

The Mycoflora of Higher Fungi in Mt. Paekdu and Adjacent Areas (I)

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白頭山の高等菌類相에 관한 연구(I)

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ABSTRACT: Some 420 species of higher fungi were collected from the Mt. Paekdu, Songwha river and their adjacent areas from 28th July to 12th of August, 1991 and identified to 2 subdivisions, 4 classes, 2 subclasses, 12 orders, 51 families, 141 genera and 336 species. The dominant species were *Clitocybe gibba*, *C. clavipes*, *Cystoderma amianthinum*, *Hygrocybe flavescens*, *H. miniata*, *Russula cyanoxantha*, *R. emetica*, *Lactarius lignyotus*, *L. torminosus* and *Phellinus igniarius*. The species found in Mt. Paekdu were newly described; *Amanita muscaria* var. *regaris*, *Volvariella speciosa* var. *speciosa*, *Cortinarius alboviolaceus*, *C. violaceus*, *Inocybe griseolilacina*, *I. hirtella* var. *hirtella*, *Boletinus paluster*, *Crepidotus badioflocosus*, *Lactarius circellatus* var. *circellatus*, *L. controversus* and *L. cilicioides*.

KEYWORDS: Mt. Paekdu, higher fungi, dominant species.

Mt. Paekdu is the highest mountain in Korea, which is located between north latitude 41° 31' -42° 38' and east latitude 127° 09' -128° 55'. Administrative district of it belongs to Samgiyon-Kun, Hamkyungbuk-Do, Korea (present Yangkang-Do in North Korea) and Ido-Backha-Jin, Ando-Hyon, 1 Killim-Sung of China. Flora of plants and animals in this area have been protected under the special administration by UNESCO.

Mt. Paekdu has plenty of plants and animals because of virgin forests several hundred years. The studies of them have been accomplished in a part by Lee (1990) and Lee (1991) in Korea, but the studies on higher fungi have never reported until now. Some 420 specimens were collected this time at Naedusan, Ido-Backha near the Mt. Paekdu and also got at the basin of Songwha river from July 28 to August, 1991.

The identifications of them showed; 2 subdivi-

sions, 4 classes, 2 subclasses, 12 orders, 51 families, 141 genera and 336 species. The Dominant species in Mt. Paekdu and its surrounding were *Clitocybe gibba*, *C. clavipes* of Tricholomataceae, *Cystoderma amianthinum* of Lepiotaceae, *Russula cyanoxantha*, *Lactarius lignyotus* of Russulaceae, *Phellinus igniarius* of Hymenochaetaceae and the dominant species collected along the basin of Songwha river from the its summit were *Hygrocybe flavescens*, *H. miniata* of Hygrophoraceae, *Russula emetica*, *R. cyanoxantha*, *Lactarius torminosus* of Russulaceae.

The species found near Mt. Paekdu were listed this and some of them were newly described.

Amanita muscaria var. *regaris* (Fr.) Bertillon 광대버섯아재비 (신칭)

Bertillon, *Dict. Encycl. Sci. Medic.* 1(3), 1866. Jenkins, *Amanita* of North America, 38, 1986.

*朴聖植이사님은 1992년 2월 1일에 불의의 사고로 유명을 달리하였으며, 이 논문은 박사님의 유고 논문입니다.

Pileus 6-12 cm broad globose or hemispherical at first then flattening, margin sulcate-striate to striate, yellowish-brown to golden-brown in center, light creamy-ochre toward margin, glabrous, viscid, volval remnants as yellowish or creamy-yellow pyramidal warts or patches, randomly distributed or to near concentric rings. Context white, tinged yellowish below the pileus cuticle. Taste pleasant, odor faint. Lamellae free crowded, thickish, 0.7-1.2 cm wide, white, edge truncate. Stipe 8.0-15.0 cm long, 1.0-2.0 cm thick, tapering slightly toward apex, white to creamy-white, fibrous to floccose-scaly, basal bulb subglobose to ovoid, subclavate to subradicate, whitish to pallid, volval remnants usually as irregular ascending ring of small to medium floccose warts or patches, yellowish to creamy-yellow, annulus superior, white to pale yellowish stuffed.

Spores 10.0-12.5×6.0-10.0 μm, subglobose to elliptic, thin-walled, smooth, nonamyloid, spore print white, basidia 32.0-45.0×8.0-12.0 μm, 4-spored, clavate. Pileipellis filamentous hyphae, interwoven, gelatinized. Lamellae bilateral. Fragments of volva on pileus consisting or inflated cell mostly globose, 35.0-55.0×25.0-60.0 μm, hyphae mixed with 4.0-7.0 μm broad. Fragments of volva on annulus consisting of inflated cells abundant, small, usually terminal filamentous hyphae 3.0-7.0 μm broad.

Habitat: Solitary on terrestrial in the frondose under the coniferous.

자실체는 중형 또는 대형에 속하며 황갈색 혹은 황노랑색의 균모 위에 옅은 노랑색의 적은 막질이 환무늬와 비슷한 모양을 이루고, 자루 위에는 큰턱받이가 있고 끝은 옅은 노랑색이며 분상의 흰 가루가 붙어 있고 끈적기가 있으며 근부는 구근을 이루고 흰색의 대주머니가 크게 붙어 있다. 그 위에 환상의 크고, 작은 막질이 계단식으로(마취광대버섯의 근부처럼) 되어 있다. 포자는 타원형이고 비아밀로이드이며, 주로 칩엽수림의 양치식물이 자라는 곳에 단생 한다.

Distribution: Mt. Paekdu.

Specimens studied: No. 225 collected from Songwha river basin above sea level 1800 meters in Mt. Paekdu on 4th of August, 1991.

Discussions: This species is easily recognized

by the yellowish or creamy-yellow pyramidal warts or patches, covered in shaggy volval remnants as the bulbous base. Fruit bodies of *A. muscaria* var. *regaris* and *A. francheti* (= *A. aspera* 누더기광대버섯) are similar in stature, but there is a distinct difference in the color of the stipe at the base and volval remnants, *A. francheti* is volva at stipe base with yellowish.

Volvariella speciosa var. *speciosa* Shaffer 예쁜털버섯아재비 (신칭)

Schaffer, *Mycologia* 49 : 553, 1957. *Amanita speciosa* Fr., *Obs. Myc.* 2 : 1, 1818. *Agaricus speciosa* (Fr.) Fr., *Syst. Myc.* 1 : 278, 1821. *Volvaria speciosa* (Fr.ex. Fr.) Kummer, *Fuhr. Pilzk.* 99, 1871. *Volvariopsis* (Fr.ex Fr.) Murr., *N. Amer. Flora* 10 : 143, 1917. *Volvaria floridana* (Murr.) Murr., *Mycologia* 30 : 371, 1938.

Pileus 6.0-12 cm broad, ovoid when young, expanding to campanulate-convex or convex and eventually nearly plane, more or less subumbonate on the disc, viscid, glabrous, at times bearing patches of the universal veil, with margin not striate, pure white to whitish, occasionally tinged with gray especially on the disc. Context moderately thick in center, thin towards the margin, tinged with pinkish. Taste mild, odor unpleasant. Lamellae free, crowded, 5-10 mm wide, ventricose, with uneven to erose, white, becoming deep pink. Stipe 8.0-15.0 cm logn, 0.7-1.5 cm thick, equal or thickening towards the large basal encased in a large white saccate volva, sometimes pale cream in later, solid, glabrous, white, with the base villose to tomentose, abruptly bulbous up to 2.5-3.0 cm thick.

Spores 12.0-18.0×7.5-10.0(-11.5) μm, oval to ovoid, smooth, thin-walled, spore print pinkish, basidia 30.0-56.0×10.0-16.0 μ, 4-spored, thin-walled, clavate, pleurocystidia 30.0-75.0(-85.0)×10.0-45.0(-60.0) μm, subcylindrical to fusoid-ventricose and then with or without a knob at the apex, cheilocystidia 25.0-72.0(-82.0)×8.0-35.0(-42.0) μm, fusoid or fusoid-ventricose, with the neck enlarged at the apex or slender and passing abruptly into the body of the cystidium, lamellae trama of hyphae 3.0-35.0 μm long, pileus

trama of hyphae 3.0–4.0 μm long, pileus cuticle or gelatinized hyphae, clamp connection absent.

Habitat: Solitary to gregarious on rich soils mixed forest of conifer and hardwoods. Edibility good.

자실체는 대형으로 균모는 종모양이다 차츰 중앙이 약간 나오거나 편평한 모양을 이룬다. 순백색에서 옅은 백색이나 간혹 그늘은 회색 또는 옅은 회갈색을 나타낸다. 육질은 흰색이나 포자의 성숙 때문에 분홍빛으로 보이기도 한다. 주름살은 떨어진 주름살로 간격은 좁고 크편이며 흰색에서 분홍빛으로 된다. 자루는 흰색으로 아래로 내려가면서 굵고 근부는 구근을 이루며 흰색의 대주머니가 붙어 있다. 혼효림의 기름진 땅에 단생 또는 군생 한다.

Distribution: Mt. Paekdu

Specimens studied: No. 74 collected from Nae-dusan area above sea level 500 meters in Mt. Paekdu on 30th of July, 1991.

Discussions: This species is characterized by its pure white pileus and stipe, pinkish lamellae, large white saccate volva. *V. speciosa* var. *speciosa* is easily confused with the deadly *Amanita*. This species is very similar *Amanita virosa* Secr. (독우산광대버섯), but differs from stipe is fibrous scales and white lamellae. Also deadly poisonous, *A. verna* (Bull. ex Fr.) Vitt. (흰알광대버섯), differing from the former in the hemispherical pileus shape of the young specimens and stipe is finely powdered.

Cortinarius alboviolaceus (Fr.) Fr. 흰보라끈적버섯 (신칭)

Fries, *Epicr. Myc.* 280, 1836.

