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Dictyostelium delicatum, a New Record of Dictyostelid Cellular Slime Molds to Taiwan

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ABSTRACT: During a survey of dictyostelid cellular slime molds in northern Taiwan, *Dictyostelium delicatum* was isolated from forest soil and reported as a new record to Taiwan. The species is examined and illustrated in this text.

KEY WORDS: ***Dictyostelium delicatum*, Dictyostelid cellular slime molds, Taiwan.**

INTRODUCTION

Dictyostelid cellular slime molds, or dictyostelids, are primarily found in the forest soils and humus of both temperate and tropical zones (Singh, 1947; Cavender and Raper, 1965; Cavender, 1973). Since Taiwan is located in the subtropics and has abundant rainfall, the plant vegetation is varied and luxuriant. At present over half of the total land surface in Taiwan is covered by forests which may provide the dictyostelids good growing habitats.

Taxanomically dictyostelids are classified in the Order Dictyosteliales, Class Dictyosteliomycetes, Phylum Dictyosteliomycota (Hawksworth *et al*. 1995; Alexopoulous, *et al.* 1996), or classified in the Subclass Dictyostelia, Class Eumycetozoa, Subphylum Mycetozoa, Phylum Gymnomyxa, Kingdom Protista (Olive, 1975; Cavender, 1990). They are composed of two distinct stages, viz., the amoeboid vegetative stage and the fruiting stage, within their life cycle. They feed selectively on bacteria by amoeboid cells. These cells are called "myxamoebae". The myxamoebae later can aggregate into pseudoplasmodia which may migrate on the substratum. After a short period of migration, the pseudoplasmodia differentiate into single or plural fruiting bodies (sorocarp). The sorocarp primarily consists of a stalk (sorophore) and a spore mass (sorus).

Dictyostelids were first described by Brefeld in 1869. Up to the present, more than fifty species have been reported in the world (Hagiwara, 1989). In Taiwan, thirteen species have been reported (Yeh and Chien, 1983; Hagiwara *et al.*, 1992; Lin and Yeh, 1999). During a survey of forest soils in northern Taiwan, *Dictyostelium delicatum* Hagiwara new record to Taiwan was isolated. The species is examined and illustrated in this text. The examined specimens and pure cultures are deposited in the Mycology Laboratory, Department of Biology, National Taiwan Normal University, Taipei, Taiwan, R.O.C.

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MATERIALS AND METHODS

Soil samples were collected from various sites of forest floor from July to October, 2000 in northern area of Taiwan. Five to ten grams of each soil sample were suspended in 50 ml of distilled water, and a small amount of the suspension were spread over the surface of 0.1% lactose yeast-extract agar plates (Norberg, 1971). The agar plates were then incubated at 25℃ in darkness. When the fruiting structures developed, the spores were removed by a sterilized needle from the sorocarps and transferred to a fresh agar plate with appropriate amount of a suspension of pre-grown *Escherichia coli*. The plate was examined periodically for one or two weeks. Measurements of both tips and bases of sorophores were taken with a Leica microscope and spores were measured with microscopic slides mounted with distilled water and ocular micrometer attached to the photomicroscope. The taxonomic system of Hagiwara (1989) was used for identification.

TAXONOMIC TREATMENT

Dictyostelium delicatum Hagiwara, Bull. Natn. Sci. Mus., Tokyo, 14:359, 1971. Figs. 1-8

Sorocarps gregarious or solitary, usually sparsely and irregularly branched, sometimes bearing 6 or more crowed branches, erect or prostrate. Sorophores colorless, sinuous, 0.65-7.8 (-12.0) mm in length, gradually tapering from bases to tips; bases clavate to acuminate, 19.4-33.2 μm in diam at a level 50 μm above the bottom; tips clavate, compound, 11.2-27.7 μm in diam at a level 50 μm below the top. Sori white, globose, 20-280 μm in diam. Spores hyaline, oblong to elliptical, usually 1.7-2.4 times longer than broad, mostly 5.7-9.3 × 2.5-5.5 μm, with conspicuous consolidated polar granules. Pseudoplasmodia radial, 0.5-6.8 mm in diam, centralized or subdivided, migrating with sorophore formation.

