陽明山國家公園紗帽山地區眞黏菌生物多樣性之研究

Biodiversity of the True Slime Molds (Myxomycetes) at Mt. Shamao of the Yangmingshan National Park

張仲豪　黃盈嘉　劉錦惠*

Jong-How Chang, Ing-Gia Huang and Chin-Hui Liu*

國立台灣大學植物系　台北市羅斯福路四段1號

Department of Botany, National Taiwan University, Taipei, Taiwan

*通訊作者

* Corresponding author

摘　要

眞黏菌爲森林中常見的棲息生物，然針對物種資源豐富的陽明山地區，所做的眞黏菌生態調查卻不多。本實驗自2000年8月至2001年8月，於陽明山國家公園紗帽山地區以直接採集和濕室培養收集標本。總計採收眞黏菌標本243份，共41種又3變種。其中以亮皮黏菌 (*Lamproderma scintillans* (Berk. & Br.) Morgan)、半圓雙皮黏菌 (*Diderma hemisphaericum* (Bull.) Hornem)、墊形雙皮黏菌承名變種 (*Diderma effusum* var. *effusum* (Schw.) Morgan)爲此區優勢種。而白頭高杯黏菌無柄變種 (*Craterium leucocephalum* var. *sessile* Liu, Huang & Chang)爲世界性新變種，另粗柄亮皮黏菌 (*Lamproderma muscorum* (Lév.) Hagelst.)和光孢絨泡黏菌 (*Physarum laevisporum* Agnihothrudu)爲台灣新紀錄種。

Abstract

A monthly survey was conducted to investigate the true slime molds (Myxomycetes) at Mt. Shamao of the Yangmingshan National Park from August 2000 to August 2001. A total of 41 specices and three varieties were identified from 243 specimens collected from the field or cultivated by the moist-chamber technique. *Lamproderma scintillans* (Berk. & Br.) Morgan, *Diderma hemisphaericum* (Bull.) Hornem, and *Diderma effusum* var. *effusum* (Schw.) Morgan were the dominant species. *Lamproderma muscorum* (Lév.) Hagelst. and *Physarum laevisporum* Agnihothrudu were found to be the new records to Taiwan, while *Craterium leucocephalum* var. *sessile* Liu, Huang & Chang was a new variety.

關鍵詞：粗柄亮皮黏菌、真黏菌、黏菌、台灣、陽明山國家公園

Key words: *Lamproderma muscorum*, Myxomycetes, slime molds, Taiwan, Yangmingshan National Park

收件日期：91年7月18日　　接受日期：92年2月10日

Received: July 18, 2002　　Acceped: February 10, 2003

緒　言

陽明山是台灣地區唯一的火山地形地質景觀區，其中紗帽山是七星山南面的一個寄生火山，爲典型的鐘狀火山，且位於水源保護區內，擁有珍稀的動植物資源 (叢 2000)。年均溫約爲15-19℃ (黃等 1983)，且雨量充沛，每年平均降雨量多在4,000 mm以上。此篇報導的採集樣區位於陽明山國家公園最南側 (圖1)，於北緯25°05’719”，東經121°32’960” ；在行政區域劃分上，屬於台北市北投區，海拔約450m。

關於陽明山眞黏菌的研究，施惠曾於1981年時，報導陽明山地區眞黏菌野外調查結果，以直接採集的方式，共獲得15種眞黏菌 (Shi 1981)。Wang *et al*. (1981)、Chung and Liu (1995a) 和 Liu and Chen (1999) 也曾報導數種陽明山的眞黏菌。而目前已知的陽明山地區的眞黏菌已達50種 (personal collections; Nakazawa 1929; Liu 1980, 1981, 1982, 1983; Shi 1981; Wang *et al*. 1981; Chiang and Liu 1991; Chung and Liu 1995a, 1995b, 1997a, 1997b, 1997c; Liu *et al*. 2001)。爲進一步瞭解國家公園內眞黏菌的物種組成，本實驗選取固定樣區，定期進行研究調查，並整理已知的陽明山眞黏菌物種。

材料與方法

本實驗自2000年8月至2001年8月間，每月至台北市陽明山國家公園採集一次，採集地點爲紗帽路及前山公園。以直接採集子實體和室內濕室培養同時進行。在鑑定上是依據Martin and Alexopoulos (1969)，Nannenga-Bremekamp (1991)，Yamamoto (1998)。以解剖顯微鏡觀察子實體外型，並解剖子實體以觀察內部構造，再將其製成玻片檢查其顯微構造。必要時補以掃描式電子顯微鏡 (SEM) 檢查子實體的細部構造。

玻片製作：於解剖開的子實體滴上99.5%酒精，待其未完全乾燥前滴上2%的KOH，蓋上蓋玻片，置於光學顯微鏡下檢查。

野外採集：將有眞黏菌子實體的基質，包括倒木、枯枝、落葉、活樹樹皮等，以小刀割取，或直接撿拾有黏菌的基質，再以白膠黏於紙盒內，並記錄生態資料和標本編號於紙盒上。採集之標本待自然風乾和低溫冷凍後再收藏於標本櫃中。

