

# The Genus *Licea* (Myxomycetes) in Taiwan

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**Abstract.** Nine species of the genus *Licea* have been reported from Taiwan. In this paper, four additional records; *L. bryophila* Nann.-Bremek., *L. erecta* var. *erectoides* (Nann.-Bremek. & Y. Yamam.) Y. Yamam., *L. parasitica* (Zukal) G.W. Martin, and *L. scyphoides* T.E. Brooks & H.W. Keller, and an unknown species are described and illustrated. A key to the *Licea* species of Taiwan is also provided.

**Key words:** *Licea*, Myxomycetes, Taiwan.

## INTRODUCTION

The genus *Licea* Schrad. (Liceaceae, Liceales) is characterized by the absence of capillitium and pseudocapillitium in the sporangia. The spores are often paler on one side, and smooth or minutely warted (Martin and Alexopoulos, 1969). Previously, nine species of *Licea* were recorded in Taiwan (Nakazawa, 1929; Shi, 1981; Chiang and Liu, 1991; Chung and Liu, 1996a, b; Chung *et al.*, 1998; Liu *et al.*, 2002b). In this paper, we report four new records; *L. bryophila*, *L. erecta* var. *erectoides*, *L. parasitica*, and *L. scyphoides*, and an unknown species. Most specimens were harvested from corticolous habitats by moist-chamber cultures. Fruiting bodies and their microscopic structures were examined by light and scanning electron microscopy as described previously (Liu *et al.*, 2002a).

## TAXONOMY

Key to species of *Licea* from Taiwan.

1. Fructification sessile, sometimes with base restricted but not stalked.....2  
Fructification stalked, or at least some sporangia with distinct stalks .....9
2. Dehiscence typically by a preformed, orbicular lid .....3  
Dehiscence not by a lid .....4

3. Lid metallic, glossy, and transparent, bearing knobs or tubules on inner surface, spores < 11  $\mu\text{m}$  in diameter and minutely echinulate .....*L. kleistobolus*  
Lid not as above, spores > 11  $\mu\text{m}$  in diam., smooth.....*L. parasitica*
4. Fructification plasmodiocarpous, reticulate .....*L. retiformis*  
Fructification not plasmodiocarpous .....5
5. Dehiscence by a distinct longitudinal fissure; sporangia elongate, laterally compressed, or plasmodiocarpous, up to 2.0 mm long .....*L. biforis*  
Dehiscence irregular, by a circumscissile fissure, or along preformed ridges, peridium divided by ridges into angular platelets; sporangia not laterally compressed .....6
6. Spores small, 7~9  $\mu\text{m}$  in diameter .....7  
Spores larger, > 10  $\mu\text{m}$  in diameter .....8
7. Peridium one-layered, smooth on the inside, sporangia reddish brown .....*L. kellerii*  
Peridium two-layered, inner peridium cartilaginous, sporangia almost black when mature .....*L. pescadorensis*
8. Dehiscence along preformed ridges, peridial platelets less than 6 per sporangium, with prominent pegs, minute warts, or elongate protuberances at margins of inner surface, spores minutely warted .....*L. minima*  
Dehiscence by a circumscissile fissure or irregular, with cup-like remains after dehi-

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- science, spores minutely warted  
.....*L. bryophila*
9. Sporangia laterally compressed, dehiscence  
by a longitudinal fissure along length of  
sporangium .....*Licea* sp.  
Dehiscence not by a longitudinal fissure,  
sporangia not as above .....10
10. Dehiscence by a lid (operculate), sporangia  
urn-shaped or globose .....11  
Dehiscence not by a lid, sporangia globose to  
ovate .....12
11. Sporangia urn-shaped, usually operculate,  
0.1~0.2 mm in diameter; spores  
(7~) 8~12  $\mu$ m in diameter .....  
.....*L. operculata*  
Sporangia globose, 0.07~0.1 mm in diam.;  
spores 10~11  $\mu$ m in diameter ...  
.....*L. bulbosa*
12. Dehiscence by a circumscissile fissure,  
basal portion persisting as a cup; spores  
minutely roughened; sporangia globose;  
up to 0.35 mm in total height .....  
.....*L. scyphoides*  
Dehiscence irregular or by a vertical slit;  
spores nearly smooth; up to 1.5 mm  
in total height .....13
13. Dehiscence by a vertical slit, sporangia  
globose; iridescent on upper part, lower  
part opaque with refuse matter .....  
.....*L. capitata*  
Dehiscence irregular; sporangia ovate to  
oblong ovate; dark brown and opaque  
throughout, bearing a network of thick-  
ened ridges but not divided into pla-  
telets .....*L. erecta* var. *erectoides*

*Licea biforis* Morgan, J. Cincinnati Soc. Nat.  
Hist. 15: 131. 1893.

= *Licea sinuosa* Nann.-Bremek., Acta Bot. Neerl.  
14: 143. 1965.

= *Pleiomorpha biforis* (Morgan) Dhillon,  
Sydowia 32: 81. 1979.

= *Licea biforis* var. *sinuosa* (Nann.-Bremek.)  
Y. Yamam., Hikobia 11: 528. 1994.

Description and illustration: H. Shi, in Bull.  
Hsin-Chu Teacher's Coll. 7: 2-3. 1981.

*Specimens examined:* Taipei City: main  
campus of National Taiwan Univ., on bark,  
*BY37M29*, Apr. 28, 1989 (moist-chamber culture:  
Apr. 3~28, 1989). Pingtung Co.: Nanjenshan  
forest, on bark, *CHL B1575*, Jan. 26, 1999 (moist-  
chamber culture: Dec. 16, 1998~Jan. 26, 1999).

