

A Taxonomical and Morphological Study of Predatory Nematodes (Mononchs) in Korea

YEONG-SHICK CHOI AND YOUNG-EOUN CHOI

崔榮植·崔永然：韓國에 있어서 捕食性線蟲(Mononchs)의 分類形態學的 研究

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ABSTRACT A Study on the taxonomy and morphology of predatory nematods (mononchs) from Korea. A total of 11 species: *Clarkus papillatus*, *Coomansus parvus*, *Iotonchus zschokkei*, *Mononchus truncatus*, *Mylonchulus apapillatus*, *M. brevicaudatus*, *M. brachyuris*, *M. incurvus*, *M. signaturus*, *Prionchulus muscorum* and *P. punctatus* belonging to 6 genera are newly recorded in Korea.

INTRODUCTION

The predatory nematodes(mononchs) have large body, strongly sclerotized feeding apparatus, provided with tooth or teeth, a long and highly muscular cylindroid oesophagus. The mononchs are a group of free-living predatory nematodes that inhabit soil and fresh water where they feed on small animal organisms, including protozoa, rotifers, and other nematods.

These can be used as a agents in the biological control of the plant parasitic nematodes.

MATERIALS AND METHODS

Nematodes were extracted from the soil by using the Baermann funnel method. After extraction, the nematodes were fixed with hot (80°C) FG4:1 (890ml distilled water+100ml formalin 40%+10ml glycerin) the nematodes were processed to glycerin by Seinhorst's glycerin method slightly modified by De Grisse and mounted by using the paraffin ring method. The slide is inserted in an aluminium slide.

DESCRIPTION

Clarkus papillatus (Bastian, 1865)

Jairajpuri, 1971(Fig. 1. A, B)

Dept. of Agricultural Biology, Coll. of Agric. Kyungpook Natl. Univ. (慶北大學校 農科大學 農生物學科)

Females(6) L=0.85~1.02mm, a=24~31, b=3.3~5.0, c=13~18, v=61~65%, tail length=60~90 μ m.

Lip region slightly set off, 22~27 μ m wide, 7~10 μ m high. Amphids 3~4 μ m wide, located at 10~15 μ m from anterior end of body and 20~24 μ m from base of buccal cavity. Buccal cavity 24~28 μ m long, 9~13 μ m wide. Dorsal tooth medium size, situated in anterior half of buccal cavity, its apex 80~85% of the length of buccal cavity from base. Non-denticulate ridge on ventral vertical wall present.

Oesophago-intestinal junction non-tuberculate. Reproductive system amphidelphic. Sphincter not present at oviduct-uterus junction. Tail conoid, ventrally curved, 60~90 μ m or 3~4 anal body-widths long. Spinneret absent.

Male: Not found.

Locality and habitat: Soil around roots of Pine tree from Ch'ongsong, Mt, Sobaeksan.

Coomansus parvus (De Man, 1880)

Jairajpuri & Khan, 1977 (Fig. 1 C-E)

Females(6) L=0.79~0.84, a=18~25, b=3.2~3.5, c=10~14, V=58~65%, tail length=58~75 μ m.

Lip region 19~25 μ m wide, 7~9 μ m high. Amphids 2~3 μ m wide located at 9~14 μ m

