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Myxomycetes of Taiwan VIII

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ABSTRACT: *Clastoderma debaryanum* var. *imperatorium*, *Craterium leucocephalum* var. *rufum*, *C. minutum*, *Didymium perforatum*, *Physarum alboradianum*, *P. penetrale*, *P. plicatum*, and *P. psittacinum* are newly recorded in Taiwan. The new status for *Physarum nutans* Persoon var. *rubrum* (Nann.-Brem. & Yamamoto) C.-H. Chung *stat. nov.* (Basionym: *Physarum nutans* Persoon f. *rubrum* Nann.-Brem. & Yamamoto, Proc. K. Ned. Akad. Wet., Ser. C 90: 341. 1987) is proposed. We agree that *Clastoderma dictyosporum* is synonymous with *C. debaryanum*, and *Physarum laevisporum* should be excluded from the myxomycete biota of Taiwan. The occurrence of *Perichaena corticalis* var. *liceoides* in Taiwan is confirmed after its first report in 1929. More collections of *Arcyria minuta* are reported, which has been recorded as *A. carnea* in Taiwan. SEM micrographs were made for *Erionema aureum* and *Willkommlangia reticulata*.

KEY WORDS: Myxomycetes, Slime molds, Taiwan.

INTRODUCTION

In order to promote our understanding on the microbial diversity of Taiwan, additions and corrections on myxomycete biota of Taiwan are made in this communication. We propose a new status for *Physarum nutans* Persoon f. *rubrum* Nann. -Brem. & Yamamoto, and report four species of *Physarum* and several other species or infraspecific taxa as new to Taiwan. Comments and observations on other Myxomycetes of special interests are also given below.

MATERIALS AND METHODS

Specimens were either collected directly from the field or from moist chamber cultures (mc). Moist chamber cultures were processed according to Chiang and Liu (1991). Measurements were made with an ocular micrometer. For microscopic observations, sporocarps were prewetted in 95% ethanol and mounted in 2% KOH. Spore ornamentation and diameter were examined under an oil immersion objective (1000x). The diameter of spores excludes the ornamentation. For SEM micrographs, sporocarps were coated with gold and examined with Hitachi S-800 or S-2400 Scanning Electron Microscope. Names of vascular plants refer to Flora of Taiwan ed. 1 (Li *et al.*, 1975-1979).

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Taxa are arranged alphabetically. Specimen number started with "*ntnu*" are deposited in the Herbarium of Mycology Laboratory, Department of Biology, National Taiwan Normal University. Other voucher specimens are deposited in the Herbarium of Mycology Laboratory, Department of Botany, National Taiwan University.

RESULTS AND DISCUSSION

1. ***Arcyria minuta*** Buchet in Pat., Mem. Acad. Malgache 6: 42. 1927. 小團網黏菌

Arcyria cinerea (Bulliard) Persoon var. *carnea* G. Lister, Mycet. 2 ed. 236. 1911.
Arcyria carnea (G. Lister) G. Lister, Journal of Botany [London] 59: 92. 1921. *non Arcyria carnea* Schumacher (1803) (= *Arcyria incarnata* (Persoon) Persoon, Obs. Myc. 1: 58. 1796. *fide* Rostafinski, Mon. 275. 1875.) 紅團網黏菌
Arcyria gulielmae Nannenga-Bremekamp, Proc. K. Ned. Akad. Wet., Ser. C 74: 357. 1971. (*nom. nov.*)

TAIWAN, **Taipei Metropolis**, Main Campus of National Taiwan University, *Liu CHLB 105* [reported as *Arcyria carnea* in Taiwania 28: 98], 14 VI 1982, on bark of *Bischofia javanica* Blume; *Liu CHLB 121*, *ditto*; *C.-H. Chung M483*, 8 X 1993, on dead petiole of *Livistona chinensis* v. *subglobosa*; *C.-H. Chung M639*, 20 III 1994, *C.-H. Chung M640*, 20 III 1994, *C.-H. Chung M876a*, 17 III 1995, on dead petiole of unidentified palm; campus of the Affiliated High School of National Taiwan Normal University, *T.-C. Chang 5*, 5 VIII 1994, on dead angiospermous twig; *T.-C. Chang 24*, *ditto* except collected on 19 IX 1994.

Neubert and Nannenga-Bremekamp (1979) revised *Arcyria minuta* Buchet and regarded it as conspecific with *A. gulielmae* Nannenga-Bremekamp. We provide nomenclatural update for this species in Taiwan with additional records.

Among specimens collected in Taiwan, we found that sporangia with short, concolorous stalks always have angular spore-like cysts, while those having a darker stalk with longitudinal furrows always with rounded spore-like cysts. All specimens were collected in the field. They appeared in March, June, and August to October.

2. **Clastoderma debaryanum** Blytt, Bot. Zeit. 38: 343. 1880. Figs. 1 & 2 碎皮黏菌

var. **debaryanum**

Clastoderma dictyosporum sensu Wei & Liu, The 5th Annual Meeting of the Mycological Society of R. O. C. , Scientific Program and Abstracts. 50. 1988; Wei & Liu, Trans. mycol. Soc. R. O. C. 4: 45. 1989.

