

Fungal Flora of Mt. Chiak (1) — Agaric Fungi —

Yang-Sup Kim*, Soon-Ja Seok, Yong-Hwan Park, Dong-Yeol Cha,
Kyong-Hee Min¹ and Kwan-Hee Yoo²

Agricultural Biotechnology Institute, Agricultural Sciences Institute,

¹Sook Myong Women's University and ²Sang Ji University

치악산버섯의 분포상

김양섭* · 석순자 · 박용환 · 차동열 · 민경희¹ · 유관희²

농업유전공학연구소 농업기술연구소, ¹숙명여자대학교, ²상지대학교

ABSTRACT: Some agaric fungi were collected at Chiak from Sep. 10, 1988 and Aug. 12, 1990. Some agaric fungi were recognized to the species. Among them six species were confirmed new to Korea and registered here with descriptions. They are *Calocybe ionides* (Bull.: Fr.) Donk; *Tricholoma psammopus* (Kalchbr.) Quel.; *Collybia cirrhata* (Per.) Quel.; *Marasmius aurantioferrugineus* Hongo; *Amanita abrupta* Peck and Bull.; *Amanita castanopsidis* Hongo.

KEYWORDS: Mt. Chiak, *Calocybe ionides*, *Tricholoma psammopus*, *Collybia cirrhata*, *Marasmius aurantioferrugineus*, *Amanita abrupta*, *Amanita castanopsidis*, identification

Introduction

The mountain Chiak has typical continental climate characterized by warm temperature. The average temperatures average is around 10.1°C throughout the year and the amount of precipitation is around 398.3 mm per year. Mt. Chiak is mainly dominated with various trees, such as *Auercus mongolica* Fisch, *Btyrax obassia* S. et Z. *Acer pseudo-sieboldianum* Komarov, *Pinus densiflora* S. et Z., *Rhododendron schlippendachii* Max, *Palura chinensis* Koidz. f. *pilosa* Hara and *Carpinus cordata* BL. etc., which provide rich humus soils and sufficient substrates for fungal growth. However, the floral study of wild mushrooms of Mt. Chiak has been very rarely carried out and the information on their occurrence in this area was lacking. The first report on higher fungi was presented by Hong and Jung (1976), titled "the

Fungal flora around Mt. Chiak" in which they listed 26 species including 5 species and among which one form was proposed as new to Korea, but it is not sufficient to represent the fungal flora. A floral research of higher fungi in this area has been further detailed information and research on the diversity of higher fungal flora in this area are needed through regular and systematic surveys.

Materials and Methods

Agaric mushrooms were collected through six field trips at Mt. Chiak in Kangwon-do.

The first survey trip was made from September 10 to 11, 1988, the second and third one was August 25 and from September 5 to 10, 1989, and forth, fifth and sixth one was from July 5 to 7 and from 20 to 28, and from August 10 to 12, 1990, respectively.

Each collections with a label was wrapped with

*Corresponding author

wax paper to avoid drying and mixing with other and put in plastic pack to avoid bumping damage, and brought them to the laboratory as soon as possible. All the basidiomes discussed here could be observed with fresh condition. Field notes were taken with regard to fresh basidiomes, forest types, habitats, and substrates. Photographs were taken the very growing places as possible, but often carried them to the brighter places, then taken with Nikon FE-2 and Olympus OM-4Ti.

Macroscopical characters on the basis of personal observation were described and supplemented with descriptions of other referances. The colours of fresh specimens before they change with age, drying or brusing were checked with "Methuen Handbook of Color, Kornerup & Wanscher 1978." Macroscopical characters for fresh materials were made at the working room in the filed and laboratory. All the collections were dried with portable drier at 40°C for 6 to 12 hours.

For the microscopic examination, a wedge taken from the pileus including lamellae were prepared by radial section and again cut by free hand tangential section in Elder berry pith. The tinny and thin tissues were put on the slide glass, then stained with Congo red and sometimes if necessary, added Phloxine and covered with a cover slip followed by immediate washing with KOH solution two or three times and then observed under the microscopes. The reaction of spore walls to Melzer's reagent is described as amyloid: when it was blue to black reaction, Pesudiamyloid: red-dish-brown. Inamyloid : noreaction. microscopical figures were drawn made with the aid of a camera lucida attached to an Ernst Leitz Wetzlar GMBH. ICT microscope. A total of 223 specimens of Agaric fungi were obtained. All the mushrooms collected are deposited as dried specimens in the herbarium of Department of Applied Mycology in Agricultural Sciences Institute (ASI).

Taxonomy

For the taxonomy and description of species of agaric mushrooms, we followed modern taxonomy of Singer (1986) and Keys to Agarics and

Boleti of Moser (1978) generally. It was very convenient to use how to identify mushrooms of Largent (1973) for the detailed descriptions of Macroscopic or mictrscopic features.

