

Notes on genus *Entoloma* of Korea (I)

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韓國產 외대버섯屬의 記錄 (I)

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ABSTRACT: Eight species of genus *Entoloma* were collected from the areas around Mt. Manduck, and newly identified in Korea; *Entoloma cuboideum*, *E. subquadratum*, *E. albinellum*, *E. albidum*, *E. commune*, *E. amplifolium*, *E. fragrans* and *E. lampropum*.

KEYWORDS: *Entoloma*, *E. cuboideum*, *E. subquadratum*, *E. albinellum*, *E. albidum*, *E. commune*, *E. amplifolium*, *E. fragrans*, *E. lampropum*.

Rhodophyllus had been used as a type of genus at Rhodophyllaceae in Korea. It was recommended by *Korean Society of Mycology* (1978), which was adopted by Imazeki-Hongo key as based on Singer's natural classification. Singer (1986) adopted genus *Entoloma* of Entolomataceae in place of *Rhodophyllus* of Rhodophyllaceae. In future, authors made proposal *Entoloma* as type genus in Korea.

Entoloma (Fr.) Kummer emend. Donk, *Bull. Bot. Gardens Buitenzorg ser. III*, 18:157. 1949. Agaricus trib. Leptonia Fr., *Syst. Myc.* 1: 201. 1821. Agaricus trib. *Nolanea* Fr., *Syst. Myc.* 1: 204. 1821. Agaricus trib. *Eccilia* Fr., *Syst. Myc.* 207: 1821. *Acurtis* Fr., *Summa Veg. Scan.*, 2: 337. 1849. *Rhodophyllus* Quélt, *Enchir. Fung.*, p.57. 1886. *Leptomiella* Earle, *Bull. N. Y. Bot. Gard.* 5: 424. 1909.

Basidiocarps pleurotoid, omphalioid, collyboid, mycenoid or tricholomatoid; the disc plane, depressed, umbilicate or umbonate, papillate or mammillat; colors variable, pallid to dark, often white or fibrillose, many species scaly especially on the disc; margin even or striate, rarely plicate or rimose; odor and taste mild or distinctive; lamellae variously attached, often white then pallid or pin-

kish; stipe present and central to eccentric or lateral; spore print pink to pinkish brown ovoid to elliptical in outline, angular at maturity, sometimes nodulose, yellowish to yellowish brown in Melzers reagent; cheilocystidia often present, pleurocystidia absent; clamp connection absent or present; habitat solitary or clustered, rarely caespitose; most species saprophytes; some species forming ectomycorrhiza.

***Entoloma cuboideum* Hesler** 네모외대버섯 (신칭)
Hesler, *Beih. Nova Hedwigia* 23:22-23, 1967.

Pileus 4.3-6.0 cm broad, broadly convex then expanding-plane, rarely depressed with slightly a umbo at center, fibrillose to scale, whitish yellow or pallid yellow, margin even, striate or with sulcate, context thin, white, odor and taste mild. Lamellae decurrent, knife-shaped or ventricose, broad, mixed long and short, white, changing whitish yellow to pinkish, close, edges even, concolorous. Stipe 7.0-9.0 cm long, 0.5-0.7 cm thick, cylindrical, glabrous, twisted, rarely flattened, brown or whitish yellow, rarely tapering downwards, bent and white myceloid at base, stuffed, becoming hollow, white.

Spores $(-7.0)9.0-10.0 \times (-7.0)8.0-10.0 \mu\text{m}$, with 4 angles in side view, cuboide-shaped or subglobose in outline, angles obtuse or slightly prominent, clamp connection absent, pleurocystidia and cheilocystidia absent, basidia clavate, $27.5-60.0 \times 12.5-16.3 \mu\text{m}$.

Habt.: Scattered or clustered on soils of mixed woods, deciduous woods. Autumn.

Distr.: Korea (Wipong-Sa near Chonju city).

Specimens studied: CHO-1002 collected from the areas between Wipong-Sa and Wipong-Sansung on 23th of September, 1989.

