

The Taxonomic Study on the Genus *Amanita* in Korea

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韓國產 光대버섯屬에 對한 分類學的 研究

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Abstract : For the purpose of investigating the distribution and flora of wild mushrooms in Korea, this study was conducted primarily on the genus *Amanita*. Through survey of Suweon, Kwangneung, Mt. Chiri, Taegwanryung, Yeongdong district, and Mt. Hanla, 25 species of *Amanita* including 3 unrecorded species were discovered and are described in this paper.

The author proposes to group 25 Korean species of *Amanita* into 3 subgenera according to morphological characteristics by the modern taxonomic system, and also designated the 3 unrecorded species of *Amanita* including one variety in Korean common name.

Introduction

Since the climatic and geographic features of the Korean peninsula offer favorable conditions for the growth of higher fungi, a number of species grow in this country. So mushrooms have been used as food and medicines since ancient times.

The first record of domestic mushrooms in Korea appeared in "Sam Kuk Saki" written by Kim in A.D. 1145. An outstanding book which listed exclusively higher fungi is Hong's Si Yong Yak Bang Gyun Bo "which appeared in 1779, which describes morphology, cultivation, cooking, harvesting and precautions on 111 mushrooms composed of 52 edible, 47 medicinal and 12 poisonous mushrooms.

In 1932. Okada who used binominal nomenclature in Latin for scientific taxonomic studies

of the higher fungi recorded for the first time 11 species of polyporaceae.

3 years later, Ree, (1935) illustrated 11 edible and poisonous mushrooms and then Uyeki, (1936) introduced 10 families, 32 genera, 63 species, in which 2 species of *Amanita* were inserted. Kaburagi (1940) grouped 163 higher fungi into 83 edible, 10 poisonous including 7 *Amanita* species, 41 non-poisonous and wood-rotting varieties.

Shortly after, Takagi (1943—1945) recorded 117 wild mushrooms, listing 96 edible species and 21 poisonous species including 10 species of *Amanita*.

From 1945 to 1955, research of higher fungi in Korea ceased because of the Korean Liberation and the 3 years Korean war.

Since then, 46 species of higher fungi were reported by Lee, and Chu (1956) in their Illustrated Korean Flora. One year later, Lee, and Lee (1957) presented a comprehensive list of 111 spec-

ies of mushrooms and added 96 more species in 1958. Lee, (1959) added 49 additional species to the previous lists. Simultaneously Lee, Lee, and Lim (1959) published a "Coloured Illustrations of Fungi of Korea" of 228 species including 9 species of *Amanita*.

Later, Lim described 397 species (392 recorded and 5 unrecorded once) including 15 species of *Amanita* in his "Total List of Korean Fungi," published in 1969. Lee, and Jeong (1972) presented a classified list of 368 species in which 158 of the present order were arranged with Korean descriptions which included 15 species of *Amanita* in "Floral Studies on the Basidiomycetes in Korea". Lim, and Kim, (1972) rearranged the list Korean higher fungi included 14 species of *Amanita*.

Quite recently, Lee, (1973) newly designated 49 species of Korean higher fungi which he had reported without Korean names in 1957, in which 6 species of *Amanita* were included. Lee, (1975) also condensed his former list to 274 species with 10 species of *Amanita* and 9 additional unrecorded species in "List of the Fungi of Korea." Kim, Kim, Park, and Hongo, (1975) reported 37 new species of higher fungi included 3 species of *Amanita* in "Taxonomic studies of Korean Basidiomycetes".

Reviewing the above sources, 22 species of *Amanita* among the higher fungi were recorded in Korea. Because the *Amanita* genera contains the most poisonous species among the higher fungi, it is necessary to distinguish edible exactly and poisonous varieties, because in rural commodity, it sometimes occurred toxication by taking poisonous mushrooms with shortage of knowledge.

This study concerns the classification of *Amanita* according to the modern taxonomic system not previously used in Korea. In addition, specific morphological characteristics of poisonous mushrooms of *Amanita* are also described.

Key and descriptions

Amanita Pers., ex S.F., Gray, *Botanicae* (1831)

Ito, My.Fl. Japan. 225, 1959; Singer, Agaricales in Modern Taxonomy, 426, 1962; Imazeki, and Hongo, Col. Ill. Fungi Japan, 2, 36, 1971.

