

Myxomycetes of Taiwan XIII. One New Record and One New Variety

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(Manuscript received 25 September, 2001; accepted 30 October, 2001)

ABSTRACT: One new record and one new variety of Physaraceae (Myxomycetes) are described and illustrated by light and scanning electron microscopy. The new variety, *Craterium leucocephalum* var. *sessile* Liu, Huang, and Chang, was collected from the field. This taxon is characterized by having sessile sporangia in cylindrical to obconic shape, which at the top is white as that of the type variety *leucocephalum*. The new record, *Physarum laevisporum* Agnihotrudu, was harvested from moist-chamber cultures. Specimens of these two taxa are deposited in the Mycological Herbarium, Department of Botany, National Taiwan University.

KEY WORDS: *Craterium*, Myxomycetes, Physaraceae, *Physarum*, Slime molds, Taiwan.

INTRODUCTION

Among the taxa of Myxomycetes of Taiwan, there were about fifty species also known from Yangmingshan area, a National Park located in the suburban area of Taipei city, northern Taiwan (personal collections; Chiang and Liu, 1991; Chung and Liu, 1997a, 1997b, 1997c; Liu, 1980 ~1983; Nakazawa, 1929; Shi, 1981; Wang et al., 1981). Last Summer we started an one-year survey of Myxomycetes in the front park of Yangmingshan National Park, along the roadside where the possible substrates of Myxomycetes were most easy to be disturbed by people walking around and also have great deal of chance to be swept away. Of the specimens collected, either directly from the field or by moist-chamber technique, two, respectively in the genera *Craterium* and *Physarum* of the family Physaraceae, were found distinct. One of them, then, was identified as a new record to Taiwan, the other as a new variety of the world. The following reports the examination and characteristics of these two specimens.

MATERIALS AND METHODS

Fruiting bodies were either collected directly from the field or harvested from moist-chamber cultures in August, 2000 and July, 2001. For moist-chamber cultures (Gilbert & Martin, 1933; Liu, 1983; Chiang and Liu, 1991), leaf litter, fallen twigs and bark of living trees were collected and temporarily stored in the refrigerator after being carried back to the laboratory for further cultivation. Morphological characteristics were examined and photographed by light and scanning electron microscopy (Martin and Alexopoulos, 1969; Robbrecht, 1973; Chung and Liu, 1997). For identification of specimens, papers or monographs by Agnihotrudu (1963), Martin and Alexopoulos (1969), Nannanga-Bremekamp and Yamamoto (1987) and Yamamoto (1998) are consulted.

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RESULTS AND DISCUSSIONS

Craterium leucocephalum (Pers.) Ditmar var. *sessile* Liu, Huang & Chang, var. nov.

Figs. 1-4, 9-13

A typo differt sporangiis sessilibus, parce bravibus stipitatis.

Holotype: **Taipei City**: Shih-lin, Yangmingshan National Park, CHL B2164, Aug. 9, 2000, on dead broad leaf. In the Mycological Herbarium, Department of Botany, National Taiwan University. Known only from the type.

Etymology: The Latin word "sessile" refers to the sessile sporangia.

