

MYXOMYCETES OF TAIWAN III

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Abstract: Twenty-two species of Myxomycetes distributing in the families of Reticulariaceae, Trichiaceae, Didymiaceae, and Physaraceae are reported from Taiwan. Ten of them are new to Taiwan, they are: *Lycogala conicum* Persoon, *Hemitrichia calyculata* (Speg.) Farr, *Trichia scabra* Rost., *Diderma platycarpum* Nann.-Brem., *Didymium ovoideum* Nann.-Brem., *D. serpula* Fries, *D. verrucosporum* Welden, *Physarum bivalve* Pers., *P. sessile* Brandza, *P. straminipes* A. Lister. Fructifications were collected mostly from the field and on the leaf litter or other plant debris. Only four specimens were collected from the moist-chamber development, and they are all rare species and new to Taiwan.

INTRODUCTION

Species of Myxomycetes collected primarily from the bed logs for growing Shiitake mushroom, *Lentinus edodes* (Berk.) Sing. have been reported (Liu, 1980, 1981). In this paper, twenty-two species distributing in the families Reticulariaceae, Trichiaceae, Didymiaceae, and Physaraceae are reported. Fructifications of them were collected mostly from the field and on the leaf litter of other plant debris except few, of which the collections were made through the use of the moist-chamber technique (Gilbert, 1933; Gray and Alexopoulos, 1968). The name of the color used for describing sporangia and spore mass follows the color plates in Ridgway's book "Color Standards and Color Nomenclature" (1912). All the specimens reported in this paper are deposited in the Mycology Herbarium, Department of Botany, National Taiwan Univ., Taipei, Taiwan, R. O. C., TAI.

SPECIES STUDIED

Reticulariaceae

1. *Lycogala conicum* Pers., Syn. Fung. 159, 1801. (Pl. IX, 6-7; Pl. X, 1)

Fructifications aethalioid, conical, seated by a broad base, scattered or in small clusters of 2-3 in incomplete separation, 1-1.7 mm broad at the base, 2-3 mm tall, ochraceous tawny to Prout's brown at maturity, marked with dark (nearly black) superficial vesiculose scales which often arranged in a reticulate pattern, mainly on the upper part; dehiscence apical; pseudocapillitium of flattened hyaline tubes, nearly smooth, 3-8 μ in diameter; spores light yellow-brown in mass, pale yellowish by transmitted light, globose, mostly 6 μ (5-7 μ) in diameter, coarsely reticulate or with a few scattered warts on the surface.

Habitat: On decaying wood.

Specimen examined: Taipei Hsien, Wu-Lai Hsiang: CHLM 188, Feb. 13, 1981; Nan-T'ou Hsien, Yü-Ch'ih Hsiang, Sun-Moon Lake: CHLM 380, Oct. 26, 1981.

A new record to Taiwan. It is distinct in the shape (cone-shaped) and the arrangement of the superficial vesicles. The sporangia when collected were rosy or scarlet, then turned to brown at maturity.

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Trichiaceae

2. *Hemitrichia clavata* (Pers.) Rost., Versuch 14, 1873. (Pl. I, 1-2)

Sporangia gregarious, olivaceous yellow, obpyriform, total height 1.6-2.0 mm after dehiscent, 0.7-1.0 mm at the broadest top; stalk short, 0.4-0.6 mm, dark red-brown, attenuating downward and merging above into the base of the sporangium, hollow, filled with large rounded spore-like cells; peridium thin, shining, dehiscent above, below (1/2-1/3) persistent as a cup-like calyculus which yellow-colored, coarsely papillate within; capillitium yellow ocher, becoming buckthorn brown, consisting of elastic threads forming a net with few free ends, the threads 5-6 μ in diameter, regularly surrounded by 4-5 spiral bands, smooth, often swollen at the junction of the branch and spinulose at this part; spores apricot yellow in mass, pale yellow by transmitted light, rounded or oval, 7.5-8 (8.2) μ in diameter, faintly warted.

Habitat: On rotten wood.

Specimen examined: Nan-T'ou Hsien, Yü-Ch'ih Hsiang, Sun-Moon Lake: CHLM 249a, Apr. 8, 1981.

A species very close to *Hemitrichia stipitata* from which it is distinguishable by the outer appearance: vase-like sporangia, the deep cup-like calyculus and the peridium which gradually merging into the short stalk.

3. *H. calyculata* (Speg.) Farr, Mycologia 66: 887, 1974. (Pl. I, 3; Pl. X, 3)

Sporangia stipitate, honey yellow before rupturing, gregarious, or scattered, turbinate, total height 1.2-2.8 mm; stalk dark redish brown, at least 0.5 mm in length (about half or a little more than half of the total height); hypothallus restricted to the individual base; peridium thin, yellow, shining, opening above, one-half or less persistent as calyculus, finely papillate or delicately reticulate within; capillitium isabella-color after spores discharged, in a dense elastic net with few free ends, smooth, with 4 or 5 spiral bands, 6-7 (7.5) μ in diameter; spores cream-buff to chamois in mass, globose, minutely spinulose, 7-8 (-8.5) μ in diameter.

Habitat: On decaying wood.

Specimen examined: Nan-T'ou Hsien, Yü-Ch'ih Hsiang: CHLM 385, Oct. 26, 1981; Taipei Hsien, Wu-Lai Hsiang: CHLB 41, Mar. 14, 1982.

This specimen is distinctive in the field by its growth habit, and readily distinguished from *H. clavata* by the nearly cylindrical stalk. This collection is new to Taiwan.

4. *Perichaena depressa* Libert, Pl. Crypt. 378, 1837. (Pl. I, 4-5; Pl. X, 2)

Sporangia sessile, flattened, crowded in clusters, usually polygonal from mutual pressure, dark (sooty black), less than 1 mm in diameter; peridium double, the outer layer calcareous, thick, opaque, black, closely appressed to the membranous inner layer, dehiscing circumscissile by a well defined flat lid; capillitium an intricate net of hollow, branched, slender threads, yellow, 2-2.5 μ in diameter, closely and slightly constricted along the threads; spores deep chrome (orange-buff to capucine yellow) in mass, pale yellowish by transmitted light, 10-12 μ in diameter, subglobose, minutely warted.

Habitat: On dead bark of twig and wood.

Specimen examined: Taipei City: CHLM 190, Feb. 16, 1981; CHLB 53, Mar. 18, 1982.

This is a common and distinct species by the following characteristics: the dark, very flat or dome-shaped in some, usually angular sporangia, the circumscissile lid, and the yellow spores. Specimens in the field are very likely to be neglected due to its black and flat appearance. The bright color of spores appearing around the margin of the preformed sporangial lid, however, is characteristic attracting the collector's attention.

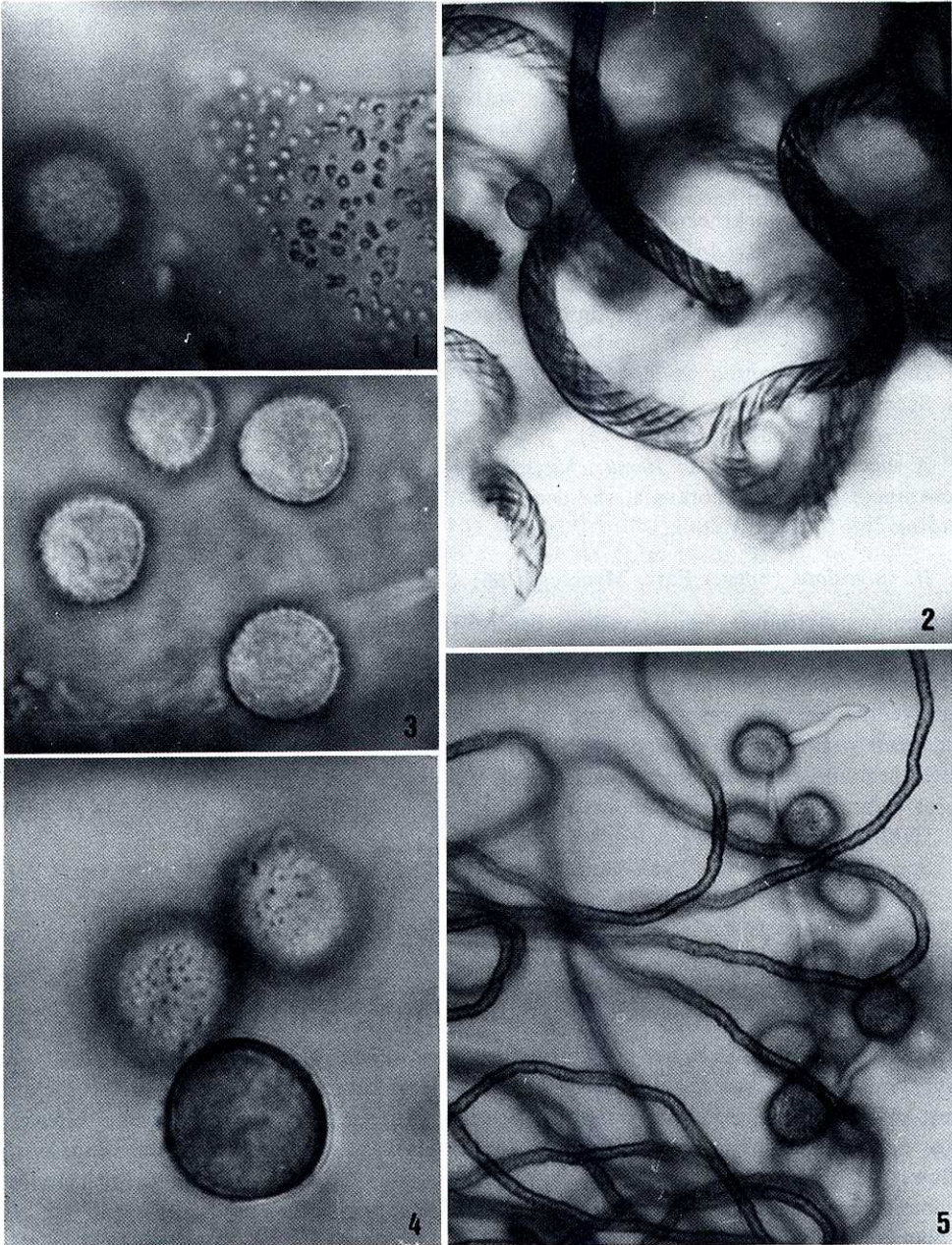


Plate I

- 1-2. *Hemitrichia clavata*, 1. Peridium, showing the papillae on the surface within, $\times 2010$;
 2. Capillitium, $\times 800$.
 3. *H. calyculata*, spores, $\times 2010$.
 4-5. *Perichaena depressa*, 4. Spores, optical section, $\times 2010$; 5. Capillitium, $\times 800$.

