

## Description of Four New and Two Unknown Species of Soil Nematodes (Nematoda: Dorylaimida) from Korea

### 韓國産 槍線蟲(Nematoda: Dorylaimida)의 4 新種 및 2 未記錄種 記載

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**Abstract** – Four new and two known species of soil nematodes belonging the order Dorylaimida are described and illustrated. *Discolaimium gyeongiens* n. sp. is 1.6~1.7 mm long, c = 37~41, odontostyle 19~21  $\mu$ m long and is characterized by having wider lip region and very short prerec-tum. *Aporcelaimellus donghwaens* n. sp. is 2.8~2.9 mm long, c = 4.0~4.5, odontostyle 19~20  $\mu$ m long and is characterized by possessing shorter odontophore, presence of cardiac disc and conoid tail. *Labronema korandus* n. sp. is 2.2~2.3 mm long, c = 68~81, odontostyle 27~28  $\mu$ m, spicule 61  $\mu$ m long and is characterized by having continuous lip region, circular vulva and cylindrical tail. *Zalophidera longus* n. sp. is 4.1~4.4 mm long, c = 107~130, spear 80~93  $\mu$ m long and is charac-terized by large sized body, spear and spear extension. *Discolaimoides bulbiferous* and *Diphthero-phora communis* were reported here for the first time in Korea.

**Key Words** – Taxonomy, Dorylaimida, *Aporcelaimellus donghwaens* n. sp., *Discolaimium gyeongiens* n. sp., *Labronema korandus* n. sp., *Zalophidera longus* n. sp., *Discolaimoides bulbiferous*, *Diphtherophora communis*, Korea

**초 록** – 槍線蟲目에 속하는 4 신종 및 2 未記錄種을 記述, 圖示하였다. *Discolaimium gyeongiens* n. sp. (경기짚룩槍線蟲)은 체장이 1.6~1.7 mm이고, c = 37~41, 槍針은 19~21  $\mu$ m이고, 구순부는 넓고, 前直腸은 매우 짧은 것이 특징이다. *Aporcelaimellus donghwaens* n. sp. (동화육각槍線蟲)은 체장이 2.8~2.9 mm이고, c = 4.0~4.5, 槍針은 19~20  $\mu$ m이고, 槍針擴張部는 짧고, 食道腸間弁 판이 있고, 꼬리는 원추형인 것이 특징이다. *Labronema korandus* n. sp. (코란두수槍線蟲)은 체장이 2.2~2.3 mm이고, c = 68~81, 槍針은 27~28  $\mu$ m이고, 交接刺는 61  $\mu$ m이고, 구순부는 연속되었고, 음문은 원형이고, 꼬리는 원통형이다. *Zalophidera longus* n. sp. (등근순劍線蟲)은 체장이 4.1~4.4 mm으로 길고, c = 107~130, 口針은 80~93  $\mu$ m으로 길고, 口針擴張部가 큰 것이 특 징이다. *Discolaimoides bulbiferous* (다산넓은槍線蟲)과 *Diphtherophora communis* (칠곡등근槍線蟲)은 우리 나라에서는 처음으로 기록되었다.

**검색어** – 분류, 창선충목, 경기짚룩창선충, 동화육각창선충, 코란두수창선충, 등근순검선충, 다산 넓은창선충, 칠곡등근창선충

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While studying Korean soil nematodes, four new and two unknown species in the order of Dorylaimida, were identified from various localities. These species are described and illustrated.

## Materials and Methods

The nematodes were extracted from soil samples by Cobb's sieving methods and centrifugal sugar flotation technique. Nematodes obtained in water were killed and fixed in hot (70°C) F:G 4-1 fixative. These nematodes were dehydrated by Seinhorst's rapid glycerine method. Measurements and drawings were made with a drawing tube attachment with Olympus BX50 microscope.

## Descriptions

### *Discolaimium gyeongi* n. sp. (경기짚룩槍線蟲) (Figs. 1, 2)

#### Measurements

Female (Holotype). L = 1.7 mm; a = 44; b = 4; c = 41; c' = 1.4; V = 43; G<sub>1</sub> = 7; G<sub>2</sub> = 7.3; Odontostyle = 19 μm; Odontophore = 20 μm; Oesophagus = 427 μm; Prerectum = 19 μm; Rectum = 23 μm; ABD = 29 μm; Tail = 41 μm.

Females (Paratype n = 5). L = 1.7 ± 0.3 (1.6~1.7) mm; a = 42.5 ± 2.6 (39~45); b = 4.0 ± 0.1 (3.8~4.2); c = 40 ± 1.7 (37~41); c' = 1.6 ± 0.2 (1.4~1.8); V = 43 ± 1.0 (42~44); G<sub>1</sub> = 6.3 ± 1.2 (5.2~7.0); G<sub>2</sub> = 6.3 ± 1.1 (5~7); Odontostyle = 20.2 ± 0.8 (19~21) μm; Odontophore = 21.1 ± 1.3 (20~23) μm; Oesophagus = 429 ± 18.7 (398~444) μm; Prerectum = 19.4 ± 3.0 (16~24) μm; Rectum = 26.8 ± 2.8 (23~30) μm; ABD = 27.2 ± 1.6 (26~29) μm; Tail = 42.6 ± 2.1 (41~46) μm.

**Female:** Qudsianematidae. Body medium sized, assumes a ventrally arcuate shape when fixed. Body cuticle composed of two finely transversally striated layers. Lateral body chords about one-third of corresponding body width wide at base of oesophagus with distinct glandular bodies numbering 68~74 on each side. Amphids stirrup-shaped, aperture about two-fifths of lip region width wide. Lip region set off from body by a deep constriction, expanded, 23~26 μm wide and 9~10 μm high. Labial papillae slightly elevated above

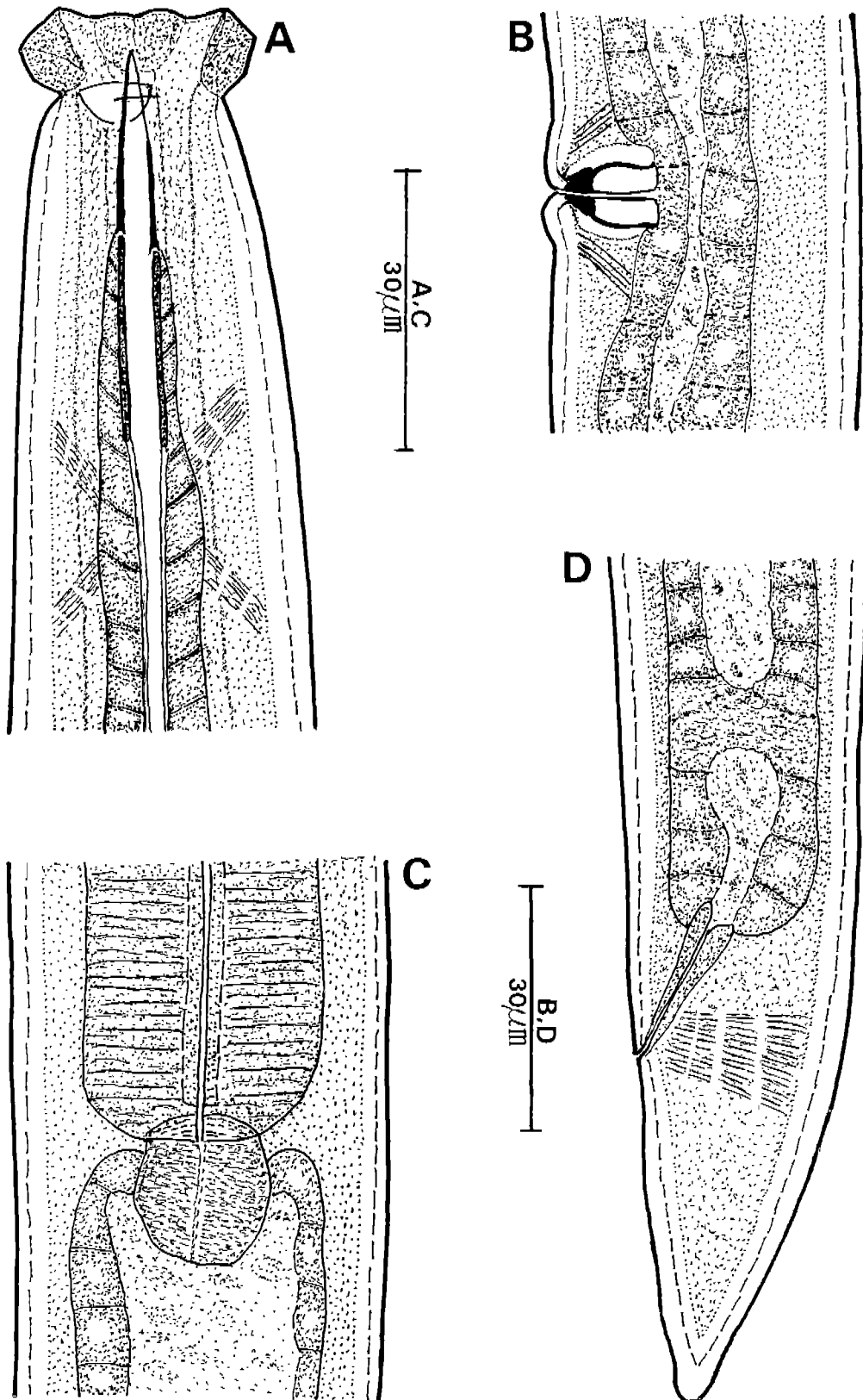
the labial contour. Odontostyle slightly less than one lip region width long, with aperture about half of its length. Guiding ring single, weak, located slightly behind the labial constriction. Odontophore simple, rod-like, equal to odontostyle length. Anterior part of oesophagus a slender muscular tube, posterior expanded portion enlarged into a muscular cylinder, occupying about 62~65% of total oesophageal length. Orifice of the dorsal oesophageal gland (DO) located at 28~30 μm from oesophageal expansion. Dorsal oesophageal gland nuclei (DN) located at 8~11 μm behind DO. Cardia oblong to rounded, 13~18 μm long. Intestine with prominent lumen and few refractive granules in its cell. Gonads paired, symmetrical, opposed, reflexed at oviduct. Ovaries about two body width long, with developing oocytes mostly in a single row. Vulva a small transverse slit, slightly elevated, with conspicuous lips. Vagina with muscular wall extending about one-third of corresponding body width deep. Prerectum small about three-fourth of anal body width long. Rectum about as long as anal body width. Tail dorsally convex conoid to a sub-digitate terminus, about 1.4~1.6 anal body width long.

