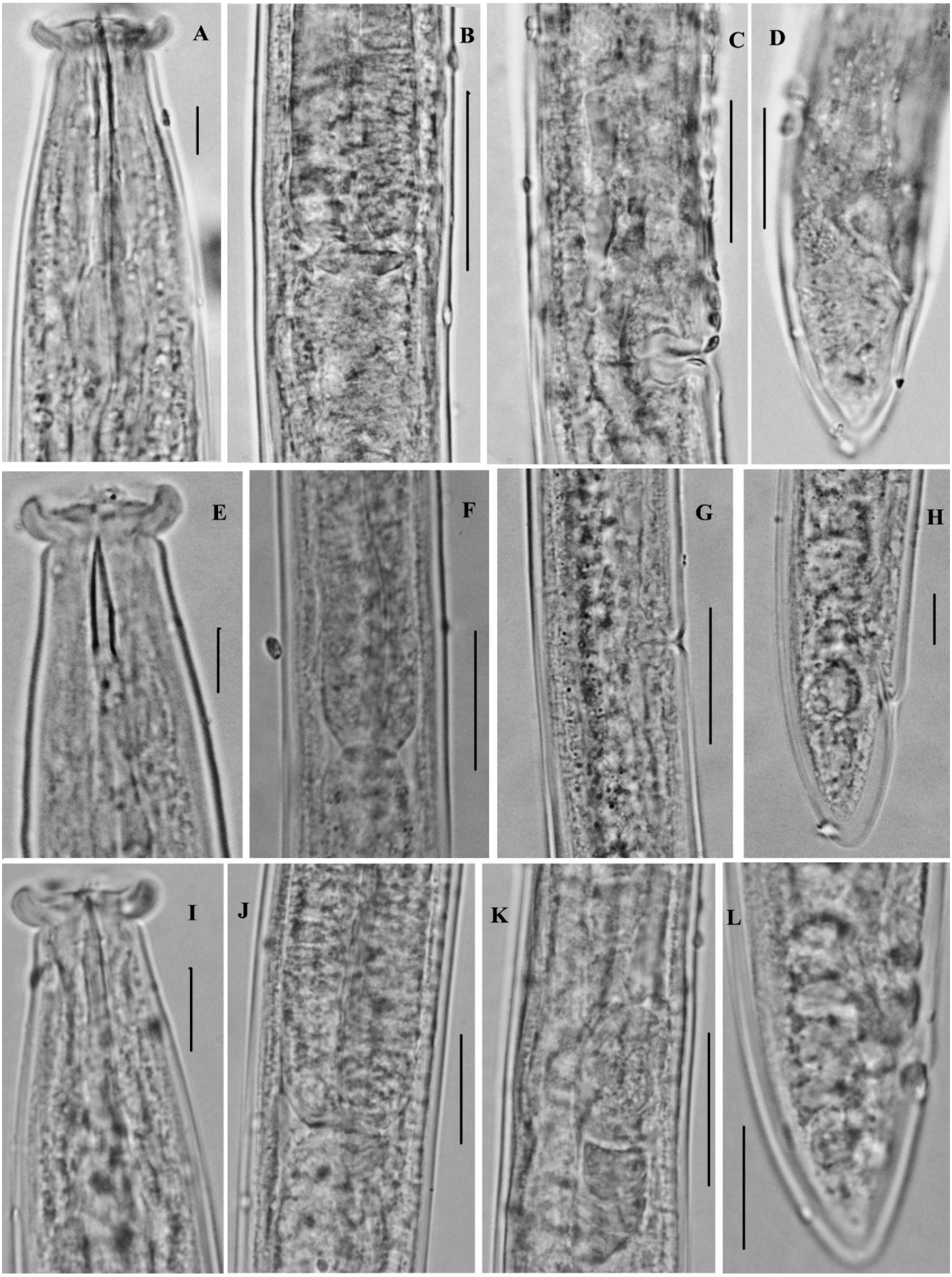

Figure 13: *(A-D) Discolaimus conicus Siddiqi, 2005; (E-H) Discolaimus laksi Khan and Laha, 1982; (I-L) Discolaimus omanensis Siddiqi, 2005.*