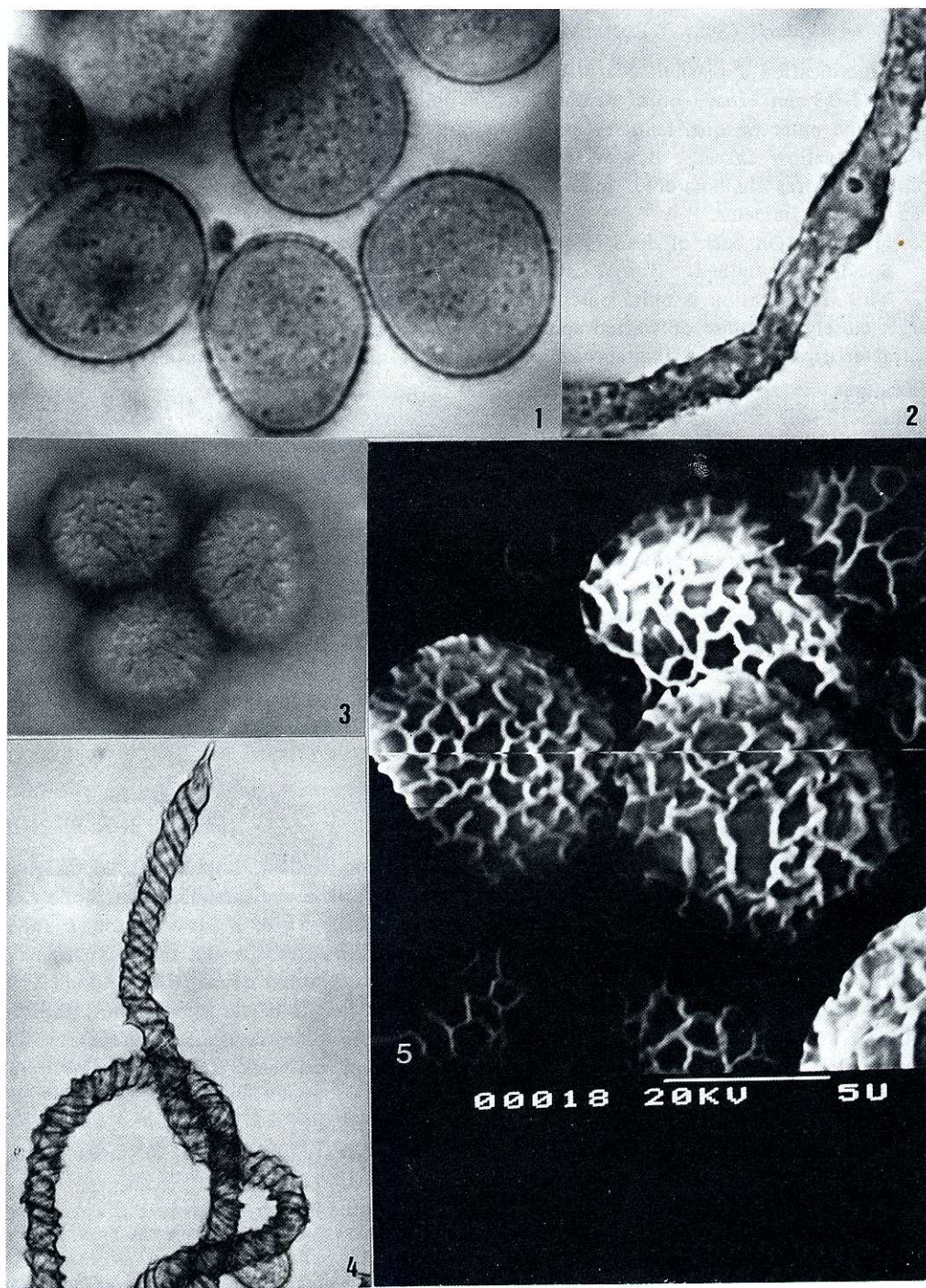


Plate II

- 1-2. *Perichaena vermicularis*, 1. Spores, $\times 2010$; 2. Capillitium, $\times 2000$.
 3-5. *Trichia scabra*, 3. Spores, surface view, $\times 2010$; 4. End part of the elater; 5. Spores, showing the surface reticulation.

5. *P. vermicularis* (Schw.) Rost., Mon. App. 34, 1876. (Pl. II, 1-2; Pl. X, 4)

Fructification a plasmodiocarp, brownish olive, branched and elongate, to short & pulvinate, 0.2-0.3 mm broad, on a membranous hypothallus; peridium of two closely combined layers, the outer opaque, leathery, and granular, the inner membranous and papillate; capillitium of yellow threads, slender, 2-3.5 μ in diameter, rough with minute scattered warts or spinules; spores chamois color in mass, pale yellow by transmitted light, globose, subglobose, 12.5-14 μ in diameter.

•Habitat: On bark of dead twigs.

Specimen examined: Taipei City: CHLM 196, Mar. 20, 1981.

This fructification is quite obscure mainly due to its dull colored outer peridium. The large, closely spinulose or warted spores, and the roughened capillitial threads are distinctive characteristics separating this species from all other members of *Perichaeana*.

6. *Trichia scabra* Rost., Mon. 258, 1875. (Pl. II, 3-5; Pl. X, 5)

Sporangia sessile, crowded, on an extensive hypothallus, golden brown before opening, orange becoming darker as Mars-Yellow when the capillitium and spores exposed, globose or turbinate, about 0.4 mm in diameter; peridium membranous, translucent, shining, papillate within; elaters simple, or coiled, 6-7 μ in diameter, bearing 3 or 4 spiral bands, the spiral bands spinulose; spores orange or yellow in mass, yellowish by transmitted light, surface banded reticulate or warted reticulate, 10-12 μ in diameter.

Habitat: On decaying wood.

Specimen examined: Nan-T'ou Hsien, Yü-Ch'ih Hsiang, Sun-Moon Lake: CHLM 392, Oct. 26, 1981.

A new record for Taiwan. The growth habit, the sessile sporangia and the reticulate spore surface markings are distinctive characteristics of this species.

Didymiaceae

7. *Diachea leucopodia* (Bull.) Rost., Mon. 190, 1874. (Pl. III, 1-3; Pl. XIII, 4)

Sporangia gregarious, metallic bronze, cylindrical or conical, stipitate, total height 0.8-1.8 mm, 0.4-0.6 mm in diameter; stalk snow white, brittle, calcareous, stout, hollow, filled with lime granules and orange-colored spherules, as long as or a little bit longer than the length of the sporangium, tapering upward; peridium thin, transparent, membranous, evanescent, or below as petalloid remains; hypothallus white, restricted at the individual base; columella white, calcareous, tapering, over half the height of the sporangium; capillitium arising from the columella, consisting of branching and anastomosing flexuous threads, brownish; spores dark-colored (nearly black) in mass, 7.5-8.5 μ in diameter, rounded, faintly warted, brownish gray by transmitted light.

Habitat: On decaying leaf, wall of a plastic flower pot.

Specimen examined: Taipei City: CHLM 394, Nov. 18, 1981; Nan-T'ou Hsien, Yü-Ch'ih Hsiang, Lien-Hwa Ch'ih: CHLM 381, Oct. 25, 1981.

A very striking species. It is easily recognized in the field by the white calcareous stalk, the dark-colored, conical sporangia.

8. *Diderma hemisphaericum* (Bull.) Hormem., Fl. Dan. 33:13, 1829. (Pl. III, 4; Pl. XII, 2)

Sporangia gregarious, discoid, often depressed above, up to 1.5 mm in diameter, white, stipitate, appearing sessile in some; stalk stout, short, longitudinally furrowed, dark, or frosted with lime; peridium double, the outer layer white, opaque, calcareous, closely appressed to the inner layer, often breaking at the margins, the inner layer grayish and rupturing irregularly;

columella broad, pinkish; hypothallus membranous, discoid, restricted at the individual base; capillitium delicate, the threads colorless or pale-colored; spores black brown in mass, pale yellowish brown by transmitted light, minutely warted, the warts often clustered, 7.5–8.5 μ in diameter.

Habitat: On decaying leaf, wood.

Specimen examined: Taipei City: CHLB 55, Mar. 18, 1982.

The sporangia may appear as sessile when seen from above. The short stalk is often completely hidden under the broad discoid white sporangia. It is well-marked by the disc-like white sporangia.

9. *Diderma platycarpum* Nann.-Brem., K. Ned. Akad. Wet. Proc. C.

69:359, 1966.

(Pl. III, 5–7; Pl. XII, 3)

Fructification plasmodiocarpous, white, depressed, very thin; peridium double, the outer layer white, smooth as egg-shell, composed of small lime granules, the inner layer membranous, smoky or brownish, separating from but close to the outer layer; columella absent; capillitial threads colorless or cream white, delicate, slender, same width throughout; spores bister in mass, brownish by transmitted light, subglobose, faintly warted, 9–10 (–12) μ in diameter; plasmodium yellow.

Habitat: On leaf litter, collected from a moist-chamber development.

Specimen examined: Kao-Hsiung Hsien, Ken-Ting National Park: CHLB 15b, Aug. 25, 1981.

This is a new record of Taiwan. The fructification appeared in the same dish of *Didymium serpula* (CHLB 15a). It was described as known only from the type collection (Martin and Alexopoulos, 1969). Apparently it is also a rare species. Our specimen has the characteristics of having no columella and having large spores (up to 12 μ) which agree with Nanneng-Bremekamp's variety *platycarpum* very well.

