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Earthworms from Mt. Jiri, Korea

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智異山 陸棲貧毛類의 分類學的 硏究

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摘 要

著者들은 1969년 7월 智異山에서 採集된 지렁이 총 500 個體를 調査 整理한 결과 *Pheretima agrestis*, *Ph. hilgendorfi*, *Ph. koreana* 및 *Ph. soulensis*의 4 기지종과 미기록종 *Ph. megascolidioides*, 신종 *Ph. jiriensis* 등 도합 1屬 6種을 얻었다.

신종 *Ph. jiriensis*는 체장 153mm., 체폭 8mm., 체절수 103개 이며, spermathecal pore는 2雙으로 6/7, 7/8에 위치한다. 본종은 *Ph. koreana* Kobayashi와 비슷하나 체장이 훨씬 길고 (150 : 100), 체폭도 굵으며, 항상 2雙의 spermathecal pore를 가지는 점 및 내부의 intestinal caecum의 모양과 typhlosole이 잘 발달하지 않은 점 등으로 뚜렷이 구분된다. 미기록종 *Ph. megascolidioides*는 지금까지 일본에서만 알려진 종으로 체장 200—235mm., 체폭 10—11mm., 체절수 117—121 개이며 spermathecal pore는 5雙으로 4/5—8/9에 있다. 한국산으로서 spermathecal pore를 5雙 가진 것은 처음이다. 본종은 우리나라의 남부지역에서 주로 채집된다.

INTRODUCTION

This article presents the results of a preliminary study of the earthworms that have been collected from Mt. Jiri, Kyungsang-namdo, during July of 1969.

The material comprises five hundred specimens. All of the worms obtained belong to genus *Pheretima*, including six species. Among these, two species are unrecorded in Korea, of which one species is new to science.

The type of new species is included in the collection of Kyungpook National University.

The authors' appreciation is extended to Dr. G.E. Gates for his endless help by sending many valuable references, and also we are indebted to Messrs Young Tae An and Un Jin Yang, student of Teacher's College, Kyungpook National University for their devotion to collect the materials.

DESCRIPTION

Fam. ***Megascolecidae***

Gen. ***Pheretima*** Kinberg, 1867

Pheretima megascolidioides (Goto et Hatai, 1899) (Figs. 1—8)

Korean name: Nambang-Jileungi(남방 지렁이)

Perichaeta megascolidioides Goto et Hatai, 1899, pp. 21—22.

Pheretima megascolidioides: Ohfuchi, 1957, p. 1366, fig. No. 3866.

External characteristics: Size, 200—235 by 10—11mm., number of segments 117—121. Prostomium epilobous.

The setae, present from ii; 37/iii, 50/v, 55/viii, 57/xii, 77/xx. The first dorsal pore, at 12/13. Clitellum is annular, extends from 13/14 to 16/17, dorsal pores and intersegmental furrows lacking.

Female pore median and slightly pre-equatorial, on xiv. Male pores present in xix, separated by 10—11 setae.

Spermathecal pores minute, 5 pairs in 4/5—8/9, externally invisible.

Genital markings are paired, postsetal, close to the posterior borders of the segment, and are located as follows:

No. of specimen.	1		2		3	
Segment.	L	R	L	R	L	R
xvii	*	-	*	*	*	*
xviii	*	*	*	-	*	*
xx	*	*	*	*	*	*
xxi	*	*	*	-	-	*
xxiii	*	-	-	-	-	-

Asterisk(*) indicates the presence of G.M. Hyphen(-) indicates the absence of G.M.

Color in formalin, blackish brown dorsally; ventrally, lighter than the former; and clitellum dark red.

Internal anatomy: Septa 4/5—8/9, 10/11—12/13 are very much thickened; 9/10 lacking. The intestine begins in xv. Intestinal caeca are simple, large with 13/14 finger-shaped protuberances on ventral margins.

Typhlosole, simply lameliform, ending in region of seventy-third segment.

Heart of x is asymmetrical, hearts of xi-xiii are as usual. Paired lymph glands found behind thirtieth segment caudalwards.