The diagnostic characters of *Amanita* are white spore-deposits, the presence of both a cup (volva) at the base of the stipe and ring (annulus) farther up, and in the budding stage typically free gills. The pileus is generally obtuse to convex and nearly plane at maturity. It may be viscid or dry and either glabrous or covered with warts. The stem is easily separated from the cap.

The ring is always present in newly expanded caps, but may be in conspicuous in older ones. The volva is sometimes prominent, or occasionally almost hidden in the ground. In some species it consists only of scaly remnants or faint ridges around the swollen base of the stem.

Key to species and subgenera of *Amanita*

A. Spores non-amyloid; Margin of the pileus sulcate

a. Annulus usually well developed; Volva developed, saccate and membranous; Chloride of lime oder never present, not pungent at all.

.....*Pseudoamanita* (I)

b. Annulus generally absent; Volva well developed, rarely marginate or friable.

.....*Vaginata* (*Amanitopsis*) (II)

B. Spores amyloid; Pileus smooth, not sulcate at the margin, or only indistinctly and shortly so in very old specimens Volva varying from membranous and saccate-shaped to almost nil at the base of the stipe; Oder often disagreeable or sometimes pungent.

.....*Amanita* (*Euamanita*) (III)

1. *Pseudoamanita*

A. Pileus red to yellow.

a. Volva well developed "cup-shaped"; Stipe and gills yellow; Spores 8-11 x 6-7 μ .

.....*A. caesarea* (1)

ab. Volva bulb-like-shaped, bands and concentric

warts: Fragments of volva in pileus surface breaking into small patches or warts; Stipe and pileus white to pale yellow; Spores $10-12 \times 8-9 \mu$

.....*A. muscaria* (2)

B. Pileus gray or blackish brown.

a. Volva well developed "cup-shaped" or also saccate or membranous; Gills white; Pileus lead color to brownish gray; Stipe almost hairless; Spores $10-13 \times 7-10 \mu$

.....*A. spreata* (3)

Gills slightly pink; Pileus grayish brown, long striate on the margin; Stipe almost hairless; Spores $11-15 \times 10-12 \mu$

.....*A. longistriata* (4)

b. Volva saccate, free, or a slight margined rim on the bulb; Gills white; Pileus pale brown to blackish brown; Stipe smooth or slightly scaly; Spores $9-12 \times 6.5-9 \mu$

.....*A. pantherina* (5)

c. Volva enlarged, circumscissile; Pileus white-gray, covered with pointed or pyramid-shaped warts on pileus surface

.....*A. echinocephala* (6)

d. Volva enlarged, covered with tiny white cream powder; Pileus white, covered with white powder; Stipe club-shaped (3-5cm); Spores broad ellipsoid, $8-10 \mu$

.....*A. virgineodites* (7)

II. *Vaginaria* (*Amanitopsis*)

A. Spores globose or spheroid.

a. Volva grayish powder; Pileus breaking into small patches or warts and covered with fragments of volva on the surface of the pileus; Volva friable, several rims at the base of the stipe; Spores: $10-13 \mu$, globose.

.....*A. inaurata* (8)

b. Volva well developed, membranous, cup-shaped; Stipe hollow, stuffed with a cottony pith; Ring soon disappearing.

1. Pileus gray to brownish gray; Stipe fragile, hollow; Spores $9-12 \mu$.

.....*A. veginata* (9)

2. Pileus gray to brownish gray; Margin of the ring dark gray

.....*A. veginata* var. *puncta* (23)

3. Pileus brown

.....*A. veginata* var. *fulva* (24)

4. Pileus white

.....*A. veginata* var. *alba* (10)

c. Volvae powdery, gray; Pileus gray, powdery; Stipe 3-5.5cm. broad; Spores egg-shaped or ellipsoid.

.....*A. farinosa* (11)

d. Volva enlarged (bulb-like), covered with white powder; Pileus yellowish waxy color, scattered with white-pale yellowish powder on the surface of the pileus; Spores broad ellipsoid $8.5-12 \mu$

.....*A. melleiceps* (12)

III. *Amanita* (*Euamaniat*)

A. Spores globose or globoid.

a. Volva membranous or saccate-cup-shaped, large, free broken concentric rings or inrolled like a ring on the enlarged base of the stem; Cap and stipe white.

