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NEW RECORD AND REDESCRIPTION OF *Mylonchulus paitensis* Yeates, 1992 (Mononchida, Mylonchulidae) IN VIETNAM

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ABSTRACT

The species *Mylonchulus paitensis* Yeates, 1992 with a re-description is recorded and illustrated for the first time from Vietnam. Two populations of *M. paitensis* were collected from Lao Cai and Ha Giang provinces, Northern Vietnam. Their measurements and features corresponded well with the type population from Paita, New Caledonia and other populations from Iran.

Keywords: Taxonomy, free-living soil nematodes, Vietnam.

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INTRODUCTION

The genus *Mylonchulus* was proposed by Cobb (1916) when he divided the genus *Mononchus* Bastian, 1865 into 5 genera namely *Mononchus* Bastian, 1865, *Prionchulus* Cobb, 1916, *Mylonchulus* Cobb, 1916, *Iotonchus* Cobb, 1916, and *Anatonchus* Cobb, 1916, and the species *Mylonchulus minor* (Cobb, 1893) Cobb, 1916 became the type species. Genus *Mylonchulus* Cobb, 1916 is the most species rich within the family Mylonchulidae and currently reaching 70 species (Vu et al., 2024). It is spread world-wide, both in natural habitats and agricultural lands. In Vietnam, 22 species were added to the nematode's fauna (Vu, 2016; Vu et al., 2024).

Mylonchulus pateinsis was found and described from the original population in Paita, New Caledonia by Yeates (1992). This species was also recorded in Iran (Farahmand et al., 2009; Mahdikhani-Moghandam et al., 2017). In this paper, *M. paitensis* is firstly reported for nematode's fauna in Vietnam.

MATERIALS AND METHODS

Soil samples were collected from a natural forest in Bao Toan commune, Bao Lac disctrict, Cao Bang province and Minh Ngoc commune, Bac Me district, Ha Giang province (Vietnam). Nematodes were extracted from soil samples using the Baermann funnel technique (Southey, 1986). Specimens were killed at 70 ^{o}C by hot water, fixed in TAF solution (Southey, 1986), transferred to anhydrous glycerol (Seinhorst, 1959), and mounted on glass slides for microscopic observation. Measurements were performed with a Nikon digital camera on a Nikon Eclipse *Ni* microscope at the Institute of Biology, Vietnam Academy of Science and Technology, Vietnam. Observations of morphological diagnostic features and photographs were taken with a Nikon digital camera mounted on a Nikon Eclipse *Ni* microscope. Illustrations were drawn using a Nikon Eclipse *Ni* microscope equipped with a Nikon Y-IDT drawing tube. Photographs and illustrations were edited using Adobe Photoshop CC 2018.

RESULTS AND DISCUSSION

Description

Order: MONONCHIDA Jairajpuri, 1969

Family: Mylonchulidae Jairajpuri, 1969

Genus: *Mylonchulus* Cobb, 1916

***Mylonchulus paitensis* Yeates, 1992** (Figs. 1, 2)

Measurements: The first population including 5 females were found in Bao Toan commune, Bao Lac district, Cao Bang province. The other population including 4 females were collected from Minh Ngoc commune, Bac Me district, Ha Giang province. All females in good condition. Measurements in Table 1.

Table 1. Comparison of morphometric data of *Mylonchulus paitensis* Yeates, 1992 (all measurements are in μm except indicated and ratios V, a, b, c, c')

Local	Caledonia		Iran		Viet Nam	
	Paita		Ahvanoo	Ali Abad	Cao Bang	Ha Giang
Reference	Yeates, 1992		Farahmand et al., 2009		Current paper	
Character	Holotype	Paratypes				
N	♀	♀♀ (n = 7)	♀♀ (n = 7)	♀♀ (n = 7)	♀♀ (n = 5)	♀♀ (n = 4)
L	1380	1280–1450	1100–1480 (1280 ± 145)	1310–1580 (1420 ± 90)	1100–1260 (1179 ± 63.7)	1230–1420 (1338 ± 80)
V (%)	65	63–67	61.4–67 (64.4 ± 1.7)	63.3–66 (65 ± 0.9)	65–69 (67 ± 1.3)	67.8–68.7 (68.2 ± 0.5)
a	31	28–33	28.6–30.4 (29.5 ± 0.7)	24.5–32.3 (29.6 ± 2.8)	25.5–31 (28.1 ± 2.8)	28.7–30 (29.1 ± 0.6)