The colored illustrations of Imazeki and Hongo (1987), Phillips (1991) and Lincoff (1981) were often consulted for confirmation. For the color description, the notations of Methuen hand book of colour (Kornerup & Wanschet, 1978) were used with in parentheses right after the color names. Hong and Jung (1975) once reported 26 agaric species including 5 species and among which one form was proposed as new to Korea in this area. A total of 223 specimens of agaric fungi were collected, and about one third of which counted 68 taxa were identified to the species including six new species in Korea. So far total identified fungi amounted to 15 families, 39 genera and 94 species.

1. 남빛밤버섯 (신칭) *Calocybe ionides* (Bull.: Fr.) Donk in Gen. Nam. Agric. p. 43. 1962.

Pileus 22~38 mm broad, convex then becoming plane often with broadly umbonate, surface dry, glabrous, somewhat moist, greyish magenta (14D 3), dull lilac to greyish lilac (15C3-2), later red haired (6C3-4), margin incurved when young. Context 3 mm thick, greyish violet (17C3) or greyish lilac (15C2). Odor farinaceous. taste mild. Lamellae 11~16×2.5~3 mm, adnate then adnexed, crowded, white, edge smooth or pruinose, with lamellulate. Stipe 25~40×4~7 mm, equal, sometimes curved, surface dry, fibrillose, often secede at apex in age, tomentose at base, indigo blue (18B3) to greyish, violet (17B3) at apex. Context somewhat firm, violet grey (17B2), becoming hollow.

Spore print white. Spores 6~7×3~3.8 um, narrowly ellipsoid to ovoid, smooth, inamyloid. Basidia 4-spored, Hymenophoral trama regular. Hyphae with clamp connection.

Habit & Habitat: Grouped on the fallen leaves of conifers, especially Pinus strobose, Saprophytic fungi.

Materials examined: Kwangnung, Pochon, Kyonggi Pro. 1984. 10. 3. (ASIK: 351), Coll. by Y. S. Kim ; Mt. Chiak, Wonju, Kangwon Prov. 1989. 9.

5. (ASIK: 3003), Coll. by S. J. Seok

Observation: This species is characterized by the greyish lilac pileus and stipe and white, crowded lamellae.

2. 처악송이 (신칭) *Tricholoma psammopus* (Kalchbr.) Quel. in Icon. Selec. Hymen. Hungariae, 12, 2, 1873.

Pileus 45~70 mm broad, broadly conic to campanulate, then becoming nearly plane, with blunt umbo, surface dry, minute scales when young, somewhat velvety or strigose, often cracked into areolate when dry, color cinnamon to raw sienna (6C6-7) to rust brown (6E8), margin inrolled when young continuing long times. Context 7 mm thick at disc, fleshy, color whitish. Odor not distinct, taste faintly bitter. Lamellae 20~30×2~3 mm, adnate, crowded, color white to tinged brownish orange (7C6), with lamellulae. Stipe 52~80×5~6 mm, slightly thickened downward or tapering at base, surface dry, fibrillose scales, fibrillose striate, color concolorous with cap or paler than pileus, central, terete. Context fleshy, somewhat soft, white, brownish grey (6C2).

Spore print white. Spores 5.5~6.5×4~5.5 μm, ellipsoid, thin-walled, inamyloid. Basidia 25~35×6~8 μm, 4-spored.

Habit & habitat: Few gregarious, scattered on the ground under Larix autumn.

Materials examined: Mt. Chiak, Wonju, Kangwon Pro. Sep. 9. 1989. (ASIK; 2928), Coll. by Y. S. Kim

Observation: This taxa is easily recognized by its yellowish brown pileus and stipe, which covered with minute fibrillose scales of the same color and habitat of growing only under Larix forests.

3. 흰무리애기버섯 (신칭) *Collybia cirrhata* (Pers.) Quel. in Mem. soc. Emul. Montbeliard, ser. II:5: 96. 1872.

Pileus 3~10 mm wide, at first convex, with an inrolled to incurved margin, becoming nearly appanate or slightly depressed at the center, with a decurved to straight margin in age, surface dry, to moist. Subhygrophanous, translucent striates

when wet, white to pale pinkish, white or faintly pinkish, flesh. Context whitish, very thin. Odor and taste none. Lamellae adnate, with slightly decurrent tooth, close to subclose, thin, narrow, white to pinkish buff (5A2), edge even. Stipe 8~35×1~1.5 mm, equal to slightly thickened downward, flexible, but not fragile, surface dry, whitish to greyish orange (5B4), darker downward. Faintly pubescent, nearly strigose toward the base, very often branched at the base, with rhizomorph like strands or whitish mycelium, not arising from a sclerotium, solid, but becoming hollow in age.

