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Higher Fungi in Korea (1)

Soon-Ja Seok*, Yang-Sup Kim, Young-Jin Ryu and Dong-Suk Park
Agricultural Science and Technology Institute, RDA, Suwon 441-707, Republic of Korea

韓國產 高等菌類(1)

石順子*·金養燮·柳榮鎭·朴東奭
農業科學技術院 農村振興廳 水原

ABSTRACT: Through a floral study and resource investigation of Korean mushrooms during the year 1993, five species of Agaricales, *Pseudoclitocybe cyathiformis* (Bull.: Fr.) Sing.; *Pholiota brunnescens* A.H. Smith & K. Hesler; *Coprinus angulatus* Peck; *Rhodophyllus bisporus* Hongo; *Suillus viscidipes* Hongo and one form of Gasteromycetes, *Lysurus mokusin* (L.: Pers.) Fr.f. *sinensis* (Lloyd) Kobayashi, were found and described new to Korean flora. *Pseudoclitocybe* is described as an unrecorded genus to Korea. The color names cited are from Kornerup & Wanscher's Methuen Handbook of Colour (1984). All the specimens are deposited in the RDAGB's and ASIK's herbarium.

KEYWORDS: *Pseudoclitocybe cyathiformis, Pholiota brunnescens, Coprinus angulatus, Rhodophyllus bisporus, Suillus viscidipes, Lysurus mokusin* f. *sinensis*, Identification

***Pseudoclitocybe* (Sing.) Sing. 헛깔때기버섯속(신칭) in Mycologia 48: 725. 1956.**

Basidiome clitocyboid or clitocyboid-tricholomatoid. Pileus glabrous, radially fibrillose, hygrophanous. Hymenophore lamella, sometimes forked, decurrent. Context not reddening when bruised, hyphae without clamp. Hymenophoral trama regular, subhymenium cellular or subcellular. Spores amyloid. Development unknown. Lignicolous. Humicolous. Northern hemisphere.

1. *Pseudoclitocybe cyathiformis* (Bull.: Fr.) Sing. 헛깔때기버섯(신칭) *in* Rev. de Mycologia 1: 281. 1936.

Pileus 25~55 mm wide, at first convex narrowly depressed at center, then becoming infundibuliformis, when young margin in curved, surface smooth, moist, without translucent striates, hygrophanous from center when dry, greyish brown (9F3) to (8F3) at young, paler or greyish brown (9E3) in mature. Context greyish white, fleshy. Odor fungoid, taste mild. Lamellae 22~28×2.5~3.3 mm, duply decurrent, narrow, subcrowded to crowded, frequently dichotomous toward margin, orange grey (6B2), edge smooth, lamellulae 2- or 3-tiers. Stipe 45~85×3.5~7 mm (11 mm thick at base), subcylindric, usually thickened downward, longitudinally fibrillose striates, without or with inconspicuous fibrillose netted, concolourous with pileus or paler, central, sorded.

Spore print whitish. Spores 7.9~8.8×5.6~6 μm, ellipsoid, oblong, amyloid thin-walled. Basidia 44.6~50×9~9.3 μm, normal, 4-spored, more or less with large sterigmata at apex. Pleurocystidia and cheilocystidia absent. Pileipellis of the pileus sparsely cylindric 54~96.7×2.3~3.4 μm, flexuose of cylindric to trichoderm. Terminal cells at the base of stipe 63~117×3.4~5.6 μm, narrowly, cylindric. Hyphae without clamp connection.

Habit & Habitat : Scattered or somewhat gregarious on the fallen twigs or decayed trunks late

