

**TWO NEW RECORDED SPECIES OF THE FAMILY LEPTONCHIDAE
(NEMATODA: DORYLAIMIDA) FOR VIETNAM'S FAUNA
FROM CUC PHUONG NATIONAL PARK**

Nguyen Thi Anh Duong^{1*}, Vu Thi Thanh Tam¹, Reyes Peña-Santiago²

⁽¹⁾Institute of Ecology and Biological Resources, VAST, ^(*)nad2807@yahoo.com

⁽²⁾University of Jaén, Spain

ABSTRACT: *Proleptonchus aestivus* and *Tyleptus projectus* from Cuc Phuong natural forest are described and illustrated for the first time in Vietnam. *Proleptonchus aestivus* species is characterized by its body 1.14-1.21 mm long; lip region cap-like with lips amalgamated and papillae little protruding; odontostyle very slender and odontophore rod-like, arcuate; female genital system mono-prodelphic; tail short and rounded, hemispheroid. *Tyleptus projectus* species is characterized by its body 0.79-0.95 mm long; lip region set off by marked depression or weak constriction; six lips conspicuous projecting liplets around the oral opening; odontostyle small but robust, odontophore rod-like; female genital system mono-opisthodelphic, male genital system diorchic, with opposite testes. Tail short and rounded, to hemispheroid.

Keywords: Dorylaimida, Leptonchidae, *Proleptonchus aestivus*, *Tyleptus projectus*, morphology, Vietnam.

INTRODUCTION

Free-living terrestrial nematode Leptonchidae is a poorly known dorylaimid family in Vietnam, with only one described species *Thornedia opisthodelphic* Jairajpuri, 1968 [4], which was collected from Cuc Phuong National forest in northern Vietnam. In this paper, two species of *Proleptonchus aestivus* and *Tyleptus projectus* in this area are recorded for the first time in Vietnam. Based on high resolution microphotographs, our study allows having better characterization of those species.

MATERIAL AND METHODS

Soil samples were collected from a pristine tropical forest in Cuc Phuong National Park (Vietnam). Nematodes were extracted from soil sample by modified Baermann funnel technique, killed by heat, fixed in formaldehyde 4%, transferred to anhydrous glycerol according to Siddiqi (1964) [12], and mounted on glass slides for their handling. Specimens were photographed with a Nikon Eclipse 80i microscope and a Nikon DS digital camera. Raw photographs were edited using Adobe® Photoshop® CS.

DESCRIPTION

Proleptonchus aestivus Lordello, 1955 (Fig. 1)

Material examined: Two females, in good condition.

Measurements: See table 1.

Female: Moderately slender nematodes of medium size, 1.14-1.21 mm long. Habitus after fixation slightly curved ventrad to an open C shape. Body cylindrical, tapering towards both ends, but more so anteriorly since the tail is rounded. Cuticle typical tylencholaimoid, with very irregular inner layer and provided with numerous dot-like radial elements. Lateral chord 10-14 μm wide or occupying one-fourth (26-28%) of mid-body diameter, lacking any differentiation. Lip region cap-like, offset by marked depression or weak constriction, 2.1-2.3 times as wide as high, and about one-fifth (20-22%) of body diameter at neck base; lips amalgamated; papillae little protruding.

Amphid fovea not observed. Stoma flask-shaped, distinctly sclerotized in its posterior half. Odontostyle very slender but with distinct lumen, slightly arcuate, approximately 10-12 times as long as wide, 0.6-0.8 times longer than lip region diameter or 0.44-0.50% of total body length. Odontophore rod-like, arcuate. Guiding ring simple, located at 7.0-8.0 μm or one lip

region diameter from anterior end. Pharynx consisting of a weakly muscular anterior portion and basal bulb, both parts separate by a distinct constriction; bulb 2.0-2.4 times as long as broad and as long as corresponding body diameter long, occupying about one-fifth (19-20%) of total neck length. Pharyngeal gland nuclei obscure. Cardia short and rounded, about a quarter of body width. Genital system monodelphic; anterior branch well developed, 245 μm long, while the posterior one is reduced to an uterine sac 56 μm long or 1.6 times the body diameter; anterior ovary large, 97 μm long, with oocytes first in two or more rows, then in one row; oviduct 178 μm or 4.7 body diameter long,