**Diagnosis and relationships:** The new species is distinguished by its wider lip region and larger odontostyle aperture, elevated vulva and short prerectum. The new species comes close to *Discolaimium conura* Thorne, 1939 and *D. paraconura* Siddiqi, 1965. But it differs from former by having larger body, anteriorly located vulva and smaller prerectum (L = 1.2, V = 54 and prerectum equal to rectum length in *D. conura*). From later differs in having longer odontostyle, tail, anteriorly located vulva and in presence of conspicuous lateral glandular bodies (Odontostyle = 9.0~9.5 μm, c = 48~54, V = 49~52 and lateral glandular bodies inconspicuous in *D. paraconura*).

**Male:** Not found.

**Type habitat and locality:** Soil samples collected from around rhizosphere of peanut (*Arachis hypogaea* L.) Dasan, Gyeongsangbug-do, Korea. Collected in August, 1991.

**Type material:** Holotype female and paratype females of *Discolaimium gyeongi* n. sp. on slides deposited in the nematode collection of Department of Agricultural Biology, College of Agriculture, Kyungpook National University, Taegu, Korea.



**Fig. 1.** *Discolaimium gyeongiens* n. sp., A: Anterior region; B: Vulval region; C: Oesophago-intestinal junction; D: Female posterior region.



**Fig. 2.** *Discolaimium gyeongi* n. sp., A: Anterior region; B: Oesophago-intestinal junction; C: Female posterior region; D: Female gonads.

***Discolaimoides bulbiferous* (Cobb, 1906) Heyns, 1963** (다산넓은槍線蟲) 신칭 (Figs. 3, 4)

**Measurements**

Females (n = 2). L = 1.6~1.7 mm; a = 50~51; b = 5.1 = 5.2; c = 31~32; c' = 2.5~2.6; V = 45.5~48.0; G<sub>1</sub> = 8.7~11.0; G<sub>2</sub> = 7.6~11.5; Odontostyle = 13~14 μm; Odontophore = 10~12 μm; Oesophagus = 310~333 μm; Prerectum = 42~48 μm; Rectum = 22~25 μm; ABD = 20~21 μm; Tail = 50~55 μm.

**Female:** Qudsianematidae. Body slender, slightly curved ventrally when fixed. Cuticle composed of two layers, inner layer with fine transverse striation. Lateral body chords about one-fifth of corresponding body width wide at base of oesophagus, with numerous lateral organs. Lateral body pores are large. Amphid apertures about three-quarter of corresponding body width wide. Lip region angular, expanded, 13~14 μm wide and 4~5 μm high. Odontostyle 13~14 μm or equal to lip region width long, with aperture occupying one-half of its length. Guiding ring single, anterior. Odontophore, linear, 10~12 μm long. Nerve ring located at 108~122 μm from anterior end. Oesophagus slender anteriorly with weak musculature till the abrupt expansion which is located at 48~50% of oesophageal length. Dorsal oesophageal gland orifice (DO) lies 22~24 μm behind oesophageal expansion. Dorsal oesophageal gland nuclei (DN) located at 10~12 μm behind DO. Cardia conoid-elongate, 10~15 μm long, cardiac disc present. Gonads paired, symmetrical, opposed, reflexed at oviduct. Vulva transverse, vagina nearly one-third of corresponding body width deep, slightly sclerotized. Ovary reflexed, oocytes arranged in a single row except at tip. Diameter of a intra-uterine egg: 109.0 × 22.5 μm. Prerectum about twice as long as rectum. Rectum 1.0~1.3 anal body width long. Tail conoid, 2.5~2.6 anal body width long.

**Remark:** *Discolaimoides bulbiferous* are being reported here for the first time from Korea. The morphology and measurements of Korean specimens agree well with the description of *D. bulbiferous* given by Dass *et al.*, 1969.

**Male:** Not found.

**Habitat and locality:** Soil samples collected from rhizosphere of peanut (*Arachis hypogaea* L.) Dasan, Gyeongsangbug-do, Korea. Collected in August, 1991.

**Material:** Females of *Discolaimoides bulbiferous* on

slides deposited in the nematode collection of Department of Agricultural Biology, College of Agriculture, Kyungpook National University, Taegu, Korea.

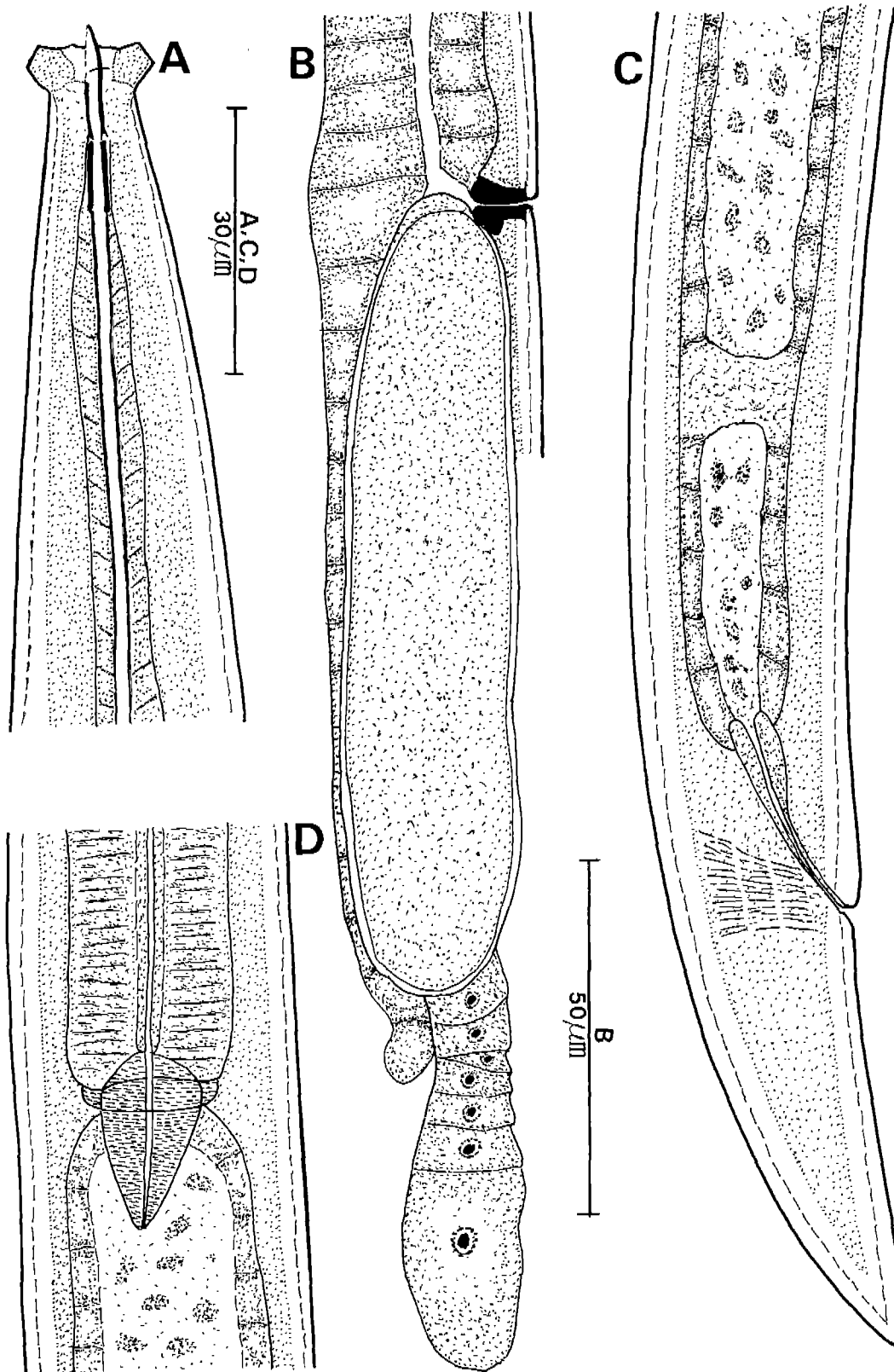
***Aporcelaimellus donghwaens* n. sp.** (동화육각槍線蟲) 신칭 (Figs. 5, 6)

