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## Four new earthworm species of the genus *Amynthas* (Oligochaeta: Megascolecidae) from Kinmen, Taiwan

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### Abstract

Four new species of terrestrial earthworms belonging to the genus *Amynthas* were collected on the islands of Kinmen and Lieyu, Taiwan from March to November, 2008. They are *Amynthas kinmenensis* **sp. nov.**, *Amynthas wuhumontis* **sp. nov.**, *Amynthas wujhouensis* **sp. nov.**, and *Amynthas taiwumontis* **sp. nov.** *Amynthas kinmenensis* **sp. nov.** is quadrithecal and is the most abundant earthworm widely distributed on the main island of Kinmen. It has numerous small genital papillae and is closely related to *Amynthas polyglandularis* (Tsai, 1964) from northern Taiwan. *Amynthas wuhumontis* **sp. nov.** is sixthelcal and is distributed only in areas around Mt. Wuhu and Mt. Taiwu in east Kinmen. It has male pores each surrounded by three genital papillae: one anterior, one posterior and one medial. *Amynthas wujhouensis* **sp. nov.** and *Amynthas taiwumontis* **sp. nov.** are octothelcal. The former has a sporadic distribution in Kinmen while the latter was only found in areas around Mt. Taiwu. *Amynthas wujhouensis* **sp. nov.** has a pair of large genital papillae closely adjacent to the crescent or semicircular shaped male porophores in XVIII. *Amynthas taiwumontis* **sp. nov.** has simple male pore structure and no genital papillae or genital markings. DNA barcodes (the 5' end sequences of the mitochondrial cytochrome *c* oxidase subunit 1 gene) from type specimens and other materials of the first three species are also reported.

**Key words:** Earthworms, Clitellata, *Amynthas*, new species, Kinmen, Taiwan

### Introduction

Kinmen is an island southeast of China with a nearest distance of about 10 km east of Xiamen, Fujian Province, China and about 227 km west of Taiwan. It has a surface area of about 131.7 km<sup>2</sup>. Lieyu, known as Little Kinmen, is a small island even closer to mainland China. It is about 14.6 km<sup>2</sup> in area and about 2 km west of the main island of Kinmen. Both Kinmen and Lieyu are built on a base of granitic gneiss. Mt. Taiwu, the highest mountain in Kinmen measured 252 m in elevation, is composed mainly of granitic gneiss. Apart from the granite hills, most of the flat terrain of the island is surfaced with laterite and covered primarily with shrubs and herbaceous plants. Woody plants like beefwoods, acacias, pines, and eucalyptus are around the island after forestation in 1949. Native plants are best preserved in areas around Mt. Taiwu and Mt. Wuhu (Kinmen National Park Headquarters 2008). As for the local fauna, Kinmen has been renowned for being a resting site on the migrating routes of hundreds of species of birds. In 1995, Kinmen National Park, including about 1/4 of the area of the main island of Kinmen and Lieyu, was established.

From March to November, 2008, we made earthworm collections all over the main island of Kinmen and Lieyu. Prior to the present study, no survey of the terrestrial earthworm fauna of Kinmen has ever been conducted. The earthworms of the neighboring Fujian Province of southeast China have also been rarely investigated. Ude (1905) described *Pheretima lauta* from Futschau (= Fuzhou, Fujian Province). Michaelsen (1929) listed six species of terrestrial earthworms, *Drawida japonicus* [= *Drawida japonica* (Michaelsen)], *Bimastus parvus* [= *Bimastos parvus* (Eisen)], *Pheretima aspergillum* [= *Amynthas aspergillum* (Perrier)], *Pheretima hawayana* [= *Amynthas*