濕室培養：爲調查樣區內眞黏菌的生物多樣性，每月收集枯枝落葉及樹皮攜回實驗室。準備直徑9 cm的玻璃培養皿，內襯等徑濾紙，滅菌後，將所採得的基質置入培養皿內，加入pH 7水，浸泡一晚後測定基質之pH值，並記錄之。倒掉培養皿中過多的水，置

於25℃下，並以12小時光照和12小時黑暗的循環培養一個月。培養期間利用解剖顯微鏡檢查，並做記錄，需要時再加水以維持濕潤。發現有子實體產生時，待其成熟後，以白膠將子實體連同基質貼黏於標本盒內。

資料分析：總頻度 (abundance)即豐富度，代表所得之標本份數。種豐度 (richness) 代表出現的種數。

結果與討論

研究期間共得眞黏菌標本243份，分屬於3亞綱6目11科16屬41種又3變種 (表1)。所得眞黏菌屬名如下： *Arcyria*、*Ceratiomyxa*、*Clastoderma*、*Collaria*、*Craterium*、*Cribraria*、*Diachea*、*Diderma*、*Didymium*、*Echinostelium*、*Hemitrichia*、*Lamproderma*、*Perichaena*、*Physarum*、*Stemonitis*、*Tubifera*。其中以*Lamproderma scintillans* (14.6%)、*Diderma hemisphaericum* (12.2%)、*Diderma effusum* var. *effusum* (10.1%)爲前三名優勢種。而研究期間獲得1個世界性新變種—白頭高杯黏菌無柄變種 (*Craterium leucocephalum* var. *sessile* Liu, Huang & Chang) (Liu *et al*. 2001)，2個台灣新紀錄種，分別爲粗柄亮皮黏菌 (*Lamproderma muscorum* (Lév.) Hagelst.)和光孢絨泡黏菌 (*Physarum laevisporum* Agnihothrudu) (Liu *et al*. 2001)。整理陽明山地區已知的眞黏菌物種，總共統計52種又4變種 (表2)。圖3A-F爲陽明山較大型的眞黏菌。

紗帽山樣區中，由基質所測得的pH值幾乎皆爲酸性，範圍在5.36-7.34之間 (表3)，而大多的眞黏菌都生長在偏酸性的基質上。Emoto (1938, cf. Gray and Alexopoulos 1968) 採自野外的106份以上之黏菌標本，著生基質皆爲酸性。陳 (1997) 並提出樹皮的pH值會影響眞黏菌的生長，不同的眞黏菌生長的樹皮pH值範圍各有不同；有些偏好較低的pH值，有些則偏好較高的pH值，但皆在酸性範圍內。楊 (2000) 提出有些眞黏菌的生長確實和其基質的pH值有關，但非絕對相關，推測應有其他生長因子調控黏菌的生長。

一般而言，眞黏菌在溫暖潮濕的環境下，較易生長。在紗帽山樣區中，眞黏菌出現的種類及頻率在8、9、10月時較高，這可能是因爲在這段期間雨量較豐沛的緣故，且氣溫均在21℃以上 (圖2)。然颱風會帶來大量的雨水，豪雨會沖刷樹皮或枯枝落葉上的眞黏菌孢子，因而使11月所採得的標本數量明顯減少。2000年8月及2001年8月相較下，發現兩月溫度相近，但後者採集所得的標本數明顯比前者少很多 (表4)，可能是因爲2001年8月降雨量明顯不夠充分 (圖2, 表5)，使眞黏菌的孢子不易達到萌發條件。

陳 (1997) 曾提到一般的樹皮黏菌，在實驗室中以濕室方法可培養出較多的黏菌，但室內條件與野外環境不同，可能只是反映該時期樹皮上黏菌孢子較多而已。此次研究也顯示相似結果，2001年1月、3月、5月、7月直接採集所得標本數量很少，但以所收集基質做濕室培養的結果，卻得到了相當多的黏菌 (表4)。

在野外採集時，主要是在樹皮上及落葉堆中找尋眞黏菌，結果發現樣區中的樹皮上，很少有黏菌生長，可能和此區中陽光充足及風勢較大有關連，導致樹皮易快速乾燥，使孢子不易萌發。此區中所得到的標本多生長在楓香落葉或腐木表面上，而其他種類的落葉，眞黏菌所出現的比例較低，這可能和基質所能提供的養分有關連 (表1)。本研究所獲得之白頭高杯黏菌無柄變種和光孢絨泡黏菌已於2001年發表 (Liu *et al*. 2001)，本報告不再加以描述，僅將台灣的新紀錄粗柄亮皮黏菌描述如下：

表1. 紗帽山地區真黏菌物種、生長基質及出現月份

Table 1. Taxa, substrates, and monthly occurrences at Mt. Shamao of the Yangmingshan National Park, August 2000 to August 2001

