DESCRIPTIONS OF TWO NEW AND A KNOWN SPECIES OF PREDATORY NEMATODES (NEMATODA: MONONCHIDA) FROM KOREA

Z. Khan[1], S.M. Lee[2], J.S. Choi[2] and S.D. Park[1]

[1] *Seongju Fruit Vegetable Experiment Station, Gyongbuk Province, Korea 719-860*
[2] *Department of Agricultural Biology, Kyungpook National University, Daegu, Korea 702-701*

Summary. Two new and a known species of mononchid nematodes from Korea are described and illustrated. *Micatonchus koreanus* sp. n. is characterized by the 2.4-2.7 mm long body, vagina with cuticularized pieces, a long tail with terminal spinneret and male with 86-90 µm long spicules and 13-15 ventromedian supplements. The other new species *M. ventralis* has a 2.2-2.5 mm long body, rectal glands and ventrally subterminal spinneret. One male of *Clarkus papillatus* with spicules of 60 µm, gubernaculum of 17 µm and 16 ventromedian supplements is reported for the first time from Korea.

The present work deals with the descriptions and illustrations of predatory nematodes collected from Korea, which include two new species *viz.*, *Micatonchus koreanus* and *M. ventralis* belonging to the family Anatonchidae. A male of *Clarkus papillatus* (Bastian, 1865) Jairajpuri, 1970 is hereby reported for the first time from Korea.

MATERIALS AND METHODS

The nematodes were extracted from soil samples by Cobb's sieving method and centrifugal sugar-flotation technique. Nematodes in clear water were heat killed at 70 °C, fixed in TAF, dehydrated and mounted on slide in anhydrous glycerin (Seinhorst, 1959). Measurements and drawings were made using a drawing tube attached to an Olympus BX50 microscope.

DESCRIPTIONS

MICATONCHUS KOREANUS sp. n.
(Figs. 1 and 2)

Holotype female: L=2.5 mm; a=36.8; b=4.3; c=8; c'=6.8; V=64.

Paratype females (n=7): L=2.6±0.13(2.4-2.7) mm; a=37.1±1.03(35.8-38.6); b=4.3±0.15(4.1-4.5); c=8.3±0.3(7.9-8.6); c'=6.8±0.18(6.6-7.1); V=63.9±1.52 (62-66).

Paratype males (n=5): L=2.3±0.17(2.1-2.4) mm; a=35.7±2.2(33.3-37.5); b=4.2±0.12(4.1-4.3); c=8.5±0.87 (7.8-9.5); c'=5.3±0.82(4.4-6.0).

Female. Body large, ventrally curved on fixation, 67-72 µm wide. Cuticle smooth, lateral body pores present. Hypodermal chords with hypodermal glands. Lip region 47-50 µm wide and 13-18 µm high, demarcated from adjoining body by depression, labial papillae prominent. Amphids cup-shaped, located at 15-18 µm from anterior end of body. Buccal cavity roomy, barrel-shaped, 52-55 µm long and 35-39 µm wide, heavily sclerotized. Dorsal vertical wall bearing a triangular tooth with apex directed forward, located at 31-34 µm or 60-65% from anterior end of buccal cavity. Subventral teeth on subventral walls, one on each, retrorse (posteriorly directed) and claw-like, hinged, located at 25-28 µm or 49-54% from anterior end of buccal cavity with tips lying at level of dorsal tooth apex. Oesophagus cylindrical, 554-616 µm long, expanded at basal portion of stoma. Nerve ring located at 153-193 µm from anterior end. Excretory pore located behind the nerve ring, 184-216 µm from anterior end. Oesophago-intestinal junction tuberculate. Intestine with wide lumen, epithelium comprising of hexagonal/polygonal cells filled with dark granules. Reproductive system didelphic amphidelphic, both sexual branches equally developed. Ovaries reflexed, oviduct with narrow distal and enlarged proximal parts. A well developed sphincter present between uterus and oviduct. Vagina with cuticularized pieces, muscular, about one third of corresponding body-width deep. Vulva transverse, elevated, provided with cuticularized flaps. Pre- and post-vulval papillae variable in number. Rectum muscular, small, less than anal body width long. Tail 301-319 µm or 6-7 anal body widths long, ventrally curved, gradually tapering to a narrow rounded terminus. Three caudal glands arranged in tandem with their ducts leading to a small terminal spinneret.