**Measurements**

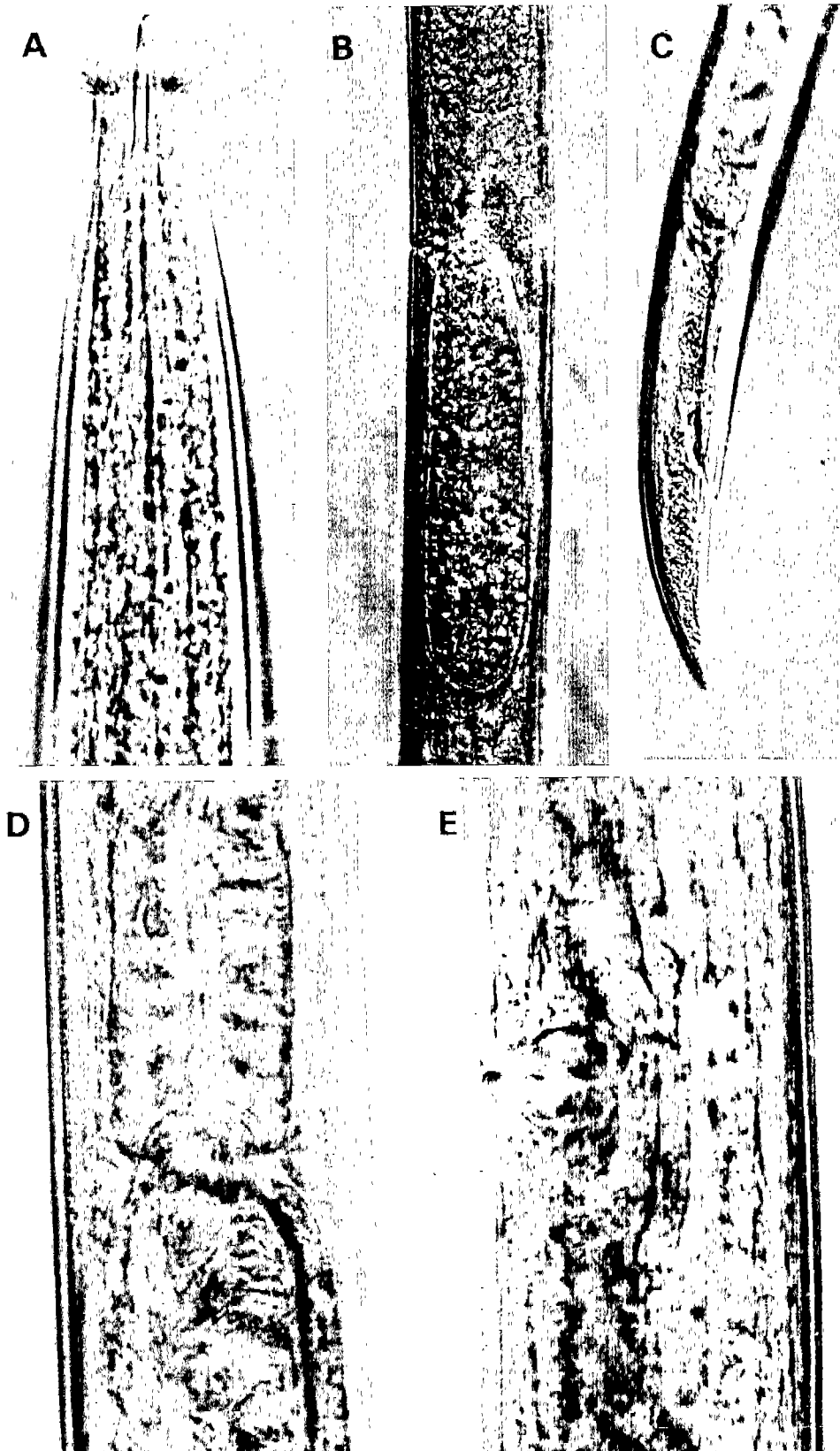
Female (Holotype). L = 2.8 mm; a = 31.4; b = 4.4; c = 41.5; c' = 1.4; V = 51; G<sub>1</sub> = 13.6; G<sub>2</sub> = 13.8; Odontostyle = 19 μm; Odontophore = 20 μm; Oesophagus = 644 μm; Prerectum = 149 μm; Rectum = 56 μm; ABD = 47 μm; Tail = 58 μm.

Females (Paratypes, n = 2). L = 2.8~2.9 mm; a = 31~33; c = 4.0~4.5; c' = 1.5~1.6; V = 52~55; G<sub>1</sub> = 13~15; G<sub>2</sub> = 14~15; Odontostyle = 19~20 μm; Odontophore = 20~24 μm; Oesophagus = 645~705 μm; Prerectum = 147~150 μm; Rectum = 50~57 μm; ABD = 43~48 μm; Tail = 68~70 μm.

**Female:** Aporcelaimidae. Body slightly ventrally curved when fixed, gradually tapering anterior to base of oesophagus. Cuticle finely transversally striated, 4~5 μm thick at mid-body and 7~8 μm on tail. Lateral body chords about one-sixth of corresponding body width wide at base of oesophagus. Lateral, dorsal and ventral body indistinct. Lip region off set by constriction, 19~20 μm wide or one-fourth to one-fifth of body-width at base of oesophagus and 5~6 μm high. Lips rounded, papillae not protruding. Amphids stirrup shaped, width at opening 9~11 μm or about half of corresponding body width wide. Odontostyle equal to lip region width long with aperture about half of its length. Guiding ring single, located at 9~11 μm from anterior end. Odontophore simple, rod-like almost equal to odontostyle length. Nerve ring located at 160~170 μm from anterior end of body. Oesophagus enlarges gradually between anterior narrow and posterior expanded portions. Expanded portion of oesophagus occupying 53~55% of total oesophageal length. Cardia elongate to rounded, 20~24 μm long. Reproductive system didelphic, amphidelphic. Vulva a transverse slit with sclerotized lips. Vagina about half of corresponding body width deep, provided with 4~5 muscle bands. Ovary reflexed with oocytes arranged in a single row except near tip. Prerectum 3.2~3.4 anal body widths long. Rectum 1.4~1.6 anal body width long. Tail conoid, equal to rectum length, with a caudal pore on dorsal



**Fig. 3.** *Discolaimoides bulbiferous*. A: Anterior region; B: Vulval region and female posterior gonad; C: Female posterior region; D: Oesophago-intestinal junction.



**Fig. 4.** *Discolaimoides bulbiferous*, A: Anterior region; B: Female posterior gonad; C: Female posterior region; D: Oesophago-intestinal junction; E: Vulval region.