Spore print white. Spores 4.5~6.5×2.5~3 μm, ellipsoid to sublacrymoid, subcylindric, smooth, inamyloid, Basidia 18~22×5~6 μm, normal, 4-spored. Cystidia absent. Hymenophoral trama interwoven to subparallel. Pileipellis a poorly differentiated layer of repent, radially arranged, mostly cylindric hyphae, often with a subgelatinous matrix. Hyphae with clamp connection.

Habit & habitat: Gregarious on rich humus, blackened fungus or well decayed wood or fallen leaves in mixed woods, spring to autumn.

Materials examined: Mt. Chiak, Wonju, Kangwon Prov. Sep. 10. 1989. (ASIK: 3057), Coll. by Y. S. Kim

Observation: The present species is very similar to *Collybia cookei* (Bres.) Arnold and *Collybia tuberosa* (Bull.: Fr.) Kummer but easily distinguished from them by the without sclerotium.

4. 황소낙엽버섯 (신칭) *Marasmius aurantioferrugineus* Hongo in Shiga Univ. Vol. 15. p. 1-5. 1965.

Pileus 38~68 mm wide, at first hemiglobose to convex, then becoming obtusely convex often with slightly umbonate, margin at first incurved, later at times uplift, somewhat rarely lobed, surface dry, glabrous, radially irregular rugulose toward margin, brick red (7E-8) on light orange (5-6A4-5) ground color. Context fleshy, firm, white. Odor garlic, taste indistinct. Lamellae 20~25×7~8 mm, free, close to subclose, lamellulae multi-tiers, white to pale cream, edge smooth or slightly erose. Stipe 60~90×4~8 mm, equal, somewhat thickened at the base, surface dry, glabrous, pruinose at apex, fibrillose to longitudinally striates,

twisted, whitish at apex paler than pileus, central, often excentric. Context fibrous, firm, white but madeira (7E4-5) downward with age.

Spore print white. Spore $11\sim 12\times 4\sim 5$ μm , fusoid-ellipsoid, smooth, inamyloid. Basidia clavate, normal, 4-spored. Cheilocystidia $25\sim 35\times 6\sim 11$ μm , cylindrical to clavate, thin-walled. Pileipellis $25\sim 34\times 17\sim 20$ μm hymeniform, thin-walled, abundant.

Habit & habitat: Gregarious on the humus ground in conifers, *Pinus densiflora*.

Materials examined: Mt. Chiak, Wonju, Kangwon Prov. Aug. 25 1990 (ASIK: 3517), Coll. by Y. S. Kim, S. J. Seok

Observation: The present species is easily recognized by the orange-brown cap, the whitish firm stipe, the broad gills and the garlic odor.

5. 양파광대버섯 (신칭) *Amanita abrupta* Peck in Bull. Torr. Bot. Club 24: 138. 1897.

Pileus 60~95 mm wide, hemiglobose, then becoming flat with broadly umbo, surface dry, glabrous, with angular warts but easily disappeared, color white at first, in age tinged brownish orange (7C4-5), margin covered with membranous partial veil when young, at times appendiculate. Context fleshy, color white. Odor not distinct. Lamellae 9x10mm, free, crowded, white, edge smooth, with lamellulate. Stipe 80~110x8~13 mm, equal, abruptly bulbous at base (30~40 mm) thick, surface dry, with cottony-hairs to fibrillose scales. Annulus membranous, superior, radial sulcates upper part, volval remnants warts or ridges at apex of bulb.

Spore print white. Spores $8\sim 9\times 7.5\sim 9.6$ μm , globose, subglobose to broadly ellipsoid, thin-walled, smooth, amyloid. Basidia $35\sim 55\times 5\sim 10$ μm , 4-spored, with basal clamp connection. Cheilocystidia $6\sim 10.4\times 15\sim 20$ μm , hymeniform, thin-walled. Pileipellis filamentous. Universal veil consisting of sphaerocysts $25\sim 62.5\times 125\sim 20$ μm , hymeniform, broadly ellipsoid, clavate or inflated cells and filamentous hyphae 3~7 μm , thick, branched. Hymenophoral trama bilateral. Hyphae interwoven, subhymenium subcellular to hymeniform.

Habit & habitat: Scattered or few grouped on

the soils in broad leaves trees.

Materials studied: Mt. Chiak, Wonju, Kangwon Pro. Sep. 9. 1989. (ASIK: 3017), Coll by Y. S. Kim

Observation: The present species is rarely found in Korea, it is easily characterized by a white pileus with a pointed warts, a slender stipe with abrupt basal bulb, and globose to subglobose spores.

6. 흰오뚜기광대버섯 *Amanita castanopsidis* Hongo in Bulletin de la Societe Linneenne Lyon, France. 192. 1974.