Male. Similar to female in general morphology but more strongly ventrally curved in posterior region. Buccal cavity 48-52 µm long and 32-35 µm wide. Testes paired, opposed, filled with elongate spindle-shaped spermatozoa. Spicules slender, arcuate, banana-shaped, 86-90 µm or 1.6-1.8 times anal body width long. Gubernaculum 20-23 µm long, spoon-shaped. Lateral guiding pieces bifid, 21-25 µm long. Ventromedian supplements weakly developed, 13-15 in number and almost equidis-

tant. Copulatory muscles strongly developed. Tail 252-288 µm or 4.5-6.0 anal body widths long, ventrally curved, gradually tapering to a narrow rounded tip. Caudal glands and spinneret present as in females.

Type habitat and locality. Soil samples collected from the rhizosphere of oak tree (*Quercus robur* L.) from Jangsung, Chollanam province of Korea.

Type material. Holotype female, paratype females and males on slides deposited in the nematode collection of Department of Agricultural Biology, College of

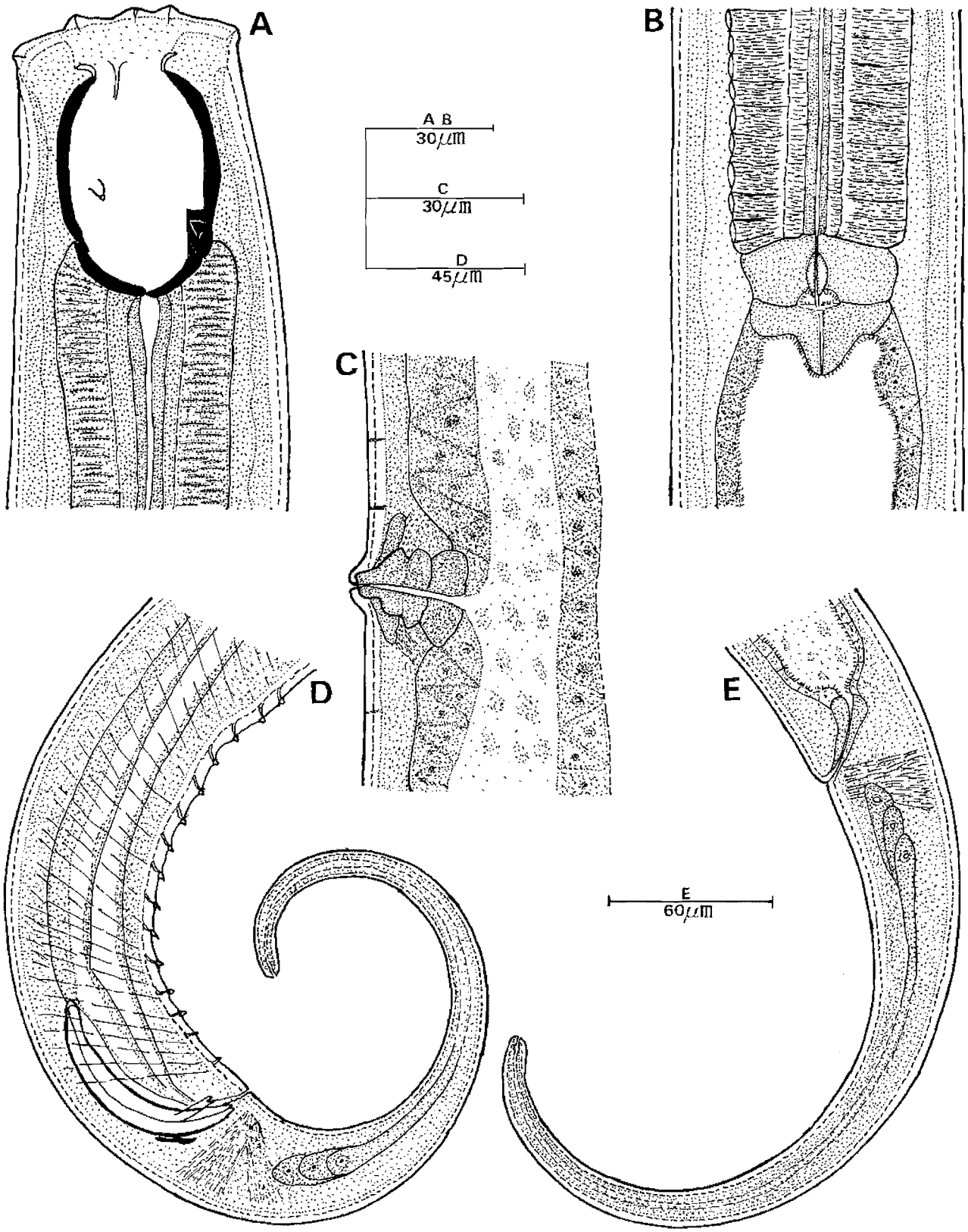

Fig. 1. *Micatonchus koreanus* sp. n.: A, anterior region; B, oesophago-intestinal junction; C, vulval region; D, male posterior region; E, female posterior region.

Agriculture, Kyungpook National University, Daegu, Korea. Two specimens (one each female and male) deposited in the Museum National d'Histoire Naturelle, Paris, France.

Diagnosis and relationships. The new species is distinctive in having an elevated vulva with flaps and vulval papillae. It differs from the only known species of the genus, *Micatonchus reversus* Jairajpuri, Tahseen *et* Choi, 2001 in having vulval flaps, vulval papillae, vagina with cuticularized pieces, larger buccal cavity, longer tail and in the presence of male (vulva flushed with body, vulval papillae absent, buccal cavity 45-47 × 35-40 µm, tail 237-245 µm long and male not reported in *M. reversus*). From *M. ventralis* sp. n. it differs in having vulval flaps, vulval papillae, absence of rectal glands and in having a terminal spinneret (vulva flushed with body, vulval papillae absent, rectal glands present and spinneret ventrally subterminal in *M. ventralis*).