Local	Caledonia		Iran		Viet Nam	
	Paita		Ahvanoo	Ali Abad	Cao Bang	Ha Giang
Reference	Yeates, 1992		Farahmand et al., 2009		Current paper	
Character	Holotype	Paratypes				
b	3.4	3.3–3.6	3.1–3.5 (3.2 ± 0.2)	3.3–3.7 (3.5 ± 0.2)	3.1–3.3 (3.2 ± 0.1)	3.0–3.2 (3.1 ± 0.1)
c	32	32–41	26.1–32.7 (28.2 ± 2.2)	30.1–39.2 (33.9 ± 3.2)	30–38 (32.6 ± 3.4)	31.2–33.7 (32.5 ± 1)
c’	1.2	1.2–1.4	1.2–1.5 (1.3 ± 0.1)	1.1–1.3 (1.3 ± 0.1)	1.1–1.5 (1.3 ± 0.2)	1.3–1.4 (1.3 ± 0.1)
Buccal cavity length	27.5	28–29	23.8–26.6 (24.8 ± 1.1)	23.8–26.6 (25.4 ± 1.3)	27.5–28.5 (28 ± 0.8)	29.5–30.5 (30 ± 0.5)
Buccal cavity width	15.5	17–18	14–16.8 (15.4 ± 0.8)	15.4–18.2 (16.6 ± 1.3)	16–18 (16.9 ± 1)	18–19 (18.5 ± 0.5)
Position of dorsal tooth apex (%)	80	78–84	82.4–84.2 (83.0 ± 0.7)	78.9–88.9 (83.6 ± 4)	81–85 (83.5 ± 1.5)	83–85.5 (84.6 ± 1.2)
Lip region width	28	25–29	21–23.8 (23.2 ± 1.1)	21–26.6 (23.6 ± 2)	25–29 (27 ± 1.9)	29.5–30.5 (30 ± 0.5)
Lip region heigth	-	-	8.4–9.8 (8.8 ± 0.7)	7–11.2 (8.4 ± 1.6)	9–10 (9.3 ± 0.5)	10–11 (10.5 ± 0.5)
Neck length	-	-	350–420 (387 ± 26.4)	371–469 (404 ± 33.6)	358–380 (363 ± 12.6)	428–454 (436 ± 17)
Cuticle at the neck base	-	-	-	-	1.6–2.2 (1.9 ± 0.2)	1.6–1.9 (1.7 ± 0.1)
Body diameter at the neck base	-	-	-	-	36.5–42.5 (38.9 ± 2.6)	40–47 (43.3 ± 2.8)
Body diameter at the vulva	-	-	-	-	37–47.5 (42.4 ± 4.6)	41–49.5 (46 ± 3.5)
Body diameter at the anus	-	-	31.5–38.5 (34.5 ± 2.4)	31.5–42 (34 ± 3.9)	26–28.5 (27.4 ± 0.8)	28–33 (31 ± 2.2)
Anterior branch of reproductive system	-	-	51–100 (70.5 ± 24)	60–100 (76.6 ± 19.7)	96–150 (121.7 ± 21.8)	126–160 (146 ± 17)
Posterior branch of reproductive system	-	-	36–66 (50.5 ± 14.7)	65–108 (83 ± 19)	87–115 (108.4 ± 14.7)	104–145 (123 ± 20.6)
Vaginae length	-	-	11–12 (11.8 ± 0.5)	12–14 (13 ± 1)	10.5–12.3 (11.6 ± 0.7)	11.2–12.4 (11.6 ± 0.6)
Rectum length	-	-	-	-	18–22 (20.2 ± 1.3)	22–24 (22.9 ± 0.9)
Tail length	43	34–44	42–56 (45.5 ± 4.9)	38.5–52.5 (42.5 ± 5.1)	30–40 (36.4 ± 4.1)	37.5–43 (41.2 ± 2.4)

Note: - no information.