Character of this species is brown color, quadrate spores and lack of pleurocystidia and cheilocystidia.

***E. subquadratum* Hesler 네모외대버섯아재비 (신칭)**

Hesler, Beih. Nova Hedwigia 23: 154, 1967.

Pileus 1.3-4.0 cm broad, broadly conic or broadly conic-campanulate, mammillate or papillate, dull orange yellowish, umbo whitish or sometimes darkening, darker at center, silky or canescent to white fibrillose, sometimes with minutely brownish scale, occasionally micaceous, often more or less zonate or subzonate, margin slightly with teeth or even, striate when moist, context thin, white rather tough, odor and taste mild. Lamellae adnate or subfree, seceding, white, changing pinkish cinnamon, close or slightly crowded, broad or medium broad, edges even. Stipe 3.5-8.5 cm long, 0.15-0.35 cm thick, cylindrical, hair brown, drab, or olive brown, apex pruinose, elsewhere silky or glabrous, swollen or bulbous at base, solid to stuffed, finally hollow, cartilaginous, dry.

Spores $9.0-13.0 \times 7.0-10.0 \mu\text{m}$, subquadrate to quadrate, more or less cruciform, mostly with 4 angles or rarely 5 angles in side view, angles obtuse acutic, prominent $1.3-2.5 \mu\text{m}$ high, spore print pinkish cinnamon, basidia clavate, $38-42.3 \times 10.0-12.5 \mu\text{m}$, pleurocystidia and cheilocystidia absent.

Habt.: Clustered on soil, often in humus of mixed woods. Summer to autumn.

Distr.: Korea (Mt. Manduck near Chonju city).

Specimens studied: CHO-1006 collected from Experiment Forests of Chonbuk-Do in Mt. Man-

duck on 2nd of September, 1989.

This species distinguish in the field by pilus color and white umbo. It is similar to *E. albo-umbonatum* (not recorded in Korea), which has pleurocystidia and cheilocystidia.

***E. albinellum* (Pk.) Hesler 흰배꼭외대버섯 (신칭)**

Hesler, Beih. Nova Hedwigia 23: 26-27, 1967. *Leptonia albiella* Pk., N. Y. State Mus. Bull. 1(2): 6, 1887. *Leptoniella albinella* (Pk.) Murr., North Amer. Flora 10: 87, 1917.

Pileus 1.9-2.5 cm broad, truncately hemispheric-convex, becoming umilicate, at first whitish yellow, finally whitish red in age, silk-fibrillose, in age the fibrils breaking up into squamules, margin faintly striate, context thin, white, odor mild or at times fragrant, taste mild. Lamellae adnate, or at times adnexed, whitish, changing reddish pink, slightly crowded, medium broad, edges even or slightly eroded, concolorous, Stipe 2.0-2.5 cm long, 0.20-0.25 cm thick, whitish, apex purinose, elsewhere glabrous, fragile, cylindrical, or slightly tapering downwards, hollow, concolorous with pileus.

Spores $7.0-8.0 \times 5.0-6.0 \mu\text{m}$, with 6-7 angles in side view, elliptical or subovoid in outline, angles obtuse or slightly prominent, pleurocystidia and cheilocystidia absent.

Habt.: Clustered on soil, or in humus. Summer to Autumn. Edibility unknown.

Distr.: Korea (Mt. Manduck near Chonju city).

Specimens studied: CHO-1009 collected from side road of Gomti-Jae in Mt. Manduck on 3rd of September, 1989.

This species is white and the pilus assumes whitish red in age, has a larger spore and sometimes fragrant odor.

***E. albidum* (Murr.) Hesler 흰색외대버섯 (신칭)**

Hesler, Beih. Nova Hedwigia 23: 27, 1967. *Leptoniella albida* Murr., North Amer. Flora 10: 87, 1917.

Pileus 2.0-4.0 cm broad, truncately broadly convex, depressed with a pallid yellowish small umbo, whitish to whitish gray, silk-fibrillose, micaceous margin even, context thin, white, odor mild, taste

slightly bitter. Lamellae adnate or subsinuate, broad, close or slightly crowded, whitish, changing pallid pink, edges even concolorous. Stipe 4.0-7.0 cm long, 0.2-0.4 cm thick, cylindrical, apex mealy, elsewhere glabrous, white to pallid white, hollow, concolorous.