Taxa	Substrate	Month of occurrence*
Arcyria cinerea 灰團網黏菌	dead wood	4, 6-8, 10, 11
Arcyria minuta 小團網黏菌	dead wood	7
Ceratiomyxa fruticulosa var. *fruticulosa* 鵝絨黏菌承名變種	dead wood	4
Clastoderma debaryanum var. *debryanum* 碎皮黏菌承名變種	fallen leaves of *Liquidambar formosana* and other leaf litter	1, 3
Collaria elegans var. *elegans* 圓頭項圈黏菌承名變種	dead wood	2
Collaria lurida 紫褐項圈黏菌	leaf litter	1, 3
Collaria rubens 紅褐項圈黏菌	fallen leaves of *Liquidambar formosana*	3
Craterium aureum 黃高杯黏菌	fallen leaves of *Liquidambar formosana* and other leaf litter	2, 4, 9-11
Craterium leucocephalum var. *leucocephalum* 白頭高杯黏菌承名變種	leaf litter	10
Craterium leucocephalum var. *scyphoides* 白頭高杯黏菌杯狀變種	fallen leaves of *Liquidambar formosana*, *Cinnamomum camphora* and other leaf litter	8
Craterium leucocephalum var. *sessile* 白頭高杯黏菌無柄變種	leaf litter	9
Craterium minutum 微高杯黏菌	leaf litter	10
Cribraria aurantiaca 橘黃篩黏菌	dead wood	8
Cribraria confusa 迷篩囊黏菌	dead wood	4, 10
Cribraria microcarpa 小篩黏菌	dead wood	4, 8, 10
Diachea leucopodia 白柄黏菌	leaf litter	1, 3, 5, 8, 11, 12
Diachea subsessiles 短白柄黏菌	fallen leaves of *Liquidambar formosana* and *Crinum asiaticum*	3, 8, 10
Diderma effusum var. *effusum* 墊形雙皮黏菌承名變種	fallen leaves of *Liquidambar formosana* and other leaf litter	1-9, 10
Diderma hemisphaericum 半圓雙皮黏菌	fallen leaves of *Liquidambar formosana* and other leaf litter	1-8
Diderma platycarpum var. *berkeleyanum* 薄雙皮黏菌柏克萊變種	bark and fallen leaves of *Liquidambar formosana* and other leaf litter	7, 8

Taxa	Substrate	Month of occurrence *
Diderma testaceum 粉紅雙皮黏菌	fallen leaves of *Liquidambar formosana*	5
Didymium iridis 鈣皮黏菌	fallen leaves of *Liquidambar formosana*	2, 3, 4, 10, 11
Didymium leoninum 黃鈣皮黏菌	leaf litter	8
Didymium melanospermum 暗孢鈣皮黏菌	leaf litter	10
Didymium nigripes 黑足鈣皮黏菌	fallen leaves of *Liquidambar formosana*	7, 8, 10, 12
Didymium squamulosum 鱗鈣皮黏菌	fallen leaves of *Liquidambar formosana* and other leaf litter	3, 5, 8, 9
Didymium verrucosporum 瘤孢鈣皮黏菌	leaf litter	7
Echinstelium minutum 小刺絲黏菌	fallen leaves of *Liquidambar formosana*	1
Hemitrichia serpula 蛇形半網黏菌	dead wood	6
Lamproderma muscorum 粗柄亮皮黏菌	fallen leaves of *Liquidambar formosana* and other leaf litter	1, 2, 7, 10
Lamproderma scintillans 亮皮黏菌	fallen leaves of *Liquidambar formosana* and other leaf litter	1-5, 7, 12
Perichaena chrysosperma 黃蓋碗黏菌	fallen leaves of *Liquidambar formosana*	5, 6, 8
Physarum bivalve 雙瓣絨泡黏菌	leaf litter	10
Physarum bogoriense 星裂絨泡黏菌	fallen leaves of *Crinum asiaticum* and other leaf litter	4, 7, 8
Physarum laevisporum 光孢絨泡黏菌	fallen leaves of *Liquidambar formosana*	3
Physarum melleum 蜂蜜絨泡黏菌	fallen leaves of *Liquidambar formosana*	1-5, 10
Physarum psittacinum 鸚鵡絨泡黏菌	leaf litter	10
Physarum rigidum 鋼絲絨泡黏菌	bark	7
Physarum roseum 薔薇絨泡黏菌	leaf litter	10
Physarum sessile 無柄絨泡黏菌	leaf litter	10
Physarum vernum 板節絨泡黏菌	fallen leaves of *Liquidambar formosana*	6
Physarum viride var. *viride* 綠絨泡黏菌承名變種	dead wood	10
Stemonitis flavogenita 黃髮網黏菌	dead wood	8
Tubifera microsperma 叢立筒黏菌	dead wood	5

* Number of 1-12 denote to January to December.

表2. 陽明山眞黏菌組成(1981-2001年)

Table 2. A list of the species of Myxomycetes reported from the Yangmingshan National Park for the period from 1981 to 2001

