

## Notes on the genus *Entoloma* of Korea (V)

Duck-Hyun Cho and Young-Bo Lee\*

Department of Biology, Chonju Woosuk University, Chonju 565-800

\*Department of Biology, College of Education, Chonsun University,  
Kwangju 501-759, Republic of Korea.

## 韓國產 외대버섯 屬의 記錄 (V)

趙德炫 · 李龍保\*

全州又石大學校 生物學科

\*朝鮮大學校 師範大學 生物教育學科

**ABSTRACT:** Eight species of genus *Entoloma* were collected from the areas of Mt. Naejang National park, Mt. Jiri National park, Mt. Manduck and Mt. Balwang and newly recorded in Korea: *Entoloma fuscodiscum*, *E. incanum*, *E. fracturans*, *E. lignoputridum*, *E. nigroviolaceum* var. *striatulum*, *E. grayanum* (Pk.) Sacc. var. *grayanum*, *E. maleoens* and *E. pungens*.

**KEYWORDS:** *Entoloma fuscodiscum*, *E. incanum*, *E. fracturans*, *E. lignoputridum*, *E. nigroviolaceum* var. *striatulum*, *E. grayanum* (Pk.) Sacc. var. *grayanum*, *E. maleoens*, *E. pungens*.

*Entoloma fuscodiscum* Hesler 겹땀이외대버섯(신청)

Hesler. *Beih Nova Hedwigia* 23: 100 (1967).

*E. alachuanum* Murr., *Mycologia* 33: 443 (1941)

Pileus 1.3-2.5 cm broad, hemiglobose, convex to expanded, slightly plane, papillate at the center, then umbrinous with fuliginous umbo, cespitose grayish brown, umbo deep grayish brown, darker, dull grayish white when dry, hygrophanous, margin striate, translucent striate when wet, uneven. Context thin, whitish gray, whitish or pallid. Odor slightly farinaceous or absent, taste slightly bitter or indistinctive, rarely strongly farinaceous. Lamellae 2.0-3.0 mm wide, sinuate or adnate with decurrent teeth, at first then finally dull pinkish, subdistant, edges uneven, slightly undulate, concolorous. Stipe 3.0-5.0 cm long, 1.0-2.0 mm thick, equal, cylindrical, often thick at apex, smooth, glabrous, shining, concolorous with the pileus when wet, whitish gray when dry, rarely fine mealy at

apex, hollow, whitish gray.

Spores 8.0-10.0×7.0-8.0 μm, mostly with 5 angles in side view, rarely with 6 angles, isodiametric, angles obtuse, subglobose, often with one oil drop, basidia 30-32.5×11.3-12.5 μm, 4-spored, subhymenium distinctive or rarely indistinctive, hyphae from gill trama 6.3-12.5 μm broad, subparallel, hyphae from stipe trama 70-120×8.8-12.5 μm, filamentous, with inconspicuous clamp connections in stipe, cheilocystidia and pleurocystidia absent, pileipellis and pileus trama 142.5-162.5×10-18.8 μm, cylindrical, inflated, often filamentous narrow than inflated with ecchinate.

**Habitat:** Solitary or clustered and cespitose on soils with stones under deciduous forests. Summer. Edibility unknown.

**Specimens studied:** CHO-2128 collected from areas between Naejang-Sa and Wonjok-Am on 6th of July, 1991.

**Discussions:** The Characteristics of this species are papillate, cespitose and grayish brown pilei. The specific name, *alachuanum*, was used earlier

by Murrill (1941) for *Nolanea alachuana*, but a new name was proposed by Hesler(1967), later.

균모는 소형이고 구형에 가까우며 점차 평평하여 지나 가운데는 젖꼭지 모양이다. 회갈색이다. 가장 자리는 줄무늬가 있고 습기가 있으면 투명하다. 냄새가 있으며 맛은 맵거나 없다. 주름살은 흠파진 또는 바른 주름살, 백색에서 분홍색으로 된다. 버섯의 자루는 비교적 길고 원통형이고 맛있게 반짝이고 균모와 동색이다. 포자는 중형이고 5개의 각이 있고 연낭상체와 측낭상체는 없다. 여름에 낙엽수림 밑에 돌발속에 단생 또는 무리지어 발생한다.

***E. incanum* (Fr.) Hesler 녹색외대버섯(신칭)**

Hesler, *Beih. Nova Hedwigia* 23: 147, figs. 109, 219 (1967). Noordeloos, *Beih. Nova Hedwigia* 91: 250, fig. 84 (1987). *Agaricus incanus* Fr., *Syst. Myc.* 1: 209 (1821). *Leptonia euchlora* (Lash apud Fr.) Kummer, *Die Fuhrer in die Pilzk.* 96 (1871). *Leptonia incana* (Fr.) Gill., *Champ. Fr.* 414 (1876). *Rhodophyllus euchlorus* (Lash) Qu'el. *Enchir. Fung.*, 61 (1886). *Rh. incanus* (Fr.) K. & R., *Flore Anal. des Champ. Super.* 203 (1953).