Spores 8.0-9.0 (-10.0)×6.0-7.0 μm, mostly with 6-7 angles in side view, angles obtuse, ovoid or subglobose in outline, basidia club-shaped, 25.0-29.0×9.0-10.0 μm, 2-4 spored, hyphae of gill trama 5.0-13.8 μm wide, clamp connection absent, pleurocystidia and cheilocystidia absent.

Habt.: Scattered or clustered on soil in humus of mixed woods. Summer to autumn. Edibility unknown.

Distr.: Korea (Mt. Manduck near Chonju city).

Specimens studied: CHO-1021 collected from Gomti-Jae in Mt. Manduck on 13th of September, 1989.

This species is white, and larger than *E. albivellum*. Character of species has a small umbo, but *E. albivellum* has umbilicate.

***E. commune* Murr. 보통외대버섯 (신칭)**

Murr., North Amer. Flora 10: 121, 1917. Hesler, Beih. Nova Hedwigia 23: 32-33, figs. 167, 1967. *Entoloma subcommune* Murr., Bull. Torrey Club 67: 60, 1940.

Pileus 2.7-6.3 cm broad, broadly convex then expanding, becoming depressed in age, umbilicate, at times small umbonate, whitish or pale whitish, disc darker, glabrous, margin striated, lobed or split, irregular, odor and taste farinaceous. Lamellae adnate, or more or less sinuate, knife-shaped, mixed long and short, whitish yellow then pinkish, broad, edges even or wrinkled in age, concolorous. Stipe 5.5-7.0 cm long, 3.5-5.0 mm thick, apex purinose, elsewhere glabrous, equal, or often tapering downward or upward, white, fragile, hollow white.

Spores 7.0-9.0 (-10.0)×5.8-7.0 μm, with 5-6 angles in side view, subglobose in outline, angles obtuse or slightly prominent, rarely with one or two oil drops, basidia 27.5-30.0×11.3-12.5 μm, clavate or club-shaped, 4 spored, hyphae of gill trama 3.5-7.0 μm wide, clamp connection absent,

pleurocystidia and cheilocystidia absent.

Habt.: Cespitose or clustered on soils of mixed woods. Summer to autumn. Edibility unknown.

Distr.: Korea (Mt. Manduck near Chonju city).

Specimens studied: CHO-1016 collected from the areas between Miruk-Sa and top of Mt. Manduck on 13th of September, 1989.

***E. ampifolium* (Murr.) Hesler 큰잎외대버섯 (신칭)**

Hesler, Beih. Nove Hedwigia 23: 33, figs. 20. 1967. *Clitopilus entoloma* Murr., Lloydia 8: 290, 1945.

Pileus 1.5-2.5 cm broad, truncately broadly campanulate to expanding, depressed, rarely with a small umbo, grayish brown or with flesh color, disc darker, glabrous, striate from margin to truncation, margin irregular, upturned in age, rarely even, context thin, concolorous, odor absent, taste pungent, not acrid. Lamellae adnate, or sinuate, slightly crowded, mixed long and short, distant, knife-shaped, broad, white, changing pinkish, edges even. Stipe 2.8-4.3 cm long, 0.1-0.2 cm thick, cylindrical, fragile, whitish yellow, glabrous, at first solid or stuffed, becoming hollow, concolorous, enlarged downward, white myceloid at base.

Spores 11.0-14.0×6.5-8.0 μm, mostly with 7 angles or rarely with 6 angles in side view, angles slightly prominent, elliptical in outline, rarely with one oil drop, pleurocystidia and cheilocystidia absent.

Habt.: Clustered on soil in grass land. Summer to early autumn. Edibility unknown.

Distr.: Korea (Wipong-Sa near Chonju city).

Specimens studied: CHO-1019 collected from the areas between Wipong-Sa and Wipong-Sansung on 18th of August, 1989.