Pileus 35~70 mm wide, semispherical then becoming convex finally almost plane, surface dry, with sparsely pyramidal warts, larger toward center, whitish, pyramidal warts almost white at times greyish to pale greyish brown, margin covered by partial veil at young then forming appendiculates of pruinose at margin. Context 4~6 mm, moderately thick, color white. Odor unpleasant like tennis shoes, taste mild. Lamellae 14~4.5 mm, free, close to subcrowded, yellowish white (4A2), edge pruinose. Stipe 45~80x8~15 mm, tapered upward, bulbous tapered downward, surface dry, with pruinose to cottony scales, color white, central, terete. Context fleshy, white. Partial veil fibrous, cottony to somewhat corti, but friable, white, generally not forming annulus. Bulbous 35x18 mm, obconic, clavate or subventricose, at times forming zones of cottony or conic wart at upper part of bulbous.

Spore print white. Spore $8.5\sim 12\times 5\sim 7$ μm , ellipsoid, smooth, thin walled, amyloid. Universal veil on the pileus thick, $34\sim 72\times 35\sim 54$ μm , ellipsoid pyriforme, often chained of inflated cells, filamentous hyphae 5~8 μm . Basidia $40\sim 55\times 9\sim 12$ μm , 4-spored. Cheilocystidia $20\sim 36\times 11\sim 18.4$ μm , hymeniform, broadly ellipsoid. Hyphae with clamp connection.

Habit & habitat: On bare soil or the cutting soil of road side in forest.

Material examined: Mt. Moak, Kimje, Chonbuk Pro. Jul. 22. 1989. (ASIK: 2836), Coll. by S. J. Seok; Mt. Chiak, Wonju, Kangwon Pro. Aug. 10. 1990. (ASIK: 3482), Coll. by Y. S. Kim

Table 1. A list of Higher Fungi in Mt. Chiak

Scientific names	Date	ASIK No.	Habitat
<i>Agaricus placomyces</i> Peck*	75.8. 1.		on humus soil under mixed woods
<i>Amanita abrupt</i> Peck	89.9. 9.	3017	on ground in mixed woods
<i>Amanita castanopsidis</i> Hongo	90.8.10.	3482	on ground in conifers or mixed woods
<i>Amanita gemmata</i> (Fr.) Bertillon	88.9.10.	2514	on ground in mixed woods
<i>Amanita verna</i> (Bull.:Fr.) Roques	88.9.10.	2506	on ground in conifers & hard woods
<i>Amanita citrina</i> (Schaeff.) Pers.	88.9.10.	2520	on ground in conifers or hard wood or mixed woods
<i>Amanita citrina</i> (Schaeff.) Pers.	89.9. 5.	3009	on ground in conifers or hard wood or mixed woods
<i>Amanita citrina</i> (Schaeff.) Pers.	90.8.10.	3473-1	on ground in conifers or hard or mixed woods
<i>Amanita citrina</i> (Schaeff.) Pers.	90.8.10.	3477	on ground in conifers or hard wood or mixed woods
<i>Amanita citrina</i> (Schaeff.) Pers.*	89.9. 5.	3044	on ground in conifers or hard wood or mixed woods
<i>Amanita ceciliae</i> (Berk. & Br.) Bas.*	75.8. 1.		on ground in hard woods
<i>Amanita pseudoporphyria</i> Hongo	90.8.10.	3483	on ground in conifer or/and hard woods
<i>Amanita vaginata</i> (Bull.:Fr.) Vitt.*	90.7. 6.	3368	on ground in hard woods or/and conifers
<i>Amanita verna</i> (Bull.:Fr.) Roques*	90.7.28.	3463	on ground in conifers or/and hard woods
<i>Amanita virosa</i> (Fr.) Bertillon	90.7.28.	3464	on ground in conifers or/and hard woods
<i>Amanita virosa</i> (Fr.) Bertillon	90.8.10.	3496	on ground in conifers or/and hard woods
<i>Amanita volvata</i> (Peck) Martin	89.9.10.	3072	on ground in hard woods
<i>Amanita volvata</i> (Peck) Martin	90.8.10.	3497	on ground in hard woods
<i>Asterophora lycoperdoides</i> (B.) D.:Fr.	90.7. 6.	3354	on decayed carphorphores of Russian sp.
<i>Boletus chromapes</i> (Frost) A.H.S. & T.	89.9. 9.	3030	on ground in conifers and hard wood
<i>Boletus edulis</i> Fr.*	75.7.29.		on ground in hard wood
<i>Boletus pulverulentus</i> Opat.*	75.7.28.		on ground in hard woods & conifers
<i>Calocybe ionides</i> (Bull.:Fr.) Donk.	89.9. 5.	3003	on humus ground in conifers
<i>Chroogomphus rutilus</i> (S.:Fr.) O.K.M.	88.9.10.	2497	on ground in Pinus sp. or conifers
<i>Clitocybe fragrans</i> (With.:Fr.) Kummer	90.7. 6.	3373	on ground in forests
<i>Clitocybe gibba</i> (Pers.:Fr.) Quel.	90.7. 6.	3369	on fallen leaves of woods
<i>Collybia butyracea</i> (Bull.:Fr.) Quel.	90.7.28.	3490	on ground in conifers & hard woods
<i>Collybia cirrhata</i> (Pers.) Quel.	89.9.10.	3057	on fungous remains or rich humus soils
<i>Collybia cookei</i> (Bres.) J.D. Arnold	89.9. 9.	3068	on fungous remains or rich humus soils
<i>Coprinus disseminatus</i> (Fr.) S.F. Gray*	90.7.28.	3475	on well decayed woods
<i>Cortinarius nigrosquamosus</i> Hongo	89.9. 9.	3022	on ground in hard woods
<i>Cortinarius salor</i> Fr.*	75.7.29.		on ground in mixed woods
<i>Crepidotus sulphurinus</i> Imaz. et Toki	90.7. 6.	3365	on trunks of

