

Notes on genus *Entoloma* of Korea (IV)

Duck-Hyun Cho

Department of Biology, Chonju Woosuk University, ChonJu,
565-800 Republic of Korea

韓國產 외대버섯屬의 記錄(IV)

趙 德 炫

全州又石大學校, 生物學科

Abstract

Many species of genus *Entoloma* were collected from areas at Mt. Naejang National Park, Mt. Sunun Provincial Park, Mt. Manduck and adjacent areas. These *Entoloma* were identified. According to the results, *Entoloma subfarinaceum*, *E. viriginicum*, *E. subgriseum*, *E. dolosum*, *E. squamiferum*, *E. intutum*, *E. violaceobrunneum* and *E. sericatum* were new to be Korea. Detail descriptions and Korean descriptions for them were made.

Keywords; *Entoloma subfarinaceum*, *E. virginicum*, *E. subgriseum*, *E. dolosum*, *E. squamiferum*, *E. intutum*, *E. violaceobrunneum* and *E. sericatum*.

History on study of *Entoloma* has been started when Lee and Lee(1957) recorded *Entoloma sinuatum* first in Korea. It was used type genus *Rhodophyllus* recently, Cho and Park(1991) proposed type genus *Entoloma* in stead of *Rhodophyllus* on base of "Standard Korean Names of Mushrooms in Korea" of *Korean Journal of Mycology*(1978).

One species was reported by Lee and Lee(1957), nine species by Lee(1972), one species by Lee, Lee and Lim(1959), three species (one among them was genus *Leptonia*) by Lim and Kim, one species by Lee(1973), one species by Hong and Chung(1976), one species by Lee(1976), four species by Hong and Chung(1977), one species by Lee, Kim and Cho(1978) and one species by Kim, Park and Hong(1978).

Koran Journal of Mycology(1978) rearranged ten species with the basic of published species. One species was reported by Cho and Lee(1980), three species by Hong and Shin(1983), twelve species by Lee and Hong(1985), one species by Park, Cho and Lee(1986), one species by Lee and Cho(1988), nine species by Lee

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(1988) and nine species by Kim and Kim(1990).

Lee(1990) rearranged seventeen species published till now. One species was reported by Cho and Ryoo (1991), twenty-four species by Cho and Park(1991, I, II, III) and two species by Cho(1992).

Many species of *Entoloma* were collected at Mt. Naejang National park Mt. Sunun Provincial Park, Mt. Manduck and adjacent areas and indentified.

According to the results, eight species were newly to be Korea and added to the list of Korean higher fungi.

***E. subfarinaceum* Hesler 가루외대버섯아재비 (신칭)**

Hesler, *Beih. Nova Hedwigia* 23 : 40-41, 1967.

Descriptions: Pileus 2.0-5.5cm broad, convex to slightly truncately convex, umbonate-umbilicate, expanding convex grayish brown, disc darker, scaly on disc, scales flat, uptuning, olive-brown when polished striate to disc from margin, margin uneven. context thin white. Odor slightly mild, taste slightly farinaceous. Lamellae Knife-shaped or ventricose, at first white to pallid pinkish, crowded or slightly close, adnexed or subadnate, broad or medium broad, edges undulate, uneven, concolorous. Stipe 5.0-8.9cm long, 1.5-3.0mm thick, slender, equal, twisted, rarely tapering downward, fragil, grayish brown with blue, or dingy grayish brown white squamulose at apex, elsewhere glabrous, at times compressed, base slightly white, attaching white myceloid, hollow, white.

Spores 9.0-11 × 6.0-8.0 μ m, mostly with 5 angles in side view, rarely with 6 angles, rarely with one or two oil drops, angles obtuse or slightly inconspicuous, isodiametric, slightly ovoid in out line, cheilocystidia and pleurocystidia absent, pileocystidia 112.5-172.5 × 22.5-35 μ m, ventricose, hyphae from gill trama 5.0-10 μ m broad, subparallel.

Habitat: Scattered or clustered on soils with fallen-leaves of mixed forests. Summer. Edibility unknown.

Distributions: Korea(Mt.Naejang National Park) and North America.

Specimens studied: CHO-1032 collected from areas between Naejang-Sa and Wonjok-Am on 3rd of August, 1990.

