RAFFLES BULLETIN OF ZOOLOGY **63**: 461–470
Date of publication: 16 October 2015
http://zoobank.org/urn:lsid:zoobank.org:pub:F029FB37-EE0C-44D1-B6CD-D078E7536E47

On the polythecate earthworms of the genus *Metaphire* (Oligochaeta: Megascolecidae) from Vietnam, with descriptions of three new species

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Abstract. The paper deals with the polythecate earthworms of the genus *Metaphire* Sims & Easton, 1972 from Vietnam. A total of four species is recorded from Vietnam including three new species, namely *M. kiengiangensis*, new species, from Kien Giang province, *M. dorsomultitheca*, new species, from An Giang province, and *M. mangophiloides*, new species, from Dong Nai province. *M. kiengiangensis* is recognised by large size, spermathecal pores ventral in intersegments 6/7/8/9 and two pairs of genital markings in 17/18 and 18/19. *M. dorsomultitheca* is diagnosed by small size, spermathecal pores located dorsally in intersegments 7/8/9, and two pairs of genital markings present, but hiding inside copulatory pouches. *M. mangophiloides* is distinguished by medium size, spermathecal pores lateroventral in intersegment 5/6, and the absence of genital markings in both spermathecal and male regions.

Key words. Oligochaeta, Megascolecidae, *Metaphire*, earthworms, new species, Vietnam

INTRODUCTION

The earthworm genus *Metaphire* was proposed by Sims & Easton (1972) for the pheretimoid species characterised with having intestinal caeca from xxvii and copulatory pouches, but no micronephridia on spermathecal ducts (Sims & Easton, 1972). Approximately 180 nominal species of the genus have been described from East Asia southward to Indo-Australia and throughout Oceania (Blakemore, 2002).

Among *Metaphire* species, normally spermathecae are paired in each thecal segment, rarely single or numerous (Sims & Easton, 1972). At present, only three species have been known with multiple spermathecae in each thecal segment: *Metaphire bitheca* (Kobayashi, 1936) from Korea; *M. multitheca* (Chen, 1938) from China (Hainan Island); and *M. dipapillata* (Thai et Tran, 1986) from Vietnam (Kobayashi, 1936; Chen, 1938; Thai & Tran, 1986; Nguyen & Nguyen, 2015). This paper describes three new polythecate species and adds more information on this group of earthworms.

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ISSN 2345-7600 (electronic) | ISSN 0217-2445 (print)

MATERIAL AND METHODS

Fresh specimens were collected from southern Vietnam in Dong Nai, Kien Giang and An Giang provinces. The worms were killed in formalin 2%, transferred to formalin 4% for fixation for approximately 24 hours, and then transferred to new 4% formalin for long-term preservation and morphological studies.

Holotype and paratypes of new species described are deposited in the Laboratory of Zoology, Cantho University (= CTU), Cantho City, Vietnam.

Abbreviations: C = Clitellate specimen/specimens, e.g., 5C = 5 clitellate specimens.

TAXONOMY

Genus *Metaphire* Sims & Easton, 1972

Metaphire Sims & Easton, 1972

Type species. *Rhodopis javanica* Kinberg, 1867, by monotypy

Distribution. The genus is widely distributed in the Oriental region, from Japan through the Indo- Australasian archipelago to the rain forests of Australasia eastwards through Oceania (Sims & Easton, 1972).

Metaphire kiengiangensis Nguyen & Trinh, new species
(Fig. 1, Tables 1, 3)

Examined material. Holotype: 1C (CTU.EW019–h01), plantation of *Hopea* and other trees, Lai Son Island, Kien Hai District, Kien Giang Province, Vietnam (09°48'21.6 N;