1.	*Arcyria cinerea* (Bull) Pers.	29.	*Didymium ovoideum* Nann.-Bremek.
2.	*Arcyria denudata* (L.) Wettst.	30.	*Didymium squamulosum* (Alb. & Schw.) Fr.
3.	*Arcyria insignis* Kalchbr. & Cooke	31.	*Didymium verrucosporum* Welden
4.	*Arcyria minuta* Buchet	32.	*Echinstelium minutum* de Bary
5.	*Ceratiomyxa fruticulosa* (Mueller) T. Macbr.	33.	*Hemitrichia serpula* (Scop.) Rostaf.
6.	*Clastoderma debaryanum* Blytt	34.	*Lamproderma muscorum* (Lév.) Hagelist.
7.	*Collaria elegans* (Racib.) Dhillon & Nann.-Bremek.	35.	*Lamproderma scintillans* (Berk. & Br.) Morgan
8.	*Collaria lurida* (Lister) Nann.-Bremek.	36.	*Licea biforis* Morgan
9.	*Collaria rubens* (Lister) Nann.-Bremek.	37.	*Licea minima* Fr.
10.	*Craterium aureum* (Schum.) Rostaf	38.	*Licea operculata* (Wingate) G. W. Martin
11.	*Craterium leucocephalum* (Pers.) Ditmar	39.	*Perichaena chrysosperma* (Currey) Lister
12.	C*raterium leucocephalum* var. *scyphoides* (Cooke & Balf.) G. Lister	40.	*Physarum bivalve* Pers.
13.	*Craterium leucocephalum* var. *sessile* Liu, Huang & Chang	41.	*Physarum bogoriense* Racib.
14.	*Craterium minutum* (Leers) Fr.	42.	*Physarum laevisporum* Agnihothrudu
15.	*Cribraria aurantiaca* Schrad.	43.	*Physarum melleum* (Berk. & Br.) Massee
16.	*Cribraria confusa* Nann.-Bremek. & Y. Yamam.	44.	*Physarum oblatum* T. Macbr.
17.	*Cribraria microcarpa* (Schrad.) Pers.	45.	*Physarum psittacinum* Ditmar
18.	*Diachea leucopodia* (Bull.) Rostaf.	46.	*Physarum rigidum* (G. Lister) G. Lister
19.	*Diachea subsessiles* Peck	47.	*Physarum roseum* Berk. & Br.
20.	*Diderma effusum* var. *effusum* (Schw.) Morgan	48.	*Physarum sessile* Brandza
21.	*Diderma hemisphaericum* (Bull.) Hornem.	49.	*Physarum vernum* Sommerf.
22.	*Diderma platycarpum* var. *berkeleyanum* Nann.-Bremek.	50.	*Physarum viride* (Bull.) Pers.
23.	*Diderma testaceum* (Schrad.) Pers.	51.	*Stemonitis axifera* var. *smithii* (T. Macbr.) Hagelst.
24.	*Didymium clavus* (Alb. & Schw.) Rab.	52.	*Stemonitis flavogenita* Jahn
25.	*Didymium iridis* (Ditmar) Fr.	53.	*Stemonitis fusca* Roth
26.	*Didymium leoninum* Berk.& Br.	54.	*Stemonitis herbatica* Peck
27.	*Didymium melanospermum* (Pers.) T. Macbr.	55.	*Trichia decipiens* (Pers.) T. Macbr.
28.	*Didymium nigripes* (Link) Fr.	56.	*Tubifera microsperma* (Berk. & Curt.) G. W. Martin

Total: 52 species and 4 varieties

表3. 紗帽山地區眞黏菌生長基質的pH值範圍(濕室培養)

Table 3. The pH ranges of substrates for Myxomycetes producing fruiting bodies in the moist-chamber culture

Taxa	pH
Arcyria cinerea	6.68
Arcyria minuta	5.36
Clastoderma debryanum	6.49-6.75
Collaria lurida	6.54-6.86
Collaria rubens	7.18
Craterium aureum	6.28-6.70
Diachea leucopodia	6.07
Diachea subsessiles	6.87
Diderma effusum	6.06-6.78
Diderma hemisphaericum	5.90-6.99
Diderma platycarpum var. *berkeleyanum*	6.07-6.68
Diderma testaceum	6.52
Didymium nigripes	6.79
Didymium squamulosum	6.52-7.18
Didymium verrucosporum	6.79
Echinstelium minutum	6.79
Lamproderma muscorum	5.36-6.79
Lamproderma scintillans	5.36-7.17
Perichaena chrysosperma	6.42-7.34
Physarum bogoriense	6.43
Physarum laevisporum	6.57
Physarum melleum	6.49-7.17
Physarum vernum	5.94

表4. 紗帽山地區眞黏菌總頻度及種豐度統計表(2000年8月-2001年8月)

Table 4. Monthly abundance (numbers of samples) and richness (numbers of collections) of Myxomycetes colleced at Mt. Shamao , August 2000 to August 2001

	2000					2001							
	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Abundance													
Field collection	15	8	27	11	4	1	7	8	6	3	5	2	5
Abundance													
Moist-chamber cultures	-	-	-	-	-	19	14	36	12	25	6	19	10
Richness	10	4	18	4	3	9	8	9	11	10	5	11	8