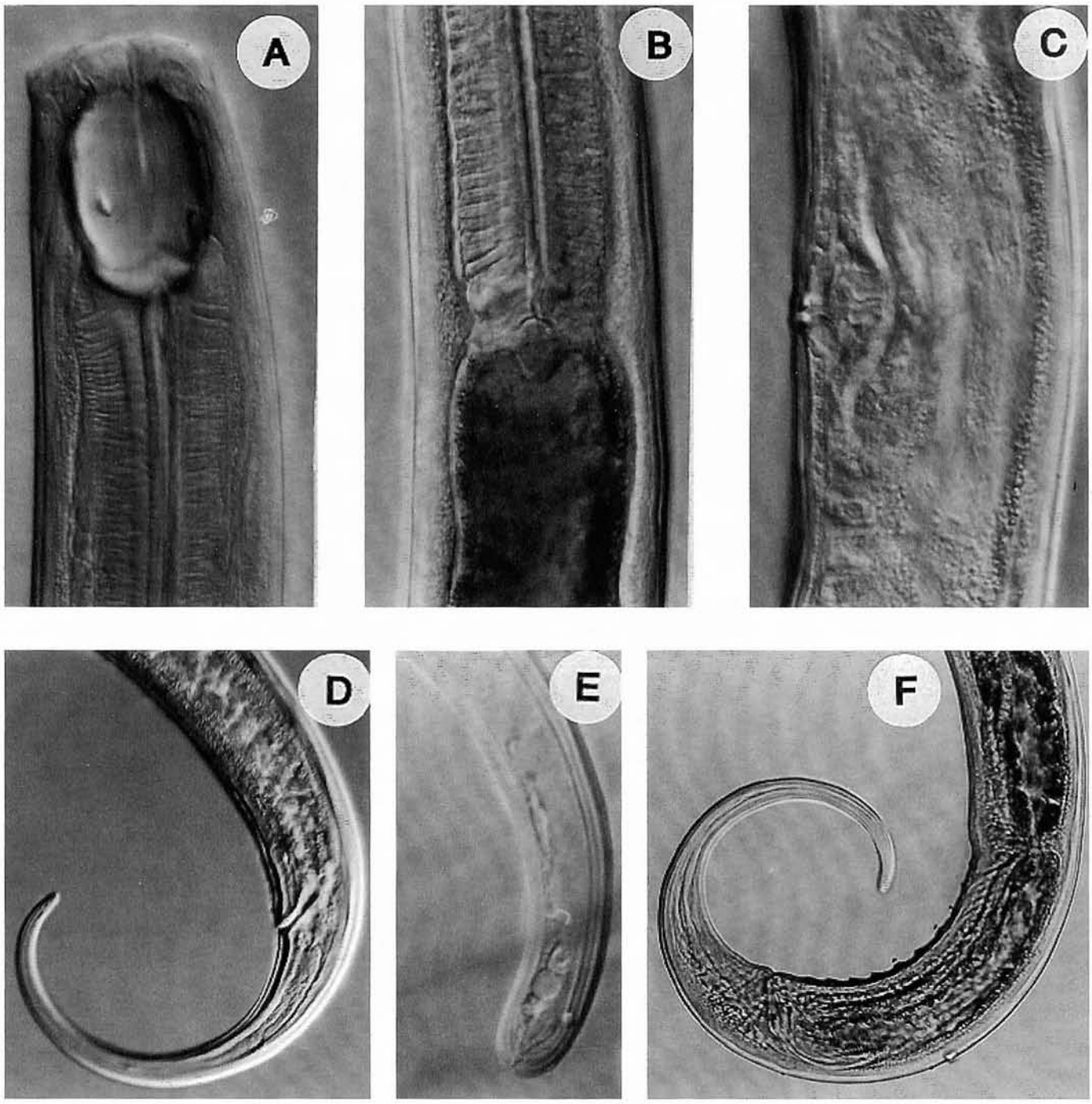

Fig. 2. Photomicrographs of *M. koreanus* sp. n.: A, anterior region; B, oesophago-intestinal junction; C, vulval region; D, female posterior region; E, tail terminus showing spinneret; F, male posterior region.