Pileus 3.6–6.0 cm broad, campanulate, then flattened and obtusely umbonate, surface not viscid, slightly silky-fibrillose, silvery bluish white or silveryviolet, soon becoming pale yellowish gray or ochraceous yellow, margin at first incurved, when young fibrillose from veil remnants. Context rather thick at the center of the pileus, abruptly thin toward the margin, whitish, pale lilac at apex, yellowish white towards base and with age. Taste mild, odor not distinctive. Lamellae slightly sinuate or adnate, crowded to moderately broad, 0.4–0.6 cm wide, with a faint bluish violet tinge when young, then rusty-cinnamon or pale greyish

brown, edge whitish. Stipe 4.0–7.5 cm long, 0.5–1.2 cm thick, thickened at the base (1.0–1.6 cm), silky-shining, concolorous with the pileus, finally becoming whitish gray. Cortina white, leaving flattened.

Spores 7.0–10.5 \times 4.5–6.0 μm , ellipsoid to amygdaliform, minutely roughened, spore print rusty-brown, basidia 20.0–30.0 \times 6.0–8.0 μm , 4-spored, hyaline, clavate, lamellae edge small, cylindric sterile cells, pileus cuticle with a moderately thick epicutis, hyphae 3.0–6.0 μm broad, hyaline, clamp connection present.

Habitat: Scattered on soils mixed oak and pine forest. Edible.

자실체는 중형에 속하며 반구형에서 차츰 편평한 모양에 중앙이 볼록 나온것도 있다. 끈적기는 없고 은빛의 옅은 자주빛 또는 푸른빛을 가진 자주빛이다. 성숙후에는 옅은 황토 갈색이 전체에 나타나거나 옅게 나타난다. 주름살은 바른주름살에 가깝고 약간 좁은 편이며 자주빛에서 차츰 활갈색이 된다. 자루는 거의 아래로 내려가면서 커지고 근부는 구근모양을 이루기도 한다. 색은 균모와 같으며 윗부분에 흰색의 거미줄 막질이 있다가 없어 진다. 육질은 흰색에 가깝다. 포자는 장타원형이고 돌기들이 나와 있으며 참나무와 소나무숲의 혼효림에 산생한다.

Distribution: Mt. Paekdu

Specimens studied: No. 183 collected from Songwha river basins above sea level 1800 meters in Mt. Paekdu on 3th of August, 1991.

Discussions: This species is characterized by the pale bluish white, shiny pileus surface, the pale greyish brown lamellae and the lack of odor. This deciduous forest species is closely related to the coniferous forest *C. camphoratus* with a penetrating smell and discolour to almost whitish. Distinguished from *C. subalboviolaceus* Hongo by the shape of the spores.

C. violaceus (L. ex Fr.) Fr. 보라끈적버섯 (신칭)

Fries, *Epicr. Myc.* 279, 1838; *Monogr. Hymen. Suec.* 2 : 46, 1863. *Agaricus violaceus* L. *Sp. plant.* 2 : 1173, 1753. *Agaricus hercynicus* Fries, *Syn. Meth. Fung.* 278, 1801.

Pileus 5.0–10.0 cm broad, hemispherical, then plano-convex, sometimes broadly, umbonate or depressed, surface not viscid, tomentose to fine

scaly, dark violet or blue amethystine with a metallic shine when young, somewhat pale bluish violet in later, often dark bluish black when old. Context violet, paler bluish in pileus and base of stipe, KOH reaction blood red. Cortina lanate, violet, soon disappearing without leaving any trace. Taste mild, odor cedar wood. Lamellae adnexed to slightly adnate moderately crowded, later rather distant, 4.0-6.0 mm wide, dark violet, then drak purplish brown or rust brown, edge whitish fimbriate. Stipe 6.0-10.0 cm long, 0.7-1.5 cm thick, more or less strongly clavate-bulbosus (2.5 cm diameter), concolorous with pileus or more or less pale, basal mycelium distinctly bluish.

Spores 12.0-16.0×8.0-10.5 μm, ellipsoid to almost subglobose, very distinctly verrucose, spore print rusty brown, basidia 25.0-33.0(-37.0)×9.0-12.5(-13.5) μm, 4-spored, thin-walled, clavate, lamellae edge clavate with sterile cells, pileus cuticle with a thick epicutis to more or less erect, hyphae 8.0-13.5 μm broad with blue, then brown vacuolar pigment, hyphae of trama similarly pigmented.

Habitat: Solitary or scattered on soils mixed broad-leaved and pine forest. Edible.

자실체는 중형에서 대형에 속하며 균모는 반구형에서 차츰 편평한 모양으로 된다. 질은 자주색 또는 푸른빛이 나는 자주색에 조모가 뾰뾰히 밀생 한다. 주름살은 바른주름살에 가까우며 질은 자주색을 띤다. 자루는 아래로 내려가면서 굵어지고 근부는 구근을 이루기도 한다. 균모와 같은 색이며 육질은 자주색을 나타낸다. 포자는 장타원형 또는 타원형이고 사마귀와 같은 침상의 돌기들이 나 있다. 활엽수와 소나무숲의 혼효림에 단생 또는 산생 한다.

Distribution: Mt. Paekdu

Specimens studied: No. 264 collected from Songwha river basins above sea level 1800 meters in Mt. Paekdu on 4th of August, 1991.

Discussions: This species is a remarkable species with its deeply violet colour pileus, lamellae and stipe, tomentose to fine scaly in pileus. In Europe two subspecies can be separated due to differentiation in habitat and shape of spores. The deciduous forest *subsp. violaceus* is distinguished from *hercynicus* by its more narrow, amygdaliform to ellipsoid spores. In North America and sou-

thern hemisphere further spore variation occur.

Inocybe griceolilacina Lange 회보라뿔버섯 (신칭)

Lange, *Dansk bot. Art.*, 2(7) : 33, 1917. *Inocybe personata* Kühner, *Bull. Soc. Nat. Oyonay* 9(Suppl.) 5, 1955. *Inocybe pusio f. elegans* Reumaux, *Docs mycol.* 12(48) : 21, (1982) 1983.

Pileus 1.5-3.0 cm broad, conico-convex to convex when young, with margin somewhat inflexed when young, soon expanding to plane-convex or subappanate with straight margin, not or rather indistinctly umbonate pale grayish brown or grayish brown around center, outward paler, near margin greyish buff with tinge violaceous or pale isabella-brown mixed with violaceous tinges, fibrillose when young, breaking up around disc and becoming recurvately squamulose in later, towards margin coarsely fibrillose. Context in upper part of stipe reddish to violaceous, more violaceous just above lamellae, other part pale yellowish brown. Taste none, odor spermatic when cut. Lamellae slightly adnate or adnexed, moderately crowded, 2.5-4.0 mm wide, ventricose or not, pale violaceous greyish to violaceous greyish when young, greyish-brown in later, fimbriate in edge, whitish. Stipe 3.5-7.0 cm long, 0.3-0.7 cm thick, equal, slightly bulbous or not, dinges violaceous or greyish violaceous, sometime with violaceous tinges only in upper, near base greyish yellow to greyish-brown, downwards longitudinally fibrillose, solid. Cortina present in young specimens.

Spores 8.0-10.5×5.0-7.0 μm, smooth, ellipsoid, thin-walled, spore print pale yellowish brown, basidia 25.0-30.0×7.5-10.0 μm, 4-spored, clavate, pleurocystidia 45.0-75.0×12.0-20.0 μm, fusiform to sublageniform, thick-walled, with up to 2.0-2.57 μm thick, almost colorless, slightly crystalliferous at apex, frequent, cheilocystidia similar to pleurocystidia, caulocystidia absent.

Habitat: Scattered on soils of frondose under a coniferous forest. Edibility unknown.

자실체는 소형이며 균모는 꼬깔형에서 차츰 반구형 또는 편평한 모양으로 된다. 중앙은 엷은 회갈색에서 회갈색에 가깝고 가장자리로 가면서 엷어지고 자주빛 질게 또는 엷게 섞여 나타난다. 나중에는

황갈색이 된다. 주름살은 자주빛이 비치는 회색에서 회갈색으로 된다. 자루는 상하 굵기가 비슷하며 전체가 자주빛 또는 부분적으로 나타난다. 육질은 엷은 노갈색에 자주빛이 엷게 비친다. 포자는 타원형이고 침엽수림 아래 엽상체식물이 자라는 곳에 산생 한다.

Distribution: Mt. Paekdu

Specimens studied: No. 150 collected from Songwha river basins above sea level 1500 meters in Mt. Paekdu on 3th of August, 1991.

Discussions: This fungus is characterized by its violaceous stipe and violaceous grey lamellae when young. This species is very similar to *I. geophylla* var. *lilacina* (Peck) Gill. (보라땀버섯) but differs in the violaceous pileus and stipe.

I. hirtella var. *hirtella* Kuyper 센털땀버섯(아재비) (신칭)

Kuyper, T.W., A revision of the Genus *Inocybe* in Europe, 168-9, 1986.(supp. vol. 3, *Persoonia*). *Inocybe hirtella* Bres., *fungi trident.* 1 : 52, 1881. *Inocybe amygdalispora* Metrod, *Bull. trimest. Sc. mycol.* Fr. 72 : 129, 1956(inal., Art. 36.1). *Inocybe pseudoconfusa* Metrod, *Bull. trimest. Sc. mycol.* Fr. 72 : 129, 1956(inal., Art. 36.1). *Inocybe hirtella* f. *tetraspora* Kühner, *Bull. Soc. Nat. Oyonax* 9(Suppl.) 25, 1955.

Pileus 2.0-3.5 cm broad, convex, plano-convex to applanate, sometimes with low obtuse umbo, with straight margin, ochraceous to slightly brownish-tinged yellow, surface dry, fibrillose, squamulose or even squarrose with age somewhat excoiating and becoming recurvately squarrose. Context moderately thick at the disc, white to whitish. Taste not distinctive, odor somewhat spermatic. Lamellae slightly adnate, crowded, 2-4 mm wide, not or slightly ventricose, greyish with yellow-brown or brownish yellow, edge fimbriate, whitish. Stipe 3.0-5.5(-7.0) cm long, 0.3-0.6 cm thick, equal or attenuated upward, solid, pale yellowish or pale orange-ochraceous at apex or sometimes middle, almost whitish at base, pruinose or fibrillose at uppart.