*Corresponding author

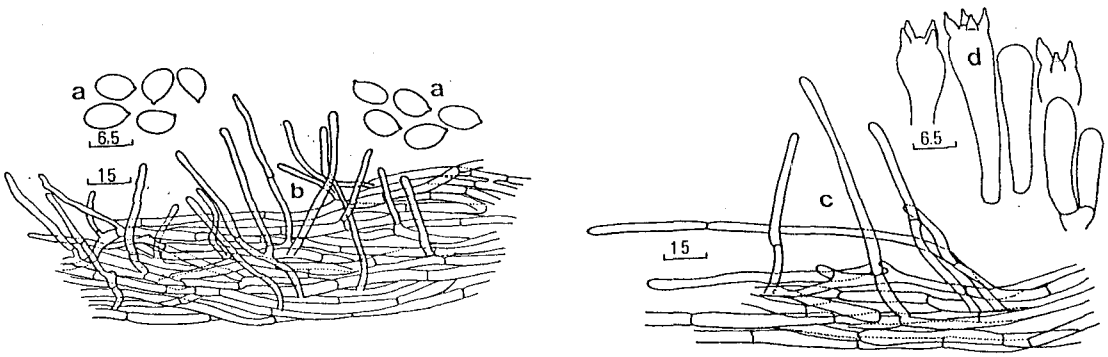

Plate 1. *Pseudoclitocybe cyathiformis*
a: spores, b: pileipellis, c: base of the stipe, d: basidia

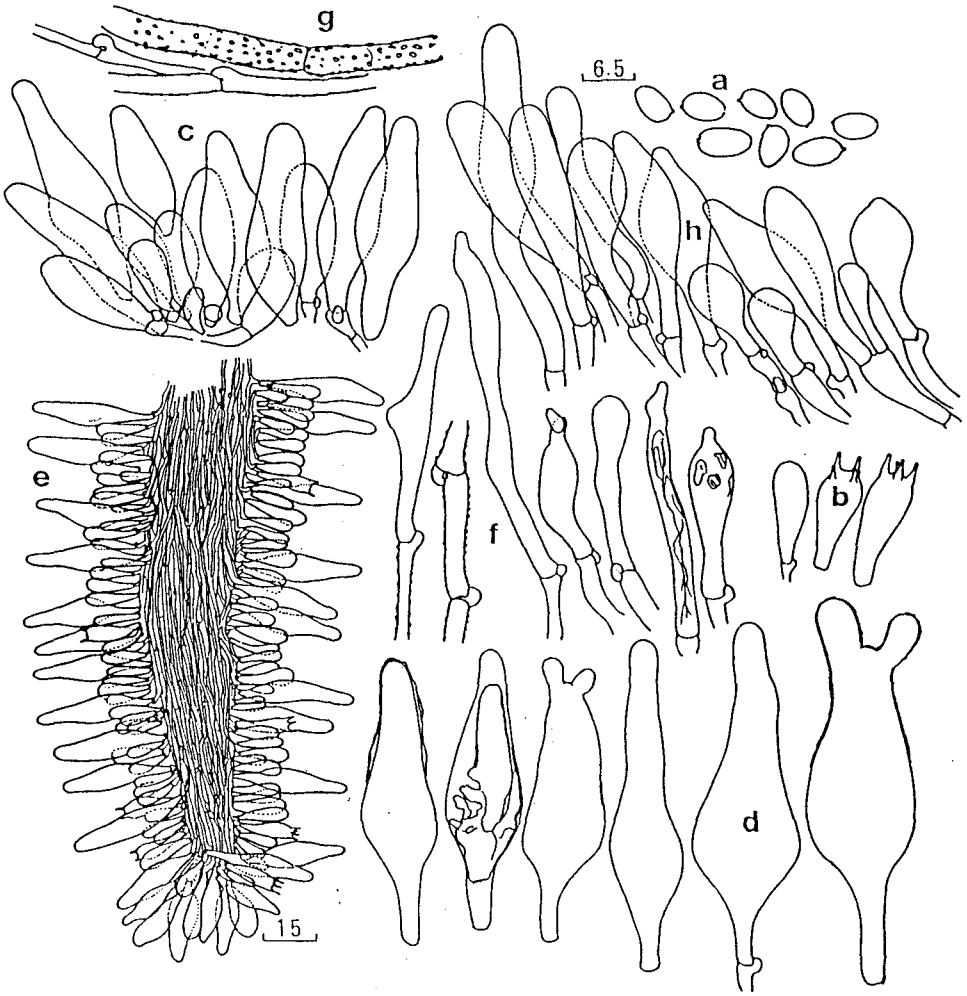

Plate 2. *Pholiota brunnescens*
a: spores, b: basidia, c: cheilocystidia, d: pleurocystidia, e: tangentisal section of hymenium, f: terminal cells above gelatinous layer, g: hyphae encrusted of hypoderma, h: terminal cell on margin of pileus

summer to autumn.