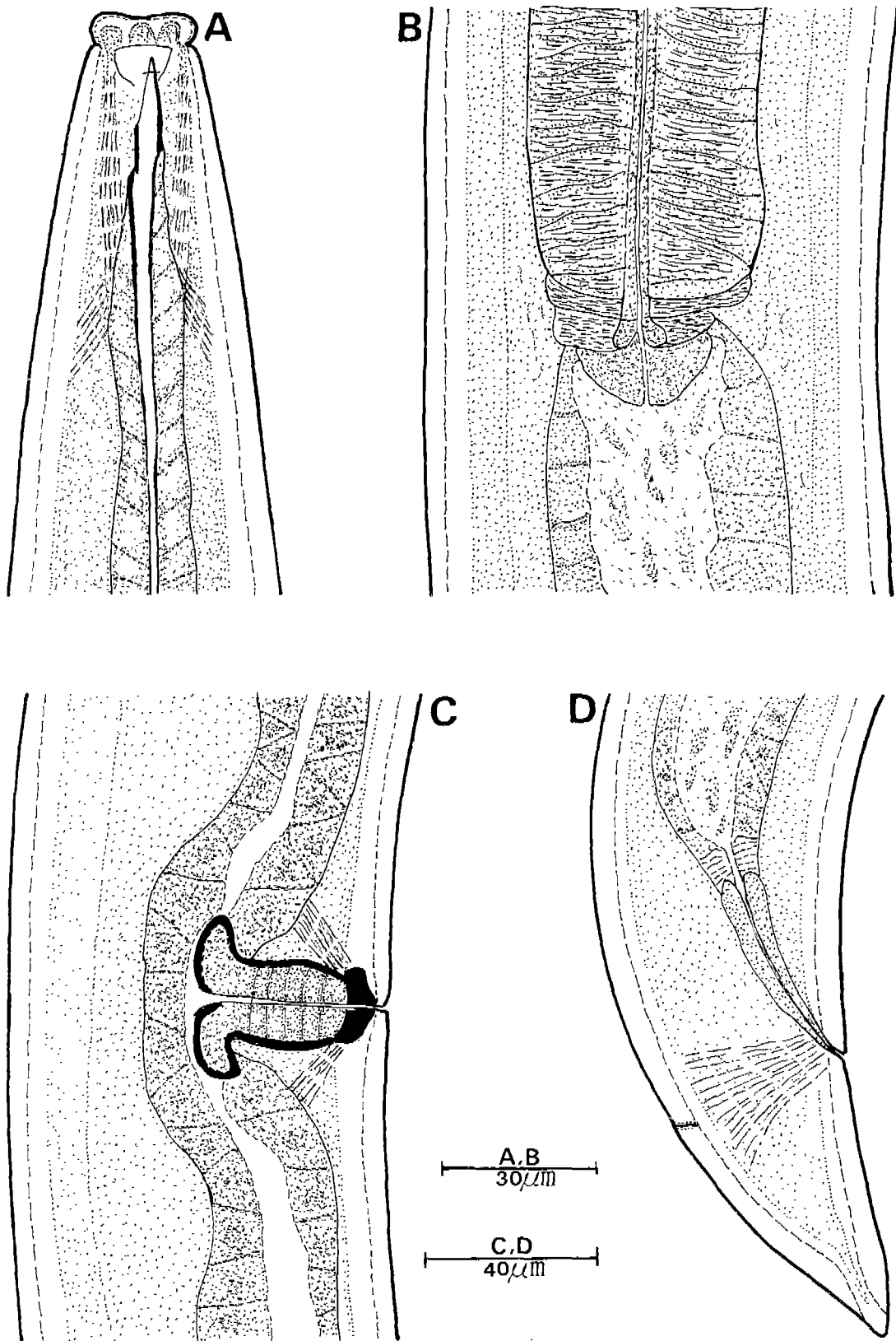
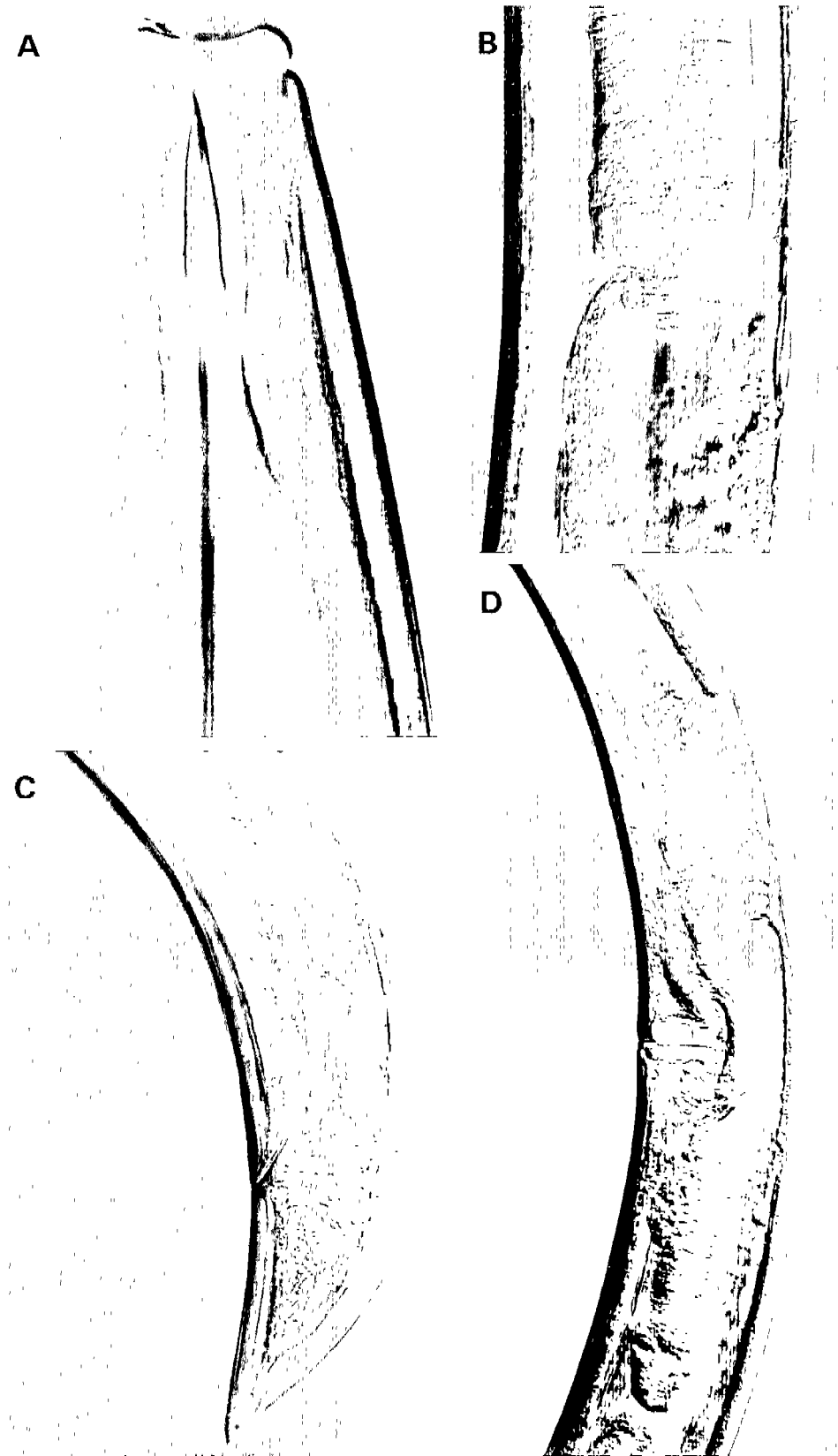


Fig. 5. *Aporcelaimellus donghwaens* n. sp., A: Anterior region; B: Oesophago-intestinal junction; C: Vulval region; D: Female posterior region.





**Fig. 6.** *Aporcelaimellus donghwaens* n. sp., A: Anterior region; B: Oesophageo-intestinal junction; C: Female posterior region; D: Female gonads.

side.

**Male:** Not found.

**Diagnosis and relationships:** The new species is characterized by the presence of cardiac disc and conoid tail. It comes close to *Aporcelaimellus obscurus* (Thorne and Swanger, 1936) Heyns, 1965 but differs from it in having smaller odontostyle, odontophore, and in the shape and size of tail (Odontostyle =  $23.8 \pm 2.1 \mu\text{m}$ ; Odontophore =  $35\sim 60 \mu\text{m}$ , tail dorsally arcuate to bluntly rounded terminus and  $c = 46.8\sim 83.7$  in *L. obscurus*). New species also resembles to *A. clamus* Thorne, 1974 but differs in having longer body, smaller odontophore and longer tail ( $L = 2.3 \text{ mm}$ , odontophore more than twice length of odontostyle and  $c = 58$  in *A. clamus*).

**Type habitat and locality:** Soil samples collected from rhizosphere of (*Pyrola japonica* Sieb) from Palgong-san, Taegu, Korea. Collected in August, 1989.

**Type material:** Holotype female and paratype females of *Aporcelaimellus donghwaens* n. sp. on slides deposited in the nematode collection of Department of Agricultural Biology, College of Agriculture, Kyungpook National University, Taegu, Korea.