Pileus 1.2-2.5 cm broad, hemispherical or conical, then expanding, more or less depressed to umbilicate, rarely broadly more or less infundibuliform, light greenish yellow, olivaceous green or lemon yellow, rarely reddish brown with darker center and paler margin, becoming opaque on drying, more or less appressed-fibrillose, finally rimose, strongly viscid when wet. Context thin, yellowish or tinged green. Taste mild or indistinctive, odor slightly or strongly of mice. Lamellae subdistant, broad, adnate or emarginate, white with slightly green tinge at first, then sordid pink, becoming bluish or bluish green when bruised, edges even, concolorous. Stipe 4-6 cm long, 1.5-3 mm thick, equal, cylindrical, yellowish green, vivid green yellow sometimes, turning brownish with age at base, smooth, glabrous. polished or innately fibrillose lengthwise, attaching white myceloid at base, hollow, concolorous with surface.

Spores 9.8-11×6.0-7.0 μm, mostly with 6 angles in side view, rarely with 7-8 angles, elliptical in outline, rarely with one oil drop, cheilocystidia and

pleurocystidia absent, pileipellis and pileus trama 5.0-7.5 μm broad, hyphae from stipe trama 3.8-8.8 μm broad.

**Habitat:** Solitary on soils of road sides within forests, in deciduous woods. Summer. Edibility unknown.

**Distribution:** Mt. Balwang.

**Specimens studied:** CHO-2390 collected from Gemunkuk-Kyo and the village on first of August, 1991.

**Discussion:** This species is easily recognized by greenish yellow color of all fungus body, which become blue green on brusing. Particularly, descriptions about this fungus by Europeans and Americans are different each other in spores. Europeans indicated to be that the spores are longer than in Hesler(8.5-11×7-8 μm, 1967) and in Jacob Lange of British(10.5-13×7-8 μm, 1963), the spores are 10-15 μm long. Also this fungus is characteristically viscid when wet. Orton (1960) lists *Leptonia euchlora* as a synonym of *Leptonia incanum*.

균모는 소형이며 반구형으로 가운데는 약간 들어간 것도 있다. 녹황색이며 섬유상 인편이 있고 갈라지는 것도 있다. 습기가 있을때 끈적기가 있다. 냄새와 맛이 있다. 주름살은 백색에서 분홍색으로 되나 상처를 받으면 청색 또는 녹색으로 변색한다. 버섯의 자루는 원통형 이고 녹황색이며 포자는 중형이고 6개의 각을 가지며 연낭상체와 측낭상체는 없다. 여름에 낙엽수림의 흙에 단생한다.

***E. fracturans* Horak 파열외대버섯(신칭)**

Horak, *Beih. Nova Hedwigia* 65: 223 (1980).

Pileus 3.8-4.3 cm broad, convex to plane with a depression, then becoming applanate to slightly umbilicate at center, yellowish brown, argillaceous to pale brown, fine mealy, disc darkish brown, with darker brown small squamules over the disc, dry, hygrophanous, strongly striate to subsulcate towards margin, center squamulose fibrillose near margin. Context concolorous, smell and taste indistinctive. Lamellae white to whitish pink, close or slightly crowded, adnexed to adnate, ventricose, pale agrillaceous when young, becoming agrilla-

ceous pink with age, edge concolorous, even. Stipe 4.4-5.2 cm long, 3.5-5.0 cm thick, cylindrical, slender, subsulcate at base, fine mealy downwards, honey brown, yellowish brown, villous, base white, covered with whitish, coarse longitudinal fibrils, dry, fistulose, fragile, hollow, concolorous with surface.

Spores 9.2-11.0×6.2-7.2 μm, mostly with 6-7 angles in side view, rarely with 5 angles, elliptical in outline, often with one or three oil drops, basidia 40-42.5×88-10 μm, clavate, 4-spored, hyphae from lamellae trama 67.5-140×11.3-22.5 μm, more or less filamentous, parallel or subparallel, cheilocystidia and pleurocystidia absent, hyphae from stipe trama 30-37.5×11.3-12.5 μm, more or less cylindrical, rarely inflated, pileipellis and hyphae from pileus trama 9-12.5-15 μm, more or less clavate, with brown pigment.

**Habitat:** Solitary on soils in broad-leaves forests. Summer. Edibility unknown.

**Distribution:** Mt. Balwang.

**Specimens studied:** CHO-2381 collected from areas between the village and top of Mt. Balwang on 31th of July, 1991.

**Discussions:** This species can be recognized by its strongly striate margin on the minutely squamulose pileus, the absence of cheilocystidia and pleurocystidia, and encrusting and plasmatic brown pigment on the cuticle.

균모는 소형이고 고깔형에서 배꼽형으로 된다. 황갈색이며 중앙은 흑갈색이다. 미세분말이 있고 가장자리에 뚜렷한 줄무늬가 있다. 주름살은 올린 주름살 또는 바른 주름살이고 간격은 좁고 백색에서 분홍색으로 된다. 버섯의 자루는 짧고 원통형이고 미세분말이 있고 갈색이다. 근부에 응모가 있다. 거친 섬유상 인편이 있다. 포자는 중형이고 6개의 각을 가진다. 연낭상체와 측낭상체는 없고 표피세포에 갈색의 색소를 가지고 있다. 여름에 활엽 수림의 흙에 단생한다.

***E. lignoputridum* Corner et Horak** 고목외대버섯 (신칭)

Corner & Horak, *Beih. Nova Hedwigia* 65: 175 (1980).