Discussions: This species is similar to *E.griseum*(not recorded in Korea which has sphaeroid spores, a darker pileus, and different structure of pileipellis. It is slightly suggestive of *Leptonia longistriate* Pk., which has large spores.

***E. virginicum* Hesler 처녀외대버섯(신칭)**

Hesler, *Beih. Nova Hdwigia* 23:52, 1967.

Pleuropus murinus Murr., *North Amer. Flora* 10:106, 1917.

Descriptions: Pileus 4.0-15mm broad, broadly convex to broadly umbilicate or depressed, grayish brown or darkish gray, disc darker, rarely fine scabrous, margin striate to disc, even. Context thin, white. Odor and indistinctive. Lamellae 2.0mm wide, ventricose, at first white to pinkish, more or less crowded, free, edges even, concolorous. Stipe 1.7-2.0cm long, 1.0-1.5mm thick, cylindrical, blue or slightly grayish blue, base whit-

ish, solid, white.

Spores $8.0-11 \times 6.0-7.0 \mu\text{m}$, mostly with 6~7 angles in side view, angles obtuse, slightly nodulose, elliptical in out line, cheilocystidia and pleurocystidia absent, terminal cell $35.1-58.8 \times 10-12.5 \mu\text{m}$, clavate, hyphae from gill trama $6.5-8.0 \mu\text{m}$ broad, subparallel.

Habitat: Clustered on decay woods with mosses of deciduous forsts. Summer. Edibility unknown.

Distributions: Mt. Sunun Provincial Park.

Speciment studies: CHO-1048 collected from areas at sunun-Sa valley on 21th of July, 1990.

Discussions: The distinguished characters of this species are its pileus and stipe color, and its medium spores. Hesler reported that this species is gill short decurrent, but writers didn't find it, elseothers is similar.

***E. subgriseum* Hesler** 잣빛외대버섯(신칭)

Hesler, *Beith. Nova Hedwigia* 23:41. 1967.

Descriptions: Pileus 2.0-4.0cm broad, broadly convex to plane, umbilicate or depressed on disc, hygrophanous, grayish brown with dark, disc darker, paler when dry, drying in radial streaks from the disc outward, glabrous, margin striate to disc. Context thin whitish, fragil. Odor distinctive, taste slightly farinaceous. Lamellae ventricose, adnate or slightly decurrent, broad, whitish, finally pinkish, close or slightly crowded, edges undulate, concolorous. Stipe 5.0-6.0cm long, 2.0-3.0mm thick, cylindrical compressed, whitish gray, apex pallid gray, white silky, fragil, base enlarged-bulbouse, attaching white myceloid.

Spores $8.0-9.0 \times 6.0-7.0 \mu\text{m}$, mostly with 5 angles in side view, isodiametric, ovoid to subglobose in out line, angles inconspicuous, prominent conspicuous, basidia $30-36 \times 8.0-10 \mu\text{m}$, 4-spored cheilocystidia and pleurocystidia absent, hyphae from gill trama subparallel, subhymenium distinctive, pileocystidia $39.5-72.5 \times 10-18.8 \mu\text{m}$, clavate, ventricose.

Habitat: Scattered or cespitose on soils of mixed with deciduous forests. Summer. Edibility unknown.

Distributions: Mt. Naejang National park and North America.

Specimens studied: CHO-1045 collected from areas between Naejang-Sa and Wonjok-Am on 3rd of August, 1990.

Discussions: This species is suggestive of *E. griseum*, which has a darker, entirely scaly pileus and larger spores. Hesler reported that subhymenium was not conspicuous, but writers observed conspicuous.

***E. dolosum* Corner & Horak** 여우외대버섯(신칭)

Corner & Horak, *Beih. Nova Hedwigia* 65:95-96, fig.56, 1980.

Descriptions: Pileus 7.0cm broad, conico-convex to broadly umbonate, reddish or reddish yellow, more deeper color at center, fibrillosescapes reddish brown, more densely on disc, easily rugulose. hygrophanous, margin fine striate, even. Context thin whitish yellow. Odor and taste indistinctive. Lamellae 4.0-5.0mm wide, knife-shaped, narrow in front, broad in behind, adnexed, slightly free, at first white to reddish brown, finally becoming pinkish, subspare, rarely subclose, edges even, concolorous. Stipe 5.5cm long, 0.7cm thick, slightly

twisted, equal, whitish fibrillose—scales, reddish brown, apex purinose, hollow, whitish yellow.