TAIWAN, **Taipei Metropolis**, main campus of the National Taiwan University, *D.-S. Wei 3860B*, 27 IV 1988, developed from a moist chamber containing bark of *Elaeocarpus sylvestris*; *Liu CHLB 1134*, developed from a moist chamber (14 - 21 VIII 1993) containing bark of *Juniperus chinensis* var. *kaizuka* collected 14 VIII 1993; campus of the Affiliated High School of National Taiwan Normal University, *C.-H. Chung M63* developed from a moist chamber (2 - 20 VIII 1992) containing bark of *Casuarina equisetifolia* collected 1 VIII 1992; **Hsinchu City**, Tungmen Elementary School, *C.-H. Chung M1291*, developed from a moist chamber (15 - 25 VII 1996) containing bark of *Eucalyptus robusta* Smith collected 13 VII 1996; campus of Chinhua

University, *Y.-C. Chiang BY906M205*, developed from a moist chamber (5 - 30 VII 1990) containing bark of *Pinus elliottii*; **Taichung County**, Tungshih Forest Recreation Area, *Liu CHLB 977*, 28 IV 1992, developed from gymnosperm bark (*?Cunninghamia*).

When *Clastoderma dictyosporum* was reported by Wei and Liu (1989) as new to Taiwan, it was commented (in Chinese): " Except the character of spores, our specimens (*D.-S. Wei 3860B, 3863*) completely agree with *Clastoderma debaryanum*. *C. dictyosporum* is mainly characterized by reticulate spores and longer sporophores. Our specimens are shorter, in the range of *C. debaryanum*, but the character of spores suggests the name *C. dictyosporum*. There are two additional specimens (*Liu CHLB 178b*, *CHLB 261*) showing the same characteristics. " These observations indicate difficulties in delimiting *C. debaryanum* and *C. dictyosporum*, and the decision made by Wei and Liu (1989) is mainly based on reticulate ornamentation of the spores. Eliasson and Keller (1996) examined the type collection of *C. debaryanum* and found that collapsed spores of type specimen have a reticulate structure. They suggest that this reticulation is not different from the ornamentation of spores of *C. dictyosporum*. We agree with them in this point, and a reexamination of the specimens cited in Wei and Liu (1989) reveals that the dimension of these specimens are in the range of var. *debaryanum*.

var. **imperatorium** Emoto, Bot. Mag. Tokyo 43: 169. 1929. 天皇碎皮黏菌

TAIWAN, **Hsinchu County**, Kuanwu, *Y.-C. Chiang BY1360M323*, developed from a moist chamber containing bark of *Pinus taiwanensis*, mc 25 V - 8 VI 1992.

Recently Eliasson and Keller (1996) recognize *C. debaryanum* var. *imperatorium* Emoto as distinct from the nominate variety. Since no attempt has been made to identify the infraspecific name of specimens of *C. debaryanum* collected in Taiwan, a revision is undertaken to see whether we have var. *imperatorium* in Taiwan or not. Most specimens reexamined are shown to be var. *debaryanum*, but one specimen is found to represent var. *imperatorium*.

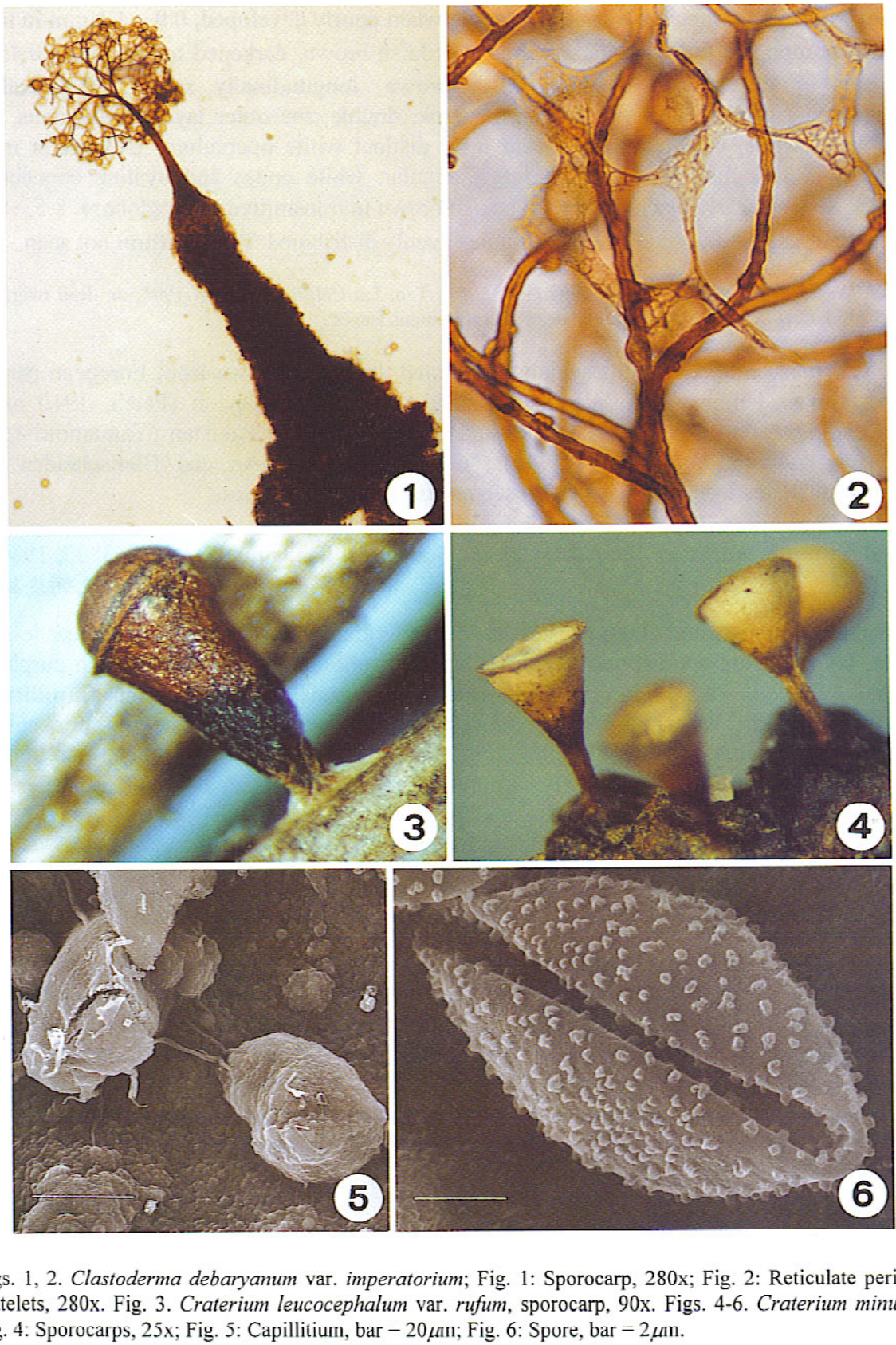
3. **Craterium leucocephalum** (Persoon) Ditmar var. **rufum** G. Lister, A Monograph of the Mycetozoa 3 ed. 78. 1925. Fig. 3 紅色白頭高杯黏菌