Adult: Moderately slender (a = 25.5–31), medium sized nematodes 1.1–1.42 mm long, habitus curved ventrally and C-shaped after fixation in TAF solution. Maximum body width at level of vulva, 37–49.5 µm wide. Cuticle smooth, two layers, 1.6–2.2 µm thick at the base of the pharynx. Lip region round, 25–31 µm width, slightly wider than body contour by depression, 2.6–3.2 times as wide as high. Lips moderately separated, prominent labial and cephalic sensilla. Anterior sensilla are arranged in two circles: an anterior one with six inner labials and a posterior one with six outer labials and four cephalic papillae slightly protruding beyond the body outline. Amphidial fovea small, fusiform shaped, its aperture oval transverse, 2–3 µm wide, located at the level of dorsal tooth apex or slightly lower. Vestibulum 5-6 µm long. Buccal cavity goblet shaped, tapering at base, 1.5–1.7 times as long as wide, its walls heavily cuticularized. Dorsal tooth large, 10–12 µm long from base to apex, claw-like, forward directed, its apex pointed, situated at anterior fifth (81–85.5%) of buccal cavity length from stoma base. A large tooth clearly present in the subventral wall. Six transverse rows of raps-like denticles on subventral walls and the sixth row contains few denticles. Two foramina present at the base of buccal cavity lying close to each other. Posterior fourth of buccal cavity embedded in pharyngeal tissue.