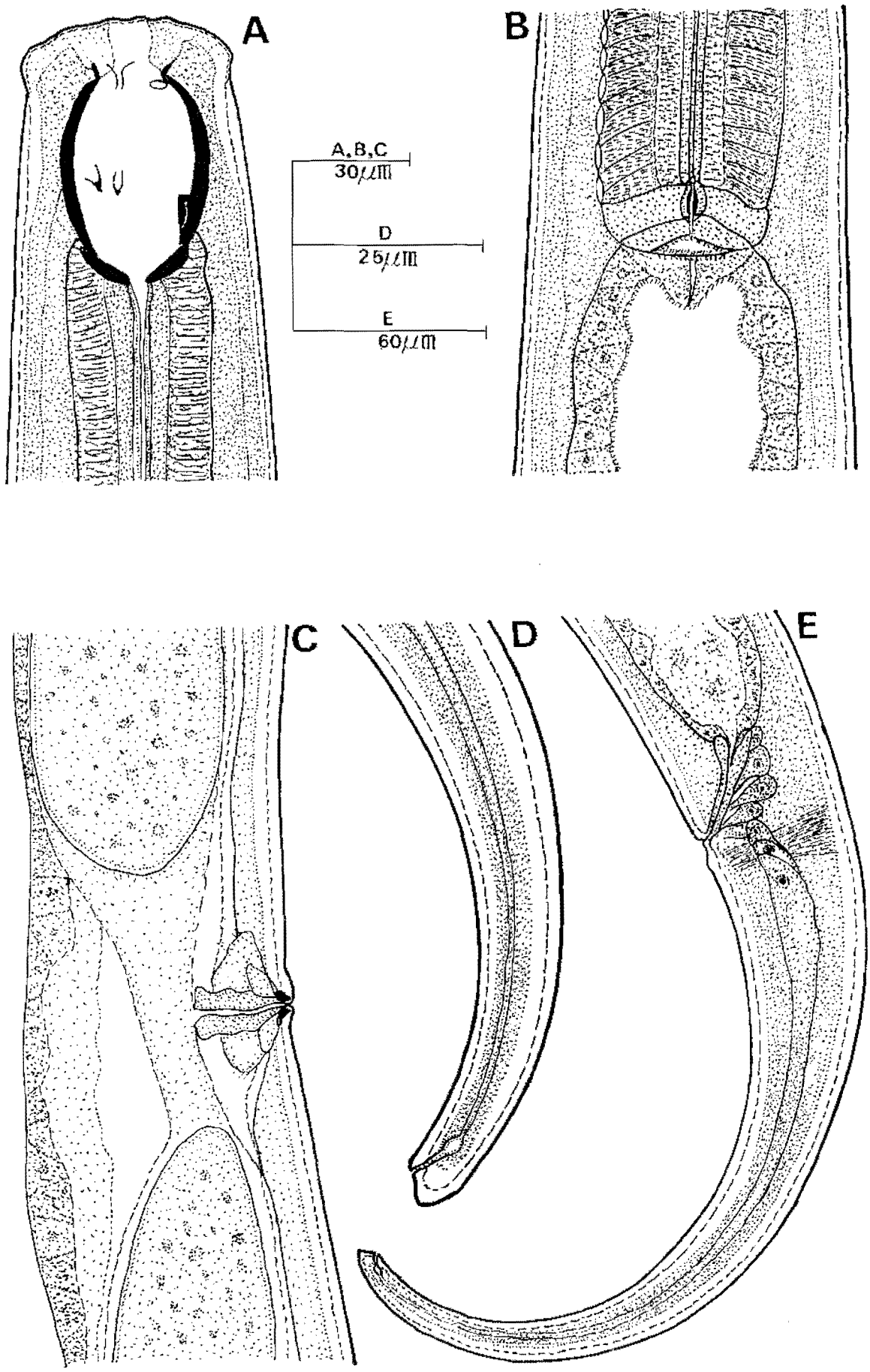

Fig. 3. *Micatonchus ventralis* sp. n.: A, anterior region; B, oesophago-intestinal junction; C, vulval region; D, tail terminus showing spinneret; E, female posterior region.

MICATONCHUS VENTRALIS **sp. n.**
(Figs. 3 and 4)

Holotype female: L=2.4 mm; a=31.6; b=4.2; c=8.7; c'=5.7; V=65.

Paratype females (n=5): L= 2.3±0.15 (2.2.2-2.5) mm; a=33.7±1.3(31.7-34.5); b=4.2±0.12(4.1-4.3); c=9.0±0.48(8.5-9.3); c'=5.5±0.11(5.4-5.7); V=64±1.1 (63-65).

Female. Body large, ventrally curved upon fixation, 77-85 µm wide. Cuticle smooth. Lip region 48-51 µm wide and 15-16 µm high, demarcated from adjoining body by slight constriction, labial papillae prominent. Amphids cup-shaped, at 15-16 µm from anterior end of body. Buccal cavity roomy, barrel-shaped, 53-54 µm long and 34-36 µm wide, heavily sclerotized. Dorsal vertical wall bearing a triangular tooth with apex directed forward, located at 31 µm or 57% from anterior end of buccal cvaity. Subventral teeth on subventral walls, one on each, retrorse (posteriorly directed) and claw-like, located at 30-31 µm or 54-58% from anterior end of buccal cavity with tips lying almost at the level of dorsal tooth apex. Oesophagus cylindrical, 583-594 µm long. Nerve ring located at 165-173 µm. Excretory pore situated behind the nerve ring, 180-194 µm from anterior end. Oesophago-intestinal junction tuberculate. Intestine with wide lumen, epithelium comprising of hexagonal/polygonal cells filled with dark granules. Reproductive