Materials examined : Mt. Yongmoon, Yangpyong-gun, Kyunggi Province. July 26. 1993. (GBDS: 347) Coll. by S.J. Seok

Observation : This taxa is very similar to *Cantharellula umbonata* (Gmel.: Fr.) Sing. in shape and size of carphophores, but differs from it in having dark greyish pigment on the cell walls and the hyphae without clamp connections.

2. *Pholiota brunnescens* A.H. Smith & K. Hesler 한천비늘버섯(신칭) in the North American Species of Pholiota. 1-381. 1968.

Pileus 35~65 mm wide, convex when young then expanding to plane or at times with a low umbo at center, sometimes slightly depressed around the umbo, margin incurved when young, prominently and rich gelatinous when moist, in young sparsely covered with whitish fibrillose squamuloses of veil remnants, prouts-brown (7.5 YR/4.7/4.0), chestnut brown (2.5YR/3.5/3.0) to tawny-olive (10YR/5.3/4.0) or apricot-orange (2.5YR/6.2/11.0) when old or toward margin. Context 3.5~4.5 mm thick, pale brown, pale tawny-olive. Odor and taste mild. Lamellae adnate to adnexed, crowded to subcrowded, somewhat narrow, edge finely fimbriate, in young whitish then becoming dull cinnamon. Stipe 35~75×3.5~8 mm, equal to subequal, cylindric, dry, whitish, dully yellowish, with concentric fibrillose zones of citron-yellow veil remnant, near 1/3 upper parts, staing tawny (5YR/5.2/6.5) in age or where toughed.

Spore print brown. Spores 7.4~7.9×4.6~5.6 μm (6~7.5×4~4.5 μm) ovate to subelliptic, smooth, thin walled, germ pore inconspicuous, yellowish in Melzer's reagent. Basidia 24.2×5.6 μm, 4-spored, hyaline in Melzer's reagent. Pleurocystidia 52.1~70×11.2~15.8 μm, fusoid-ventricose, broadly fusoid, apex obtuse or tapered at times forked, thin walled, not frequently covered with yellowish gelatinous membrane up to upper half, abundant. Cheilocystidia 26~40×8.8~10.7 μm, subfusoid to fusoid-ventricose, thin walled, smooth, hyaline to ochreous in KOH, bundled. Hymenophoral trama parallel to subparallel, 4~12 μm wide, smooth, thin-walled. Pileus cutis a thick gelatinous layer 50~70 μm thick and hyaline. Hyphae under the gelatinous layer encrusted with pigment and terminal cells clavate to subclavate, apex elongate. Hypodermium consist of dark rusty brown hyphae from coarse incrustations, walls thin to slightly thickened. Pileocystidia 14~63.2×4.6~13.9 μm, clavate to subclavate, broadly fusiform or hymeni- form thin-walled. Caulocystidia 38~30×15~35 μm, voluminous, thin walled, smooth, clavate to clavate-mucronate to fusoid, some forked, wall yellowish in KOH,in tufts. Hyphae with clamp connection.

Habit & Habitat : Gregarious on burnt ground in forests.

Materials examined : Mt. Yongmoon, Yangpyong-gun, Kyonggi Province, June 16. 1993 (GBDS: 16) Coll. by Y.S. Kim and Gara K dong, Seoul, July 13. 1993. (GDBS:204) Coll. by S.J. Seok

Observation : This species is similar to *P. hilandensis* but differ from it in having the yellow inner veil and rather larger fruiting body and also having voluminous caulocystidia and forked pleurocystidia.

3. *Coprinus angulatus* Peck 쥐방울먹물버섯(신칭) in Ann. Rep. New York State Museum, 26. 60. 1874.

Pileus 4~25 mm high, 5~20 mm broad, at first conico-cylindric, cylindric-ellipsoid or conico-parabolic then convex or broadly ovoid or campanulate to expanding convex, umber or bay, at times chest nut at center, brick to cinnamon or grey toward margin, smooth, or with finely pubescent, sulcate striates. Context thin, brittle. Odor and taste mild. Lamellae 2~3 mm broad, free, at first whitish or pale cream then becoming greyish black edge fimbriate. Stipe 10~25×1~2 mm, equal or slightly tapering upwards, whitish, with finely pruinose and/or whitish basal tomentose hollow.