consisting of a slender portion with prismatic cells and a very well developed *pars dilatata* with distinct lumen; sphincter well marked between oviduct and uterus; uterus a simple tube-like structure, 70 μm long or 1.8 times of body diameter; vagina extending inwards 23 μm or approximately one-half (50%) of body diameter: *pars proximalis* 20 \times 18 μm , with convergent walls and enveloped by circular musculature in its distal portion, *pars refringens* absent, and *pars distalis* 6.0 μm long; vulva a post-equatorial transverse slit. Prerectum 2.7 and rectum 1.4 anal body diameter long. Tail short and rounded, hemispheroid.

Male: Not found.

Table 1. Morphometric data of *Proleptonchus aestivus*. All measurements are in μm except ratios a, b, c, V, c' and L in mm

Reference	Distribution	<i>Proleptonchus aestivus</i>		
		Brazil	India	Vietnam
		Lordello (1955)	Jairajpuri (1964)	Present paper
		Type material	Paratype	
n		10 ♀♀	50 ♀♀	2 ♀♀
Character				
L		1.3-1.5	1.2-1.5	1.14-1.21
a		30-35	32-35	24-30
b		6.0-7.3	6.0-7.5	5.8-5.8
c		70-80	70-75	76-93
V		52-60	52-58	59-61
c'		?	?	0.6-0.8
Lip region diameter		?	?	7.5-8.0
Odontostyle length		?	?	5.0-6.0
Odontophore length		?	?	10.0-13.0
Guiding ring from anterior end		?	?	7.0-8.0
Neck length		?	?	195-207
Pharyngeal expansion length		?	?	40-40
Body diameter - neck base		?	?	37-41
Body diameter - mid-body		?	?	38-50
Body diameter - anus		?	?	20-22
Prerectum length		?	?	?-60
Rectum length		?	?	?-30
Tail length		?	?	13-15

?. no information.