Spores 8.0-11.0×5.0-6.0 μm, subamygdali-form, smooth, thin-walled, spore print ochraceous brown, basidia 23.0-30.0×8.0-10.0 μm, 4-spored, clavate, pleurocystidia 45.0-68.0×11.0-18.0(-

20.0) μm, clavate to fusiform, thick-walled, with up to 2.0(-2.5) μm thick, colorless, slightly crystalliferous at apex, frequent, cheilocystidia similar to pleurocystidia, caulocystidia descending to base of stipe, similar to pleurocystidia, clamp connection present.

Habitat: Scattered on soils oak and pine forest. Edibility unknown.

자실체는 소형으로 균모는 반구형에서 중앙이 나오는 편평한 모양을 이루고, 중앙은 삼각형 모양 혹은 비늘 모양의 돌기들이 나와 있고 가장자리는 섬유상 비늘모양을 이룬다. 성숙 후에는 점차 섬유상 비늘모양을 이룬다. 황토갈색 또는 노란색이 나는 황갈색을 나타낸다. 육질은 흰색이며, 주름살은 약간 바른주름살로 간격은 좁고 크기는 보통이고 황갈색이 된다. 자루는 굵기가 비슷하며 위부분에 엷은 황색을 나타내고 아래로 가면서 흰색을 띤다. 포자는 타원형이며 혼효림의 땅 위에 산생한다.

Distribution: Mt. Paekdu

Specimens studied: No. 221 collected from Ido-Backha areas above sea level 300 meters near Mt. Paekdu on 3th of August, 1991.

Discussions: This species is characterized by the ochraceous or brownish-yellow pileus and uppart of the stipe, fibrillose to squamulose, becoming recurvately squarrose. This is very close to *I. langei* Heim, but differs in the somewhat bulbous base of stipe and more or less large spores.

Boletinus paluster (Peck) 방망이황금그물버섯 (신칭)

Peck, *Bull. N. Y. Stat Mus.* 8 : 78, 1889. *Boletus paluster* Peck, *Ann. Rept. N. Y. State Cob.* 23 : 132, 1872. *Boletinellus paluster* (Peck) Murrill, *Mycologia* 1 : 8, 1909. *Fuscoboletinus paluster* (Peck) Pomerleau, *Mycologia* 56 : 708-9. pl. 104, 1964. Smith & Thiers, *The Boletus of Michigan*, 76, 1971.

Pileus 5.0-1.0 cm broad, obtuse to convex, becoming flattened with or without an obtuse umbo, surface deep red or rose-pinkish from the colored floccose-tomentose covering which breaks up into fibrillose squamules, margin incurved and usually appendiculate with fragments of the broken veil when young. Context yellowish white to golden or deeper yellow, unchanging when bruised. Taste and odor none. Tubes adnate to decurrent, large

angular mouths more or less in radial arrangement or sublamellate with crossveins producing, yellow, not changing in age merely dingy ochraceous. Stipe 2.5-5.0 cm long, 0.5-0.8 cm thick, equal, surface yellow above, central part reddish to bright red, yellow and tomentose at base, evanescent annulus concolorous with squamules on pileus, solid.

Spores 7.0-9.5×3.0-4.0 μm, subcylindric to slightly inequilateral, smooth, spore print dark purplish brown when moist, pinkish brown when dry, basidia 20.0-27.0×5.0-7.5 μm, 4-spored, clavate, hyaline in KOH, yellowish in Melzers, pleurocystidia 42.0-75.0×7.5-13.0 μm, subcylindric with obtuse apex, thin-walled, cheilocystidia similar pleurocystidia, tube trama apparently interwoven, pileus trichodermium 7.0-12.0 μm, non gelatinous, hyphae orang to red or red-brown in Melzers, clamp connection present but different to find.

Habitat: Scattered on soils of frondose mixed coniferous and deciduous forests.

자실체는 중형 또는 약간 대형이며 균모는 반구형에서 차츰 편평한 모양을 이룬다. 어릴때는 가장 자리에 막질이 붙어 있다. 분홍적색, 밝은 선홍색에서 약간 황적색을 나타내기도 한다. 갓의 표면에 비로드 모양의 조모가 뺏뺏하거나 다소 성긴 모양으로 나 있다. 막공은 다각형이며 큰편이고 주름살처럼 그물모양으로 연결되어 있으며 노란색이다. 자루는 짧은 편이고 갓과 같은 색과 조모가 나 있다. 육질은 노란색으로 변하지 않으며 포자는 타원형 또는 씨앗모양이며 침엽수와 낙엽수의 혼합림 아래 엽상체식물등이 자라는 곳에 산생 한다.

Distribution: Mt. Paekdu

Specimens studied: No. 331 collected from Ido-Backha areas above sea level 500 meters near Mt. Paekdu on 6th of August, 1991.

Discussions: This species is characterized by the deep red or rose-pink red floccose-tomentose covering which breaks up into fibrillose squamules pileus and concolorous with stipe, the reaction of the hyphae of the trichodermium in Melzers. This species is very similar *Boletinus cavipes* (Opat.) Kalchbr. (황금그물버섯), but differs from ochraceous-tawny to brownish-red in pileus and stipe.

Crepidotus badiofloccosus Imai 노랑털귀버섯 (신칭)

Imai, *Bot. Mag. Tokyo*, 53: 339, 1939.

Pileus 2.0-4.5 cm broad, 3.5-7.0 cm long, kidney-shape or shell-shaped, central portion of pileus with densely hairy which brown, rest short hairs with brown to buff in center, pale toward margin, margin not striate. Context thin, gelatinous, white to whitish, pale pinkish white in later. Taste mild, odor unplesent. Lamellae radiating from point of attachment, crowded to close, 3.0-5.0 mm wide, white, becoming pinkish. Stipe absent or rudimentary.

Spores 5.0-6.0×5.5-6.5 μm, ovoid or nearly globose, warted, colorless to tinted, spore print pinkish, basidia 17.0-24.0×6.0-0.8 μm, 4-spored, thin-walled, clavate, cheilocystidia 15.0-36.0(-45.0)×8.0 12.0 μm, clavate to fusiform or lageniform with elongated, trama of lamellae subparallel near subhymenium to interwoven over central portion, hyphae 4.0-8.0 μm broad, clamp connection present.

Habitat: Clustered on stumps or decaying wood of deciduous trees.

자실체는 중형에 속하며 자루가 없는 편심생으로 중앙은 갈색의 조모가 뺏뺏히 나 있고 가장자리로 갈수록 적고 얇게 나 있다. 균모의 색은 담갈색에서 가장자리로 갈수록 노황색 또는 이보다 옅은 색을 띤다. 육질은 흰색 또는 바랜 흰색으로 포자의 성숙 때문에 옅게 분홍으로 보이기도 한다. 주름살 간격은 좁거나 보통이며 흰색에서 분홍색으로 된다. 포자는 둥글고 침상의 돌기가 나와 있으며 활엽수림의 고목에 무리지어 발생한다.

Distribution: Mt. Paekdu

Specimens studied: No. 402 collected from Naedusan areas above sea level 500 meters in Mt. Paekdu on 8th of August, 1991.

Discussions: This species is characterized by its brownish pileus and densely covered hairs and pinkish lamellae, sessile.

Lactarius circellatus var. *circellatus* Smith & Hesler 작은테젓버섯아재비 (신칭)

Fries, *Epicr. Syst. Mycol.* 338, 1839. Smith & Hesler, North American species of *Lactarius*, 376.

1971.

Pileus 4.0-8.0 cm broad, convex becoming convex-depressed to shallowly infundibuliform, surface glabrous, slightly viscid in wet weather and usually dry, zonate to subzonate, lilac-drab or lavender-drab, cinnamon-drab or vinaceous-drab over the disc, margin even, faintly pruinose at first. Context grayish next to cuticle and pallid in the interior, taste acrid, odor slightly mushroomy. Latex white unchanging, not staining, acrid. Lamellae adnate, crowded, moderately close in later, 4-7 mm wide, thin, pale ochre-buff or yellowish-ochre. Stipe 3.0-6.0 cm long, 0.5-1.2 cm equal or tapered downward, solid, firm, concolorous with pileus or paler, not viscid.

Spores 6.0-7.5×5.0-6.5 μm, subglobose to broadly ellipsoid, ornamentation in the form of heavy bands, rows of nodules connected by lines, and isolated particles, prominences 1.0 μm high, spore print yellowish, amyloid, basidia 35.0-45.0×6.5-8.5 μm, 4-spored, clavate, pleurocystidia; macrocystidia 45.0-65.0×6.0-9.0 μm, fusoid-ventricose with apex pointed or narrowly fusoid to subcylindric, hyaline, thin-walled, cheilocystidia 30.0-45.0×6.0-9.0 μm, similar to pleurocystidia, lamellae trama connective hyphae with greatly inflated cell, pileus trama heteromerous.

Habitat; Scattered on soils of frondose under coniferous forest. Edibility unknown.

자실체는 중형이며 균모는 중앙이 들어가거나 편평하며 성숙하면 약간 깔때기 모양이 되기도 한다. 가장자리가 안으로 말려 있을 때는 얇게 조모가 있는 것도 있다. 습기가 있을 때는 끈적기가 있으나 건조 하면 없어진다. 회색빛의 담갈색, 분홍갈색 또는 얇게 자주빛의 분홍 암갈색이며 분홍 담갈색의 환무늬가 뚜렷한 것과 얇게 나타나는 것도 있다. 주름살 간격은 좁고 보통이며 흰색에서 노랑색으로 된다. 자루는 균모와 같은 색이거나 옅다. 포자는 둥근 타원형이거나 구형에 가까우며 그물눈이 얼룩말 무늬처럼 선명하게 나 있기도 한다. 주로 침엽수림의 엽상체식물등이 자라는 곳에 산생한다.

Distribution: Mt. Paekdu

Specimens studied: No. 270 collected from Songwha river basins above sea level 1500 meters in Mt. Paekdu on 4th of August, 1991.

