

MYXOMYCETES OF TAIWAN I.

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Abstract: Fifteen species of Myxomycetes are reported from Taiwan. The genera included are *Arcyria*, *Hemitrichia*, *Metatrichia*, *Trichia*, *Stemonitis*, *Lycogala*, *Fuligo*, *Physarella*, and *Physarum*. Specimens were collected mostly from the bed logs of Shiitake mushrooms.

INTRODUCTION

The Myxomycetes, or plasmodial slime moulds as they are more commonly known, are a group of very interesting organisms whose systematic status has been a subject of considerable debate. By the earlier naturalists this group of organisms was considered as fungi for the resemblance of the sporangia that some taxa bear to minute puffballs, and was placed under the class Gasteromycetes. But that during part of their life cycle, the characteristic amoeboid movement resembling those of lowest animal members and their lack of cell walls made them claimed as animals by the zoologists. De Bary (1859, 1887) is probably the first person to describe the complete life cycle of this group of organisms. He also noticed the plant- and animal-like features of the organisms and first introduced the term Mycetozoa (fungusanimals) animals for the Myxomycetes and a small group of cellular slime moulds, Acrasieae, as well. Nevertheless, more recent biologist (Olive, 1969, 1970) has classified them in the phylum Gymnomyxa which along with the phylum Euprotista belongs to the kingdom Protista owing to the fact that they are similar to the protozoan forms especially in the creeping amoeboid movement and the characteristic nutritive mode. In this new classification system the true plasmodial slime moulds is placed under the class Eumycetozoa, sub-class Myxogastria (Olive, 1969, 1970, 1975).

Myxomycetes are widely distributed, mostly grow on decaying wood, dead leaves, dead logs, old sawdust heaps, or other undisturbed damp organic matter. Others has been found on mushrooms such as *Auricularia*, *Schizophyllum*. The conditions suitable for their growth are varied. Most live in cool, shady, moist places in the woods in both tropics and the temperate regions. Some few forms are found only in alpine situation. Taiwan's climate is characterized by high temperatures, and heavy rainfall with an annual mean temperature of more than 21°C and an average annual rainfall of almost 2500 mm, a condition suitable for luxuriant growth of Myxomycetes. Nevertheless, in studying the pertinent literatures, the author found that very little work about Taiwan's Myxomycetes has been done. Siro Koaze (Nakazawa, 1929) was probable the first person conducting the collecting work of Myxomycetes of Taiwan. Other persons who also contributed to the work are Yasuhiko Asahina, Eidi Otiati, and Ryodi Nakazawa (see Nakazawa, 1929). The name of collected species were reported by Nakazawa (1929) in "A List of Formosan Mycetozoa" which is the earliest available paper about the Myxomycetes of Taiwan. Since then only limited numbers of references and papers dealing with Myxomycetes found on Taiwan were published (Nakazawa, 1931; Hattori, 1935; Emoto, 1939, 1942; Yang, 1968, 1970, 1972). There were more than one hundred species reported, all of them were included in Nakazawa's list (1929), except one which was reported by Nakazawa in 1931. As to

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the places where the specimens deposited were not mentioned, or they are no longer in the place as described.

This article is to give a preliminary report on the *Myxomyces* collected mostly by the author in the past two years from Taiwan, mainly from the bed logs of Shiitake mushrooms, *Lentinus edodes* (Berk.) Sing. The list of species in the following account includes all those of which the identification seems to be reasonably certain. A few forms believed to represent undescribed species and some collected from the bark of living trees are reserved for later treatment. Nomenclature follows that of Martin and Alexopoulos (1969). All species collected are deposited in the Mycology Lab of the Botany Department, National Taiwan University.