Spores $10-12 \times 6.0-8.0 \mu\text{m}$, mostly with 5–6 angles in side view, rarely with one oil drop, elliptical in outline, basidia $26.3-32.3 \times 9.0-10 \mu\text{m}$ clavate, 4-spored, hyphae from gill trama subparallel, cheilocystidia $30 \times 42 \times 16.3-20 \mu\text{m}$, ellipsoid, ventricose, pleurocystidia $92.5-150 \times$ clavate, ventricose, pileocystidia $70-77.5 \times 21-25 \mu\text{m}$, clavate, ventricose, caulocystidia $77.5-83.8 \times 7.5-17.5 \mu\text{m}$, clavate.

Habitat: Solitary on soils of mixed forests. Summer. Edibility unknown.

Distributions: Korea (Mt. Naejang national park)

Specimens Studies: CHO-1050 collected from areas between naejang—Sa and Wonlok—Am on 20th of July, 1990.

Discussions: Corner & Horak reported that pileus is 1.0–2.0cm broad, this species is larger, It is distinguished by its reddish brown pileus.

***E. squamiferum* Horak**

Horak, *Beih. Nova hedwigia* 43:19–20, fig.8, 1973.

Horak, *Beih. Nova hedwigia* 65:198, pl.15, fig.139, 1980.

Descriptions: Pileus 1.0–2.5cm broad, broadly campanulate, truncately umbilicate, dry, hygrophanous, densely covered by concolorous squamules, striate to disc from margin, reddish brown, disc darkish reddish brown. Context thin, white, lightly brownish. Odor and taste indistinctive. Lamellae 2.0–3.0mm wide, whitish yellow to pinkish, ventricose, edge serrate, not fimbriate, concolorous. Stipe 5.0–9.0cm long, 2.0–4.0mm thick cylindrical, or with flat-shaped, whitish yellow, reddish brown fine purinose at apex, tough, hollow, white.

Spores $9.5-11 \times 9.0-10 \mu\text{m}$ quadrate, mostly 4 angles in side view, rarely with 5 angles, angles not sharp, basidia $37.5-42.5 \times 12.5-15 \mu\text{m}$, clavate, 4-spored, cheilocystidia $70-75 \times 6.3-7.5 \mu\text{m}$, filamentous clavate, acutic at apex, pleurocystidia $27.5-37.5 \times 5.0-7.5 \mu\text{m}$, sorsage-shaped, caulocystidia $75-180 \times 5.0-7.5 \mu\text{m}$, slender sorsage-shaped.

Habitat: Solitary on soils of fallen—leaves in deciduous of *Sasa borealis*.

Distributions: Korea (Mt. Naejang National Park)

Specimens studied: CHO-1047 collected from areas between Naejang—Sa and Wonjok—Am on 20th of July, 1990.

Discussions: The characteristics of this species are truncately umbilicate pileus, serrate lamellae, flat stipe and especially quadrate spores. Horak reported that cheilocystidia and pleurocystidia were fusoid or ampullaceous.

***E. intutum* Corner & Horak 헛외대버섯 (신칭)**

Corner & Horak, *Beih. Nova Hedwigia* 65:292–293, fig. 220, 1980.

Descriptions: Pileus 1.5–3.5cm broad, broadly umbonate to plane, broadly depressed or broadly umbilicate, grayish brown blue, grayish dark scale or minutely mealy, disc darker, dry, hygrophanous, margin even,

fibrillose. Context thin, white with blue. Odor ad taste distinctive. Lamellae 1.5–3.0mm wide, adnate or emarinate–decurrent, white to whitish yellow, becoming pinkish, edges uneven, serrulate, brownish. Stipe 3.0–8.0cm long, 2.0–4.0mm thick, slender, equal rarely flat compressed, whitish with grayish blue, scale fibrillose grayish brown, base white villose, hollow white.

Spores 8.0–10×6.0–7.0 μ m, mostly with 5–6 angles in side view, elliptical in out line, basidia 25–40×8.0–10 μ m, clavate, 4–spored, cheilocystidia 36–80×6.0–8.0 μ m, slightly clavate, hyphae from gill trama subparallel, pileocystidia 65–70×6.5–8.5 μ m, slender clavate.

Habitat: Solitary on soils of *Sasa borealis*. Summer, Edibility unknown.

Distributions: Mt.naejang National Park.