TAIWAN, **Hualien County**, Kuanyuan Forest Recreation Area, *C.-H. Chung M1401*, 19 IX 1996, on plant debris.

This variety differs from the nominate variety in possessing reddish brown sporocarps, short stalks, and clearly defined lids. We did not observe any intermediate form between this and nominate variety. Formerly *C. leucocephalum* var. *rufum* is known from Japan (Lister, 1925).

4. **Craterium minutum** (Leers) Fries, Syst. Myc. 3: 151. 1829. Figs. 4-6 微高杯黏菌

Basionym: *Peziza minuta* Leers, Fl. Herborn. 277. 1775.



Figs. 1, 2. *Clastoderma debaryanum* var. *imperatorium*; Fig. 1: Sporocarp, 280x; Fig. 2: Reticulate peridial platelets, 280x. Fig. 3. *Craterium leucocephalum* var. *rufum*, sporocarp, 90x. Figs. 4-6. *Craterium minutum*: Fig. 4: Sporocarps, 25x; Fig. 5: Capillitium, bar = 20μm; Fig. 6: Spore, bar = 2μm.

Sporocarps sporangiate, stalked or sessile when poorly developed, 0.9—1.1 mm in total height, sporophores turbinate, ochraceous to reddish brown, darkened toward base, 0.45—0.8 mm in widest part. **Stalk** reddish brown, longitudinally striate. **Hypothallus** membranous, yellowish brown. **Peridium** thick, double, the outer layer catilaginous, the inner layer white, calcareous; dehiscent by a distinct white operculum. **Columella** none. **Capillitium** reticulate, constsing of large, angular, white nodes and hyaline connecting threads. **Spores** nearly black in mass, blackish brown in transmitted light, globose, 8.5—9.5 μm in diam., minutely spinulose, the spinules evenly distributed. **Plasmodium** not seen.

TAIWAN, **Taichung County**, Hoping Hsiang, Mt. Tao, *Liu CHLB 1155*, 2 II 1994, on dead twig; *Liu CHLB 1153*, *CHLB 1156*, *ditto* except on dead angiospermous leaves.

Craterium minutum is quite widely distributed, formerly known from European part of former Soviet Union, Malay Peninsula (Sanderson, 1922), Ceylon (Petch, 1910 as *C. pedunculatum* Trent.), Nepal (Hagiwara and Bhandary, 1982), Pakistan (Yamamoto *et al.*, 1993), and Australia (Mitchell, 1995). "*C. vulgare* Nees. An den Blattscheiden der Bambusen." listed in Raciborski (1898) seems also to be this species.

5. **Didymium perforatum** Yamashiro, Journ. Sci. Hiroshima Univ., Ser. B, 2, 3: 33. 1936. Figs. 7-10 穿孔鈣皮黏菌