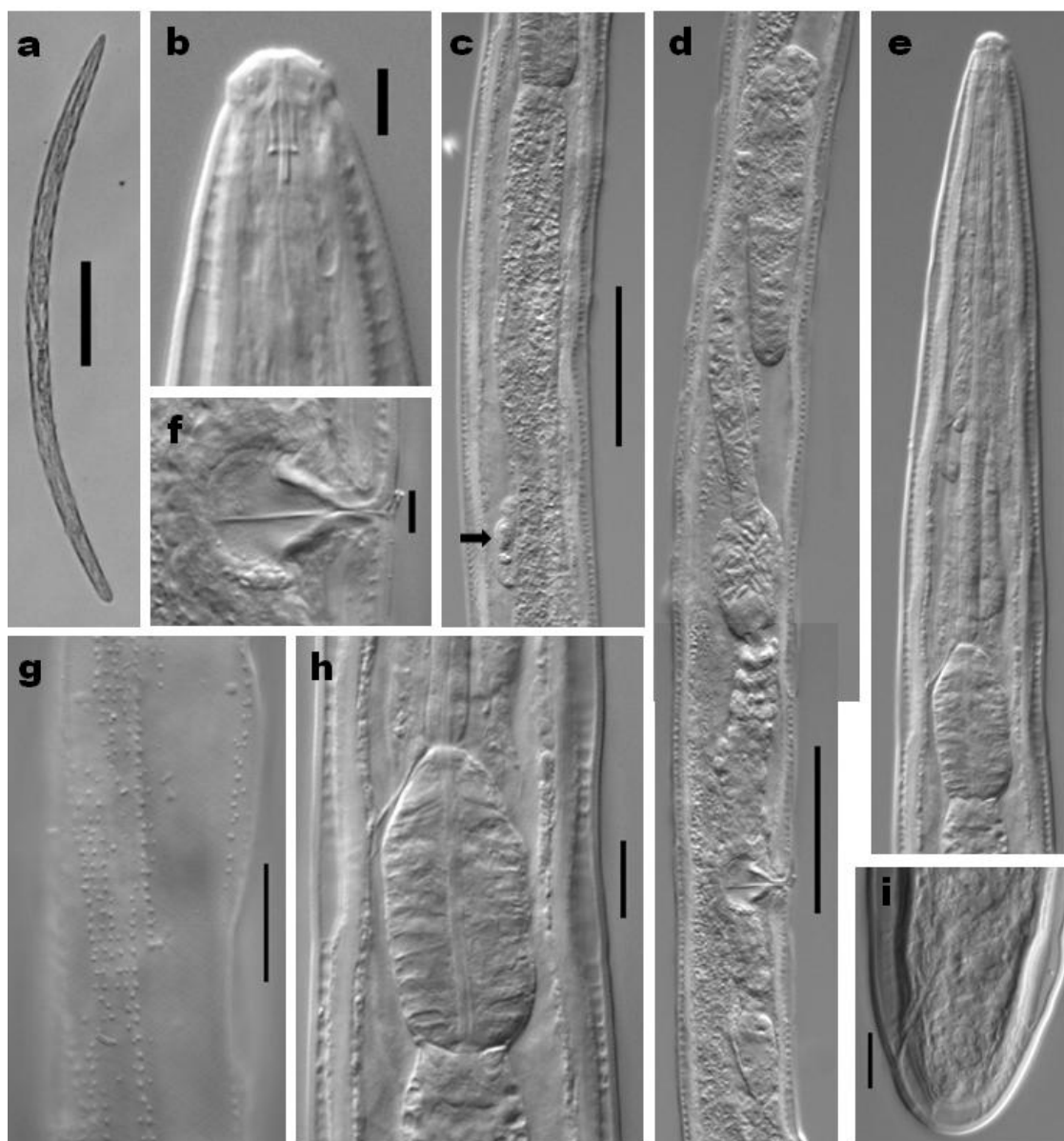


Figure 1. *Proleptonchus aestivus* Lordello, 1955 (female, LM)

a. Female, entire; b. Anterior region in median view; c. Body region behind pharyngeal bulb showing a pseudocelomocyte; d. Genital system; e. Neck region; f. Vagina; g. Cuticle in submedian view; h. Pharyngeal bulb and cardia; i. Caudal region (Scale bars: a = 200 μm ; b, f = 5 μm ; c-e = 50 μm ; g = 20 μm ; h, i = 10 μm).

Remarks

The two Vietnamese specimens correspond well to type population from Brazil [5, 6, 11] as well as Indian specimens reported by Jairajpuri

& Siddiqi (1964) [8], with no significant difference observed.

Baqri (1991) [1] described an Indian population of *P. clarus* Timm [6,9,14] which

does not fit other populations of this species due to its smaller body in females (1.14-1.38, n=5 vs 1.43-1.83 mm, n=10), shorter posterior uterine sac (51-68 μm or 1.1-1.7 body diameters vs 98-129 μm or 2.0-2.5 body diameters) and male absent (vs as frequent as females). This population is not distinguishable from others belonging to *P. aestivus*, also known to occur in India.

Choi & Jairajpuri (1998) [2] described the new species *P. parkerus* from Korea, very similar to *P. aestivus*, which was not compared to. These two species might be identical.

***Tyleptus projectus* Thorne, 1939 (Fig. 2)**

Material examined: Seven females and one male, in very good condition.

Measurements: See table 2.

Adult: Moderately slender to slender nematodes of medium size, 0.79-0.95 mm long. Habitus after fixation curved ventrad to open C-shaped. Body cylindrical, tapering towards both ends, but more so at anterior body region. Cuticle typical tylencholaimoid, outer cuticle without visible transverse striation while the inner one shows irregular outline; radial refractive elements present. Lateral chord 7 μm wide or occupying one-third of mid-body diameter, with two lines of coarse ducts reaching to their large pores. Lip region set off by marked depression or weak constriction, 1.8-2.0 times as wide as high and approximately one-half (50%) of body diameter, at neck base; six lips conspicuous projecting liplets around the oral opening. Amphid fovea stirrup-shaped, opening at level of cephalic depression, its aperture occupying 6.0 μm or approximately three-fourths of lip region diameter. Cheilostom truncate cone, lacking any differentiation.