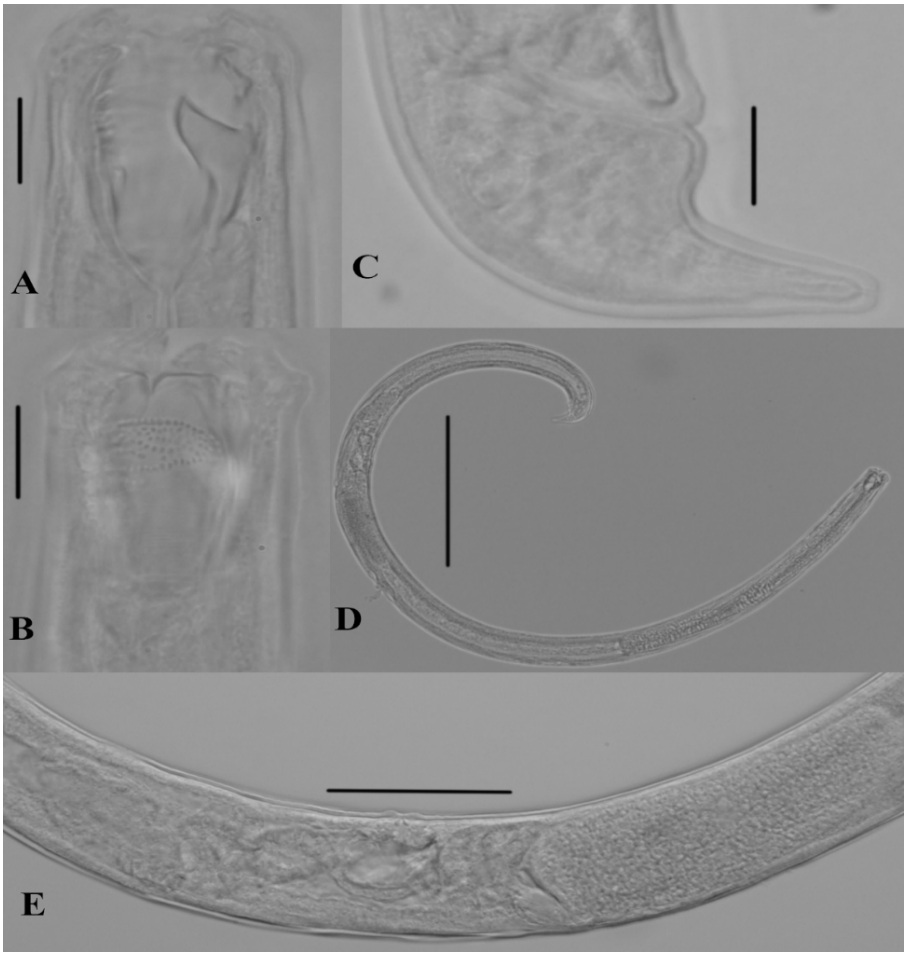

Figure 1. Mylonchulus paitensis Yeates, 1992. A: Head region (dorsal tooth and subventral tooth); B: Head region with six transverse rows of denticles; C: Tail region; D: Entire body; E: Female reproductive system (scare bars: A-C = 20 µm; D = 200 µm; E = 50 µm)

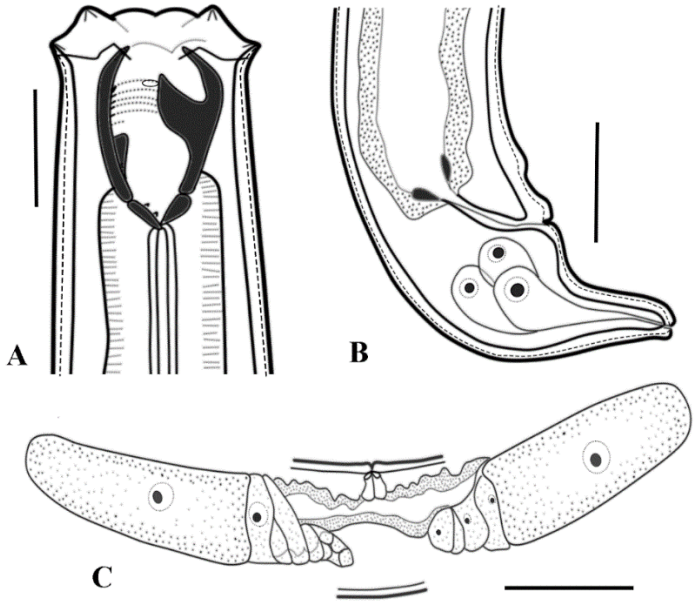

Figure 2. Mylonchulus paitensis Yeates, 1992. A: Head region. B: Tail region; C: Female reproductive system (scare bars: A-C = 20 µm)

Pharynx cylindrical, nerve ring encircling pharynx, located at 25–27% of neck length. Secretory-excretory pore (SE-pore) distinct, situated at 29–31% of neck length. Pharyngo-intestinal junction non-tuberculate, 13–17 × 8–11 µm. Rectum straight, shorter than anal body width, 0.7–0.8 times the anal body diameter long. Tail short 1.3–1.5 time the anal body diameter long; first half part strongly conoid and then ventrally bent with digitiform tip. Three caudal glands well developed, lying in group and *spinneret* on terminal tail.

Female: Genital system didelphic-amphidelphic, with both branches equally developed, first branch occupying 9–12% and post branch occupying 8–10% of total body length. Ovaries reflexed with oocytes first arranged in several rows and then in single row; sphincter between oviduct and ovary not present. Vagina length 10–12 µm occupying one-fourth corresponding body diameter. *Pars proximalis vaginae* short; *pars refringens vaginae* small 2–3 × 1.5 µm, sclerotized in teardrop-shaped pieces; *pars distalis vaginae* 6–8 × 2–3 µm. Vulva transverse, slit-like, at 65–68% of body length.

Male: Not found.

Remarks: The measurements of Vietnamese specimens corresponded well with those of holotype and paratype specimens of type population from Paita, New Caledonia (Yeates, 1992), they differ only in number rows of transverse denticles (6 *vs* perhaps 5) (see Table 1).