Pileus 1.3-1.7 cm broad, broadly convex to broadly umbonate, finally plane with umbo at center, disc minutely slightly squamulose, grayish brown, slightly fuscous when wet, umbo grayish brown, margin uneven, mostly with conspicuous translucent striate when wet, dry, hygrophanous. Context thin, white with pale brown tint. Odor and taste indistinctive. Lamellae knife-shaped, ventricose, more or less broad, slightly free or adnexed, crowded, white at first to whitish gray, finally becoming pinkish, edges even, concolorous. Stipe 2.1-2.7 cm long, 1.0-2.0 mm thick, cylindrical, whitish gray with brown, base rarely swollen, villous at base, whitish at base, fragile, solid to hollow, white.

Spores 8.0-10×4.5-5.5 μm, mostly with 6-7 angles in side view, slightly nodulose, angles blunt, long elliptical in outline, basidia 27.5-31.3×7.5-8.8 μm, clavate, ventricose, cheilocystidia and pleurocystidia absent, pileocystidia 28-50×10-12.5 μm, clavate, ventricose, lamellae trama subparallel.

**Habitat:** Solitary on clustered or decay-wood with mosses. Summer. Edibility unknown.

**Distribution:** Youngmun-Sa (Chonju City suburban).

**Specimens studied:** CHO-1051 collected from areas of Youngmun-Sa in Wanju, Chonrabuk-Do on 25th of July, 1990.

**Discussion:** This species is easily distinguished by its habitat and conspicuously translucent striation on the pileus when wet. Corner and Horak (1980) state that striations on the margin are darker.

균모는 소형이며 처음은 고깔형이나 차차 평평하여지며 중앙은 볼록하다. 가운데는 인편이 있고 회갈색이며 가장자리는 습기가 있을 때 뚜렷하고 투명한 줄무늬가 있다. 주름살은 배 볼록이형이고 끝붙은 주름살 또는 올린 주름살이고 밀생하며 백색에서 분홍색으로 된다. 버섯의 자루는 약간 짧고 원통형이고 백회색이며 근부는 부풀고 털이 나있다. 포자는 소형 또는 중형이고 6-7개의 각을 가지며 약간 결절형이다. 연낭상체와 측낭상체는 없다. 여름에 고목의 이끼속에 단생 또는 무리지어 발생한다.

***E. nigroviolaceum* var. *striatulum* Hesler 흑보라줄외대버섯(신칭)**

Hesler, *Beih. Nova Hedwigia* 23: 49 (1967).

*L. parva* var. *macrospora* Largent forma *striatula* (Hesl.) Largent, Genus *L.* Pac. Coast United States, p.189 (1977).

Pileus 1.2-2.0 cm broad, hemi-convex, expanding-convex, finally umbilicate, hygrophanous, blue, dark bluish with drab color at first, somewhat paler at maturity, fine mealy, minutely scaly throughout but finally only on disc, innately fibrillose, atomate, margin striate to disc. Context pale, bluish gray when dry, daker bluish when wet, thin. Odor none, taste fungoid. Lamellae white to pinkish, subsinuate, finally with a flesh tint, close, rather broad, edges even, concolorous. Stipe 3.0-4.5 cm long, 1.5-2.0 mm thick, cylindrical, equal, at first neutral gray, finally paler or light neutral gray, base white-myceloid, apex slightly white-purpurose, elsewhere glabrous, hollow.

Spores 9-11×7-8 μm, mostly with 5-6 angles in side view, subglobose in outline, angles obtuse, basidia 4 spored, clavate 27.5-35×7.5-8.8 μm, cheilocystidia and pleurocystidia absent, hyphae from stipe trama 11.3-25×2.5-5.0 μm, filamentous, pilocystidia 50-66.3×15-22.5 μm, clavate, fusoid, rosette-shaped, caulocystidia 100-127.5×25-30 μm, clavate.

**Habitat:** Scattered on soil of road sides of forests. Summer. Edibility unknown.

**Distribution:** Mt. Balwang.

**Specimens studied:** CHO-2392 collected from areas between Gemunkuk-Kyo and Mt. Balwang's South side on first of August, 1991.

**Discussion:** This variety has several characters which are close to *E. nigroviolaceum* var. *nigroviolaceum*, it differs, however, in its distinct striation to the disc, slightly thinner pileus context, slightly more slender stipe, its darker lamellae and its habitat.

균모는 소형이고 고깔형이나 결국 배꼽형으로 된다. 청색이며 미세분말이 분포한다. 줄무늬가 가장자리에서 중앙까지 있다. 주름살은 약간 흠파진 주름살, 분홍색이고 간격은 보통이다. 버섯의 자루는

길고 회색이며 윗쪽에 하얀 분말이 있다. 포자는 중형이고 5-6개의 각을 가지며 연낭상체와 측낭상체는 없다. 여름에 흙에 산생하며 유사종으로 *E. nigroviolaceum* var. *nigroviolaceum* (흑자색외대버섯아재비)이 있으나 줄무늬에서 차이가 있다.

***E. grayanum* (Pk.) Sacc. var. *grayanum* Hesler 회색외대버섯아재비(신칭)**

Hesler, *Beih. Nova Hedwigia* 23: 69, fig. 192 (1967). Sacc. *Syll. Fung.* 5: 698 (1887). *Agaricus grayanus* Pk., *N. Y. State Mus. Ann. Rept* 24: 64 (1872). *Rh. grayanus* (Pk.) Sing., *Lilloa* 22: 617 (1951).