The distinct outer feature of this species is

its brown plasmodiocarpous fructification with  
a prominent dehiscent fissure along the long  
axis of the sporangium. The specimen from  
Yangmingshan (Shi, 1981) appears to have much  
larger plasmodiocarps with smaller spores. In  
our specimens, the sporangia are 0.2~0.75  $\times$   
0.075~0.18 mm and spores are 10~12  $\mu$ m in  
diam. for the globose form, or proportionately  
longer for the oval form.

*Licea bryophila* Nann.-Bremek., Proc. Kon. Ned.  
Akad. Wetensch. C. 79: 382. 1978.

(Figs. 1A, 2A-F)

Fructification sporangiate or aethalioid,  
scattered, sessile, on a somewhat narrow base in  
the globose form or on a broad base in the nearly  
hemispheric type, irregular in size, 0.07~0.18  
mm in diam., globose or subglobose, 0.12~0.23  
 $\times$  0.25~0.37 mm in the somewhat elongated  
form, dingy brown to blackish. Hypothallus  
concolorous with the sporangium. Peridium  
membranous, translucent, often enveloped by  
gelatinous refuse matter, exposed when the slimy  
outer coating slipped away, minutely papillate or  
warted, dehiscence circumscissile or irregular,  
leaving the lower part of the sporangium as a  
cup. Spores dark brown in mass, medium or pale  
brown by transmitted light, globose, 13~17  $\mu$ m  
in diam., roughened in high dry lens, minutely  
spinulate under oil lens, with a pale area on one  
side, by SEM the warts or spinules dense and low,  
connected at base. Plasmodium not observed.

*Specimen examined:* Taipei City: main  
campus of National Taiwan Univ., on bare bark of  
*Carica papaya*, *BY31M06*, Mar. 23, 1989 (moist-  
chamber culture: Mar. 9~23, 1989).

*Distribution:* Europe (Britain, France,  
Switzerland), Taiwan.

This species is quite close to *L. kayokare*  
Y. Yamam. (Yamamoto, 2000) in the outer  
appearance of the sporangium (size, form, color  
and dehiscent manner) and in the spores (densely  
and minutely spinulose or verruculose). However,  
*L. bryophila* has smaller spores (14~15  $\mu$ m)  
(Mitchell and Nannenga-Bremekamp, 1976) than  
those of *L. kayokare* (15~21  $\mu$ m in diam.). The  
peridium of *L. kayokare* is single-layered, almost  
without gelatinous refuse matter (Yamamoto,  
2000), but *L. bryophila* has a double-layered  
peridium with a gelatinous outer layer. We  
identified our specimen as *L. bryophila* based on  
the characteristics of the spores and the peridium.

*Licea bulbosa* Nann.-Bremek. & Y. Yamam.,

Proc. Kon. Ned. Akad. Wetensch. C. 90: 324.1987.  
= *Licea tropica* Chao H. Chung and C.H. Liu,  
Proc. Nat. Sci. Council., ROC. B. 20: 140. 1996.  
(Figs. 1B-G)

*Specimens examined*: Taipei City: Yangmingshan National Park, Hsiaoyoukeng, on fallen twigs and leaves of *Miscanthus floridulus*, CHL B2343, Oct. 2, 2001 (moist-chamber culture: Aug. 26~Oct. 2, 2001). Taipei Co.: Shih-ting, Wenshan Botanical Gardens of National Taiwan Univ., on fallen twigs and leaves, CHL B2161, July 25, 2000 (moist-chamber culture: July 10~25, 2000).

Relevant characters were examined. The height of the fruiting body and the diameter of the sporangium were noted as the main differences of *L. tropica* and *L. bulbosa* by Chung and Liu (1996a). But when examining our subsequent moist-chamber cultures (as listed above) with the same characteristics as those of *L. tropica* and the isotype of *L. bulbosa* in Wrigley de Basanta and Lado (2005), the smaller sizes of the fruiting bodies and the sporangia as those of *L. bulbosa* were also found.

*Licea capitata* Ing & McHugh, in Ing, Trans. Br. Myc. Soc. 78: 439. 1982.

Description and illustration: Y.C. Chiang and C.H. Liu, in *Taiwania* 36: 252, 258. 1991.

It was classified as a lidless form of *Licea operculata* with no differences in microscopic characters (Ing, 1999), then was treated as a synonym to *L. floriformis* var. *aureospora* M.T.M. Willemsse & Nann.-Bremek. based on the similar characteristics of spores, stalks, and peridium (Wrigley de Basanta and Lado, 2005). Similarities of this species with *L. operculata* were noted (Chiang and Liu, 1991), but the way of sporangial dehiscence, that by a vertical slit instead of by a lid is apparently different from that of the latter. We therefore recognize *L. capitata* as a distinct species.

*Licea erecta* var. *erectoides* (Nann.-Bremek. & Y. Yamam.) Y. Yamam., Myxomycete Biota Japan 130. 1998.

(Figs. 1H-J)

= *Licea erectoides* Nann.-Bremek. & Y. Yamam., Proc. Kon. Ned. Akad. Wetensch., C. 86: 209. 1983.

Fructification sporangiate, scattered. Sporangia stalked, dark brown to blackish, ovate to oblong ovate, 0.17~0.33 mm in diam. Stalk

long, up to 0.75 mm long. Peridium dark brown, opaque, marked by ridges in longitudinal and irregular but anastomosing arrangement, with blunt outgrowth on upper part of sporangium, dehiscence along ridges. Spores ochraceous in mass, pale by transmitted light, globose, 9~11 µm in diam., smooth under high dry lens.

*Specimen examined*: Taipei City: main campus of National Taiwan Univ., on bark of *Liquidambar formosana*, CHL B2350, May 26, 1988.

*Distribution*: Asia (China, Japan, Taiwan), Costa Rica, Cuba.