Table 1. Continued

Scientific names	Date	ASIK No.	Habitat
<i>Cyptotrama asprata</i> (Berk.) R. et Gins	90.7. 7.	3382	on trunks of hard wood
<i>Cystoderma amianthinum</i> (Scop.:Fr.) F.	89.9. 9.	3052	on ground in mixed woods
<i>Cystoderma japonicum</i> Thoen et Hongo	90.7.28.	3474	on ground in conifers
<i>Flammulina velutipes</i> (Curt.:Fr.) Sing.*	89.9. 9.	3079	on trunks & stumps of hard woods
<i>Gomphidius roseus</i> (Fr.) Karst.	88.9.10.	2496	on ground in Pinus sp.
<i>Hygrophorus russula</i> (S.: Fr.) Quel.	89.9.10.	3041	on ground in hard woods
<i>Hygrocybe subcinnabarina</i> (Hongo) Hongo*	75.7.30.		on ground in hard woods & conifers
<i>Hygrocybe subviteninus</i> (Iami) S. Ito*	75.7.30.		on ground in hard woods
<i>Inocybe fastigiata</i> (Schaeff.) Quel.	90.7. 6.	3372	on ground in mixed woods
<i>Inocybe fastigiata</i> (Schaeff.) Quel.	89.9. 9.	3071	on ground in mixed woods
<i>Laccaria amethystea</i> (Bull.) Murr.*	75.8. 1.		on ground in forests
<i>Laccaria vinaceoavellanea</i> Hongo	90.8.12.	3501	on ground in forests
<i>Lactarius camphoratus</i> (Bull.:Fr.) Fr.	90.7.28.	3454	on ground in mixed woods
<i>Lactarius chrysorrheus</i> Fr.	90.7. 5.	3366	on ground in conifers & hard woods
<i>Lactarius glaucescens</i> Croc.	90.8.12.	3493	on ground in conifers & hard woods
<i>Lactarius laeticolorus</i> (Imai, Imaz.)	88.9.10.	2493	on ground in conifers (Abies.)
<i>Lactarius piperatus</i> (Scop.) S. F. Gray	75.8. 1.		on ground in hard woods & conifers
<i>Lactarius pubescens</i> Fr.	75.8. 1.	3070	on ground in hard woods
<i>Lactarius subvellereus</i> Peck.	90.8.11.	3492	on ground in hard woods & conifers
<i>Lactarius torminosus</i> (Schaeff.: Fr.) S.F.G. var. <i>miniatus</i> (Jun.) Imaz*	75.8.11.		on ground in hard woods & conifer
<i>Lactarius volemus</i> (Fr.) Fr.*	75.8.11.	3491	on ground in hard woods & conifers
<i>Leccinum extremiorientale</i> (L. Vass.) Sing.	90.7.26.	3456	on ground in hard woods
<i>Lentinus edodes</i> (Berk.) Sing.*	89.9.10.	3090-1	on trunks of hard woods
<i>Lepiota acutesquamosa</i> (Weinm.:Fr.) Gill.*	75.8. 1.		on ground in garden or forests
<i>Lepiota castanea</i> Quel.	89.9.10.	3058	on ground in forests
<i>Lepiota clypeolaria</i> (Bull.:Fr.) Kummer	89.9. 9.	3011	on ground in forests
<i>Lepiota cristata</i> (Bolt.:Fr.) Kummer	90.7. 6.	3346	on ground in garden or forests
<i>Lepista irina</i> (Fr.) Bigelow	88.9.10.	2504	on ground in forests
<i>Lepista irina</i> (Fr.) Bigelow	88.9.11.	2511	on ground in forests
<i>Lepista nuda</i> (Bull.:Fr.) Cooke	88.9.11.	2512	on ground in forests
<i>Macrolepiota procera</i> (Scop.:Fr) Sing.	89.9.10.	3051	on ground in pasture or forests
<i>Marasmiellus candidus</i> (Bolt.) Sing.	90.7. 6.	3357	on twigs
<i>Marasmius aurantioferrugineus</i> Hongo	89.8.25.	3517	on ground in mixed woods
<i>Marasmius cohaerens</i> (A. et S.:Fr.) C. & Q.	88.9.10.	2521	on ground or fallen leaves
<i>Marasmius maximus</i> Hongo*	90.7.27.	3462	on ground or fallen leaves in mixed wood
<i>Marasmius purpureostriatus</i> Hongo	90.7. 7.	3376	on twigs or fallen leaves in hard wood
<i>Marasmius siccus</i> (Schw.) Fr.*	75.8. 1.		on fallen leaves in hard woods