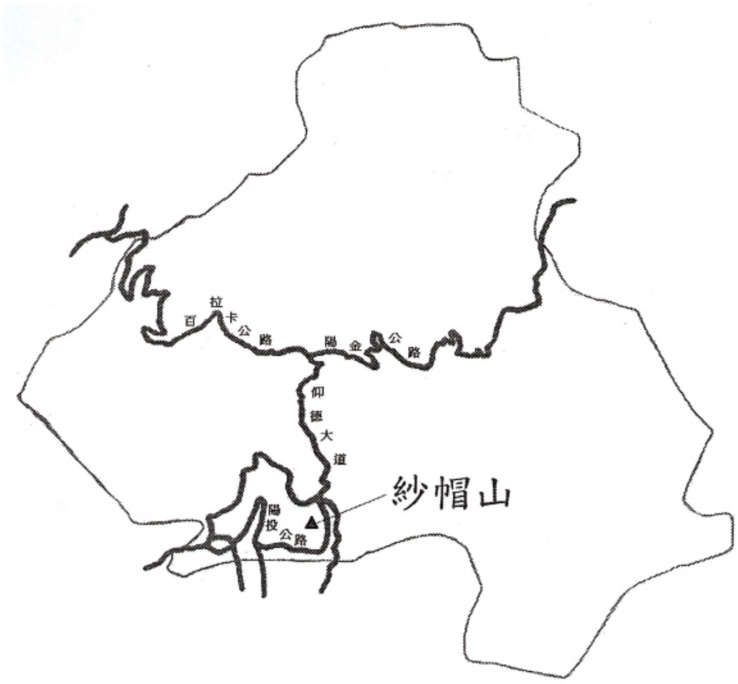

圖1. 陽明山國家公園地圖。

Fig. 1. A map of the Yangmingshan National Park, showing the location of Mt. Shamao.

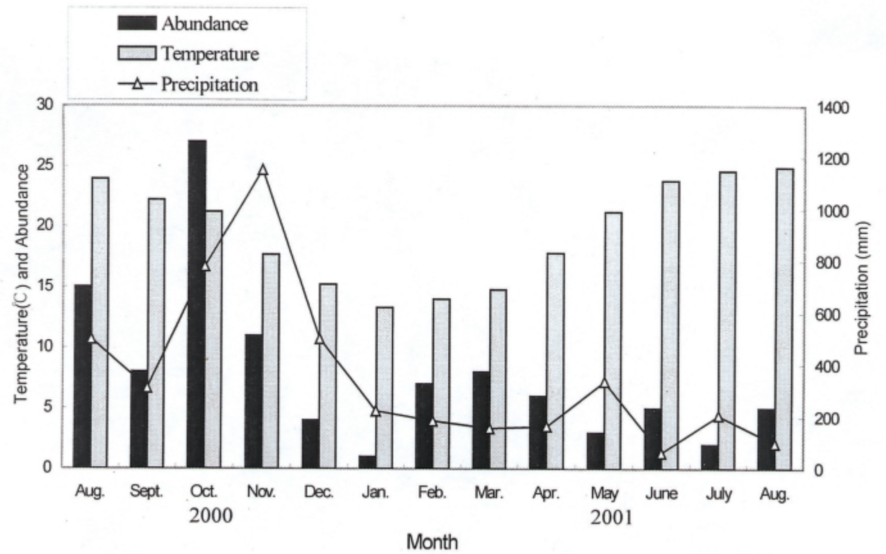

圖2. 溫度、降雨量與眞黏菌豐富度關係(野外採集)。

Fig. 2. Relationships of sporulation frequencies of Myxomycetes observed in the field (open triangles with solid line) to temperature (solid columns) and precipitation (dotted columns), August 2000 to August 2001.

