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Myxomycetes of Taiwan XV. Three New Records

Chin-Hui Liu[1,2], Jong-How Chang[1], Ya-Fen Chen[1] and Fu-Hung Yang[1]

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ABSTRACT: Three new records of Myxomycetes from Taiwan are described and illustrated by light and scanning electron microscopy. *Ceratiomyxa fruticulosa* var. *descendens* is characterized by the unbranched, cylindrical forms of sporophores, the pillars. *Licea retiformis* is the only species in *Licea* with reticulate plasmodiocarpous fructifications. *Trichia munda* is distinct by the areolate peridium, of which the yellowish inner layer appearing as narrow bands that divide the outer layer into large reticulations. Fruiting bodies of these three taxa were either collected from fields or harvested from moist-chamber cultures.

KEY WORDS: ***Ceratiomyxa*, *Licea*, *Trichia*, Myxomycetes, Slime molds, Taiwan.**

INTRODUCTION

In managing the previous collections of Myxomycetes specimens we have found several of them being new to Taiwan or perhaps not yet described in the world. In this paper we publish three of them. One is in the genus *Ceratiomyxa*, of which one species (*C. fruticulosa*) and one variety (*C. fruticulosa* var. *porioides*) were published previously (Chung and Liu, 1997; Nakazawa, 1929; Tsai, 1998). The other two are in the genera *Licea* and *Trichia* respectively. In the genus *Licea*, there were eleven species that have ever been reported from Taiwan, they are *L. biforis, L. capitata, L. erecta, L. kleistobolus, L. kellerii, L. minima, L. operculata, L. parasitica L. pescadorensis, L. scyphoides, L. tropica* (Chiang and Liu, 1991; Chung and Liu, 1996a, 1996b; Chung *et al.*, 1998; Liu *et al.*, 1989; Liu, 1992; Nakazawa, 1929; Shi, 1981), while in the genus *Trichia* six species and two varieties (*T. botrytis*, *T. botrytis* var. *cerifera*, *T. contorta* var. *iowensis*, *T. decipiens*, *T. erecta*, *T. favoginea*, *T. scabra*, and *T. verrucosa*) have ever been found in Taiwan (Chung and Tzean, 1998; Liu, 1980; Liu, 1982; Nakazawa, 1929). In this paper we report additional three newly recorded taxa of these three genera that were either collected directly from fields or obtained from moist-chamber cultures.

MATERIALS AND METHODS

Fruiting bodies were collected either directly from the fields or harvested from moist-chamber cultures as described previously (Liu *et al.*, 2002). Morphological characteristics were examined by light and scanning electron microscopy. For specimen identification, references by Emoto (1977), Nannenga-Bremekamp (1991), Yamamoto (1998), and Moreno *et al.* (2001) were consulted.

1. Department of Botany, National Taiwan University, Taipei 106, Taiwan.
2. Corresponding author. E-mail: huil4951@ccms.ntu.edu.tw

RESULTS AND DICUSSION

Ceratiomyxa fruticulosa (Mueller) Macbr. var. **descendens** Emoto, Proc. Imp. Acad. 9: 416. 1933. Figs. 1-2, 10

Sporophores gregarious, 0.31-0.42 mm in total height, white, cylindrical and unbranched, 0.9-1.3 mm in diameter. Spores superficial, borne on slender, individual stalk, hyaline to milky white in mass, colorless in transmitted light, mostly obovate or subglobose, globose in few, 4-5 x 9-10 μm in diameter, smooth with irregularly scattered dotted inclusions. Plasmodium not observed.

Specimen examined: Taipei County: Shih-ting, Wenshan Botanical Garden of National Taiwan Univ.,Yang A5-13, May 15, 1999, on dead wood; Yang A6-47, Jun. 12, 1999, on dead wood. **Taipei** City: Peitou, Yangmingshan National Park, CHL B2347, Sept. 28, 2001(moist-chamber culture: 8/26-9/28/2001), on dead wood.

Distribution: China (Emoto, 1942), Japan (Yamamoto, 1998), Taiwan.

The var. *descendens* is different from the var. *fruticulosa* in the spore size and forms of sporophores. Spore diameter of the var. *fruticulosa* is larger (6-7 x 10-13 μm), and the sporophores are branched and dendroid. The cylindrical form (unbranched) of sporophore is distinct in the var. *descendens*.