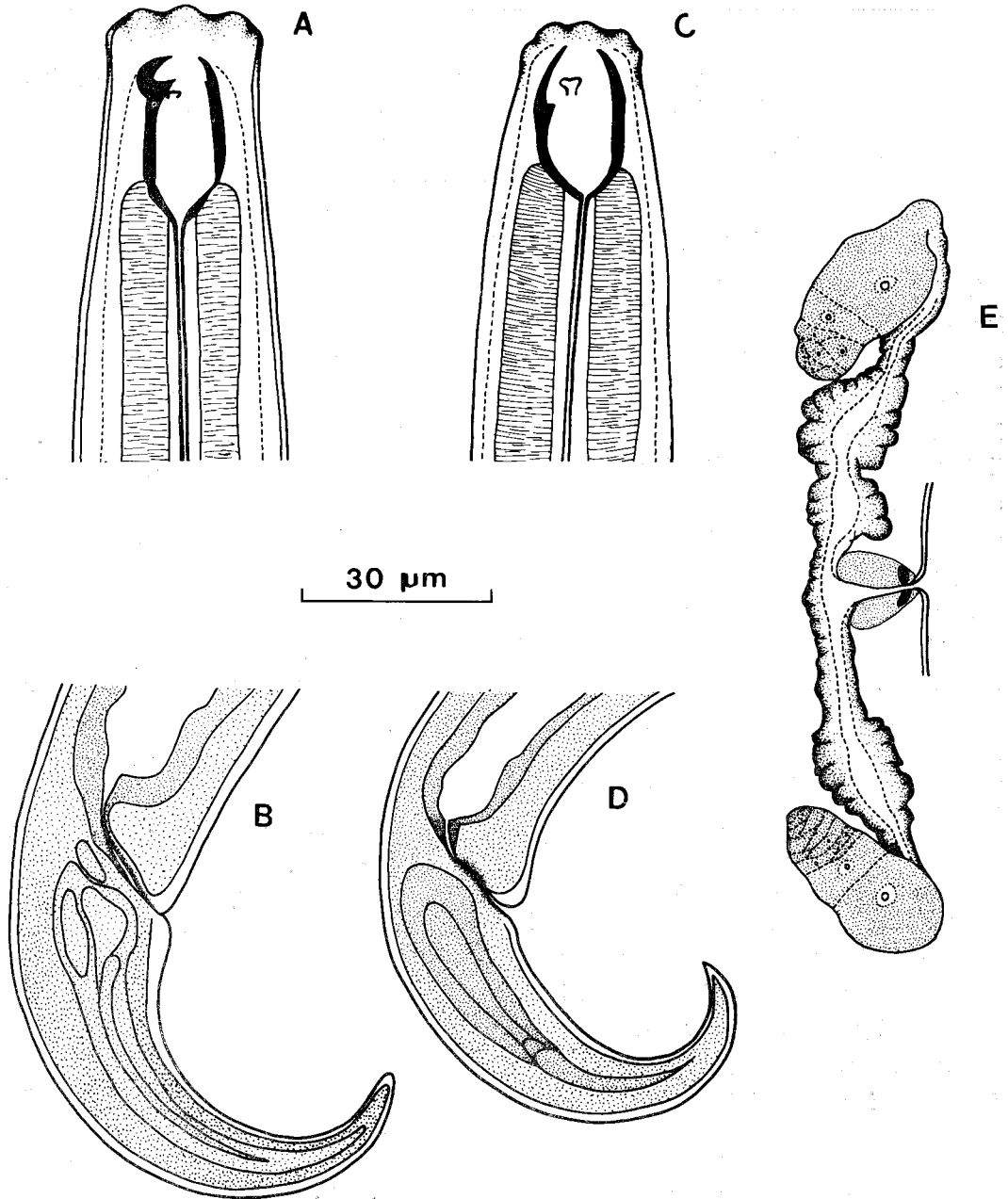


Fig.1. A-B. *Clarkus papillatus*. A. Head, B. Tail.
C-E. *Coomansus parvus*. C. Head, D. Female gonad, E. Tail.