Discussions: *L. circellatus* has always been a

problem to American as well as, apparent, European mycologists. Fries(*Epicr.* p. 338) described the pileus as "viscoso" but Neuhoff(1956; 149) stated that it was only slightly viscid in wet weather and usually dry. Also, he described the dried drops of latex as pale to bright greenish yellow, and injured places stained dingy ochraceous to brownish olive. This is not in accordans with the original description and suggests *L. pyrogalus*(제브라젓버섯) of the present. But ling hams concept, as represented by specimens we have studied (*Bull.* 569, Newfane, Vt.), has spores distinctly more reticulate than "zebra-like" in their ornamentation and a much more poorly developed pileus cuticle.

L. controversus (Fr.) Fr. 삼젓버섯 (신칭)

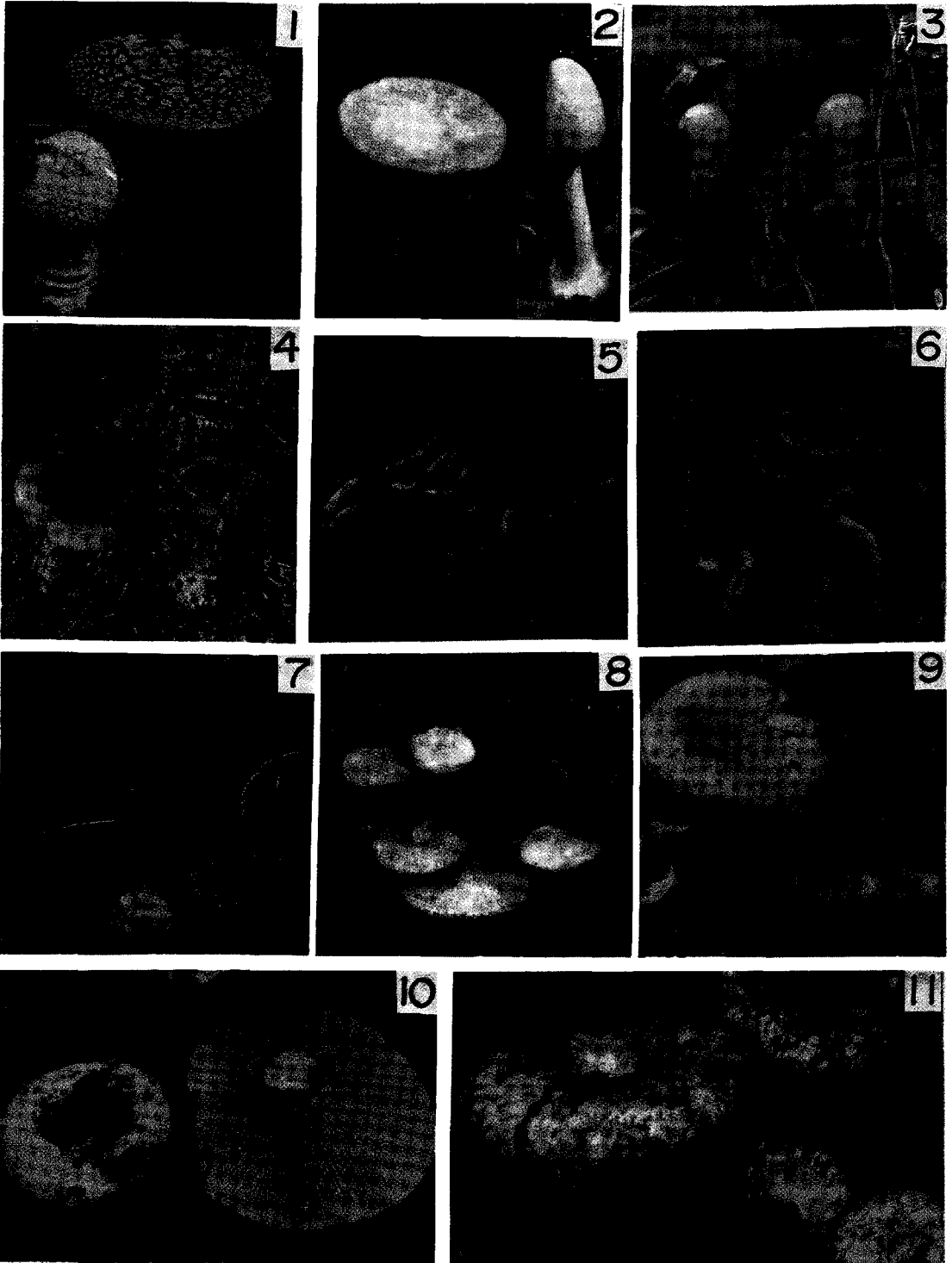
Fries, *Epicr. Syst. Mycol.* 335, 1839. *Agaricus controversus* Fries, *Syst. Mycol.* 1: 62, 1821. Smith & Hesler, North America species of *Lactarius*, 248, 1979.

Pileus 7.0-15.0 cm broad, broadly convex with a depressed disc, expanding to broadly infundibuliform, margin at first inrolled and short pubescent-tomentose at first, then straightened out, white to whitish, more or less distinctly indistinctly zonate, the surface appressed-fibrillose, viscid but soon dry. Context white, firm, taste slowly but strongly burning-acrid, odor mild. Latex white, unchnge. Lamellae adnate to subdecurrent, crowded, 3-6 mm wide, thin, light salmon tinge or pale pink, becoming pinkish cream in age, some forking near the stipe. Stipe 3.0-6.0 cm long, 0.5-2.0 cm thick, equal of tapering downward, concolorous with pileus, when wet somewhat tacky, soon dry, sometimes spotted, stuffed then hollow.

Spores 6.0-8.0×5.0-6.0 μm, ellipsoid or broadly ovate, ornamentation proper a broken to a partial reticulum with many free ends, some isolated particles and warts present, prominences 0.2-0.5 μm high, spore print pale pinkish cinnamon, amyloid, basidia 32.0-40.0×7.0-9.0 μm, 4-spored, clavate, pleurocystidia 30.0-40.0×3.5-6.0 μm, intermediate type, acuminate and with one or more subapical constrictions.

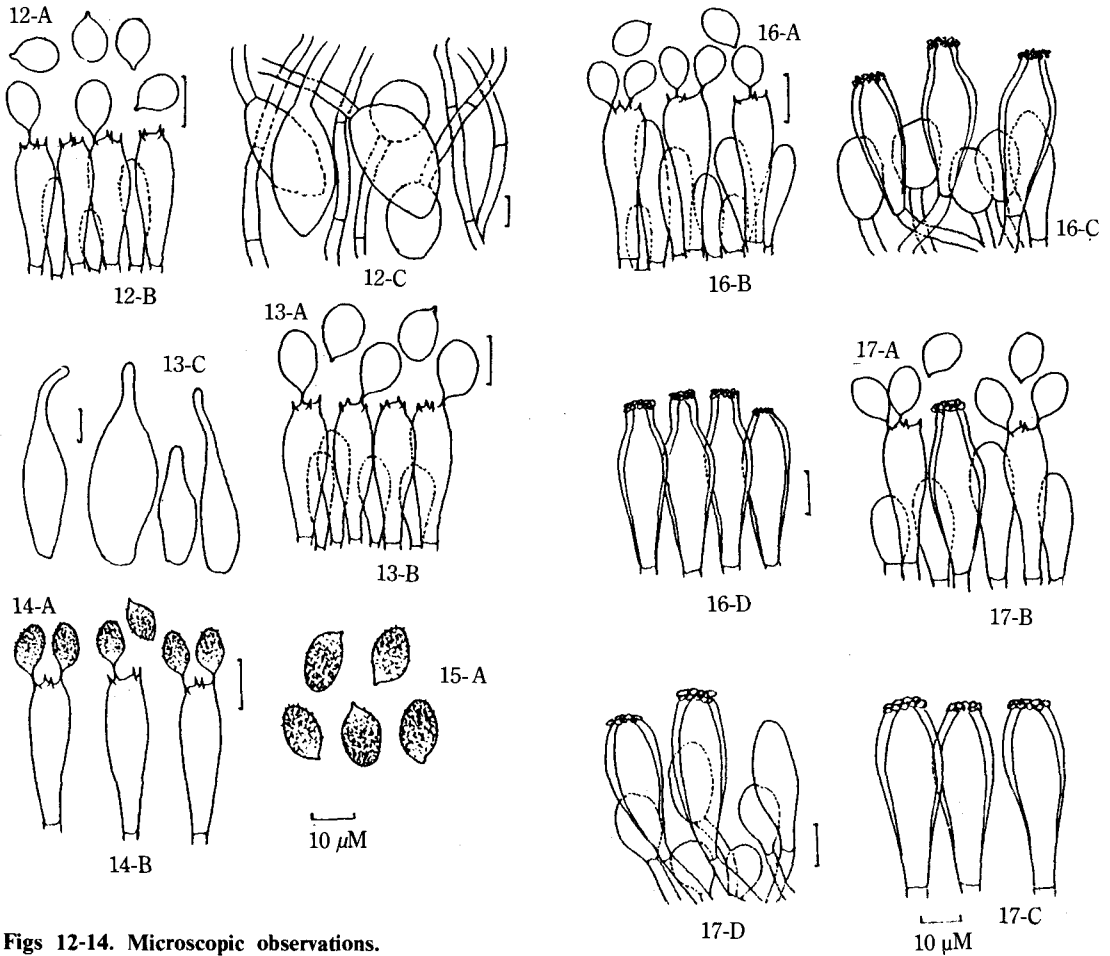
Habitat: Scattered on soils mixed coniferous

Plate I



Figs 1-12. Basidiocarps (1/2).