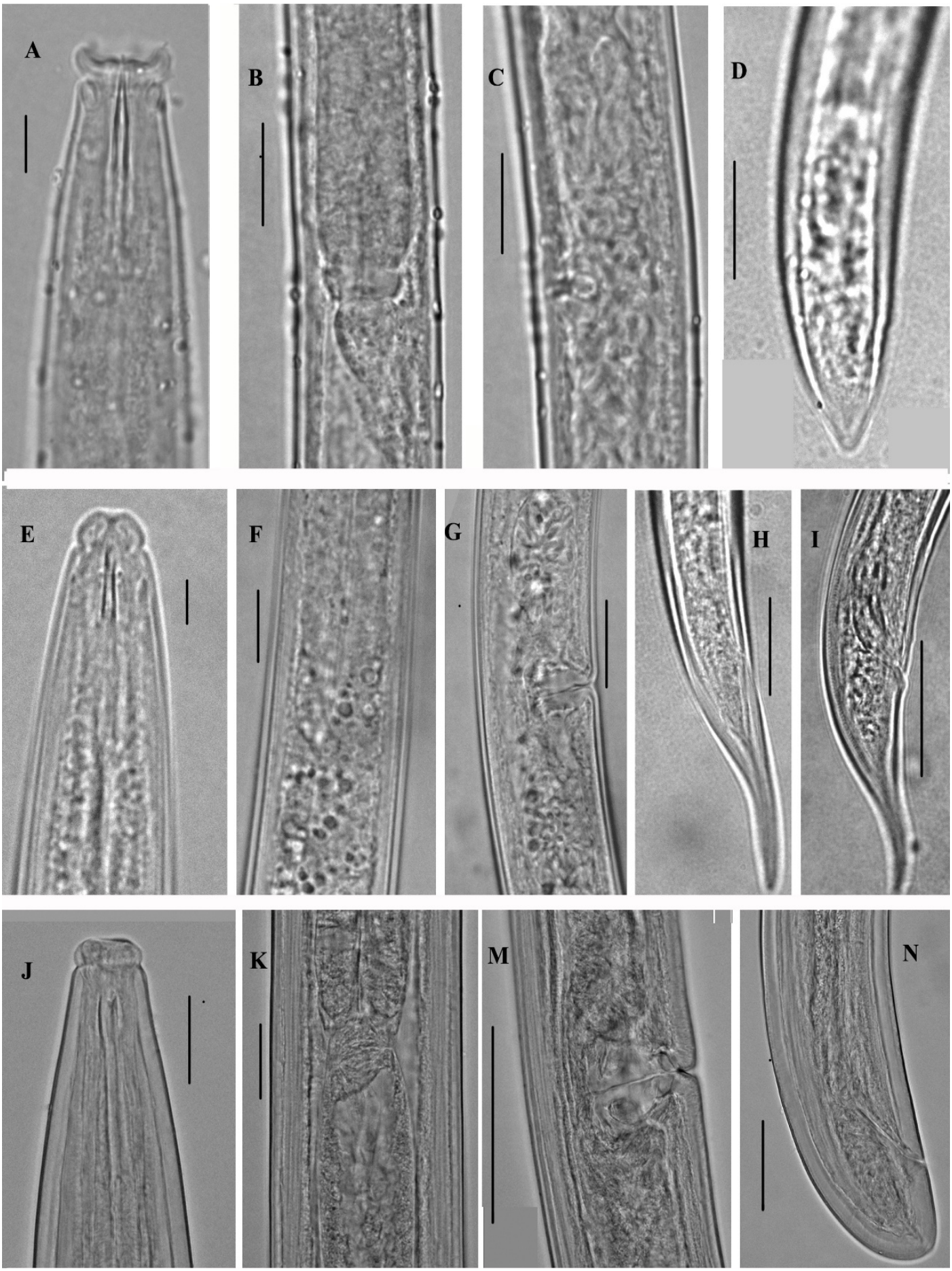

Figure 14: *(A-D) Discolaimus paratenaxs Siddiqi, 2005; (E-H) Dorylaimoides micoletzkii (de Man, 1921) Thorne and Swanger, 1936; (I-L) Sectonema ventralis Thorne, 1930.*