The long-stalked and dark brown sporangium with more or less longitudinal and anastomosing ridges is distinct but similar to *L. erecta* K.S. Thind & Dhillon. The much smaller spore size of this taxon is, however, different from the type species *L. erecta* which has spores in 14~15 µm in diam. (Martin and Alexopoulos, 1969). Spores in both the type species and the var. *erectoides* are similar in color and surface markings.

*Licea kellerii* Nann.-Bremek. & Y. Yamam., Proc. Kon. Ned. Akad. Wetensch. C. 86: 211. 1983.

Description and illustration: C.H. Chung *et al.*, in *J. Taiwan Mus.* 51: 51-53. 1998.

*Specimen examined*: Taitung Co.: Orchid Island, Mt. Tasen, on dead twigs, CHL B824, June 23, 1988 (moist-chamber culture: May 23~June 23, 1988).

*Licea kleistobolus* G.W. Martin, *Mycologia* 34: 702. 1942.

= *Kleistobolus pusillus* C. Lippert, Verh. Zool. Bot. Ges. Wein 44: 70. 1894.

= *Orcadella pusilla* (C. Lippert) Hagelst., *Mycologia* 34: 258. 1942.

Description and illustration: Y.C. Chiang and C.H. Liu, in *Taiwania* 36: 253, 259. 1991.

*Specimens examined*: Taipei City: main campus of National Taiwan Univ., on bark, CHL B832, Mar. 28, 1989 (moist-chamber culture: Mar. 9~28, 1989); Yangmingshan National Park, Arhtzuping, on bark, BY420M82, Nov. 30, 1989 (moist-chamber culture: Oct. 29~Nov. 30, 1989). Taichung Co.: Heping, Wuling Farm, on bark, CHL B1169, Oct. 13, 1994 (moist-chamber culture: Sept. 26~Oct. 13, 1994).

*Licea minima* Fr., *Syst. Mycol.* 3: 199. 1829. (Figs. 2G-L)

= *Phelonites minima* (Fr.) Fr., *Summa Veg.*

Scand. 459. 1849.  
 = *Tubulina minima* (Fr.) Masee, Monogr.  
 Myxogastr. 36. 1892.

Description and illustration: H. Shi, in Bull.  
 Hsinchu Teacher's Coll. 7: 2-3. 1981.

*Specimens examined*: Nantou Co.: Hsitou, on  
 bark, CHL B921, Nov. 15, 1991 (moist-chamber

culture: Oct. 18~Nov. 15, 1991). Pingtung Co.:  
 Nanjenshan forest, on bark, CHL B1371, Dec. 15,  
 1997 (moist-chamber culture: Sept. 22~Dec. 15,  
 1997).

At first glance our specimens are close to  
*Licea pusilla*, but differ in the sizes of both the  
 sporangia (0.10~0.22 mm in our specimens)