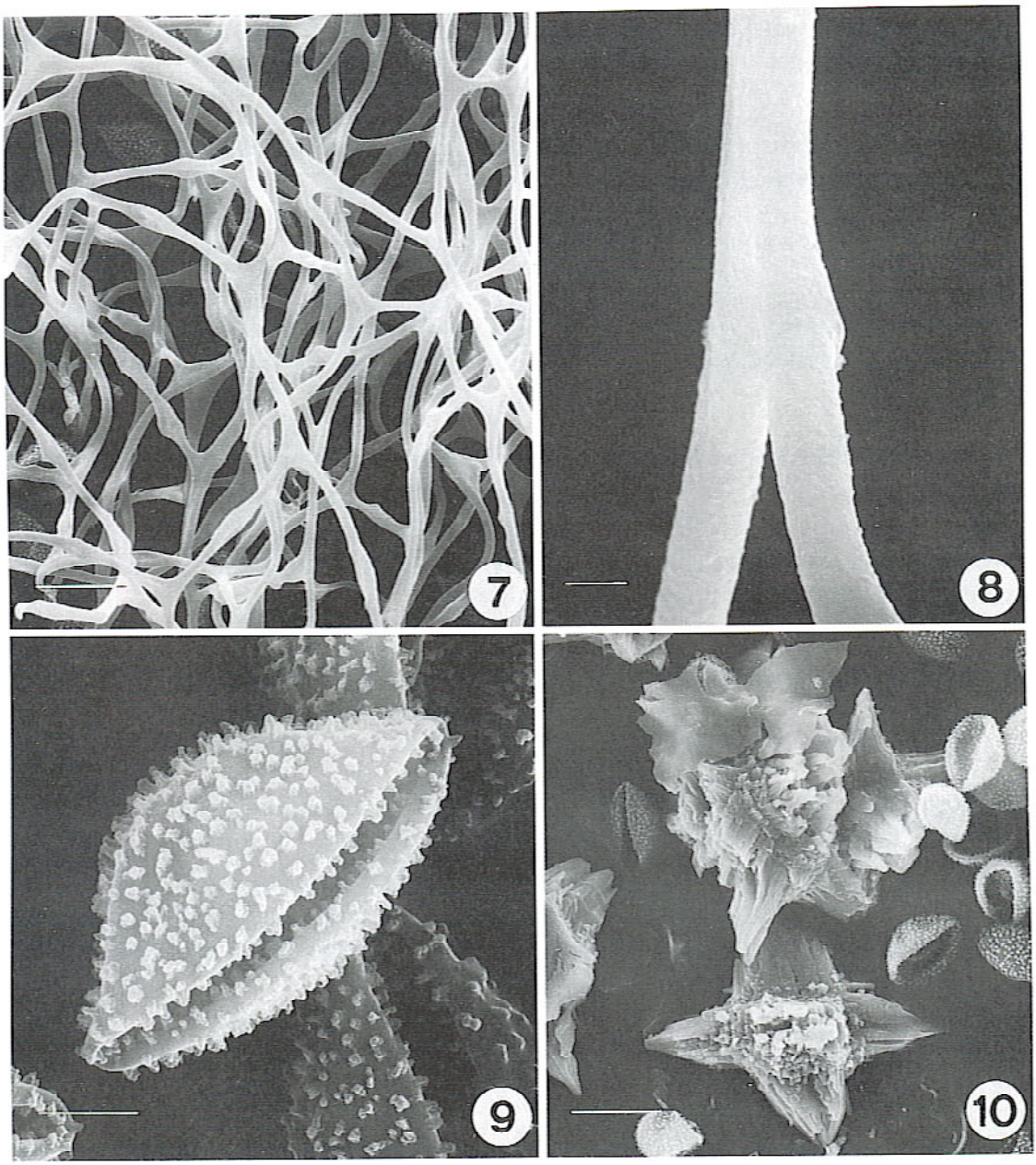
Sporocarps plasmodiocarpous, sessile, the individual vein thin, *ca.* 0.2 mm or less in width. **Hypothallus** not distinct. **Peridium** single, membranous, iridescent bluish purple in reflective light, sprinkled with large, yellowish lime crystals. **Columella** none. **Capillitium** dark brown, elastic, branching and anastomasing, with many irregular or nodular thickenings, paler at ends. **Spores** globose, dark brown in mass, violaceous brown in transmitted light, 9—10 μm in diameter, spinulose, the spinules irregularly distributed, sometimes interconnected into a subreticulate pattern.

TAIWAN, **Taipei Metropolis**, campus of the Affliated High School of the National Taiwan Normal University, collected by Mr. Chen-hsuen Shen *sub no. C.-H. Chung M1507*, 21 XII 1996, on dead leaves of *Eucalyptus robusta* Smith.

This species is known from Kansas of United States, Kyushu of Japan and West Pakistan (Martin and Alexopoulos, 1969). As this is the first newly recorded species for Taiwan from the Affiliated Senior High School of the National Taiwan Normal University, the exploration of Myxomycetes at this senior high school should be briefly noted. Continuous efforts on exploring the myxomycete biota of the Affiliated Senior High School of the National Taiwan Normal University has revealed many interesting results. Chung *et al.* (1994) reported 26 taxa from that campus, and now 50 species and 2 varieties are known from here (Chung *et al.*, unpubl.).

6. **Erionema aureum** Penzig, Myxom. Buitenz. 37. 1898. Figs. 11 & 13 黃絨線黏菌

TAIWAN, **Taipei Metropolis**, Mt. Shamao, *Y.-F. Chen 11*, *12*, on lower side of a fallen log; **Taipei County**, Houtong, Chintzupei Ancient Path, *C.-H. Chung M2020*, 5 IX 1997, pendent on rotten wood and adjecent herbs; **Pingtung County**, Nanjen Lake, *Y.-F. Chen 255*, 31 I 1996, hanging upside down inside a hollow fallen log.



Figs. 7-10. *Didymium perforatum*; Fig. 7: Capillitium, bar = 10μm; Fig. 8: Capillitium, bar = 1μm; Fig. 9. Spores, bar = 2μm; Fig. 10. Crystalline lime crystals, note the size compared with spores, bar = 10μm.

The monotypic myxomycete genus *Erionema* was erected by Penzig (1898) for a collection from botanic gardens of Buitenzorg. It has been regarded as a southeast Asian taxon (Gray and Alexopoulos, 1968; Martin and Alexopoulos, 1969). Contemporary monographers, including G. Lister (1925), Martin and Alexopoulos (1969) and Neubert *et al.* (1996) have doubted whether *Erionema* is distinct enough to be a separate genus. Lister pointed its resemblance with ecorticate *Fuligo septica*, and Martin and Alexopoulos thought they are close to *Physarum famintzinii*. Our field observations indicate that *E. aureum* forms a pendent 3-dimensional net of sporocarps, and it seems proper to maintain this unique

genus according to its special habitat and form of sporocarps. Plasmodium of the specimen *C.-H. Chung M2020* was yellow before fruiting, and freshly formed sporocarps had green tints as seen in the field.