***Labronema korandus* n. sp (코란두수槍線蟲)**  
신칭 (Figs. 7, 8)

**Measurements**

Female (Holotype).  $L = 2.3 \text{ mm}$ ;  $a = 36.7$ ;  $b = 4.0$ ;  $c = 68$ ;  $c' = 0.9$ ;  $V = 48$ ;  $G_1 = 25$ ;  $G_2 = 14.5$ ; Odontostyle =  $27 \mu\text{m}$ ; Odontophore =  $29 \mu\text{m}$ ; Oesophagus =  $569 \mu\text{m}$ ; Prerectum =  $149 \mu\text{m}$ ; Rectum =  $47 \mu\text{m}$ ; ABD =  $29 \mu\text{m}$ ; Tail =  $34 \mu\text{m}$ .

Male (Paratype,  $n = 1$ ).  $L = 2.2 \text{ mm}$ ;  $a = 41$ ;  $b = 3.7$ ;  $c = 81$ ;  $c' = 0.8$ ; Odontostyle =  $28 \mu\text{m}$ ; Odontophore =  $31 \mu\text{m}$ ; Oesophagus =  $590 \mu\text{m}$ ; Spicule =  $61 \mu\text{m}$ ; Ventromedian supplements =  $22$ ; Prerectum =  $253 \mu\text{m}$ ; Rectum =  $56 \mu\text{m}$ ; ABD =  $33 \mu\text{m}$ ; Tail =  $27 \mu\text{m}$ .

**Female:** Qudsianematidae. Body almost straight upon fixation; tapering slightly towards anterior extremity. Cuticle with transverse striations,  $4\sim 5 \mu\text{m}$  thick at mid-body and  $8\sim 10 \mu\text{m}$  on tail. Lateral chords about one-fifth of corresponding body width wide at mid-body. Lip region narrow continuous with body contour,  $16\sim 17 \mu\text{m}$  wide and  $7\sim 8 \mu\text{m}$  high. Amphids stirrup-shaped, their aperture about half of corresponding body width wide. Odontostyle  $1.6\sim 1.7$  lip region widths

long and as wide as adjacent body cuticle; aperture about one-third of its length. Guiding ring double, located at  $17\sim 18 \mu\text{m}$  from anterior end of body. Odontophore simple rod-like, almost equal to odontostyle length. Nerve ring located at  $155\sim 162 \mu\text{m}$  from anterior end of body. Basal expanded portion of oesophagus occupying  $48\sim 49\%$  of total oesophageal length. Cardia elongate-conoid,  $21\sim 30 \mu\text{m}$  long. Reproductive system didelphic, amphidelphic. Vulva circular, sclerotized, about one-third of corresponding body width deep. Well developed sphincter present between oviduct and uterus. Ovaries very large,  $205\sim 250 \mu\text{m}$  long, reflexed. Sperms present in uterus. Prerectum about three times as long as rectum. Rectum  $1.6$  anal body width long. Tail cylindrical with two prominent caudal pores on each side; terminus flattened.

**Male:** Body ventrally coiled in posterior region. Supplements an adanal pair and  $22$  contiguously arranged ventromedians. Spicules  $1.8$  anal body width long. Lateral guiding pieces with pointed chisel-shaped end, about one-fourth of spicule length. Prerectum  $7.7$  anal body width long, extending well beyond the range of ventromedian supplements. Rectum  $1.7$  anal body width long. Tail bluntly rounded with slight projections on both side just above the terminus.

**Diagnosis and relationships:** The new species is characterized by having continuous lip region, circular vulva, extremely large ovary and cylindrical female tail. It comes close to *Labronema neopacificum* Rahman *et al.*, 1986 but differs from that in having smaller odontostyle, odontophore, spicules and longer tail and male prerectum (Odontostyle =  $32\sim 36 \mu\text{m}$ ; Odontophore =  $49\sim 53 \mu\text{m}$ ; Spicules =  $65\sim 71 \mu\text{m}$ ;  $c = 81\sim 95$  and prerectum terminating within the range of ventromedian supplements in *L. neopacificum*). The new species also resembles to *L. pacificum* (Cobb, 1906) Thorne, 1939 but differs in having slender body, in the shape of lip region, spicules and tails ( $a = 21\sim 31$ , lips projecting over the vestibule, spicules strongly curved with narrow proximal ends and tails bluntly-conoid,  $c = 100$ , in *L. pacificum*).

**Type habitat and locality:** Soil samples collected from rhizosphere of rice (*Oriza sativa* L.) Gyeongsangnam-do, Korea. Collected in August, 1993.

**Type material:** Holotype female and paratype male of *Labronema korandus* n. sp. on slides deposited in the nematode collection of Department of Agricultural

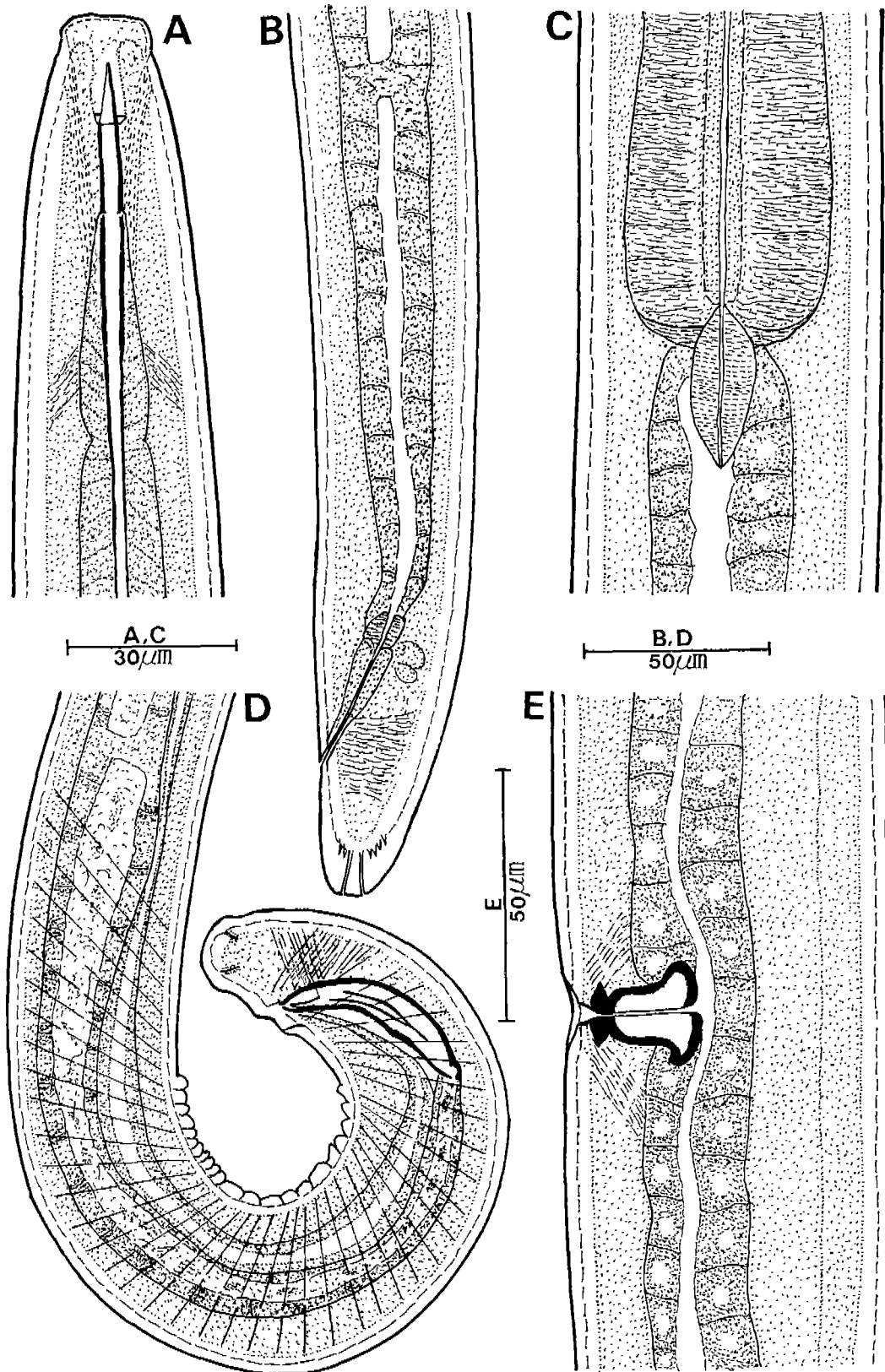


Fig. 7. *Labronema korandus* n. sp., A: Anterior region; B: Female posterior region; C: Oesophago-intestinal junction; D: Male posterior region; E: Vulval region.