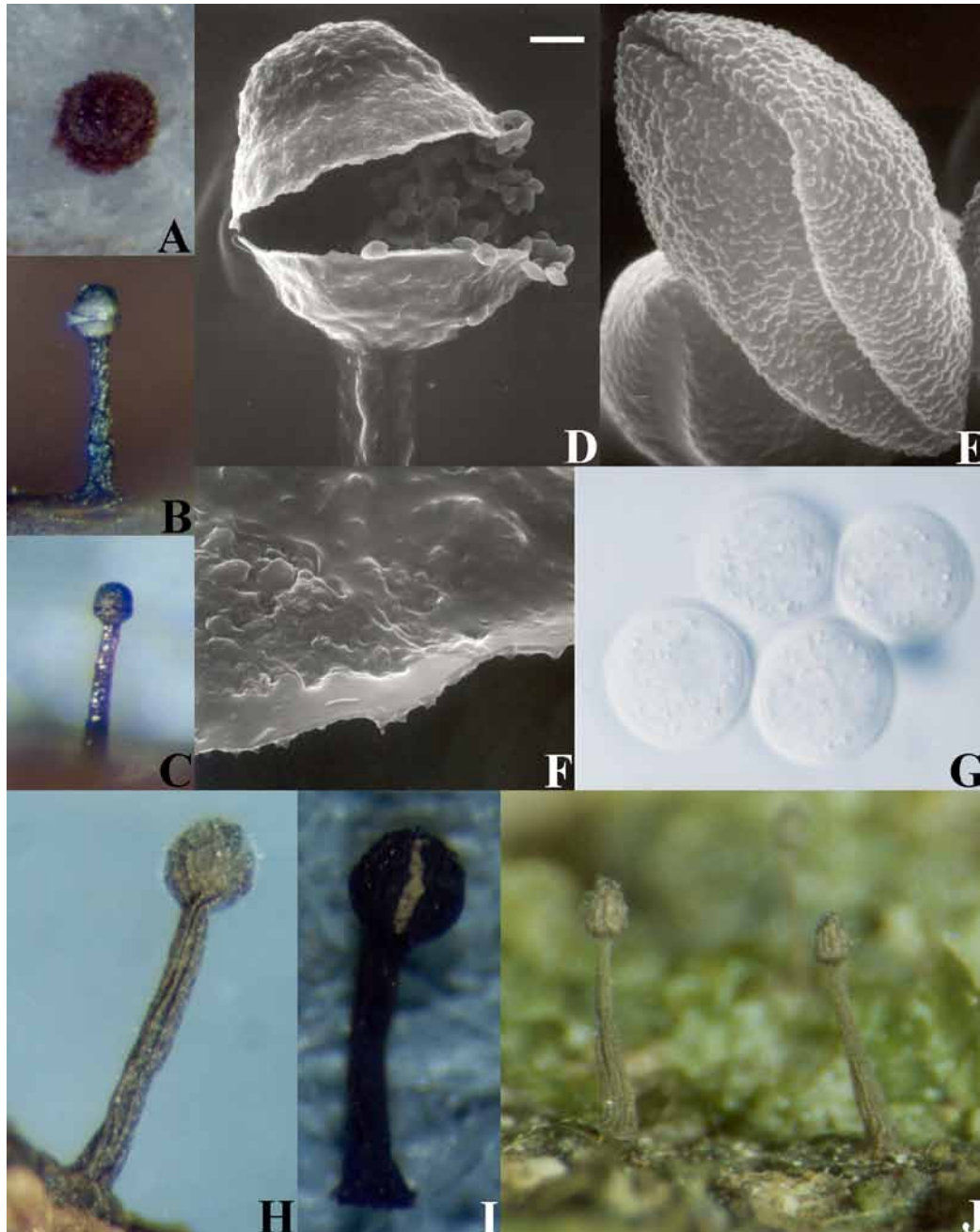


Fig. 1. A. Fruiting body of *Licea bryophila*. B-G. *Licea bulbosa*. B-C. Fruiting bodies. D. SEM of dehiscent sporangium. E. Surface markings of spore, by SEM. F. Part of the sporangial lid, showing the spinules on the inner edge. G. Spores. H-J. *Licea erecta* var. *erectoides*. H and J. Fruiting bodies. I. Dehiscent fruiting body, showing a distinct longitudinal fissure on the sporangium. Scale bar: A, H, I = 150  $\mu$ m, B, C, J = 250  $\mu$ m, D = 20  $\mu$ m, E = 1  $\mu$ m, F = 3  $\mu$ m, G = 4  $\mu$ m.

and the spores (12~13  $\mu\text{m}$  in our specimens) which are much larger in *L. pusilla* (Martin and Alexopoulos, 1969; Lado and Pando, 1997).

*Licea operculata* (Wingate) G.W. Martin, Mycologia 34: 702. 1942.  
= *Orcadella operculata* Wingate, Proc. Acad.

Nat.Sci. Philadelphia 41: 280. 1889.  
= *Orcadella operculata* var. sessile G. Lister, Monogr. Mycetozoa, 3rd ed. 186. 1925.

(Figs. 2M-O)

Fructification sporangiate, scattered, dark brown or blackish throughout, 0.35~0.71 mm in total height. Sporangia stalked, urn-shaped or

