

# A New Species of the Genus *Pithemera* (Oligochaeta: Megascolecidae) from Namat NBCA, Laos

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## ABSTRACT

As a result of a taxonomic study on the earthworm material collected from Namat National Biodiversity Conservation Area (NBCA), Hoaphane Province, Laos, a new species, *Pithemera viengthongensis* sp. nov. is described from near Namchong river, Viengthong district. The new species bearing two pairs of spermathecal pores in 7/8, 8/9 is not assignable to any other species of *Pithemera* as defined by Sims and Easton (1972). In the new species, the male pore region has kidney-shaped pads extending between XVII-19/20, the male pores and spermathecal pores are 0.31 circumference apart, and genital papillae are lacking. The ventral view of anterior body region and the spermathecae are illustrated.

**Key words:** Earthworms, Oligochaeta, Megascolecidae, *Pithemera*, Namat NBCA, Laos, taxonomy

## INTRODUCTION

*Pheretima*-complex species having the intestinal caeca (um) originating in or near segment XXII have been assigned to the genus *Pithemera* by Sims and Easton (1972). They also defined four species groups within *Pithemera*, one of which, the *bicineta* group, contains the type species *Pithemera bicincta* (Perrier, 1875). *Pithemera bicincta* group has the first spermathecal pores in 4/5, species in the *pacifica*-group have the first spermathecal pores in 5/6, and species in the *sedgewicki*-group have a single intestinal caecum. Kobayashi described *Pheretima sempoensis* with intestinal caeca originating in XXIV and three pairs of spermathecal pores in 5/6-7/8 (Kobayashi, 1938). It has been later removed to the genus *Pithemera*. In this paper, we report a new *Pithemera* species does not belong to any group in Sims and Easton (1972).

Most Laos earthworm species of the family Megascolecidae belong to the genus *Amyntas*. They are abundant in the litter layers and soils in forests (Thai and Samphon, 1988, 1989, 1990a, b, 1991a, b). However, no one has recorded the genus *Pithemera* in Laos, not even the widespread peregrine Asian species, *Pithemera bicincta*. The Namat National Biodiversity Conservation Area (NBCA) is one of the important protected areas in Laos. Mountains reach 2275 meters elevation. Over 90% of its land area is covered by an

evergreen and mossy forest. Namat NBCA was a high priority site for our Laos earthworm project.

Specimens were collected from July to September 2004. Material was found from litter and soil layers in forests by digging and hand sorting. The type material is deposited in the Biology of Department, Faculty of Science, National University of Laos, Vientiane (BDNUL).

## SYSTEMATIC ACCOUNTS

Family Megascolecidae Rosa, 1891

Genus *Pithemera* Sims and Easton, 1972

*Pithemera viengthongensis* Hong and James sp. nov.  
(Fig. 1A, B)

*Type material.* Holotype: Clitellate specimen (BDNUL 0007): Laos, Hoaphane province, Namat NBCA, Viengthong district, Namchong river (20° 19.400'N, 103° 21.973'E), 960 m, litter layers and soils, 28 July 2004, Y. Hong and K. Inkhavilay colls.

*Etymology.* The species is named for its type locality.

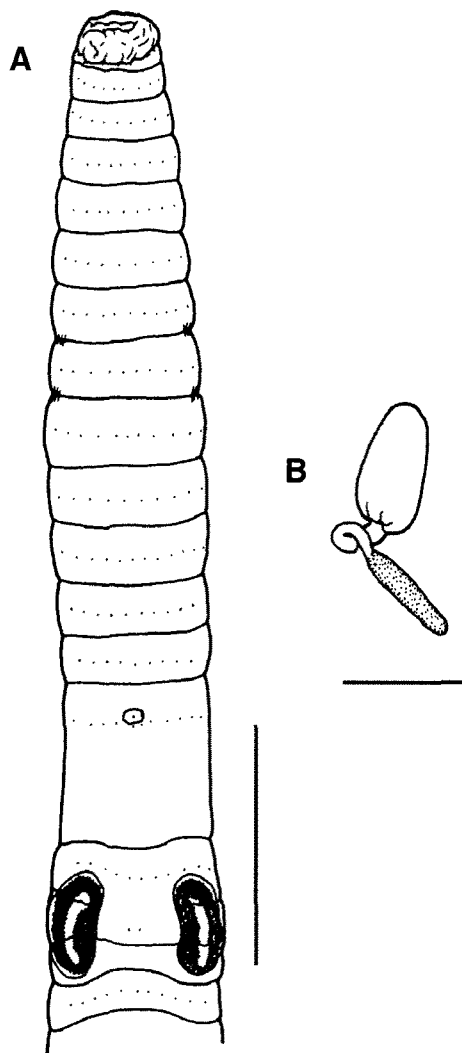
*Diagnosis.* Spermathecal pores two pairs deep in furrows 7/8, 8/9; male and spermathecal pores 0.31 circumference apart; male pores at lateral margins within 0.6 × 1.0 mm kidney-shaped pads extending between XVII-19/20, genital papillae lacking.

*Description.* Dimensions 39 mm long by 2.7 mm at segment X, 2.6 mm at segment XXX, 2.9 mm at clitellum; body cylin-

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**Fig. 1.** *Pithemera viengthongensis* sp. nov. A, ventral view; B, spermathecae. Scale bars=2.5 mm (A), 1 mm (B).

drical throughout, segments 67. Setae regularly distributed around segmental equators numbering 37 at VII, 29 at XX, 2 between male pore, setal formula AA : AB : ZZ : YZ=3 : 3 : 2 at XIII. Female pore single in XIV on 0.3 mm oval. Prostomium epilobic with tongue open. Unpigmented. First dorsal pore at 12/13. Clitellum annular XIV-XVI; setae invisible externally.