Pileus 3.0-5.0 cm broad, hemiglobose to broadly convex at first or slightly broadly umbonate at times, glabrous, shining, grayish brown with white or deep grayish brown with dark, hygrophanous, margin not striate, even. Context white, thick, sponge-form. Odor farinaceous, taste slightly mild. Lamellae 4.0-5.0 mm wide, white or whitish gray to pinkish, finally pallid pinkish with age, knife-shaped, broad-inwards, crowded, slightly close, edges undulate, concolorous. Stipe 5.5-8.0 cm long, 7.0-10 mm thick, white or pallid white, slightly twisted, white fibrillose, apex white mealy, equal, slightly tapering downward, base swollen, solid to stuffed at first, finally hollow, white.

Spores 9.0-11×6.0-7.0 μm, mostly with 6 angles in side view, rarely with 5 angles, elliptical or subglobose in outline, angles not sharp, basidia 35-47×11.3-13.8 μm, clavate, 4-spored, cheilocystidia and pleurocystidia absent, hyphae from lamellae trama 47.5-77.5×6.3-11.3 μm, slightly cylindrical, parallel or subparallel, hyphae from stipe trama 5.0-10 μm broad, filamentous, clamp connection present in stipe, pileipellis and pileus trama 45-65×10-13.8 μm, cylindrical, terminal cell acurtic.

**Habitat:** Clustered or caespitose on soils or fallen-leaves of fir and pine trees. Autumn. Edibility unknown.

**Distribution:** Mt. Manduck.

**Specimens studied:** CHO-1038 collected from areas around Gomti-Jae of Mt. Manduck on 7th of October, 1990.

**Discussions:** Hesler states that habitat of this

species is on soils of deciduous woods, but writers collected them from needle forests. Peck (1872) states that pileus is dull watery yellow when wet, whitish when dry.

균모는 비교적 소형, 둥근형에서 점차 평평하여진다. 흡수성이며 백회색 또는 회색이다. 주름살은 올린주름살 또는 바른주름살이며 가장자리는 물결형이다. 백색에서 분홍색으로 된다. 버섯의 자루는 비교적 짧고 약간 비틀리고 백색 또는 회백색이다. 윗쪽에 미세분말이 있고 근부는 부풀어 있다. 포자는 중형이고 6개의 각을 가지며, 연낭상체와 측낭상체는 없다. 여름에서 가을에 걸쳐 침엽수림의 낙엽속에 군생 또는 속생한다.

***E. maleolens* Horak 큰렌즈외대버섯(신칭)**

Horak, *Beih. Nova Hedwigia* 65: 70 (1980).

Pileus 1.4-4.0 cm broad, truncately convex to broadly campanulate with an umbilicus, white to slightly whitish with a yellow tint, changing to pale ochraceous, pink, disc brown, slightly concave and tint in age, minutely fibrillose to glabrous, margin distinctively striate, hygrophanous, dry. Context white, smell spermatic or farinaceous. Lamellae white to whitish pink, close, slightly crowded, emarginate and subdecurrent with short teeth, white, turning pink, edge concolorous, even. Stipe 2.5-5.3 cm long, 1.0-2.0 mm thick, equal, cylindrical, white, easily fragile, fistulose, glabrous, often with villose base.

Spores 9.9-11.6×6.0-6.9 μm, mostly with 6-7 angles in side view, elliptical in outline, rarely with one oil drop, basidia 25-27.5×8.0-10 μm, clavate, hyphae from lamellae trama 22.5-27.5×15-16.3 (Fig. 7-C, upper) or 87.5-112.5×10-15 μm, cylindrical or terminal, more or less acute, cheilocystidia and pleurocystidia absent, hyphae from stipe trama 41.3-72.5×10-11.3 μm, long clavate, rarely filamentous.

**Habitat:** Clustered or gregarious on soils. Summer. Edibility unknown.

**Specimens studied:** CHO-2379 collected from the village and top of Mt. Balwang's south side on 3th of July, 1991.

**Discussion:** Characteristics of these fungi are

the spermatic odor, the whitish fragile carpophores and the lack of clamp connection. Horak states that cheilocystidia are absent or inconspicuously clavate. The authors don't find them in spite of several detections.

균모는 소형이고 배꼽형을 가진 고깔형 또는 종의 모양이며 부서지기 쉽다. 백색에서 황토색이나 가운데는 갈색이다. 처음은 미세섬유가 있으나 차차 밋밋하여진다. 가장자리는 뚜렷한 줄무늬가 있다. 주름살은 백색에서 분홍색으로 된다. 간격은 보통이고 약간 내린 주름살, 버섯의 자루는 짧고 원통형이며 밋밋하고 가끔 털이 나 있는 것도 있다. 포자는 중형이고 6-7개의 각을 가지고 있으며 연낭상체와 측낭상체는 없다. 여름에 흙에 군생 또는 속생한다.

***E. pungens* (Sm. et Hesl.) Courteuisse 가시외대버섯(신칭)**

Courteuisse, *Docum. mycol.* 54: 80 (1984). *L. pungens* Sm. et Hesl. *Elisha Mitchell Sci. Soc. Jour.* 56: 316 (1940). *E. foeitdum* Hesler, *Beih. Nova Hedwigia* 23: 44, fig. 21 (1967).