10. *Didymium iridis* (Ditmar) Fries, Syst. Myc.

(Pl. IV, 1–2; Pl. V, 2; Pl. XII, 1)

3:120, 1829.

Sporangia gregarious, stipitate, white, globose, somewhat flattened at the base, 0.4–0.6 (0.7) mm in diameter, with a small umbilicus below, total height 1.3–1.8 mm, erect, nodding only in few; stalk long, tapering upward, 0.8–1.3 mm long (about 2/3 of the total height), limeless, longitudinally furrowed, dark brown and shining, appearing translucent orange brown under high dry lens; hypothallus discoid, membranous, orange brown, conspicuous; peridium membranous, transparent, densely covered with white lime crystals; columella present, stalked, globose, or turbinate, whitish; capillitium abundant, of colorless or palid, branched and anastomosing threads, radiating from the columella; spores black brown in mass, bright violaceous brown by transmitted light, globose, faintly warted, nearly smooth under high dry lens, 8.5–10 μ in diameter; plasmodium brown.

Habitat: On bark of living tree, collected from a moist-chamber development.

Specimen examined: Kao-Hsiung Hsien, Ken-Ting National Park: CHLB 23, Aug. 25, 1981.

Our collection agree with *D. iridis* in general. The most distinctiveness of our specimen is the color of the columella and of the stalk. Columellum of our collection is stalked, appears brown, turbinate or ovoid in shape. But it was then found, after several sporangial dissections being made, that the most outer layer of the columella seems to be a white membrane, this membrane is readily broken away when dissected. The stalk is limeless, shining, dark brown, but appears translucent orange brown under high dry lens by transmitted light

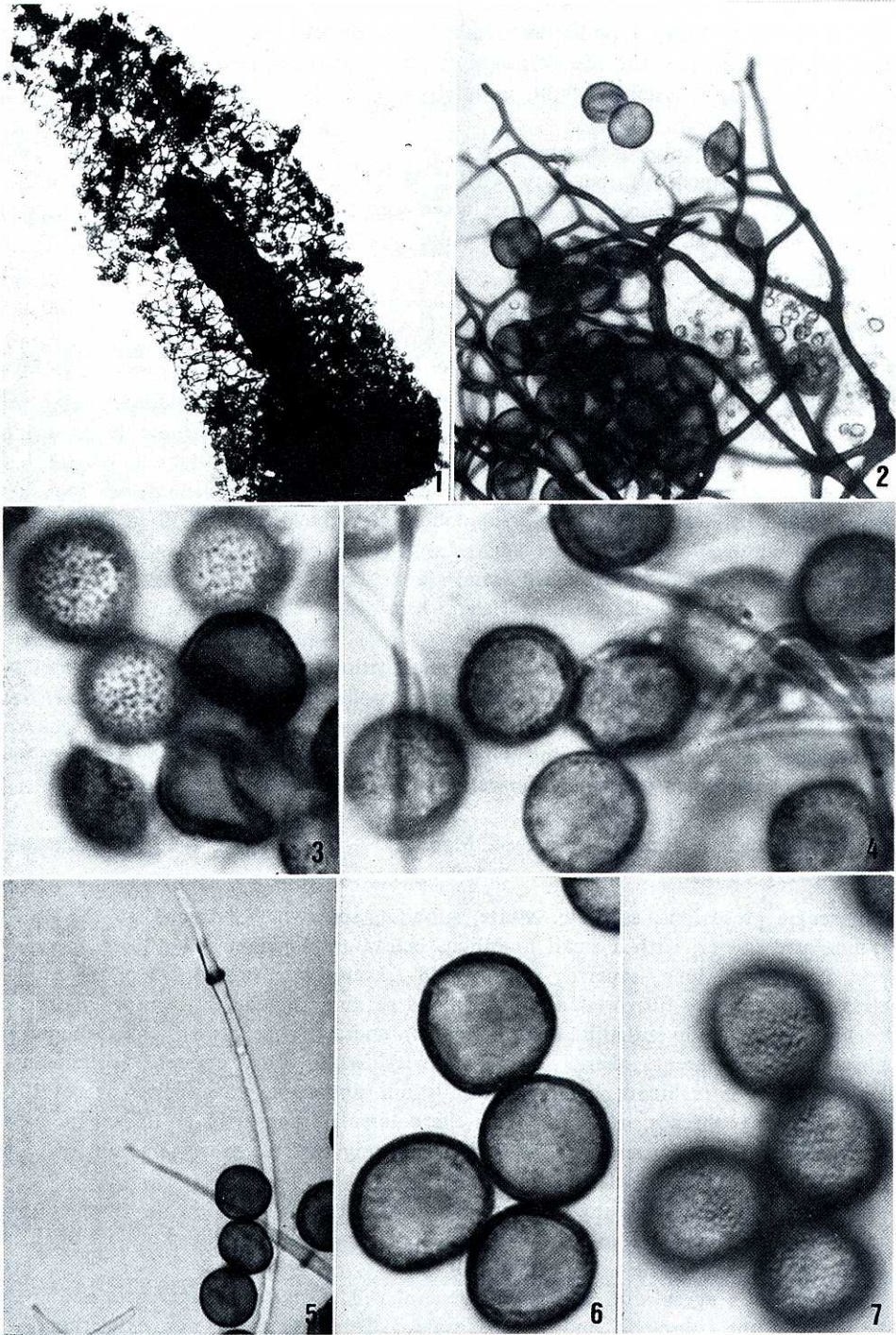


Plate III

- 1-3. *Diachea leucopodia*, 1. Sporangium, showing the columella, $\times 80$; 2. Capillitium, $\times 800$; 3. Spores, optical section, $\times 2010$.
 4. *Diderma hemisphaericum*, spores, $\times 2010$.
 5-7. *D. platycarpum*, 5. Capillitial thread, $\times 800$; 6. Spores, marginal view, $\times 2010$; 7. Spores, surface view, $\times 2010$.

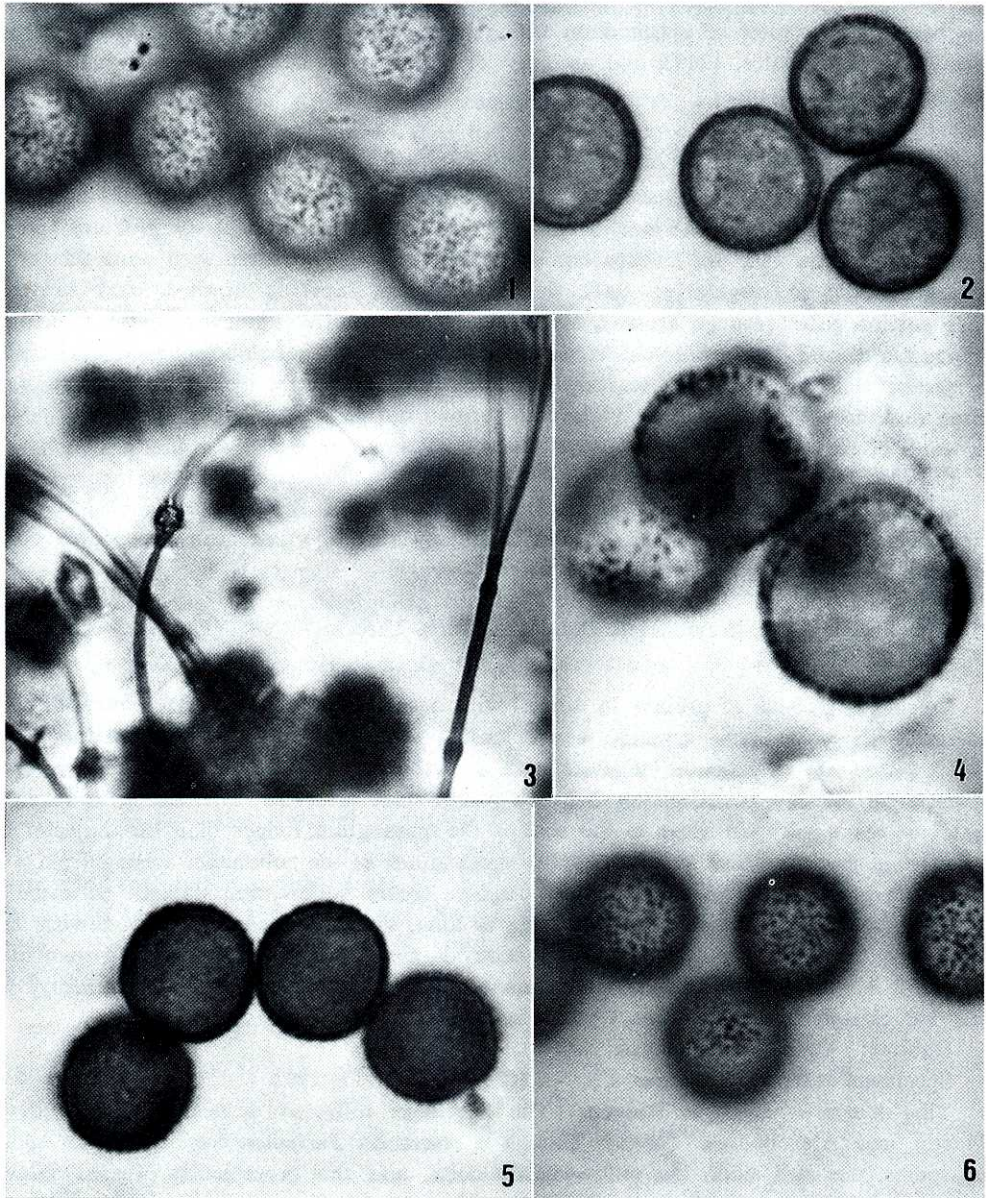


Plate IV

- 1-2. *Didymium iridis*, Spores, $\times 2010$, 1. Surface view; 2. Marginal view.
3-4. *D. nigripes*, 3. Capillitium, $\times 800$; 4. Spores, optical section, $\times 2350$.
5-6. *D. ovoideum*, Spores, $\times 2010$, 5. Marginal view; 6. Surface view.