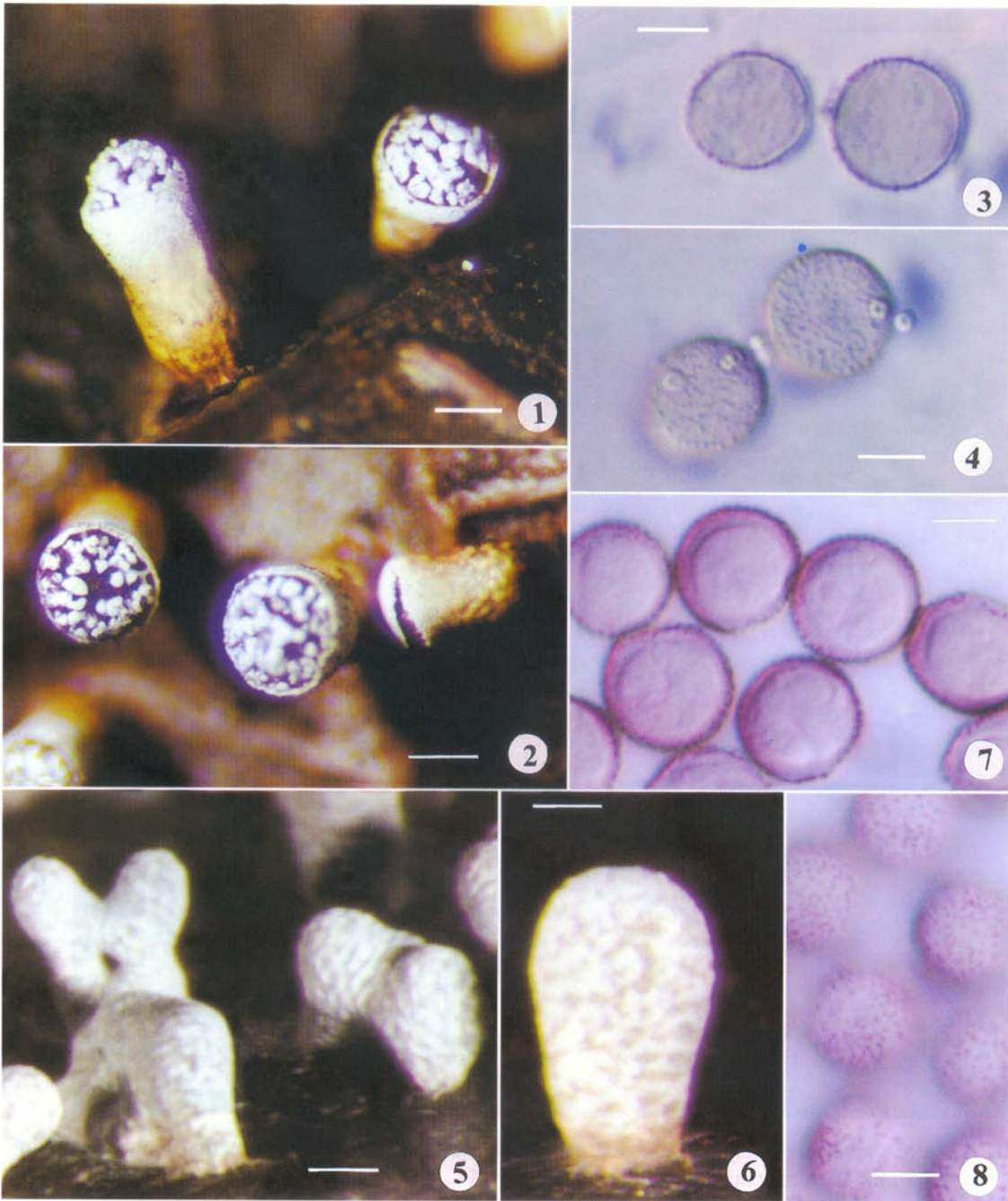
Fructifications sporangiate, gregarious, sessile or rarely short-stalked, total height 0.45-0.70 mm. **Sporangia** cylindric, obconic, or vase-shaped, 0.29-0.40 mm in diameter, dark brown to brown below, turning to ochraceous above, pale ochraceous to white around the margin of the lid, white at the top. **Stalk** usually absent; when present, short, up to 0.12 mm long (about 1/4 of total height). **Hypothallus** conspicuous, membranous, dull brown, discoid, with brown ribs radiating from the base of the sporangium. **Peridium** thick, cartilaginous, dark brown and longitudinally ribbed at the basal area, bumpy reticulate (as peanut shell) upward and paler to about middle part, usually white above due to densely frosted white lime granules, dehiscence circumscissile by a convex white lid. **Columella** none. **Capillitium** abundant, consisting of large, irregular, white lime nodes (25-64 μm in diameter) and delicate, branching, hyaline connecting threads. **Spores** dark brown in mass, grayish brown by transmitted light, globose, rarely subglobose, 7.5-9 (-11) μm in diameter, minutely verrucose or spinulose. Plasmodium not observed.

The sessile, rarely short-stalked, fructification with long and conic-shaped sporangium is a distinct feature of this variety. Other characteristics, such as color of sporangia, circumscissile dehiscence, white lid, spore size and wall ornamentation are identical with var. *leucocephalum*, of which the sporangia is stipitate, rarely sessile. This taxon is similar to *Craterium reticulatum* Nann.-Brem. & Y. Yamam. in the shape of sporangia (sessile, long and conical) but different by the lid which is brown and fragmented at dehiscence in *Craterium reticulatum*, while in var. *sessile* the lid is white (due to the dense white lime granules) and dehiscent as a whole piece along a circumscissile line which is transparent and very fine only discernible in some sporangia.

Physarum laevisporum Agnihotrudu, Sydowia 16: 121. 1

Figs. 5-8, 14-16

Fruitification plasmodiocarpous, often broken into sporangiate-like fruiting bodies, gregarious or densely gregarious, white, grayish white, or pallid (yellowish white), 0.41-0.89 mm high, 0.21-0.30 mm thick; plasmodiocarps laterally depressed but plump, usually short and crowded into a reticulate arrangement; sporangia obovate, or clavate in the longly erected forms. **Hypothallus** lacking. **Peridium** double, outer layer densely covered with thin layers of lime granules in smooth but somewhat areolate pattern; inner layer membranous, translucent, dehiscence irregularly. **Columella** lacking. **Capillitium** dense, lime nodes large, white or pale, rounded or angular, connected by slender, hyaline threads. **Spores** blackish brown in mass, violaceous brown by transmitted light, globose, 7.5-10.0 μm in diameter, smooth under high dry lens, minutely warted under oil immersion lens, with very short warts. Plasmodium not observed.