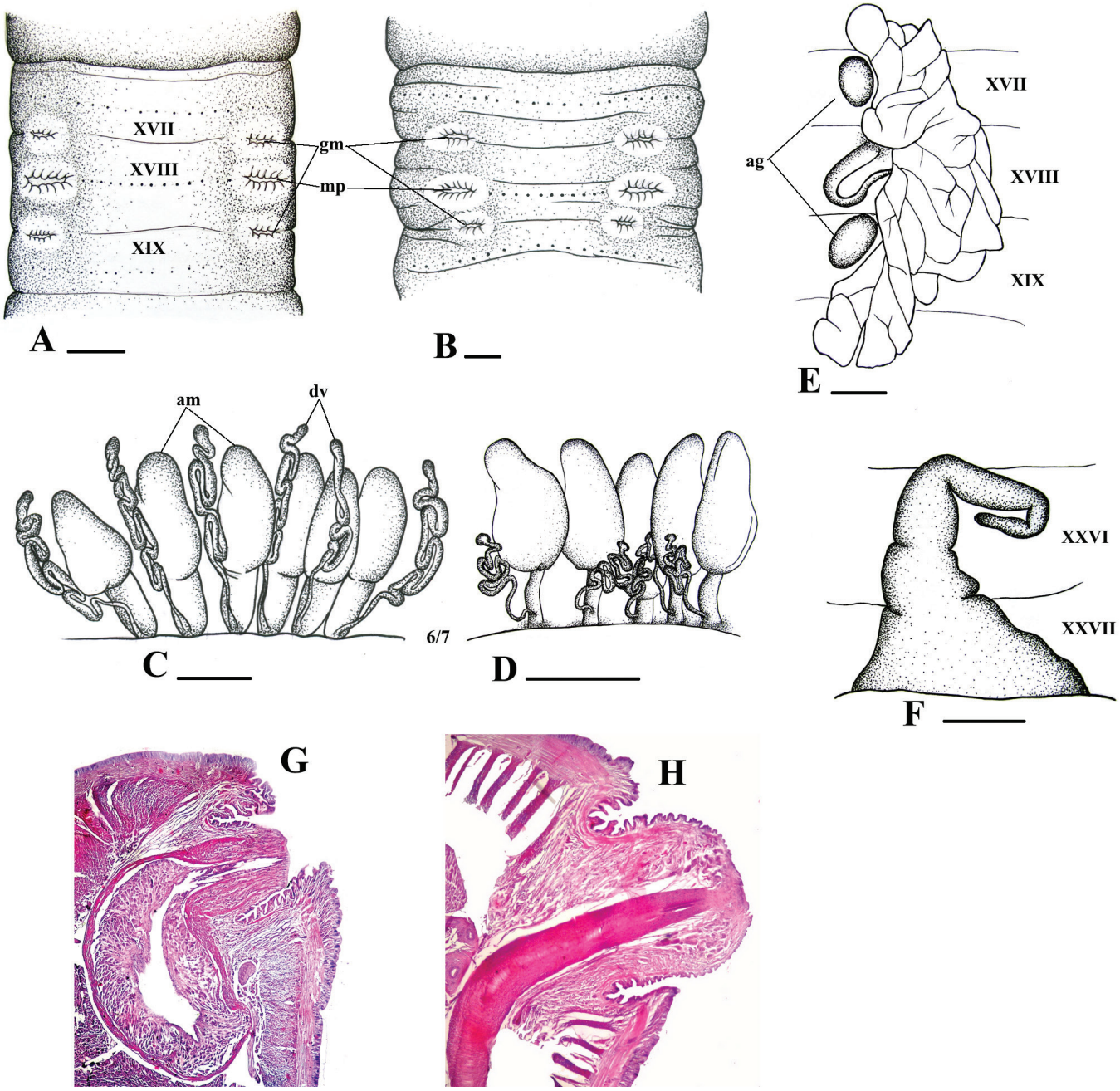

Fig. 1. *Metaphire kiengiangensis*, new species, holotype and specimen 13 (CTU.EW019-p04). A, B, male pore region (mp = male pore; gm = genital markings): A, mainland population; and B, island population; C, D, spermathecae, left side (am = ampulla; dv = diverticula): C, mainland population; and D, island population; E, prostate gland (ag = accessory gland); F, intestinal caeca; G, H, transverse body section of segment xviii: G, male pore; and H, accessory glands. Scale bars = 1mm.

104°38'01.1 E), elevation of 81 m a.s.l., 15 November 2013, coll. Trinh Thi Kim Binh. Paratypes: 10C (CTU.EW019–p02) same data as for holotype; 3C (CTU.EW019–p03) fruit tree garden, on the way to Bang Beach, Lai Son Island, Kien Hai District, Kien Giang Province, Vietnam (09°48'32.4 N; 104°39'23.0 E), 14 October 2014, coll. Trinh Thi Kim Binh.

Further material. 13C (CTU.EW019–p04) mango garden, Hon Dat Mountain, Hon Dat District, Kien Giang Province, Vietnam (10°06'37.6 N; 104°53'06.2 E), 13 November 2010, coll. Nguyen Thanh Tung.

Diagnosis. Large-size worm, length 176–280 mm, diameter 6.3–8.1 mm. Setae perichaetine; pre-clitellar setae stouter and sparser than post-clitellar setae; setae distance aa = ab, zz = zy. First dorsal pore in 12/13. Multiple spermathecal pores ventral in intersegments 6/7/8/9. Two pairs of genital markings in intersegments 17/18 and 18/19. Holandric. Intestinal caeca simple. Septa 8/9/10 absent.

Etymology. "*kiengiangensis*" after the name of province where type material was found.

Description. External characters: Body cylindrical, large size; length 176–280 mm, diameter 6.3–8.1 mm, weight 6.0–19.3 g. Dorsum darkish grey, but ventrum paler; body generally greenish shining, especially for living specimens.

Table 1. Number of spermathecae in the type series of *Metaphire kiengiangensis*, new species.

Preservation code	Material examined	Position	Left	Right	Total
CTU.EW019–h01	Holotype	6/7	6	6	12
		7/8	6	6	12
		8/9	7	6	13
CTU.EW019–p02	Paratype 1	6/7	5	7	12
		7/8	6	6	12
		8/9	6	8	14
	Paratype 2	6/7	4	4	8
		7/8	6	6	12
		8/9	6	6	12
	Paratype 3	6/7	7	7	14
		7/8	9	9	18
		8/9	7	7	14
	Paratype 4	6/7	6	5	11
		7/8	7	5	12
		8/9	7	7	14
	Paratype 5	6/7	5	6	11
		7/8	6	7	13
		8/9	5	6	11
	Paratype 6	6/7	5	6	11
		7/8	6	6	12
		8/9	6	7	13
	Paratype 7	6/7	5	5	10
		7/8	8	7	15
		8/9	7	7	14
	Paratype 8	6/7	4	4	8
		7/8	7	9	16
		8/9	9	7	16
	Paratype 9	6/7	5	5	10
		7/8	7	6	13
		8/9	8	7	15
	Paratype 10	6/7	4	5	9
		7/8	5	5	10
		8/9	6	5	11
CTU.EW019–p03	Paratype 11	6/7	5	8	13
		7/8	6	7	13
		8/9	7	8	15
	Paratype 12	6/7	5	7	12
		7/8	7	8	15
		8/9	8	6	14
	Paratype 13	6/7	5	4	9
		7/8	6	7	13
		8/9	5	6	11