Pileus 2.3-3.4 cm broad, broadly truncately convex, becoming roughly plane with a slight depression at disc, margin slightly incurved at first, plane in age or then margin arched or wavy slightly, often with a sinus on one side, grayish brown or whitish brown, smoke-gray, fading to tiller buff when moist, minutely fibrillose, rarely glistening. Context thin, watery grayish, easily fragile. Odor resembling that of the crushed back of elderberry, taste similar and very strong. Lamellae subadnate to subdecurrent, whitish gray at first to slightly pinkish, slightly sparse to close, slightly narrow, edges even concolorous. Stipe 3.5-4.0 cm long, 4.0-6.0 mm thick, equal, cylindrical, rarely thick at apex, with terete or compressed base at times slightly enlarged, white to whitish gray, soon whitish, minutely fibrillose at first, finally becoming nearly glabrous, solid to stuffed, finally hollow.

Spores 9.0-11×7.0-8.0 μm, elliptical or subglobose in outline, mostly with 5 angles in side view, often with 6 angles, angles obtuse, cheilocystidia

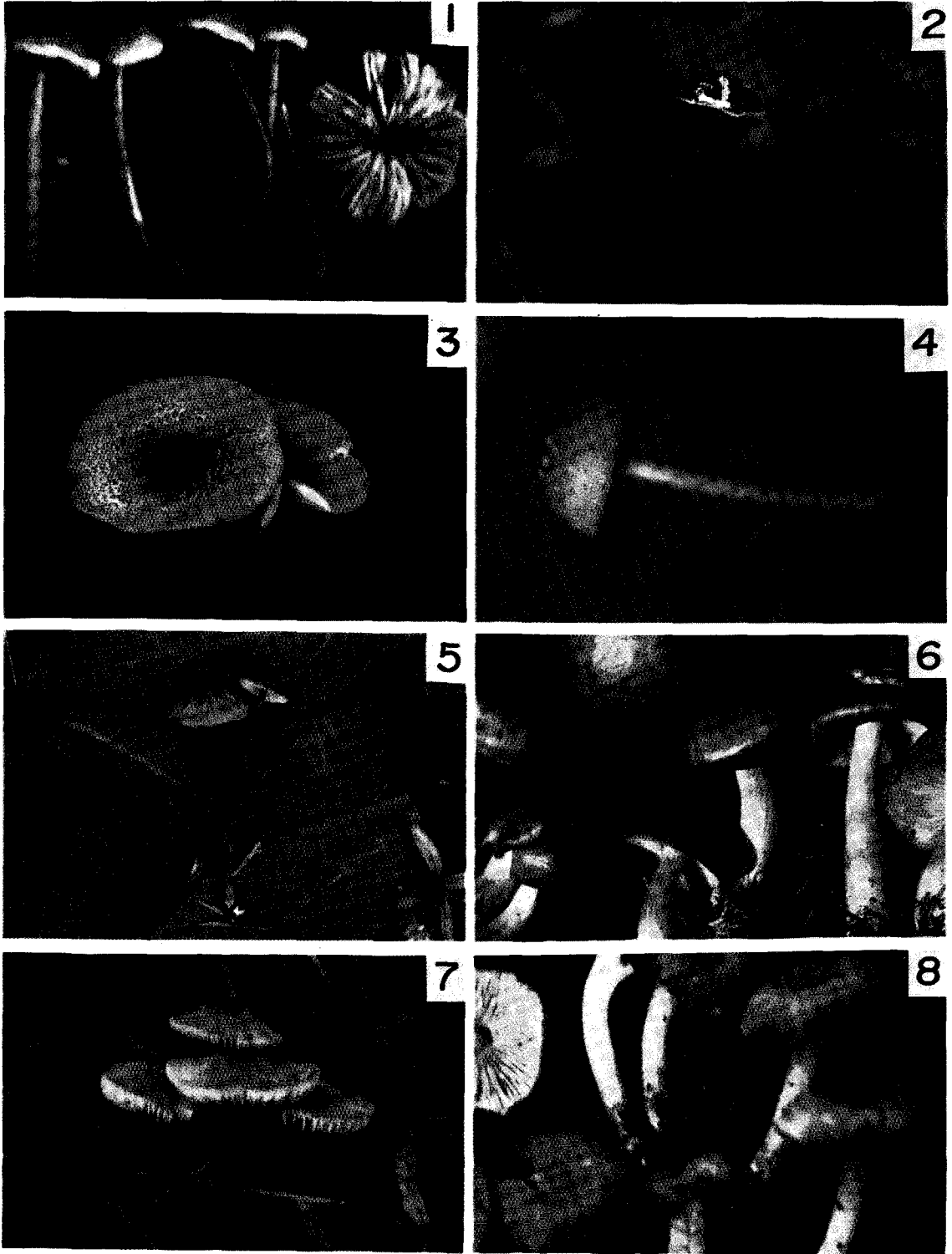
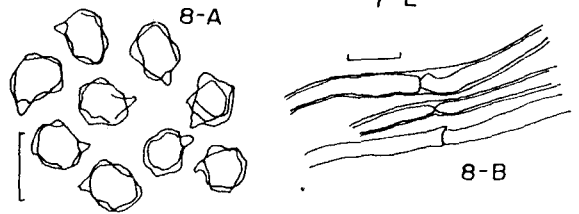
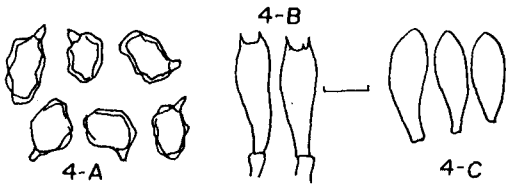
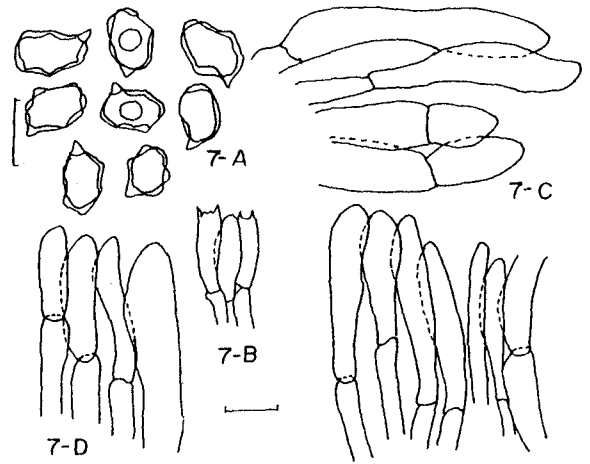
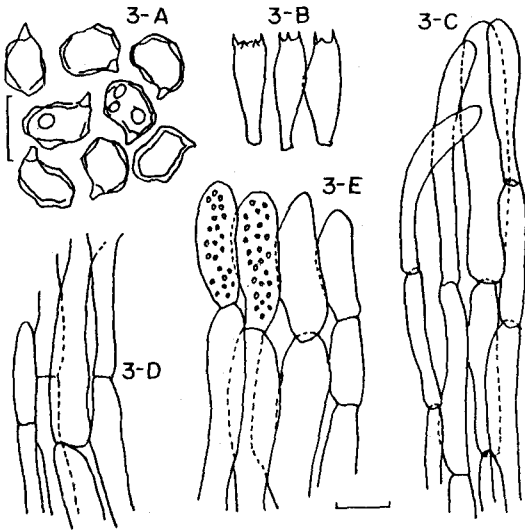
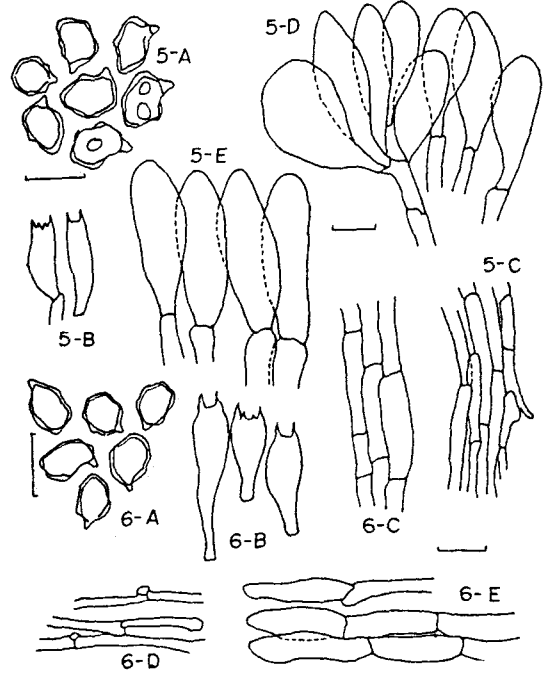
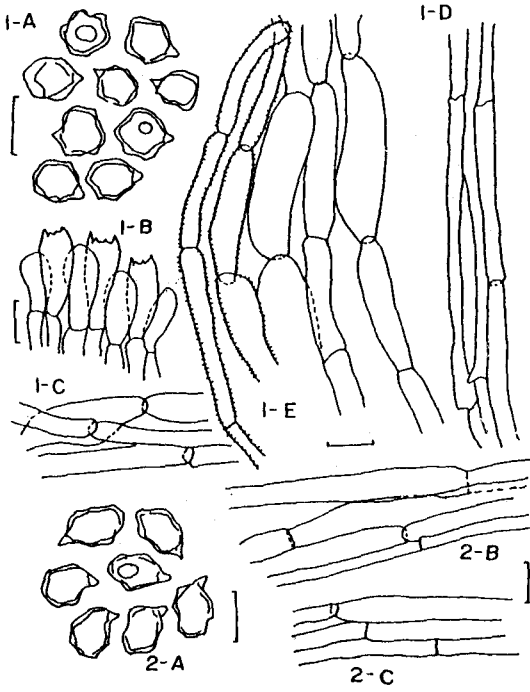


Plate 1.



**Fig. 1-2.** Microscopic features (bar 10  $\mu$ m). 1; *Entoloma fuscodiscum* 1-A, spores. 1-B, basidia. 1-C, hyphae from gill trama. 1-D, hyphae from stem trama. 1-E, pileipellis and cap trama. 2; *E. incanum* 2-A, spores 2-B, pileipellis and cap trama. 2-C, hyphae from stem trama.