7. **Perichaena corticalis** (Batsch) Rostafinski var. **liceoides** (Rostafinski) G. Lister, A Monograph of the Mycetozoa, 3 ed. 247. 1925. Fig. 15 擬無絲皮蓋碗黏菌

Basionym: *Perichaena liceoides* Rostafinski, Mon. 295. 1875.

TAIWAN, **Keelung City**, Chitu, on path side between Taian Waterfall and hilltop of Mt. Chitzuhou, ridge, open, altitude about 250 - 350m, *C.-H. Chung M830*, sporocarps developed from a moist chamber culture (24 XII 1994 - 2 I 1995) on bark of *Daphniphyllum glaucescens* Blume subsp. *oldhamii* (Hemsl.) Huang collected on 24 XII 1994.

Nakazawa (1929) reported this variety from Taiwan without any description or specimen citation. Regardless of the absence of capillitium, Martin and Alexopoulos (1969) treated this variety as synonymous with *P. corticalis* var. *corticalis*. Gilert (1990) reexamined the type specimen and she suggested that the variety was distinct and should be recognized. We now confirm the existence of this variety in Taiwan.

8. **Physarum alboradianum** Gottsberger, Nova Hedwigia 15: 363. 1968. 射絲絨泡黏菌

Physarum sp. C; Liu, Taiwania 28: 106. 1983.

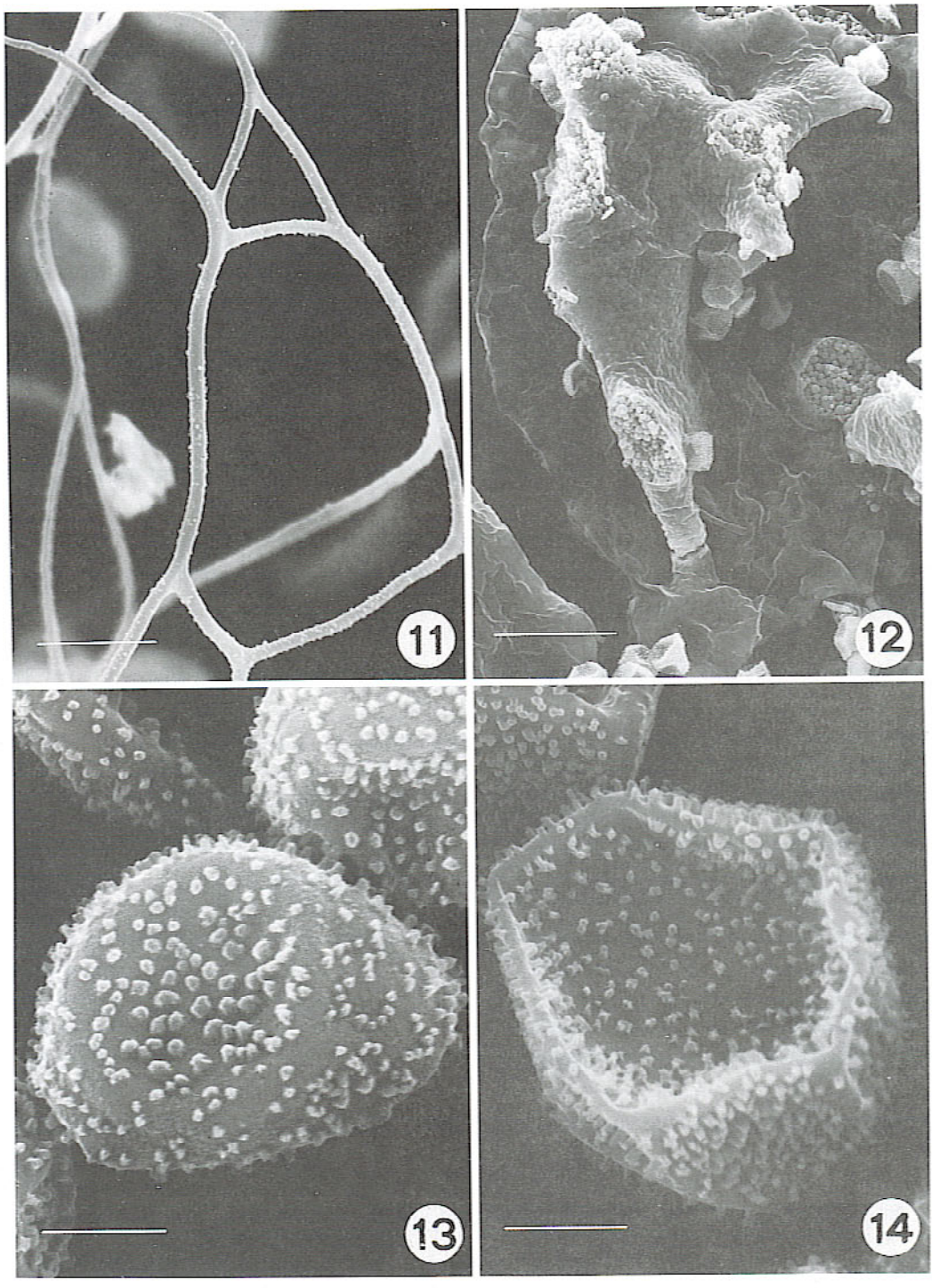
The description in Liu (1983) reads: "Sporangia (*i. e.* Sporophores) globose, depressed-globose, or rod shaped, 0.5 mm in diameter, 0.3—0.4 mm high, white; stalk limy except at the basal end, 0.5 mm long; columella lacking, pseudocolumella white, flat or stellate, conspicuous; capillitial threads forking, lime nodes angular, large, white; spores black brown in mass, large, (10 -) 10.4—13.6 μm in diameter, conspicuously spinulate, the spines often in dense clusters scattering on the surface."