Male pores at lateral margins of ventrum in XVIII at 6<sup>th</sup> setal line within 0.6 × 1.0 mm kidney-shaped pads extending between XVII-19/20, convex laterally; anterior, posterior thirds of pads slightly demarcated from central section with male pore, male pores 0.31 circumference apart; 2.0 mm between male pores. Spermathecal pores two pairs deep in furrows 7/8-8/9 at 8<sup>th</sup> setal line, spermathecal pores 0.31 circumference apart; 2.6 mm between spermathecal pores. Genital markings lacking.

Septa 5/6-7/8 thick, 8/9 only some muscle fiber, 9/10 ab-

sent, 10/11-12/13 slightly muscular. Gizzard globular within VIII-IX. Intestine begins in XVII, lymph glands not found. Typhlosole large fold from XXIII. Intestinal caeca simple, originating in about XXII-XXIII, extending anteriorly about to XVII, long finger-shaped sac. Hearts in X-XIII. Male sexual system holandric, testes in X-XI; sacs X dorsally joined, ventrally separate, sacs XI annular, funnels lack iridescence. Seminal vesicle two pairs, small arcs in XI-XII. Prostates in XVIII, with small angular gland within XVII-XVIII; duct proximal 1/3 slender, distal 2/3 C-shaped, muscular, copulatory pouches absent. Genital papillae glands not found.

Ovaries in XIII. Pairs of spermathecae in VIII, IX each ampulla ovate, smooth surface, duct short, thick, no nephridia on spermathecal ducts, diverticulum stalk long and slender, chamber chili-shaped; diverticulum larger than ampulla, chamber filled with white non-iridescent material. Genital marking glands not found.

*Remarks.* *Pithemera viengthongensis* sp. nov. is unique among its congeners by having the spermathecal pores in 7/8 and 8/9. The kidney-shaped pads extending between XVII-19/20 of the male pore region are also very peculiar, and resemble those of some *Amyntas* species. The *bicincta* group (*sensu* Sims and Easton, 1972) is composed of species with spermathecal pores in 4/5-8/9. This includes *P. bicincta* (Perrier, 1875) and *P. violacea* (Beddard, 1895). However, several oligochaetologists stated that *P. violacea* is a junior synonym of *P. bicincta* (Michaelsen, 1910; Ohfuchi, 1957; Shen and Tsai, 2002). Shen and Tsai added one species *bicincta* group, *P. lanyuensis* from Lanyu Island, Taiwan (2002). James et al. (2004) also recorded one species of the *P. bicincta* group from Mt. Arayat, Luzon Island, Philippines, *P. rotunda* (Table 1).

*Pithemera* from two montane locations of Luzon, Philippines, *Pithemera* sp. 1 from Kalbaryo and *Pithemera* sp. 2 from Banaue (Hong and James, unpublished data) are also unlike *Pithemera viengthongensis* sp. nov. Both species have paired intestinal caeca in XXII and first spermathecal pores in 4/5 and are tentatively assigned to the *bicincta* group regardless of the number of spermathecae. *Pithemera* sp. 2 has three pairs of spermathecal pores in 4/5-6/7, and *Pithemera* sp. 1 has four pairs of spermathecal pores in 4/5-7/8.

*Pithemera viengthongensis* sp. nov. is well outside of the previously known natural distribution of *Pithemera*, which appears to be mainly the northern islands of the Philippines. Peregrine species are found throughout the South Pacific and elsewhere (Gates, 1972; Sims and Easton, 1972). Several Papuan species (the *sedgewicki* group) are probably better placed in another genus.

*Pithemera viengthongensis* sp. nov. would be the only *Pithemera* with hearts in XIII and caeca extending through

**Table 1.** Comparison of species of the genus *Pithemera*

	<i>Pithemera</i> <i>viengthongensis</i> sp. nov.	<i>rotunda</i> James & Hong, 2004	<i>lanyuensis</i> Shen & Tsai, 2002	<i>sempoensis</i> (Kobayashi, 1938)	<i>bicincta</i> (Perrier, 1875)
Length (mm)	39	31-44	37-46	94-98	40-80
Pigment	unpigmented	unpigmented	?	?	?
Setae VII, XX	37, 29	49-54, 48-61	52-57, 46-52	56-61, 50-62	42, 46
Male pore setae	2	9	9-12	12-15	?
Spermathecal pore	7/8, 8/9	4/5-8/9	4/5-8/9	5/6-7/8	4/5-8/9
Spermathecal pore spacing	0.31	?	0.25-0.23	?	0.26
Intestinal origin	XVII	XV	XV	XV	?
Typhlosole	+	+	+	?	?
Thecal segm	VIII-IX	V-IX	V-IX	VI-VIII	V-IX
Septa 8/9/10	+, -	-, +	-, +	-, -	?
Hearts	X-XIII	X-XII	X-XI	X-XIII	X-XII
Male porephore	kidney	circular	round or oval	oval-disc	conical
GM shape, location	absent	circular, XVIII-XXII	round, XX	absent	absent
Locality	Laos	Philippines	Taiwan	Korea	Philippines

\*Septal presence: +, Septal absent: -

\*\*Missing data: ?

several segments, but we place the species provisionally in *Pithemera*. *Pithemera viengthongensis* sp. nov. has the caeca farther forward than *P. sempoensis*, so we reserve judgement until further data can be obtained. These characters are more like *Amyntas*, but we place the species provisionally in *Pithemera*. Additional data, such as DNA sequence information, could test this placement vs. placement in *Amyntas*.

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