Table 1...Contiuned

Preservation code	Material examined	Position	Left	Right	Total
CTU.EW019–p04	Specimen 1	6/7	3	4	7
		7/8	8	10	18
		8/9	10	8	18
	Specimen 2	6/7	7	7	14
		7/8	7	9	16
		8/9	10	10	20
	Specimen 3	6/7	6	6	12
		7/8	8	9	17
		8/9	11	9	17
	Specimen 4	6/7	6	6	12
		7/8	7	9	16
		8/9	10	10	20
	Specimen 5	6/7	6	7	13
		7/8	11	10	21
		8/9	11	9	20
	Specimen 6	6/7	4	5	9
		7/8	7	9	16
		8/9	8	8	16
	Specimen 7	6/7	7	9	16
		7/8	8	10	18
		8/9	9	9	18
	Specimen 8	6/7	5	4	9
		7/8	10	9	19
		8/9	12	10	22
	Specimen 9	6/7	7	7	14
		7/8	10	10	20
		8/9	10	10	20
	Specimen 10	6/7	7	?	?
		7/8	11	9	20
		8/9	12	10	22
	Specimen 11	6/7	6	6	12
		7/8	9	10	19
		8/9	8	9	17
	Specimen 12	6/7	6	6	12
		7/8	8	8	16
		8/9	11	9	20
	Specimen 13	6/7	5	5	10
		7/8	9	9	18
		8/9	10	9	19

Prostomium 2/3 epilobous. First dorsal pore in 12/13. Setae perichaetine; pre-clitellar setae stouter and sparser than post-clitellar setae, 31–39 in v, 42–53 in viii, 81–88 in xxv, 72–88 in xxx, 10–18 between male porophores in xviii; setal distance aa = ab, zz = zy. Clitellum annular, xiv–xvi, greyish brown, smooth and without setae and dorsal pores. Female pore single, mid-ventral in xiv.

Spermathecal pores round and small, multiple, ventral in intersegments 6/7/8/9. No genital markings in spermathecal region.

Male pores deeply located inside copulatory pouches in xviii; ventral distance between male porophores about 0.3× body circumference. Two pairs of genital markings present in intersegments 17/18 and 18/19; anterior pair in 17/18 in front of male pores, posterior pair in 18/19 slightly medial to male pores.

Internal characters: Septa 6/7/8 thickened, 8/9/10 absent, 10/11 thin, and 11/12/13 slightly thickened. Oesophageal gizzard within viii–x. Intestinal origin at xv or xvi; caeca simple, within xxvii–xxvi. Last hearts in xiii. Pharyngeal micronephridia developed in 4/5 and well developed in

5/6. Lymph glands present from xv. Typhlosole simple, lamelliform.

Spemathecae variable, 30–46 altogether in intrasegmental 6/7/8/9: 8–14 in 6/7, 10–18 in 7/8 and 11–16 in 8/9 (Table 1). Spermathecal ampulla subcylindrical; duct about 1/3 ampulla in length. Diverticula irregularly sinusoidal, folded onto itself several times, longer than ampulla; duct attached to base of ampulla. No accessory glands.

Holandric. Testis sacs not separated. Seminal vesicles well developed within xi–xii. Oviduct on septum 12/13 posteriorly; ovaries not visible. Prostate glands racemose, paired in xv–xx; prostatic ducts U-shaped, slightly getting smaller distally. Two pairs of accessory glands present, highly elevated towards body coelom, and being covered with thick muscle layer.

Habitat and ecology. All specimens of this new species collected in October and November were adults and having clitellum. No adult specimens have been found in the other months of the year. The species was found in light-clay soils, especially in mango gardens in mountain.

Remarks. Only two populations have been found in Kien Giang province, one in mainland mountains of Hon Dat District, the other in Lai Son island of Kien Hai District. Both populations have same stable characters, such as prostomium 2/3 epilobous, first dorsal pore in 12/13, multiple spermathecal pores in 6/7/8/9, presence of copulatory pouches, two pairs of genital markings in 17/18 and 18/19, intestinal caeca simple, and holandric. The first population (n=13) differs from the second (n=14) in shorter (95–160 mm vs 176–280 mm in length; 4.7–5.6 mm vs 6.3–8.1 mm in diameter), lighter (1.7–3.3 g vs 6.0–19.3 g), clitellum (incomplete xiv–2/3xvi vs complete xiv–xvi). The mainland population has 43–54 spermathecae: 7–16 in 6/7, 16–21 in 7/8, 16–22 in 8/9; ampulla mango-shaped, diverticula shorter than ampulla and directly attached to duct of ampulla. On the contrary, the island population has 30–46 spermathecae: 8–14 in 6/7, 10–18 in 7/8, 11–16 in 8/9; ampulla cylindrical; diverticula longer than ampulla and directly attached to base of ampulla.

The new species obviously belongs to the *multitheca*-group containing only two species, *Metaphire multitheca* (Chen, 1938) and *M. dipapillata* (Thai et Tran, 1986). The species shares with two species multiple spermathecal pores per segment. *M. multitheca* (Chen, 1938) differs from the new species in having two pairs of genital markings in front of and behind male porophores in xviii, multiple spermathecal pores on posterior border of segments vi, vii and viii. *M. dipapillata* (Thai et Tran, 1986) differs from the new species in having four thecal segments, multiple spermathecal pores in intersegments 5/6/7/8/9, and having a pair of round genital markings in intersegment 17/18. Marker characters of three species are presented in Table 3.