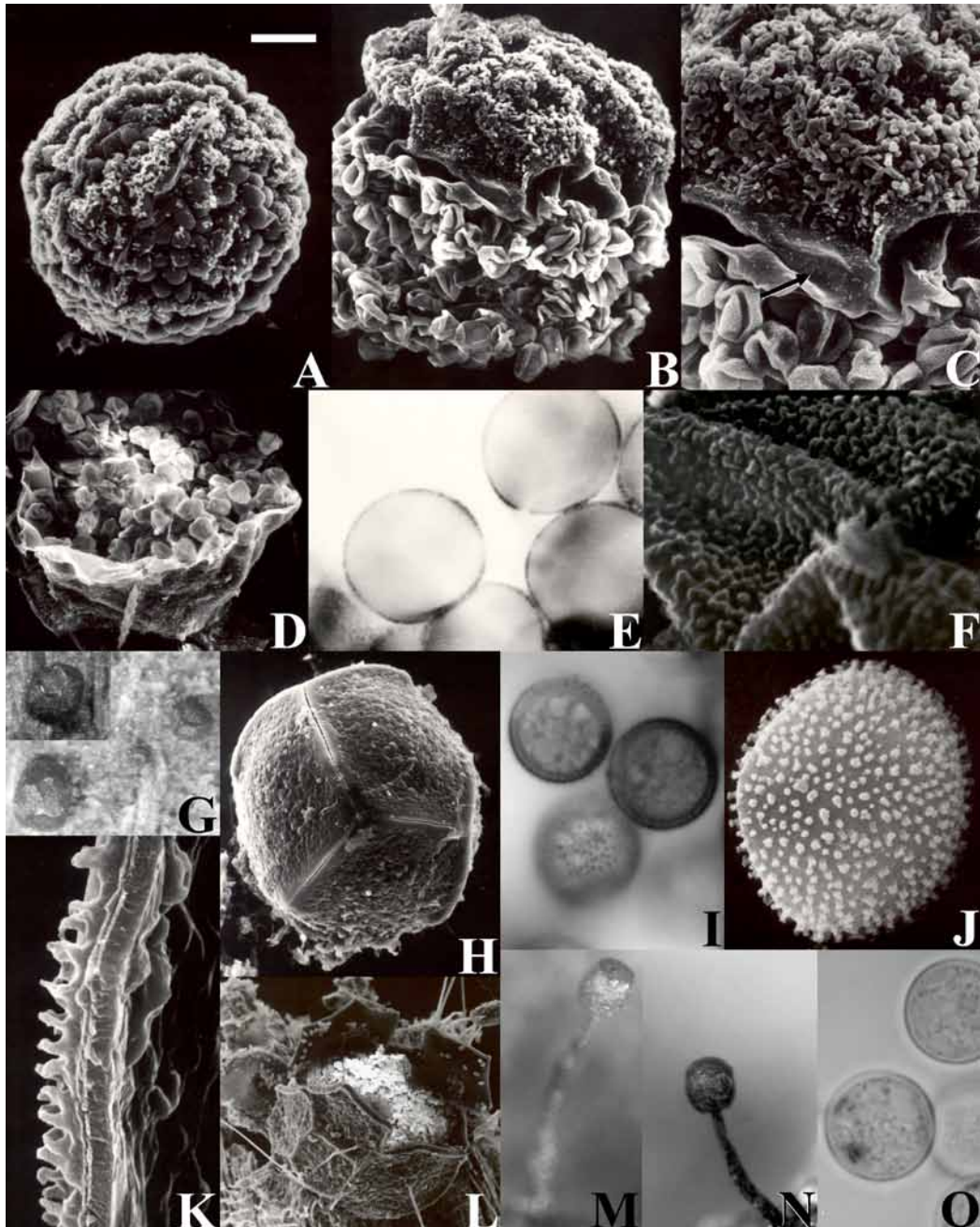


Fig. 2. A-F. *Licea bryophila*. A. Top view of sporangium. B. A dehiscent sporangium with the lid attached. C. Upper half of a dehiscent sporangium, showing the membranous peridium (arrow) and the refuse matter on it. D. Dehiscent sporangium, showing the bottom half. E. Marginal view of spores. F. Surface markings of one spore, by SEM. G-L. *Licea minima*. G. Fruiting bodies. H. Sporangium, by SEM. I. Surface and marginal views of spores. J. Surface markings of one spore, by SEM. K. Margin of a lobe of the peridium. L. Dehiscent sporangium, by SEM. M-O. *Licea operculata*. M-N. Fruiting bodies. O. Spores. Scale bar: A, D = 23  $\mu\text{m}$ , B = 18  $\mu\text{m}$ , C = 9  $\mu\text{m}$ , E = 8  $\mu\text{m}$ , F = 1  $\mu\text{m}$ , G = 400  $\mu\text{m}$ , H = 42  $\mu\text{m}$ , I, O = 6  $\mu\text{m}$ , J = 2  $\mu\text{m}$ , K = 3.6  $\mu\text{m}$ , L = 87  $\mu\text{m}$ , M, N = 200  $\mu\text{m}$ .



rounded, ochraceous when moist, dark smoky brown when dry, 0.1~0.2 mm in diam.; with a membranous lid in metallic brown color. Stalk long, stout (ca. 82  $\mu\text{m}$  thick at base), tapering upwards, dark (smoky brown), furrowed (ca. 0.47~0.55 mm long). Spores pale yellowish in mass, very pale or colorless by transmitted light, globose, (7.5~) 8~12  $\mu\text{m}$  in diam., smooth.

*Specimens examined:* Nantou Co.: Meifeng, Highlands Experimental Farm, National Taiwan Univ., on bark of *Cryptomeria japonica*, CHL B1042b, July 17, 1992 (moist-chamber culture: July 4~17, 1992). Hualien Co.: Chinan National Forest Recreation Area, on bark of *Pinus elliotii*, CHL B1094, Oct. 4, 1992 (moist-chamber culture: Sept. 12~Oct. 4, 1992). Pingtung Co.: Nanjenshan forest, on bark, CHL B1813, May. 18, 1999 (moist-chamber culture: Apr. 29~May. 18, 1999).

*Distribution:* Cosmopolitan.

This species is common in Taiwan. It was reported in a list by Nakazawa (1929), but no specimens were deposited in Taiwan.

***Licea parasitica*** (Zukal) G.W. Martin, Mycologia 34: 702. 1942.

= *Cylichnium operculatum* Wallr., Fl. Crypt. Germ. 2: 268. 1833.

= *Hymenobolus parasiticus* Zukal, Oesterr. Bot. Zeits. 43: 73. 1893.

= *Hymenobolina parasitica* (Zukal) Zukal, Oesterr. Bot. Zeits. 43: 133. 1893.

= *Orcadella parasitica* (Zukal) Hagelst., Mycologia 34: 258. 1942.

= *Orcadella singularis* (E. Jahn) R. Sant., Svensk Bot. Tidskr. 42: 46. 1948.

(Fig. 3)

Fructification sporangiate, scattered or gregarious. Sporangia sessile, globose, subglobose or urn-shaped, 0.08~0.30 mm in diam., when moist greenish and gelatinous, or grayish, or blackish depending on substrata. Peridium membranous, pale yellow, translucent, covered by debris matter except at circumscissile line close to upper part, dehiscence operculate, echinulate or warted on under surface. Spores brown in mass, globose, subglobose, pale and thinner on one side, 11~15 (~17)  $\mu\text{m}$  in diam., smooth. Plasmodium not observed.

*Specimens examined:* Taipei Co.: Sansia Town, Hsiungkung, on bark, CHL B948, Feb. 30, 1991 (moist-chamber culture: Dec. 19, 1991~Feb. 30, 1992). Nantou Co.: Meifeng, Highlands Experimental Farm, National Taiwan Univ., on

bark of *Cryptomeria japonica*, CHL B1042a, July 14, 1992 (moist-chamber culture: July 1~14, 1992); CHL B1050b, July 27, 1992 (moist-chamber culture: July 4~27, 1992); Hsitou, on bark of *C. japonica*, CHL B932a, Nov. 18, 1991 (moist-chamber culture: Oct. 18~Nov. 18, 1991). Pingtung Co.: Nanjenshan forest, on bark of *Syzygium samarangense*, Y.F. Chen 38, Aug. 18, 1995 (moist-chamber culture: Aug. 8~18, 1995).

*Distribution:* Cosmopolitan.

The sessile, globose or urn-shaped sporangium with an orbicular lid close to the upper part is distinct of this species. The dehiscent line of the lid and the echinulate under surface markings of the peridium (under SEM) are quite prominent.

***Licea pescadorensis*** Chao H. Chung and C.H. Liu, Taiwania 41: 259. 1996.

Description and illustration: C.H. Chung and C.H. Liu, in Taiwania 41: 259-262. 1996b.

*Specimen examined:* Penghu Co.: Makung, Wukan south 1 km, open dry farmland, on cow dung, C.H. Chung M924, July 8, 1995 (moist-chamber culture: June 17~July 8, 1995).

***Licea retiformis*** Nawawi, Trans. Br. Myc. Soc. 60: 153. 1973.

Description and illustration: C.H. Liu *et al.*, in Taiwania 47: 180-182. 2002b.