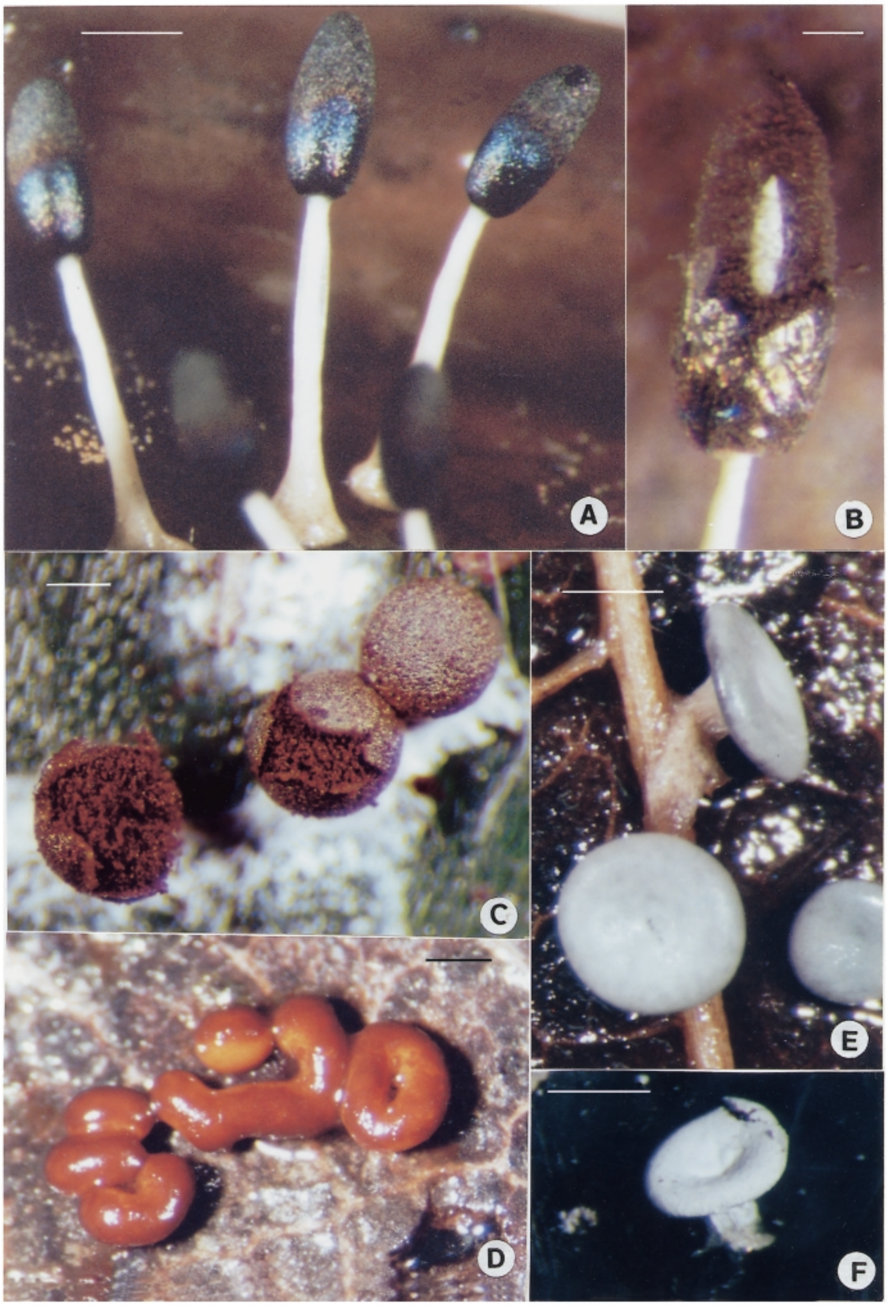

圖3. A和B，白柄黏菌。A，子實體，線段等於500μm；B，孢子囊中的白色中軸，線段等於200μm。C，短白柄黏菌的子實體，線段等於200μm。D，黃蓋碗黏菌的幼嫩子實體，線段等於500μm。 E-F，半圓雙皮黏菌的子實體，線段等於500μm。

Fig. 3. A&B, *Diachia leucopodia*. A, Fruiting bodies, bar =500μm; B, Sporangium showing the white columella, bar =200μm. C, Sporangia of *Diachia subsessiles*, bar =200μm. D, Young fruiting bodies of *Perichaena chrysosperma*, bar =500μm. E-F, Fruiting bodies of *Diderma hemisphaericum*, bar =500μm.