This specimen was identified as *D. nigripes* (Link) Fries at first, but is now named as *D. iridis* based on the color of plasmodium which in *D. iridis* is described as yellowish or brown (Martin and Alexopoulos, 1969), and as gray or colorless in *D. nigripes*. Our collection has dark brown plasmodium.

11. *D. nigripes* (Link) Fries, Syst. Myc. 3:119, 1829. (Pl. IV, 3-4; Pl. V, 1; Pl. XII, 4)

Sporangia gregarious, stipitate, white, globose, somewhat compressed at the base, with a small umbilicus below, 0.4-0.8 mm in diameter, nodding, total height up to 2 mm; peridium membranous, brownish, not transparent by transmitted light, covered with white lime crystals, opening petaloid or irregularly; stalk slender, limeless, tapering upward, dark brown, the upper portion paler (orange brown), translucent by transmitted light, longitudinally furrowed; hypothallus discoid, dark in color; columella present, brown, subglobose; capillitium delicate, the thread slender, branched, scarcely anastomosing, brownish, bearing dark thickenings; spores dark brown in mass, pale violaceous brown by transmitted light, prominently warted, the warts often clustered. 11-12 μ in diameter.

Habitat: On decaying leaves.

Specimen examined: Taipei Hsien, Wu-Lai Hsiang, CHLB 42, Mar. 15, 1982.

A species very close to *D. iridis*. But it differs from the latter in the brown color of columella which in *D. iridis* is white.

12. *D. ovoideum* Nann.-Brem., Med. Bot. Mus. Herb. Utrecht (Pl. IV, 5-6; Pl. XII, 5)
150:780, 1958.

Sporangia globose or prolate in some, with a small umbilicus at the center of the base, covered with white lime crystals which loosely scattering in thick layer on the peridium. 0.3-0.5 (-0.6) mm in diameter, stipitate with a total height up to 1 (0.7-1.0) mm, gregarious or scattered, solitary, occasionally 2-3 in a group; stalk somewhat attenuating upwards, dark, lighter at the upper part close to the base of the sporangium, longer than the diameter of the sporangium, furrowed and penetrating the sporangium as the columella, arising from a small circular hypothallus; columella discoid, rugose, cream yellow, and stalked; peridium membranous, translucent; capillitium consisting of long, slender, limeless, and yellowish threads which are branching and anastomosing with darker swellings; spores dark brown in mass, globose, 8-9 (-10) μ in diameter, violaceous brown by transmitted light, prominently warted with 1-3 clusters of more compact warts in one hemisphere.

Habitat: On decaying leaves.

Specimen examined: Taipei City: CHLB 34, Mar. 11, 1982.

This is a new record of Taiwan. The specimen collected is not as tall as described (Martin and Alexopoulos, 1969). Though it resembles *Didymium iridis* in size of sporangia and spores, the dark stalk, the yellowish columella, and the prominently warted spores are distinct characteristics of this species.

13. *D. serpula* Fries, Syst. Myc. 3:126, 1829. (Pl. VI, 1-2; Pl. XI, 1)

Fructifications scattered, rounded or in patches of small and large thin, flat plasmodiocarp, appearing olive gray if covered by thin layers of lime crystals, white but rough when densely coated with lime crystals; peridium membranous, translucent, covered with stellate lime crystals; columella lacking; capillitial threads notably branched and limeless, slender, light brownish, pale at the apex; spores bister in mass, pale brownish by transmitted light, globose, short ovoid or oblong, mostly 7.5-10 μ (-12 μ) in diameter, very minutely warted, mingled with some abnormally large spheres; plasmodium yellow.

Habitat: On leaf litter, collected from a moist-chamber development.

Specimen examined: Kao-Hsiung Hsien, Ken-Ting National Park: CHLB 15a, Aug. 25, 1981.

This is a new record of Taiwan. The fructifications were collected in the lab by the use of the moist-chamber technique. The leaf litter was collected in August and placed in moist chamber on 8th of October. Fruitings appeared on 18th of November. This specimen is distinctive by the thin flat plasmodiocarps which are olive gray or white depend on the thickness of the surface white lime crystals. The presence of the abnormally large vesicular bodies in the sporangium is also a characteristic of this rare species.

14. *D. squamulosum* (Alb. & Schw.) Fries, Symb. Gast. 19, 1818. (Pl. VI, 3-6; Pl. XI, 4)

Sporangia stipitate, but vary to nearly sessile in some, total height up to 1 mm, closely gregarious, globose, subglobose, 0.4-0.6 mm in diameter, snow white, below with a small umbilicus into which the stalk penetrating; stalk stout, limy, cream yellow, as long as or longer than the width of the sporangium, longitudinally furrowed; peridium membranous, transparent, covered with a thick white lime crust of stellate crystals, the lime crust remained as scale-like pieces when rupturing and the spores dehiscent; hypothallus membranous, restricted at the base of the individual sporangium, cream yellow, or transparent; columella present, discoid, or spherical, pale as cream yellow; capillitium abundant, consisting of long, scarcely branched threads which usually bear conspicuous node-like swellings, colorless or pale; spores dark brown in mass, violaceous brownish yellow by transmitted light, 9-10 (-12) μ in diameter, prominently warted, the warts forming 2-3 more compact clusters in one hemisphere.

Habitat: On decaying leaves, straw, and other dead plant remains.

Specimen examined: Taipei City: CHLB 35, Mar. 12, 1982; CHLB 59, CHLB 60, CHLB 61, Mar. 18, 1982.

The sporangia when collected were fresh but perfectly developed. They distributed widely in the same area on the ground site and also on the dead part of the hanging vines. Sporangia of specimen # CHLB 69 are all short-stalked, some even appear sessile because the short stalk is buried in the umbilicus. Spores of the same collection are larger, 10-12 μ in diameter. Effused sporangia are also found in this collection but the individual sporangia remain recognizable.

15. *D. verrucosporum* Welden, Mycologia 46:98, 1954. (Pl. VII, 1-4; Pl. XI, 2)

Sporangia stipitate, total height 1.2-1.5 mm, globose, or oblate, 0.4-0.5 mm in diameter, with a small umbilicus below, nodding, white, for the presence of white lime crystals on the whole surface of the peridium; stalk long, limeless, dark brown at the base, translucent, and appearing yellowish brown toward apex, tapering upwards, arising from the discoid hypothallus; hypothallus dark brown, right at the base of the stalk, translucent with stripes of brown color radiating toward the margins; columella globose, or compressed more or less, stalked to the center of the sporangium, white; capillitium abundant, yellowish or brownish, branching and bearing dark swellings, limeless; spores black brown in mass, violaceous brown by transmitted light, distinctly warted, with 1-3 clusters of more compact warts in one hemisphere, 9-11 μ in diameter.

Habitat: On straw.

Specimen examined: Taipei City: CHLB 64, Mar. 5, 1982.

This is a new record of Taiwan. There are only three sporangia collected. It resembles *D. nigripes* in the outer appearance, but differs from the latter in the pure white columella and from the *D. iridis* in the nodding sporangium.

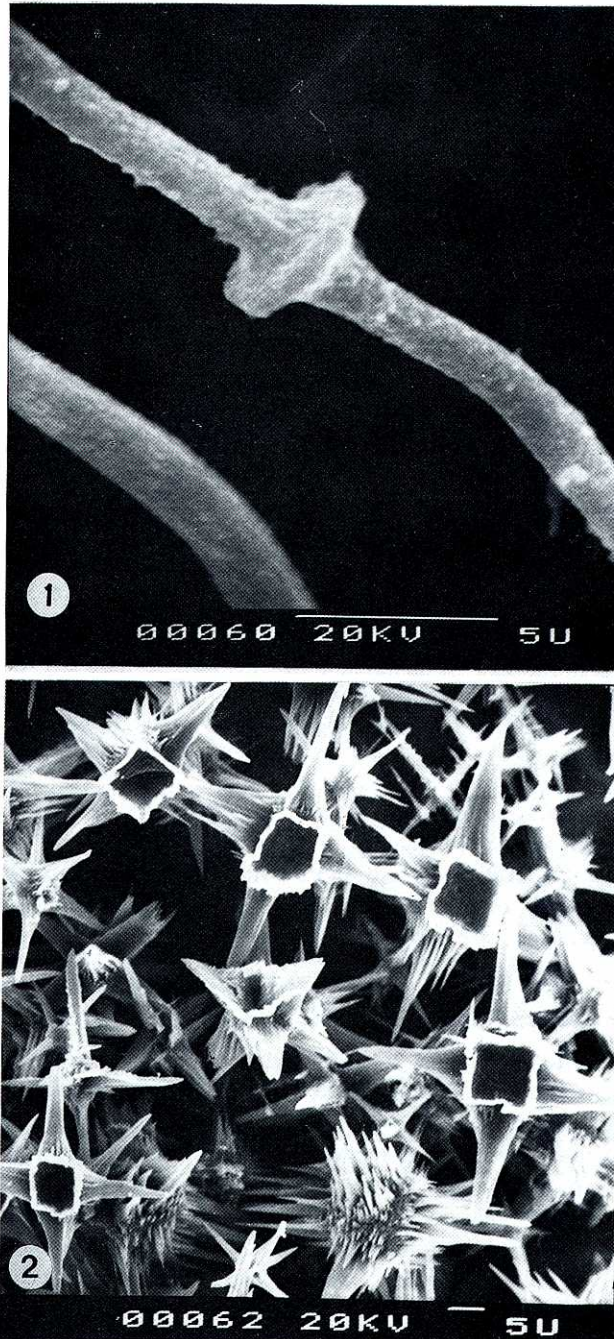


Plate V

1. *Didymium nigripes*, part of capillitial thread.
2. *D. iridis*, lime crystals on the peridium.

