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Three new earthworm species of the genus *Polypheretima* Michaelsen, 1934 (Oligochaeta: Megascolecidae) from Vietnam

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Abstract

The paper provides descriptions of three new species of the earthworm genus *Polypheretima* Michaelsen, 1934 from Dong Nai Province, South Vietnam. They are named *Po. cattienensis* sp. nov., *Po. militium* sp. nov., and *Po. cordata* sp. nov.. All three species are characterized by spermathecal pores in 5/6/7 and the absence of genital markings. *Po. cattienensis* sp. nov. is distinguished by paired spermathecal pores and seven spermathecae per porus. *Po. militium* sp. nov. is diagnosed by paired spermathecal pores and a variable number of spermathecae, 21–40 altogether, with 7–17 in 5/6 and 11–23 in 6/7. *Po. cordata* sp. nov. is recognized by one pair of spermathecal pores in 5/6 and two in 6/7, by only one spermatheca per porus, and by a heart-shaped spermathecal ampulla.

Key words: Clitellata, Megascolecidae, *Polypheretima*, earthworms, new species, Dong Nai, Vietnam

Introduction

Polypheretima Michaelsen, 1934 was firstly established as a subgenus of the genus *Pheretima* (Michaelsen 1934) and later elevated to genus rank (Easton 1979). *Polypheretima* is distinguished from other genera within the family Megascolecidae by the absence of intestinal caeca, intestinal gizzards and a creeping sole; it has a cylindrical body, male pores on circular porophores, no crescentic genital markings, small spermathecal pores and simple spermathecal diverticula (Easton 1979).

To date, forty-three *Polypheretima* species have been described, but only two of them, *Polypheretima elongata* (Perrier, 1872) and *P. taprobanae* (Beddard, 1892), are common species (Blakemore 2007). All other species are narrowly and strictly found in New Guinea, Indonesia, Philippines and Vietnam (Easton 1979; Blakemore 2007).

In Vietnam, the genus *Polypheretima* has been recorded with ten species, *Polypheretima annamensis* (Stephenson, 1931), *Po. colonensis* (Thai, 1996), *Po. elongata* (Perrier, 1872), *Po. grandisetosa* (Thai, 1996), *Po. kyhaensis* (Thai, 1996), *Po. mekongmontis* Nguyen, Tran & Nguyen, 2014, *Po. parataprobanae* (Thai & Nguyen, 1993), *Po. spiridonovi* (Thai, 1996), *Po. taprobanae* (Beddard, 1892), and *Po. touranensis* (Michaelsen, 1934) (Stephenson 1931; Michaelsen 1934b; Nguyen 1993; Thai 1996, 2000; Nguyen *et al.* 2014). The number of species is expected to be higher due to Vietnam's location in the tropical region and a lack of intensive surveys in this country. This paper contributes to the better understanding of the earthworm fauna of Vietnam with descriptions of three new species.

TABLE 2. Marker characters for Vietnamese *Polypheretima* species (GMM=genital markings in male region; GMS=genital markings in spermathecal region; + = present; - = absent)

Species	First dorsal pore	Spermathecal pores	Spermathecae type	GMM	GMS	Male organ system	Copulatory pouches	Intestinal origin	Last hearts
<i>Po. annamensis</i>	12/13	6/7	Bithecal	+	-	Holandric	+	xv	xiii
<i>Po. colonensis</i>	11/12	5/6/7	Bithecal	-	-	Metandric	-	xvii	xiii
<i>Po. grandisetosa</i>	11/12	5/6/7	Bithecal	-	-	Metandric	-	xvii	xiii
<i>Po. kyhaensis</i>	11/12	5/6/7/8/9	Bithecal	+	+	Holandric	-	xv	xii
<i>Po. parataprobanae</i>	12/13	7/8	Bithecal	-	+	Holandric	-	xvi	?
<i>Po. taprobanae</i>	12/13	7/8	Bithecal	+	+	Holandric	-	xv	xii
<i>Po. touranensis</i>	12/13	7/8/9	Bithecal	+	-	Holandric	-	?	?
<i>Po. spiridonovi</i>	12/13	4/5/6/7	Polythecal	-	-	Holandric	-	xv	xii
<i>Po. elongata</i>	12/13	5/6/7	Polythecal	+	-	Holandric	+	xv	xiii
<i>Po. mekongmontis</i>	12/13	4/5/6/7	Polythecal	+	-	Holandric	+	xv or xvi	xii
<i>Po. cattienensis</i>	12/13	5/6/7	Polythecal	-	-	Holandric	+	xv	xiii
<i>Po. militium</i>	12/13	5/6/7	Polythecal	-	-	Holandric	+	xv	xiii
<i>Po. cordata</i>	12/13	5/6/7	Intermediate	-	-	Holandric	+	xv	xiii

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