TAIWAN, **Taipei Metropolis**, main campus of the National Taiwan University, *Liu CHLB108*, 14 VI 1982, on bark of *Bischofia javanica* Blume.

The voucher specimen only deviates from *P. alboradianum* Gottsberger in having slightly larger spores and corticolous habitat. *Physarum bubalinum* Farr occasionally has pseudocolumella, but it is mainly a sessile species. Besides, its spore ornamentation and habitat (rotten epicarp of cacao fruit) are also different from the specimen discussed here. Formerly *Physarum alboradianum* is known only from its type collection in Brazil.

9. **Physarum bogoriense** Raciborski, Hedwigia 37: 52. 18F. 1898; Liu & Chung, Taiwania 38: 92. 1993. 星裂絨泡黏菌

Physarum bivalve sensu auct. non Persoon: Liu, Taiwania 27: 78. 1982.
Physarum laevisporum sensu auct. non Agnihothrudu: Wang, The Third Annual Meeting of the Mycological Society of Republic of China, Scientific Program and Abstracts. [1]. 1986. 光孢絨泡黏菌



Figs. 11, 13. *Erionema aureum*; Fig. 11: Capillitium, bar = 5μm; Fig. 13: Spores, bar = 2μm. Figs. 12, 14. *Willkommlangia reticulata*. Fig. 12: Broken calcareous capillitium showing lime globules enclosed in, bar = 20μm; Fig. 14: Spores, bar = 2μm.

TAIWAN, **Taipei Metropolis**, Main Campus of National Taiwan University, *C.-H. Chung M486*, 29 X 1993; *C.-H. Chung M490*, 6 XI 1993; *Leong W. C. 245*, 10 XII 1993; *Liu CHLB1117*, 5 V 1993, all of the above cited specimens on dead angiospermous leaves; **Taipei County**, Wulai, *Liu CHLB 44a*, 15 III 1982, on fallen leaves [reported as *Physarum bivalve*]; Wulai, Fushan Village, *C.-H. Chung M1125*, 15 VI 1996, on

dead angiospermous leaves; **Keelung City**, Chungho Rd., *C.-H. Chung M798*, 31 X 1994, road side, on dead herbaceous leaf; Chitu, *C.-H. Chung M791*, 31 X 1994, on herbaceous debris; *C.-H. Chung M792*, 31 X 1994, on living leaves of species of *Poaceae*; **Tainan City**, campus of the National Tainan Teachers' College, *C.-H. Chung M1360*, 7 IX 1996, on lower side of dead and living leaves of *Wedelia* sp.; **No detailed locality and coll. date**: *ntnu 0944*.

We have observed that *Physarum bogoriense* is common in the campus of NTU in Taipei. It would be very peculiar if the distribution of this species is restricted in one point in Taiwan, since wind, rain drops and insects can effeciently disperse the spores of Myxomycetes. A brief review of the literature suggests (1) the photograph of "*P. bivalve*" given by Liu (1982) revealed sporocarps with ochraceous (not white as in *P. bivalve*) peridium, which strongly suggests *P. bogoriense*; (2) *Physarum laevisporum* was reported by Wang (1986) as new to Taiwan, but it differs from *P. bogoriense* only in its color of peridium, and *P. laevisporum* is known only from its type collection in India. After examining the voucher specimens cited in these two works, we feel that both records should better be identified as *P. bogoriense*.

As additions and corrections on plasmodiocarpous species of *Physarum* with double or triple peridium have been made in past few years and the present contribution, a key is given to facilitate identification of this group.

Key to plasmodiocarpous *Physarum* spp. with double or triple peridia known from Taiwan

1. Peridium with many pleats..... *P. plicatum*
1. Peridium not as above..... 2
2. Sporocarps strongly compressed laterally..... 3
2. Sporocarps terete..... 6
3. Sporocarps labyrinthiform, dehiscence irregular..... *P. gyrosum*
3. Sporocarps not forming pseudoaethalia, dehiscence by a preformed fissure..... 4
4. Spores minutely spinulose, 8—10 μm in diam..... *P. bivalve*
4. Spores more or less reticulate, 9—13μm in diam..... 5
5. Peridium white, spores 11—13 μm in diam..... *P. echinosporum*
5. Peridium brown, spores 9—11 μm in diam..... *P. retisporum*
6. Sporocarps yellow, ochraceous, bronze or brown..... *P. aeneum*
6. Sporocarps ochraceous, dehiscence by triangular lobes..... *P. bogoriense*

10. **Physarum nutans** Persoon var. **rubrum** (Nann.-Brem. & Yamamoto) C.-H. Chung **stat. nov.**
Figs. 16, 17 紅色垂頭絨泡黏菌

Basionym: *Physarum nutans* Persoon f. *rubrum* Nann.-Brem. & Yamamoto, Proc. K. Ned. Akad. Wet., Ser. C 90: 341. 1987.

TAIWAN, **Taipei Metropolis**, Shilin District, Chiengtiankang, *C.-H. Chung M1116*, 11 VI 1996, on mossy bark of a broad-leaved tree.