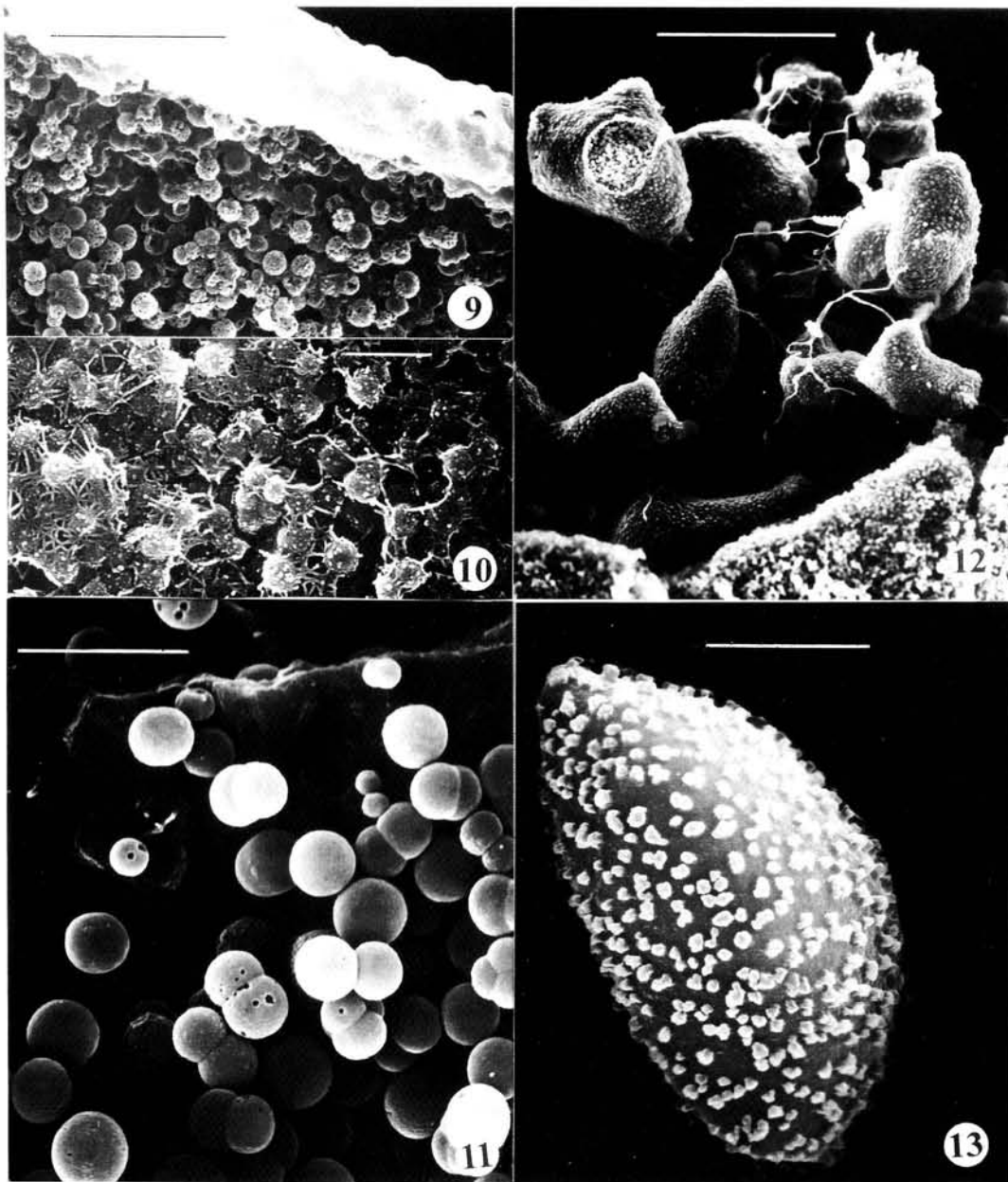


Figs. 1-4. *Craterium leucocephalum* var. *sessile*. 1 & 2. Fruiting bodies, bar = 200 μm ; 3 & 4. Spores, marginal and surface view, bar = 5 μm . Figs. 5-8. *Physarum laevisporum*. 5. Plasmodiocarps, bar = 200 μm ; 6. Sporangium, bar = 250 μm ; 7 & 8. Spores, marginal and surface view, bar = 5 μm .