SPECIES STUDIED

TRICHIACEAE

1. *Arctyria cinerea* (Bull.) Pers., Syn. Fung. 184, (1801). (Plate I, Fig. 4)

Sporangia stipitate, gregarious, or scattered, gray to light ochraceous buff, or olive buff, subcylindrical or ovoid, rarely subglobose, 1-2.5 mm long, 0.5-0.8 mm at the broadest base; Stalk furrowed, shining, gray to dark near the base, 0.2-2 mm long, filled with sporelike vesicles; total height up to 4 mm; peridium fugacious, except for few fragments remained on the capillitium, shining; calyculus gray to olive buff, plicate below, nearly smooth or minutely papillose on the surface inside; spore pale gray or light-colored in mass, nearly colorless by transmitted light, rounded, marked with few inconspicuous scattered warts, 6-8 μ in diameter; capillitium a close network of gray to light brownish threads, firmly attached to the calyculus, with many free ends which sharply or bluntly pointed, slender, 3-4 μ in diameter, densely warted or spinulose, those close to the base coarser, 4-8 μ in diameter, smooth or faintly warted.

A common species easily recognized by its color. The capillitium is quite dense and less expanded at maturity.

Habitat: On dead logs of hard wood.

Specimen examined: Taipei Hsien, Wu-Lai Hsiang, CHLM 1, Dec. 12, 1978; CHLM 32, Nov. 26, 1979.

2. *Arctyria denudata* (L.) wettst., Verh. Zool.-Bot. Ges. Wien 35: Abh 535, (1886).

(Plate I, Figs. 1-2)

Sporangia stipitate, gregarious, or scattered, ovoid, subcylindrical to cylindrical, crimson, weathering to redish brown to cinnamon-brown, 1-3 mm long and 0.6-0.8 mm wide when expanded; total height up to 5 mm when expanded; stalk long, furrowed, crimson, red-brown to dark-colored, shining, 1.2-2.5 mm long, arising from the continuous red-brown or brown hypothallus, filled with spore-like vesicles of about 10 μ in diameter; peridium fugacious, except for the calyculus; calyculus, plicate, membranous, firm and shining, of the same color as the sporangia, smooth, echinulate, or reticulate on the inner surface; capillitium a highly elastic thread net, firmly attached to the calyculus, usually erect, crimson, red-brown, tawny to ochraceous tawny, the threads 5-6 μ in diameter, marked with prominent cogs, warts, spines, and half rings, the cogs and spines usually much stouter and larger on one side than the opposite side, free ends rare, hence roundedly pointed or clavate and spinulose on the surface, those close to the calyculus distantly marked, smoother, or nearly smooth, of the same size as those above or smaller in diameter; spores crimson, brick-red, orange-cinnamon, tawny to russet in mass, rounded, marked with few scattered minute warts, 5-8 (-9) μ in diameter.

This species is very common on dead, or decaying wood. One of the specimens was collected from a small pot where a *Ficus* plant grew. The sporangia were scattered or clustered in small number on the minute root almost exposed to the surface layer of soil, and wood debris, and looked as if they were growing on the soil surface. The collected specimens show

considerable variety in the color of frutification, capillitium and spore mass. They are usually crimson, or brick-red when freshly collected, and then weather to tawny or cinnamon brown. The mostly rather long stalks, highly elastic and firmly attached capillitium (to the calyculus) are quite distinct characters.

Habitat: On dead or decaying hard wood, or plant debris.

Specimen examined: Taipei Hsien, Wu-Lai Hsiang: CHLM 1a, 2, 3, Dec. 12, 1978; Taipei City, National Taiwan University, Mycology Lab: CHLM 16, Oct. 30, 1979; Kao-Hsiung Hsien, Liu-Kuei Hsiang: CHLM 21, Jan. 1, 1979; Nan-T'ou Hsien, Yü-Ch'ih Hsiang: CHLM 42, Nov. 25, 1979.