Pileus 6-15cm wide, at first conical-shaped, later umbonate; Ring several torn, Spores $9-10 \mu$

.....*A. virosa* (13)

Pileus 5-8cm. wide, convex, later hemispherical; Ring green; Stipe almost glabrous; Spores $7-10 \mu$

.....*A. verna* (14)

Pileus gray, greenish brown 7-15cm. broad; Stipe and cap in the same color as upper sides of ring; Spores $9-10 \mu$

.....*A. phalloides* (15)

b. Volva thin, merely a margined rim; Pileus 3-8cm. broad, pale greenish yellow, citrine color, covered with remnants of the volva; Ring yellow orange; Spores $7.5-10 \mu$

.....*A. citrina* (16)

Pileus 5-8cm. wide, grayish brown to br-

own; Volva friable or merely persistent; Ring gray or reddish purple gray; Spores 10-12.5μ

.....*A. Porphyria* (17)

B. Spore large ellipsoid or cylindrical

a. Volva usually present; Pileus plate, scattered with patches of volva remnants, prominent diamond-shaped or pyramid.

Volva permanent, free, white; Pileus 5-9 cm. broad, gray to dull gray in the center; Spores 7.5-8.5μ

.....*A. pseudoporphyria* (18)

b Volva powdery or fragmentous; Pileus remnants of the volva.

1. Pileus: yellow to belt-shaped brownish yellow 4.5-7cm. diameter, scattered with little powdery patches of yellow; Stipe powdery yellow; Ring pale yellow; Volva covered with powder; Spores 8-9μ

.....*A. falvipes* (25)

2. Pileus: brown and reddish or dull brown belts; Volva powdery gray of fragmentous; Flesh reddish tinged when bruised; Pileus 8-10cm. wide Ring white; Volva powdery; Spores 6-9×6-7μ

.....*A. rubescens* (19)

3. Pileus 6-10cm. gray to dull brown, covered with angular warts on the surface; Stipe deep grayish scale at under sides of the ring; Spores 8-9.5×6.5-7.5μ

.....*A. spissacea* (20)

C. Volva inconspicuous

Ring: fibrilous, usually disappearing quickly; Volva large, cup-shape; Pileus 2-8cm. wide. pure white with a yellowbelt at the base covered with scales or large warts from the volva; Stipe white; Flesh pale reddish tinged when bruised; Spores 8-12×5-8μ

.....*A. agglutinata*. (21)

Ring powdery or floccosus, but soon disappearing; Pileus and stipe covered with remnants of the volva.

A. griseofarinosa. (22)

List of recorded species of the

Genus Amanita

1. Amanita caesarea (Fr.) Schw

Kaburagi, 1940, P. 353; Takagi, 1943, p. 18. 20; Lee, and Lee, 1957, p.6; Lee, 1957, Lim, 1968, p.5; Lim and Kim. 1972; p.13; Lee, and Jeong, 1972, p.63; Singer, 1962, p.420; Imazeki, Hongo, and Tubaki, 1970, p.80; Imazeki, and Hongo, 1965, p.44; Ito, 1959, p.228; Charles, and Macadam, 1973, p.12.

Edibility: Edible

Habitat: Open woods, on lawns, July to October.

Locality: Suweon, Kwangneung, Mt. Chiri, Taegwanryung, Yeongdong district, and Mt. Hanla.

Distribution: Korea, Japan, Northern Hemisphere, world wide.

2. Amanita muscaria (Fr.) Hooker

Uayegi, 1943, p.32; Lee, and Lee, 1957, p.6; Lee, 1957; Lee, et. al. 1959, p335; Lim, 1968, p.5; Lim, and Kim, 1972, p.13; Lee, and Jeong, 1972, p.62; Lim, and Kim. 1972, p.13; Cooke, 1883, p.7, (Illus. t. 117.); Smith, 1949, p.414; Christensen, 1955, p.20; Imazeki, and Hongo, 1957, p.44; Ito, 1959, p.229; Smith, 1963, p.177; Singer, 1962, p.427; Imazeki, and Hongo, 1970, p.81; Tosco, and Farelli, 1972, p.71; Charles, and Macadam, 1973, p.14.