Habitat: In forest soils.

Specimens examined: Wu-lai, Tai 2000-1; Yangming Shan, Tai 2000-2; Tauyuan Tai 2000-3; and Hsinchu, Tai 2000-4.

Distribution: Asia, Japan, Nepal and Taiwan.

Note: This species is less common in the forest soils as compared with other species in the genera *Dictyostelium* or *Polysphondylium* in northern Taiwan. The delicate sorophores with sparse and irregular branches are characteristics of this species.

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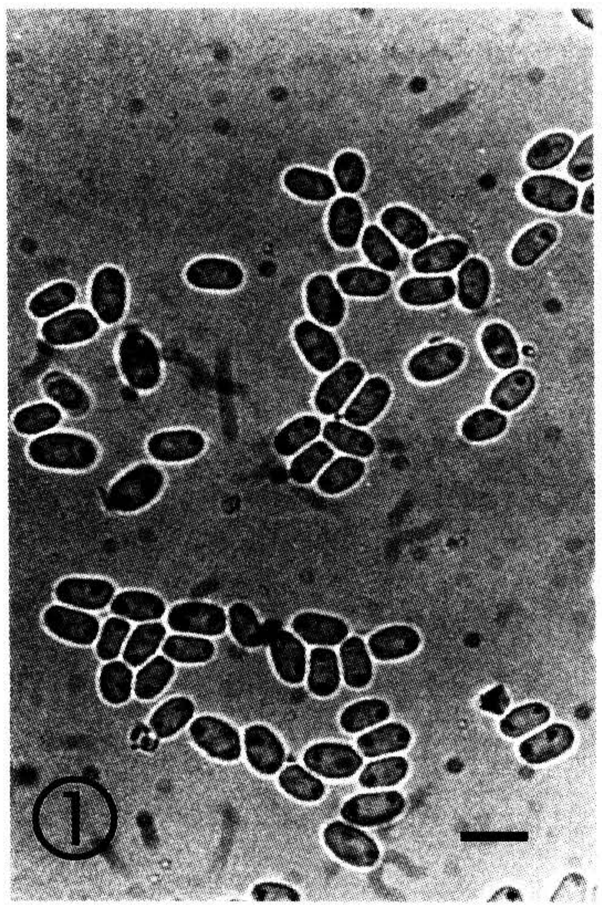