system didelphic-amphidelphic, both sexual branches equally developed. Ovaries reflexed, oviduct with narrow distal and enlarged proximal parts. A well developed sphincter present between uterus and oviduct. Vagina provided with prominent cuticularized pieces, muscular, about one third of corresponding body-width deep. Vulva transverse, vulval papillae absent. Rectum muscular, small, less than anal body width long. Rectal glands present. Anus sunken, pit-like. Tail 281-285 µm or about six anal body widths long, ventrally curved, gradually tapering to an acute rounded terminus. Three caudal glands lying in a row, with ducts leading to a small ventrally subterminal spinneret.

Male. Male not found.

Type habitat and locality. Soil samples collected from the rhizosphere of oak tree (*Quercus robur* L.) from Jangsung, Ch'ollanam province of Korea.

Type specimens. Holotype and paratype females on slides deposited in the nematode collection of Department of Agricultural Biology, College of Agriculture, Kyungpook National University, Daegu, Korea. A paratype female deposited in the Museum National d'Histoire Naturelle, Paris, France.

Diagnosis and relationships. Micatonchus ventralis sp. n. is characterized by having a long body, rectal glands, sunken anus, a long tail with ventral spinneret. It differs from *Micatonchus reversus* Jairajpuri, Tahseen *et* Choi, 2001 in all the above characters (rectal glands absent, anus flushed with body and spinneret terminal in *M. reversus*).