Metaphire dorsomultitheca Nguyen & Nguyen, new species

(Fig. 2, Tables 2, 3)

Examined material. Holotype: 1C (CTU.EW025–h01) natural forest, Sam Mountain (10°40’06.8 N; 105°04’50.2 E), Chau Doc District, An Giang Province, Vietnam, 06 November 2010, coll. Nguyen Thanh Tung. Paratypes: 8C (CTU.EW025–p02) same data as for holotype.

Table 2. Number of spermathecae in the type series of *Metaphire dorsomultitheca*, new species

Preservation code	Material examined	Position	Left	Right	Total
CTU.EW025–h01	Holotype	7/8	9	10	19
		8/9	12	12	24
CTU.EW025–p02	Paratype 1	7/8	17	14	31
		8/9	19	12	31
	Paratype 2	7/8	16	11	27
		8/9	17	20	37
	Paratype 3	7/8	10	11	21
		8/9	17	17	34
	Paratype 4	7/8	15	13	28
		8/9	17	20	37
	Paratype 5	7/8	9	11	20
		8/9	12	12	24
	Paratype 6	7/8	11	10	21
		8/9	16	15	31
	Paratype 7	7/8	15	14	29
		8/9	19	13	32
	Paratype 8	7/8	16	11	27
		8/9	15	18	33

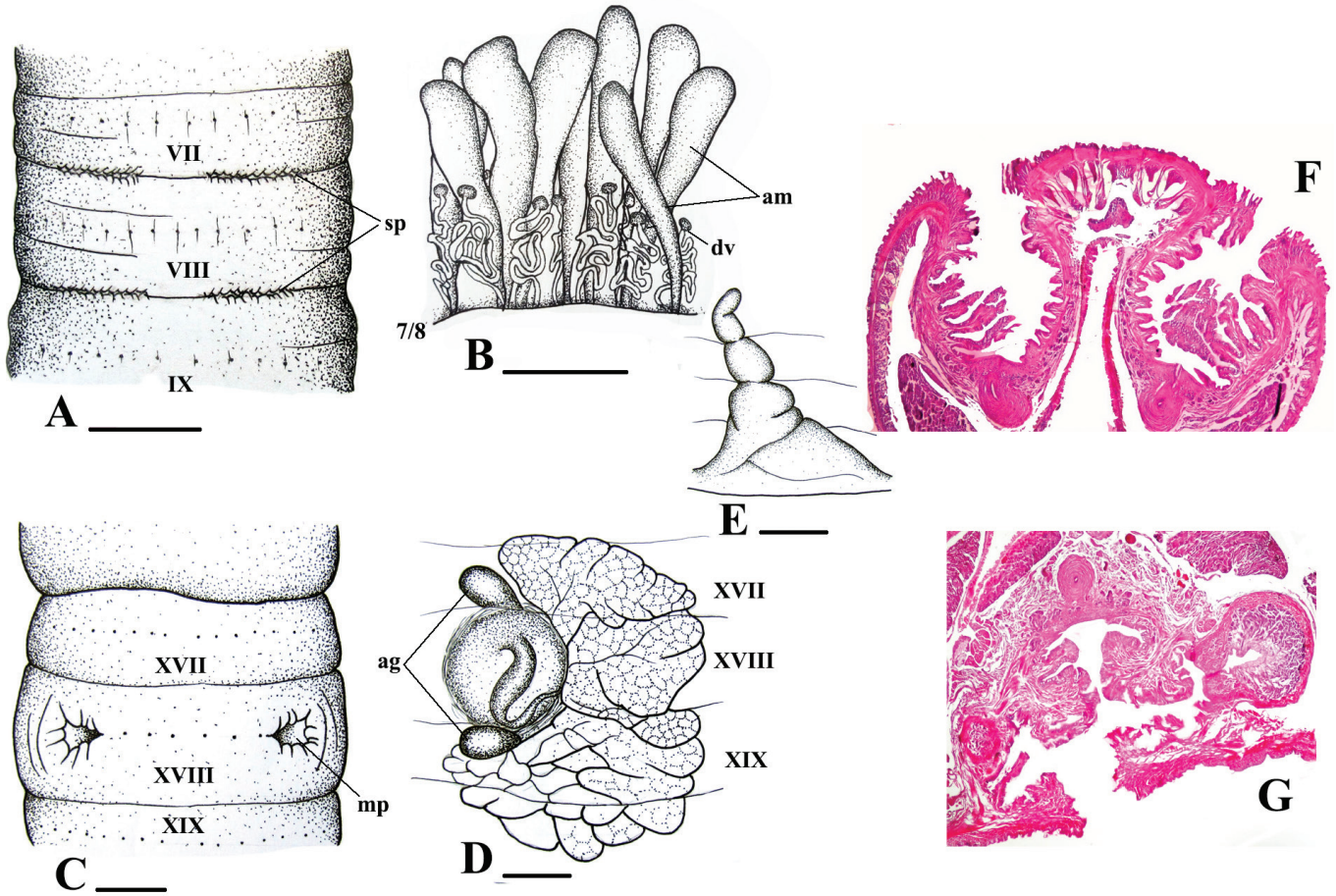

Fig. 2. *Metaphire dorsomultitheca*, new species, holotype. A, spermathecal region (sp = spermathecal pores); B, spermathecae, left side (am = ampulla; dv = diverticula); C, male pore region (mp = male pore); D, Prostate gland (ag = accessory gland); E, intestinal caeca; F, G, transverse body section of segment xviii: F, accessory glands; and G, male pore. Scale bars = 1mm.