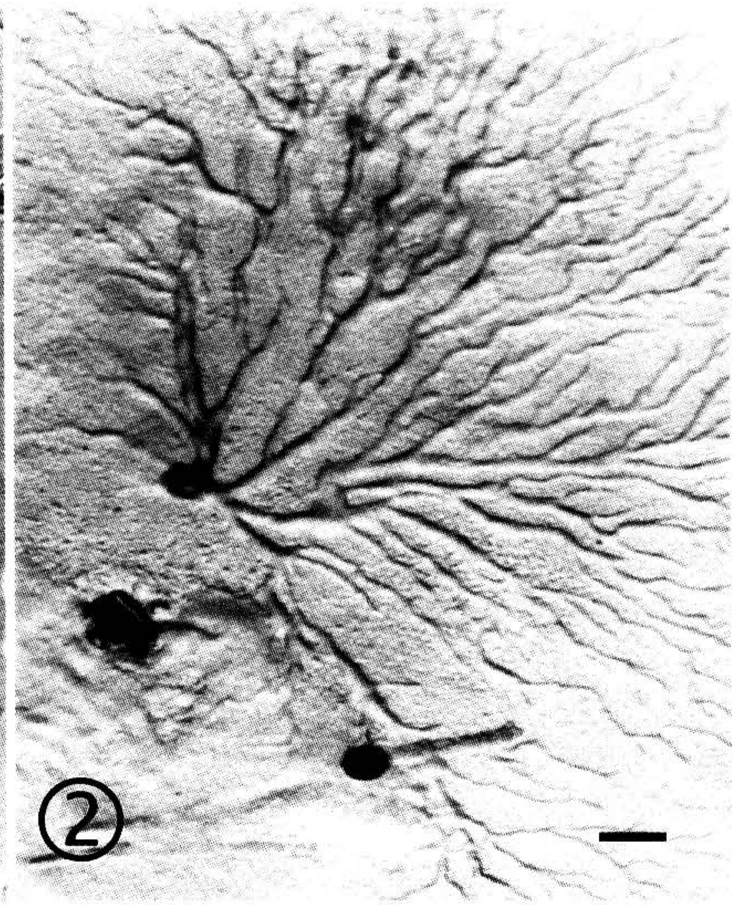

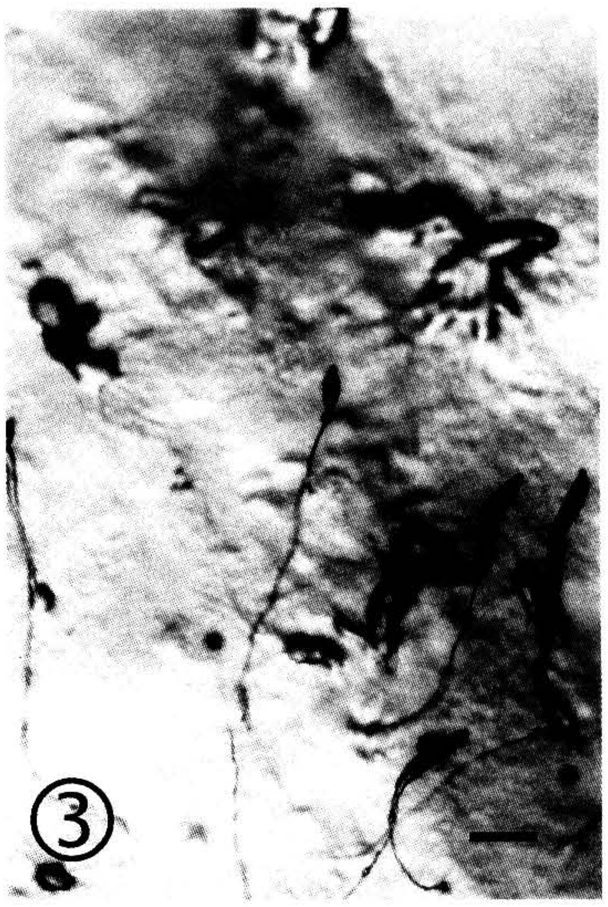

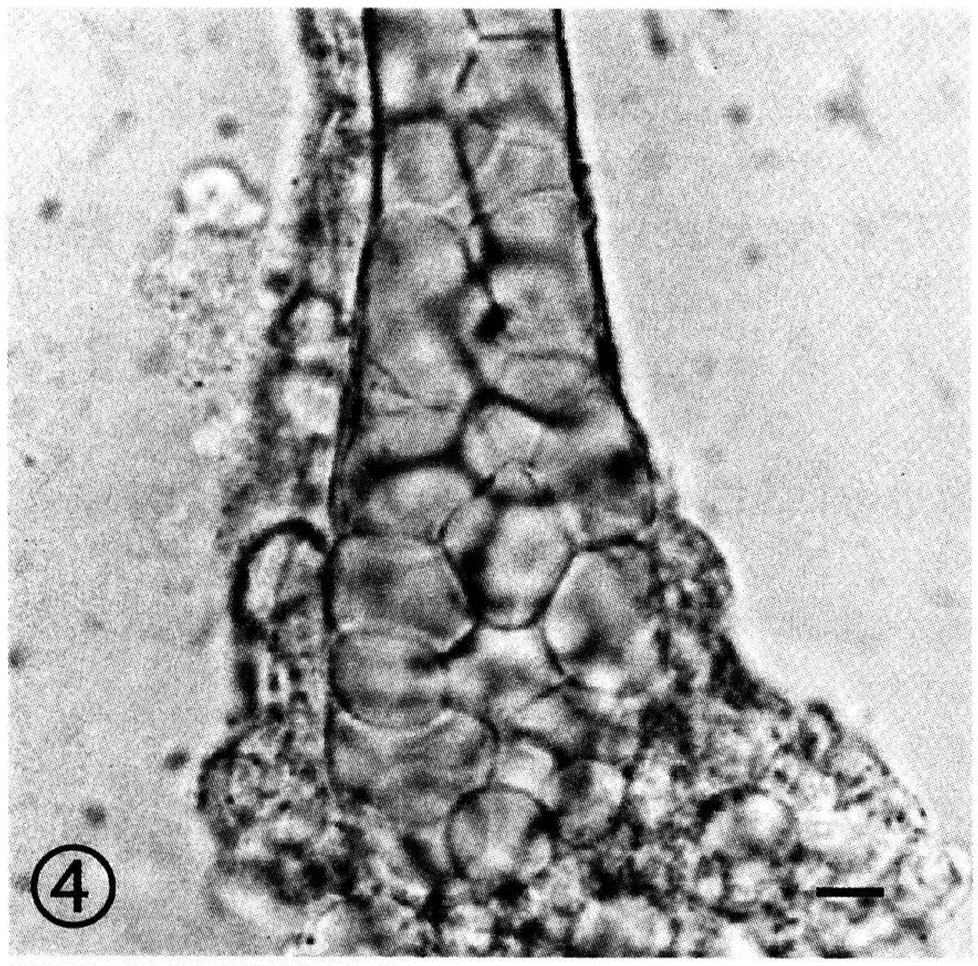

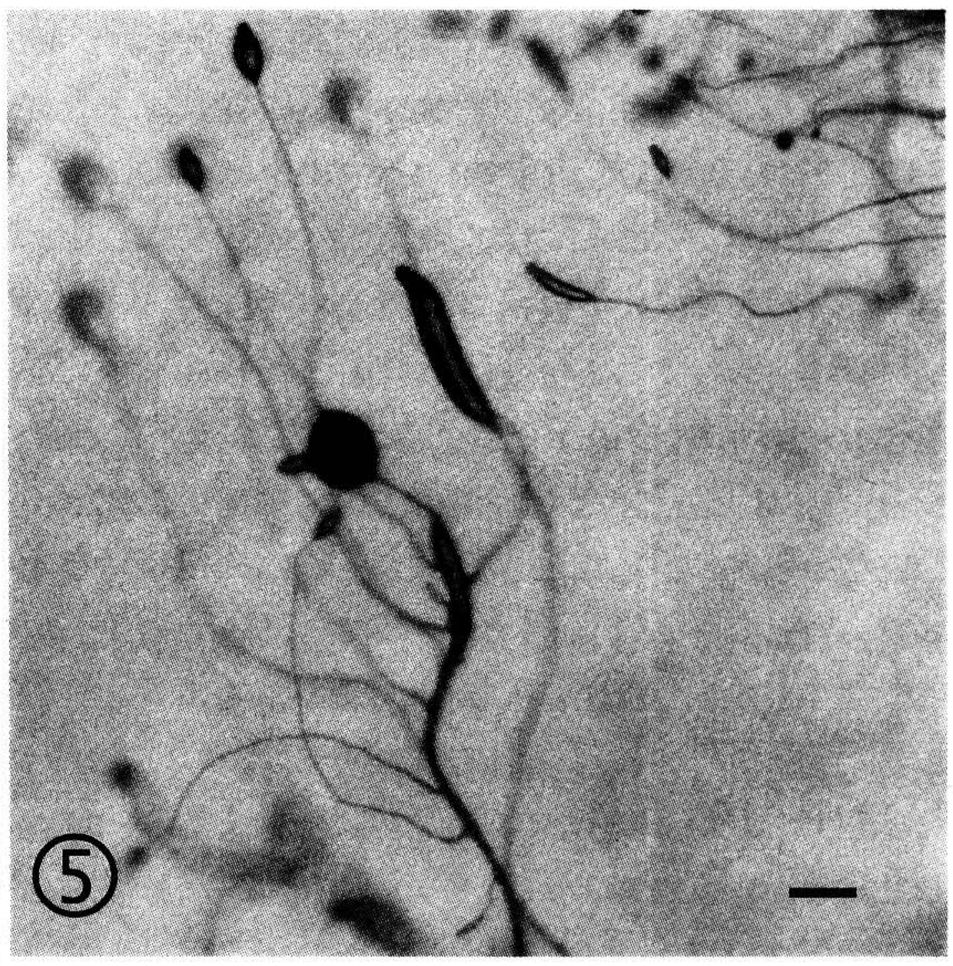

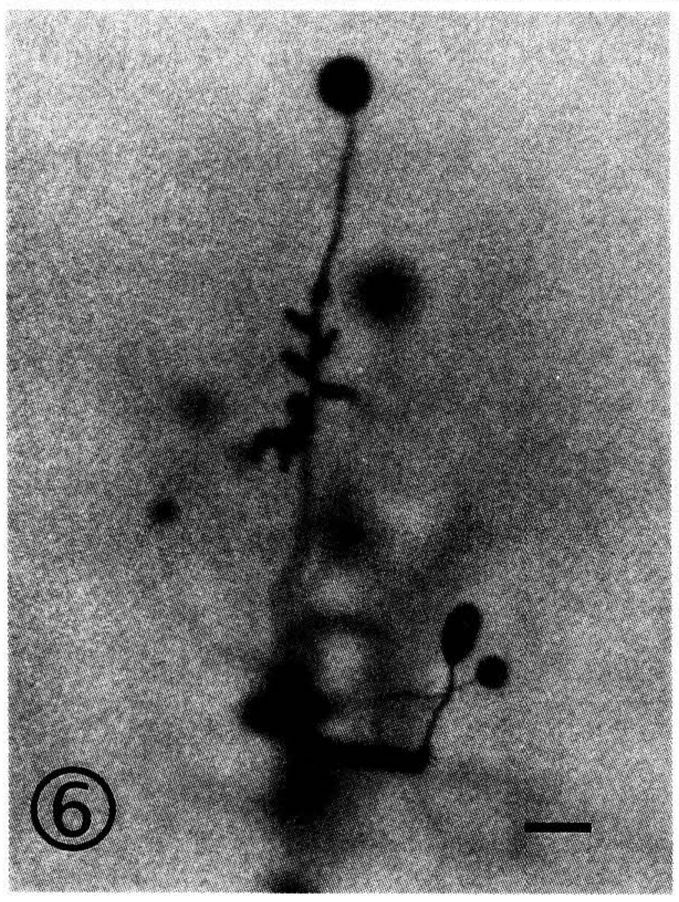

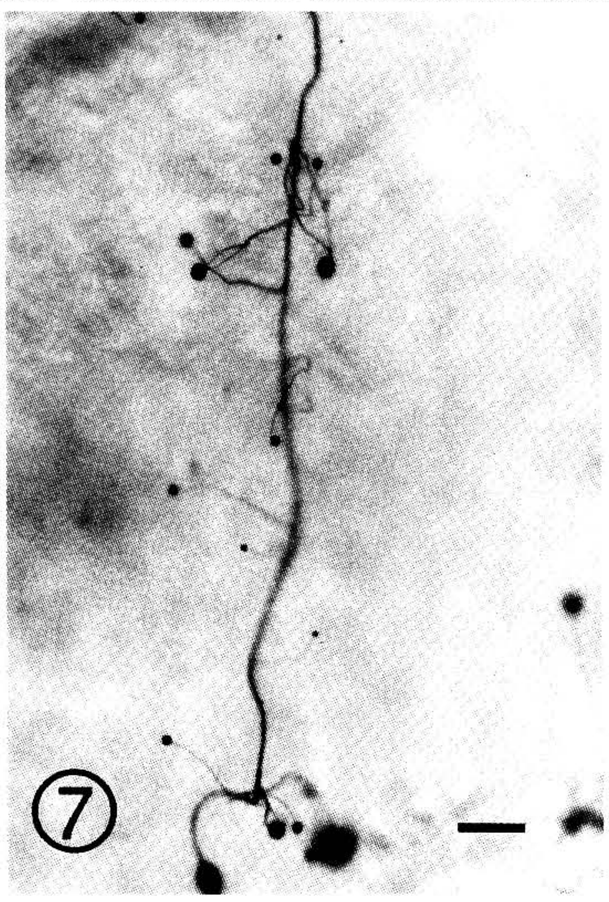

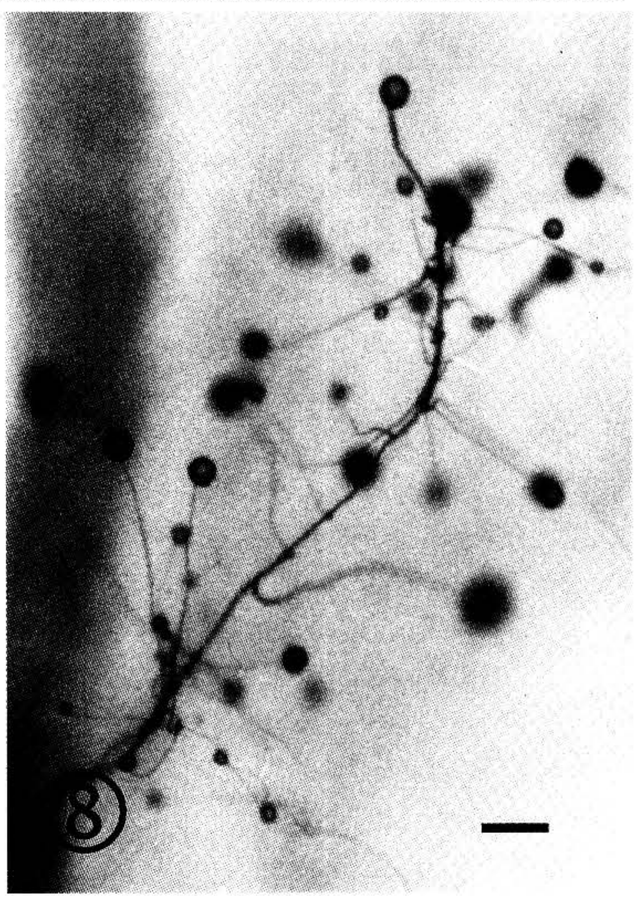