The measurements of two populations from Iran fitted well with the original population from New Caledonia (Table 1). However, the description and picture did not mention about the tooth in the subventral of the buccal cavity, the main character of *M. paitensis* differs from *Mylonchulus kermaniensis* Shokoohi et al., 2013 (*vs* present subventral tooth in the original description) (Yeates, 1992; Farahmand et al., 2009; Shokoohi et al., 2013). Mahdikhani-Moghandam et al. (2017) reported *M. paitensis* in Iran again. Nevertheless, it was not described, without measurements and very low quality photos so that it was very difficult to identify them. In addition, the tail shape was different from the original description. So, *M. paitensis* seems not to be present in Iran.

Locality: Bao Toan commune (22°57’31”N, 105°36’38”E, altitude at 450 m), Bao Lac district, Cao Bang province,

Vietnam. Other locality is Minh Ngoc commune (22°43'18"N, 105°11'38"E, altitude at 300 m), Bac Me district, Ha Giang province (Vietnam).

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REFERENCES

Ahmad W., Jairajpuri M. S., 2010. Mononchida: The predaceous nematodes. Brill Leiden-Boston. 298 p.

Cobb N. A., 1916. Notes on new genera and species of nematodes. Four subdivisions of *Mononchus*. *Journal of Parasitology*, 2: 195−196.

Cobb N. A., 1917. The mononchs (*Mononchus* Bastian, 1865). A genus of free-living predatory nematodes. Contributions to a science of Nematology VI. *Soil Science*, 3: 431–437.

Farahmand S., Eskandari A., Orselli L., Karegar A., 2009. Some known species of the genera *Mononchus* Bastian, 1865 and *Mylonchulus* (Cobb, 1916) Altherr, 1953 (Nematoda: Mononchina) from Semnan province, Iran. *Nematol. medit.*, 37: 145−154.

Jairajpuri, M. S., 1969. Studies on Mononchida of India. I. The genera *Hadronchus*, *Iotonchus* and *Miconchus* and a revised classification of Mononchida, a new order. *Nematologica*, 15(4): 557−581. https://doi.org/10.1163/187529269X00894

Mahdikhani-Moghandam E., Bub J. A. A., Chery S. B., Ahani S., 2017. Study of some mononchids (Nematoda, Mononchida) from Iran. *Pakistan Journal of Nematology*, 35(1): 37−45.

Nguyen Vu Thanh, 2007. Fauna of Vietnam. No 22. Free living nematodes: Monhysterida, Araeolaimida, Chromadorida, Rhabditida, Enoplida, Mononchida, Dorylaimida. Science and Technics Publishing House. 455 p (in Vietnamese).

Seinhorst J. W., 1959. A rapid method for the transfer of nematodes from fixative to anhydrous glycerin. *Nematologica*, 4(1): 67–69.

Shokoohi E., Mehrabi-Nasab A., Mirzaei M., Peneva V., 2013. Study of mononchids from Iran, with description of *Mylonchulus kermaniensis* sp. n. (Nematoda: Mononchida). *Zootaxa*, 3599(6): 519−534. http://dx.doi.org/10.11646/zootaxa.3599.6.2

Southey J. F., 1986. Laboratory methods for work with plant and soil nematodes. London: Her Majesty' Stationery Office. 202 p.

Vu Thi Thanh Tam, 2016. New data of two *Mylonchulus* species (Mononchida, Mylonchulidae) and an updated key to species from Vietnam. *Tap chi Sinh hoc*, 38(3): 287−292. http://dx.doi.org/10.15625/0866-7160/v38n3.7924

Vu T. T. T., Le T. M. L., Peneva V., 2024. Morphological and molecular characterization of *Mylonchulus laocaiensis* sp. n. (Nematoda: Mylonchulidae) from Vietnam. *Journal of Helminthology*, 98(e 75): 1−11. https://doi.org/10.1017/S0022149X24000671

Yeates G. W., 1992. Nematodes from New Caledonia. 1. Introduction and Mononchoidea. *Fundamental Applied in Nematology*, 15(2): 101−126.