Spore print black. Spores 9.3~10.2×7.9~8.4×5.8~6.5 μm, lentiform, ellipsoid to amygdaliform in side view, mitriform in front view, somewhat thick walled, with large central germ pore and truncate. Basidia dimorphics, small basidia 23.2~25.1×8.8~9.8 μm, large one 30.6~33.5×7.4~9.3 μm, 4-spored. Cheilocystidia dimorphics, 40.5~

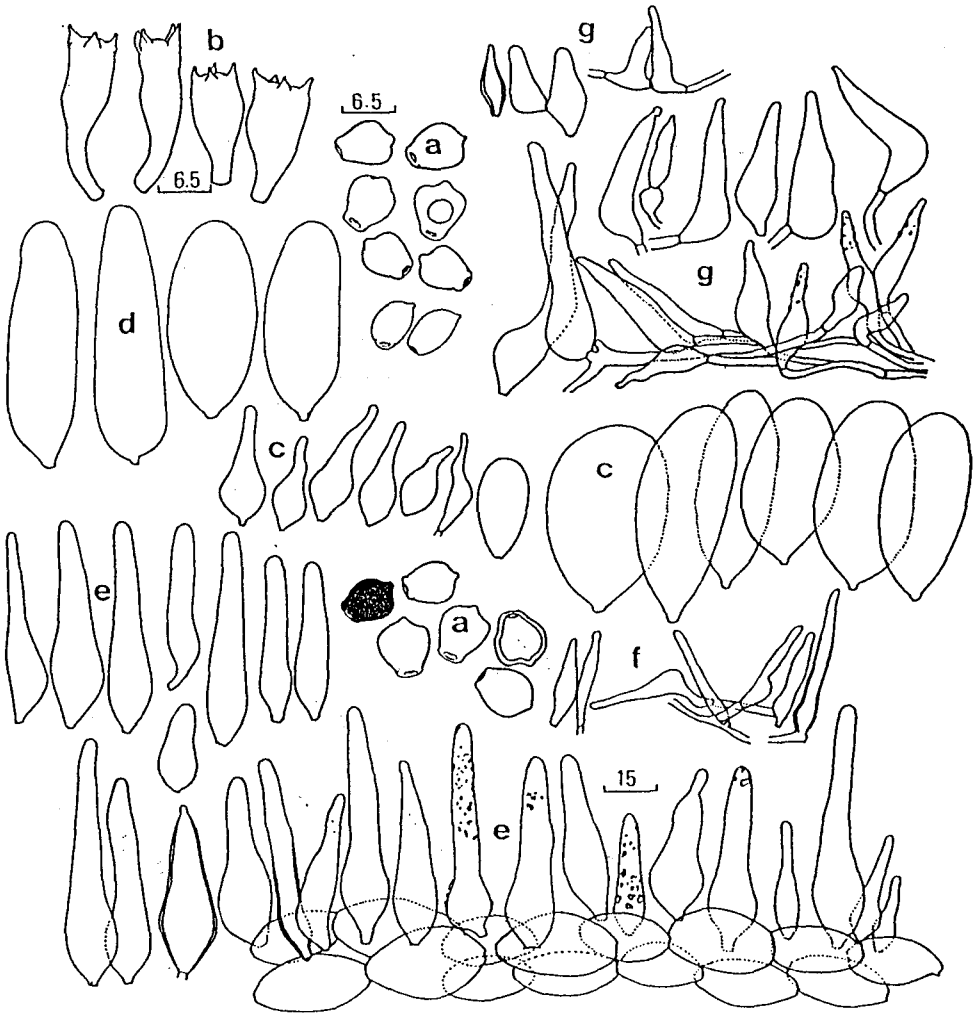

Plate 3. *Coprinus angulatus*
a: spores, b: basidia, c: cheilocystidia, d: pleurocystidia, e: pileipellis, f: veil on cap, g: caulocystidia

96.7×31.5~49.5 μm, vesiculose to subvesiculose or subpyriform and 36~56.3×7.8~18 μm, sublageniform or subfusiform, thin-walled, bundled. Pleurocystidia absent. Pilei-pellis dimorphics, cellular sphaerocyst or subglobose and sublageniform. Setules thin or slightly thick, hyaline or brownish intrapigment. Hyphae with clamp connection, but few in number.

