A New Record of the Earthworm *Desmogaster sinensis* Gates, 1930 from Matsu

馬祖新紀錄種蚯蚓中華合胃蚓 *Desmogaster sinensis* Gates, 1930

Huei-Ping Shen

沈慧萍

Endemic Species Research Institute, Jiji, Nantou, Taiwan

行政院農業委員會特有生物研究保育中心 55244 南投縣集集鎮民生東路 1 號

Corresponding author: shenhp@tesri.gov.tw

通訊作者：shenhp@tesri.gov.tw

Abstract

This paper describes the moniligastrid earthworm *Desmogaster sinensis* Gates, 1930 as a new record from Matsu. It is a large earthworm without setae, dwelling at low hills in Nangan and Dongju, Matsu. It has been found only in Jiangsu, China; its occurrence in Matsu reported herein constitutes the island as the southernmost range of this species to date.

摘 要

本文描述一採自馬祖南竿及東莒之新紀錄種蚯蚓中華合胃蚓 *Desmogaster sinensis* Gates, 1930。其爲大型蚯蚓，不具剛毛，屬於鏈胃蚓科(Moniligastridae)合胃蚓屬(*Desmogaster*)。此種蚯蚓僅於中國江蘇省有採集紀錄，馬祖爲其第二處發現地。

Key words: *Desmogaster sinensis*, earthworm, Matsu

關鍵詞：中華合胃蚓、蚯蚓、馬祖

Received: October 01, 2012 Accepted: October 30, 2012

收件日期：2012 年 10 月 01 日 接受日期：2012 年 10 月 30 日

Introduction

Desmogaster sinensis Gates, 1930 was first found in April 1930 by Dr. Y. Chen on top of the Tiger Hill in Soochow, Jiangsu Province, China among ancient ruins of mixed soils and pebbles (Chen 1933). In August 1930 it was also found abundantly in both cultivated and hard soils from the foothill of Huishan in Wuhsi, a district near Soochow, Jiangsu (Chen 1933). It was described and published in November 1930 by G. E. Gates based on a single specimen sent by the Biological Supply Service of Soochow University (Gates 1930a; Chen 1933). Except the above two localities, *D. sinensis* has never been found elsewhere in the lower Yangtze Valley (Chen 1933). Gates (1972) considers that the abundant presence of *D. sinensis* in a limited area in and around Soochow warrants successful colonization of this species after introduction by man. Its occurrence in Matsu reported herein constitutes the island as the southernmost range of this species to date.

Currently only ten nominal species have been reported for the genus *Desmogaster*. All of them are found in Southeast Asia except for *D. sinensis* in China. Of these, *Desmogaster doriae* Rosa, 1890, *Desmogaster albalabia* Gates, 1930, *Desmogaster planata* Gates, 1931, and *Desmogaster ferina* Gates, 1943 are from Burma (Michaelsen 1900; Gates 1930b, 1931, 1943), *Desmogaster horsti* Beddard, 1893 and *Desmogaster schildi* Rosa, 1897 are from Sumatra (Michaelsen 1900), and *Desmogaster giardi* Horst, 1899, *Desmogaster büttikoferi* Michaelsen, 1922 and *Desmogaster stephensoni* Michaelsen, 1934 are from Borneo (Michaelsen 1900, 1922, 1934). Except *D. büttikoferi* with a small body size of 35–57 mm long, all the other species are medium to large earthworms with the body lengths ranging from over 100 mm to more than 500 mm. Within this genus *D. sinensis* is the only species having no setae. According to Gates (1972), each species, with the possible exception of *D. sinensis*, is assumed to be endemic in the area where it is now known.

The following description is based on 15 preserved specimens deposited at the Taiwan Endemic Species Research Institute, Jiji, Nantou, Taiwan.

Desmogaster sinensis Gates, 1930

Desmogaster sinensis Gates, 1930a: 590; 1932: 510; 1972: 241. – Chen, 1931: 2; 1933: 180. – Blakemore, 2002: 68.

Materials examined.–Three mature (clitellate) and three immature specimens collected 30 May 2012 near Dapu Stone Inscription (elevation 46 m), Dongju, Matsu by H. P. Chen and T. L. Ai (coll. no. 2012-51); one mature specimen collected 25 June 2012 from Mt. Yuntai (elevation 242 m), Nangan, Matsu by H. P. Chen and W. J. Chih (coll. no. 2012-59); one mature (dissected) and two immature specimens collected 27 June 2012 at Fuzheng Reservoir (elevation 23 m), Dongju, Matsu by H. P. Chen and W. J. Chih (coll. no. 2012-66); one mature specimen (amputated) collected 28 August 2012 from Motianling Path (elevation 142 m) Nangan, Matsu by H. P. Chen and H. H. Huang (coll. no. 2012-115); four immature specimens collected 29 August 2012 near Dapu Stone Inscription (elevation 46 m), Dongju, Matsu by H. P. Chen and H. H. Huang (coll. no. 2012-118).

Description.–Length (clitellates) 113–215 mm, diameter 6.42–9.53 mm. Segment number 279–424. First three segments short, longitudinally wrinkled (Fig. 1A), IV–XX each with at least two annuli. Prostomium prolobous, large, transversely elongate. Dorsal pores absent. Clitellum X–XV, XI–XV or XI–XVI, whiter, indistinct. Setae absent from anterior to posterior segments. Spermathecal pores two pairs, on posterior margin of VII and VIII (Fig. 1A), slightly lateral to male pores. Each pore on top of a spindle-shaped tubercle formed by folding of skin; the tubercle pink in color, conspicuous in mature specimens and smaller, papilla-like in younger specimens. Male pores two pairs in intersegmental furrows of 11/12 and 12/13 (Fig. 1A, B), about 0.24 body circumference ventrally apart. Each pore in center of a large, transverse slit or pouch, visible when lips of pouch widely opened but invisible entirely when closed. Female pores one pair in anterior annulus of XIV (Fig. 1B), inconspicuous, medial to male pores. Live worms with translucent pale skin, iridescent, greasily smooth.