Nannenga-Bremekamp and Yamamoto (1987) noted: "...as colour variations may be due to environmental conditions...", they decided to describe this taxon as forma. However in former studies of Myxomycetes, varieties were more frequently used for color differences among sporocarps. Examples are *Physarum bilgramii* Hagelstein var. *coeruleum* G. Lister, *P. robustum* (A. Lister) Nannenga-Bremekamp var. *coeruleum* Nannenga-Bremekamp, *P.*

viride (Bull.) Persoon var. *aurantium* (Bull.) A. Lister, *Craterium leucocephalum* (Persoon) Ditmar var. *rufum* G. Lister, and *Fuligo septica* (L.) Wiggers var. *flava* (Persoon) R. E. Fries, *etc.* In addition, myxomycologists use varieties much more often than forms to indicate the infraspecific variation. The only forma in current use is *Physarella oblonga* f. *alba*, which has a white plasmodium, in contrast to the yellow-plasmodium-possessing var. *oblonga*. To avoid inconsistency of applying different status for similar morphological variance, the use of forma may better be retained for indicating variance other than morphological deviation(s) among sporocarps. Formerly *Physarum nutans* var. *rubrum* is known only from its type collection in Japan.

11. **Physarum penetrale** Rex, Proc. Acad. Phila. 43: 389. 1891. Figs. 18-20 穿透絨泡黏菌

Sporocarps sporangiate, more or less nodding, total height 1.2—1.6 mm; sporophores subglobose to prolate, 0.3—0.35 mm in diam. **Stalk** bright orange, non-calcareous, attenuating, translucent in transmitted light. **Peridium** single, yellowish green, dull due to underlying spores, dotted with small, pale yellow lime patches; dehiscence irregular. **Columella** a homogenous continuation of the stalk, reaching to the upper half of sporophores, enlarged at the tip. **Capillitium** delicate, persistent, reticulate, connecting threads hyaline, with many limeless junctions and acute endings, lime nodes small, yellowish, varying from rounded to angular. **Spores** dark brown in mass, brownish in transmitted light, globose, 6—6.5 μm in diam., minutely warted, the warts clustered.

TAIWAN, **Pingtung County**, Mt. Nanjen, *Y.-F. Chen 20a*, 5 IX 1995, on plant litter of angiosperms.

According to Martin & Alexopoulos (1969), *Physarum penetrale* is known from Maine to Ontario, south to Georgia and Iowa, and Washingtong and Oregon of United States, Europe, Asia, Africa. Farr (1976) reported this taxon from Panama, Jamaica, Dominica, Venezuela, and Chile. In eastern and south-eastern part of Asia, this species is known from Fukien (Fujien) Province of China (Li and Li, 1989), Japan (Minakata, 1927), Java (Penzig, 1898) and Taiwan.

12. **Physarum plicatum** Nann.-Brem. & Yamamoto, Proc. K. Ned. Akad. Wet., Ser. C 93: 284. 1990. Fig. 21 皺摺絨泡黏菌

Sporocarps scattered, plasmodiocarpous, sessile, the individual vein more than 0.25 mm in width. **Hypothallus** membranous, concolorous with outer peridium. **Peridium** double, both membranous; the outer peridium wrinkled, yellowish or rice-colored; the inner layer grayish; dehiscence from above. **Columella** none. **Capillitium** reticulate, connecting threads hyaline, lime nodes white. **Spores** brown in mass, in transmitted light, globose, 8—9 (- 10) μm in diam., minutely warted, the warts evenly distributed.

TAIWAN, **Hualien County**, Lushui-Holiu Trail, *C.-H. Chung M1571*, 13 III 1997, on dead leaf of an angiosperm.