3. *Arctia insignis* Kalchbr. & Cooke var. *major* G. Lister, in Kalchbr., *Grevillea* 10: 143, (1882). (Plate I, Fig. 3)

Sporangia stipitate, gregarious or clustered in scattered groups, crimson, vinaceous-rufous (redish brown) to cream buff, 1-1.3 mm long, 0.4-0.7 mm wide, 0.75-1.0 mm wide and up to 3.3 mm long when expanded; total height up to 4 mm when expanded; sporangia cylindrical, subcylindrical, or ovoid; stalk short, 0.3-1.0 mm long, furrowed, redish above, becoming dark below, filled with spore-like vesicles; peridium membranous, fugacious except for few fragments still remained on the apex of expanded sporangia, and the basal calyculus; calyculus plicate, brownish tinted with red, or cream buff, echinulate, or reticulate on the inner surface; capillitium pale salmon, or tawny with age, highly elastic, consisting of close and anastomosing thread with few free ends, 5-7 μ in diameter, densely and prominently marked with spines, half rings, and rings on the surface, those close to calyculus smoother, free ends acutely or truncately pointed; spores pinkish (pale salmon) in mass, mostly 7-8 μ (6.5-8.5 μ) in diameter, marked with few scattered warts; hypothallus brownish, membranous, continuous, dark in some and then not membranous.

A quite distinct and recognizable species in the field by the compact clusters of sporangia which are pinkish when expanded. The color of the sporangia in the field actually is the color of the capillitium and spore mass, since the peridium is early fugacious and the remained few fragments on the sporangial top are not visible by the naked eyes. The frutification of this collection is quite large, falling in the range for the var. *major* G. Lister, Mycet. ed. 3: 236, 1925, which was erected for somewhat robust collections. The capillitium was described as "with transverse ridges well developed", the diameter of the capillitium thread was not mentioned. Our collection has the capillitium thread with 5-7 μ in diameter, much wider than that of *A. insignis* var. *insignis* which is 2-3 μ . *Arctia denudata* collected shows somewhat similar to *A. insignis* in the surface markings of capillitium threads.

Habitat: On dead wood.

Specimen examined: Nan-T'ou Hsien, Yü-Ch'ih Hsiang: CHLM 30.

4. *Arctia incarnata* (Pers.) Pers., Obs. Myc. 1: 58, (1796). (Plate I, Figs. 5-6)

Sporangia stipitate, or rarely sessile, crowded, ovoid, sub-cylindrical, or cylindrical, crimson to redish brown, about 2 mm long, 0.5-0.8 mm at the broadest base before expansion; total height up to 6 mm when expanded; stalk never longer than 1.0 mm, filled with spore-like vesicles; peridium fugacious except for the large shallow usually red-brown plicate calyculus, inside surface of calyculus spinulose or papillose, capillitium a highly elastic net of crimson threads, weathering to tawny or ochraceous-tawny, densely marked with conspicuous sharp spines, and half rings, 3-5 μ (markings excluded) in diameter, loosely attached only to the center of calyculus and easily breaking away as a whole, usually erected, not dropping, spores rosy (old rose) in mass, 7-9 (-10) μ in diameter, rounded, marked with few scattered warts; hypothallus continuous, membranous, brownish.

This specimen grew side by side with *A. insignis* when collected, but very distinct by the

crowded 'Eugene red' (Ridgway, 1912) sporangia when expanded. They are easily distinguished from *A. demudata* by the brighter color, shorter stipe, and larger cup, and especially by the loosely attached capillitium. The capillitium thread of our collection is unique. It is very spiny when viewed by the margins, the half rings and spines are quite large and high up to 3 μ long. In this respect, our specimen is very similar to *Arcyria oerstedtii* Rost., Mon. 278, 1875 (Martin and Alexopoulos, 1969; Lister, 1925; Macbride, 1922). But the fully expanded capillitium net of our specimen is erect instead of drooping which is a distinct characteristic of *A. oerstedtii*. The capillitium thread analyzed by SEM (Robbrecht, 1973) was described as "marked with great spines and cogs and a finer pattern of warts and ridges". This sort of fine ridges have also been clearly observed along the surface of the thread in our specimen.

Habitat: On dead hard wood.

Specimen examined: Nan-T'ou Hsien, Yü-Ch'ih Hsiang: CHLM 31, Nov. 26, 1979.