Habit & Habitat : solitary or gregarious on burnt ground, under birch tree

Materials examined : Mt. Yongmoon, Yangpyong-gun, Kyonggi Prov. June. 4. 1993 (GBDS:509) Coll. by S.J. Seok; Mt. Chilbo, Hwasong Kyonggi Pro. June 15. 1993. (GBDS:30) Coll. by D.S. Park

Observation : This species is easily recognized by the peculiar shape of the spores, dark brown roundish pileus when young and the habitat on burned areas.

4. *Rhodophyllus bisporus* Hongo 쌍포자외대버섯(신칭) in Journ. Jap. Bot. Vol. 32(7), 2.8-214, 1957.

Pileus 8~26 mm wide, at first convex to planoconvex, sometimes slightly depressed at center.

Surface pale greyish white, around center smooth, hygrophanous and transluscent striates when wet, shining dry, margin at first incurved. Context thin, nearly concolorous fragile. Odor indistinct, taste mild. Lamellae adnexed, ventricose, distant to subdistant, 1~2 μm broad, (L=15~19), at first whitish then turning to rose to sordid. Lamellulae 2- or 3-tiors. Stipe 11~32 mm high, 1~2 mm thick, equal to subequal, surface glabrous, concolorous to pileus or somewhat paler, pruinose it apex, with white tomentose at the base, hollew.

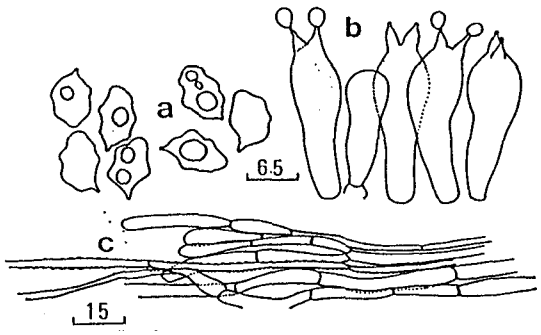

Plate 4. *Rhodophyllus bisporus*
a: spores, b: basidia, c: pileipellis

Spore print sordid. Spores 10.7~12.6×6.6~7.4 μm, 5~7 angular, smooth, 1-or multiguttular. Basidia 31.6~38.1×8.4~9.3 μm, two-spored without clamp. Cheilocystidia absent. Pleurocystidia absent. Pileipellis cutis 32.6~42.8×4.5~9 μm at times encrusted, 2~6.8 μm wide, thin-walled. Hyphae clampless.

Habit & Habitat : solitory or somewhat gregarious on humus or on well decayed wood.

Materials examined : Mt. Yongmoon, Yangpyong-gun, Kyonggi Province, July 26. 1993. (GBDS:

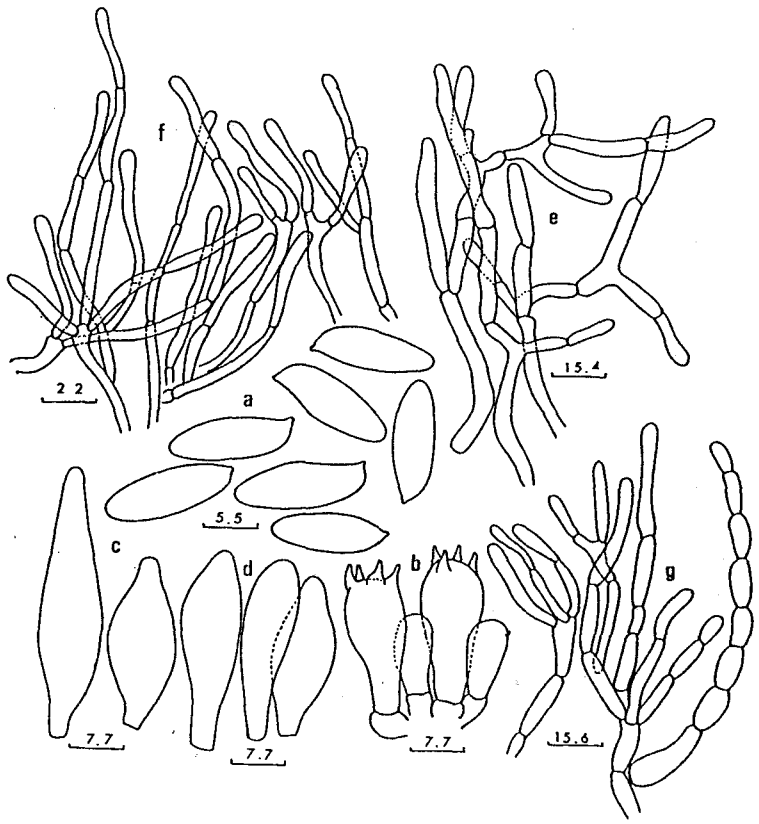

Plate 5. *Suillus viscidipes*
a: spores, b: basidia, c: pleurocystidia, d: cheilocystidia, e: pileal surface, f: surface of stipe, g: inner veil

353), Coll. by S.J. Seok.