Further material. 3C (CTU.EW025–p03) natural forest, To Mountain (10°23'09.2 N; 105°00'22.8 E), Tri Ton District, An Giang Province, Vietnam, 09 November 2010, coll. Nguyen Thanh Tung.

Diagnosis. Body small, length 76–111 mm, diameter 2.9–3.6 mm. Setae perichaetine; pre-clitellar setae sparser than post-clitellar setae; setae distance aa = 1.3–2.0 ab, zz = 1.2–1.6 zy. First dorsal pore in 12/13. Multiple spermathecal pores dorsal in intersegments 7/8/9. Two pairs of genital markings present, but hiding inside copulatory pouches. Holandric. Intestinal caeca simple. Septa 8/9/10 absent.

Etymology. "*dorsomultitheca*" a noun in apposition to emphasize multiple spermathecal pores on dorsum.

Description. External characters: Body cylindrical, small size; length 76–111 mm, diameter 2.9–3.6 mm, segments 88–120, weight 0.43–0.54 g. Body uniformly greyish brown except clitellum darkish brown. Setae perichaetine; pre-clitellar setae sparser than post-clitellar setae, 29–32 in v, 33–40 in viii, 45–51 in xxv, 39–50 in xxx, 6–8 between male porophores in xviii; setal distance aa = 1.3–2.0 ab, zz = 1.2–1.6 zy. Prostomium 2/3 epilobous. First dorsal pore in 12/13. Clitellum annular, xiv–xvi, smooth and without setae and dorsal pores. Female pore single, mid-ventral in xiv. Spermathecal pores tiny, multiple, dorsal in intersegments 7/8/9. No genital markings in spermathecal region.

Male pores deeply located inside copulatory pouches in xviii; ventral distance between male porophores about 0.3× body circumference. Two pairs of genital markings present, but invisible due to hiding inside copulatory pouches.

Internal characters: Septa 6/7/8 thickened, 8/9/10 absent, and 10/11/12/13 thin. Oesophageal gizzard within viii–x. Intestinal origin at xv; caeca simple, within xxvii–xxiv. Last hearts in xiii. Pharyngeal micronephridia in 4/5/6, but well developed in 5/6. Lymph glands present from xv. Typhlosole simple, lamelliform.

Spemathecae variable, about 41–65 altogether in intrasegmental 7/8/9: 19–31 in 7/8 and 24–37 in 8/9 (Table 2). Spermathecal ampulla cylindrical, but enlarged distally. Diverticula waved, shorter than ampulla; distal part with an opalescent, oval-shaped chamber; duct attached to base of ampulla. No accessory glands.

Holandric. Testis sacs not separated. Seminal vesicles well developed within xi–xii. Oviduct on septum 12/13 posteriorly; ovaries not visible. Prostate glands racemose, paired in xvii–xx; prostatic ducts U-shaped, slightly getting smaller

distally, opening into large chambers. Two accessory glands present, highly elevated towards body coelom, and being covered with thick muscle layer.

Habitat and ecology. A total of nine specimens was collected in a mountainous area of the Cuu Long River Delta: Sam mountain and To mountain in An Giang Province. The species was found in sandy soils or light-clay soils with small rocks in environs of low humidity.

Like *Metaphire kiengiangensis*, adult specimens of this new species were only collected in November in rainy season.

Remarks. The new species shares with *Metaphire kiengiangensis*, new species, *M. multitheca* (Chen, 1938), and *M. bitheca* (Kobayashi, 1936) by having multiple spermathecae. It differs clearly from all three species in dorsally located spermathecal pores whereas the other three species have ventral or lateroventral spermathecal pores (Table 3). The new species is distinguished from *M. kiengiangensis* by genital markings hiding inside copulatory pouches in male region, two thecal segments; ampulla without ducts; septa 11/12/13 thin. *M. multitheca* (Chen, 1938) differs from new species in having two pairs of genital markings in front of and behind male porophores in xviii, multiple spermathecal pores on posterior border of segments vi, vii and viii. *M. bitheca* (Kobayashi, 1936) is distinguished from new species by absence of genital markings in both spermathecal and male regions, two grouped pairs of spermathecal pores on anterior vi and vii with each group consisting of 2+2 pores, large, oval, disc-shaped male porophores, and short, cylindrical spermathecal diverticula.

***Metaphire mangophiloides* Nguyen & Le, new species**
(Fig. 3, Table 3)

Examined material. Holotype: 1C (CTU.EW082–h01) *Acacia* plantation, Thien Tam community, Vinh Cuu District, Dong Nai Province, Vietnam (11°15'54.7" N; 107°03'52.7" E), 13 September 2012, coll. Duong Chi Trong. Paratype: 1C (CTU.EW082–p01) same data as for holotype.

Diagnosis. Worm medium-size, length 70–74 mm, diameter 5.25–5.31 mm. Number of setae higher in pre-clitellar than post-clitellar region; setae distance aa = 1.2 ab, zz = 1.3 yz. First dorsal pore in 12/13. Multiple spermathecal pores lateroventral in intersegment 5/6. No genital markings in both spermathecal and male regions. Holandric. Intestinal caeca manicate. Septa 8/9/10 absent.

Etymology. Named to emphasise its similarity with the species *Metaphire mangophila* (Nguyen, 2011).