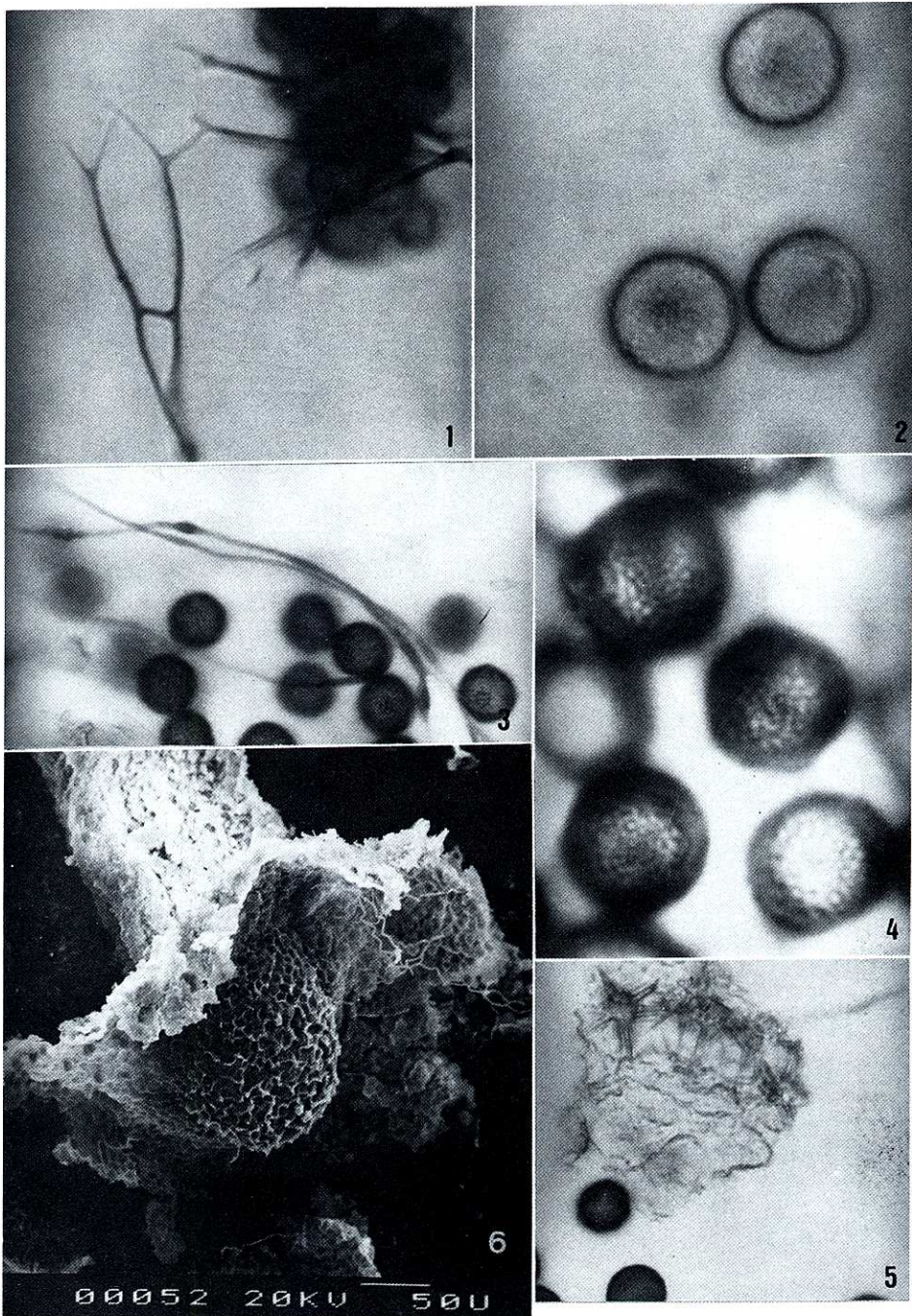


Plate VI

- 1-2. *Didymium serpula*, 1. Capillitium, $\times 800$; 2. Spores, surface view, $\times 2010$.
 3-6. *D. squamulosum*, 3. Capillitium and spores, $\times 800$; 4. Spores, $\times 2010$; 5. Lime crystals on the peridium, $\times 800$; 6. Basal part of sporangium, showing the columella and the limy stalk.

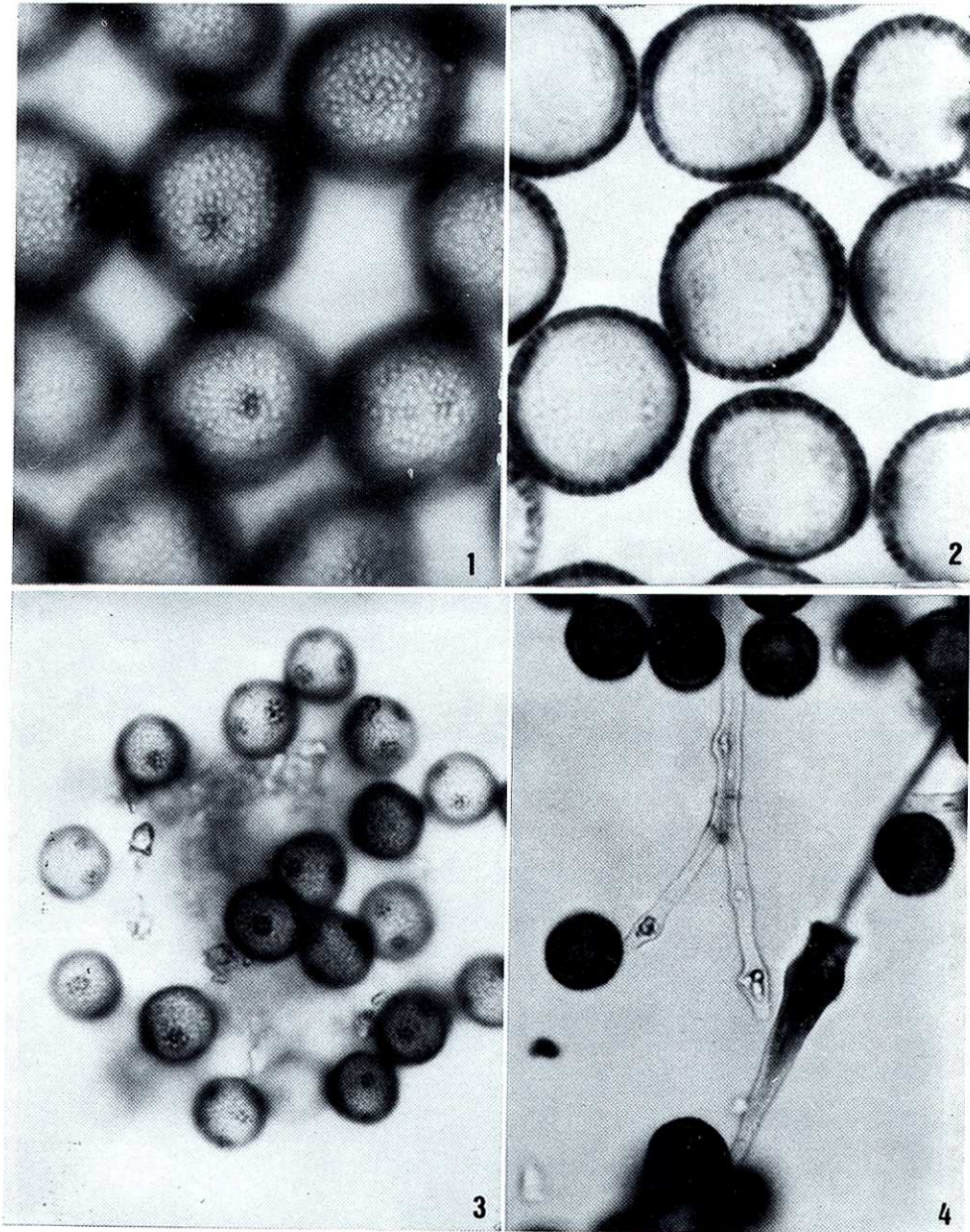


Plate VII

- 1-4. *Didymium verrucosporum*, 1-2. Spores, $\times 2350$, 1. Surface view; 2. Marginal view; 3. Spores and lime crystals, $\times 800$; 4. Capillitium, branched, $\times 800$.