Testis sac of x is paired, v-shaped and ventral; the sac of xi is paired, reaching up to the level of the dorsal face of the gut. The seminal vesicles of xi are small, included within the testis sac imbedded in testicular coagulum. Vesicles of xii are small-sized.

Prostates extend through xviii-xx, small compared with large body size, consist of two or three main lobes, each divided into small lobes. The prostatic duct bent into a question mark-shaped loop with muscular sheen, and nearly equal thickness all its part.

Spermathecae, 5 pairs in v, vi, vii, viii and ix; ampulla elongated oval or peach-shaped with a slightly pointed apex. The spermathecal duct is almost equal to the ampulla or slightly longer than the latter in length, and also distinctly marked off from the latter. Diverticulum tubular and convoluted, as long as the main portion or sometimes longer than the latter.

Specimens examined: Mt. Jiri (3 clitellate specimens, 22~26-vii-1969, Y.T. An & Y.J. Yang)

Distribution: Korea, Japan.

Pheretima jiriensis n. sp.

(Figs. 9—17)

Korean name: Jirisan-Jilcungi(지리산 지렁이)

External characteristics: Holotype; size, 153 by 8mm, number of segments 103. Variation of paratypes are as follows; Based on 50 clitellate specimens, average listed first and the range of all follows; length, 152mm., 110—165mm.; diameter, 7mm., 6—9mm.; number of segments, 101, 90—105.

Prostomium epilobous. The setae begin on ii; 40/iii, 52/v, 65/viii, 72/xii, and 63/xx; between male pore setae are 22; spermathecal pore setae 22(vi), 22(vii) and 24(viii). The first dorsal pore, at 12/13.

Clitellum entire in xiv-xvi; dorsal pores and intersegmental furrows lacking.

Female pore median, on xiv. Male pores present in ventrolateral side of xviii, less than 1/2 of the circumference ventrally apart. Both ventrolateral side of xviii are protuberant in general appearance; its posterior and anterior margins quite close to the intersegmental furrows; the male disc is elevated and formed epidermal invagination; on the center opened the male pore which is small and circular. One pair of genital marking are found in xviii segment, presetal, just close to the setal line and medially to the male pore; circular with slight central depression, and are equal to spermathecal genital markings in size.

Spermathecal pores minute, superficial, at or just behind 6/7, 7/8 and less than 1/2 circumference ventrally apart. Genital markings, small tubercles, two pairs and presetal in vii and viii, respectively, of which one is just behind to each pore, and the other is median to each spermathecal pore. Sometimes, in addition these one or more genital markings are found in this region.

Color in formalin light reddish brown dorsally; ventrally, lighter than the former; clitellum reddish brown.

Internal anatomy: No septa especially thickened, 8/9, 9/10 lacking. Gizzard in viii, ix. Intestinal origin in xv. Intestinal caeca originating in xxvii, complicated; each consisting of 5—7 finger-shaped secondary caeca, of which the dorsalmost is shorter as compared with secondary caeca in most cases, and dorsally but proximally with several serriformed outgrowths. Typhlosole is a low simple lamella, begins in region of xxvii and is unrecognizable behind thirty-seventh segment.

Heart of x is asymmetrical, hearts of xi-xiii are normal, small in calibre. Paired lymph glands present from xv segment posteriorly.

Testis sacs paired in x and xi. The first pair is forming a v-shaped sac and the second pair is a transverse sac. Seminal vesicles large, two pairs in xi and xii. Pseudovesicles small, one pair, and on posterior face of 12/13. Prostates are large in xvi-xx; consist of two or three main lobes, each divides into small lobes. Prostatic duct bent into a u-shaped loop or hair-pin shaped loop with muscular sheen. Ectal limb thicker than ental limb. The stalks of the genital marking glands of xviii pass into the parietes just median to the prostatic duct.