Description. External characters: Body cylindrical, medium size; length 70–74 mm, diameter 5.25–5.31 mm, segments 71–78, weight 0.94–1.28 g. Body greyish brown dorsally and paler ventrally. Number of setae higher in pre-clitellar than post-clitellar region, 68–69 in v, 62–70 in viii, 60–63 in xxv, 56–62 in xxx, 17–20 between male porophores in

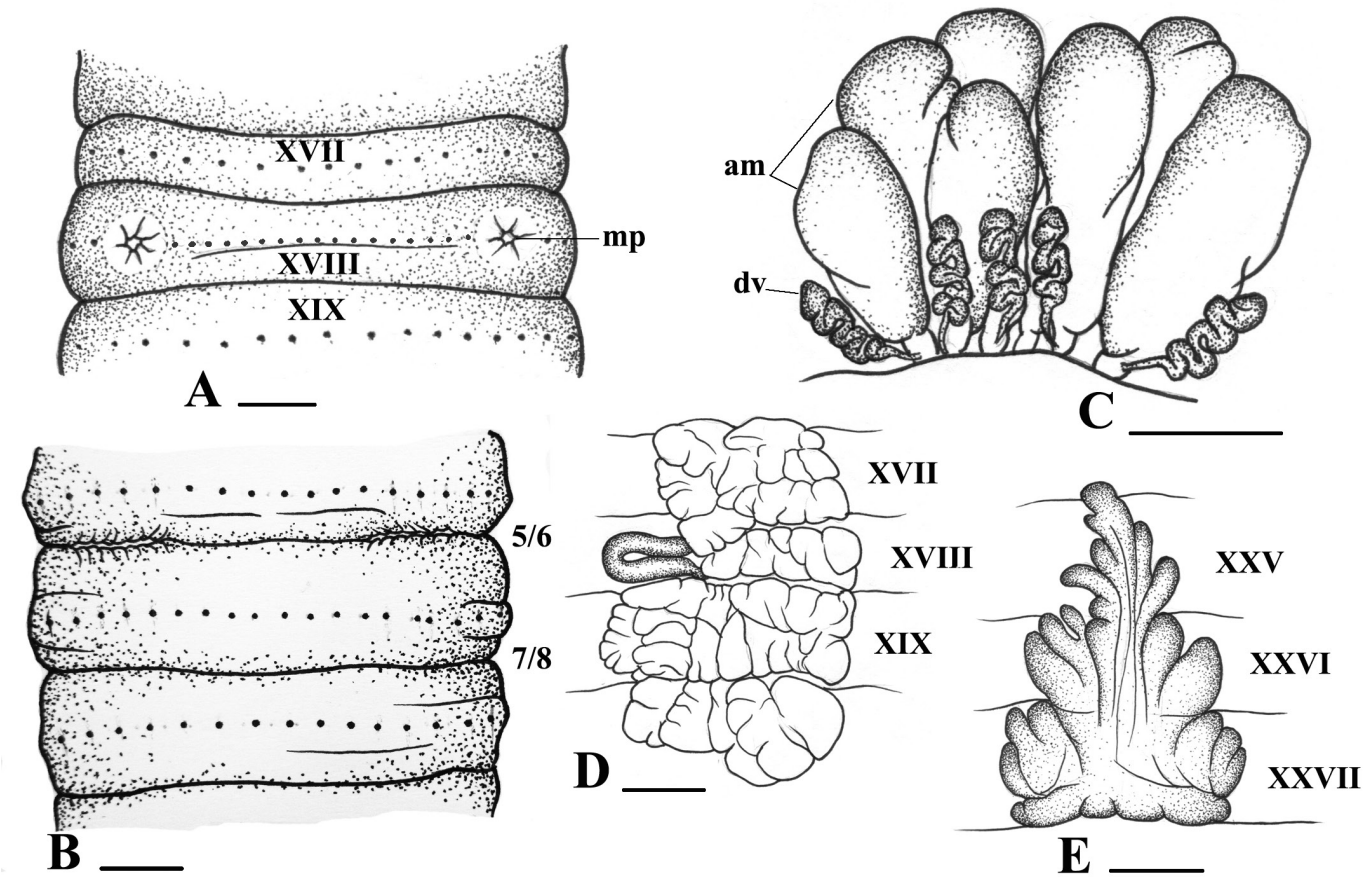

Fig. 3. *Metaphire magnophiloides*, new species, holotype. A, male pore region (mp = male pore); B, spermathecal region; C, spermathecae, right side (am = ampulla; dv = diverticula); D, prostate gland; E, intestinal caeca. Scale bars = 1 mm.

Table 3. Marker characters of six polythecate *Metaphire* species, *M. dipapillata*, *M. multitheca*, *M. bitheca*, *M. kiengiangensis*, *M. dorsomultitheca*, *M. mangophiloides*. (GM = Genital markings)