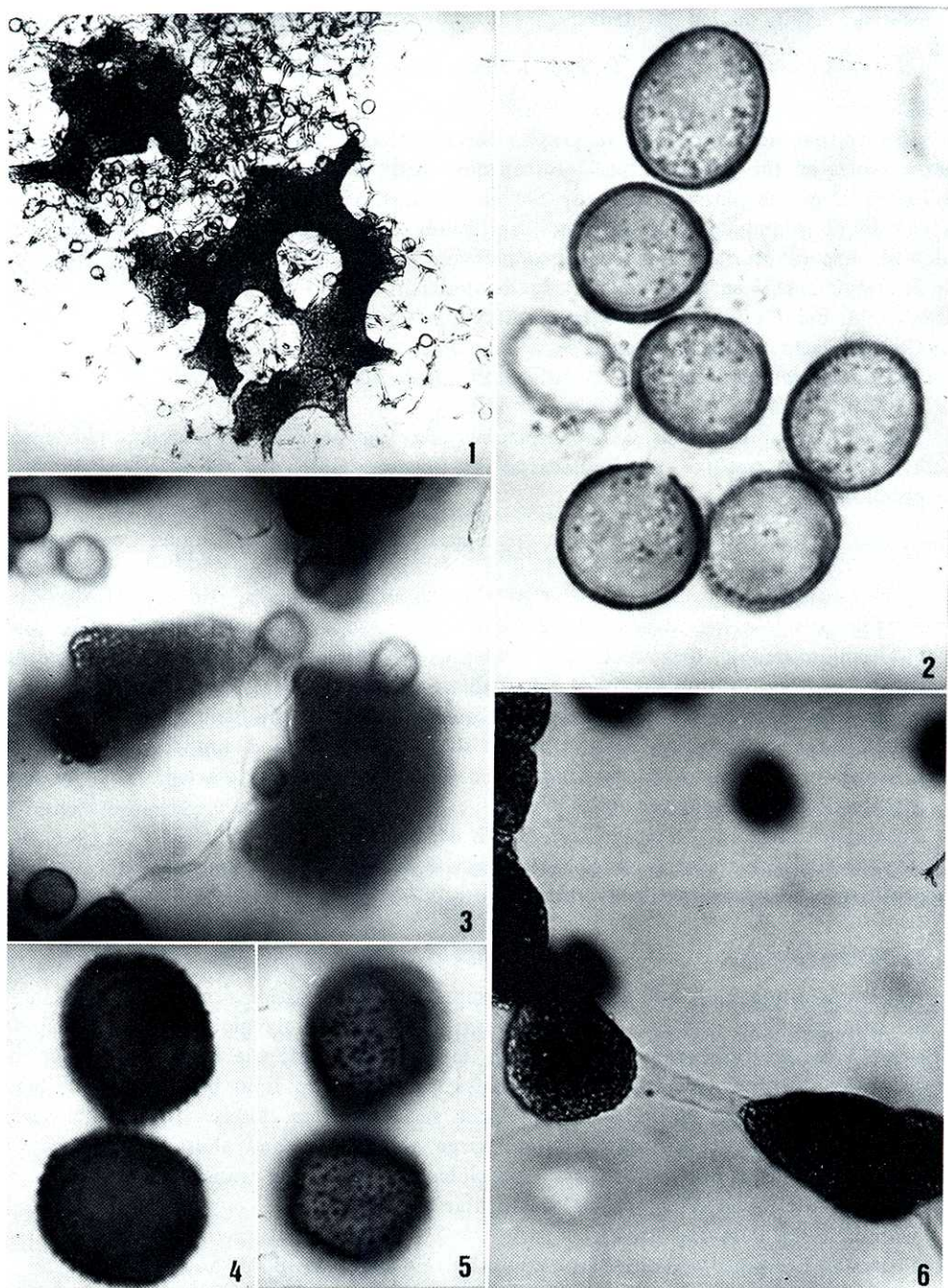


Plate VIII

- 1-2. *Cienkowskia reticulata*, 1. Capillitium and the lime plates, $\times 200$; 2. Spores, $\times 2010$.
 3. *Physarum bivalve*, Capillitium, $\times 800$.
 4-6. *P. compressum*. 4-5. Spores, $\times 2010$, 4. Marginal view; 5. Surface view;
 6. Capillitium, $\times 800$.

Physaraceae

16. *Cienkowskia reticulata* (Alb. & Schw.) Rost., Mon. 91, 1874. (Pl. VIII, 1-2; Pl. XI, 3)

Fructification a plasmodiocarp, pulvinate, cylindrical, net-like, 0.3-0.5 mm in diameter, buffy brown, ochraceous orange, to grayish olive, scattered with ox-blood red spots and white lime granules on the peridium; peridium opaque, cartilaginous, dehiscent transversely or along the long axis of the plasmodiocarp, in the inside surface of peridium along the long axis marked by a prominent fine groove; capillitium duplex, consisting of an elastic, flexuose, yellowish, fine tubules and lime-deposited plates which perforated and dividing the interior into incomplete segments; spores dark lead-colored in mass, light ochraceous brown by transmitted light, densely warted, 8.5-10 μ (mostly 9 μ) in diameter.

Habitat: On the bark of dead logs.

Specimen examined: Nan-T'ou Hsien, Yü-Ch'ih Hsiang, Sun-Moon Lake: CHLM 336, Apr. 8, 1981.

The duplex capillitium is very conspicuous after the peridium ruptured. This species is distinctive on the net-like plasmodiocarp, the limy peridium, and the scattered red spots on the peridium.

17. *Physarum bivalve* Pers., Ann. Bot. Usteri 15:5, 1795. (Pl. VIII, 3; Pl. XI, 5)

Fructifications plasmodiocarpous, or pulvinate sporangia, sitting on the substratum by a narrow line or a constricted base, 0.5-0.6 mm wide, up to 4 mm long, ochraceous, or Isabella-color; peridium double, the outer layer calcareous, white and limy on the inside surface of the outer peridium, opaque, ruptured from the preformed fissures which are more or less longitudinal or lobate, the inner layer delicate, translucent; capillitium abundant, the white lime knots large and angular, connecting the short, colorless, and branched threads; spores black brown in mass, brownish by transmitted light, very minutely warted, 8-9 μ in diameter.

Habitat: On decaying leaves.

Specimen examined: Taipei City: CHLB 44, Mar. 15, 1982.

A very distinctive species and a new record for Taiwan. The color and form of plasmodiocarps are characteristics readily recognized.

18. *P. compressum* Alb. & Schw., Consp. Fung. 97, 1805. (Pl. VIII, 4-6; Pl. XIII, 2)

Sporangia gregarious, white, laterally compressed, fan-shaped, reniform, conical or, more or less hemispherical, stipitate, total height up to 1.5 mm, rarely globose; Stalk stout, frosted with thin layer of lime granules, furrowed, tapering upward; the basal hypothallus discoid, transparent or frosted with white lime granules; peridium thin, light brown, opaque, the outer surface with white lime granules which form small clusters closely covering the peridium; capillitium abundant, consisting of white large lime knots and short transparent tubular threads; spores dark brown in mass, dark violaceous brown by transmitted light, 11-12 μ in diameter, minutely warted, more or less angular in shape.

Habitat: On decaying leaves.

Specimen examined: Taipei Hsien, Wu-Lai Hsiang: CHLB 43, Mar. 14, 1982.

A very well-marked species. It is readily recognized by the laterally compressed fan-shaped sporangia. The lobate and plasmodiocarpous sparangia are not found in our collection.

19. *P. melleum* (Berk. & Br.) Masee, Mon. 278, 1892. (Pl. IX, 5; Pl. XIII, 1)

Sporangia gregarious, apricot orange to vinaceous rufous, globose, 0.4-0.5 mm or less in diameter, stipitate, 0.8 mm in total height; stalk stout, snow white, calcareous cylindrical or

slightly tapering upward, furrowed, hollow, mostly longer than the height of the sporangium; peridium yellowish, transparent, membranous, rugose, encrusted with white and yellow lime granules, persistent below; hypothallus white or colorless, restricted at the individual base; columella present, minute, conical, white or yellowish; capillitium abundant, consisting of delicate, branching, hyaline threads, with large white lime knots which usually angular in shape; spores dark brown in mass, pale violet-brown by transmitted light, minutely warted, 8–9 μ in diameter.

Habitat: On straw.

Specimen examined: Taipei City: CHLB 36b, Mar. 13, 1982.

This is a very well-marked species. The sporangia when collected from the field are bright apricot orange when young. The color turned to dark olivaceous, then to vinaceous rufous at maturity. The followings are the distinctive characteristics of this species: sporangia globose, erect in position, rugose and limy, yellow, white cylindrical stalks and the minute conic yellowish columella.

20. *P. pusillum* (Berk. & Curt.) G. Lister, Mycet. ed. 2. 64, 1911. (Pl. IX, 2–3; Pl. XIII, 3)

Sporangia gregarious, stipitate, globose, or lenticular, white or grayish white, 0.3–0.5 mm in diameter, total height 0.8–1.5 mm, often with a brown, thickened and persistent base; stalk limeless, tapering upward and merging into the base of the sporangium, yellow brown or red brown above, turning to deep brown close to the base, furrowed; peridium thin, rugose, incrustated with clusters of white lime granules, often thickened and rufous at the base; columella lacking; capillitium conspicuous, consisting of colorless, short and branching tubules, and large white lime knots; spores dark brown in mass, pale violaceous brown by transmitted light, globose, subglobose, minutely warted, the warts often forming clusters on the surface, 10–12 μ in diameter.

Habitat: Bark of dead wood, straw.

Specimen examined: Taipei City: CHLM 194, Mar. 20, 1981; CHLB 36a, CHLB 37, Mar. 13, 1982.

This species is distinct in the followings: the erect white sporangia, the thickened, rufous sporangial base, the tapering yellow brown stalks, and the large, angular, white lime knots.

21. *P. sessile* Brandza, Ann. Sci. Univ. Jassy 11:116, 1921. (Pl. IX, 4; Pl. XI, 6)

Sporangium sessile, erect rounded, or prostrate elongated, or somewhat sinuous in form, white, or orange, 0.4–0.5 mm in diameter, the lime granules forming a rugulose crust compactly covered the peridium, sitting on the substrate by a wide base; peridium membranous, translucent, densely covered by white lime granules of about 1–2 μ ; columella lacking; capillitium abundant, with many rounded or angular whitish lime knots connecting the colorless short capillitial threads; spores black brown in mass, globose, subglobose, 7–8 (–9) μ in diameter, minutely and obscurely warted, nearly smooth under high dry lens; plasmodium light yellow.

Habitat: On leaf litter.

Specimen examined: Kao-Hsiung Hsien, Ken-Ting National Park: CHLB 13, CHLB 14, Aug. 25, 1981.