Specimens studied: CHO–1049 collected from areas between Naejang–Sa and Wonjok–Am on 20th of July, 1990.

Discussions: This species is distinguished by its scaly pileus, serrulate lamellae, slender stipe, and medium sized spores.

E. violaceobrunneum Hesler 황보라외대버섯(신칭)

Hesler, *Beih. Nova Hedwigia* 23:51, 1967.

Leptoniella alachuana Murr., *Florida Acad. Sci. Oro.* 7:117, 1945.

Descriptions: Pileus 2.0–3.0cm broad, truncately convex, slightly depressed, brownish blue or violet brown, dry, minutely squamulose, slightly shiny when fresh, margin incurved, undulate, white. Context thin, whitish. Odor and taste absent. Lamellae adnate or subsinuate, white to bluish pink, broad, close, mixed short and long, edges slightly uneven, concolorous. Stipe 4.0–6.3cm long, 3.0–5.0mm thick, bluish violet at apex, paler violet or whitish below, slightly tapering upward, apex furfuraceous.

Spores 9.5–11×6.5–7.0 μ m, mostly with 5–6 angles in side view, angles obtuse, elliptical in out line, cheilocystidia and pleurocystida absent hyphae from gill trama subparallel, subhymenium a narrow zone of small

Habitat: Solitary on soils of *Quercus* ssp. and mixed forests. Summer. Edibility unknown.

Distributions: Korea(Mt.Songni National Park) and North America.

Specimens studied: CHO–1042 collected from areas at Ori–Sup of Mt.Songni National park on 5th of August, 1990.

Discussions: Characteristics of this species is bluish violet pileus, bluish pink, adnate lamellae, bluish violet stipe.

E. sericatum(Britz.) Sacc.

Sacc., *Syll. Fung.* 11:45, 1985.

Agaricus sericatus Britz., *Hymen. Subb.* 9:8, 1987.

Rhodophyllus sericatus(Britz) Romagn., apud Kühner and Romagest, *Flore Anel. Champ. Super.*, 195,

1953.

Hesler, *Beih. Nova Hedwigia* 23:77-78, 1967.

Descriptions: Pileus 3.0cm broad, campanulate or broadly umbonate more or less becoming plane, silky shining, fimbriose, brownish gray with slightly blue, brownish dark, disc darker, rarely cracked or rugolose, margin pallid, slightly striate, uneven, upturning. Context thin, white. Lamellae 2.0-3.5mm wide, adnexed, pallid white to pinkish, ventricose, forked, close edge even or rarely eroded, concolorous. Stipe 5cm long, 5mm thick, white, cylindrical, shining, white fine purinose at base, solid to hollow, white.

Spores 8.0-9.0×5.0-5.5μm, mostly with 6-7 angles in side view, rarely with 8 angles, angles obtuse, elliptical in out line, basidia 4-spored, 22.5-28.5×6.3-7.5μm, clavate, cheilocystidia and pleurocystidia 32.5-37.5×12.5-13.8μm, clavate, caulocystidia 70-85.5×25-35μm, clavate, ventricose.

Habitat: Solitary on soils of *Sasa borealis*. Summer. Edibility unknown.

Distributions: Wipong-Sa valley (Chongju city suburb)

Specimens studies: CHO-1030 collected from areas Wipong-Sa valley on 10th of July, 1990.

Discussions: The distinctive characters include the silky shining Cap and white stipe. The pileus colors vary from dark brown when young and moist to gray-brown when mature, and paler when dry. It has a pronounced farinaceous odor and taste.

적 요

1990년 5월부터 10월까지 내장산 국립공원, 선운산 도립공원 및 만덕산 일대에서 외대버섯들을 다수 채집하였다. 이 외대버섯들을 동정한 결과, 한국미기록종으로 확인된 것은 다음과 같으며 이들에 대하여 한국보통명과 한국어 설명을 첨가하였다.

Entoloma subfarinaceum(가루외대버섯아재비) : 균모(갓)는 소형, 배꼽형, 회갈색, 가루비늘, 가장자리에 줄무늬가 있다. 주름살은 올린주름살 또는 바른주름살, 가장자리는 물결형이다. 자루(대)는 가늘고 비틀리며, 회갈색, 윗쪽은 가루비늘이 분포하나 아래는 밋밋하다. 포자는 중형, 5각형, 연낭상체와 측낭상체는 없다. 여름에 혼효림의 낙엽속의 흙에 산생 또는 균생한다.