*Specimen examined:* Taipei Co.: Shih-ting, Wenshan Botanical Garden of National Taiwan Univ., on bark of *Persea thunbergii*, Yang99-11B3B2, Jan. 24, 1999 (moist-chamber culture: Dec. 28, 1998~Jan. 24, 1999).

***Licea scyphoides*** T.E. Brooks & H.W. Keller, Mycologia 69: 679. 1977.

(Fig. 4)

= *Licea tanzanica* Ukkola, Haerk. & Gilert, in Ukkola, Haerk & Saarimaeki, Karstenia 36: 57. 1996.

Fructification sporangiate, scattered, 0.11~0.30 (~0.35) mm in total height. Sporangia stipitate, globose but slightly depressed, 0.07~0.20 (~0.25) mm in diam., grayish brown and opaque above, golden brown and glossy below. Peridium membranous, minutely papillose on under surface, dehiscing by an equatorial circumscissile fissure. Stalk stout, black. Spores golden brown or russet in mass, brownish by transmitted light, smooth by margins under oil lens, with a paler area to one side, minutely papillose by SEM, globose, (6.0~) 7.0~12.5  $\mu\text{m}$  in

diam. Plasmodium not observed.

*Specimens examined*: Taipei City: main campus of National Taiwan Univ., on bark of *Koelreuteria formosana*, CHL B830, Mar. 27, 1989 (moist-chamber culture: Mar. 9~27, 1989); Peitou District, Zhongzheng Senior High School,

on bark of *Albizia julibrissin*, CHL B843, May 2, 1991 (moist-chamber culture: Apr. 26~May 2, 1991). Hsinchu City: National Ch'inghua Univ., on bark, BY26M4, Mar. 27, 1989 (moist-chamber culture: Mar. 21~27, 1989). Nantou Co.: Sun-Moon Lake, on bark, CHL B849, Dec. 27, 1983

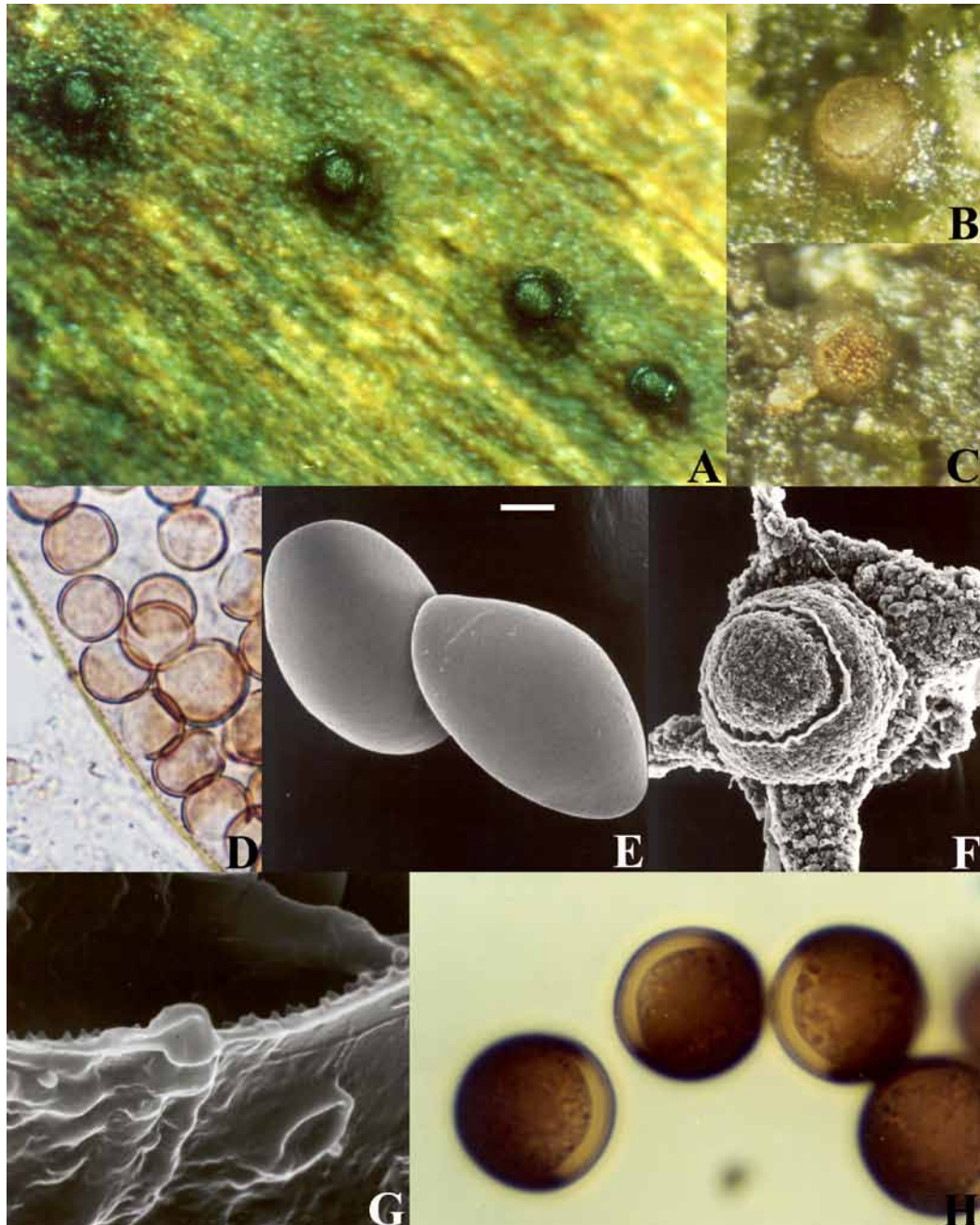


Fig. 3. *Licea parasitica*. A-B. Fruiting bodies. C. An opened sporangium exposing the ochraceous spore mass. D. Spores and margin of the peridium. E. Smooth spores, by SEM. F. Sporangium, by SEM. G. Margins of opening mouth of a sporangium. H. Spores. Scale bar: A= 200  $\mu$ m, B, C = 150  $\mu$ m, D = 10  $\mu$ m, E = 2.3  $\mu$ m, F = 40  $\mu$ m, G = 1.5  $\mu$ m, H = 4  $\mu$ m.