- | | |
|--|--|
| 1. <i>Amanita muscaria</i> var. <i>regaris</i> (Fr.) Bertillon | 7. <i>Boletinus paluster</i> (Peck) Peck |
| 2. <i>Volvariella speciosa</i> var. <i>speciosa</i> Sing. | 8. <i>Crepidotus badiofloccosus</i> Imai |
| 3. <i>Cortinarius alboviolaeus</i> (Pers.: Fr.) Fr. | 9. <i>Lactarius circellatus</i> var. <i>circellatus</i> Smith & Hesler |
| 4. <i>C. violaceus</i> (L.: Fr.) Fr. | 10. <i>L. controversus</i> (Fr.) Fr. |
| 5. <i>Inocybe griceoililacina</i> Lange | 11. <i>L. cilicioides</i> (Fr.) Fr. |
| 6. <i>I. hirtella</i> var. <i>hirtella</i> Kuyper | ※The Natural Size 1/2 |

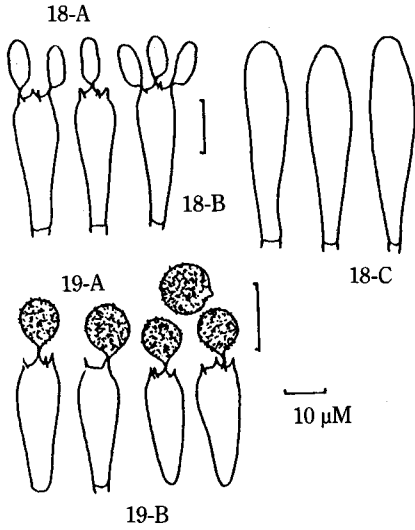


Figs 12-14. Microscopic observations.

12. *Amanita muscaria* var. *regaris*(Fr.) Bertillon.
 1-A. spores, 1-B. basidia, 1-C. Fragments of volval remnants from pileus
 13. *Volvariella speciosa* var. *speciosa* Sing.
 2-A. spores, 2-B. basidia, 2-C. pleurocystidia
 14. *Cortinarius alboviolaeus*(Pers.: Fr.) Fr. 3-A. spores, 3-B. basidia.
 15. *C. violaceus*(L.: Fr.) Fr. 4-A. spores.

Figs 16-17. Microscopic observations of Basidiocarps.

16. *Inocybe griceoililacina* Lange.
 1-A. spores, 1-B. basidia, 1-C. pleurocystidia, 1-D. cheilocystidia
 17. *I. hirtella* var. *hirtella* Kuyper.
 2-A. spores, 2-B. basidia, 2-C. pleurocystidia 2-D. caulocystidia



Figs 18-19. Microscopic observations of Basidiocarps.
 18. *Boletinus paluster* (Peck) Peck
 1-A. spores, 1-B. basidia, 1-C. pleurocystidia.
 19. *Crepidotus badiofloccosus* Imai
 2-A. spores, 2-B. basidia.

and deciduous forests. Edibility unknown.
 자실체는 중형에서 대형에 속하며, 균모는 중앙이 들어가거나 평평하며 가장자리가 안으로 말린다. 차차 약간 깔대기 모양이 된다. 밝은 흰색에 환무늬가 있는것도 있으며 성숙되면 얇게 퇴색되기도 한다. 주름살은 분홍색이며 간격이 좁다. 자루는 균모와 같은 색이며 대체로 속이 차 있다. 육질은 흰색이며, 유액은 흰색으로 변치않고 매운맛을 낸다. 포자는 타원형이며 그물눈이 선명하게 나 있거나 떨어져 있다. 활엽수림과 침엽수림의 혼효림에 산생한다.

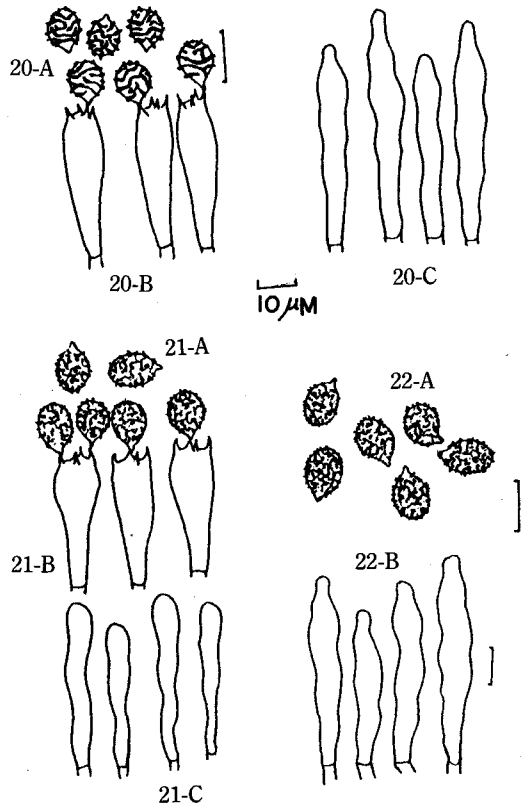
Distribution: Mt. Paekdu

Specimens studied: No. 48 collected from Naedusan areas above sea level 300 meters in Mt. Paekdu on 31 of July, 1991.

Discussions: Rocognizable by the uniform bright whitish pileus and stipe, pink lamellae, white matted-fibrillose to glabrous pileus, slow but strong burning acrid latex are the distinctive characters.

Lactarius cilioides (Fr.) Fr. 염소털젓버섯 (신칭)

Fries, *Epier. Syst. Mycol.* 334, 1838. *Agaricus cilioides* Fries, *Syst. Mycol.* 1 : 62, 1821. Hesler &



Figs 20-22. Microscopic observations of Basidiocarps.
 20. *L. circellatus* var. *circellatus* Smith & Hesler.
 1-A. spores, 1-B. basidia, 1-C. pleurocystidia.
 21. *L. controversus* (Fr.) Fr.
 2-A. spores, 2-B. basidia, 2-C. pleurocystidia.
 22. *Lactarius cilioides* (Fr.) Fr.
 3-A. spores, 3-B. pleurocystidia.

Smith, North American species of *Lactarius*, 573, 1979.

Pileus. 7.0-15.0 cm broad, convex, convex-depressed or plano-depressed, viscid at first but dry, margin often scalloped at first, arched and incurved coarsely hairy margin, marginal area covered with matted tomentum, or typically covered with long dense hairs that gradually joined in matted tufts, the disc appressed-fibrillose, pale yellowish buff to ocher-yellow or ocher-buff, the fibrils and scales brownish yellow, orange-brown. Latex copious, slowly acrid and hot, white, sulphur yellow on exposure to the air, odor none. Lamellae adnate-

decurrent, subdistant or distant, 3-6 mm wide, thick, pale pinkish ochre-buff. Stipe 3.5-5.5 cm long, 1.2-2.5 cm thick, narrowing downwards the base or cylindrical, hard and rigid, pale yellowish buff or orange brown, above scrobiculate with ochraceous to clay color spots at base sparsely with buff or dull buff brown mycelium, hollow.

Spores 7.0-9.0(-10.0)×5.5-7.5 μm, broadly elliptic to subglobose with a fairly full network of both thick and thin ridges and an occasional isolated warts, spore print pale ochre, amyloid, basidia 34.0-50.0×7.0-10.0 μm, 4-spored, clavate, pleurocystidia; macrocystidia 35.0-62.0×5.8-8.0 μm, broadly to narrowly fusoid, hyaline, thin-walled, hyphae nearly parallel, 3.0-5.0 μm broad.

Habitat: Scattered on soils mixed coniferous and deciduous forests. Edibility unknown.

자실체는 대형이며 중앙이 들어가고 평평한 모양이며 가장자리가 안으로 말린다. 얇은 황토갈색 또는 오렌지 황토색이다. 질은 갈색의 조모가 가장자리로 갈수록 긴 것이 많이 나 있으며, 균모의 전체를 덮고 있다. 주름살의 간격은 넓고 두꺼운 편이며, 자루는 짧고 균모와 같은 색이나 질은 갈색의 반점이 나타나기도 한다. 유액은 흰색으로 차차 노란색 혹은 오렌지 노란색으로 변하며 맛은 맵고 강한 편이다. 포자는 장타원형에서 타원형에 가깝고 그물눈이 연결되는 곳곳에 두껍고 크게 나타나는 부위가 있다. 침엽수와 활엽수의 혼효림의 땅위에 산생한다.

Distribution: Mt. Paekdu.

Specimens studied: No. 10, 11 collected from Naedusan areas above sea level 300 meters in Mt. Paekdu on 29th of July, 1991.

Discussions: It should be easily recognized by a pale orange brown to ochre brown coarsely hairy, marginal area covered with matted tomentum, latex white but changing yellow. *L. torminosus* var. *nordmanensis* Hesler & Smith is very simillary, but light pinkish cinnamon pileus, at times almost rose-pink in places and lamellae pale cinnamon-pink, spore print white.