Licea retiformis Nawawi, Trans. Br. Myc. Soc. 60(1): 153. 1973. Figs. 3-5, 11

Fructifications plasmodiocarpous, gregarious, reticulate, the reticulation 0.59-1.56 mm in extension, ochraceous to yellowish brown. Plasmodiocarps 78-91 μm in diameter, appearing smooth on the surface. Peridium single, memebrous, firm. Spores yellowish brown in mass, pale yellow in transmitted light, globose, subglobose, 10-11 μm in diameter, smooth under high dry lens, densely and minutely warted under SEM. Plasmodium not observed.

Specimen examined: Taipei county: Shih-ting, Wenshan Botanical Garden of National Taiwan Univ., Yang99-11B3B2. Jan. 24, 1999(moist-chamber culture: 12/28-1/24/1999), on bark of *Persea thunbergii*.

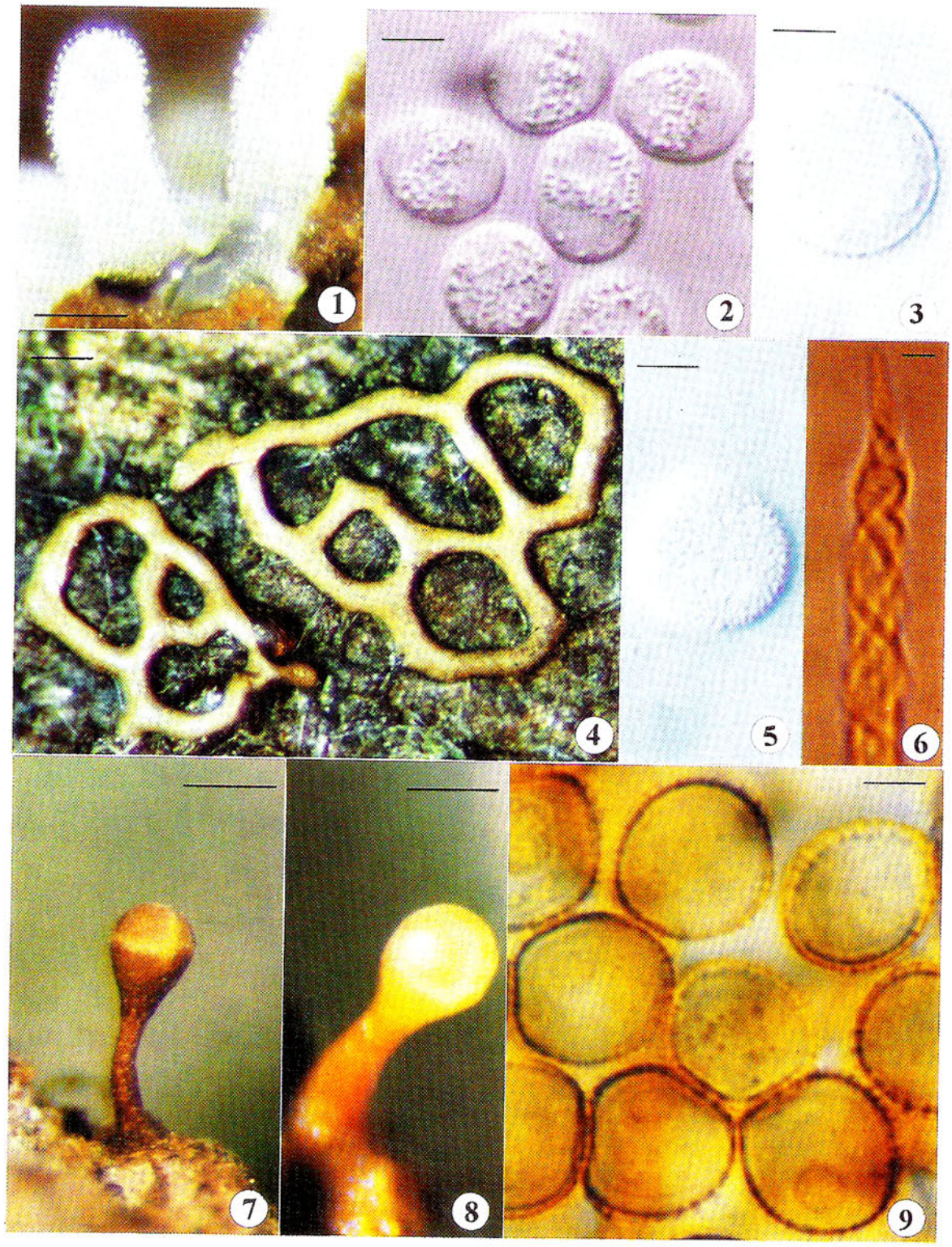
Distribution: Japan (Yamamoto, 1998), Malaysia (Nawawi, 1973), Taiwan.