Observation : This species is characterized by the small spring fungus and by the 2-spored basidia.

5. *Suillus viscidipes* Hongo 끈적비단그물버섯(신칭) in Journ. Jap. Bot. Vol. 49(10). 301. 1974

Pileus 19~26 mm wide, at first semiglobose, somewhat conico-semiglobose then becoming convex to plano-convex, margin incurved when young, smooth, surface glabrous to uneven, or minutely hairy to finely dofted, viscid when wet, cognac (6E7), or greyish orange (6B3). Context fleshy, yellowish white (4A2). Odor indistinct, taste mild. Tube 8~10 mm long, adnate, sinuate, olive brown to sallow (4D3-4). Pore angular, large.

Stipe 45~70×3~4 mm, subequal to at times tapering upwards or rarely downwards, often curved, surface viscid when wet, orange white to pale orange (6A2-3) downwards, reddish grey (7B2) to brownish orange (7C3) or orange white to pale orange (6A2-3), pale yellow (4A2-3), central, solid. Innerveil viscid, membranous, white, at times forming annulus but easily disappeared, middle.

Spore print dark brownish yellow (Hue 10YR4/4). Spores 9.9~13.5×4~5 μm, cylindric fusoid to narrowly fusoid, smooth, with or without suprahilar depression. Basidia 27~28×9.5~10 μm, nor-