The List of Higher Fungi in Mt. Paekdu Areas

Basidiomycotina	담자균아문
Eubasidiomycetes	진정담자균강
Hymenomycetidae	모균아강
Agaricales	주름버섯목

Amanitaceae

	광대버섯과
<i>Amanita citrina</i> S.F. Gray	애광대버섯
<i>A. flavipes</i> Imai	노란대광대버섯
<i>A. hemibapha</i> (Berk. et Br.) Sacc.	달갈버섯
<i>A. pantherina</i> (Dc. ex Fr.) Krombh	마귀광대버섯
<i>A. rubescens</i> Pers. ex Fr.	붉은점박이광대버섯
<i>A. rubrovolvata</i> Imai.	붉은점박이 광대버섯
<i>A. vaginata</i> (Bull. ex Fr.) Vitt.	우산버섯
<i>A. vaginata</i> (Bull. ex Fr.) var. <i>fulva</i> (Schaeff.) Gill.	고동색우산버섯
<i>A. vaginata</i> (Bull. ex Fr.) var. <i>punctata</i> (Cleland et Ched) Gill.	큰우산버섯
<i>A. vaginata</i> (Bull. ex Fr.) var. <i>alva</i> Gill.	흰우산버섯
<i>A. vaginata</i> var. <i>regaris</i> (Fr.) Bertillon	광대버섯아재비

Pluteaceae

	난버섯과
<i>Volvariella bombycina</i> (Schaeff. ex Fr.) Sing.	흰비단털버섯
<i>V. speciosa</i> var. <i>speciosa</i> Sing.	예쁜털버섯아재비
<i>Pluteus atricapillus</i> (Batch) Foyod	난버섯
<i>P. leoninus</i> (Schaeff. ex Fr.) Kummer	노란그늘치마버섯

Agaricaceae

	주름버섯과
<i>Agaricus arvensis</i> Schaeff. ex Fr.	흰주름버섯
<i>A. campestris</i> L. ex Fr.	주름버섯
<i>A. placomyces</i> Pk.	주름버섯아재비

Lepiotaceae

	갓버섯과
<i>Lepiota autesquamosa</i> (Weinm. ex Fr.) Gill.	가시갓버섯
<i>L. clypeolaria</i> (Fr.) Quel.	방패갓버섯
<i>L. cristata</i> (Bolt. ex Fr.) Kummer	갈색고리갓버섯
<i>L. cygnea</i> J. Lange	백조갓버섯
<i>Cystoderma amiantinum</i> (Scop. ex Fr.) Fayod	참낭피버섯
<i>C. fallax</i> A. H. Smith et Sing.	꿀낭피버섯
<i>C. cinnabarinum</i> (Alb. et Schw.) Fayod	황갈낭피버섯
<i>Leucocoprinus birnbaumii</i> (Corda) Sing.	노란각시버섯
<i>Leucoagaricus rubrotinctus</i> (Peck) Sing.	주홍갓버섯
<i>Macrolepiota procera</i> (Scop. ex Fr.) Sing.	갓버섯

- Entolomataceae** 외대버섯과
Entoloma crassipes Imaz. & Toki 외대덧버섯
E. clypeatum (L.) Kummer. 방패외대버섯
E. rhodopolium (Fr.) Kummer. 샷갓외대버섯
E. sinuatum (Bull.: Fr.) Kummer. 굽은외대버섯
E. lazurina Qu'el. 흑청색외대버섯
E. lampropum (Fr.) Hesler 빛외대버섯
Clitopilus prunulus (Scop. ex Fr.) Kummer 그늘버섯
- Hygropholaceae** 빗꽃버섯과
Hygrophorus lucorum Kalchbr. 노란털빗꽃버섯
H. russula (Schaeff. ex Fr.) Qu'el. 다색빗꽃버섯
Hygrocybe acutoconica (Clem.) Sing. f. *jponica* (Hongo) Hongo 좁고갈빗꽃버섯
H. cantharellus (Schw.) Murr. 화병빗꽃버섯
H. coccinea (Schaeff. ex Fr.) Kummer 진빨간빗꽃버섯
H. conica (Scop. et Fr.) Kummer 붉은산빗꽃버섯
H. cuspidata (Peck) Kummer 붉은산빗꽃버섯
H. flavescens (Kauffm.) Sing. 노란대빗꽃버섯
H. imazekii (Hongo) Hongo 황적색빗꽃버섯
H. miniata (Fr.) Kummer 붉은무명버섯
H. psittacina (Schaeff. ex Fr.) Wunsche 이끼빗꽃버섯
H. subcinnabarina (Hongo) Hongo 황적색빗꽃버섯
Camarophyllus virgineus (Walt.: Fr.) Kummer 처녀버섯
- Tricholomataceae** 송이버섯과
Lyophyllum connatum (Schum. ex Fr.) Sing. 흰주름갈대기버섯
Asterophora lycoperdoides (Bull.) Ditm. ex Fr. 덧부치버섯
Calocybe gambosa (Fr.) Sing. 밤버섯
Laccaria proxima (Boud.) Mair. 큰줄각버섯
L. laccata (Fr.) Berk. et Br. 줄각버섯
Clitocybe candicans (Pers. ex Fr.) Kummer 비단빛갈대기버섯
C. clavipes (Pers. ex Fr.) Kummer 배불뚝이갈대기버섯
C. flaccida (Fr.) Kummer 끝말림갈대기버섯
C. fragrans (With. ex Fr.) Kummer 흰샷갓갈대기버섯
C. gibba (Pers. ex Fr.) Kummer 갈대기버섯
C. odora (Bull. ex Fr.) Kummer 하늘색갈대기버섯
Clitocybula familia (Peck) Sing. 애기무리버섯
Tricholomopsis rutilans (Schaeff. ex Fr.) Sing. 솔버섯
T. decora (Fr.) Sing. 장식솔버섯
Collybia butyracea (Bull. ex Fr.) Qu'el. 버터애기버섯
C. dryophila (Bull. ex Fr.) Kummer 애기버섯
C. maculata (Alb. et Schw. ex Fr.) Qu'el. 점박이애기버섯
Lepista nuda (Bull. ex Fr.) Cooke 민자주방망이버섯
Armillariella mellea (Vahl ex Fr.) Karst. 뿔나무버섯
A. tabescens (Scop.) Sing. 뿔나무버섯부치
Melanoleuca melaleuca (Pers. ex Fr.) Murr. 잔디배꼽버섯
Panellus stypticus (Bull. ex Fr.) Fr. 부채버섯
Xeromphalina campanella (Batsch ex Fr.) Maire 이끼살이버섯
X. caudicinalis (Fr.) Kuhn et Mre. 가랑잎이끼살이버섯
Gerronema fibula (Bull.: Fr.) Sing. 이끼패랭이버섯
Oudemansiella mucida (Schrad. ex Fr.) Honel 끈적진뿌리버섯
O. platyphylla (Pers. ex Fr.) Moser 넓은솔버섯
Marasmiellus nigripes (Schw.) Sing. 검은대낙엽버섯
M. candidus (Bolt.) Sing. 하얀선녀버섯
Marasmius cohaerens (Alb. et Schw. ex Fr.) Cooke 우산낙엽버섯
M. crinissequi F. Mull. ex Kalchbr. 달총낙엽버섯
M. graminum (Lib.) Berk. 풀잎낙엽버섯
M. maximum Hongo 큰낙엽버섯
M. oreades (Bolt. ex Fr.) Fr. 선녀낙엽버섯
M. ramealis (Bull. ex Fr.) Fr. 마른가지낙엽버섯
M. pulcherripes Peck 애기낙엽버섯
Mycena alcalina (Fr. ex Fr.) Kummer 약취애주름버섯
M. haematopoda (Pers. ex Fr.) Kummer 적갈색애주름버섯
M. osmundicola J. Jange 흰애주름버섯
M. pelianthina (Fr.) Qu'el. 줄각애주름버섯

M. pura (Pers. ex Fr.) Kummer 맑은애주름버섯
M. rorida (Scop. ex Fr.) Qu'el. 점질대애주름버섯
M. stylobatea (Pers. ex Fr.) Kummer 빨판애주름버섯

G. penetrans (Fr. ex Fr.) Murr. 솔미치광이버섯
G. spectabilis (Fr.) Sing. 칩투미치광이버섯
 갈황색미치광이버섯

Pleurotaceae 느타리과
Panus rudis Fr. 애참버섯
Pleurotus cornucopiae var. *citrinopileatus* (Sing) 노랑느타리
Ohira 노랑느타리
P. ostreatus (Jacq. ex Fr.) Kummer 느타리
P. pulmonarius (Fr.) Qu'el. 산느타리
Lentinus lepideus (Fr. ex Fr.) Fr. 잣버섯
Pleurocybella porrigens (Pers.: Fr.) Sing. 넓은잎버섯

Crepidotaceae 귀버섯과
Crepidotus applanatus (Pers. ex Pers.) Kühn. 평평귀버섯
C. badiofloccosura Imai 노랑털귀버섯

Cortinariaceae 끈적버섯과
Inocybe asterospora Qu'el. 샷갓땀버섯
I. calamistrata (Fr.) Qu'el. 큰비늘땀버섯
I. calospora Qu'el. 비늘땀버섯
I. cincinnata (Fr.: Fr.) Qu'el. 곱슬머리땀버섯
I. fastigiata (Schaeff.) Qu'el. 솔땀버섯
I. laccera (Fr. ex Fr.) Kummer 비듬땀버섯
I. niigatensis Hongo 모래밭땀버섯
I. maculata Boud. 털땀버섯
I. mixtilis (Britz.) 잡색땀버섯
I. praetervisa Qu'el. 땀버섯아재비
I. umbratica Qu'el. 흰땀버섯
I. griseoililacina Lange 회보라땀버섯
I. hirtella var. *hirtella* *Kuyper*. 셉털땀버섯아재비
Cortinarius allutus Fr. 적각색끈적버섯
C. bovinus Fr. 황소끈적버섯
C. collinitus (Sow. ex Fr.) Fr. 진흙끈적버섯
C. elatior Fr. 키다리끈적버섯
C. pseudopurpurascens Hongo 자주색끈적버섯아재비

Strophariaceae 독청버섯과
Pholiota carbonaria (Fr.) Sing. 재비늘버섯
P. lubrica (Pers.: Fr.) Sing. 갈색밋밋비늘버섯
P. squarrosoides (Peck) Sacc. 칩비늘버섯
Naematoloma fasciculare (Hudson ex Fr.) Karst. 노란다발
Kuehneromyces mutabilis (Schaeff. ex Fr.) Sing. & A. H. Smith 무리우버섯
Psilocybe caprophila (Bull. ex Fr.) Kühn. 좁환각버섯

C. pseudopurpurascens Hongo 자주색끈적버섯아재비
C. pseudosalor J. Lange 가지색끈적버섯아재비
C. purpurascens (Fr.) Fr. 풍선끈적버섯
C. salor Fr. 푸른끈적버섯
C. vibratilis (Fr.) Fr. 쓴맛끈적버섯
C. varicolor (Pers. ex Fr.) Fr. 다색끈적버섯
C. alboviolaceus (Pers.: Fr) Fr. 흰보라끈적버섯
C. violaceus (L.: Fr) Fr. 보라끈적버섯
Rozites caperata (Pers. ex Fr.) Karst. 노란띠버섯
Descolea flavannulate (L. Vass). Horak 노란털돌버섯

Bolbitaceae 소똥버섯과
Agrocybe praecox (Pers ex Fr.) Fayod 벗길버섯
A. semiorbicularis (Bull.) Fayod 황토벗길버섯
Conocybe lactea (J. Lange) Metrod 노란종버섯

Coprinaceae 먹물버섯과
Coprinus atramentarius (Bull. ex Fr.) Fr. 두염먹물버섯
C. disseminatus (Pers. ex Fr.) S.F. Gray 꼬갈먹물버섯
C. lagopus (Fr.) Fr. 소녀먹물버섯
C. micaceus (Bull. ex Fr.) Fr. 갈색먹물버섯
C. radians (Desm. ex Fr.) Fr. 노랑먹물버섯
Psathyrella candollians (Fr. ex Fr.) Maire 족재비눈물버섯
P. hydrophila (Bull.) Maire 다람쥐눈물버섯
Panaeous sphinctrinus (Fr.) Qu'el. 좁말똥버섯

Boletaceae 그물버섯과
Boletinus cavipes (Opat.) Kalchbr. 황금그물버섯
B. paluster (Peck) Peck 방망이황금그물버섯
Boletus edulis Fr. 그물버섯
B. griseus Frost 검정그물버섯
B. pseudocalopus Hongo 산속그물버섯아재비
B. fraternus Peck 붉은그물버섯

Gymnopilus liquiritiae (Pers. ex Fr.) Karst.