5. *Hemitrichia serpula* (Scop.) Rost., in Lister, Mycet. 179, (1894) (Plate II, Figs. 1-2)

Fructification plasmodiocarpous, in elongated winding or reticulate form, terete, bright yellow, tawny, or rusty; peridium thin, transparent, opening irregularly but longitudinally along the long axiles of plasmodiocarps, hypothallus like the peridium, or a little darker in color, capillitium a highly elastic, long, tangle, orange yellow (capucine yellow; Ridgway, 1912) or yellow threads, often bent and tightly coiled together with few free ends, sparsely marked with long spines (2-2.5 μ) and 3-4 regular spiral bands, 7-7.5 μ (spines excluded) in diameter, fine longitudinal ridges between two consecutive spiral bands distinct; spores yellow in mass, globose, subglobose, marked by conspicuous, high ridges dividing the hemisphere into several large, irregular meshes, irregular ridges present in some, 10-12.5 μ in diam.,

A conspicuous species by its plasmodiocarpous fructification. The spiny capillitium threads and the coarsely reticulated spores also make this species distinctive.

Habitat: On decaying hard wood.

Specimen examined: Nan-T'ou Hsien, Yü-Ch'ih Hsiang: CHLM 39, Nov. 25, 1979.

6. *Metatrichia vesparium* (Batsch) Nann-Brem., K. Ned. Akad. Wet. C. 69: 146, (1966).

(Plate II, Figs. 3-5)

Sporangia stipitate, in clusters of 2-20 each, clavate, or sub-cylindrical, dark red, red-brown (rusty red) fading to dark color, shining, 1.0-1.5 mm long and up to 0.6 mm at the widest rounded top; total height 1.0-2.5 mm; stalks usually fused, with clusters of sporangia erect on the apex, brownish red or darker, furrowed, solid; peridium opaque, firm, dehiscent by a preformed dome-shaped lid near the apex; capillitium rusty red, or reddish brown, consisting of twisting, rarely branched, free threads, marked with prominent spines and 3 or 4 spiral bands, the ends bluntly pointed, about 8 μ in diameter (spines included); spores brownish red in mass, globose, subglobose, ovoid, faintly warted, 8-10 (-11) μ in diameter.

A very distinctive species in the woods, on rotten and very moist hard wood. Usually recognized at sight by its color and fasciculate habit. The preformed operculum, the tough and

Plate I.

Figs. 1-2. *Arcyria demudata*. 1. Capillitium threads and spores (CHLM 42), $\times 804$; 2. Inside surface of calyculus, showing the reticulate pattern, $\times 804$.

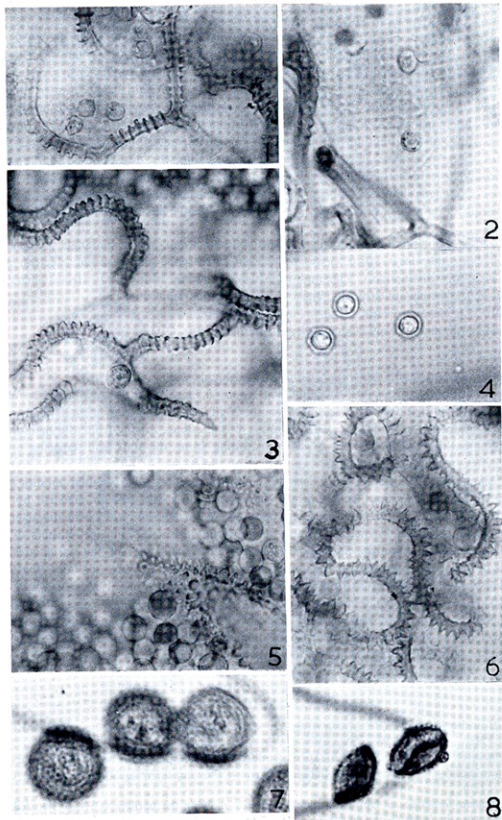
Fig. 3. *Arcyria insignis* (CHLM 30): Capillitium threads, $\times 804$.