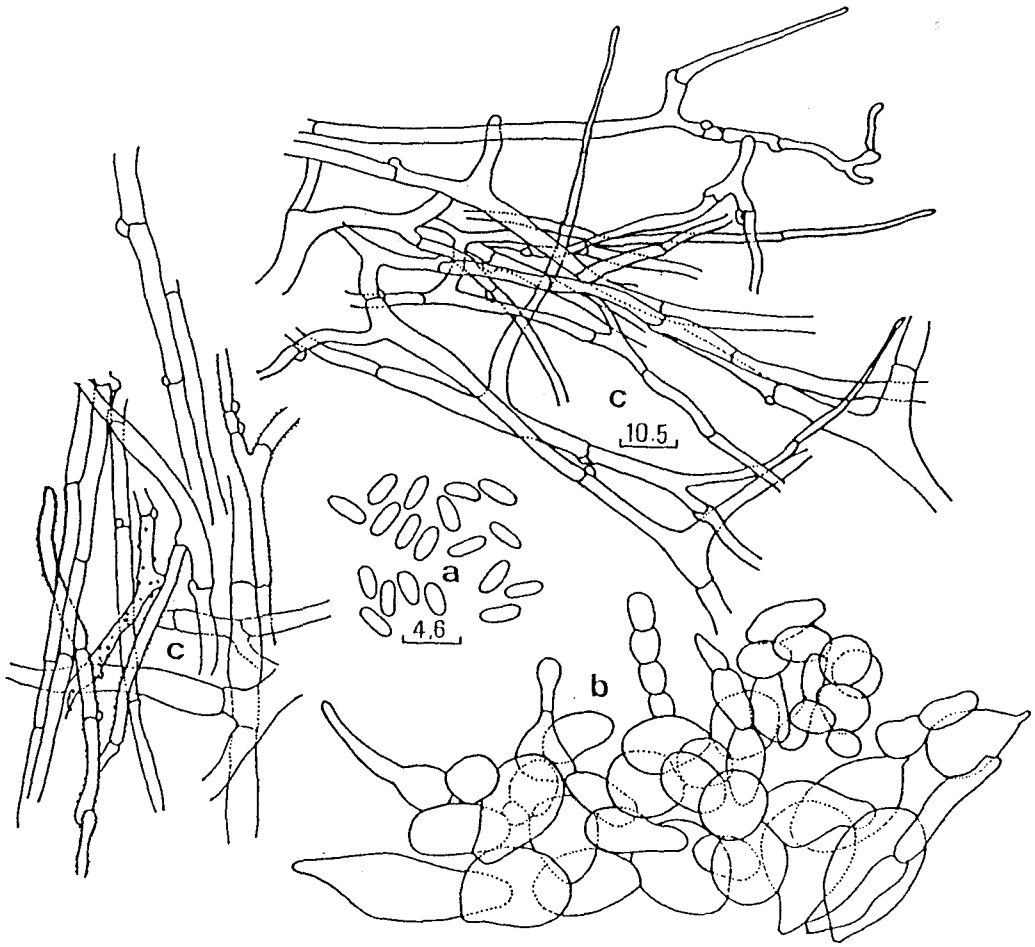

Plate 6. *Lysurus mokusin* f. *sinensis*
a: spores, b: gleba, c: cell of volva

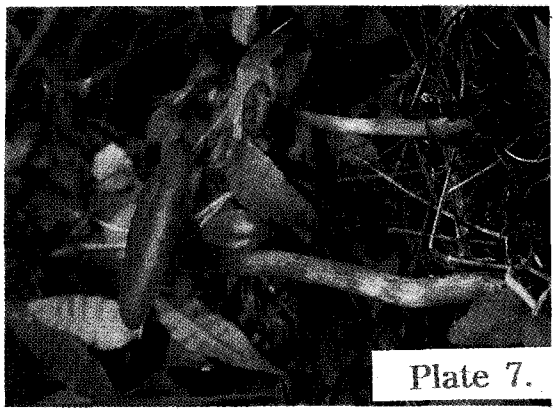

Plate 7. *Pseudoclitocybe cyathiformis* (Bull.: Fr.) Sing.