Table 1. Continued

Scientific names	Date	ASIK No.	Habitat
<i>Mycena pura</i> (Pers.:Fr.) Kummer	88.9.10.	2502	on fallen leaves
<i>Mycena pura</i> (Pers.:Fr.) Kummer	88.9.10.	3036	on fallen leaves
<i>Mycena stylobates</i> (Pers.:Fr.) Kummer	90.7. 6.	3375	on fallen leaves or twigs
<i>Mycena subaquosa</i> A.H. Smith	90.7. 6.	3347	on fallen leaves or debris
<i>Naematoloma squamosum</i> (Pers.:Fr.) Sing.	90.7. 6.	3378	on ground in forests
<i>Oudemansiella platyphylla</i> (P.:Fr.) M.	90.8.11.	3498	on trunk of hard woods
<i>Pluteus leoninus</i> (Fr.) Kummer*	75.7.30.		on trunks or stumps of hard woods
<i>Pulveroboletus ravenelii</i> (B. et C.) Murr.	89.9.11.	3093	on ground in conifers
<i>Rhodophyllum murrarii</i> (B.& C.) S.f.albus (Hiroe) Hongo*	89.9.10.	3048	on ground in forests
<i>Russula aurata</i> (With.) Fr.	90.7. 6.	3355	on ground in mixed woods
<i>Russula castanopsidis</i> Hongo	90.8.11.	3504	on ground in hard woods
<i>Russula pectinatoides</i> Peck	90.7. 6.	3371	on ground in hard woods
<i>Russula sanguinea</i> (Bull.) Fr.	88.9.10.	2518	on ground in Pinus forests
<i>Russula vesca</i> Fr.	90.7. 6.	3350	on ground in broad leaves trees
<i>Russula compacta</i> Frost et Peck apud Peck	90.7.28.	3471	on ground in broad leaves trees
<i>Russula delica</i> Fr.	88.9.10.	2508	on ground in mixed woods
<i>Russula delica</i> Fr.	90.7. 6.	3370-1	on ground in mixed woods
<i>Russula emetica</i> (Fr.) S. F. Gray*	75.8. 1.		on ground in mixed woods
<i>Russula senecis</i> Imai	89.9. 9.	3028	on ground in broad leaves trees
<i>Russula senecis</i> Imai	89.9.10.	3075	on ground in broad leaves trees
<i>Russula senecis</i> Imai	90.7. 7.	3388-1	on ground in broad leaves trees
<i>Russula subnigricans</i> Hongo	90.8.10.	3485	on ground in broad leaves trees
<i>Russula virescens</i> (Schaeff.) Fr.	90.8.10.	3495	on ground in broad leaves trees
<i>Strobilomyces floccopus</i> * (Fr.) Karst.	75.8. 1.		on ground in mixed woods
<i>Schizophyllum commune</i> * (Fr.)	75.7.30.		on stumps or twigs of hardwood
<i>Strobilomyces strobilaceus</i> (S.:Fr.) Berk.	90.7.27.	3461	on ground in mixed woods
<i>Stropharia rugosoannulata</i> Farlow	90.7. 6.	3343	on wood chips & mulch
<i>Suillus bovinus</i> (L.:Fr.) O. Kuntze	88.9.10.	2498	on ground in 2-needle pinus
<i>Suillus granulatus</i> (L.:Fr.) O. Kuntze	90.7.28.	3469	on ground in 2-needle pinus
<i>Tricholoma caligatum</i> (Viv.) Ricken	89.9.11.	3093-2	on ground in Pinus densiflora
<i>Tricholoma portentosum</i> (Fr.) Quel.	89.9.10.	3054	on ground in conifers
<i>Tricholoma pssammopus</i> (Kalch.) Quel.	89.9. 9.	2928	on ground in mixed woods
<i>Tricholoma saponaceum</i> (Fr.) Kummer	89.9. 9.	3010	on ground in mixed woods
<i>Tylopilus nigerrimus</i> (Heim) Hongo	90.8.10.	3503	on ground in broad leaves woods
<i>Xerocomus nigromaculata</i> Hongo	90.7.28.	3460	on ground in broad leaves woods
<i>Xeromphalma campanella</i> (Fr.) K. et. M.*	89.9. 9.	3018	on trunks of stumps of conifers

*A Report on the Scientific Survey of Mt. Chiak Area. Total: 93 species

Observation: The present species is easily recognized by the dense, floccose, conical warts on pileus, clavate bulbous stipe with thick, floccose-corti, friable ring and elongate to subcylindrical spores, and differ from *A. virgineoides* Bas in spore shape.