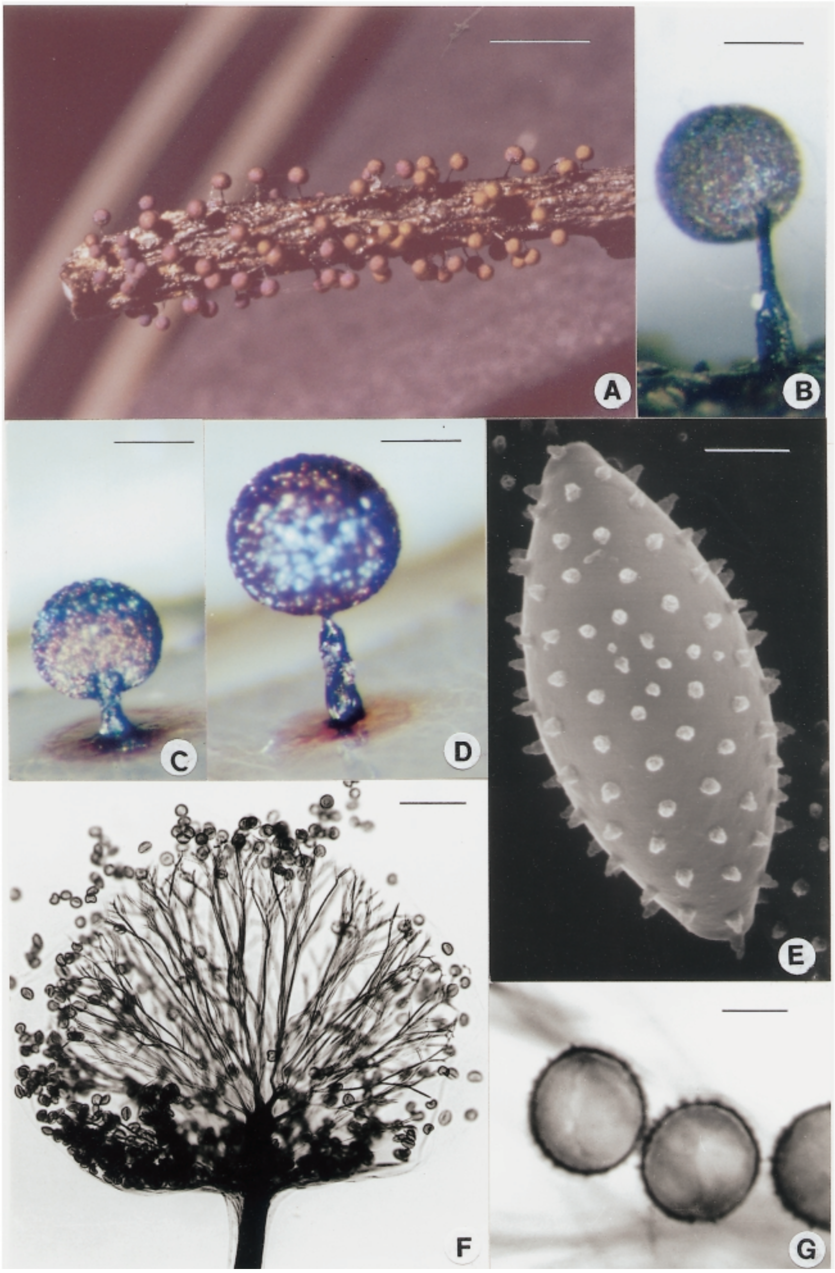

圖4. 粗柄亮皮黏菌。A，基質上的子實體，線段等於2000 μm；B-D，各種大小的子實體，線段等於150 μm；E，掃瞄式電子顯微鏡下的孢子表面突起，線段等於1.5 μm；F，裂開孢子囊中叉狀分支的細毛體，線段等於50 μm；G，孢子側面觀，線段等於5 μm。

Fig. 4. *Lamproderma muscorum*. A, Fruiting bodies in habit, bar =2000 μm; B-D, Fruiting bodies of various size, bar =150 μm; E, SEM of spore surface markings, bar =1.5 μm; F, Dehiscent sporangium, showing the dichotomously branched capillitium, bar =50 μm; G, Spores, marginal view, bar =5 μm.

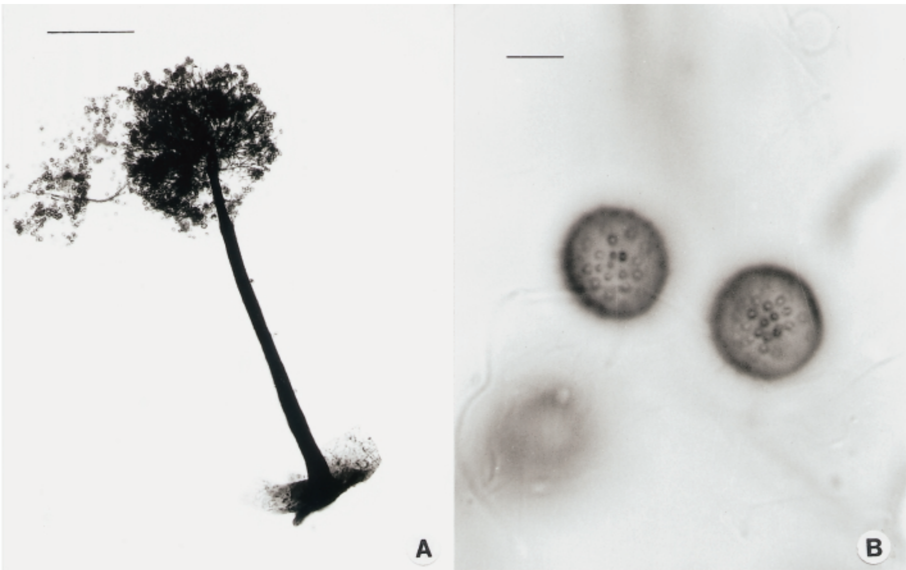

圖5. 粗柄亮皮黏菌。A，子實體中軸達到孢子囊1/2的位置，線段等於200μm；B，孢子表面觀，線段等於5μm。

Fig. 5. *Lamproderma muscorum*. A, Fruiting body, showing the columella reaching to the center of sporangial cavity, bar =200μm; B, Spores, surface view, bar =5μm.

表5. 陽明山氣象資料(2000年8月-2001年8月)

Table 5. Monthly mean temperature and precipitation at the Yangmingshan National Park, August 2000 to August 2001[1]

	2000					2001							
	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Jul	Aug
Precipitation (mm)	499	311	780	1153	501	224	185	156	165	336	61.3	206	99
Temperature (℃)	23.9	22.2	21.2	17.7	15.2	13.3	14	14.8	17.8	21.2	23.8	24.6	24.9

[1]Weather statistics collected at Chutzu Lake Observatory (竹子湖氣象觀測站).

Lamproderma muscorum (Lév.) Hagelst., Mycologia **27**: 88. 1935. (Figs. 4A-G, 5A-B)

Fructifications sporangiate, scattered or gregarious, 0.36-0.88 mm in total height. **Sporangia** globose, steel blue with bronze iridescence, 0.17-0.48 mm in diameter. **Stalk** erect, thick, black, 0.20-0.56 mm tall, about 1/2-2/3 of the total height. **Peridium** thin, membranous, shining, transparent, persistent or fugacious with few remnants at base. **Columella** black, attaining the center of the sporangia, the end obtuse. **Hypothallus** dark brown, membranous, discoid. **Capillitium** dense, dark brown, arising from the tip of the columella, consisting of rigid and dichotomously branched thread. **Spores** globose or subglobose, (5.5-) 7.0-10.0 (-15.0) μm, blackish brown in mass, light brown by transmitted light, prominently spinulate on the surface, the spines often irregularly scattered. **Plasmodium** white.