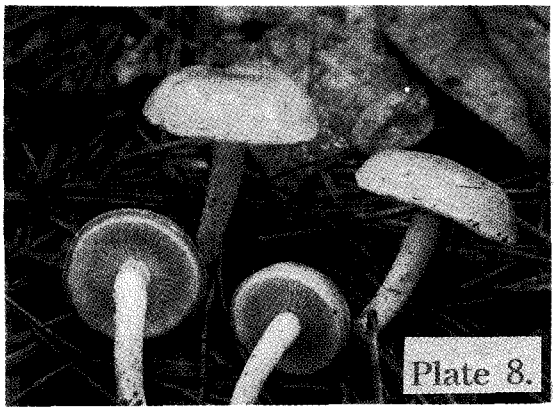

Plate 8. *Pholiota brunnescens* (A.H. Smith) K. Hesler

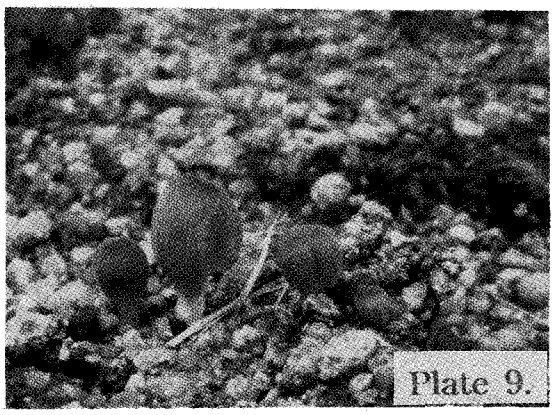

Plate 9. *Coprinus angulatus* Peck

Plate 10. *Rhodophyllus bisporus* Hongo

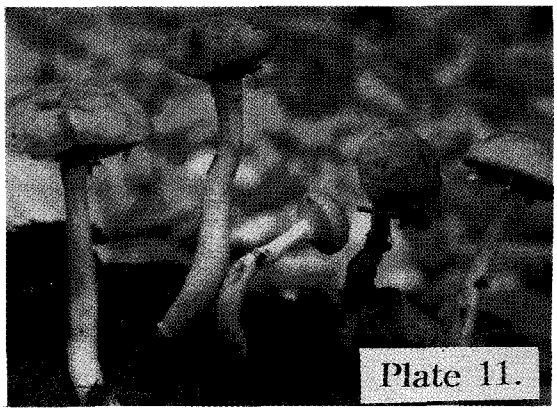

Plate 11. *Suillus viscidipes* Hongo

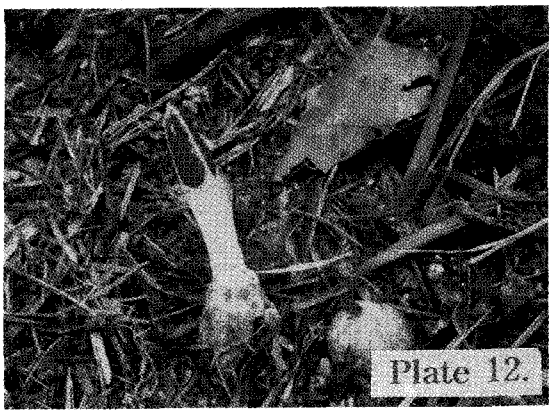

Plate 12. *Lysurus mokusin* (L.: Pers.) Fr. f. *sinensis* (Lloyd) Kobayashi

mal, 4-spored. Pleurocystidia 25~60×8~14 μm, clavate to subventicose, thin-walled, numerous, hyaline. Cheilocystidia 25~44×8~15 μm, the same as the Pleurocystidia in shape and size. Hymenophoral trama bilateral.

Habit & Habitat : Scattered on the ground under mixed woods (Pinus and Quercus)

Materials examined : Mt. Chonsong, Yangsan, Kyongnam Prov. July 26. 1993. (GBDS:353), Coll. by S.J. Seok.

Observation : This taxa is very similar to *Boletellus longicollis* (Ces.) in shape of carphorphores, but differs from it in having the smooth boletoid spores.

6. *Lysurus mokusin* (L.: Pers.) Fr. f. *sinensis* (Lloyd) Kobayashi, 용문새주둥이버섯(신칭) in Nova Fl. Jap. Hymenogast. Phall. 52. 1938.

Basidiome whitish egg shaped, ovoid then open at apex by expansion from within, and a single, stalk-like extension with head at apex. Head 10~18 mm high, 8~13 mm wide, longitudinally angular and archwise grooved and top of head longitudinally angular-conic 1~5 mm high, transversely plicate or somewhat verrucose pinkish to reddish brown, gleba covered over head, blackish to greenish brown. Slimy fetid. Stalk 40~100 mm high 5~12 mm wide 5~6 square pillars, with both face of the square, meprojecting, and obarchwise grooved between square pillars, pale pink to pink upward but paler to pinkish white or almost whitish downward, 2~3 layer consisting of mimutely room hollow, distinctly boadered between head and stalk, fragile.

Spores 4~5×2~2.2 μm, ellipsoid, smooth, thin-walled. Basidia usually 8-spored, gleba composed of cells chained of subglobose, fusiform, ellipsoid to broadly clavate 6.5~7.4×2.8~5.6 μm or 37.1~46.3×18~28 μm and also mixed with filamentous cells 2.3~4.5 μm broad. Hyphae with clamp connection.

Habit & Habitat : Single or scattered on the ground in pasture, garden or woods, summer.

Materials examined : Mt. Yongmoon, Yangpyong-gun, Kyonggi Province 27. July 1993. (GBDS: 412), Coll. by S.J. Seok

Observation : This taxa is very similar to *Lysurus mokusin* (L.:Pers.) Fr. f. *mokusin*, but differ from it in having the longitudinal angular-conic top of head.

적 요

본 논문은 한국산 버섯류의 분포상과 자원탐색을 위한 연구조사중 주름버섯류내의 한국미기록 1속, 헛깔때기버섯속 *Pseudoclitocybe*과 미기록 5종, 헛깔때기버섯 *Pseudoclitocybe cyathiformis*(Bull.: Fr.) Sing., 한천비늘버섯 *Pholiota brunnescense* Smith & Hesler, 쥐방울먹물버섯 *Coprinus angulatus* Peck, 쌍포자외대버섯 *Rhodophyllus bisporus* Hongo, 끈적비단그물버섯 *Suillus viscidipes* Hongo과 복균류 1품종, 용문새주둥이버섯 *Lysurus mokusin* (L.; Pers.) Fr. f. *sinnensis* (Lloyd) Kobayasi 등이 판명되어 이를 보고한다.

色名은 "Methuen Handbook of Colour"(Kornerut & Wanscher, 1978)을 引用하였다. 採集된 모든 버섯標本은 農業科學技術院에 保存되어 있다.

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