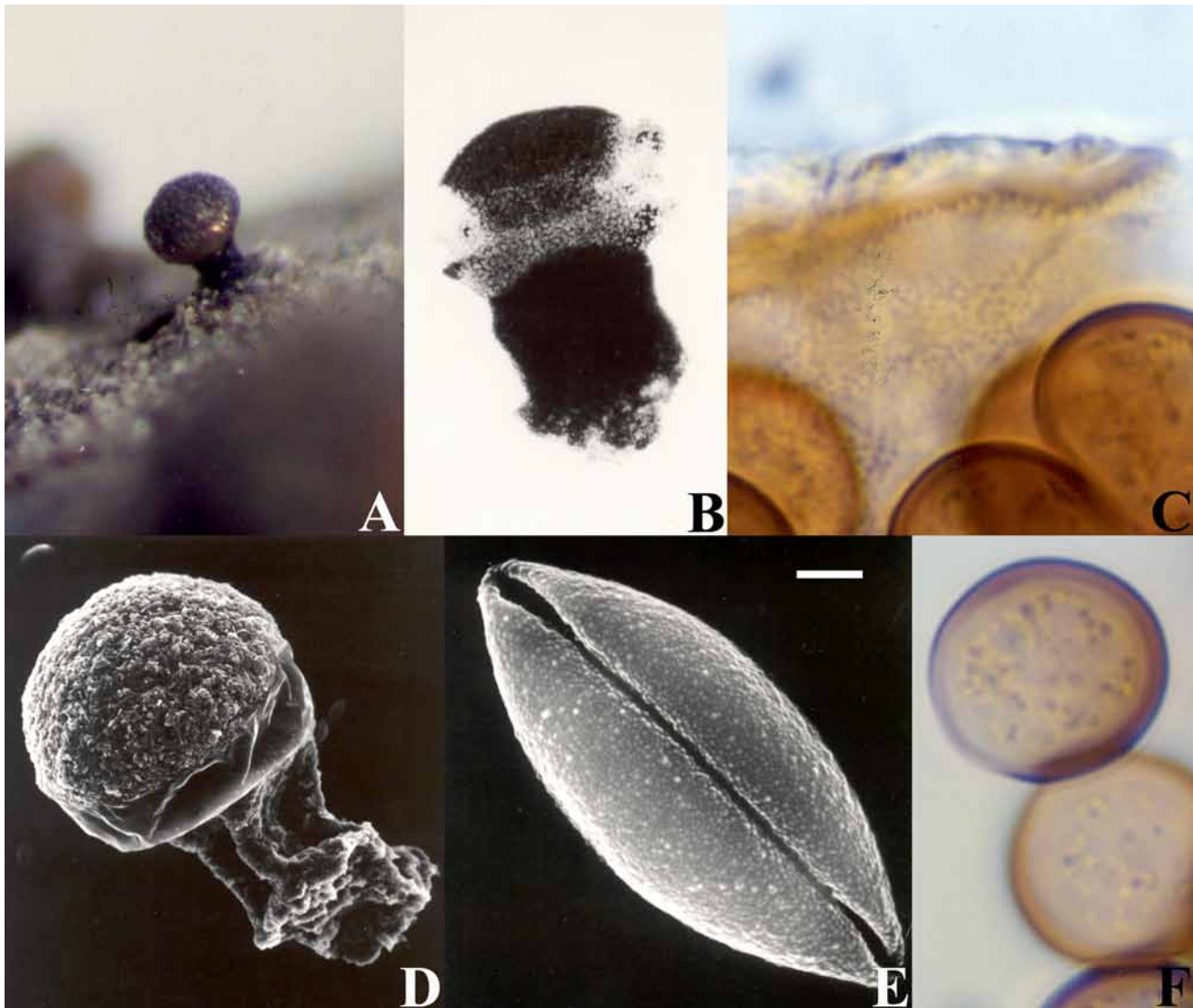


Fig. 4. *Licea scyphoides*. A. Fruiting body. B. Dehiscent sporangium. C. Under surface of the peridium and the part of spores. D. Sporangium, by SEM. E. Surface markings of one spore, by SEM. F. Spores. Scale bar: A = 150  $\mu$ m, B = 75  $\mu$ m, C, F = 3  $\mu$ m, D = 28  $\mu$ m, E = 1.6  $\mu$ m.

(moist-chamber culture: Dec. 10~27, 1983); Huisun Forest Station, on bark of *Lagerstroemia subcostata*, CHL B849, May 11, 1991 (moist-chamber culture: May 1~11, 1991). Pingtung Co.: Nanjenshan forest, on bark, CHL B1598, Mar. 3, 1999 (moist-chamber culture: Feb. 4~Mar. 3, 1999).

**Distribution:** Africa (Tanzania), Asia (China, Japan, Taiwan), Europe (Spain, Wales), North America, South America (Mexico, Peru).

Among the stipitate forms of *Licea*, this species is distinct in the way of the peridial dehiscence by an equatorial and circumscissile fissure.

***Licea* sp.** (Fig. 5)

Fructification sporangiata, scattered.