Odontostyle typical of the genus, small but robust, with distinct lumen and aperture that occupies one-fifth of total its length. Guiding ring simple, located at 5.0 μm or 0.6 lip region diameter from anterior end. Odontophore rod-like, 1.3 times as long as odontostyle. Pharynx consisting of a slender, weakly muscular and very convoluted anterior portion and a pyriform

basal bulb as long as the body diameter at neck base. Pharyngeal gland nuclei obscure. Cardia short and rounded. Prerectum 4.3, rectum 1.7 anal body diameter long. Tail short and rounded, to hemispheroid; its inner core imperfect irregular and sunken.

Female

Genital system mono-opisthodelphic. Anterior branch reduced to a short rudimentary pouch as long as body diameter. Posterior branch well developed, 215-220 μm ; reflex ovary, 60-70 μm ; oocytes first in two or more rows, then in one row. Oviduct 90 μm long or 3.0-3.3 body diameter long and consisting of a slender portion with prismatic cells and a moderately developed *pars dilatata* with distinct lumen. Oviduct and uterus are separated by sphincter. Uterus a simple tube-like structure, 140 μm long or 5.0 times the body diameter. Vagina extending inwards 13-14 μm : *pars proximalis* wider than long, with convergent walls and enveloped by weak circular musculature *pars refringens* absent, and *pars distalis* 3.0 μm long. Vulva a pre-equatorial, transverse slit.

Male

Genital system diorchic, with opposite testes. In addition to the ad-cloacal pair, situated at 6.0 μm from cloacal aperture, there are three ventromedian supplements, the posteriormost of which is situated out of the range of spicules and at 33 μm from ad-cloacal pair. Spicules dorylaimoid, curved ventrad and relatively robust, 5.8 times as long as wide and 1.9 times as long as anal body diameter. Lateral guiding pieces 9.0 μm long, 6.0 times as long as wide.

Remarks

The above description fits well that of type material [6, 13] and later records of this species [9, 10]. Nevertheless, *T. projectus* belongs to a group of very similar (if not identical) species, namely *T. oryzae* Dhanam & Jairajpuri, 1999 [3], *T. striatus* Heyns, 1963 [7] and *T. variabilis* Jairajpuri & Siddiqi, 1964 [8], which was never compared in depth and should be matter of a detailed study.

Table 2. Morphometric data of *Tyleptus projectus*. All measurements are in μm except ratios a, b, c, V, c' and L in mm

Distribution	<i>Tyleptus projectus</i>			
	USA		Vietnam	
	Thorne (1939)	Goseco et al. (1974)	Present paper	
	Type material	Paratype	Paratype	
Reference				
n	5♀♀	11♀♀	1♂	7♀♀
L	1.18 ± 0.10 (1.07-1.28)	1.07 ± 0.08 (0.90-1.17)	0.79	0.90 ± 0.03 (0.87-0.95)
a	30.3 ± 4.4 (25.6-36.3)	28 ± 1.8 (25-31)	41.4	35.7 ± 2.2 (33.0-37.9)
b	5.1 ± 0.2 (4.8-5.2)	4.5 ± 0.4 (3.8-5)	3.3	3.9 ± 0.3 (3.6-4.5)
c	67.9 ± 5.5 (64-74.3)	78.3 ± 17.9 (56-105)	56.2	64.6 ± 6.8 (58.1-75.1)
V	33.4 ± 1.4 (32-35.3)	33 ± 2.3 (31-37)	0.71	37 ± 2 (35-38)
c'	?	?	0.9	0.8 ± 0.0 (0.8-0.8)
Lip region diameter	?	?	9.0	8.8 ± 0.8 (8.0-10.0)
Odontostyle length	?	?	9.0	9.0 ± 0.0 (9.0-9.0)
Odontophore length	?	?	10.0	10.0 ± 0.0 (10.0-10.0)
Guiding ring from anterior end	?	?	6.0	5.2 ± 0.4 (5.0-6.0)
Neck length	235 ± 9.5 (220-246)	234.9 ± 20.3 (200-237)	235	229 ± 17.7 (200-243)
Pharyngeal expansion length	?	?	28	27.4 ± 1.9 (25.0-30.0)
Body diameter - neck base	?	?	19.0	23.8 ± 1.1 (23.0-25.0)
Body diameter - mid-body	?	?	19.0	25.2 ± 2.2 (23.0-28.0)
Body diameter - anus	?	?	15.0	18.2 ± 1.8 (16.0-20.0)
Prerectum length	66.4 ± 17.2 (46-84.4)	69.3 ± 20.6 (48-106)	65	?
Rectum length	?	?	25	14.0 ± 1.4 (12.0-15.0)
Tail length	17.6 ± 2.7 (14.4-19.2)	14.5 ± 4.1 (10-21)	14.0	17.4 ± 1.3 (15.0-18.0)
Spicules length	-	-	29	-
Ventromedian supplements	-	-	3	-