**Fig. 3-4.** Microscopic features (bar 10  $\mu$ m). 3; *Entoloma fracturans*. 3-A, spores 3-B, basidia 3-C, hyphae from gill trama 3-D, hyphae from stem trama 3-E, pileipellis and cap trama. 4; *E. lignoputridum*, 4-A, spores. 4-B, basidia 4-C, pilocystidia.

**Fig. 5-6.** Microscopic features (bar 10  $\mu$ m). 5. *Entoloma nigroviolaceum* var. *striatulum* 5-A, spores 5-B, basidia 5-C, hyphae from stem trama 5-D, pileipellis and cap trama 5-E, caulocystidia. 6. *E. grayanum* (Pk.) Sacc. var. *grayanum* 6-A, spores 6-B, basidia, 6-C, hyphae from gill trama 6-D, hyphae from stem trama 6-E, pileipellis and cap trama.

**Fig. 7-8.** Microscopic features (bar 10  $\mu$ m). 7; *Entoloma maleolens* 7-A, spores 7-B, basidia 7-C, hyphae from gill trama 7-D, hyphae from stem trama 7-E, pileipellis and cap trama. 8; *E. pungens* 8-A, spores, 8-B, hyphae from gill trama.

and pleurocystidia absent, hyphae from lamellae trama 3.8-5.0  $\mu$ m broad, cell wall double, subparallel, subhymenium indistinctive, pileus trama radial.

**Habitat:** Clustered on soils with fallen leaves under mixed forests. Summer. Edibility unknown.

**Specimens studied:** CHO-2183 collected from areas along the Whaom-Sa Kegok in Mt. Jiri on 13th of July, 1991.

**Discussion:** This is distinguished from *Eccilia pungens* Murr. which has an avellaneous pileus, an odor of chloride of lime, and lamellae which are white at first. Hesler(1967) observed basidia, pilocystidia and Noodeloos(1988) did basidia, clamp connections from lamellae trama and pileipellis, but the authors did not find them on account of bad specimens.

균모는 소형이고 고갈형에서 점차 평편하여진다. 회갈색 또는 백갈색이며 습기가 있을때 미세섬유상으로 가끔 반짝인다. 주름살은 바른 주름살 내지는 약간 내린 주름살이며 백색에서 밝은 분홍색으로 된다. 간격은 보통이다. 버섯의 자루는 짧고 원통형이나 위가 굵은 것도 있다. 백회색이고 미세섬유의 인편이 있으나 곧 밋밋해진다. 포자는 소형 또는 중형이고 타원형이다. 5개의 각을 가지며 연낭상체와 측낭상체는 없다. 여름에 혼효립의 낙엽속에 무리지어 발생한다.

### Acknowledgements

This paper was supported in part by NON DIRECTED RESEARCH FUND, Korea Research Foundation, 1991.

### 摘 要

1990년 5월부터 1991년 10월까지 국립공원 내장산, 지리산과 전주근교의 용문사와 전라북도 임업시험림이 있는 만덕산, 강원도 평창군의 발왕산에서 다수의 외대 버섯을 채집하였다. 이 외대버섯류를 동정한 결과 한국 미기록종으로 확인된 것은 다음과 같으며 이들에 대하여 한국보통명을 신청하였다. 이것들은 *E. fuscodiscum* (검댕이 외대 버섯), *E. incanum* (녹색외대버섯), *E. fracturans* (파열외대버섯), *E. lignoputridum* (고목외대버섯), *E. nigroviolaceum* var. *striatulum* (흑보라줄외대버섯), *E. grayanum* var. *grayanum* (회색외대버섯아재비), *E. maleolens* (큰렌즈외대버섯) 그리고 *E. pungens* (가시외대버섯)이다.

### Explanations of Plate I

1. *Entoloma fuscodiscum* x 1/2
2. *E. incanum* x 1/2
3. *E. fracturans* x 1/2
4. *E. lignoputridum* x 1
5. *E. nigroviolaceum* var. *striatulum* x 1/2
6. *E. grayanum* (Pk.) Sacc. var. *grayanum* x 1/2
7. *E. maleolens* x 1/2
8. *E. pungens* x 1/2

### References

- Bessette, A. and Sunberg, W. J. 1987. *Mushrooms*, Macmillan Publishing Co. pp 1-170.
- Bon, M. 1987. *The Mushrooms and Toadstools of Britain and North-western Europe*. Hodder and Stoughton. pp 188-195.