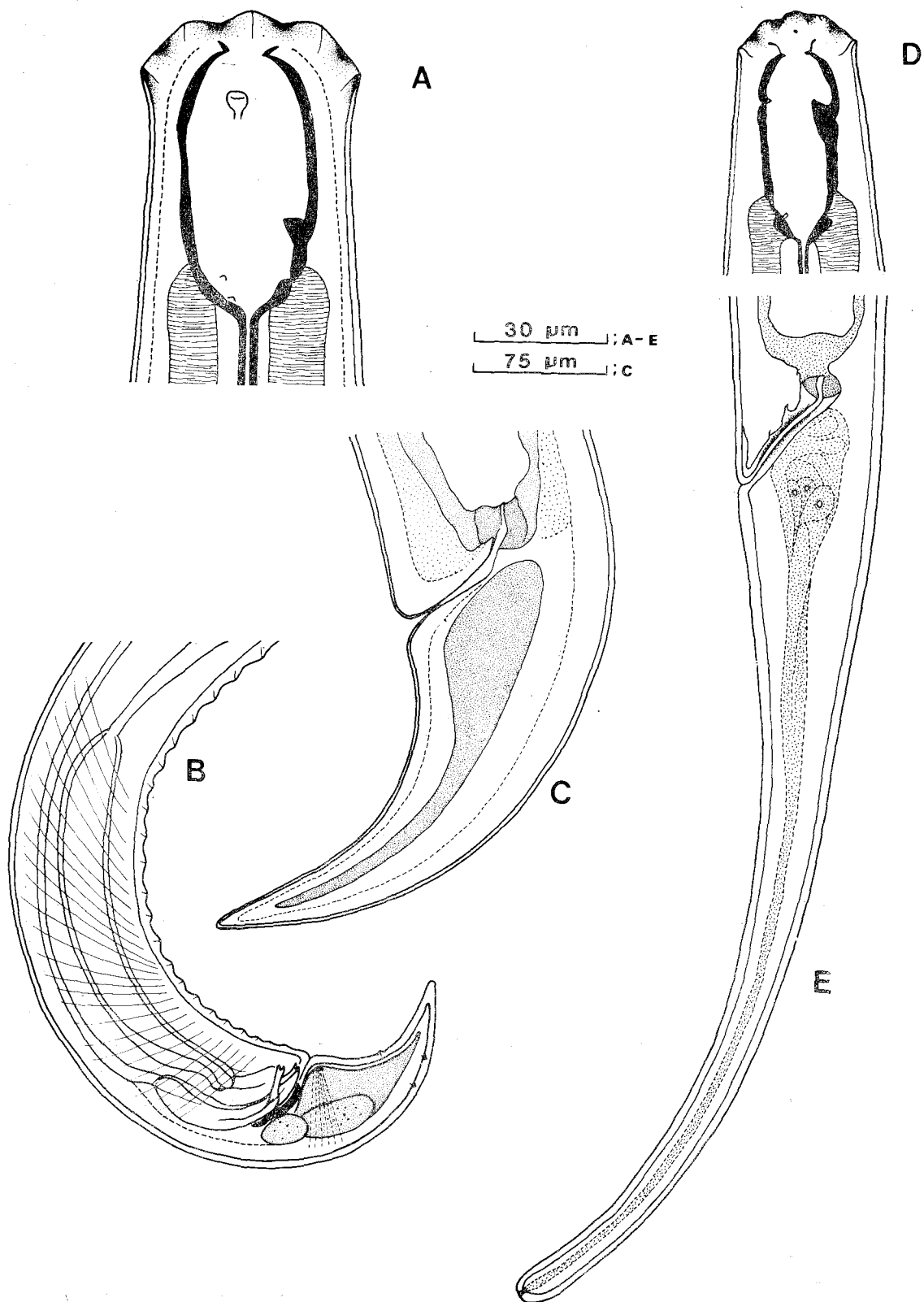


Fig. 2. A-C. *Iolonchus zschokkei*. A. Head, B. Mail tail, C. Female tail. D-E. *Mononchus truncatus*. D. Head, E. Tail.

from anterior end of body. Buccal cavity 19~23 μ m long, 8~12 μ m wide. Dorsal tooth small, situated near middle in buccal cavity, not opposed by a ventral rib, its apex 50~55% of the length of buccal cavity from base. Oesophago-intestinal junction non-tuberculate. Reproductive system amphidelphic, ovaries well developed, without vulval papillae. Sphincter not present at oviduct-uterus junction. Tail conoid arcuate, generally sharply bent, 2~3.5 anal body-widths long. Spinneret absent.

Male: Not found.

Locality and habitat: Soil around roots of Pine tree from Ch'ongsong and Mt. Sobae-ksan.

Iotonchus zschokkei (Henzel, 1913)

Altherr, 1955 (Fig. 2. A-C)

Females(10) L=2.18~2.8mm, a=29~37, b=3.5~3.9, c=16.6~25.3, V=66~71%, tail length=100~105 μ m.

Males (12) L=2.14~2.8mm, a=28~34, b=3.5~4.0, c=20.6~24.8, supplement=21~25, tail length=110~120 μ m, spicule=95~110 μ m, gubernaculum=30~37 μ m, beccal cavity=53~60 \times 25~27 μ m.

Female: Body slightly arcuate, lip region set off by a constrictions. Amphids 4~5 μ m, located at 22~26 μ m from anterior end of body. Buccal cavity 55~57 μ m long, 25~27 μ m wide. Micro-onchi present at base of buccal cavity. Dorsal tooth forward of posterior-third in buccal cavity. Oesophago-intestinal junction tuberculate. Rectum 42~45 μ m or about 1 anal body width long. Reproductive system amphidelphic, ovaries well developed. Tail 125~139 μ m long, about 3 anal body-widths long, conoid, ventrally arcuate with acutely rounded terminus. Caudal glands and spinneret absent.