Sporangium broadly stalked, horizontally elongate, arcuate, or peach-like in few, 0.11~0.21 mm in diam., up to 0.48 mm long. Stalk stout, dark grayish brown, covered by detritus matters. Peridium translucent, appearing smooth, with scattered granular matter on outer surface, dehiscence by a longitudinal fissure dividing peridium into two equal parts; ochraceous, with dark bands of detritus matters around fissure and around junction of sporangium and stalk. Spores pale yellowish in mass, nearly hyaline in transmitted light, smooth under high dry lens, prominently and densely warted by SEM, globose, 11~12.5  $\mu$ m in diam.

**Specimen examined:** Hsinchu City: Kuanwu, on bark of *Cryptomeria japonica*, BY1251M312, May 4, 1992 (moist-chamber culture: Apr.



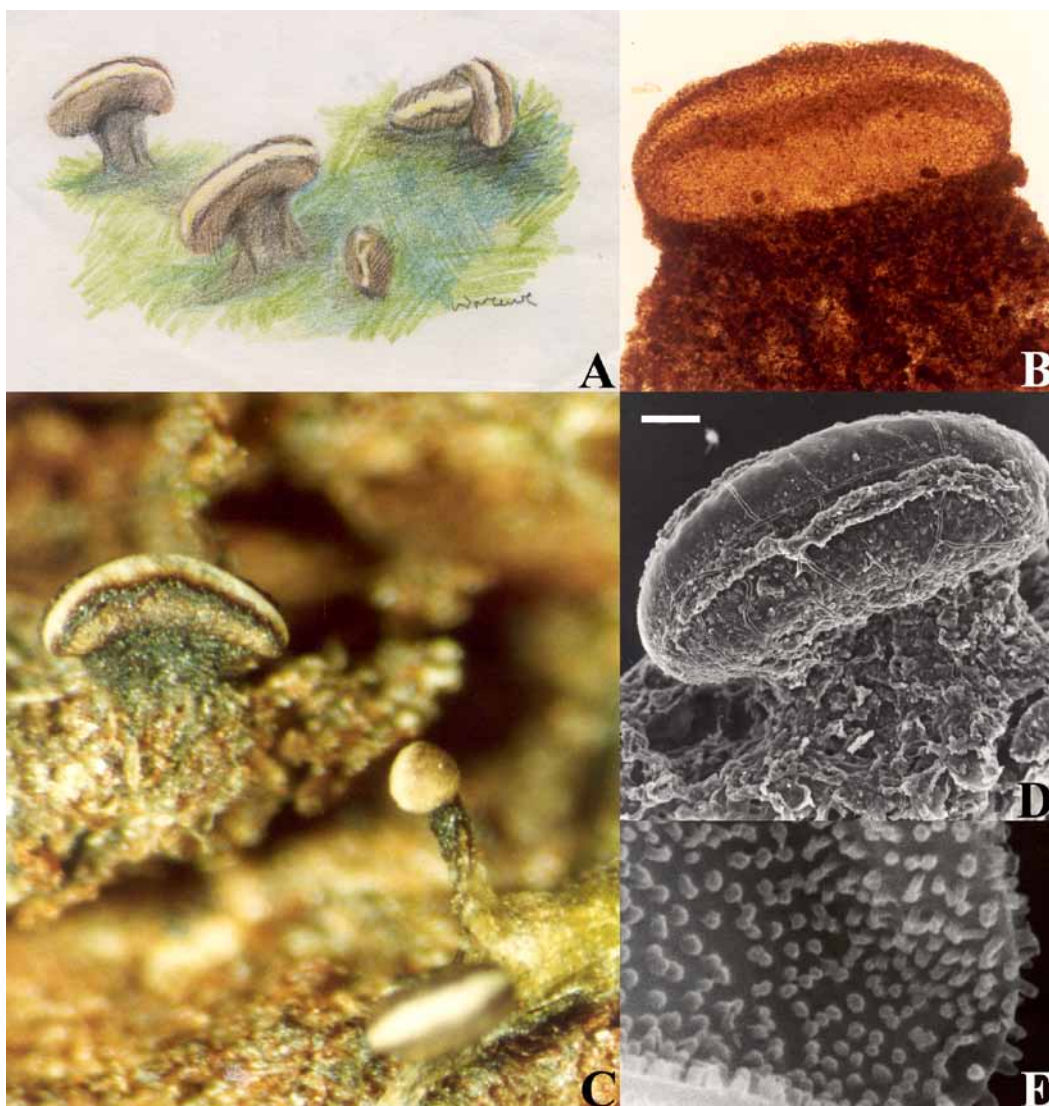


Fig. 5. *Licea* sp. A-D. Fruiting bodies. E. Surface markings of one spore, by SEM. Scale bar: A, C = 125  $\mu\text{m}$ , B, D = 50  $\mu\text{m}$ , E = 0.6  $\mu\text{m}$ .

13~May 4, 1992).

The distinctive characteristic of this specimen is the broadly stipitate sporangia which are elongate horizontally and mostly arcuate, a character not found in any known stipitate species of *Licea* (Wrigley de Basanta and Lado, 2005). This specimen closely resembles *L. biforis* in outer appearance of the sporangium, however, in *L. biforis* the sporangium is sessile and never stipitate as in our specimen.

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## 台灣黏菌：無絲黏菌屬

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無絲黏菌屬在台灣已紀錄有九種，本篇共報導3個新記錄種與1個新記錄變種，分別為親藓無絲黏菌(*Licea bryophila*)、直立無絲黏菌立狀變種(*L. erecta* var. *erectoides*)、寄生型無絲黏菌(*L. parasitica*)與杯狀無絲黏菌(*L. scyphoides*)；另外一種*Licea* sp.疑為世界新種，並提供台灣所有紀錄的無絲黏菌屬種類的檢索表。

關鍵詞：無絲黏菌屬；真黏菌綱；臺灣。