Figs: 1-8 *Dictyostelium delicatum* Hagiwara. 1. Spores. 2. Aggregation. 3. Pseudoplasmodia. 4. Basal part of sorophore. 5. Migrating pseudoplasmodia. 6. Initiation of branches from sorophore. 7. Mature sorophore with sparse branches. 8. Mature sorocarp with irregular branches. Scale bars: 1 = 5 μm, 2 = 250 μm, 3 =300 μm, 4 = 5 μm, 5 = 180 μm, 6 =180 μm, 7 = 200 μm, 8 = 220 μm.

sparse branches. 8. Mature sorocarp with irregular branches. Scale bars: 1 = 5 μm, 2 = 250 μm, 3 =300 μm, 4 = 5 μm, 5 = 180 μm, 6 =180 μm, 7 = 200 μm, 8 = 220 μm.

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台灣新紀錄種－纖細網柱細胞黏菌

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摘　　要

本文報導從台灣北部(烏來、陽明山、桃園及新竹)地區森林土壤表層，分離的網柱細胞黏菌屬一台灣新紀錄種，纖細網柱細胞黏菌(*Dictyostelium delicatum* Hagiwara)。文中記述本種形態特徵之檢視，並有附圖說明。

關鍵詞：纖細網柱細胞黏菌、網柱細胞黏菌、台灣。

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