No.	Characters	*M. kiengiangensis*	*M. dorsomultitheca*	*M. mangophiloides*	*M. bitheca*	*M. dipapillata*	*M. multitheca*
1	Length (mm)	176–280	76–111	70–74	85–98	115–180	155
2	Diameter (mm)	6.3–9.1	2.9–3.6	5.25–5.31	5–6.5	5–7	7
3	Weight (g)	6.0–19.3	0.43-0.54	0.94–1.28	–	4.2–7.0	–
4	Segments	?	88–120	71–78	104–114	103–124	95
5	Setae between male porophores	10–18	6–8	17–20	14	10–11	4
6	Coloration	Dorsum darkish grey, ventrum paler	greyish brown	Dorsum greyish brown, ventrum paler	Dorsum reddish brown	Dorsum whitish grey, ventrum paler	Dorsum darkish grey, ventrum paler
	Clitellum	xiv–xvi	xiv–xvi	xiv–xvi	xiv–xvi	xiv–xvi	xiv–xvi
7	Prostomium	2/3 epilobous	2/3 epilobous	1/3 epilobous	1/2 epilobous	epilobous	1/3 epilobous
8	First dorsal pore	12/13	12/13	12/13	12/13	11/12	12/13
9	Spermathecal pores	Multiple in 6/7/8/9	Multiple, dorsal in 7/8/9	Multiple in 5/6	Two grouped pairs in vi, vii	Multiple in 5/6/7/8/9	Multiple in vi, vii, viii
10	GM in spermathecal region	Absent	Absent	Absent	Absent	Absent	Absent
11	GM in male region	Two pairs in 17/18 and 18/19	Two pairs present, but invisible	Absent	Absent	A pair in 17/18	Two pairs in xviii
12	Copulatory pouches	Present	Present	Present	Present	Present	Present
13	Spermathecae	30–46	41–65	12–17	8	30–40	30–32
14	Male sexual system	Holandric	Holandric	Holandric	Holandric	Holandric	Holandric
15	Pharyngeal micronephridia	4/5/6	4/5/6	5/6/7	–	5/6/7/8	5/6/7
16	Septa 8/9/10	Absent	Absent	Absent	Absent	Absent	Absent
17	Intestinal caeca	Simple	Simple	Manicate	Manicate	Simple	Simple

xviii; setae distance aa = 1.2 ab, zz = 1.3 yz. Prostomium 1/3 epilobous. First dorsal pore in 12/13. Clitellum annular, xiv-xvi, smooth, without setae and dorsal pores. Female pore single, mid-ventral in xiv.

Spermathecal pores tiny, multiple, lateroventral in intersegments 5/6.

Male pores deeply located inside copulatory pouches in xviii; ventral distance between male porophores about 0.3× body circumference. Copulatory pouches having small, O-shaped openings. No genital markings in both spermathecal and male regions.

Internal characters: Septa 5/6/7/8 thickened, 8/9/10 absent. Oesophageal gizzard within viii–x. Intestinal origin at xv; caeca manicate, within xxvii–xxv. Last hearts in xiii. Pharyngeal micronephridia in 5/6/7. Lymph glands absent. Typhlosole simple, lamelliform.

Fifteen spermathecae in intrasegmental 5/6: 6–8 on the left side and 7–9 on the right side. Ampulla opalescent, subcylindrical, but slightly enlarged distally; duct extremely short, about 1/10 of ampulla length. Diverticula waved and short, about 1/3 ampulla, attached directly to ampulla duct. Accessory glands absent in spermathecal region.

Holandric. Testis sacs not separated. Seminal vesicles well developed within xi–xii, opalescent. Oviduct on septum 12/13 ventrally; a pair of small ovaries in xiii. Prostate glands large, racemose, paired in xvii–xx; prostatic ducts U-shaped. Accessory glands absent.

Habitat and ecology. The new species was found in *Acacia* tree plantation in Thien Tam commune, Vinh Cuu District, Dong Nai Province. All specimens were collected from soil surface, just under leaf litter at the end of the rainy season.

Remarks. This new species is fairly similar to *M. mangophila* (Nguyen, 2011) and *M. bitheca* (Kobayashi, 1936) in the following characters: genital makings absent in both spermathecal and male regions, intestinal caeca manicate. However, *M. mangophiloides* has multiple spermathecal pores in intersegment 5/6, pharyngeal micronephridia not water-drop shaped, ampulla duct extremely short (1/10 ampulla length) whereas *M. mangophila* (Nguyen, 2011) has two pairs of spermathecal pores in 5/6/7, two spermathecae in each thecal segment, pharyngeal micronephridia water-drop shaped, ampulla duct relatively long (=1/3 ampulla length). *M. bitheca* is distinguished from new species by two grouped pairs of spermathecal pores on anterior vi and vii with each group consisting of 2+2 pores, large, oval, disc-shaped male porophores, and short, cylindrical spermathecal diverticula (Kobayashi, 1936).