Fig. 4. *Arcyria cinerea* (CHLM 1): Spores, $\times 965$.

Figs. 5-6. *Arcyria incarnata* (CHLM 31). 5. Inside surface of calyculus, $\times 831$; 6. Capillitium threads, $\times 830$.

Fig. 7. *Stemonitis fusca* (CHLM 44): Spores, face view, showing the warted reticulation, $\times 2110$.

Fig. 8. *Physarum polycephalum* (CHLM 7): Spores, showing warts along the margins of the spores, $\times 2110$.



opaque sporangial wall, and the twisted remarkably spinescent capillitium threads are also characters unmistakable.

Habitat: On rotten hard wood, in a very moist shady place.

Specimen examined: Nan-T'ou Hsien, Yü-Ch'ih Hsiang: CHLM 33, Nov. 26, 1979.

7. *Trichia favoginea* (Batsch) Pers., Neues Mag. Bot. 1: 90, (1794). (Plate II, Figs. 6-7)

Sporangia sessile, crowded, gregarious, or occasionally solitary on extensive membranous brownish hypothallus, globose, pulvinate, to clavate, or cylindrical, 0.6-0.8 mm in diameter, apricot yellow to yellow-brown, or olivaceous; peridium iridescent, translucent and membranous, opening from the top, usually in floriform; capillitium yellow, apricot yellow, to brownish yellow, consisting of long cylindrical elaters, 6-7 μ in diameter, bearing 4-5 spiral bands, marked with short spines, the spiral bands closely surrounding the thread, tips acutely ended; spores apricot yellow in mass, globose, subglobose, large, 12-15 μ in diameter (border included), marked by conspicuous bands dividing the surface of one hemisphere into 4-5 meshes, the bands consisting of minute pits or holes, poorly or incompletely developed bands also present in some meshes.

A species very distinct by its crowded, bright yellow-colored, sessile sporangia. The surface markings of the rather large spores under both light microscope and scanning electron microscope are especially distinctive. The highly raised narrow or wide bands always marked by many small holes which are arranged linearly or in a reticulum.

Habitat: On decaying hard wood.

Specimen examined: Nan-T'ou Hsien, Yü-Ch'ih Hsiang: CHLM 34, 37, 38, Nov. 25, 1979.

STEMONITACEAE

8. *Stemonitis axifera* (Bull) Macbr., N. Am. Slime-Moulds 120, (1889).

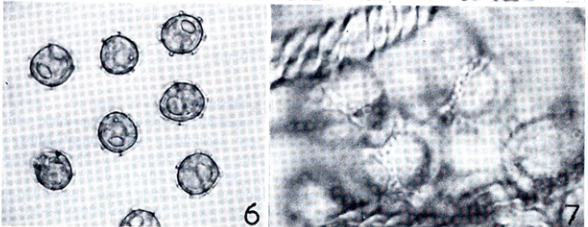
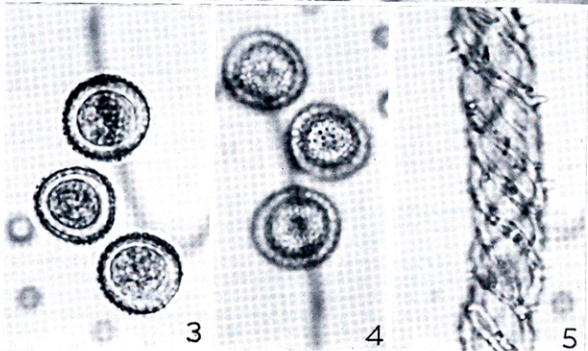
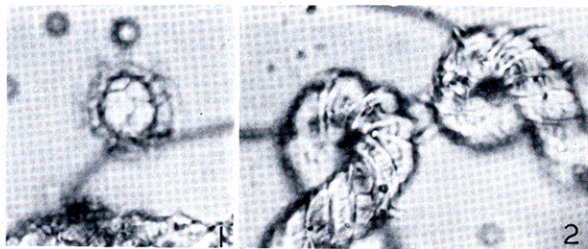
Sporangia stipitate, cylindrical, 4-5 mm long by 0.3-0.5 mm broad, verona brown to mikado brown (Ridgway, 1912), tufted into scattered compact clusters of 6-7 mm in total height; stalk reddish black, or maroon (Ridgway, 1912), shining, 2-3 mm long, arising from the membranous, brownish hypothallus; columella dark as stalk, extending from the stalk and tapering upward, dissipated before reaching the acuminate apex; capillitium evenly arising from all parts of the columella, branching and anastomosing, forming a fine surface net with angular meshes of 10-18 μ on the broadest dimension; spores bright rusty brown in mass, pale or greenish by transmitted light, very faintly warted, or nearly smooth by the edge view, 5-6.5 μ in diameter.