E. virginicum(처녀외대버섯) : 균모는 소형, 배꼽형, 회갈색, 가장자리에 줄무늬가 있다. 주름살은 배불뚝형, 간격은 좁고, 끝붙은주름살이다. 자

루는 원통형, 거의 청색이다. 포자는 중형, 대부분 7각형으로 결절형, 연낭상체와 측낭상체는 없다. 여름에 고목의 이끼속에 균생한다.

E. subgriseum(젓빛외대버섯아재비) : 균모는 소형, 배꼽형, 회갈색, 가장자리에 줄무늬가 있다. 주름살은 배불뚝형, 바른주름살, 간격은 보통이다. 자루는 원통형, 백회색, 근부는 부풀어있다. 포자는 약간중형, 5각형, 연낭상체와 측낭상체는 없다. 여름에 낙엽수림의 흙에 산생 또는 속생한다.

E. dolosum(여우외대버섯) : 균모는 중형, 불룩한 모양, 적갈색, 섬유상인편, 찌지고, 가장자리에 줄무늬가 있다. 주름살은 올림주름살이다. 자루는 약간 비틀리고, 섬유상 인편이 있다. 포자는 중형, 5-6각형, 연낭상체와 측낭상체가 있다. 여름에 혼효림의 흙에 단생한다.

E. squamiferum(비늘외대버섯) : 균모는 소형, 배꼽형, 적갈색, 가장자리에 줄무늬가 있다. 주름살은 배불뚝형, 가장자리는 툭니꼴이다. 자루는 막대모양, 황백색, 질기다. 포자는 중형, 4각형, 연낭상

체는 있으나 측낭상체는 없다. 조릿대(일명 신호대)속의 낙엽속에 단생한다.

E. intutum(헛외대버섯) : 균모는 소형, 배꼽형, 회갈색, 비늘있고, 가장자리는 섬유상이다. 주름살은 바른주름살이고 가장자리는 툭니꼴이다. 자루는 가늘고 납작한 꼴, 백색, 섬유상 인편이 있다. 포자는 중형, 5-6각형, 연낭상체는 있으나 측낭상체는 없다. 여름에 조릿대(일명 신호대)의 흙에 단생한다.

E. violaceobrunneum(황보라외대버섯) : 균모는 소형, 전기스텐드형, 가지색, 미세한 비늘, 가장자리

는 물결형이다. 주름살은 바른주름살, 간격은 보통이다. 자루는 원통형, 균모보다 얇은 가지색, 윗쪽은 미세가루가 분포한다. 포자는 중형, 5-6각형, 연낭상체와 측낭상체는 없다. 여름에 참나무 숲의 흙에 단생한다.