This is a new record for Taiwan. The sporangia were collected from the moist-chamber development after one to one and half month cultivation in the lab. Sporangia of various colors were gathered: white in specimen CHLB 13, due to the white lime granules; orange with pale yellowish ornamenting bands in specimen CHLB 14. The sporangia of CHLB 14 are probably the kind of young, immaturred ones. If so, that the plasmodium of our collection

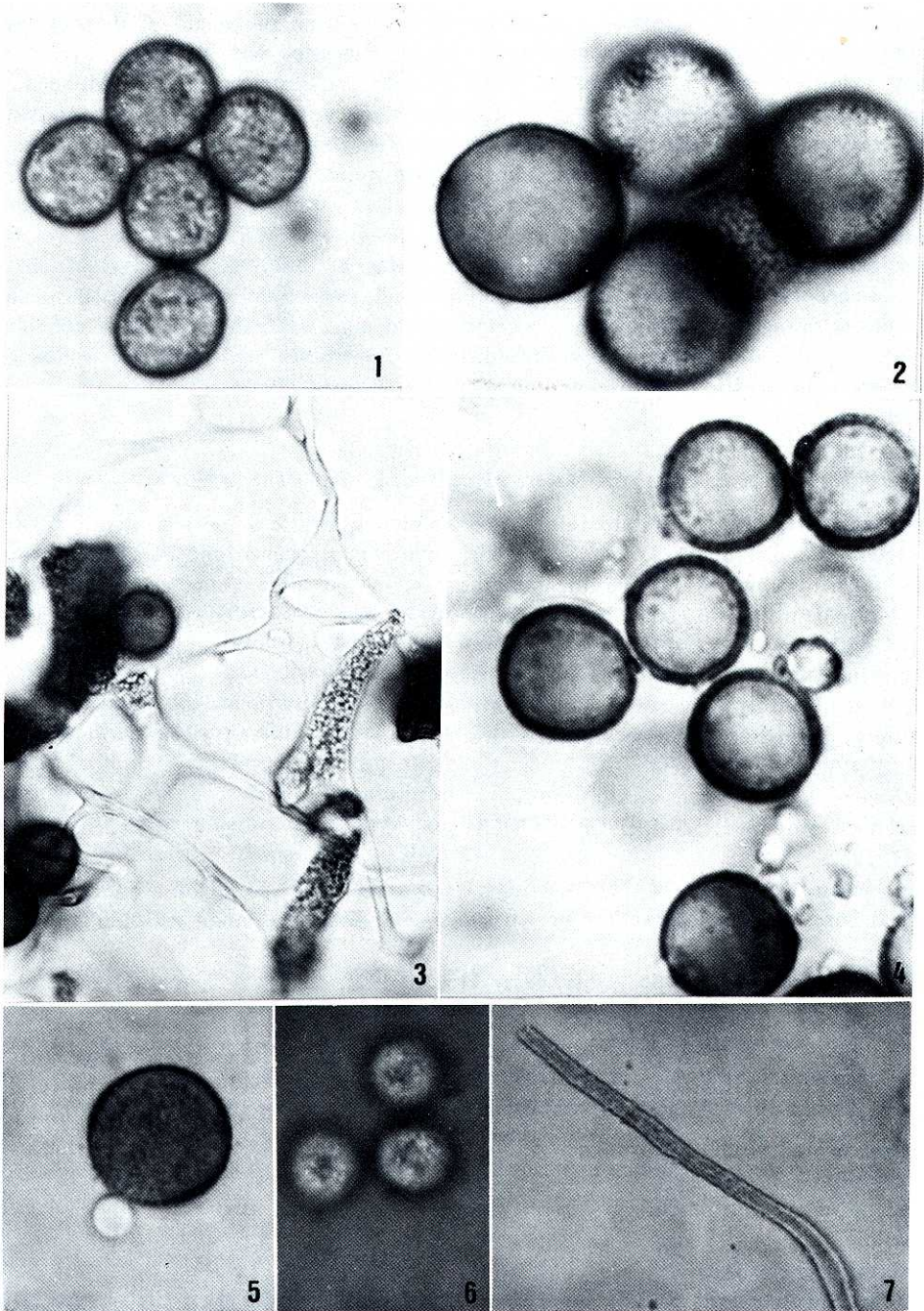


Plate IX

1. *Physarum straminipes*, spores, optical sections, $\times 2010$.
- 2-3. *P. pusillum*, 2. Spores, $\times 2350$; 3. Capillitium, $\times 830$.
4. *P. sessile*, Spores, marginal view, $\times 2010$.
5. *P. melleum*, Spore, $\times 2010$.
- 6-7. *Lycogala conicum*, 6. Spores, surface view, $\times 2010$; 7. Pseudocapillitium, $\times 800$.

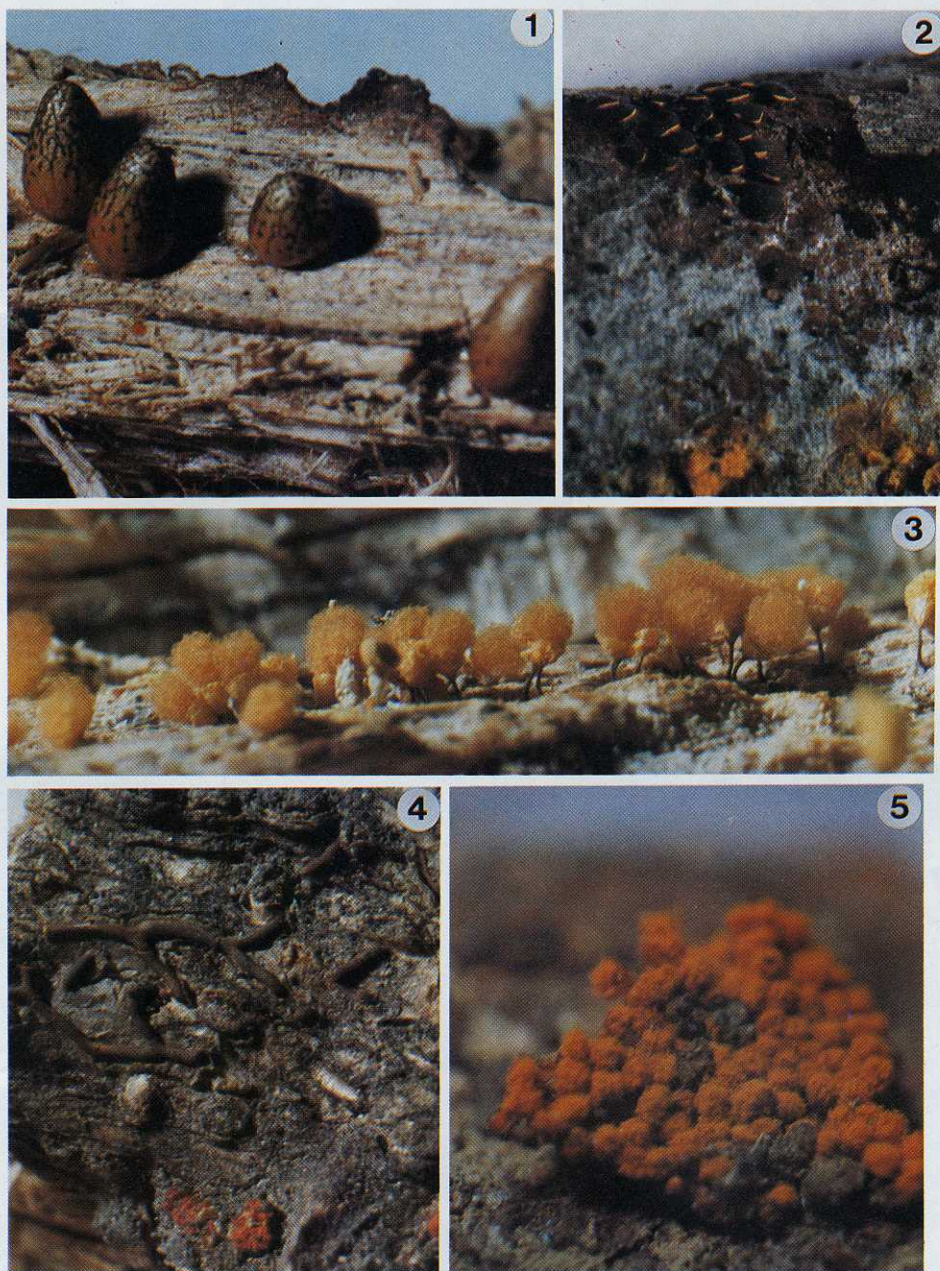


Plate X

1. *Lycogala conicum*, $\times 8$.
2. *Perichaeana depressa*, $\times 7.5$.
3. *Hemitrichia calyculata*, $\times 8$.
4. *Perichaeana vermicularis*, $\times 8$.
5. *Trichia scabra*, $\times 8$.