The specimen collected is distinct in the field by the scattered compact clusters of rusty brown sporangia which resembles *Stemonitis herbaticea* Peck. but spores of the latter are larger in size and different in markings. The markings of spore surface are so faint that often described as "nearly smooth" (Martin & Alexopoulos, 1969; Macbride, 1922; A. Lister & G. Lister, 1925), or "minutely punctate" (Martin & Alexopoulos, 1969), "faintly ferruginous" (Macbride, 1922). With SEM analysis of the spores of this species, Rammeloo (1975) described the sculptures of the spores as "verrucate (see Rammeloo, 1974), then baculate". He also noted that the bacula (see Rammeloo, 1974) are very short.

Habitat: On decaying wood.

Plate II.

- Figs. 1-2. *Hemitrichia serpula* (CHLM 39): 1. Spore, $\times 2110$; 2. elaters, the longitudinal striae is distinct, $\times 2110$.
- Figs. 3-5. *Metatrichia vesparium* (CHLM 33): 3. Optical section of spores, the warts along the margins are clearly shown, $\times 2110$; 4. Spores, face view, showing the reticulation, $\times 2110$; 5. Elater, $\times 2110$.
- Figs. 6-7. *Trichia favoginea*: 6. Optical section of spores showing the borders (CHLM 38), $\times 804$; 7. Spores, the holes in the bands are clearly shown (CHLM 37), $\times 2110$.



Specimen examined: Nan-T'ou Hsien, Yü-Ch'ih Hsiang: CHLM 36, Nov. 26, 1979.

9. *Stemonitis fusca* Roth, Mag. Bot. Römer & Usteri 1(2): 26, (1787). (Plate I, Fig. 7)

Sporangia stipitate, cylindrical, rather long, 9-13 mm in length, verona brown or vandyke brown to fuscous (Ridgway, 1912), usually tufted into clusters of more than 10 mm in total height; stalk slender, dark (reddish) to nearly black, shining, tapering, 2-6 mm long (nearly $\frac{1}{2}$ - $\frac{3}{4}$ of the total height), arising from the membranous, transparent or brownish hypothallus which continuous and common to the cluster; columella dark, extending from the stalk, reaching nearly to the apex; capillitium arising from all parts of the columella, branching and anastomosing repeatedly into a close net of irregular, angular meshes; spores enclosed in the capillitium net, reddish brown or natal brown (Ridgway, 1912) in mass, brownish by transmitted light, globose, subglobose, very densely warted-reticulate, 7.5-10.0 μ (rarely reaching 12.5 μ) in diameter.

This species are abundant and very common in both low and high altitudes in Taiwan. The densely clustered fructification on a common hypothallus, usually quite tall and dark in color make this species distinct in the field. The spore marking is vague, clearly visible only in oil immersion as warted-reticulate, the meshes formed are quite small. SEM pictures of the spores of various specimens by Rammeloo (1975) clearly showed the reticulate patterns of the spore surface with variations in dimensions of the lumina. Exceptionally, a small part of the reticulum was found absent, but the "merely spinulose or papillate" spore type (Martin & Alexopoulos, 1969) was not observed by SEM analysis. This type of spores was not found in this present study either.