Suillus aeruginascens (Secr.) Snell
 녹색은그물버섯
S. grevillei (Klotz.) Sing. 큰비단그물버섯
S. pictus (Peck) Smith et Thiers
 증황금비단그물버섯
S. placidus (Bon) Sing. 평원비단그물버섯
Leccinum rufum (Schaeff.) Kreis
 등색겉껍이그물버섯
L. scabrum (Fr.) S.F. Gray 거친겉껍이그물버섯
Tylopilus alboater (Peck) Sing. 옹단쓴맛그물버섯
Xerocomus subtomentosus (Fr.) Qu'el. 산그물버섯

Russulaceae

무당버섯과

Russula aeruginea (Lindbl. apud) Fr.
 구릿빛무당버섯
R. alboareolata Hongo
 흰둘레무당버섯
R. albonigra (Krombh.) Fr.
 박하무당버섯
R. amoena Qu'el.
 가지무당버섯
R. atropurpurea (Krombh.) Britz.
 참무당버섯
R. aurata (With) Fr.
 금무당버섯
R. bella Hongo
 수원무당버섯
R. cyanoxantha (Secr.) Fr.
 청머루무당버섯
R. densifolia (Secr.) Gill.
 애기무당버섯
R. emetica (Fr.) S. F. Gray
 냄새무당버섯
R. flavida Frost et Peck
 노랑무당버섯
R. foetens (Fr.) Fr.
 깔대기무당버섯
R. fragilis (Pers. ex Fr.) Fr.
 홍색애기무당버섯
R. lauroceraci Melzer
 밀짚색무당버섯
R. lepida Fr.
 줄각무당버섯
R. lilacea Qy'el.
 연보라무당버섯
R. nigricans (Bull.) Fr.
 절구버섯
R. ochroleuca (Secr.) Fr.
 쪼개무당버섯
R. olivaceae (Schaeff.) Fr.
 혈색줄기무당버섯
R. pectinata (St. Amans) Fr.
 달팽이무당버섯
R. pseudodelica Lange
 흰무당버섯아재비
R. sanguinea Fr.
 혈색무당버섯
R. senecis Imai
 흙무당버섯
R. vesca Fr.
 조각무당버섯
R. violeipes Qu'el.
 자주빛무당버섯
R. xerampelina (Secr.) Fr.
 포도무당버섯
Lactarius campholatus (Fr.) Fr.
 민맛젖버섯
L. chrysorrheus Fr.
 노란젖버섯
L. gerardii var. *gerardii* Smith & Thiers
 주름검은젖버섯
L. laeticolorus (Imai) Imaz.
 붉은 젖버섯
L. lignyotus Fr.
 잣빛햇대젖버섯

L. lignyotus var. *marginatus* Smith & Thiers
 보라빛햇대젖버섯
L. piperatus (Fr.) S. F. Gray
 굴털이
L. pyrogalus (Fr.) Fr.
 제브라젖버섯
L. subdulcis (Fr.) S.F. Gray
 광릉젖버섯
L. torminosus (Fr.) S.F. Gray
 큰붉은젖버섯
L. vellereus var. *vellereus* Smith & Thiers
 흰털젖버섯아재비
L. violascens (Ott.:Fr.) Fr.
 잣빛젖버섯
L. uvidus var. *uvidus* Smith & Thiers
 물젖버섯아재비
L. zonarius (Fr.:Neuh.) var. *zonarius* Hesler & Smith
 당귀젖버섯아재비
L. circellatus var. *circellatus*
 작은테젖버섯아재비
L. controversus (Fr.) Fr.
 싹젖버섯
L. cilicioides (Fr.) Fr.
 염소털젖버섯

Paxillaceae

우단버섯과

Paxillus involutus (Batsch ex Fr.) Fr.
 주름우단버섯
P. panuoides (Fr. ex Fr.) Fr.
 은행잎우단버섯
P. curtisii Ber. in Berk. et Curt.
 꽃잎우단버섯

Aphylophorales

민주름버섯목

Ramariaceae

짜리버섯과

Ramaria apiculata (Fr.) Donk
 바늘짜리버섯
R. aurea (Schaeff. ex Fr.) Qu'el.
 황금짜리버섯
R. flaccida (Fr.) Ricken
 다박짜리버섯
R. formosa (Fr.) Qu'el.
 붉은짜리버섯
Multiclavula mucida (Fr.) Petersen
 끈적땀아버섯

Clavariaceae

국수버섯과

Ramariopsis kunzei (Fr.) Donk
 쇠뜨기버섯
Clavaria purpurea Mull. ex Fr.
 자주국수버섯
C. vermicularis Fr.
 국수버섯
Clavicornona pyxidata (Fr.) Doty
 줄나무짜리버섯

Clavariadelphaceae

방망이짜리버섯과

Clavariadelphus pistillaris (Fr.) Donk
 방망이짜리버섯

Clavulinaceae

창짜리버섯과

Clavulinopsis fusiformis (Fr.) Corner
 노란창짜리버섯
C. helvola (Fr.) Corner
 종창짜리버섯

<i>C. miyabeana</i> S. Ito	붉은창싸리버섯	<i>Meruliaceae</i>	아교버섯과
Cantharellaceae	피꼬리버섯과	<i>Stereopsis burtiannum</i> (Peck) Reid.	꽃자개버섯
<i>Cantharellus cibarius</i> Fr.	피꼬리버섯	Ganodermataceae	불로초과
<i>C. fraiesii</i> Qu'el.	호박피꼬리버섯	<i>Ganoderma lucidum</i> (Leyss. ex Fr.) Karst.	불로초
<i>C. minor</i> Pk.	애기피꼬리버섯	Polyporaceae	구멍장이버섯과
Thelephoraceae	굴뚝버섯과	<i>Merurius tremellosus</i> Fr.	아교버섯
<i>Thelephora multiparita</i> Fr.	많은가지사마귀버섯	<i>Coriarius consors</i> (Berk.) Imaz.	송곳니구름버섯
<i>T. terrestris</i> Fr.	사마귀버섯	<i>C. hirsutus</i> (Fr.) Qu'el.	흰구름버섯
Stereaceae	꽃구름버섯과	<i>C. versicolor</i> (Fr.) Qu'el.	구름버섯
<i>Stereum hirsutum</i> (Willd ex Fr.) S.F. Gray	꽃구름버섯	<i>Fomes fomentarius</i> (L. ex Fr.) Kickx.	말굽버섯
<i>S. ostrea</i> (Bl. et Nees) Fr.	갈색꽃구름버섯	<i>Lenzites betulina</i> (L. ex Fr.) Fr.	조개껍질버섯
<i>S. spectabile</i> Klozsch	단풍꽃구름버섯	<i>Daedalea dickinsii</i> (Berk. ex Cooke) Yasuda	등갈색미로버섯
Sparassiaceae	꽃송이버섯과	<i>Trametes pubescens</i> (Schum ex Fr.) Pil.	흰용털구름버섯
<i>Sparasis crispa</i> Wolf. ex Fr.	꽃송이버섯	<i>T. suaveolens</i> (L. ex Fr.) Fr.	송편버섯
Corticiaceae	고약버섯과	<i>Pycnoporus cinnabarinus</i> (Jacq. ex Fr.) Karst.	주걱간버섯
<i>Corticium chrysocreas</i> Berk. et Curt.	황금고약버섯	<i>P. coccineus</i> (Fr.) Bond et Sing.	간버섯
<i>Pulcherricium caetuleum</i> (St. Amans) Parmasto	청자색모피버섯	<i>Fomitopsis afficinarius</i> (Fr.) Bond. et Sing.	말굽잔나미버섯
Climacodontaceae	수염버섯과	<i>F. insularis</i> (Murr.) Imaz.	벽돌빛잔나미버섯
<i>Climacodon septentrionalis</i> (Fr.) Karst.	수염버섯	<i>F. nigra</i> (Berk.) Imaz.	검은잔나미버섯
Schizophyllaceae	치마버섯과	<i>F. pinicola</i> (Fr.) Karst.	소나무잔나미버섯
<i>Schizophyllum commune</i> Fr.	치마버섯	<i>F. rhodophaeus</i> (Lev.) Imaz.	넓적잔나미버섯
Hydnaceae	턱수염버섯과	<i>Favolus alveolarius</i> Qu'el.	벌집버섯
<i>Sarcodon aspratus</i> (Berk.) S. Ito	능이	<i>F. arcularius</i> (Fr.) Amas.	줄벌집버섯
<i>Hydnellum aurantiacum</i> (Batsch.: Fr.) Karst.	황갈색갈대기버섯	<i>Daedaleopsis confragosa</i> (Bolt. ex Fr.) Schroet	도장버섯
<i>H. conrescens</i> (Pers.:Schw.) Banker	고리갈색갈대기버섯	<i>D. styrcina</i> (P. Henn.) Imaz.	매죽도장버섯
<i>Phellodon melaleucus</i> (Fr.:Fr.) Karst	살팽이버섯	<i>D. tricolor</i> (Fr.) Bond. et Sing.	삼색도장버섯
<i>Hydnum repandum</i> L. ex Fr.	턱수염버섯	<i>Piptoporus beturina</i> (Bull. ex Fr.) Karst.	자작나무버섯
<i>H. repandum var. album</i> Qu'el.	흰턱수염버섯	<i>Laetiporus sulphurerus</i> (Fr.) Bond. et Sing.	덕다리버섯
<i>Basidioradulum malare</i> (Fr.) Furukawa	큰이빨버섯	<i>L. sulphurerus var. miniatus</i> (Jungh) Imaz.	붉은덕다리버섯
<i>Steccherinum ochraceum</i> (Pers. ex Fr.) S.F. Gray	바늘버섯	<i>Polyporus brumalis</i> (Fr.) Karst.	겨울우산버섯
<i>Hericeum erinacium</i> (Bull. ex Fr.) Pers.	노루궁뎅이	<i>P. picipes</i> (Fr.) Karst.	검정대겨울우산버섯
		<i>P. elegans</i> (GFr.) Karst.	노란대겨울우산버섯
		<i>Hirschioporus abietinus</i> (Fr.) Donk	옷술버섯
		<i>H. fusco-violaceus</i> (Fr.) Donk	기와옷술버섯
		<i>Microporus affinis</i> (Blume et Nees ex Fr.) Fr.	