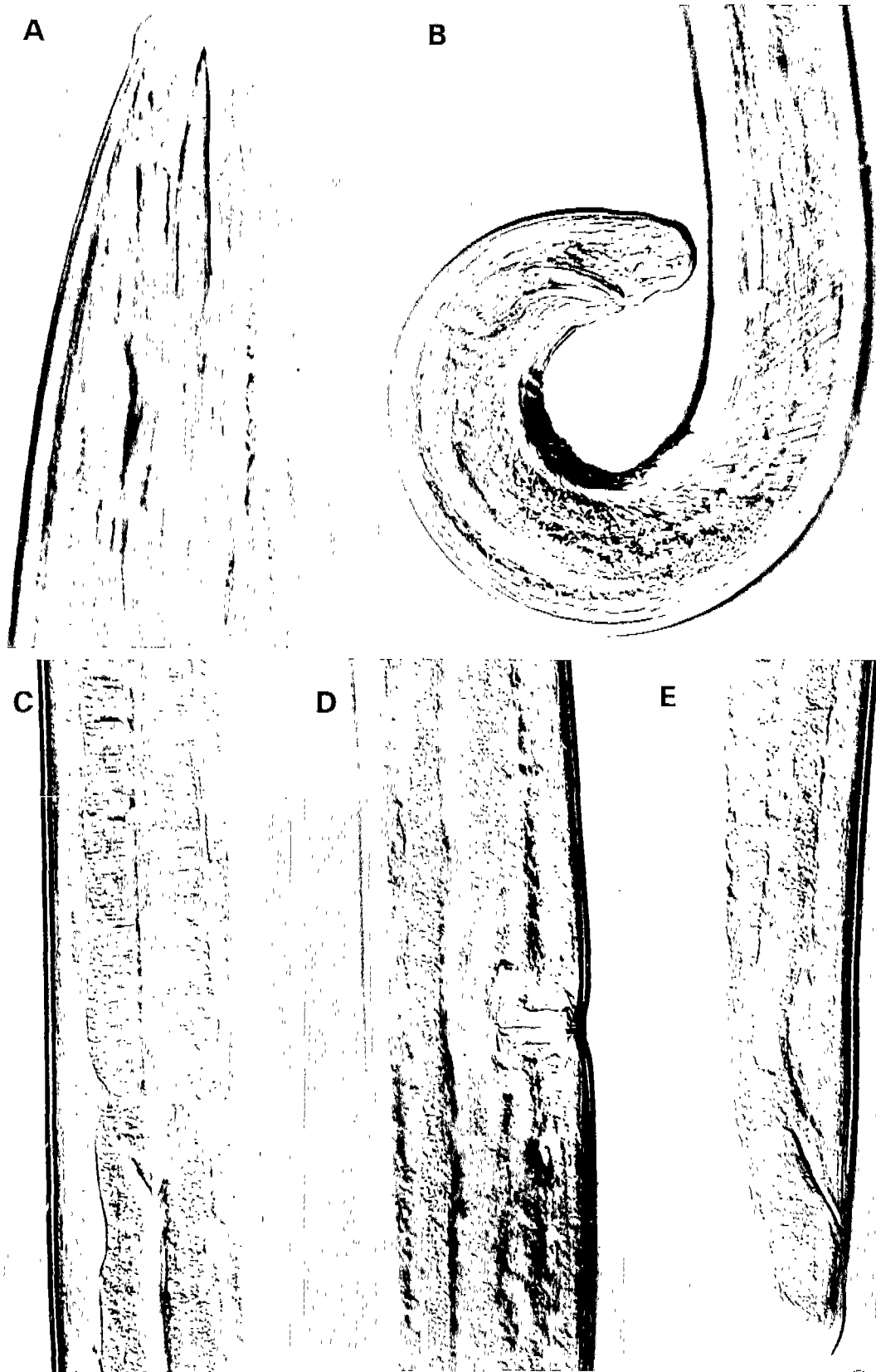


Fig. 8. *Labronema korandus* n. sp., A: Anterior region; B: Male posterior region; C: Oesophago-intestinal junction; D: Vulval region; E: Female posterior region.

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***Zalophidera longus* n. sp.** (둥근순劍線蟲)  
신칭 (Figs. 9, 10)

**Measurements**

Female (Holotype). L = 4.4 mm; a = 62; b = 9.6; c = 107; V = 51; G<sub>1</sub> = 11; G<sub>2</sub> = 10; Stylet = 93 μm; Stylet extension = 70 μm; Prerectum = 236 μm; Rectum = 44 μm; ABD = 58 μm; Tail = 39 μm.

**Female** (Paratype n = 1). L = 4.2 mm; a = 61; b = 13; c = 130; V = 49; G<sub>1</sub> = 12; G<sub>2</sub> = 10; Stylet = 80 μm; Stylet extension = 64 μm; Prerectum = 257 μm; Rectum = 38 μm; ABD = 52 μm; Tail = 35 μm.

Juveniles (n = 3). L = 3.7~4.5 mm; a = 61~72; b = 11~13; c = 84~99; Stylet = 92~100 μm; Stylet extension = 60~72 μm; Prerectum = 248~333 μm; Rectum = 31~43 μm; ABD = 56~61 μm; Tail = 43~46 μm.

**Female:** Tylencholaimidae Body large sized, ventrally curved in posterior region. Cuticle thick with radial muscles; outer cuticle finely striated, hypodermis distinctly striated. Lateral hypodermal chords irregular in width, about one-fourth of corresponding body width wide at mid-body; pores distinct. Lip region hemispherical, cap-like, 22~24 μm wide and 10~12 μm high, offset by deep constriction, papillae not elevated; perioral disc absent. Stoma tubular, slightly sclerotized 41~43 μm long. Amphids stirrup-shaped, aperture about 14~15 μm or two-thirds of lip region width. Stylet 80~93 μm long, attenuated, with very fine lumen and obscured aperture. Stylet extension rod-like, 64~70 μm long, posteriorly bearing conspicuous tri-radiate flanges. Oesophagus a narrow tube until it expands in its posterior fourth to form a cylindrical bulb about 91~113 μm long and 28~32 μm wide. Cardia rounded, 12~18 μm long. Intestine three cells in cross section, hexagonal, with distinct lumen. Prerectum about four times anal body widths long. Rectum three-fourths of anal body widths long. Tail conoid-rounded, with two pairs of lateral pores. Vulva transverse. Vagina with thick walls, about half body width long. Gonad paired, opposed, well developed; ovaries reflexed.

**Male:** Not found.

**Type habitat and locality:** Soil samples collected from rhizosphere of *Daphniphyllum macropodium* Miq. Cheongju-si. Chungcheongbuk-do, Korea. Col-

lected in August, 1991.

**Type material:** Holotype female and paratype female and juveniles of *Zalophidera longus* n. sp. on slides deposited in the nematode collection of Department of Agricultural Biology, College of Agriculture, Kyungpook National University, Taegu, Korea.

**Diagnosis and relationships:** The new species differs from other two known species of the genus, *Zalophidera tylocephala* Siddiqi, 1982 and *Z. idiostoma* Siddiqi, 1982 in having longer body, stoma, stylet and stylet extension (L = 1.6~2.2 vs 1.3~1.4 mm; Stoma = 31~36 vs 16 μm; Stylet = 35~37 vs 15.5~17.5 μm; Stylet extension = 35~38 vs 23 μm in *Zalophidera tylocephala*, and *Z. idiostoma*, respectively).

***Diphtherophora communis* De Man, 1880**  
(칠곡둥근槍線蟲) 신칭 (Figs. 11, 12)

**Measurements**

Female (n = 8). L = 0.65 ± 0.05 (0.53~0.69) mm; a = 21 ± 3.2 (15.3~25.4); b = 4.8 ± 0.1 (4.6~4.9); c = 20.8 ± 0.9 (19~25.4); c' = 1.5 ± 0.1 (1.3~1.8); V = 57.8 ± 0.9 (56.6~59.9); Stylet = 21.7 ± 1.0 (20.1~23.7) μm.

Males (n = 8). L = 0.63 ± 0.04 (0.57~0.71) mm; a = 22.4 ± 3.9 (17.2~28.7); b = 4.4 ± 0.4 (3.8~5.0); c = 17.8 ± 0.9 (16.3~19.6); Stylet = 21.5 ± 1.4 (18.7~23.7) μm; Gubernaculum = 5.8 ± 0.9 (5.0~7.2) μm. Spicules = 22.2 ± 1.1 (20.1~23.0) μm.