Habitat: On decaying wood, or the bark of dead wood.

Specimen examined: Yü Shan: CHLM 17, 18, Oct. 25, 1979; Nan-T'ou Hsien, Yü-Ch'ih Hsiang: CHLM 41, 44, Nov. 26, 1979.

RETICULARIACEAE

10. *Lycogala epidendrum* (L.) Fries, Syst. Myc. 3: 80, (1829)

Fructification aethalia, solitary or clustered, subglobose to depressed spherical, irregular when crowded, brownish olive to nearly black, flesh color or coral pink when young, 3-15 mm broad; peridium thin and fragile, warted with brown, more or less triangular warts, dehiscence apical; pseudocapillitium composed of long, branching and anastomosing flattened tubes marked with conspicuous transverse wrinkles, ends clavate or obtuse, the main branches wider than the secondary branches, 6-25 μ in diameter; spores pale flesh color in mass, globose, closely reticulate, 5-7 μ in diameter.

Conspicuous in the field by the small puff ball-like aethalia. It is very common on dead or decaying hard wood.

Habitat: On dead or decaying hard wood.

Specimen examined: Nan-T'ou Hsien, Yü-Ch'ih Hsiang: CHLM 35, Nov. 26, 1979.

PHYSARACEAE

11. *Fuligo septica* (L.) Wiggers, Prim. Fl. Holsat. 112, (1780).

Aethalia pulvinate, size various, 2-20 cm in their longer dimension, 0.5-3.0 cm thick, white, ochraceous, cortex calcareous, fragile, rather thick and separable; capillitium of white, or yellowish fusiform nodes connected by hyaline threads, scanty; spores dull black in mass, spherical, purplish brown by transmitted light, minutely warted 7.5-9.0 μ in diameter.

The specimen collected is a small aethalium, about 2 cm in their longer dimension and 0.5 cm thick. The spore size and color of fructification are distinct characteristics of the species named.

Habitat: On decaying hard wood.

Specimen examined: Nan-T'ou Hsien, Yü-Ch'ih Hsiang: CHLM 45, Nov. 26, 1979.

12. Physarella oblonga (Berk. & Curt) Morgan, Jour. Cinc. Soc. Nat.Hist. 19. 7, (1896).

Sporangia stipitate, gregarious, short cylindrical, deeply perforated from above and appearing as hollow cups or funnels, up to 1 mm in diameter, dark greenish flecked with yellowish limy scales; total height up to 5 mm; stalk usually long, up to 2.5 mm in length, light yellow brown, or red-brown, terete or flattened, continuous with the hollow of the sporangial cups; abnormal sporangia not rare, irregularly expanded and distorted, sessile form may also present; peridium yellowish or brownish, dehiscent from above, the outer ring rupturing in more or less floriform, the segments becoming recurved, the inner ring persisting as a hollow pseudocolumella; capillitium duplex, composed of limy spine-like, simple or, more or less, branched processes, arising from the inner walls of the outer part of the peridium, and a dense network of slender threads bearing few fusiform, yellow lime nodes; spores globose, minutely warted, 8-10 μ in diameter, brownish in transmitted light, dark brown (Natal brown to clove brown, Ridgway, 1912) in mass; plasmodium rich yellow.

The fructifications collected were developed from the plasmodium on water agar. The plasmodium was profusely growing on saw dust being compactly packed in a bottle-shaped and enclosed in cellophane, piled among others in a room for oyster mushroom growth. After growing on water agar sprinkled with oat flakes, the plasmodium eventually climbed up mostly to the lid and fruited there. All the sporangia are hanging upside-down with the sporangia erect on the stalk straightly downward. When fully developed, the sporangium is very distinct. The thimble-shaped sporangia as what Alexopoulos described, the flowerlike outer part of the peridium, and the tubular pseudocolumella formed by the persisting peridial wall of the inner part, the spine-like protuberance on the inner surface of the outer peridium make this species unmistakable.