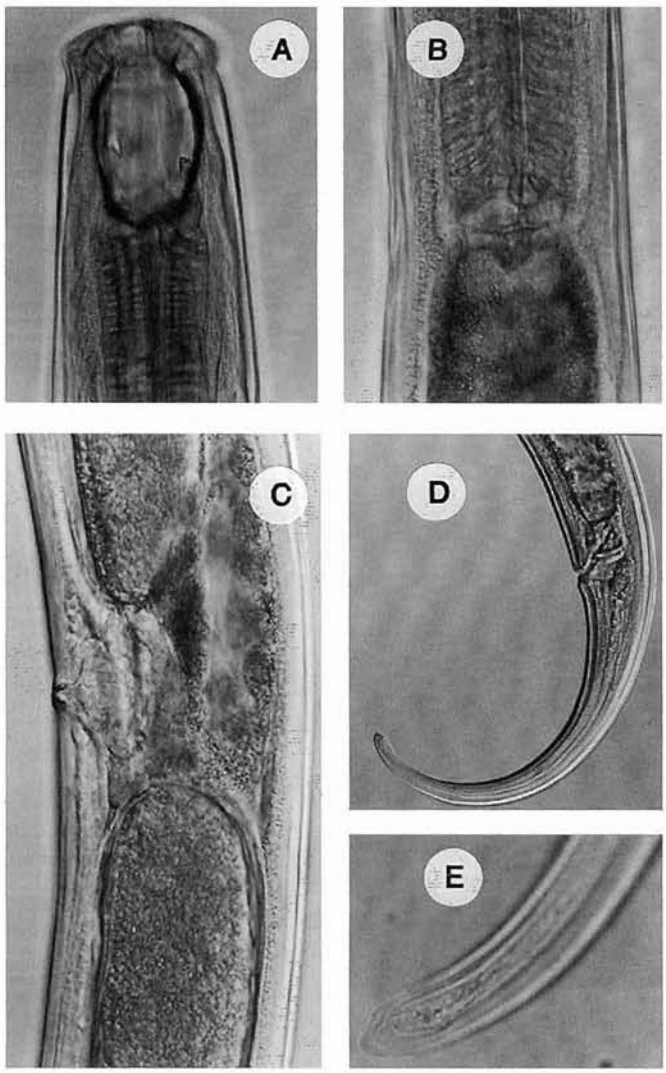

Fig. 4. Photomicrographs of *M. ventralis* sp. n.: A, anterior region; B, oesophago-intestinal junction; C, vulval region; D, female posterior region; E, tail terminus showing spinneret.

CLARKUS PAPILLATUS
(Bastian, 1865) Jairajpuri, 1970
(Fig. 5)

Females (n=6): L=1.0±0.15(0.9-1.2) mm; a=24.4±2.8 (22.5-27.6); b=3.4±0.1(3.3-3.5); c=13.4±0.9(12.6-14.3); c'=2.9±0.4(2.5-3.2); V=62.5±1.3(61-64).

Male (n=1): L=1.0 mm; a= 26.5; b=3.7; c=15.7; c'=2.0.

Male. Testes paired, opposed with elongate, spindle-shaped spermatozoa. Spicules paired, free, slender, ventrally curved, measuring 60 µm along median line. Gubernaculum 17 µm long; lateral guiding pieces absent. Ventromedian supplements 16 in numbers regularly spaced. Copulatory muscles strongly developed. Tail conoid, ventrally curved, 66 µm or two anal body widths long. Caudal glands rudimentary, spinneret absent.