Septa 3/4/5 thin, 5/6–8/9 thickened, 9/10 slightly thinner than preceding ones, and 10/11 to posterior end thin and membraneous. Septa 10/11–13/14 shifted backward due to the formation of ovarian chamber. Gizzards large, three in XIV–XVII, pale, with longitudinal ridges on the surface. Intestine enlarged immediately behind the last gizzard. Dorsal vessel large, bifurcating in segment X. Hearts six pairs in VI–XI. Nephridia holoic.

Spermathecae two pairs in VIII and IX (Fig. 1C). Each ampulla elongated oval-shaped, surface smooth, 1.82–2.53 mm long and 1.05–1.64 mm wide, connected with a long, coiled duct slender at ental half and enlarged toward distal half. Accessory glands absent. Holandric. Testis sacs two pairs in XI and XII, posterior pair about three times larger than the anterior pair. Prostate glands small, round, yellowish, compact, and follicular; two pairs in anterior XII and XIII, 1–2 mm in diameter. Ovarian chambers in XIII–XIV. Ovaries large. A pair of egg sacs in XIV–XV.

Remarks.—According to Chen (1933), *D. sinensis* was often found on low hills whether rich in humus or hard soil, even in cultivated land near hillside. It was a sluggish worm and would not move when left undisturbed during collecting process.

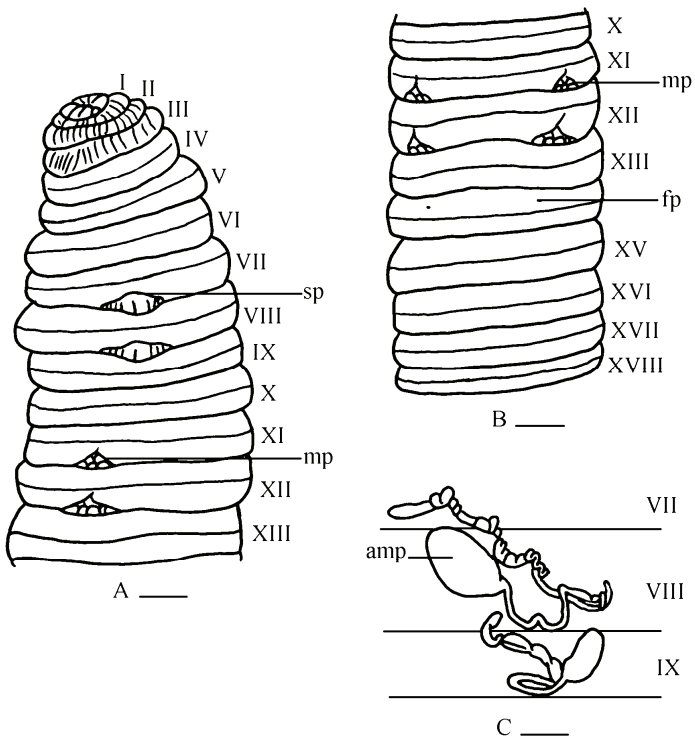

Fig. 1. *Desmogaster sinensis* Gates: A, lateral view of left spermathecal and male pore region (sp, spermathecal tubercle; mp, male porophore); B, ventral view of male pore region (fp, female pore); C, dorsal view of right spermathecae (amp, ampulla); scale bar 1 mm.

Acknowledgements

The author is grateful to Messrs. H. P. Chen, T. L. Ai, W. J. Chih and H. H. Huang who assisted in field collections and specimen preparation.

Literature Cited

Blakemore, R. J. 2002. Cosmopolitan earthworms – an eco-taxonomic guide to the peregrine species of the world. CD-ROM. VermEcology,

Australia.

Chen, Y. 1931. Miscellaneous Notes on Zoölogy, from my collecting trips to Chekiang and Kiangsu Provinces. Wissen und Wissenschaft 11: 1-16.

Chen, Y. 1933. A preliminary survey of the earthworms of the lower Yangtze Valley. Contributions from the Biological Laboratory of the Science Society of China (Zoology) 9: 177-295.

Gates, G. E. 1930a. On a new species of the moniligastrid genus *Desmogaster* from China. Annals and Magazine of Natural History, Series 10, 6: 589-593.

Gates, G. E. 1930b. The earthworms of Burma. I. Records of the Indian Museum 32: 257-356.

Gates, G. E. 1931. The earthworms of Burma. II. Records of the Indian Museum 33: 327-442.

Gates, G. E. 1932. The earthworms of China. Lingnan Science Journal 11: 509-514.

Gates, G. E. 1943. On some American and Oriental earthworms. Part I. The Ohio Journal of Science 43: 87-98.

Gates, G. E. 1972. Burmese earthworms: an introduction to the systematics and biology of megadrile oligochaetes with special reference to Southeast Asia. Transactions of the American Philosophical Society 62: 1-326.

Michaelsen, W. 1900. Oligochaeta. Das Tierreich 10: 1-575.

Michaelsen, W. 1922. Oligochäten aus dem Rijks Museum van Natuurlijke Historie zu Leiden. Capita Zoologica 1: 1-68.

Michaelsen, W. 1934. Oligochaeta from Sarawak. Quarterly Journal of Microscopical Science 77: 1-47.