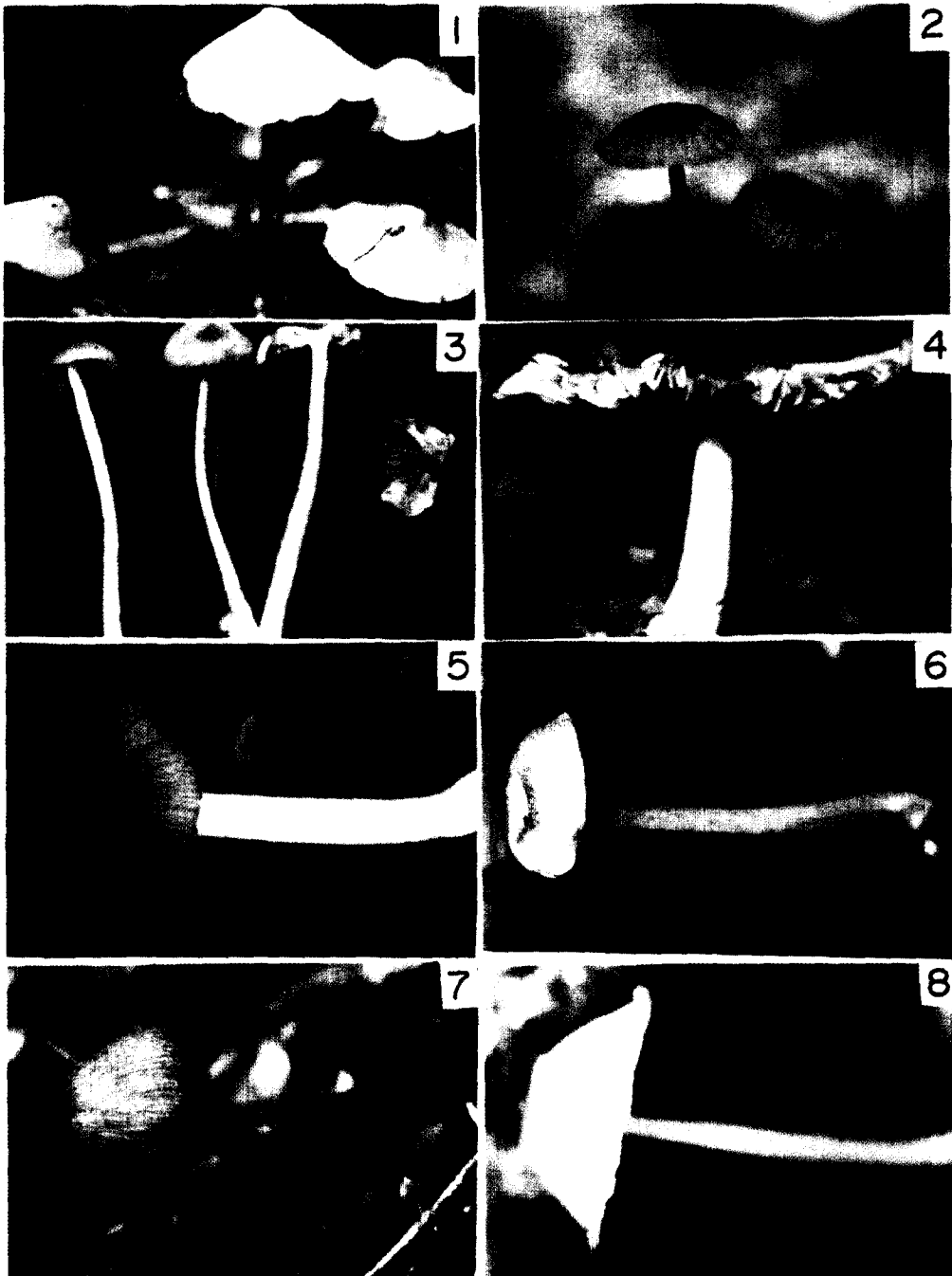
E. sericatum(섬유비단외대버섯) : 균모는 소형, 등근형, 비단 섬유상, 회갈색이다. 주름살은 배불뚝형, 울린주름살, 간격은 보통이다. 자루는 원통형, 하얀색이다. 포자는 중형, 6-7각형, 연낭상체와 측낭상체가 있다. 여름에 조릿대 속의 흙에 단생한다.

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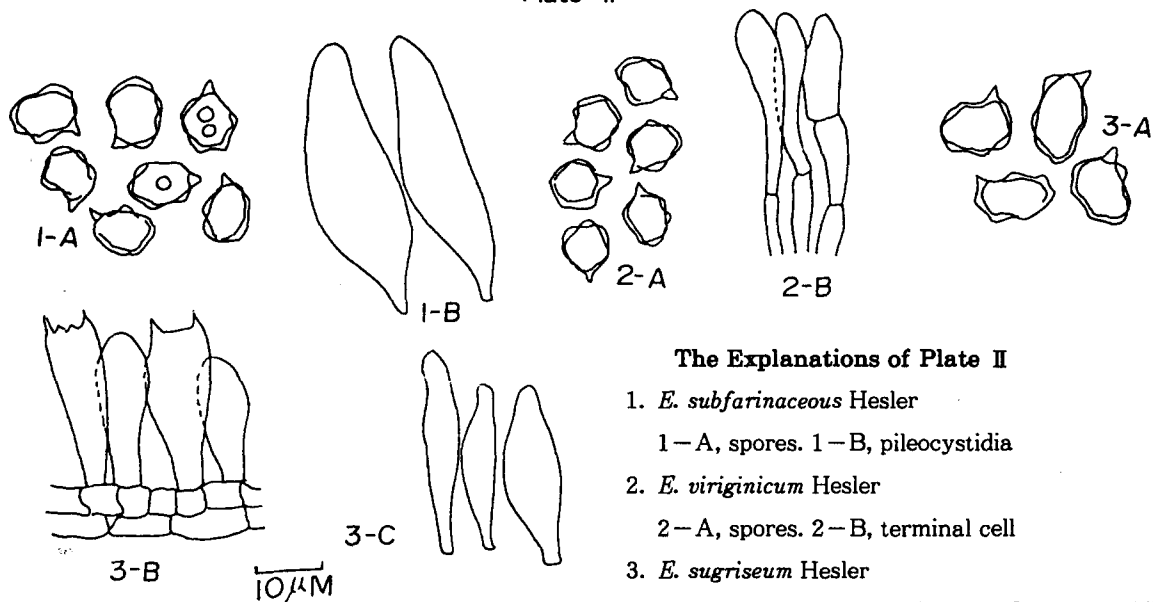
Plate I