Spermathecae are two pairs in vii and viii; ampullae are filled with a flocculent material, somewhat round or peach-shaped; duct is moderate in thickness and nearly equal or shorter than the ampulla in length, from which it is sharply demarcated. Di-

verticulum a little longer than the main portion; the ectal portion is very slender, longer than ampulla duct, slightly coiled and is joining the latter near body wall; the ental portion is swollen to form sausage-like seminal chamber which is filled with a tough white coagulum. Two pairs of genital marking glands are sessile on the parietes in vii and viii, respectively, of which one is associated with each spermathecae, and the other opens through the discrete tubercle.

Specimens examined: Holotype; Mt. Jiri, (1 clitellate specimen, 22~26-vii—1969, Y.T. An), Paratypes; Mt. Jiri, (73 clitellate specimens, 22~26-vii—1969, Y.T. An & Y.J. Yang.)

Diagnosis: Present species closely resembles *Ph. koreana* Kobayashi, 1938. But, this new species differs from the latter with respect to the 1) body size, 2) two pairs of spermathecal pores are always present, 3) shape of male pore region, 4) shape of the intestinal caecum, and 5) paired lymph glands present from 15/16 caudalwards.

Pheretima agrestis(Goto et Hatai, 1899)
Korean name: Batt-Jileungi (밭 지렁이)

Specimens examined: Mt. Jiri,(178 clitellate specimens, 22~26-vii—1969, Y.T. An & Y.J. Yang)

Distribution: Korea, Japan, America.

Pheretima hilgendorfi(Michaelsen, 1892)
Korean name: Oemunni-Jileungi(외두뇌 지렁이)

Specimens examined: Mt. Jiri, (96 clitellate specimens, 22~26-vii—1969, Y.T. An & Y. J. Yang)

Distribution: Korea, Japan, America.

Pheretima koreana Kobayashi, 1938
Korean name: Cham-Jileungi (참 지렁이)

Specimens examined: Mt. Jiri, (7 clitellate specimens, 22~26-vii—1969, Y.T. An & Y. J. Yang)

Distribution: Korea.

Pheretima soulensis Kobayashi, 1938
Korean name: Seoul-Jileungi (서울 지렁이)

Specimens examined: Mt. Jiri,(142 clitellate specimens, 22~26-vii—1969, Y.T. An & Y. J. Yang)

Distribution: Korea.

REFERENCES

Chen, Y., 1933. A Preliminary Survey of the Earthworms of the lower Yangtze Valley. *Contr. Biol. Lab. Sci. Soc. China, Zool.* **9**(6) : 177—269.

Gates, G.E., 1943. On Some American and Oriental Earthworms. *Ohio Jour. Sci.* **43** (3) : 99—116.

——1957. Earthworms. *Nat. Hist. Rennell Isl., British Solomon Isl., Copenhagen.* **2** : 7—23.

——1958. On Some Species of Oriental Earthworms Genus Pheretima Kinberg, 1867, with Key to species reported from Americas. *Amer. Mus. Novit.* (1888) : 1—33.

——1960. On Burmese Earthworms of the family Megascolecidae. *Bull. Mus. Comp. Zoology, Harvard Coll.* **123**(6) : 201—282.

Goto, S., and S. Hatai, 1899. New or imperfectly known species of earthworms. *Annot. Zool.* (Jap.) **3**(2) : 13—23.

Kobayashi, S., 1937. Preliminary Survey of the Earthworms of Quelpart Island. *Sci. Rep. Tohoku Imp. Univ. Biol.* **11**(3) : 333—351.

——1938. Earthworms of Korea 1. *Ibid.* **13** (2) : 89—170.

Ohfuchi, S., 1957. Annelida, Oligochaeta, *In* Uchida et. al, Illustrated Encyclopedia of the Fauna of Japan. Tokyo, Hokuryukan, (Jap.) pp. 1352—1369.

Stephenson, J., 1923. Oligochaeta. The Fauna of British India including Ceylon and Burma. London, Taylor & Francis, pp. i-xxiv+1-518.