Habitat: On saw dust as plasmodium when collected.

Specimen examined: Taipei City, National Taiwan Univ.: CHLM 15, Jan. 1979.

13. Physarum nucleatum Rex, Proc. Acad. Phila. 43: 389, (1891).

Sporangia stipitate, globose, 0.3-0.5 mm in diameter, erect, or inclined; total height up to 2 mm; peridium membranous, covered densely with rounded white lime nodules, dehiscent irregularly, the lower portion remaining as a flat disc (saucer-like) after the upper portion has disappeared; stalk long, and tapering upward, 0.5-2.8 mm long, yellowish, wrinkled, not limy; columella lacking, capillitium a dense net of slender threads; white or grayish, with minute scattered rounded white lime nodes, in the center a conspicuous white ball consisting of aggregated lime nodules, this ball free from the stalk; spores dark in mass, clear lilaceous or brownish by transmitted light, 7.5-8.5 μ in diameter, very minutely spinulose or warted.

This species is characterized by the spherical and long-stalked sporangia covered with white lime nodules, the central ball of lime, the limeless stalk, and the pale violet spores by transmitted light.

Habitat: On bark of decaying wood.

Specimen examined: Nan-T'ou Hsien, Yü-Ch'ih Hsiang: CHLM 40, Nov. 25, 1979.

14. Physarum polycephalum Schw., Schr. Natur. Ges. Leipzig 1: 63, (1822). (Plate I, Fig. 8)

Sporangia stipitate, gregarious, yellow, yellowish gray, or whitish, shining, irregular in shape, much compressed, lenticular, or gyrose-confluent, often forming a helvelloid cluster, umbilicate below; peridium thin, fragile, covered with white or yellowish lime granules; total height 1.5-2.0 mm; stalk long, slender, inclined or flexuous, tawny, or brownish, arising from an expanded membranous, brownish hypothallus; columella lacking; capillitium a loose network of slender threads, very light or nearly hyaline in color, nodes many, irregular in shape, yellowish or white; spores dark in mass, violaceous brown by transmitted light, minutely warted, 8.5-10.0 μ in diameter; plasmodium yellow.

Specimen when collected was a yellow plasmodium growing vigorously on *Auricularia* in the field. Sporangia were developed in the lab in a moist chamber after the plasmodium being brought back.

Habitat: On ear fungus, *Auricularia* sp.

Specimen examined: Taipei Hsien, Wu-Lai Hsiang: CHLM 7, Dec. 12, 1978.

15. *Physarum rigidum* (G. Lister) G. Lister, Mycet. ed. 3, 36, (1925).

Sporangia stipitate, gregarious, or scattered, flate lenticular, often umbilicate above, nodding, 0.5-1.0 mm in diameter, brown to dark in color at first, then densely covered with yellow or green-yellow lime granules, some dark forms iridescent from lack of lime granules, dehiscent irregularly; stalk slender, tapering, up to 2 mm or more in length, yellowish, or cream brown, becoming darker below, furrowed; capillitium of intricate, slender, sparsely branched threads, with long, narrow, yellowish lime nodes; spores dark in mass, violet brown by transmitted light, globose, subglobose, 9-13 μ in diameter, nearly smooth, or minutely warty; hypothallus restricted to the individual stalk base, brownish; plasmodium yellow.

This species is distinctive by its sporangium shape (lenticular and umbilicate above). It differs from *Physarum viride* in the darker and larger spores.

Specimen was collected as plasmodium on dead wood in the field. Plasmodium was then transferred to CMA/2 sprinkled with sterile pulverized rolled oat flakes. From pale lemon yellow becoming apricot yellow in color, the plasmodium fruited right on the agar medium bearing weak, long stalks.

Habitat: On dead and decaying hard wood.

Specimen examined: Nan-T'ou Hsien, Yü-Ch'ih Hsiang: CHLM 43, Nov. 26, 1979.

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