Specimens examined: Pingtung County: Kenting National Park, CHL B137a, Jul. 5, 1982 (moist-chamber culture: 6/18-7/5/1982), on leaf litter; CHL B157b, Sep. 23, 1982 (moist-chamber culture: 8/20-9/23/1982), on leaf litter. Taoyuan County: Fu-Hsing Hsiang, Mountain La-La, CHL B189, Feb. 4, 1983 (moist-chamber culture: 1/18-2/4/1983), on leaf litter; CHL B190, Feb. 7, 1983 (moist-chamber culture: 1/18-2/7/1983), on leaf litter. Taipei City: Peitou, Yangmingshan National Park, CHL B2210, Oct. 10, 2000, on leaf litter; CHL B2297, Jan. 31, 2001 (moist-chamber culture: 1/15-1/31/2001), on fallen leaves of *Liquidambar formosana*; CHL B2298, Apr. 6, 2001 (moist-chamber culture: 2/15-4/6/2001), on fallen leaves of *Liquidambar formosana*; CHL B2299, Apr. 4, 2001 (moist-chamber culture: 2/15-4/4/2001), on fallen leaves of *Liquidambar formosana*; CHL B2300, Aug. 10, 2001 (moist-chamber culture: 7/19-8/10/2001), on fallen leaves of *Liquidambar formosana*; CHL B2301, Sep. 3, 2001 (moist-chamber culture: 7/19-9/3/2001), on fallen leaves of *Liquidambar formosana*; CHL B2302, Sep. 19, 2001 (moist-chamber culture: 7/19-9/19/2001), on fallen leaves of *Liquidambar formosana*.

Distribution: Colombia, Costa Rica, New York, Pennsylvania, Taiwan, Venezuela.

Remarks: *Lamproderma muscorum* is characterized by having relatively short stalk and dense, rigid capillitium. The basal parts of the dichotomously branched capillitium are not pale but brown, as the other parts. This character differs from that of *L. scintillans*. White plasmodium was observed in one of the specimens obtained by moist-chamber culture (CHLB 157b).

引用文獻

陳雅芬。1997。南仁山亞熱帶雨林樹皮黏菌之組成及分佈類型。國立台灣大學植物學研究所碩士論文。

黃增泉、謝長富、楊國禎、湯惟新。1983。陽明山國家公園植物生態景觀資源。內政部營建署。94頁。

楊馥鴻。2000。文山植物園真黏菌生物多樣性之研究。國立台灣大學植物學研究所碩士論文。

叢培芝。2000。陽明山國家公園解說叢書(5)步道篇。內政部營建署。183頁。

Chiang, Y. C., and C. H. Liu. 1991. Corticolous Myxomycetes of Taiwan: On the bark of *Pinus* trees from central and northern Taiwan. Taiwania 36: 248-264.

Chung, C. H., and C. H. Liu. 1995a. First report of fimicolous Myxomycetes from Taiwan. Fungal Science 10: 33-35.

Chung, C. H., and C. H. Liu. 1995b. Notes on distribution and phenology of some Myxomycetes in Taipei district. Fungal Science 10: 45-52.

Chung, C. H., and C. H. Liu. 1997a. Myxomycetes of Taiwan VIII. Taiwania 42: 274-288.

Chung, C. H., and C. H. Liu. 1997b. Notes on slime molds from Changhua County, Taiwan (II). Fungal Science 12: 93-98.

Chung, C. H., and C. H. Liu. 1997c. Notes on slime molds (Myxomycota: Myxomycetes) from Tainan City, Taiwan. Journal of Taiwan Museum 50: 57-65.

Emoto, Y. 1938. Untersuchungen über die Entwicklung der Myxomyceten auf Faulenden Holzern. Botanical Magazine Tokyo 52: 253-257. (cf. Gray & Alexopoulos, 1968)

Hagelstein, R. 1935. An Adirondack myxomycete. Mycologia 27: 86-88.

Liu, C. H. 1980. Myxomycetes of Taiwan I. Taiwania 25: 141-151.

Liu, C. H. 1981. Myxomycetes of Taiwan II. Taiwania 26: 58-67.

Liu, C. H. 1982. Myxomycetes of Taiwan III. Taiwania 27: 64-85.

Liu, C. H. 1983. Myxomycetes of Taiwan IV. Taiwania 28: 89-116.

Liu, C. H., and Y. F. Chen. 1999. Myxomycetes of Taiwan-XII. New records and newly rediscovered species. Taiwania 44: 368-375.

Liu, C. H., J. H. Chang, and I. G. Huang. 2001. Myxomycetes of Taiwan XIII. One new record and one new variety. Taiwania 46: 325-331.

Martin, G. W., and C. J. Alexopoulos. 1969. The Myxomycetes. 477 pp. University of Iowa Press, Iowa City, U S A.

Nakazawa, R. 1929. A list of Formosan Mycetozoa. Transactions of the Natural and Historical Society Formosa 19(100): 16-30.

Nannenga-Bremekamp, N. E. 1991. A guide to temperate Myxomycetes. 409 pp. Biopress Limited, Bristol; England.

Shi, H. 1981. Myxomycetes in Yangmingshan Area, I. Bulletin of the Hsin-Chu Teacher's College 7: 392-410.

Wang, S. M., Y. W. Wang, and S. Huang. 1981. The revised checklist of Myxomycetes in Taiwan. Biological Bulletin of the National Taiwan Normal University 16: 1-12.

Yamamoto, Y. 1998. The Myxomycetes Biota of Japan. 700 pp. Toyo Shorin Publishing Co. Ltd., Tokyo, Japan.