Specimen examined: Taipei City: Shih-lin, Yangmingshan National Park, CHL B2288. July 25, 2001, from moist chamber culture, on decaying leaves of *Liquidambar formosana*.

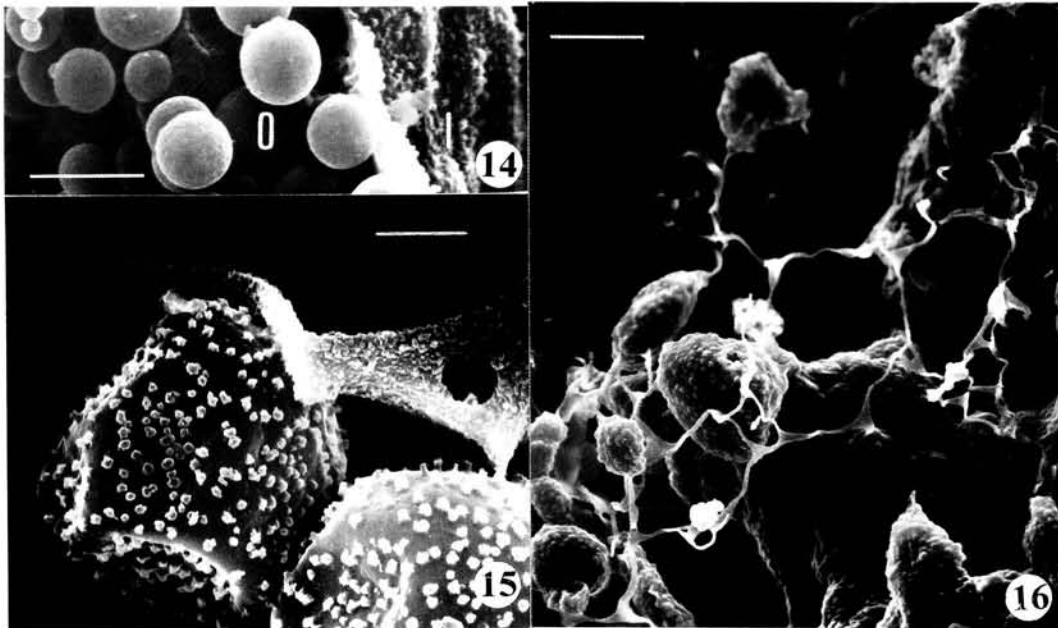
Distribution: Assam (India, Asia) and Taiwan.

This species is a rather rare species. Our specimen is the second collection of the world. Our collection is deviated from the type in having lime knots of both angular and rounded



Figs. 9-13. SEM of *Craterium leucocephalum* var. *sessile*. 9. Outer surface of lid, showing the abundant lime granules, bar = 7.5 μm ; 10. Under surface of lid, bar = 3 μm ; 11. Part of peridium close to the lid, bar = 3 μm ; 12. Capillitium, showing the lime nodes and connecting threads, bar = 50 μm ; 13. Spore ornamentations, bar = 2.5 μm .

forms (Fig. 16) instead of only the angular type as shown in the illustration (Agnihotrudu, 1963). Other characters such as whitish plasmodiocarps, double peridium, and nearly smooth-walled spores (under high dry lens) are distinct and coincident with the descriptions for the type, although spores of our specimen can reach to 10 μm in diameter, 2 μm larger than the largest spore of this species (7-8 μm in diameter in the reference). The size ranges of spores of *Physarum nicaraguense* were found variable when sporangia developed on different substrates, spores developed on agar medium were usually larger than those on bark substrate (Gray and Alexopoulos, 1968).



Figs. 14-16. SEM of *Physarum laevisporum*. 14. Part of peridium, showing the limy outer layer (O) and the limeless inner layer (I), bar = 1.5 μm ; 15. Spore ornamentations, bar = 1.4 μm ; 16. Capillitium, showing the lime nodes and connecting threads, bar = 15 μm .

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臺灣黏菌(十三):一新記錄種及一新變種

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(收稿日期:2001年9月25日;接受日期:2001年10月30日)

摘 要

本文描述兩絨泡黏菌科的成員，並以光學顯微鏡和掃描式電子顯微鏡的觀察來圖示。其中白頭高杯黏菌無柄變種(*Craterium leucocephalum* Ditmar var. sessile Liu, Huang, and Chang)為世界性的新變種，其子實體自野外直接採得，孢子囊具有如下的特徵：無柄、長圓桶形或倒圓錐形、白色的頂蓋。而光孢絨泡黏菌(*Physarum laevisporum* Agnihotrudu) 是採用濕室培養得到，為臺灣的新紀錄種。標本皆存放於台大植物系菌類標本室。

關鍵詞: 高杯黏菌屬、真黏菌、絨泡黏菌科、絨泡黏菌屬、黏菌、臺灣。

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