?. no information.

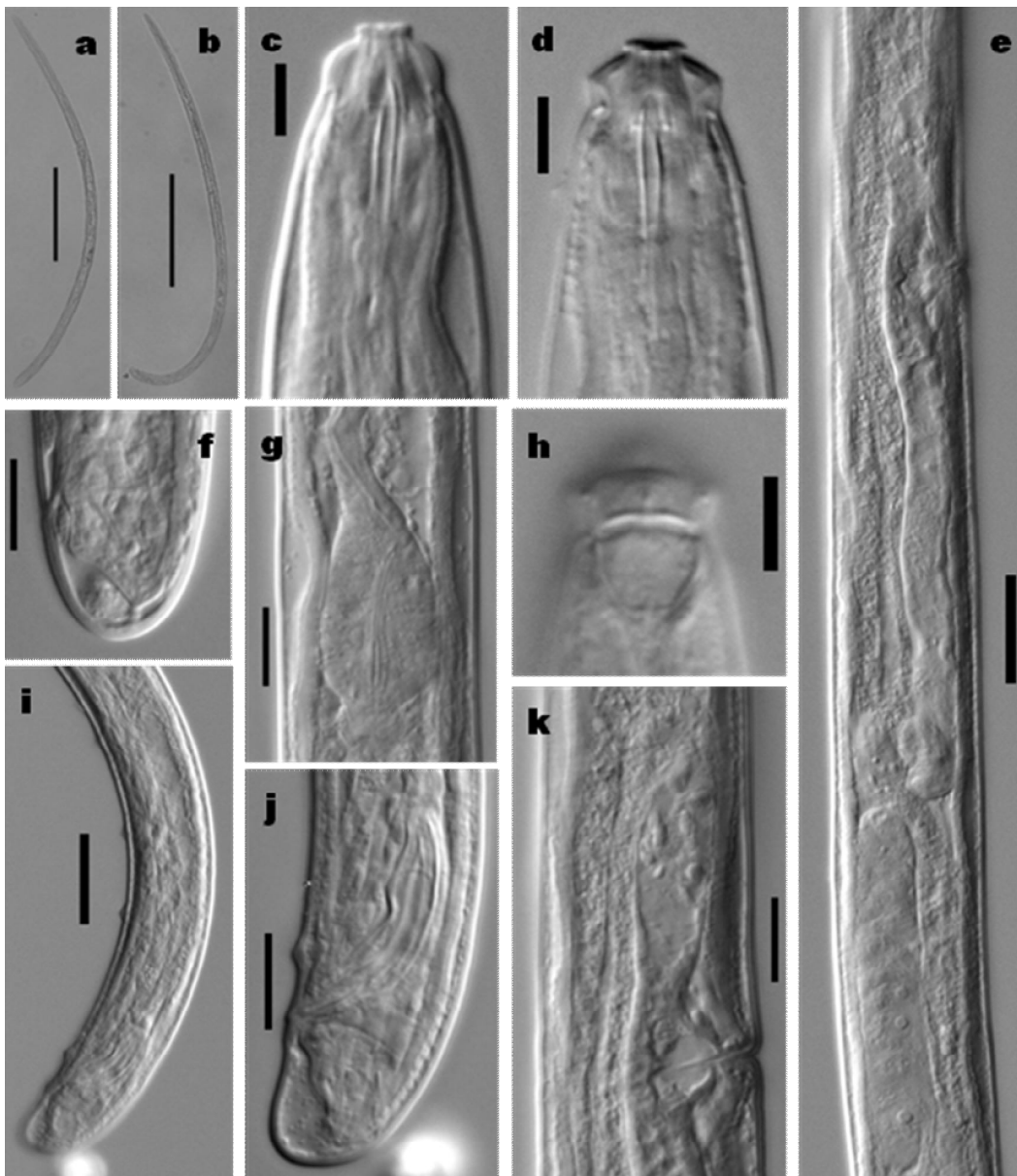


Figure 2. *Tyleptus projectus* Thorne, 1939 (LM)

- a. Female, entire; b. Male, entire; c, d. Anterior region in median view; e. Female, genital system; f. Female, caudal region; g. Pharyngeal bulb and cardia. h. Lip region, surface view; i. Male, posterior body region; j. Male, caudal region and spicules; k. Female, prevulval uterine sac and vagina (Scale bars: a, b = 200 μ m; c, d, h = 5 μ m; e, i = 20 μ m; f, g, j, k = 10 μ m).

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**PHÁT HIỆN MŨI HAI LOÀI TUYẾN TRÙNG THUỘC HỌ LEPTONCHIDAE
(NEMATODA: DORYLAIMIDA) CHO KHU HỆ VIỆT NAM
Ở VƯỜN QUỐC GIA CÚC PHƯƠNG**

Nguyễn Thị Ánh Dương¹, Vũ Thị Thanh Tâm¹, Reyes Peña-Santiago²

⁽¹⁾Viện Sinh thái và Tài nguyên sinh vật, Viện Khoa học và Công nghệ Việt Nam

⁽²⁾Đại học tổng hợp Jaén, Tây Ban Nha

TÓM TẮT

Tuyến trùng sống tự do trong đất họ Leptonchidae là một trong những họ thuộc bộ Dorylaimida ít được biết đến nhất ở Việt Nam, cho đến nay mới chỉ có 1 loài *Thornedia opisthodelphic* Jairajpuri, 1968 được phát

hiện từ vườn quốc gia Cúc Phương. Bài báo này ghi nhận thêm 2 loài tuyến trùng cho khu hệ Việt Nam là *Proleptonchus aestivus* Lordello, 1955 và *Tyleptus projectus* Thorne, 1939.