Conclusion

Some agaric fungi were collected from Mt. Chiak area through six field trips from September of 1988 to August of 1990 and were identified and classified according to the recent classification systems. They represented 81 species of genera in families of the Agaricales. And among them, six species were confirmed as unrecorded taxa to Korea, including were *Calocybe ionides*, *Tricholoma psammopus*, *Collybia cirrhata*, *Marasmius aurantioferrugineus*, *Amanita abrupta* and *Amanita castanopsidis*.

A total of 50 species of ectomycorrhizal fungi representing 15 genera of 8 families were found in this area, and the major genera were *Amanita*, *Lactarius*, and *Russula*. Among them, *Tricholoma psammopus* was found only on the soils under the *Larix stands*, and also *Calocybe ionides* seemed to emerge recently at the same place.

On the other hand, the genera *Chroogomphus*, *Gomphidius*, *Inocybe*, *Leccinum*, *Pulveroboletus*, *Rhodophyllus*, *Strobilomyces*, *Tylopilus* and *Xerocomus* were found only as one species, respectively, and occurred a tendency as minor genera.

One species of *Chroogomphus* and one of *Gomphidius* were found only under *Pinus* stand in this study and it agreed with the observations by Miller (1972). Trappe (1962) indicated in his review of literature on fungus associates of ectomycorrhizal trees indicated that *Gomphidius* was found only under *Pinaceae*.

The rest 43 species representing 25 genera

were found, to be saprophytic fungi. Compared with ectomycorrhizal fungi, they have more genera rather than species.

Further researches will broaden our knowledge on the diversity and fungal flora, and are expected to define dominant and rare species of higher fungi in this area.

摘 要

치악산지역에 발생하는 버섯류를 조사하기 위하여 1988년 9월부터 1990년 8월까지 6회 채집하였다. 주름버섯류를 수집하여, 최근 분류체계에 준하여 종을 분류 동정한 결과, 15과 43속 93종을 분류동정하였으며, 그중 한국미기록 6종, 남빛밤버섯 *Calocybe ionides*(Bull.: Fr.) Donk.; 치악송이 *Tricholoma psammopus*(Kalchbr.) Quel.; 흰무리에기버섯 *Collybia cirrhata*(Per.) Quel.; 황소낙엽버섯 *Marasmius aurantioferrugineus* Hongo; 양파광대버섯 *Amanita abrupta* Peck in Bull.; 흰오뚜기광대버섯 *Amanita castanopsidis* Hongo이 확인되었다.

수목과 공생하며 외생균근을 형성하는 버섯류는 9과 18속 54종이었으며, 그중 광대버섯속, 젓버섯속, 무당버섯속이 우점종으로서의 가능성을 보였다.

한편, 못버섯속, 마개버섯속, 담버섯속, 짙겉이그물버섯속, 분말그물버섯속, 외대버섯속, 귀신그물버섯속, 쓴맛그물버섯속과 산그물버섯속은 드물게 발생하고 있었다.

치악송이는 일본일갈나무에서만 발견된 기주특이성 종이었고, 남빛밤버섯도 같은 장소에서만 발견되었고, 못버섯속과 마개버섯속은 소나무림내에서 발견되었는데 이는 Miller(1972)의 관찰과 일치하였으며, Trappe(1962)는 그의 연구에서 마개버섯속은 소나무과에서만 발견된다고 보고한 바 있다. 사물기생균은 8과 25속 39종이 발견되었으며, 외생균근버섯류에 비해 속은 다양하나 종은 대단히 적었다.

이 지역의 버섯류에 대하여 체계적이고 지속적인 조사를 통하여 종다양성, 분포상, 희귀종, 우점종등에 의한 기초자료가 확보될 것으로 기대된다.