Males: Body shape similar to female. Lateral accessory pieces 18~22 μ m long. Gubernaculum 30~37 μ m long. Twenty one to twenty five supplement. Tail conoid, arcuate, 110~120 μ m, or about 2 anal body-widths long with acutely rounded terminus. Caudal glands and spinneret absent. Caudal papillae three pairs as illustrated.

Locality and habitat: Soil around roots of Pine tree from Piagol valley in Mt. Chirisan, Ch'ongdo, Masan, Mt. Sobaeksan and Taegu.

Mononchus truncatus Bastian, 1865

(Fig. 2. D-E)

Females(3) L=1.69~1.80mm, a=33~37, b=4.0 c=8.0~9.3, V=52~55%, tail length=175~205 μ m.

Body long, lip region 24~27 μ m wide, 8~10 μ m high. Amphids obscure. Buccal cavity long and narrow, from two and a half to three times as long as wide, Walls straight, 38~42 μ m long, 12~17 μ m wide. Dorsal tooth situated in anterior third of buccal cavity, medium-size, its apex 70% of the length of buccal cavity from base. Oesophago-intestinal junction non-tuberculate. Reproductive system amphidelphic, ovaries reflexed. Tail conoid-cylindroid, 6~1.5 anal body-widths long. Caudal glands three leading to a terminal opening, spinneret developed.

Male: Not found.

Locality and habitat: Soil around roots of Penut from Koryong.

Mylonchulus apapillatus Khan &

Jairajpuri, 1979 (Fig. 3. A, B)

Females(3) L=1.3~1.7mm, a=33~38, b=3.5~3.9, c=22~26, V=60~64%, tail length=50~76 μ m.

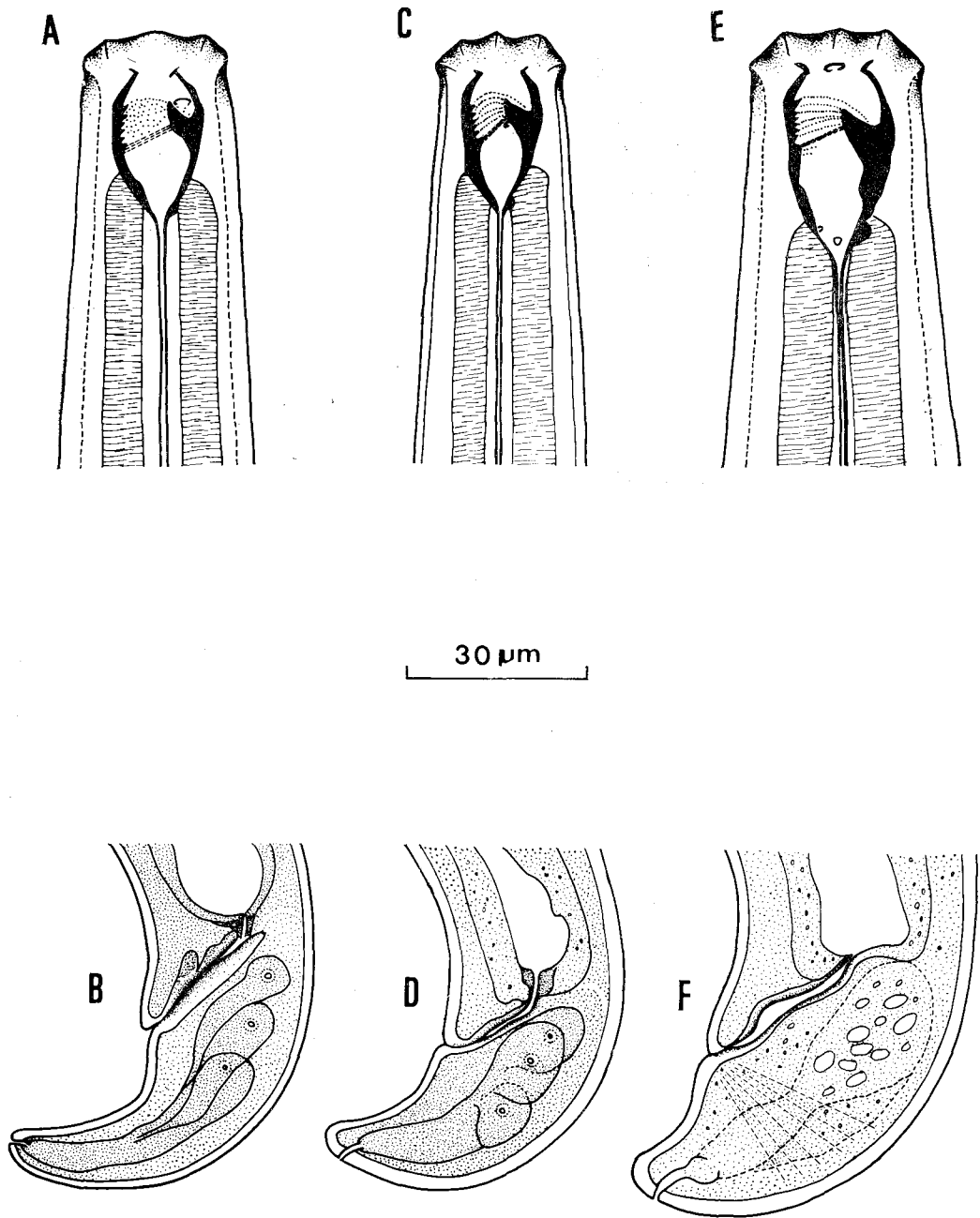


Fig. 3. A-B. *Mylonchulus apapillatus*. A. Head, B. Tail.
C-D. *Mylonchulus brachyuris*. C. Head, D. Tail.
E-F. *Mylonchulus brevicaudatus*. E. Head, F. Tail.

Lip region 21~24 μ m wide, 5~6 μ m high. Amphids 3~4 μ m wide, located at 9~12 μ m from anterior end of body. Buccal cavity 20~24 μ m long, 11~12 μ m wide. Dorsal tooth massive, situated in anterior half of buccal cavity, its apex 75~82% of the length from base of buccal cavity. Transverse rows of denticles scattered. Submedian teeth prominent. Oesophago-intestinal junction non-tuberculate. Reproductive system amphidelphic. Sphincter not present at oviduct-uterus junction. Tail conoid, arcuate, 2 anal body-widths long. Caudal glands tandem. Spinneret terminal.

Male: Not found.

Locality and habitat: Soil around roots of Penut from Korynög and Pine tree from Mt. Chirisan.

Mylonchulus brachyuris (Bütschli, 1873)
Andrassy, 1958 (Fig. 3. C, D)

Females(18) L=1.05~1.12mm, a=27~35, b=3~4, c=29~33, V=60~62%, tail length=32~35 μ m.

Lip region 20~24 μ m wide, 5~8 μ m high. Amphids 3~4 μ m wide, located at 8~13 μ m from anterior end of body. Buccal cavity 21~28 μ m long, 10~15 μ m wide. Dorsal tooth massive, situated in anterior half of buccal cavity, its apex 72~78% of the length from base of buccal cavity. Subventral walls with 5~6 transverse rows of denticles. Submedian teeth present. Oesophago-intestinal junction non-tuberculate. Reproductive system amphidelphic. Tail conoid, arcuate, terminus blunt, 1~1.5 anal body-widths long. Caudal glands in tandem leading into a well developed subdorsal spinneret.

Male: Not found.

Locality and habitat: Soil around roots of Pine tree from Mt. Chirisan, Mt. Palgong-

san, Mt. Sobaeksan, Is. Tokto and Is. Ullüngdo.

Mylonchulus brevicaudatus (Cobb, 1917)
Altherr, 1954 (Fig. 3. E, F)

Females(2) L=1.58~1.64mm, a=29~32, b=3.3~3.5, c=56~58, V=55~61%, tail length=27~20 μ m.

Lip region 28 μ m wide, 11 μ m high. Amphids 3~4 μ m wide, located at 6~7 μ m wide. Dorsal teeth massive, situated in anterior half of buccal cavity, its apex 79% of the length from base of buccal cavity. Subventral walls with 6~7 transverse rows of denticles. Submedian teeth present. Oesophago-intestinal junction non-tuberculate. Reproductive system amphidelphic. Tail obtusely rounded, about 1 anal body width long. Caudal glands grouped. Spinneret subdorsal.

Male: Not found.

Locality and habitat: Soil around roots of Bamboo from Mt. Chirisan.

Mylonchulus incurvus (Cobb, 1877)
Andrassy, 1958 (Fig. 4. C~E)

Females (3) L=1.62~1.71mm, a=35, b=2.8~3.2, c=37~39, v=65~69%, tail length=47~50 μ m.

Lip region 26~28 μ m wide, 9~11 μ m high. Amphids 3~4 μ m wide, located at 12~14 μ m from anterior end of body. Buccal cavity 30~36 μ m long, 15~21 μ m wide. Dorsal tooth massive, situated in anterior half of buccal cavity, its apex 76~78% of the length from base of buccal cavity. Subventral walls with 5~6 transverse rows of denticles. Submedian teeth present. Oesophago-intestinal junction non-tuberculate. Reproductive system amphidelphic. Tail arcuate, sharply bent midway to terminus. Caudal glands

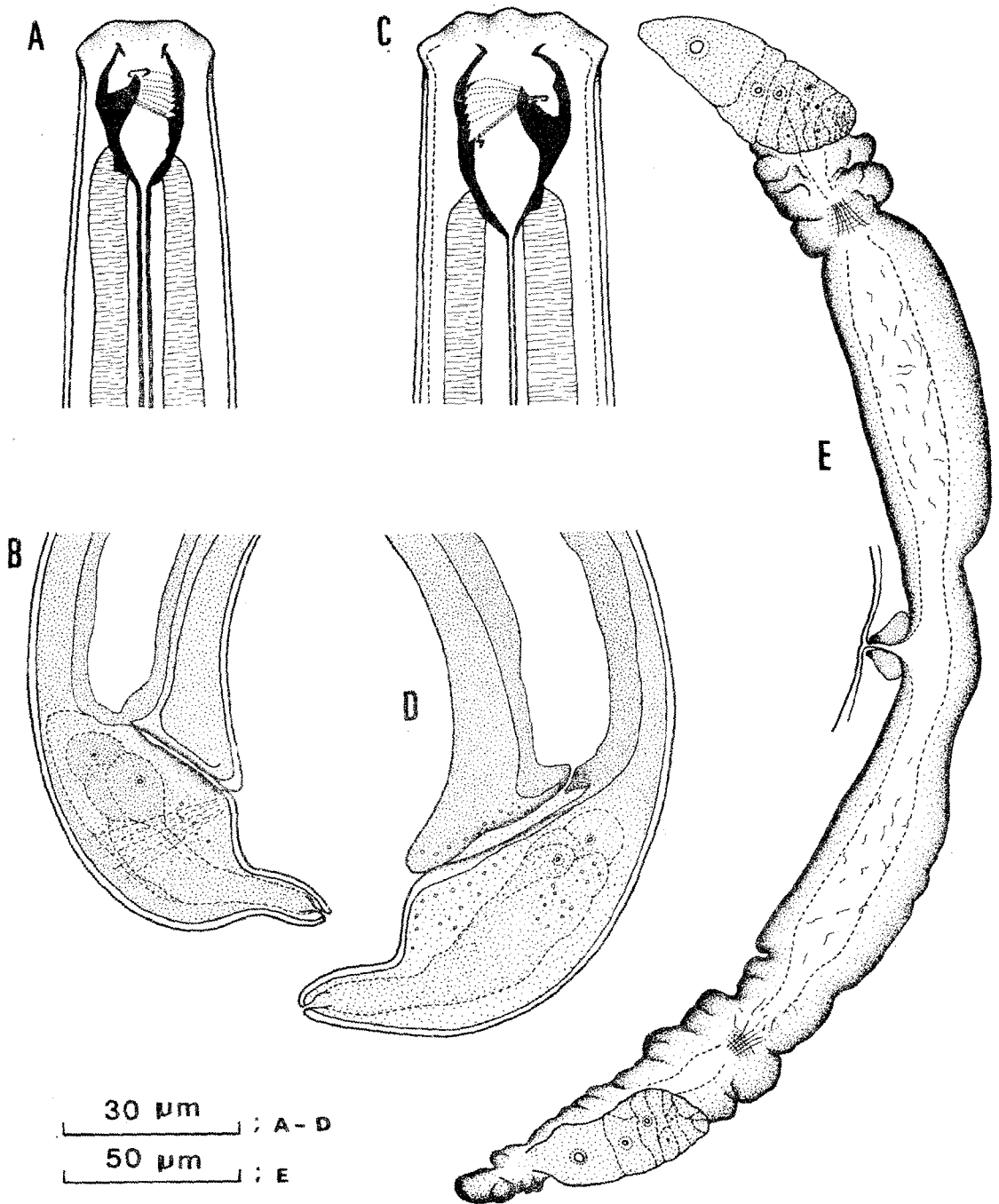
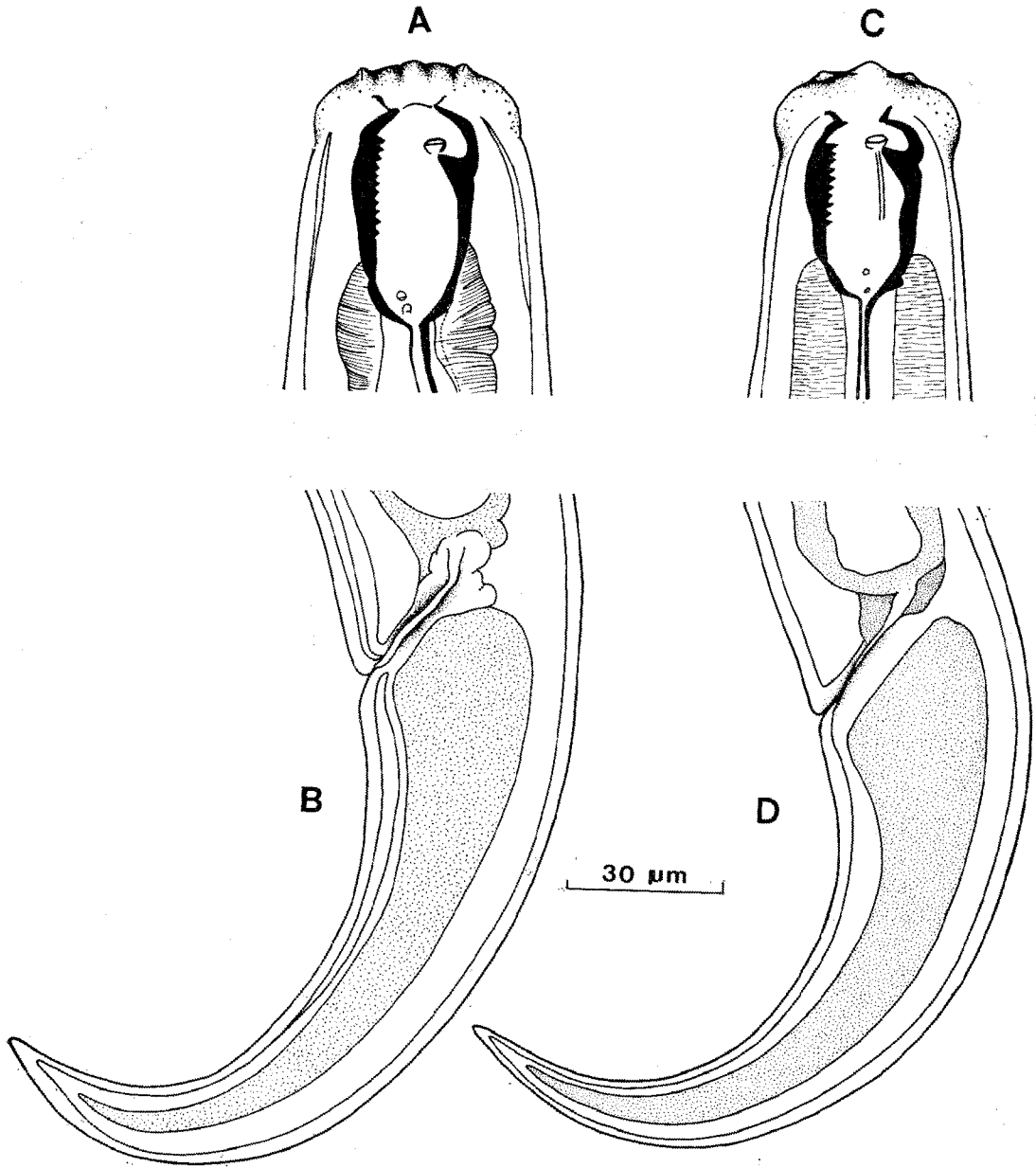


Fig. 4. A-B. *Mylonchulus sigmaturus*. A. Head, B. Tail.
C-E. *Mylonchulus incurvus*. C. Head, D. Female gonad, E. Tail.