This is the only species in *Licea* with reticulate plasmodiocarpous fructifications. It is usually difficult to detect in the field possibly due to the color and minute fructifications that hide behind the substratum.

Trichia munda (A. Lister) Meylan, Bull. Soc. Vaud. Sci. Nat. 56: 327. 1925.

Trichia botrytis (J.G. Gmel.) Pers. var. *munda* A. Lister, Jour. Bot. 35: 216. 1897. Figs. 6-9, 12-14

Fructifications sporangiate, scattered, 0.58-0.71 mm in total height. Sporangia stipitate, turbinate (obovate), yellowish brown to purplish brown, (0.13-) 0.19-0.27 mm in diameter. Peridium double, the outer layer brown, with deposited refuse matter, often areolate before dehiscence, the inner layer membranous, yellowish, adhering to the outer layer, appearing as narrow bands on the peridium, dehiscing along the narrow bands. Stalk cylindrical, reddish brown, opaque, translucent under transmitted light, filled with debris matter, ca. 0.05 mm in diameter. Hypothallus membranous, discoid, reddish brown. Elaters bright yellow, with 3-4 smooth spirals, ca. 4-5 μm in diameter, tapering toward ends, the end acuminate, acute from



Figs. 1-2. *Ceratiomyxa fruticulosa* var. *descendens*. 1. White sporophores, bar = 200 μm; 2. Spores, bar = 5 μm. Figs. 3-5. *Licea retiformis*. 3. Spore, marginal view, bar = 4 μm; 4. Reticulate plasmodiocarps, bar = 200 μm; 5. Spore, surface view, bar = 4 μm. Figs. 6-9. *Trichia munda*. 6. Part of the elater showing the acuminate end, bar = 2 μm; 7. Fruiting body, bar = 200 μm; 8. Young fruiting body, bar = 200 μm; 9. Spores, marginal view, bar = 5 μm.