***E. fragrans* Hesler 향외대버섯 (신칭)**

Hesler, Beih. Nova Hedwigia 23: 119, figs. 42-43, 178, 212, 1967.

Pileus 2.6-8.0 cm broad, broadly truncately hemispheric-convex, broadly umbilicate, expanding-convex densely brownish or darkish brown scaly at center, disc darker, margin short striate, context thin, white, odor fragrant, taste slightly plea-

Plate I

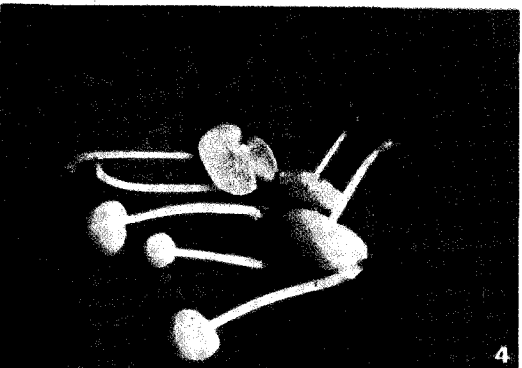
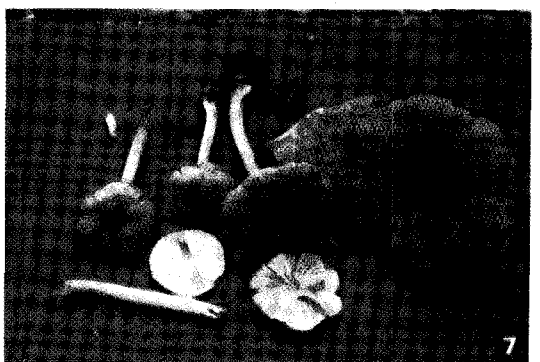
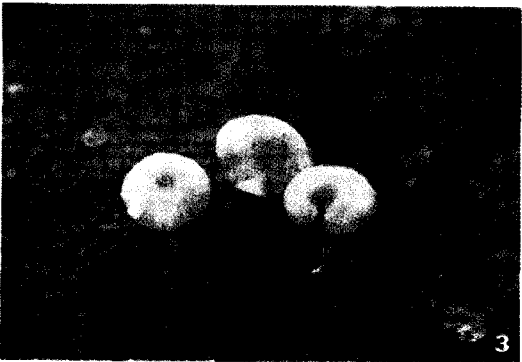
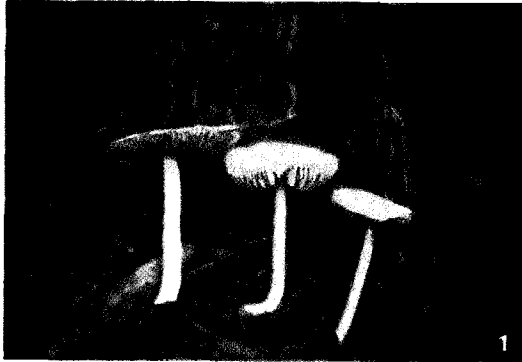
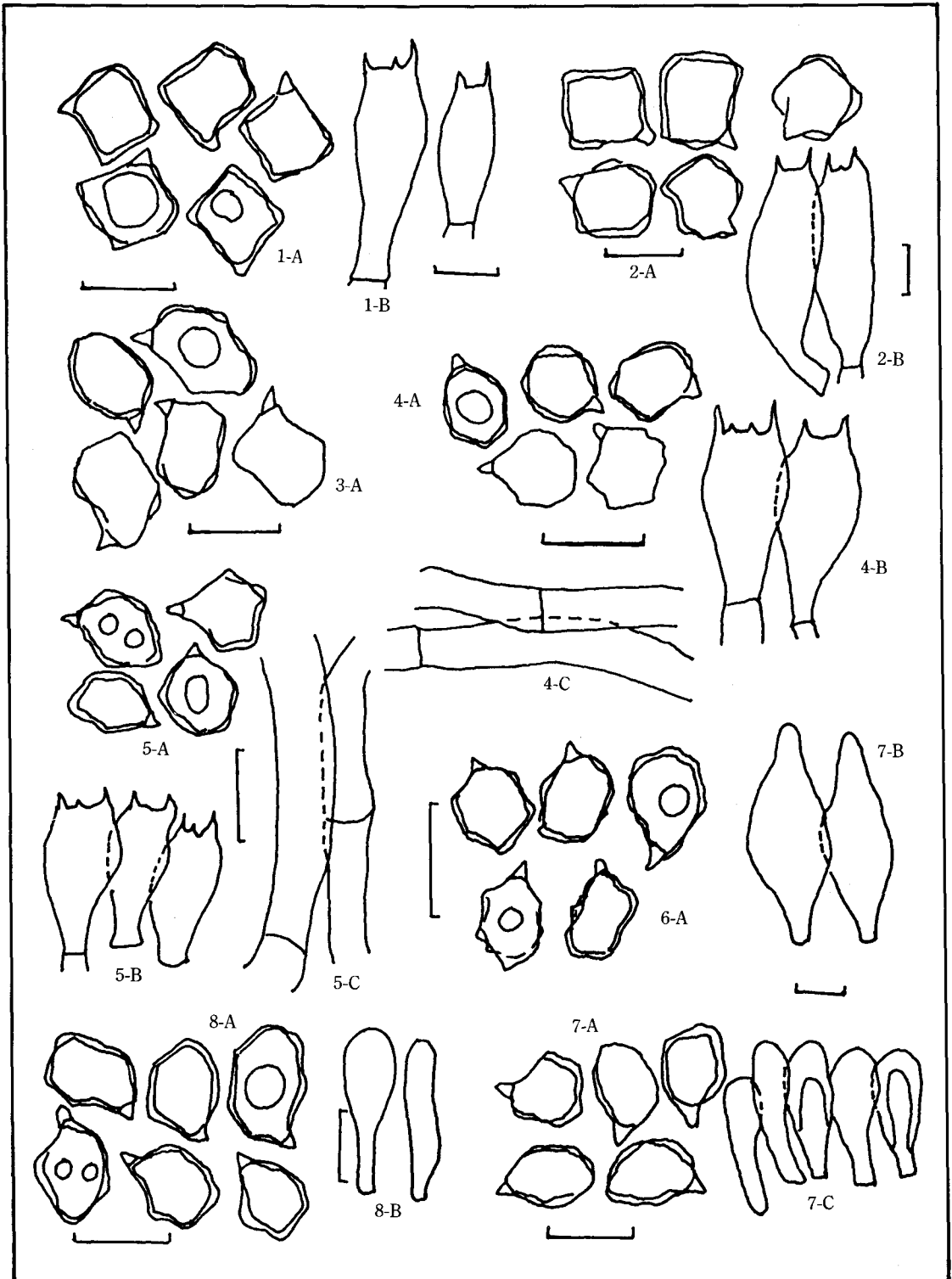