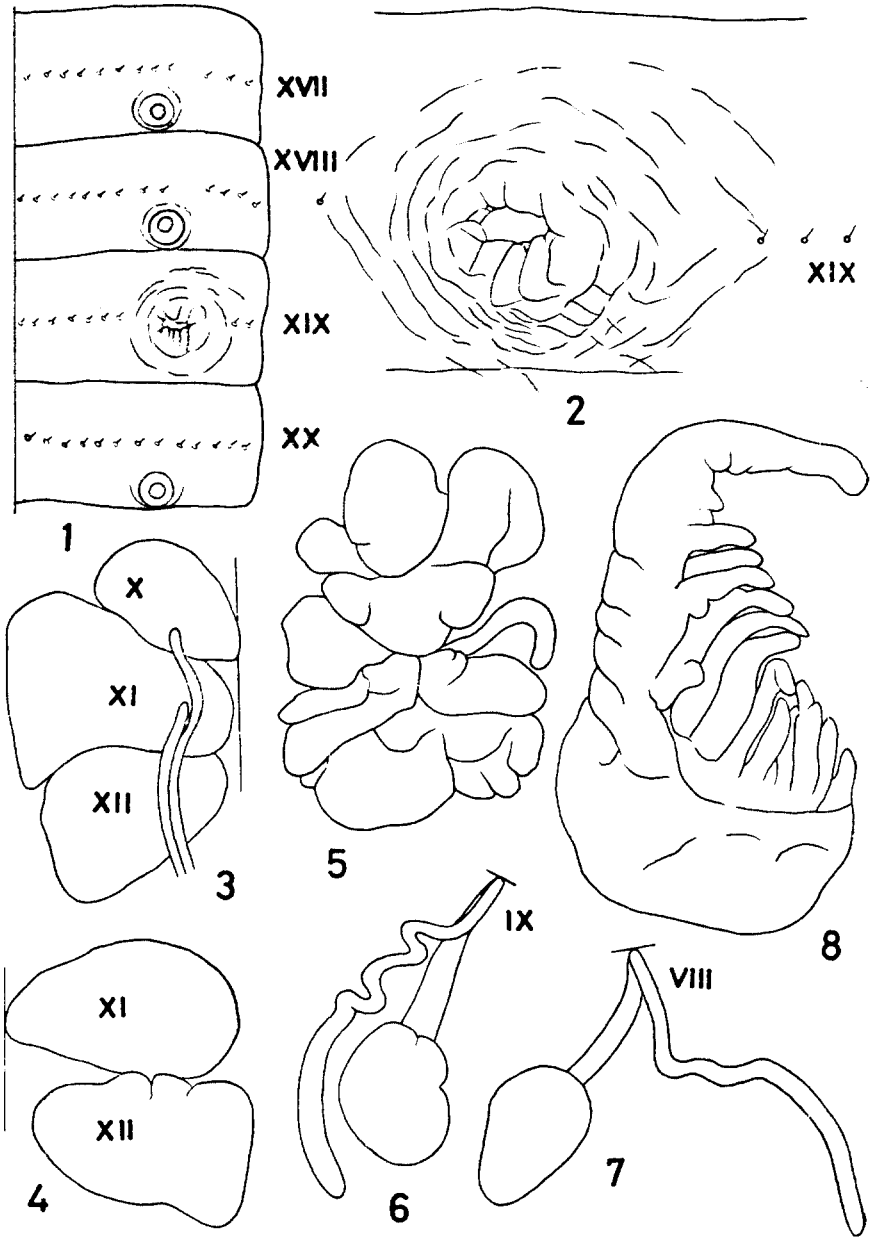
Explanation of Figures

Pheretima megascolidioides (Goto et Hatai, 1899)

1. Ventral view of male pore region (left) of xvii, xviii, xix and xx.
2. Ventrolateral view of male pore region (left).
3. Ventral view of the anterior male organs.
4. Dorsal view of right seminal vesicles.
5. Left prostate gland.
6. Left spermathecae in ix (v).
7. Left spermathecae in viii (iv).
8. Right intestinal caecum.

Pheretima jiriensis n. sp.