	매꽃버섯부치	<i>Dacrymyces palmatus</i> (Schw.) Brut.	손바닥붉은목이
<i>Tyromyces borearis</i> (Fr.) Imaz	물렁개떡버섯		
<i>T. sambuceus</i> (Lloyd) Imaz.	멍이주개떡버섯	Gasteromycetes	복균강
<i>Elfvigia applanata</i> (Pers.) Karst.	잔나비겉상		
<i>Irpex lacteus</i> (Fr. ex Fr.) Fr.	기계층버섯	Lycoperdales	말불버섯목
<i>Bjerkandera adusta</i> (Fr.) Karst.	줄버섯		
<i>Gloeophyllum abietinum</i> (Fr. ex) Fr.	전나무조개버섯	Lycoperdaceae	말불버섯과
		<i>Lycoperdon mammaeforme</i> Pers. ex Pers.	비늘말불버섯
Hymenochaetaceae	소나무비늘버섯과	<i>L. pedicellatum</i> Peck	진꼬리말불버섯
<i>H. yasudai</i> Imaz	무늬소나무비늘버섯	<i>L. perlatum</i> Pers.	말불버섯
<i>Coltricia cinnamomea</i> (Jacq. ex Fr.) Murr.	톱니겨우살이버섯	<i>L. pyriforme</i> Schaëff. ex Pers.	좀말불버섯
<i>C. perennis</i> (L. ex Fr.) Murr.	겨우살이버섯	<i>Lanopila nipponica</i> (Kaw.) Y. Kobay.	땡구알버섯
<i>Phaeolus schweinitzii</i> (Fr.) Pat.	해면버섯		
<i>Cyclomyces fuscus</i> Kunze	고리버섯	Tulostomatales	연지버섯목
Pjellinaceae	진흙버섯과	Galostomataceae	연지버섯과
<i>Phellinus igniarius</i> (L. ex Fr.) Qu'el.	말뚝진흙버섯	<i>Calostoma japonicum</i> P. Henn.	연지버섯
<i>P. robustus</i> (Korst.) Bourd. et Galz.	찰진흙버섯		
		Astraeaceae	먼지버섯과
Heterobasidomycetes	이형담지자균아강	<i>Astraeus hygrometricus</i> (Pers.) Morg.	먼지버섯
Tremellales	흰목이목	Geastraceae	방귀버섯과
		<i>Geastrum sessile</i> (Sow.) Pouz.	테두리방귀버섯
Tremellaceae	흰목이과		
<i>Tremella foliacea</i> Fr.	꽃흰목이	Phallales	말뚝버섯목
<i>T. fuciformis</i> Berk.	흰목이		
<i>T. globospora</i> Reid	방울백목이	Phallaceae	말뚝버섯과
<i>Exidia wa-passa</i> Lloyd	아교좀목이	<i>Phallus rugulosus</i> (Fisch.) O. Kuntze	붉은말뚝버섯
<i>Phlogiotis helvelloides</i> (Fr.) Martin	장미주걱목이	<i>Mutinus bambusinus</i> (Zell.) Fisch.	끝검은뱀버섯
<i>Pseudohydnum gelatinosum</i> (Scop. ex Fr.) Karst.	헛바늘목이		
		Clathraceae	바구니버섯과
Auriculariales	목이목	<i>Lysurus mokusin</i> (L. ex Pers) Fr.	새주둥이버섯
Auriculariaceae	목이과	Nidulariles	찾잔버섯목
<i>Auricularia auricula-judae</i> (Bull. ex St. Am.) Berk.	목이		
		Nidulariaceae	찾잔버섯과
Dacrymycetales	붉은목이목	<i>Cyathus stercoreus</i> (Schw.) De Toni	좁주름찾잔버섯
		<i>C. striatus</i> (Huds.) Wied.	주름찾잔버섯
Dacrymycetaceae	붉은목이과		
<i>Calocera cornea</i> (Batsch ex Fr.) Fr.	아교뿔버섯	Ascomycotina	자낭균이목
<i>C. viscosa</i> (Pers. ex Fr.) Fr.	등황색끈적싸리버섯		
		Discomycetes	반균강
		Pezizales	주발버섯목

Helvellaceae	안장버섯과
<i>Helvella crispa</i> Fr.	주름안장버섯
<i>H. lacunosa</i> Afz. ex Fr.	안장버섯
<i>Leptopodia elastica</i> (St. Amans) Boud.	긴대안장버섯
<i>Gyromitra esculenta</i> (Pers.) Fr.	마귀곰보버섯
Peziziaceae	주발버섯과
<i>Peziza badia</i> Pers. ex Merat	자주주발버섯
<i>P. badoconfusa</i> Korf	고려주발버섯
<i>P. repanda</i> Pers.	넓은주발버섯
<i>P. vesiculosa</i> Bull. ex St. Amans	주발버섯
Sarcosomataceae	털고무버섯과
<i>Galiella celebica</i> (P. Henn.) Nannf.	갈색털고무버섯
Pyromenataceae	접시버섯과
<i>Scutellinia scutellata</i> (L. ex St. Amans) Lamb	접시버섯
<i>Trichophaea gregaria</i> (Rehm) Boud.	무리털종지버섯
<i>Otidea alutacea</i> (Pers.) Masee	주머니째진귀버섯
Helotiales	고무버섯목
Geoglossaceae	콩나물고무버섯과
<i>Trichoglossum walteri</i> (Berk.) Dur.	알트마귀순갈버섯
<i>Microglossum viride</i> (Pers. ex Fr.) Gill.	녹색좁콩나물버섯
<i>Spathularia clavata</i> Pers. ex Fr.	넓적콩나물버섯
<i>S. flavida</i> Pers. ex Fr.	황금넓적콩나물버섯
<i>Leotia lubrica</i> Pers.	콩두건버섯
<i>Cudonia circinans</i> (Pers.) Fr.	투구버섯
Sclerotiniaceae	균핵버섯과
<i>Bisporella citrina</i> (Batsch ex Fr.) Korf et Carpenter	황색황고무버섯
Dermateaceae	살갓버섯과
<i>Chlorosplenium aeruginosum</i> (Gray) De Not.	녹청균
Pyrenomycetes	핵균강
Sphaeriales	콩버섯과
Hypocreaceae	육좌균과

<i>Hypocrea rufa</i> (Pers. ex Fr.) Fr.	점버섯
Xylariaceae	콩코투리버섯과
<i>Xylaria carpophila</i> (Pers.) Fr.	젓가락콩코투리버섯
<i>X. polymorpha</i> (Pers. ex Mer.) Grev.	다형콩코투리버섯
<i>Daldinia concentrica</i> (Bott. ex Fr.) Ces. et do Not.	콩버섯

摘 要

1991년 7월 28일부터 동년 8월 12일까지 백두산과 송화강의 유역 및 그 부근에서 고등균류 420여종을 채집하여 동정한 결과 2아문, 4강, 2아강, 12목, 51과, 141속, 336종을 확인하였다. 우점종은 깔대기버섯, 배불뚝이깔대기버섯, 참낭피버섯, 무명버섯, 붉은벚꽃버섯, 청머루무당버섯, 냄새무당버섯, 잣빛햇대젓버섯, 큰붉은젓버섯, 말뚝진흙버섯이다. 한국에 처음 보고되는 종은 *Amanita muscaria* var. *regaris*(광대버섯아재비), *Volvariella speciosa* var. *speciosa*(예쁜털버섯아재비), *Cortinarius alboviolaceus*(흰보라끝적버섯), *C. violaceus*(보라끈적버섯), *Inocybe gri-seolilacina*(회보라땀버섯), *I. hirtella* var. *hirtella*(센털땀버섯아재비), *Boletinus paluster*(방망이황금그물버섯), *Crepidotus badiifloccosus*(노랑털귀버섯), *Lactarius circellatus* var. *circellatus*(작은테젓버섯아재비), *L. controversus*(쌈젓버섯), *I. cilicioides*(염소털젓버섯)이다.

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Accepted for Publication on February 26, 1992

삼가고인의 명복을 빕니다

박성식 이사님은 1992년 2월 1일에 불의의 사고로 유명을 달리하셨습니다. 이에 본 학회는 삼가고인의 명복을 빕니다.

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학위논문 : 무학상 일대의 고등균류

기 타 : 무학상 일대의 고등균류 2편

지리산 일대의 고등균류 5편

한국산 의대 버섯속의 기록 4편

백두산의 고등균류 상에 관한 연구 1편