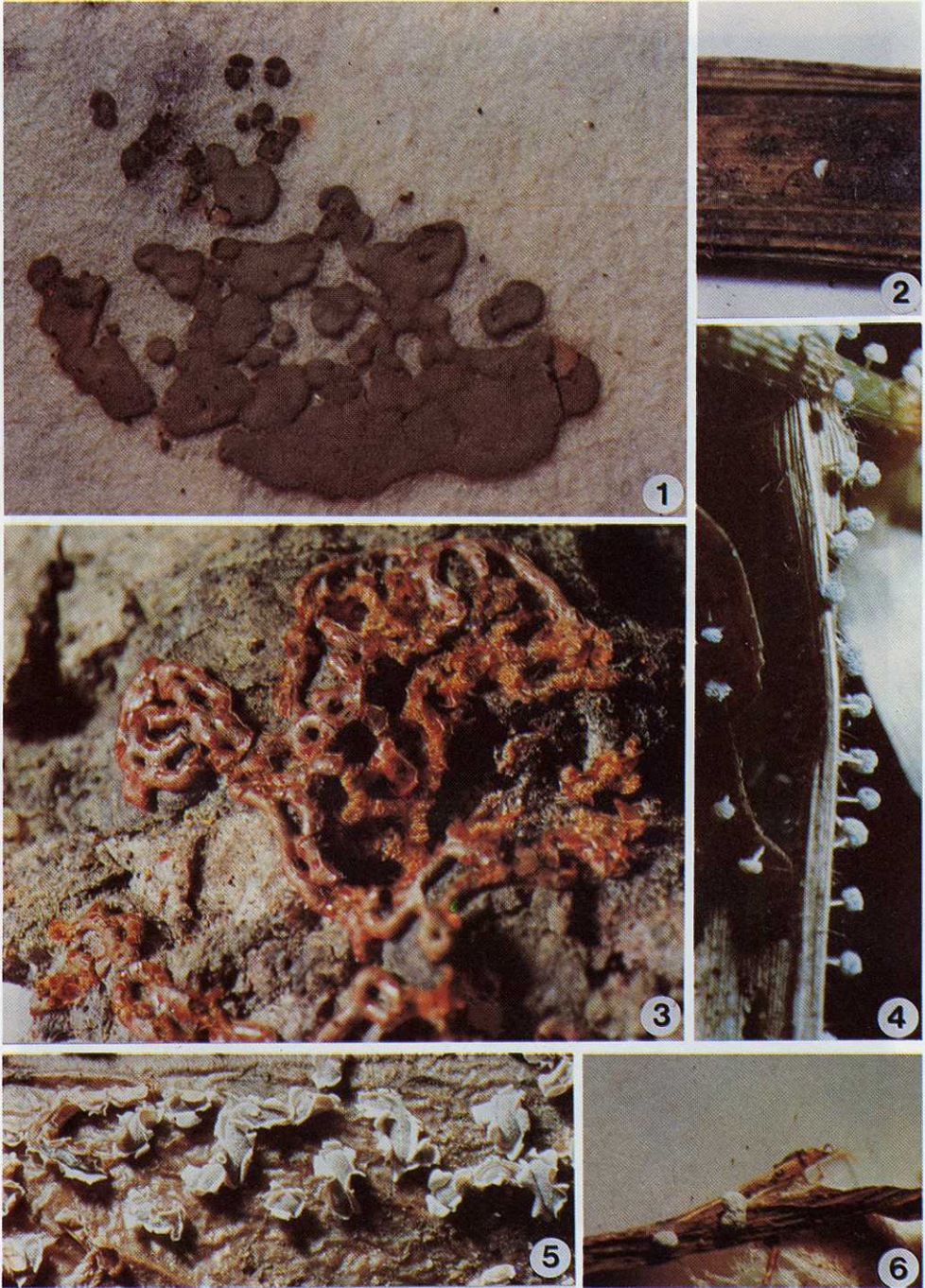


Plate XI

- | | |
|---|---|
| 1. <i>Didymium serpula</i> , $\times 8$. | 4. <i>Didymium squamulosum</i> , $\times 7.5$. |
| 2. <i>D. verrucosporum</i> , $\times 7.5$. | 5. <i>Physarum bivalve</i> , $\times 7.5$. |
| 3. <i>Cienkowskia reticulata</i> , $\times 7.5$. | 6. <i>Physarum sessile</i> , $\times 7.5$. |

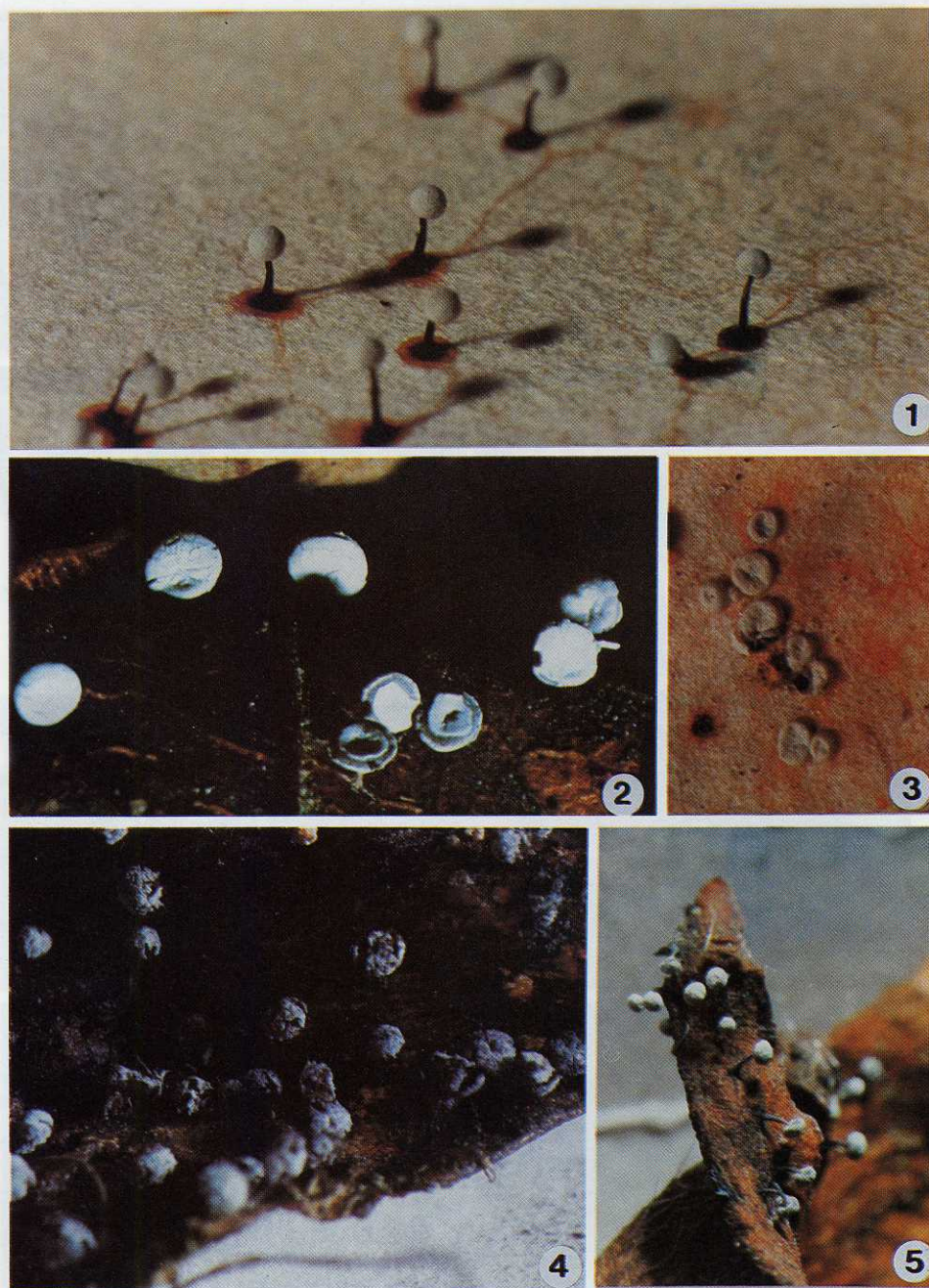


Plate XII

1. *Didymium iridis*, $\times 10$.
2. *Diderma hemisphaericum*, $\times 10.5$.
3. *D. platycarpum*, $\times 8$.
4. *Didymium nigripes*, 7.5 .
5. *D. ovoideum*, $\times 7.5$.

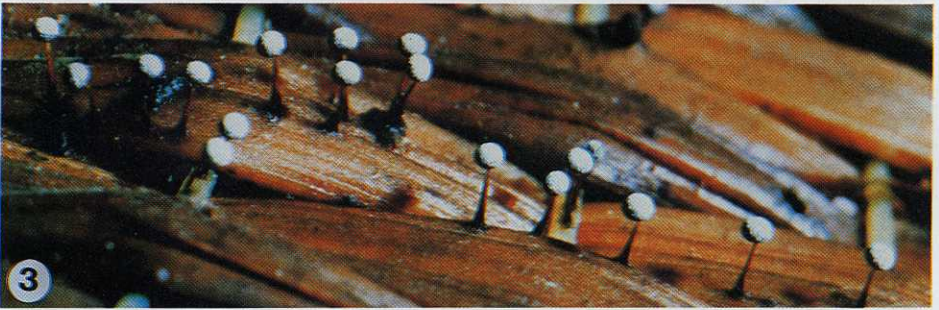
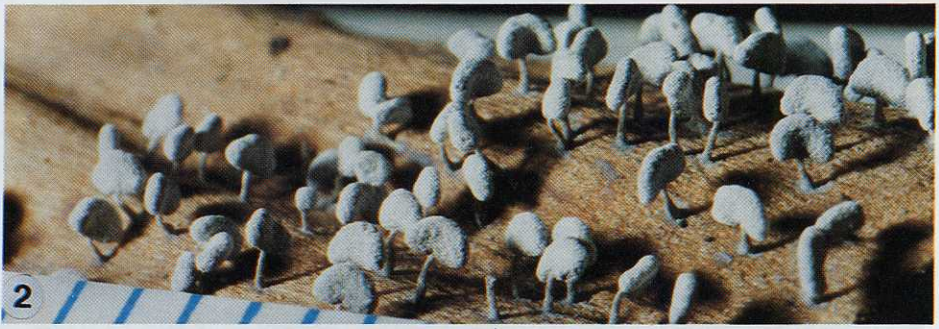


Plate XIII

1. *Physarum melleum*, $\times 7.5$.
2. *P. compressum*, $\times 7.5$.
3. *P. pusillum*, $\times 7.5$.
4. *Diachea leucopodia*, $\times 8$.

must be turning from pale yellow to orange during the differentiation. Plasmodium is also described as orange (Lister, 1925), and as grayish white (Martin and Alexopoulos, 1969). The variation in color of plasmodium is probably only a matter of environmental effect, because we also found the yellowish orange scleritium pieces in our collection (CHLB 14).

22. *P. straminipes* A. Lister, Jour. Bot. 36:163, 1898. (Pl. IX, 1)

Sporangia reniform, subglobose, or sausage-like and strongly curved to appear as globose, white, the umbilicus below shallow and yellow brown, 0.3-0.5 mm in diameter, scattered or clustered on long or short stalks, often 2 or more on a single stalk; stalk straw-colored, transparent, weak, flattened and brittle when dry, erect with nodding sporangia, or more often prostrate, and branched, about 0.7 mm long; peridium transparent, membranous, covered densely by patches of white lime granules, brownish at the umbilicate base; pseudocolumella present, white, at the center free from the base, elongate and banana-like; capillitium a network of colorless branched tubules with numerous rounded white lime knots; spores nearly black in mass, yellowish brown by transmitted light, globose, subglobose, 7-8 μ in diameter, nearly smooth under high dry lens, densely warted under oil immersion.

Habitat: On dead wood of cajuput-tree (*Melaleuca leucadendron* Linn.).

Specimen examined: Taipei City: CHLM 55a, May 26, 1980.

A new species to Taiwan. This specimen is distinguished by the weak often branched, straw-colored sporangial stalks, and the elongate, white pseudocolumella. Spores of our specimen are much smaller than as described in the references (Emoto, 1977; Martin and Alexopoulos, 1969; Lister, 1925). It probably represents a variety of the species. Since the number of collected sporangia are few, more collections or cultural fructifications are necessary for further identification.

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