9. Ventrolateral view of male pore region (left).
10. Ventral view of male pore region.
11. Lateral view of spermathecal pore region (6/7 and 7/8).
12. Right prostate gland.
13. Dorsal view of seminal vesicles (left).
14. Ventral view of the anterior male organs.
15. Spermathecae with G.M. glands. (left, vii, viii)
16. Spermathecae (left, viii).
17. Left intestinal caecum.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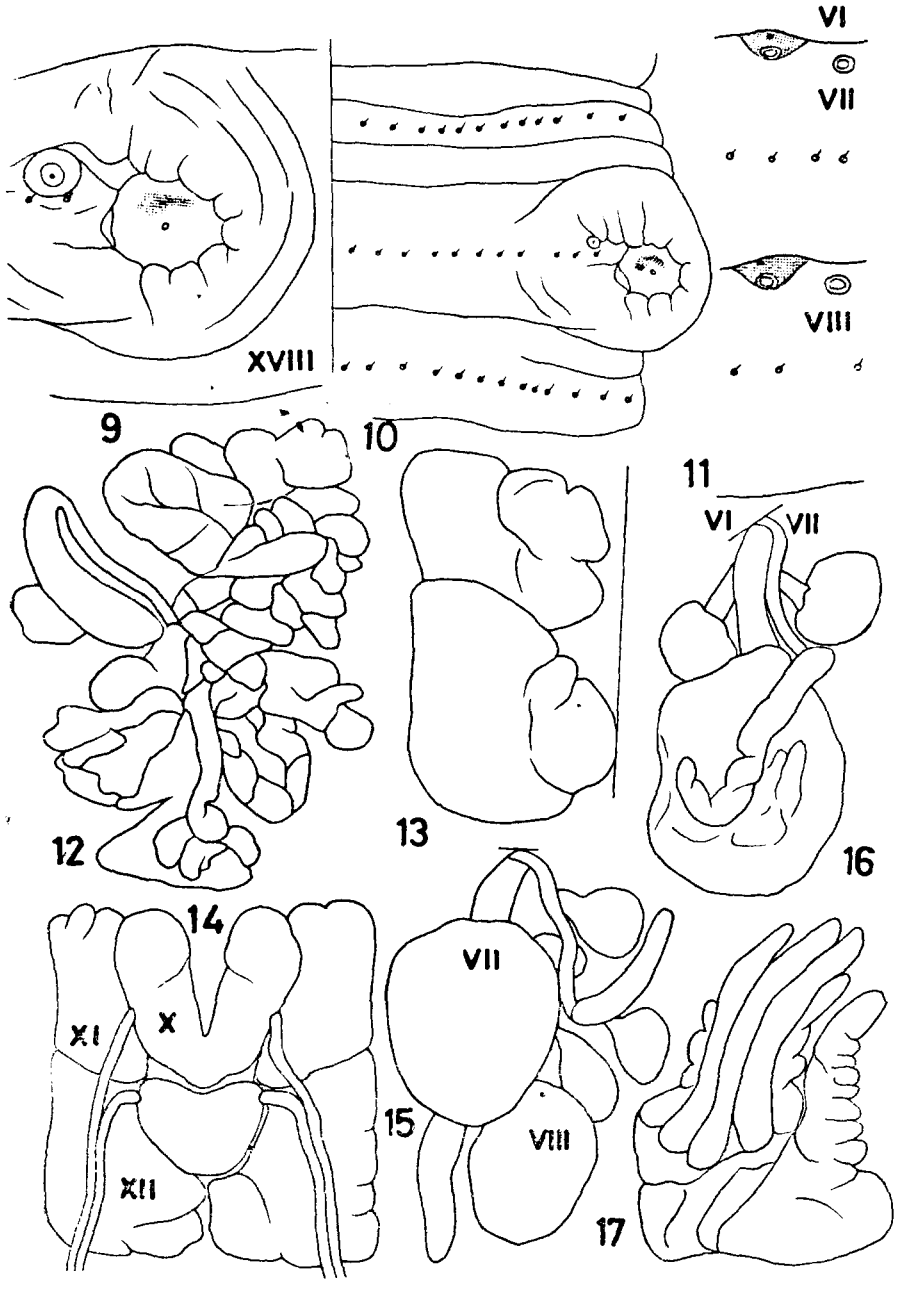
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