The Explanations of Plate I

- | | |
|---|--------------------------------------|
| 1. <i>Entoloma subfarinaceus</i> Hesler | 6. <i>E. intutum</i> Corner & Horak |
| 2. <i>E. viriginicum</i> Hesler | 7. <i>E. violaceobrunneum</i> Hesler |
| 3. <i>E. subgriseum</i> Hesler | 8. <i>E. sericatum</i> Sacc. |
| 4. <i>E. dolosum</i> Corner & Horak | ※ Natural size 1/2 |
| 5. <i>E. squamiferum</i> Horak | |

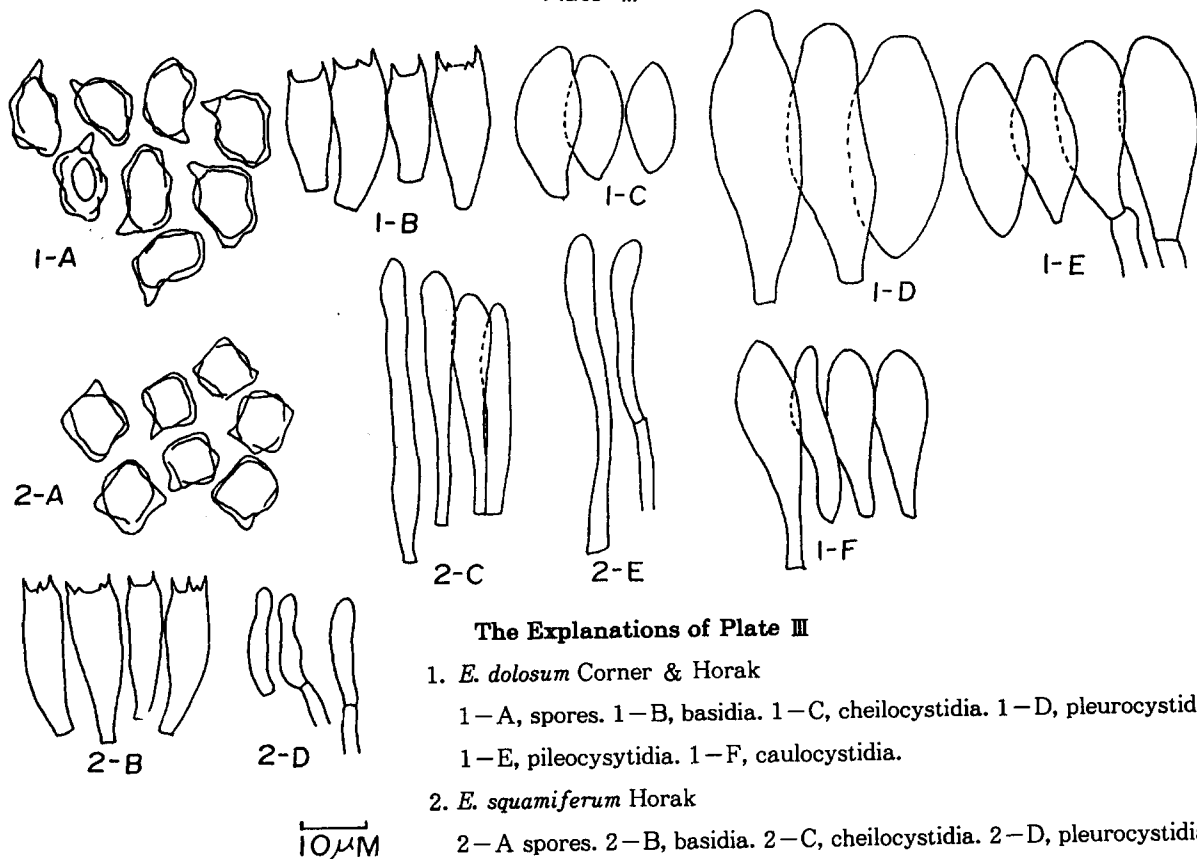
Plate II



The Explanations of Plate II

1. *E. subfarinaceus* Hesler
1-A, spores. 1-B, pileocystidia
2. *E. viriginicum* Hesler
2-A, spores. 2-B, terminal cell
3. *E. sugriseum* Hesler