Plate II



sant. Lamellae adnate or free, close to crowded, broad, mixed long and short, white, changing pale pinkish cinnamon, edges slightly fimbriate, concolorous. Stipe 5.5-10.0 cm long, 0.35-0.60 cm thick, cylindrical, rarely bent at base, yellowish white, apex purinose, elsewhere glabrous or rarely pallid brownish scaly, at times twisted upwards, swollen and white myceloid at base, hollow, white.

Spores 8.5-11.0×6.0-7.0 μm, mostly with 6-7 angles in side view, rarely with 8 angles, elliptical in outline, angles obtuse, or slightly prominent, pleurocystidia fusiform or ventricose, apex acutic, 25.0-40.0×7.0-12.0 μm, cheilocystidia clavate or club-shaped 22.5-27.5×5.0-7.5 μm, pleurocystidia absent.

Habt.: Clustered on soil in grass. Summer. Edibility unknown.

Distr.: Korea (Mt. Manduck near Chonju city).

Specimens studied: CHO-1004 collected from side road of Gomti-Jae in Mt. Manduck on 16th July, 1989.

Character of this species has the fragrant odor.

***E. lampropum* (Fr.) Heseler 빛외대버섯 (신칭)**

Hesler, Beih. Nova Hewdigia 23: 154, figs. 112-113, 1967. *Agaricus lampropus* Fr., Syst. Myc., 203, 1821. *Leptonia lampropa* (Fr.) Qué. sensu Bresadala. Champ. Jura Vosg., 88, 1872. *Rhodophyllus lampropus* (Fr.) Qué., Enchir. Fung., 60, 1866.

Pileus 2.8-4.0 cm broad, broadly truncately convex to expanding, not fully expanding, fragile, umbilicate, grayish brown or grayish dark, slightly fibrillose, disc with darkish brown scale or fibrillose, striate or furrow to disc, margin not even, irregular, context thin, white, odor and taste slightly unpleasant. Lamellae distant or free, close or slightly crowded, mixed long and short, knife-shaped or ventricose, grayish white or white, changing pinkish, edges fimbriate, concolorous. Stipe 4.7-5.5 cm long, 0.23-0.30 cm thick, cylindrical, grayish blue, glabrous, slightly bent at base, white myceloid at base, hollow, white.

Spores 9.0-12.2×6.0-8.8 μm, mostly with 6-7 angles or rarely with 5 angles in side view, angles slightly prominent, with one or two oil drops, pleurocystidia absent, cheilocystidia slightly cla-

vate or vesiculose, 22.5-38.0×8.5-17.5 μm.

Habt.: Clustered on soil, on mosses, or in deciduous woods. Summer to early autumn. Edibility unknown.

Distr.: Korea (Mt. Manduck near Chonju city)

Specimens studied: CHO-1010 collected from the side and wood-decay of Gomti-Jae in Mt. Manduck on 16th July, 1989.

This species has a gray-brown, sometimes striate pileus, a pale bluish to grayish blue stipe and vesiculose to clavate cheilocystidia.

Explanation of Plates

- Plate 1.** 1. *Entoloma cuboideum* Hesler
 2. *E. subquadratum* Hesler
 3. *E. albinellum* Hesler
 4. *E. albidum* (Murr.) Hesler
 5. *E. commune* Murr.
 6. *E. amplifolium* (Murr.) Hesler
 7. *E. fragrans* Hesler
 8. *E. lampropum* (Fr.) Hesler
 *Natural size ×1/3

- Plate 2.** 1. *Entoloma cuboideum* Hesler
 1-A, spores; 1-B, basidia
 2. *E. subquadratum* Hesler
 2-A, spores; 2-B, basidia
 3. *E. albinellum* Hesler
 3-A, spores
 4. *E. albidum* (Murr.) Hesler
 4-A, spores; 2-B, Basidia; 4-C, hyphae of gill trama
 5. *E. commune* Murr.
 5-A, spores; 5-B, basidia; 5-C, hyphae of gill trama
 6. *E. amplifolium* (Murr.) Hesler
 6-A, spores
 7. *E. fragrans* Hesler
 7-A, spores; 7-B, pleurocystidia; 7-C, cheilocystidia
 8. *E. lampropum* (Fr.) Hesler
 8-A, spores; 8-B, cheilocystidia
 *Standard scale line 10 μm

摘 要

全州교외에 위치한 萬德山과 그 부근에서 많은 외대버섯屬을 採集하여 同定 하였다. 그 結果 韓國産 未記錄種으로 확인된 것은 다음과 같으며 이들에 대하여 普通名을 新稱하였다.; *Entoloma cuboideum*

Hesler(네모외대버섯), *E. subquadratum* Hesler(네모외대버섯아재비), *E. albinellum* Hesler(흰배꼽외대버섯), *E. albidum*(Murr.) Hesler(흰색외대버섯), *E. commune* Murr.(보통외대버섯) *E. amplifolium*(Murr.) Hesler(큰잎외대버섯), *E. fragrans* Hesler(향외대버섯), *E. lampropum*(Fr.) Hesler(빛외대버섯).

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