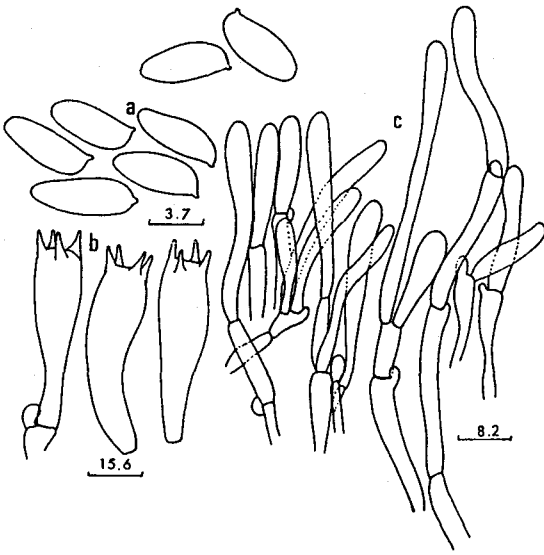


Fig. 1. *Calocybe ionides*
a. spores, b. basidia, c. pileipellis of pileus

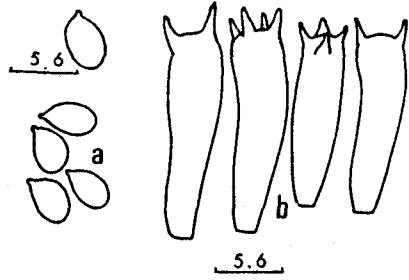


Fig. 3. *Collybia cirrhata*
a. spores, b. basidia

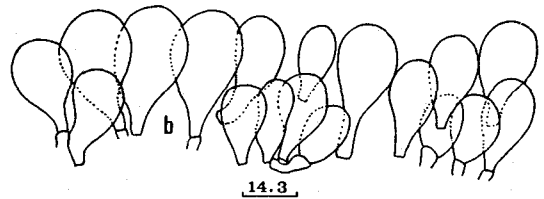
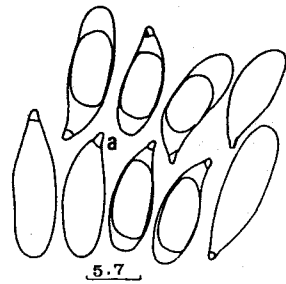


Fig. 4. *Marasmius aurantioferrugineus*
a. spores, b. cutis of pileus

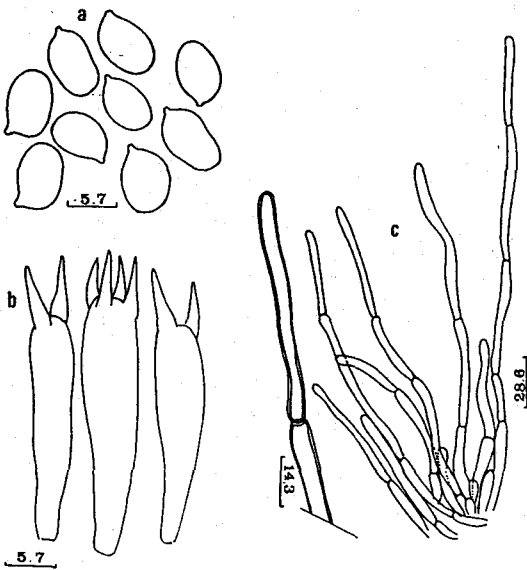


Fig. 2. *Tricholoma psammopus*
a. spores, b. basidia, c. hairs on pileus

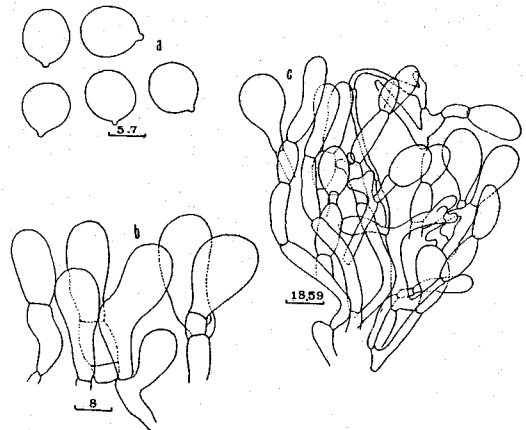


Fig. 5. *Amanita abrupta*
a. spores, b. cheilocystidia, c. universal veil

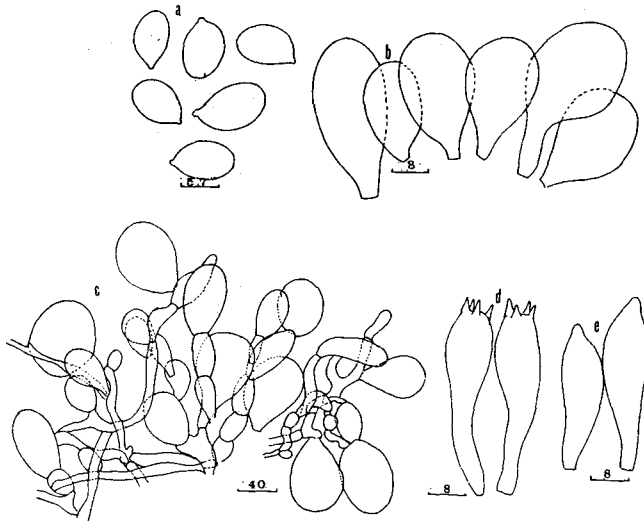


Fig. 6. *Amanita castanopsidis*

a. spores, b. cheilocystidia, c. universal veil, d. basidia, e. pleurocystidia

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