- Cetto, B. 1987. Pilze, Band 2, BLV Verlagsgesell  
Schaft: 526-567.
- Cho, D. H. 1992. The Mycoflora of Higher Fungi in  
Mt. Balwang Areas, Korean Associate For Conser-  
vation of Nature 30: in press.
- Cho, D. H. and Lee, J. Y. 1980. Fungal Flora in Bam-  
boo Forests of Korea(II). *Korean Mycol* 8: 29-32.
- Cho, D. H. and Park, S. S. 1990. The Mycofflora of  
Higher in Mt. Kaya National Park, Korean Asso-  
ciate For Conservation of Nature 28: 165-173.
- Cho, D. H. and Park, S. S. 1991. Notes on genus  
*Entoloma* of Korea(I). *Korean Mycol* 19: 11-17.
- Cho, D. H. and Park, S. S. 1991. Notes on genus  
*Entoloma* of Korea(II). *Korean Mycol* 19: 93-100.
- Cho, D. H. 1992. Notes on genus *Entoloma* of Korea  
(IV). *J. Orient Botanic Resource*: in press.
- Cho, D. H. and Park, S. S. 1991. Notes on genus  
*Entoloma* of Korea(III). *Korean Mycol* 19: 241-249.
- Cho, D. H. and Ryoo, C. I. 1991. The Mycoflora of  
Higher Fungi in Mt. Songni, *The Report of the Cor-  
nerp. and Horak E. 1980. Entoloma (Agaricales) in  
Indomalaya and Australasia J. Cramer* 65: 175-177.
- Dennis, R. W. G., Orton, P. D. and Hora, F. B. 1960.  
New Check List of British *Agarics* and *Boleti*, Cam-  
bridge University Press. pp 63-65.
- Hesler, L. R. 1967. *Entoloma* in Southeastern North  
America, *Nova Hedwigia* 23, Verlag von J. Cramer.  
3301 Lehre. p 195.
- Hongo, T. 1960. The Agaricales of Japan 1-2 ( Rhod-  
phyllaceae, Paxillaceae, Gomphidiaceae, Boletaceae  
and Strobilomycetaceae). *Acta Phytotax. Geobot* 18:  
97-112.
- Hongo, T. 1977. Higher Fungi of Bonin Islands I,  
*Mem. Not. Sci.* 10: 31-41.
- Horak, E. 1973. Fungi Agaricini Novazeladiael-V,  
*Nova Hedwigia* 43, Verlag von J. Cramer, pp 1-86.
- Horak, E. 1980. *Entoloma* (Agaricales) in Indomalaya  
and Australasia, *Nova Hedwigia* 65, J. Cramer. FL-  
9490 Vaduz. p 352.
- Imazeki, R. and Hongo, T. 1987. *Colored Illustration  
of Mushrooms of Japan* Vol. I, Hoikusha Publishing  
Co. pp 225-264.
- Ito, S. 1955. *Mycological Flora of Japan* 2: 433-448.
- Korean Society of Mycology. 1978. Suggestion on  
"Standard Korean Names of Mushrooms in Korea",  
*Korean Mycol* 6: 45-55.
- Kornerup, A. and Wanscher, J. H. 1989. *Methuen Ha-  
ndbook of Color*, Methuen.
- Lange, M. and Hora, F. B. 1963. *Mushrooms and Toa-  
dstools*, Collins St. James Places, pp 178-183.
- Largent, D. L. 1977. The Genus *Leptonia* on the Paci-  
fic Coast of the United States, J. Cramer. pp 1-286.
- Lee, J. Y. 1980. *Coloured Korean Mushrooms*, Vol.I,  
Academic Press. pp 57-61.
- Lee, J. Y. and Cho, D. H. 1988. The Mycoflora of  
Higher Fungi in Mt. Wolchul, The Report of the  
KACN 27: 213-219.
- Lee, J. Y., Cho, D. H. and Kim, S. S. 1978. Notes  
on Korea Higher Fungi (IV). *Korean Mycol* 6: 43-  
52.
- Lee, J. Y. and Hong, S. W. 1985. *Illustrated Flora and  
Fauna of Korea*. Ministry of Education, pp 560-570.
- Lee, T. S. 1990. The Full List of Recorded Mush-  
rooms in Korea. *Korean Mycol* 18: 233-259.
- Lee, Y. W. and Lee, D. S. 1957. A List of the Korean  
Fungi Part (I). *Bulletin of Forests Experiment Sta-  
tion*, Seoul, Korea p 24.
- Lincof, G. H. 1981. *The Adubon Society Field Guide  
to North America Mushrooms*, Alfred A. Knof. pp  
642-648.
- Noordeloos, M. E. 1987. *Entoloma* (Agaricales) in Eu-  
rope, *Nova hedwigia* 91, J. Cramer, pp 1-149.
- Noordeloos, M. E. 1987. Flora Agraicina Neelandica,  
A.A. Balkema/Rot- terdam/Brookfield. pp 77-177.
- Noordeloos, M. E. 1988. *type-studied and comments*,  
*Gustav. L. R. Hesler, A. H. Smith and S. J. Mazzer:*  
*Entoloma* in North America, Fischer Verlag, pp 1-  
164.
- Orton, 1960. New Check-list of British agarics and  
boleti. III, *Trans. Brit. Myc. Soc* 43: 159-439.
- Park, S. S. and Cho, D. H. 1988. The Flora of Higher  
Fungi in Mt. Jiri Areas (II). *Korean Mycol* 16: 144-  
150.
- Phillips, R. 1981. *Mushrooms and other Great Britain  
and Europe*, Pam Books. pp 115-118.
- Romagnesi, H. 1941. Les *Rhodophylles* de Mandagas-  
car, R. Rue de Buffon Paris (5). pp 1-164.
- Romagnesi, H. 1978. Les Fondements de la Taxino-  
mie des *Rhodophylles* et Leur. Classification. J. Cra-  
mer. pp1-80.
- Romagnesi, H. 1979. Les *Rhodophylles* des forets co-  
tieres du Gabon et de la Cote d'Ivoire, J. Cramer.  
pp 1-649.
- Singer, R. 1975. *The Agaricales in modern Taxonomy*,  
3rd. ed. Gantner Vdillage, KG. pp 1-912.