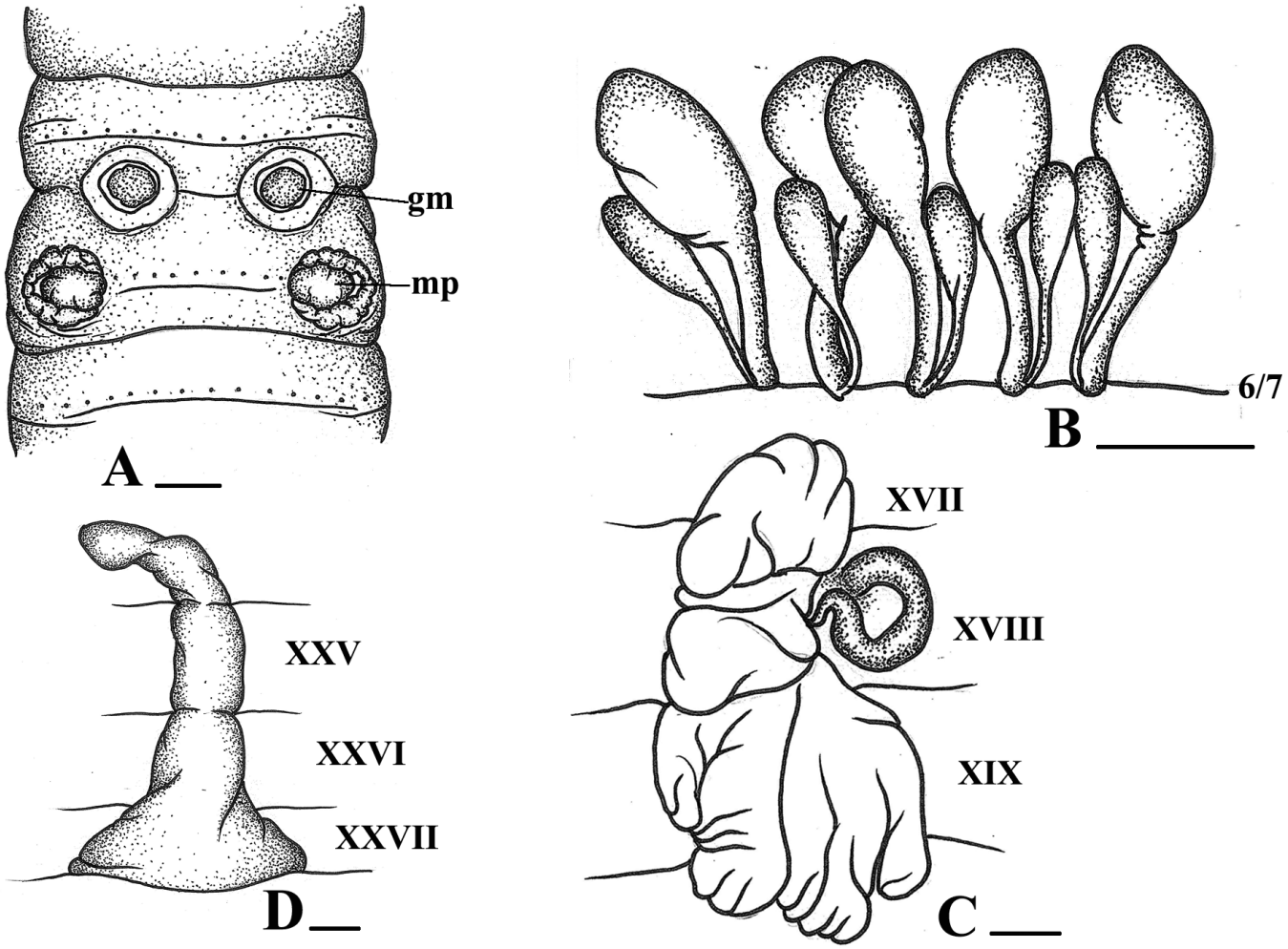

Fig. 4. *Metaphire dipapillata* (Thai et Tran, 1986). A, male pore region (mp = male pore; gm = genital markings); B, spermathecae, right side (am = ampulla; dv = diverticula); C, prostate gland; D, intestinal caeca. Scale bars = 1 mm.

***Metaphire dipapillata* (Thai et Tran, 1986)**
(Fig. 4, Table 3)

Pheretima multitheca dipapillata Thai et Tran, 1986: 9, fig. 3C.
Metaphire multitheca dipapillata – Blakemore, 2007: 68, "*species inquirenda*".
Metaphire dipapillata – Nguyen & Nguyen, 2015: 132.

Type locality. Vietnam (Nghe An: Ky Son).

Examined material. 5C (SORC-PV.70.01) Muong Long, Ky Son, Nghe An, 1/1/1986, coll. Tran Ba Cu.

Diagnosis. First dorsal pore in 11/12. Four thecal segments, multiple spermathecal pores in intersegments 5/6/7/8/9. Male pores located inside highly elevated copulatory pouches in xviii. A pair of round genital markings in intersegment 17/18. Intestinal origin at xvi, caeca simple from xxvii. Septa 8/9/10 absent.

Remarks. The species was originally described as subspecies *Pheretima multitheca dipapillata* Thai et Tran, 1986. Blakemore (2007) allocated it to the genus *Metaphire* but listed it as "*species inquirenda*" without explanation. However, the species is clearly different from *Metaphire multitheca* (Chen, 1938) in having a pair of genital markings in 17/18, multiple spermathecal pores in 5/6/7/8/9 and first dorsal pore in 11/12. *Metaphire multitheca* (Chen, 1938) has two pairs of genital markings in front of and behind male porophores in xviii, multiple spermathecal pores on posterior border of segments vi, vii and viii, and first dorsal pore in 12/13 (Table 3). As a result, the species has been raised to full rank and assigned to the genus *Metaphire* (Nguyen & Nguyen, 2015).

CONCLUSION

Although about nominal 180 species of the genus *Metaphire* have been reported (Blakemore, 2002), only few species are polythecate. To date, six species, *Metaphire multitheca* (Chen, 1938), *M. bitheca* (Kobayashi, 1936), *M. dipapillata* (Thai et Tran, 1986), *M. kiengiangensis*, *M. dorsomultitheca*, and *M. mangophiloides*, have been described. Almost all known species are found in Vietnam, except *M. multitheca* originally known from Hainan Island and *M. bitheca* only known from Korea.

ACKNOWLEDGEMENTS

We would like to thank Mr. Nguyen Hai Quan, a lecturer in Hue University of Agriculture and Forestry for kindly providing the paper published by Dr. Kobayashi in 1936. Two anonymous reviewers are thanked for their invaluable comments and suggestions to improve the paper.

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