**Female:** Diphtherophoridae. Body granulated, cylindrical with gradually tapering ends, slightly ventrally arcuate when fixed. Cuticle thick, finely transversally striated, loosely fitted with body. Lip region continuous with body contour, rounded; labial papillae elevated. Amphids vase-shaped. Stylet with anterior refractive irregular part and posterior cylindrical extension bearing prominent basal knobs; its total length 20.1~23.7 μm or about twice head width long. Stylet guiding apparatus arch-like. Protruder muscles of spear attached with its basal knobs. Oesophagus with an anterior cylindrical tube crossed by nerve ring somewhere in the middle and posterior bulbar region, pyriform form in shape. Behind the cardia two glandular organ are present. Excretory pore situated at 83~106 μm from anterior end of body. Intestine wide, packed with refractive granules. Prerectum not defined. Rectum about anal body width long. Tail dorsally convex-conoid with sub-digitate terminus, 1.3~1.8 anal body

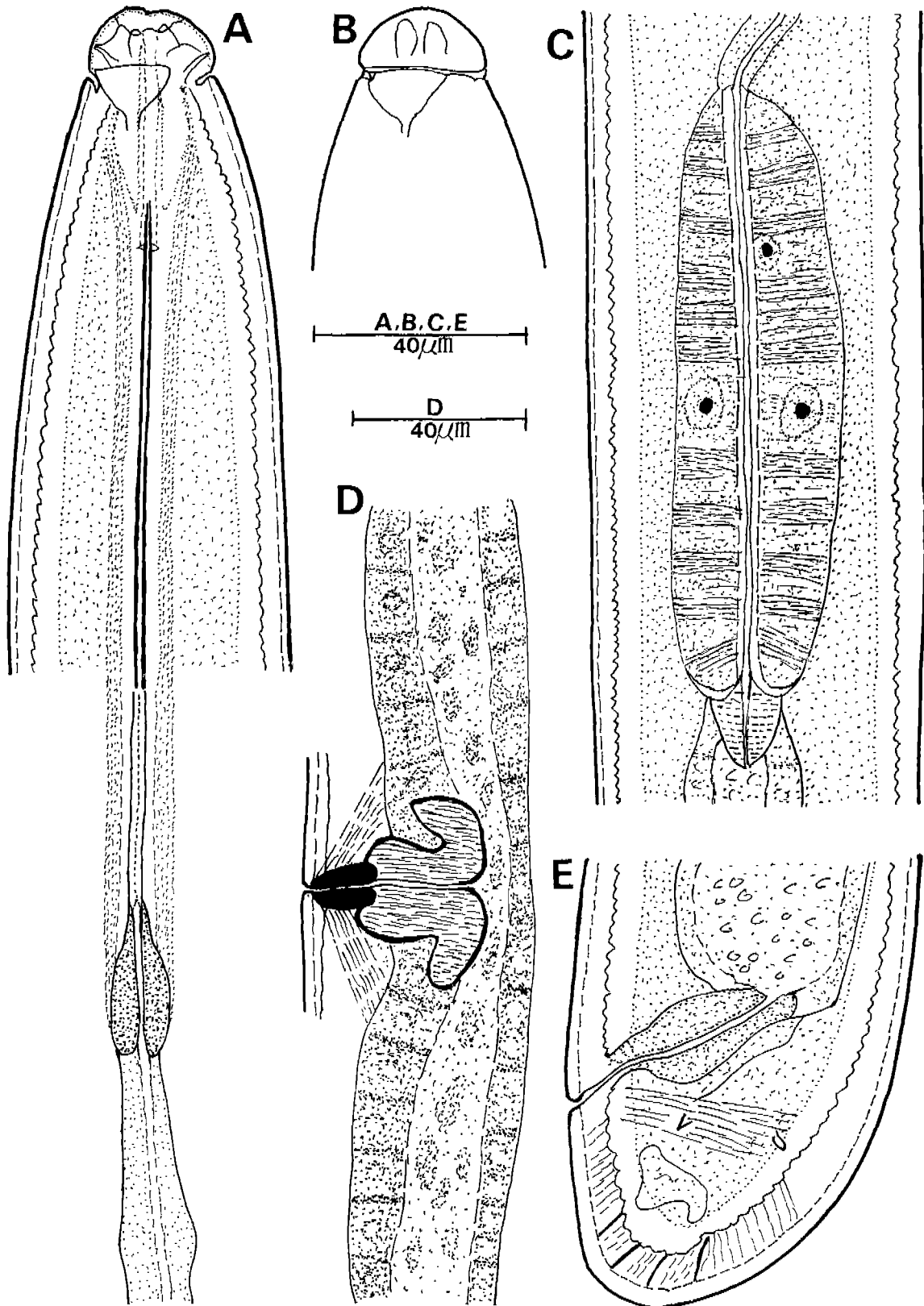
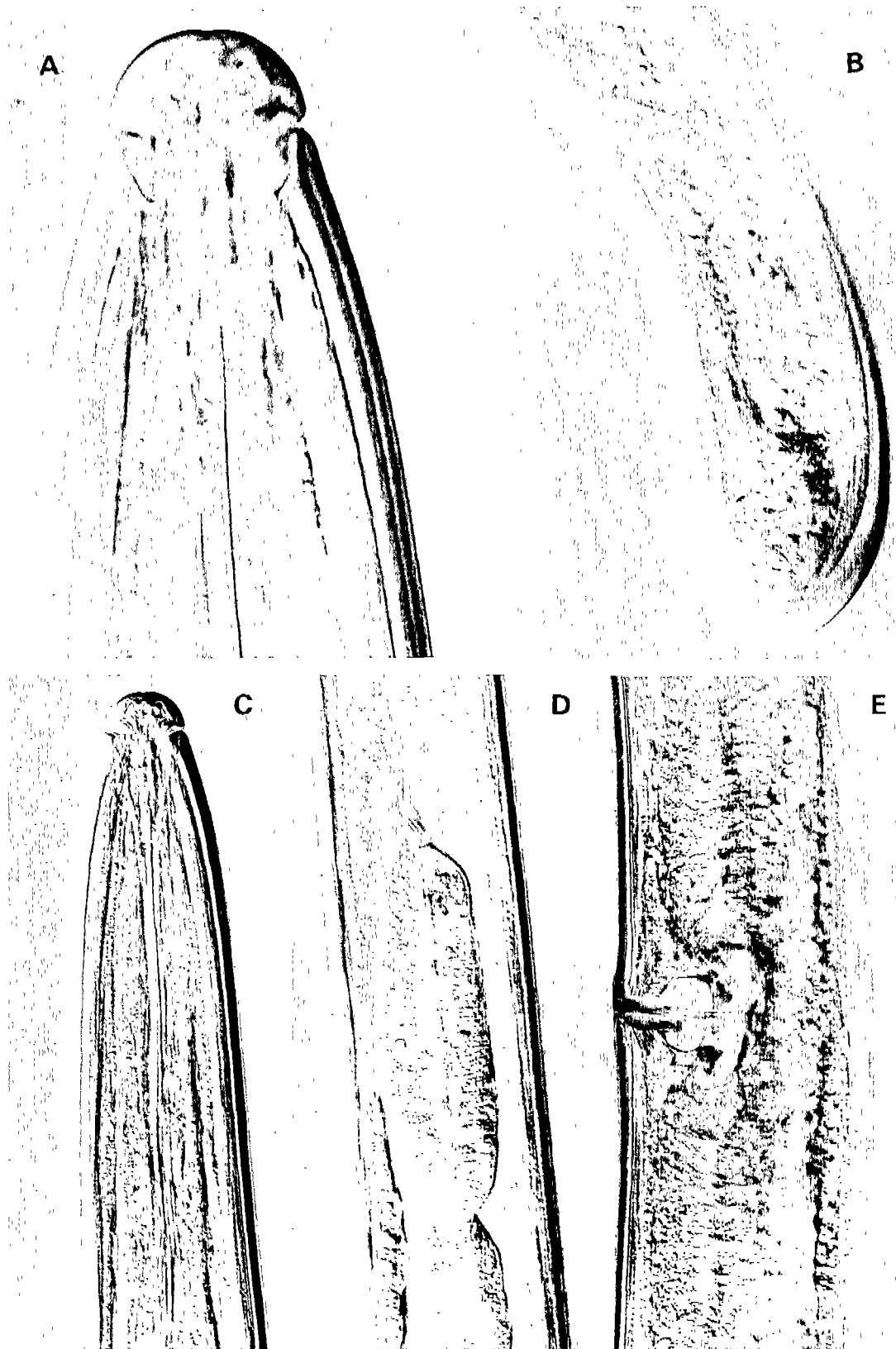
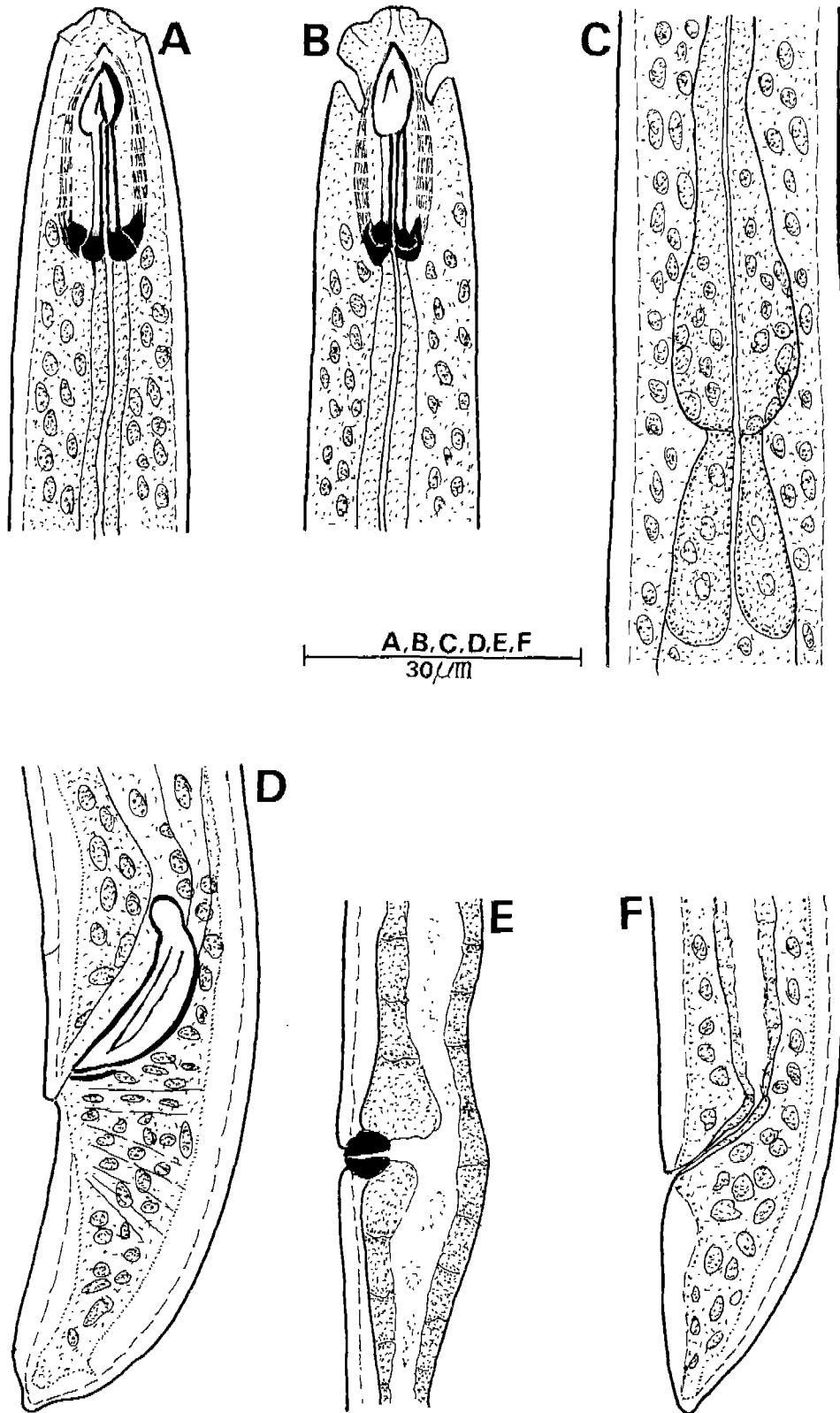