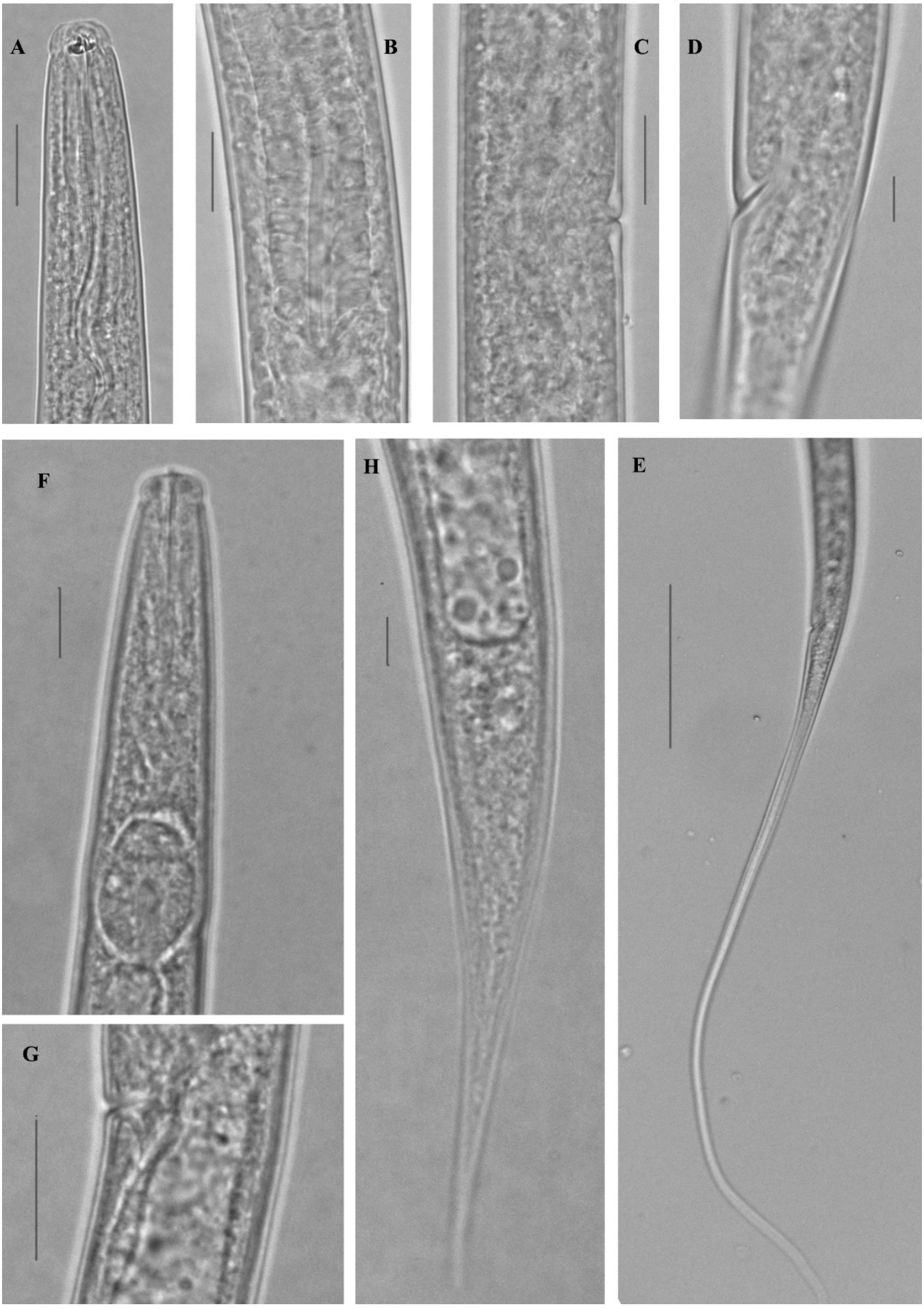

Figure 15: *(A-E) Ironus terranovus* Ebsary, 1985*; (F-H) Seinura oswegoensis (Van de Linde, 1938)* Goodey, 1960.

Novelty Statement

The taxonomical research of two new species and eight new records of predacious nematode of Pakistan has been presented in this article.

Author's Contribution

Uzma Ishaque performed survey and collect morphometric data, Nasira Kazi did identification, line drawing and description , Erum Iqbal did photography and review the manuscript and Shahnaz Dawar supervised the research.

Conflict of interest

The authors have declared no conflict of interest.

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