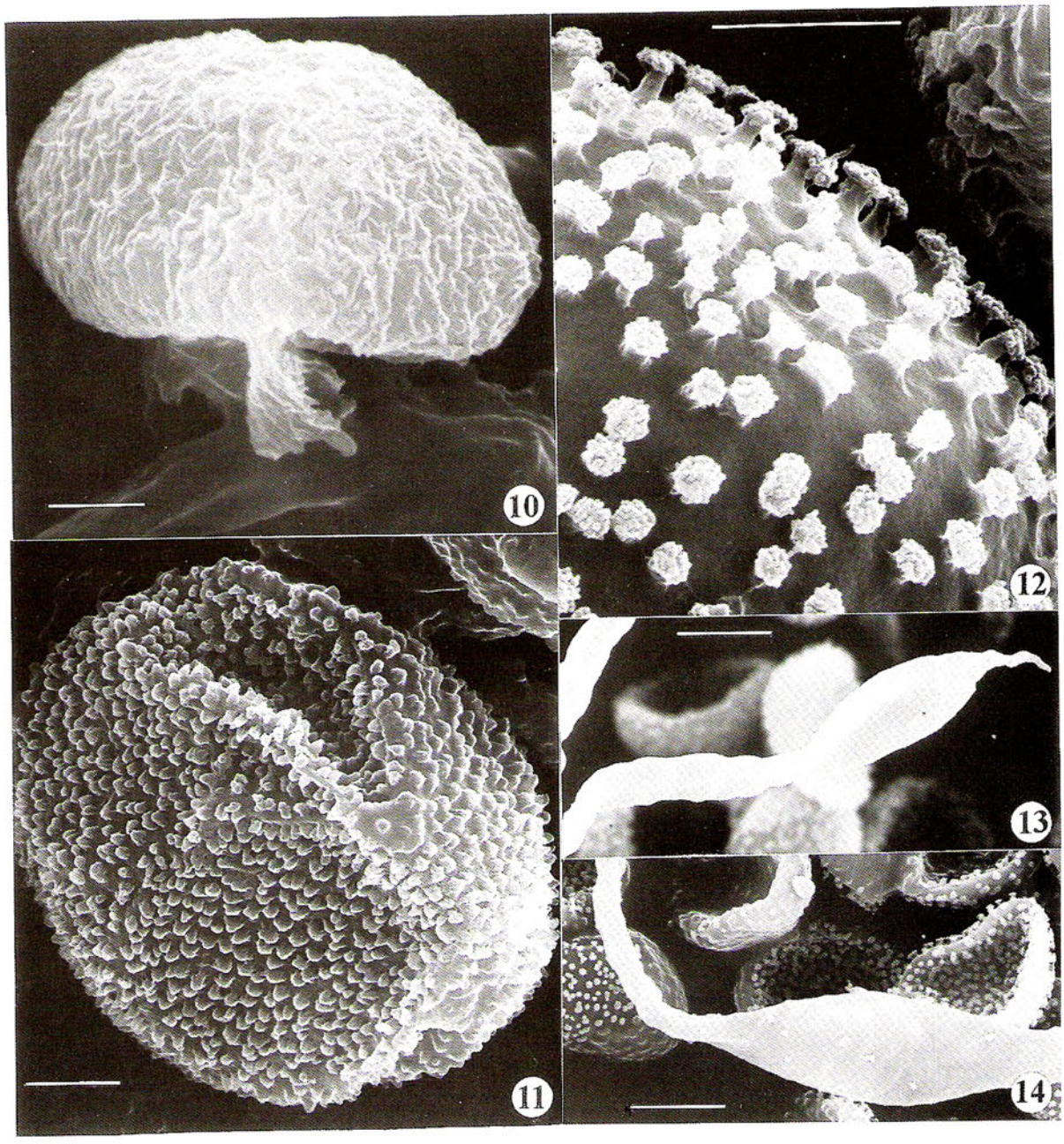


Fig. 10. One spore on the sterigma of *Ceratiomyxa fruticulosa* var. *descendens*, SEM, bar = 1.5 μm. Fig. 11. Spore of *Licea retiformis*, SEM, bar = 1.5 μm. Figs. 12-14. SEM of *Trichia munda*. 12. Surface markings of spore, bar = 1.5 μm; 13 & 14. Parts of the elaters showing the inflation close to the end (13), and elsewhere along the length (14), bar = 5 μm.

an inflation of the thread in some, and the inflation also observed elsewhere along the length when viewed under SEM. Spores bright yellow in mass, yellow under transmitted light, globose, subglobose to ovate, 9-11 μm in diameter, warted, the warts pin- or mushroom-like. Plasmodium not observed.

Specimen examined: Pintung County: Nanjenshan forest, CHL B1328, Oct. 15, 1997 (moist-chamber culture: 10/3-10/15/1997), on bark of living tree of *Cyclobalanopsis championii*.

Distribution: Austria, Portugal, South Chili, and Washington Territory (Lister, 1925), China (Tarja *et al.*, 2001), Great Britain (Nannenga-Bremekamp, 1991), Japan (Yamamoto *et al.*, 2002), Spain (Moreno *et al.*, 2001), Taiwan.

The distinct characteristics of our specimen are the spore wall markings, the character of the elater, and the size of the fruiting bodies which are quite different from those of *Trichia botrytis*.

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台灣黏菌(十五): 三種新紀錄

劉錦惠[1,2]、張仲豪[1]、陳雅芬[1]、楊馥鴻[1]

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摘　　要

本文描述台灣真黏菌的三個新紀錄種，並以光學及電子顯微鏡圖片圖示。鵝絨黏菌單枝變種(*Ceratiomyxa fruticulosa* var. *descendens*)的特徵是其具有不分枝的圓柱型孢子體。網形無絲黏菌(*Licea retiformis*)其子實體是無絲黏菌屬中，唯一呈網狀原生質果型的種類。工緻團毛黏菌(*Trichia munda*)的區別在於龜裂狀的周膜，此乃是由內周膜顯露出的黃色窄條紋，將外周膜分隔成大網格狀所形成。所鑑定的子實體是由野外直接採集或濕室培養所獲得。

關鍵詞：鵝絨黏菌屬、無絲黏菌屬、團毛黏菌屬、真黏菌、黏菌、台灣。

1.國立台灣大學植物系，台北市 106 羅斯福路 4 段 1 號，台灣。
2.通信作者。E-mail: huil4951@ccms.ntu.edu.tw