Fig. 9. *Zalophidera longus* n. sp., A & B: Anterior region; C: Posterior bulbar region of oesophagus and cardia; D: Vulval region; E: Female posterior region.

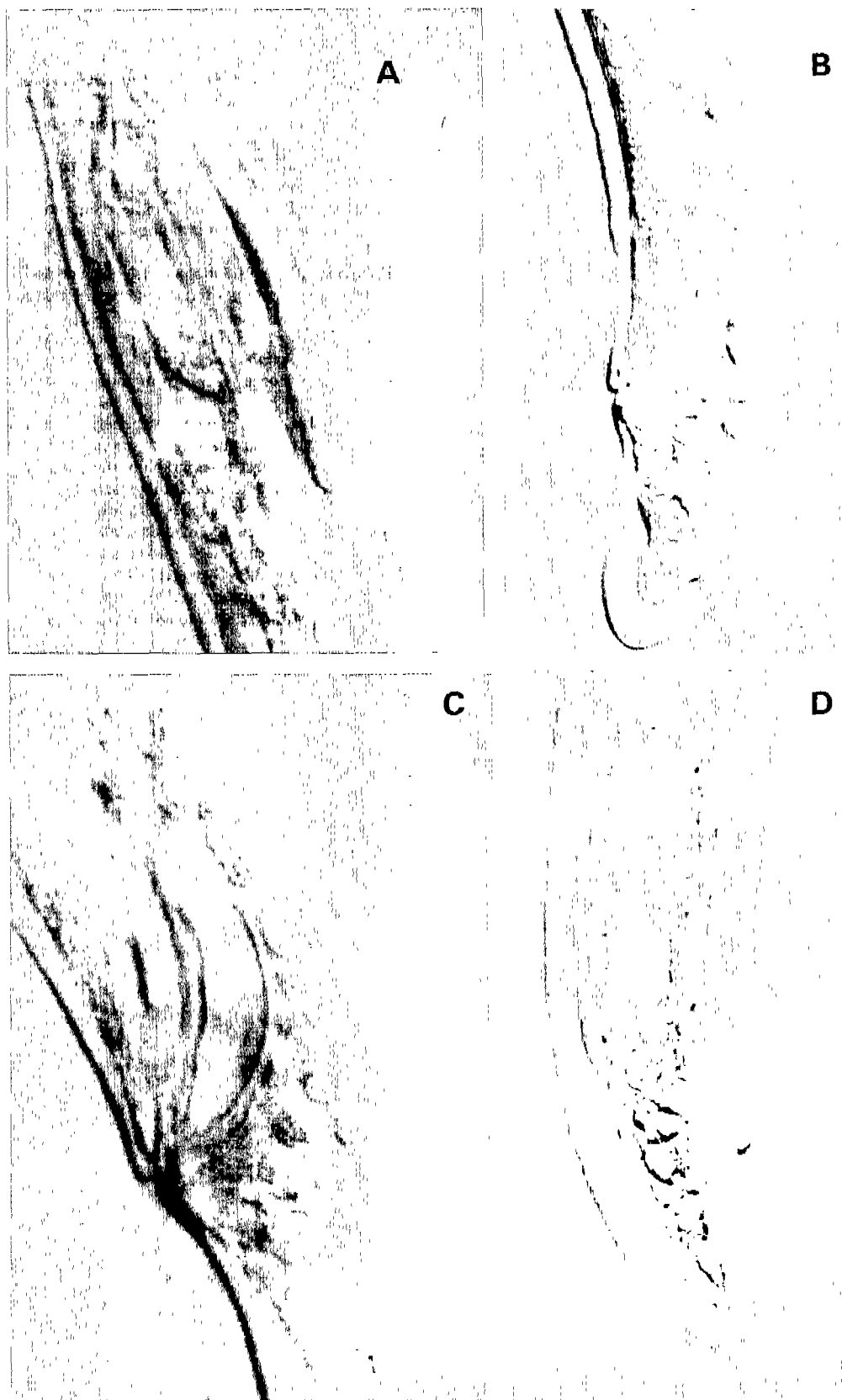


**Fig. 10.** *Zalophidera longus* n. sp., A: Anterior region; B: Female posterior region; C: Anterior region showing odontostyle; D: Posterior bulbar region of oesophagus and cardia; E: Vulval region.



**Fig. 11.** *Diphtherophore communis*. A & B: Anterior region; C: Basal bulbar region of oesophagus; D: Male posterior region; E: Vulval region; F: Female posterior region.





**Fig. 12.** *Diphtherophore communis*. A: Anterior region; B: Male posterior region; C: Spicule; D: Female posterior region.

width long. Reproductive system didelphic, amphidelphic. Ovaries reflexed half way to vulva. Vulva transverse. Vagina short, about one-fifth of corresponding body with deep, not sclerotized.

**Male:** Similar to female in general morphology. Testes single. Spicule simple, arcuate. Gubernaculum present, simple one-third to one-fourth of spicule length long. A single ventromedian supplement visible at the level of spicule head. Prerectum not defined. Rectum about anal body width long. Tail dorsally convex-conoid, with rounded to sub-digitate terminus.

**Habitat and locality:** Soil samples collected from rhizosphere of peony (*Paeonia albiflora* Pall) from Chilgok-gun, Gyeongsangbug-do, Korea.

**Material:** Female and males of *Diphtherophore communis* on slides deposited in the nematode collection of Department of Agricultural Biology, College of Agriculture, Kyungpook National University, Taegu, Korea.

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