Edibility: poisonous

Habitat: Solitary or in groups, sometimes in fairy rings, frequently under spruce trees.

Locality: Kwangneung

Distribution: Korea, Japan, North-America Europe.

3. Amanita spreta (Peck) Sacc.

Lee et al. 1959, p.230; Lim, 1968, p.5 Lim, and Kim, 1972, p.13; Lee, and Jeong, 1972, p.63; Smith, 1949 p.408; Ito, 1959, p.230; Singer, 1962, p.426; Imazeki, and Hongo, 1971. p.38; Charles, and Macadam, 1973, p.11. Amanita cinerea; Lee, and Lee, 1957, p.8; Lee, 1957. Edibility: poisonous (?)

Habitat: In woods and on wood-margins. August to September

Locality: Suweon, Mt. Hanla, Kwangneung, Mt. Chiri, Yeongdong district, Mt. Hanla.

Distribution: Korea, Japan, Europe, North-Amer-

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4. *Amanita pantherina* (Fr.) Secr

Kaburagi, 1940, p. 358; Takagi, 1943, p. 32; Lee, and Lee, 1957, p. 6; Lee, J.Y. 1957; Lim, 1968; p. 5; Lim and Lim., 1972, p. 13; Lee, and Jeong, 1972, p. 63; Cooke, 1883, p. 8, (Illus. t. 6.); Smith, 1949, p. 410; Imazeki, and Hongo, 1957, p. 44; Ito, 1959, p. 232; Tosco, and Fanelli, 1972, p. 22; Charles, and Macadam, 1973, p. 17.

Edibility: Doubtful

Habitat: In woods and pastures

Locality: Kwangneung, Suweon, Mt. Hanla, Mt. Chiri, Yeongdong district.

Distribution: Korea, Japan, North-Hemisphere, Africa.

5. *Amanita longistriata* Imai (*A. rhodophylla* Imaz. & Toki)

Kim, Kim, Park and Hongo, 1975, Ito, 1959, p. 231; Imazeki and Hongo, 1971, p. 39.

Edibility: poisonous (?)

Habitat: on the ground in the woods, Summer to Autumn.

Locality: Suweon, Kwangneung, Mt. Chiri.

Distribution: Korea, Japan, North-America, Europe.

6. *Amanita echinocephala* (Vitt.) Quéf.

Lepiota vittadinii (Moret.) Fr: Kaburagi, 1940, p. 358; Takagi, 1943, p. 32; Lee, 1957; Lim, 1968, p. 6; Lim and Kim, 1973, p. 13; Lee, and Jeong, 1973, p. 64; Cooke, 1883, p. 15, (Illus. t. 36); Smith, 1949, p. 431; *Amanita echinocephala* (vitt) Quéf: Ito, 1959, p. 248; Singer 1962, p. 44.

Edibility: Doubtful

Habitat: On the ground in woods.

Locality: Kwangneung, Suweon, Mt. Hanla, Mt. Chiri, Taekwanryung.

Distribution: Korea, Japan, Europe, North-America.

7. *Amanita virgineoides* Bas.

Lee, 1975, p. 28; Imazeki, and Hongo, 1970, p. 83.

Edibility: Edible (?)

Habitat: In woods.

Locality: Kwangneung, Suweon.

Distribution: Korea, Japan.

8. *Amanita inaurata* Secr.

Lee, 1959, p. 3; Lim. 1968, p. 5; Smith, 1949, p. 398; Cooke, Handb. Brit. Fungi, pl. 13 (No. 17). 1883; Imazeki, and Hongo, 1957, p. 47; Ito, 1959, p. 233; Singer, 1962, p. 428; Imazeki, and Hongo, 1970, p. 79.

Edibility: Edible

Habitat: Scattered on the ground in woods.

Locality: Kwangneung, Suweon.

Distribution: Korea, Japan, North-Hemisphere.

9. *Amanita vaginata* (Fr.) Vitt.

Lee et al. 1959, p. 37; Lim, 1968, p. 6 *Ananitopsis vaginata* (Bull.) