

Descriptions of *Pratylenchus gibbicaudatus* n. sp.
and *P. macrostylus* WU, 1971
(Tylenchida : Pratylenchidae) from Kyushu

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Morphology and dimensions of *Pratylenchus macrostylus* Wu, 1971 detected from rhizosphere of *Quercus* spp. and *Prunus Jamasakura* in Kumamoto Pref. were described and illustrated. *P. gibbicaudatus* n.sp., which resembled *P. flakkensis* SEINHORST, 1968 and *P. bicaudatus* MEYL, 1954, was also described from soil around the root of *Scirpus Wichurai* f. *concolor* in Mt. Aso, Kumamoto Pref. This new species differed from related species in flattened stylet knobs, shape of tail terminus, posterior location of phasmid on the tail and a smaller V-value.

INTRODUCTION

More than sixteen species of the genus *Pratylenchus* were recorded from cultivated and uncultivated soil in Japan. Although most of them have already been taxonomically studied (GOTOH and OHSHIMA, 1963; GOTOH, 1974), some species remain unidentified to the specific level; one of these has been reported as *Pratylenchus* sp. 1 (GOTOH and OHSHIMA, 1963) or *Hoplotylus* sp. (GOTOH, 1974) is referred to *Pratylenchus macrostylus* Wu, 1971 originally described in Canada. In Japan, this species has been detected in Kumamoto Pref. by the present author and earlier recorded from Nagano and Nagasaki Pref. by GOTOH and OHSHIMA (1963).

In this paper another species of *Pratylenchus* is described as a new species, *P. gibbicaudatus* n. sp., which resembles *P. flakkensis* SEINHORST, 1968 and *P. bicaudatus* MEYL, 1954 in the annulated tail tip. This species was isolated from soil around the root of *Scirpus Wichurai* BÖCKLER, f. *concolor* (MAXIM.) T. KOYAMA in the Somma of Mt. Aso. All specimens in this study were fixed by TAF fixative and mounted in glycerine.

Pratylenchus gibbicaudatus n. sp. (Fig. 1 A-H)

Female. Paratypes: n=30, L=409-532 μ m (483 \pm 34: mean \pm standard deviation), a=16.0-29.7 (20.0 \pm 3.6), b=5.3-9.5 (6.5 \pm 0.8), c=12.8-19.0 (15.5 \pm 1.4), c'=1.6-3.9 (2.4 \pm 0.5), V=69.5-77.4 (72.8 \pm 1.8), stylet=13.9-16.4 μ m (15.3 \pm 0.6), prorhabdion=7.6-9.1 μ m (8.2 \pm 0.4). Holotype: L=507 μ m, a=17.9, b=6.6, c=16.0, c'=2.1, V=72.3, stylet=15.2 μ m, prorhabdion=8.2 μ m.

Body stout, straight to open C-shape after fixation. Body width slightly increasing around median esophagus bulb to vulva and decreasing regularly from vulva to near tail terminus. Lip region stepped by sides from body contour, flattened in front, with two annules, 1.9-2.5 μ m (2.4 \pm 0.2) high, 6.6-8.2 μ m (7.4 \pm 0.4) wide. Labial

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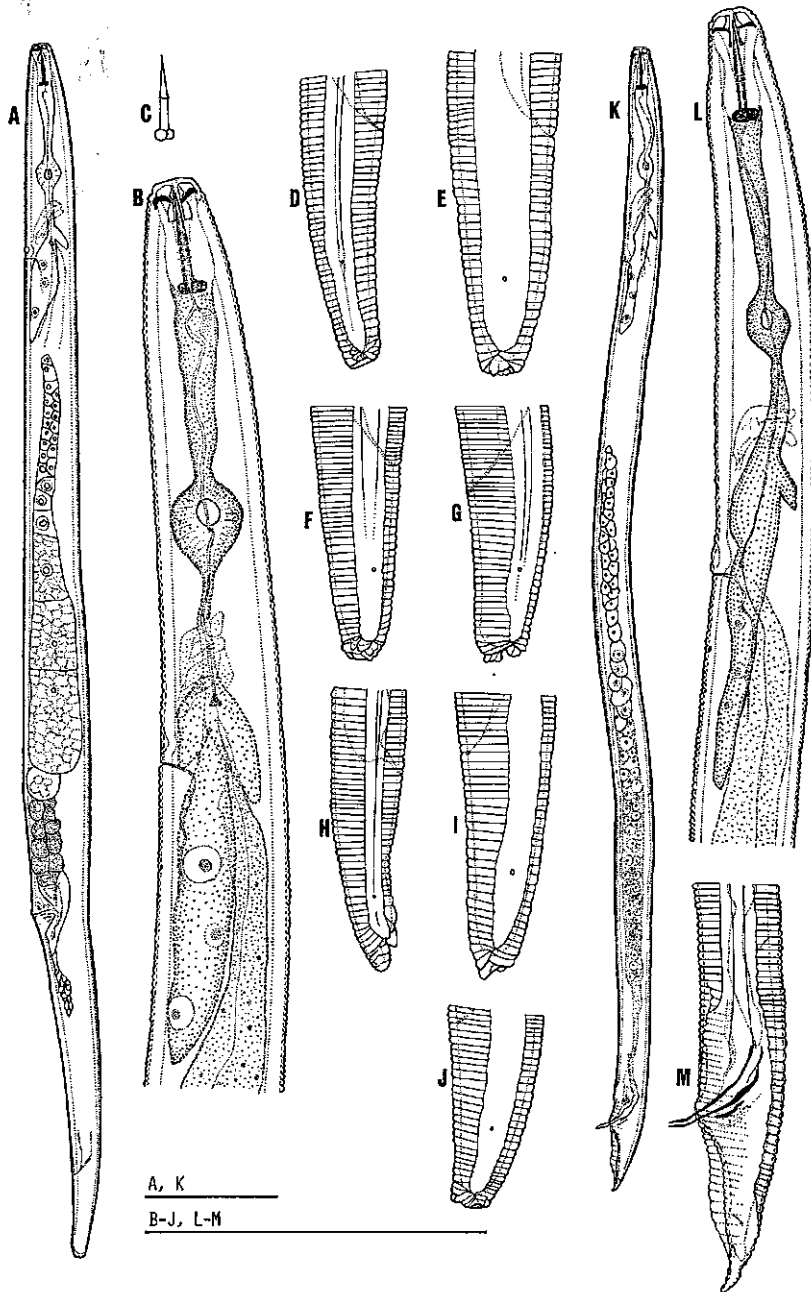


Fig. 1. *Pratylenchus gibbicaudatus* n. sp. A-J: Female, A: general view, B: anterior part of body, C: stylet, D-J: variations of tail. K-M: Male, K: general view, L: anterior part of body, M: posterior part of body. Scales indicate 50 μ m.

framework well developed, strongly sclerotized, arch-shaped, margin extending into two body annules. Stylet stout; knobs round or slightly flattened at anterior surface, 1.9–2.5 μm (2.1 ± 0.2) high, 3.2–4.4 μm (4.0 ± 0.3) wide. Dorsal esophageal gland orifice at 2.5–3.8 μm (3.2 ± 0.3) behind stylet base. Metacarpus round, occupying nearly whole body width, 34.7–61.9 μm (51.9 ± 5.1) from the anterior end. Esophagus 61.3–98.5 μm (76.6 ± 9.4) long from anterior end of body to esophageal-intestinal junction. Glandular esophageal basal lobe ended 107.4–217.9 μm (131.7 ± 25.6) from lip. Excretory pore at 71.4–105.5 μm (83.8 ± 6.8), 15.6–20.3% (17.5 ± 1.1) of body from anterior end. Hemizonid located immediately in front of excretory pore, two-annules long; hemizonion one-annule long, around 15 μm posterior to hemizonid in some specimens. Lateral field about 6.3–10.1 μm wide with four incisures, inner two fused around phasmid. Vulva prominent at 112.5–150.5 μm (131.4 ± 9.6) from posterior end. Reproduction system well developed. Spermatheca round without sperms. Postvulval uterine branch 21.5–46.7 μm (33.5 ± 8.4) long, 0.7–2.6 times (1.5 ± 0.5) body width at vulva. Distance between vulva and anus 2.8–4.5 times (3.3 ± 0.5) tail length. Tail 25.3–36.6 μm (31.2 ± 2.9) long with 24–39 (30 ± 2.5) annules. Phasmid at posterior half of tail, 7.6–15.8 μm (12.5 ± 2.0) from tail tip. Tail terminus annulated, truncate, or broadly rounded with shallow notch at the top, and rarely bifurcate (Fig. 1 H, I). Body annules faint, about 0.7–1.2 μm (1.0 ± 0.1) apart at midbody.

Male. Paratype: $n=1$, $L=470 \mu\text{m}$, $a=32.3$, $b=7.9$, $c=18.6$, $c'=2.0$, stylet= $14.8 \mu\text{m}$, prorhabdion= $8.2 \mu\text{m}$, stylet knob 1.9 μm thick and 3.2 μm wide, spicules= $17.7 \mu\text{m}$, gubernaculum= $5.1 \mu\text{m}$. General view similar to female but body more slender and esophagus gland less developed. Spicules arch-shaped; gubernaculum small.

Type specimens. Holotype: female collected by N. MINAGAWA on September 2, 1980. Paratypes: 30 females, 1 male and 3 larvae same data as holotype. Holotype and 28 female- and other paratype specimens are deposited in the Herbarium and Insect Museum of the National Institute of Agricultural Sciences in Yatabe, Ibaraki Pref. Two-paratype females are deposited in the Kyushu National Agricultural Experiment Station, Nishigoshi, Kumamoto Pref.

Type habitat and locality. Specimens were collected from rhizosphere of *Scirpus Wichurii* BÖCKLR. f. *concolor* (MAXIM.) T. KOYAMA grown in a swamp adjacent to pastures in the Somma area of Mt. Aso, Kumamoto Pref. (860 m alt.).

Diagnosis. *Pratylenchus gibbicaudatus* n. sp. is characterized by two lip annules and crenated tail terminus. This species is most closely related to *P. flakkensis* SEINHORST, 1968, but differs from it by flattened anterior surface of stylet knobs, more posteriorly located phasmid, and greater number of tail annules (24–39 vs. 18–24). *P. gibbicaudatus* n. sp. also resembles *P. bicaudatus* MEYL, 1954, which was usually treated as *species inquirenda* (LOOF, 1960), in the shape of tail terminus, but differs from it by smaller V-value (MEYL, 1961).

Pratylenchus macrostylus WU, 1971 (Fig. 2 A–P)

Female. Measurements are shown in Table 1. Body stout, usually straight after treatment by heat. Body sides parallel, gradually tapering from median esophageal bulb to rounded lip region, and from around vulva to mid-tail posteriorly. Posterior

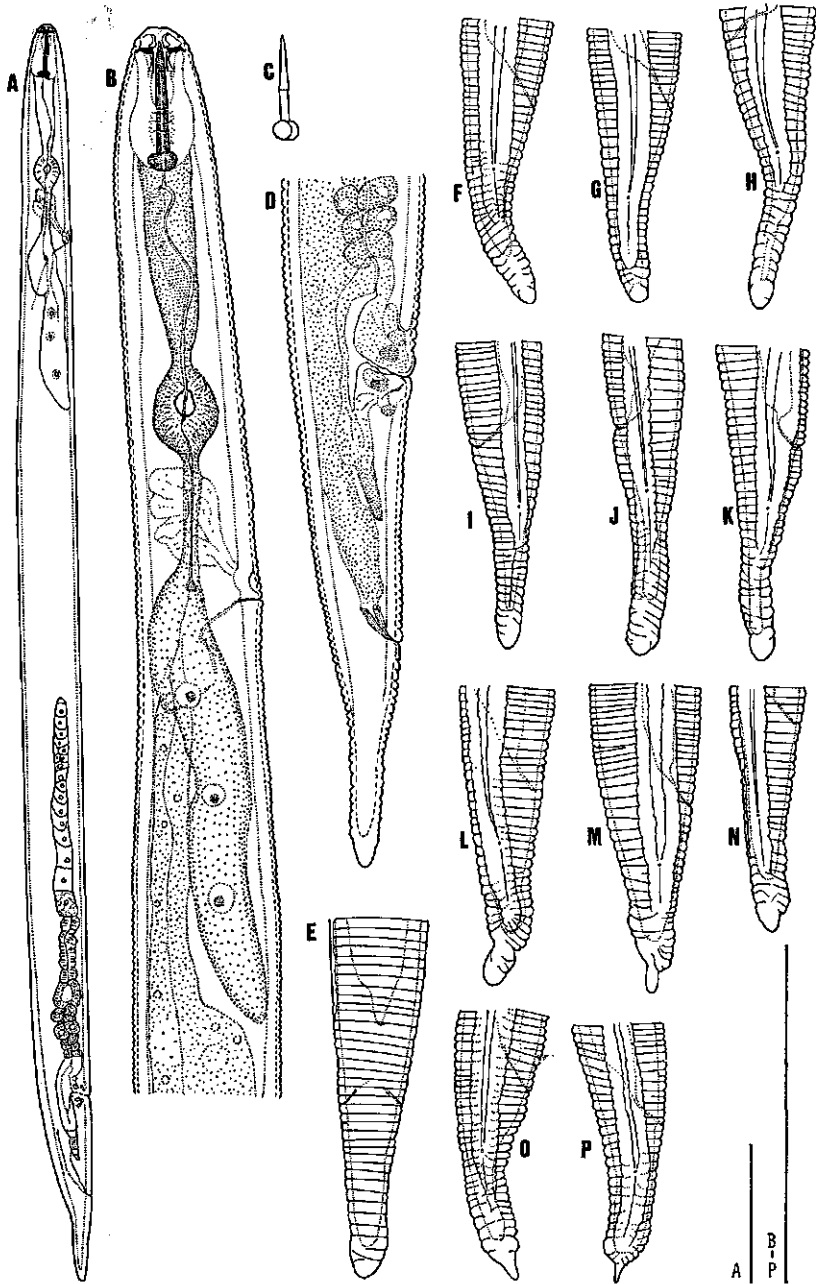


Fig. 2. *Pratylenchus macrostylus* Wu, 1971. Female, A: general view, B: anterior part of body, C: stylet, D: posterior part of body, E: tail region (ventral view), F-P: variations of tail. Scales indicate 50 μ m.

Table 1. Comparison of measurements of *Pratylenchus macrostylus* Wu, 1971 from various localities

Locality	Ontario ¹	Nagasaki ²	Nishigoshi	Mt. Aso
N	22	4	50	22
L (μm)	510–680	429–610	437–698 (521 \pm 58)	485–619 (538 \pm 42)
a	22–33	22.2–27.8	16.0–36.6 (25.3 \pm 3.4)	22.8–30.2 (26.6 \pm 1.9)
b	5.0–7.4		5.3–10.3 (7.0 \pm 1.0)	6.5–9.9 (7.4 \pm 0.8)
c	16–24	15.3–17.4	12.9–20.7 (17.4 \pm 2.1)	14.1–20.7 (17.2 \pm 1.7)
c'	2.1–3.3	2.5–3.3	1.4–4.5 (2.9 \pm 0.9)	2.3–3.6 (2.8 \pm 0.4)
V (%)	85.0–88.8	84.2–86.4	82.8–89.2 (86.4 \pm 1.3)	82.3–89.0 (86.3 \pm 1.5)
Stylet (μm)	21–24.7	17.5–20.0	18.3–20.8 (19.3 \pm 0.7)	18.3–19.6 (19.0 \pm 0.4)
Protrahedion (μm)	10.5–12.1		7.4–11.4 (9.9 \pm 0.6)	9.5–10.7 (10.1 \pm 0.4)
St kn h ³ (μm)			2.5–3.2 (2.8 \pm 0.3)	2.5–3.2 (3.1 \pm 0.3)
St kn w ⁴ (μm)	4–5.8		2.5–5.1 (3.9 \pm 0.3)	3.2–5.1 (4.3 \pm 0.4)
Ex. pore ⁵ (μm)	86–107		70.7–97.3 (83.4 \pm 6.0)	77.1–93.5 (83.6 \pm 4.3)
Do./L (%)		17.9–20.2	12.9–17.9 (16.2 \pm 1.4)	13.9–16.9 (15.6 \pm 0.8)
Tail annules	17–26	20–21	20–29 (24 \pm 2.0)	24–30 (26 \pm 2.1)
Tail (μm)	25–40		24.0–37.9 (29.9 \pm 3.2)	26.5–36.0 (31.6 \pm 2.7)
P vu ut ⁶	18–32		9.5–29.7 (15.8 \pm 5.8)	17.1–30.3 (24.4 \pm 3.1)
Lip annules	2 or 3	3	2 or 3	2 or 3

Figures indicate minimum and maximum measurements and the means and the standard deviations are in parentheses.

¹ After Wu (1971). ² After GOTOH and OHSHIMA (1963). ³ Stylet knob height. ⁴ Stylet knob width. ⁵ Excretory pore from the anterior end of body. ⁶ Postvulval uterine branch.

half of tail cylindrical. Lip region continuous to body contour, hemispherical, mostly with two annules and rarely three. Labial framework well developed. Stylet stout; knobs round. Dorsal esophageal gland orifice 1.6–3.8 μm behind stylet base. Metacarpus round and massive. Esophagus stout and variable in length. Excretory pore just behind hemizonid. Lateral field with four incisures, inner two fused around phasmid. Vulva at posterior one-fifth of body. Reproductive system well developed. Spermatheca round, without sperms. Postvulval uterine branch 9.5–30.3 μm long, 1.0–1.8 times vulval body width. Tail 24.0–37.9 μm in length. Phasmid at anterior half of tail. Tail end variable in shape; usually round or bluntly pointed (Fig. 2 F–L); rarely finger-like shape (Fig. 2 N) or pointed terminus like a mucro (Fig. 2 O, P).

Male. Unknown in Japan.

Host plants and localities. *Quercus acutissima* CARRUTH., *Q. dentata* THUNB. and *Q. serrata* MURRAY from Nishigoshi, Kumamoto Pref.; *Prunus Jamasakura* SIEB. ex. KOBZ. in the Somma of Mt. Aso (860 m alt.), Kumamoto Pref.

Discussion. *Pratylenchus macrostylus* Wu, 1971 is unique in this genus with stout body, spherical lip region and posterior located vulva. This species was originally described in Canada from soil around *Betula papyrifera* MARSH., *Picea glauca* (MOENCH) VOSS and *Pseudotsuga menziesii* (MIRB.) FRANCO (WU, 1971), and in Japan this was reported from loquat, *Eriobotrya japonica* LINDLEY in Nagasaki Pref. and apple, *Malus domestica* BORKH. in Nagano Pref. which was referred to *Pratylenchus* sp.₁ (GOTOH and OHSHIMA, 1963). Later GOTOH (1974) transferred this species to genus *Hoplotylus*

s'JACOB, 1969 based on the morphology wherein glandular lobes of esophagi of some specimens overlap the intestine dorsally like those of *Hoplotylus*. Since it is apparent, however, that the percentage of females with such a character is not high within the population examined, this species should be treated as a member of *Pratylenchus* rather than *Hoplotylus*. Although Japanese specimens show smaller c-value and shorter body and stylet than those of the Canadian population, other morphological characters including variation of tail shapes correspond with the original description.

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