5. A-B. *Prionchulus muscorum*. A. Head, B. Tail. C. D. *Prionchulus punctatus*. C. Head, D. Tail.

three in tandem. Spinneret subdorsal.

Male: Not found.

Locality and habitat: Soil around roots of Bamboo from Masan and Pine tree from Mt. Palgongsan.

Mylonchulus sigmaturus (Cobb, 1917)

Altherr, 1953 (Fig. 4. A~B)

Females (2) L=1.14~1.15mm, a=28~32, b=3.2~3.3, c=28~33, v=64~65%, tail length=35~40 μ m.

Lip region 23~25 μ m wide, 8~9 μ m high. Amphids 4~5 μ m wide, located at 10~12 μ m from anterior end of body. Buccal cavity 22~24 μ m long, 12~13 μ m wide. Dorsal tooth massive, its apex 79~83% of the length from base of buccal cavity. Subventral walls with 5~6 transverse rows of denticles. Submedian teeth present. Oesophago-intestinal junction non-tuberculate. Reproductive system amphidelphic. Sphincter not present at oviduct-uterus junction. Tail conoid with clavate terminus, sharply bent about midway, about 1 anal body-width long. Caudal glands grouped. Spinneret terminal.

Male: Not found.

Locality and habitat: Soil around roots of Pine tree from Ch'öngdo, Masan and Taegu.

Prionchulus muscorum (Dujardin, 1845)

Wu & Hoeppli, 1929 (Fig. 5. A,B)

Females (9) L=1.62~2.82mm, a=26~29, b=3.6~4.3, c=13~16, v=60~63%, tail length=95~215 μ m.

Lip region set off, 31~42 μ m wide, 13~17 μ m high. Amphids 4~7 μ m wide, located at from anterior end of body. Buccal cavity 32~48 μ m long, 16~27 μ m wide. Dorsal tooth medium size, situated in anterior half of buccal cavity, its apex 78~84% of the length

from base of buccal cavity. Subventral walls with two longitudinal denticulate ridges of 11~15 denticles in each. Oesophago-intestinal junction non-tuberculate. Reproductive system amphidelphic, ovaries reflexed. Sphincter at oviduct-uterus junction weakly developed or absent. Uterine containing either one or two eggs with smooth or ridged shells.

Male: Not found.

Locality and habitat: Soil around roots of Pine tree from Mt. Chirisan, Mt. Sobaeksan and Taegu.

Prionchulus punctatus (Cobb, 1917)

Andrassy, 1958 (Fig. 5. C, D)

Females (8) L=1.73~2.1mm, a=22~39, b=3.6~4.4, c=15~21, v=63~66%, tail length=110~120 μ m.

Lip region set off, 31~40 μ m wide, 12~16 μ m high. Amphids 5~6 μ m wide, located at 8~18 μ m from anterior end of body. Buccal cavity 33~36 μ m long, 16~24 μ m wide. Dorsal tooth medium size, situated in anterior half of buccal cavity, its apex 78~86% of the length from base of buccal cavity. Subventral walls with two longitudinal denticulate ridges of 11~13 denticles in each. Oesophago-intestinal junction non-tuberculate. Reproductive system amphidelphic, ovaries reflexed, egg shell punctate. Sphincter at oviduct-uterus junction absent. Tail conoid, arcuate ventrally, about 2~3 anal body-widths long. Caudal glands and spinneret absent.

Male: Not found.

Locality and habitat: Soil around roots of Pine tree from Mt. Chirisan and Mt. Sobaeksan.

摘 要

捕食性線蟲인 Mononchs에 對해 調査한 結果

Clarkus papillatus, *Coomansus parvus*, *Iotonchus zschokkei*, *Mononchus truncatus*, *Mylonchulus apapillatus*, *M. brachyuris*, *M. brevicaudatus*, *M. incurvus*, *M. sigmaturus*, *Prionchulus muscorum* and *P. punctatus* 등 6屬, 11種이 發見되었는데 이들 種은 우리나라 未記錄 種으로 밝혀졌다.

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