Remarks. Although *Clarkus papillatus* has already

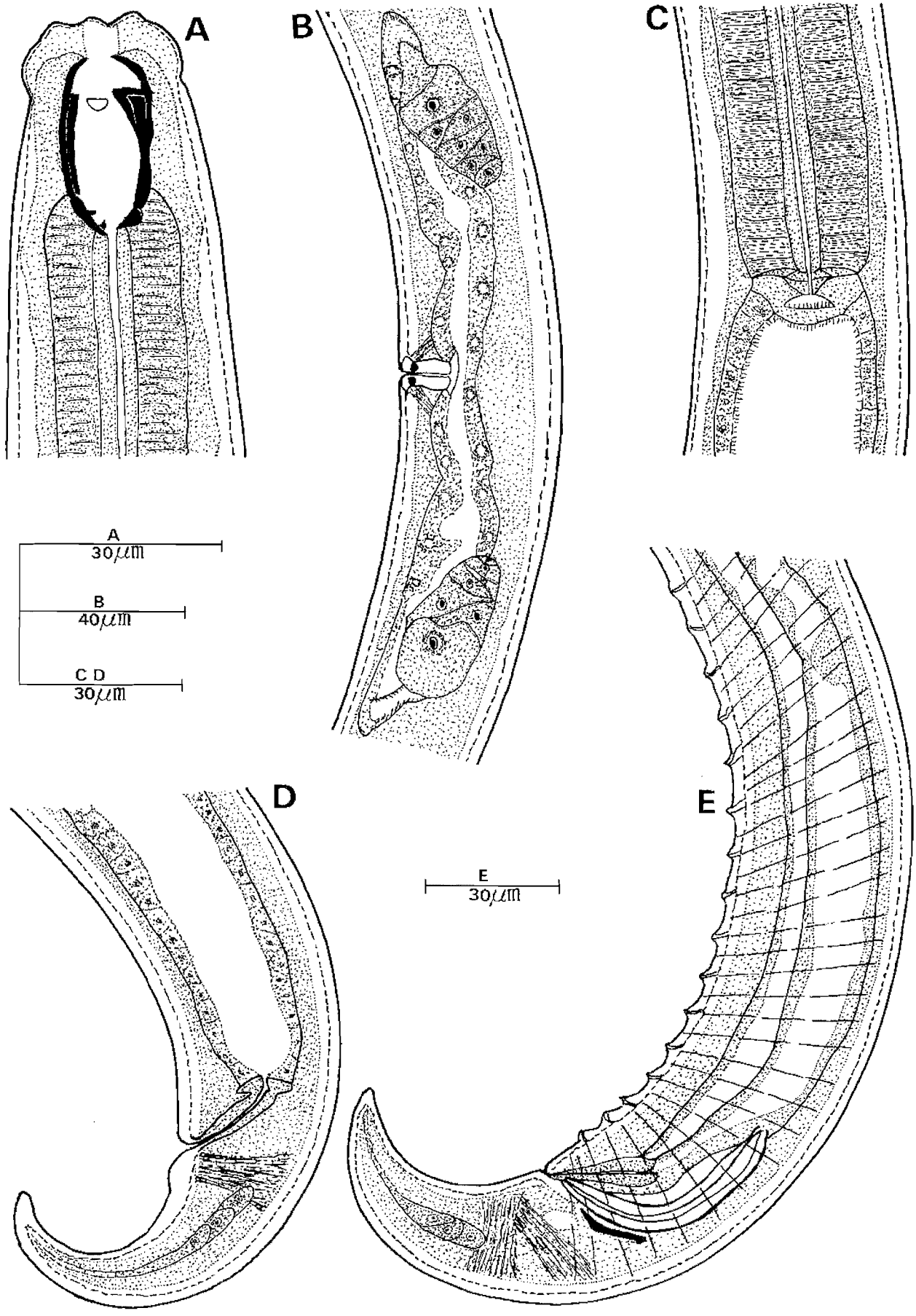

Fig. 5. *Clarkus papillatus*: A, anterior region; B, female gonads; C, oesophago-intestinal junction; D, female posterior region; E, male posterior region.

been reported from Korea (Choi and Choi, 1987), this is the first record of male. The morphometrics of Korean specimens agree well with those described by Jairajpuri (1970) and Coomans and Khan (1981) from India and Belgium, respectively. However, these specimens resemble more closely to the Belgian specimens and differ from the Indian specimens in the position of amphids (at the level of dorsal tooth *vs* anterior to dorsal tooth), numbers of ventromedial supplements (16 *vs* 13) and in having rudimentary caudal glands.

Habitat and locality. Soil samples collected from the rhizosphere of oak tree (*Quercus robur* L.) from Jangsung, Ch'ollanam province of Korea.

Reference specimens. Females and male on slides deposited in the nematode collection of Department of Agricultural Biology, College of Agriculture, Kyungpook National University, Daegu, Korea.

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