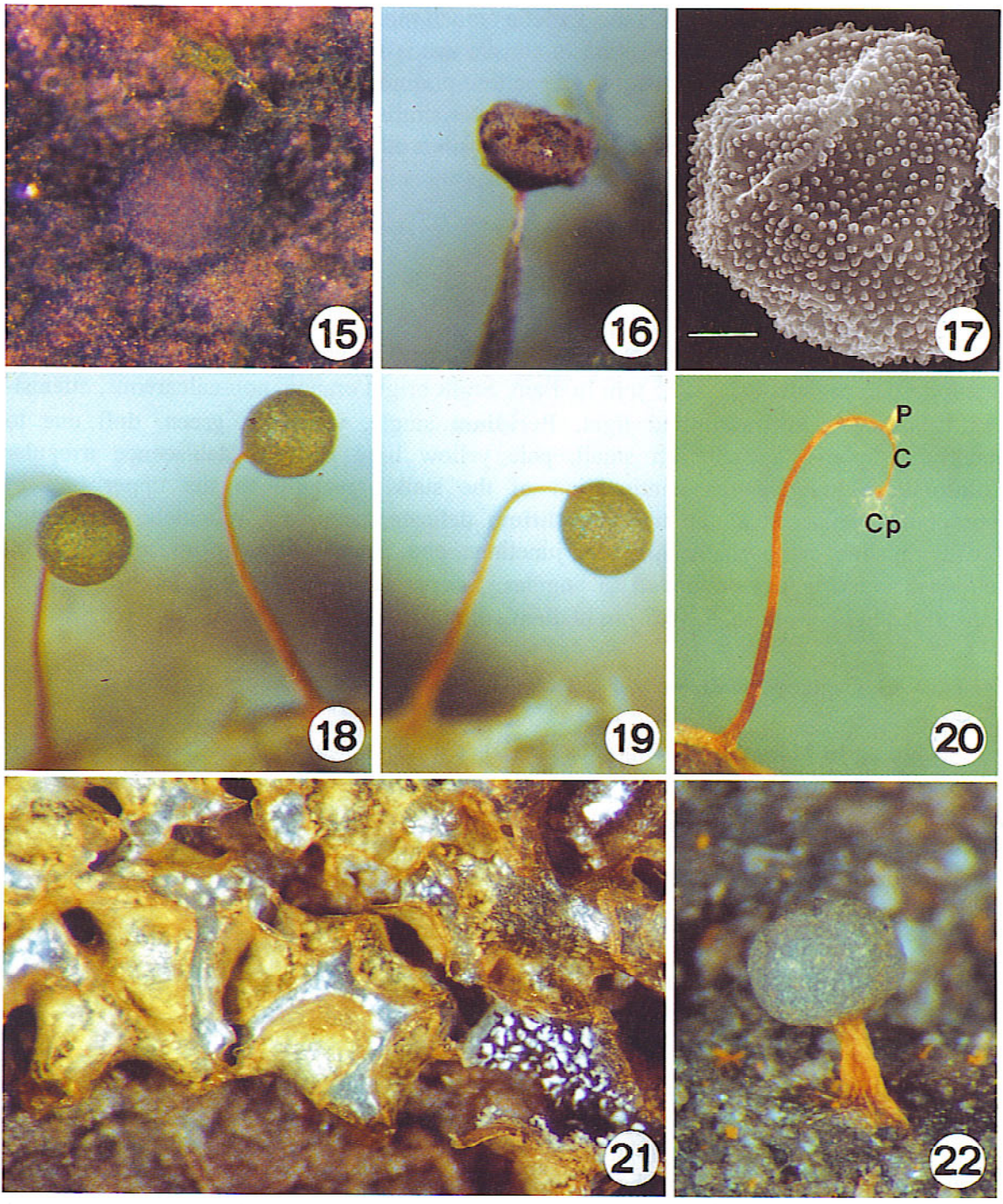


Fig. 15. *Perichaena corticalis* var. *liceoides*, sporocarp, 150x. Figs. 16, 17. *Physarum nutans* var. *rubrum*. Fig. 16: Sporocarp, 90x; Fig. 17: Spore, bar = 2μm. Figs. 18-20. *Physarum penetrale*. Fig. 18, 19: Sporocarps, 90x; Fig. 20: Sporocarp with spores shed, showing the remaining peridium (P), columella (C) and persistent capillitium (Cp), 65x. Fig. 21. *Physarum plicatum*, sporocarp, 90x. Fig. 22. *Physarum psittacinum*, sporocarp, 90x.

Some sporocarps have a rice-colored peridium that is different from the yellow peridium in original description. The color variation seems to result from unstable environment, as many spores from those sporocarps are of uneven size and shape. Our measurement of spore diameter is slightly larger than that in original description (7.5—8 μm in diam.), but the pleats on the peridium are very distinct, clearly indicating the characteristic of this taxon. *Physarum plicatum* has been reported from Japan (Hagiwara *et al.*, 1995) and Nepal (Nannenga-Bremekamp and Yamamoto, 1990).

13. **Physarum psittacinum** Ditmar in Sturm, Deuts. Fl. Pilze 1: 125. 1817.
Fig. 22 鸚鵡絨泡黏菌

Sporocarps sporangiate, stalked; sporophores globose to subglobose, slightly depressed, 0.4—0.6 mm in diam. **Stalk** at least half the total height, longitudinally striate, more or less tapering toward tip, yellowish orange in reflective light, translucent with some brownish red portions in transmitted light. **Hypothallus** concolorous with stalk. **Peridium** single, greyish and iridescent, with whitish lime scales. **Columella** none. **Capillitium** reticulate; lime nodes angular to branched, larger than spores, concolorous with stalk or paler at some parts, not fading in color; connecting threads hyaline, flattened at joint points, limeless junctions present. **Spores** deep brown in mass, pale brown in transmitted light, 7—8 μm in diam., minutely warted, the warts evenly distributed.

TAIWAN, **Nantou County**, Chingching Farm, *C.-H. Chung M1953a*, 28 VII 1997, *s. coll. s. d.* NTNU*0139*.

Physarum psittacinum has been reported from western Europe, Rumania, North America, Japan, Philippines (Martin and Alexopoulos, 1969) and India (Lakhanpal and Mukerji, 1981).

14. **Willkommlangia reticulata** (Albertini & Schweinitz) O. Kuntze, Rev. Gen. Pl. 3: 875. 1891. Figs. 12 & 14 鉤絲黏菌

Basionym: *Physarum reticulata* Albertini & Schweinitz, Consp. Fung. 90. 1805.

TAIWAN, **Taipei County**, between Wulai and Hsiaoyi, *C.-H. Chung M144*, developed from a moist chamber containing dead wood collected on 28 VII 1992. Plasmodium red.

Nakazawa (1929) and subsequent students of Myxomycetes in Taiwan have reported this taxon under the genus *Cienkowskia*.

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臺灣黏菌（八）

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摘　　要

本文報導碎皮黏菌天皇變種、白頭高杯黏菌紅色變種、微高杯黏菌穿孔鈣皮黏菌、射絲絨泡黏菌、穿透絨泡黏菌、皺摺絨泡黏菌、鸚鵡絨泡黏菌為臺灣新記錄之分類群，建議使用垂頭絨泡黏菌紅色變種（原為垂頭絨泡黏菌紅色型）之新位階。網孢碎皮黏菌應為碎皮黏菌之同物異名，另外光孢絨泡黏菌此一學名應自臺灣黏菌名錄中剔除。皮蓋碗黏菌擬無絲變種於1929年首次報導後重新在臺灣發現。以往小團網黏菌在臺灣曾以紅團網黏菌之學名被報導過，本文對其學名作了修正，並增添了更多採集記錄。另外，以掃描電子顯微鏡對黃絨線黏菌與鉤絲黏菌作了觀察。

關鍵詞：黏菌，臺灣。

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