3-A, spores. 3-B, basidia. 3-C, pileocystidia

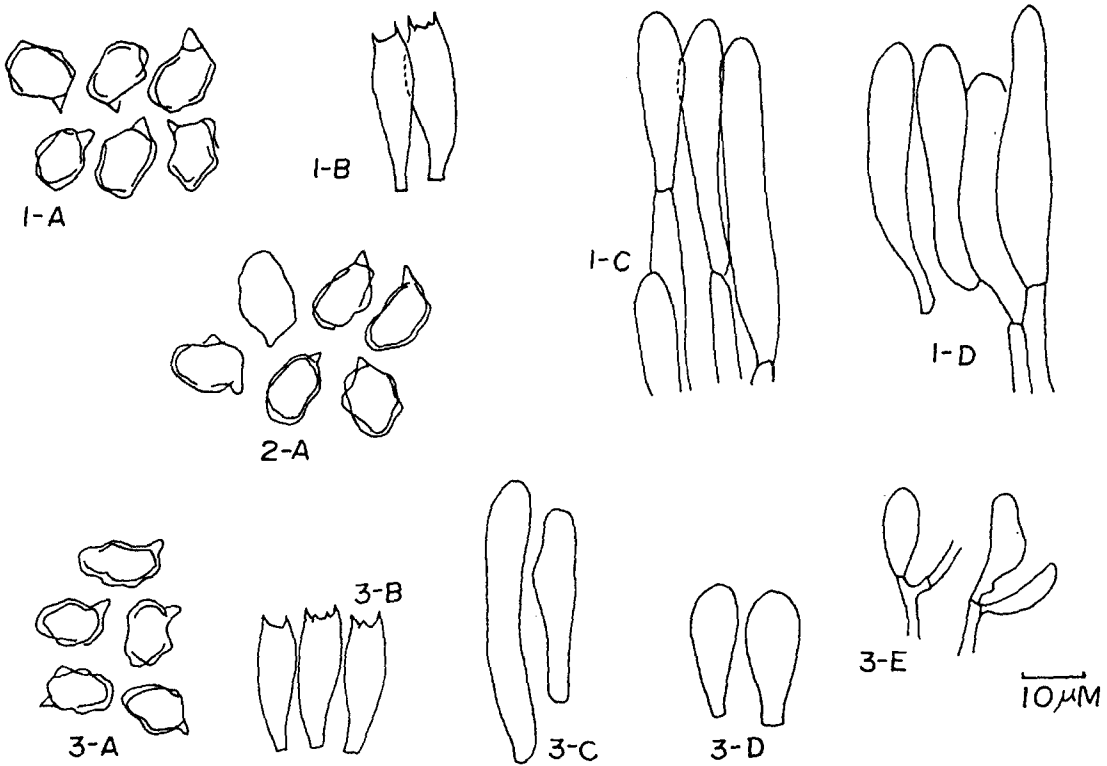
Plate III



The Explanations of Plate III

1. *E. dolosum* Corner & Horak
1-A, spores. 1-B, basidia. 1-C, cheilocystidia. 1-D, pleurocystidia
1-E, pileocystidia. 1-F, caulocystidia.
2. *E. squamiferum* Horak
2-A spores. 2-B, basidia. 2-C, cheilocystidia. 2-D, pleurocystidia
2-E, caulocystidia.

Plate IV



The Explanations of Plate IV

1. *E. intuitum* Corner & Horak

1-A, spores. 1-B, basidia. 1-C, cheilocystidia. 1-D, pileocystidia

2. *E. violaceobunneum*

2-A, spores.

3. *E. sericatum* Sacc.

3-A, spores. 3-B, basidia. 3-C, cheilocystidia. 3-D, pileocystidia. 3-E, caulocystidia.