Loài *Proleptonchus aestivus* Lordello, 1955 có kích thước cơ thể $L = 1,14-1,21$ mm; vùng môi nhô cao hình mũ với các môi hợp lại với nhau. Odontostyle rất mảnh mai với lumen rõ ràng, có chiều dài gấp 10-12 lần chiều rộng. Thực quản có 2 phần tách biệt khá rõ ràng. Con cái có hệ sinh sản đơn kiểu *mono-prodelphic* với nhánh phía trước phát triển, nhánh phía sau tiêu giảm thành túi tử cung với chiều dài bằng 1,6 lần chiều rộng của cơ thể tại vulva. Đuôi ngắn, mút đuôi tù tròn.

Loài *Tyleptus projectus* Thorne, 1939 có kích thước cơ thể trung bình, $L = 0,8-0,95$ mm, vùng môi hơi tách biệt với đường viền cơ thể và có 6 phần phụ nhô cao quanh miệng. Odontostyle ngắn, lumen rõ ràng. Thực quản có 2 phần tách biệt khá rõ ràng với phần phía sau hình quả lê, có chiều dài tương đương với chiều rộng của cơ thể tại vị trí thực quản. Con cái có hệ sinh sản đơn kiểu *mono-opisthodelphic* với nhánh phía sau phát triển. Con đực có 2 nhánh sinh sản phát triển đều nhau. Đuôi ngắn với mút đuôi tù tròn.

Từ khóa: Dorylaimida, Leptonchidae, ghi nhận mới, tuyến trùng, Cúc Phương, Việt Nam.

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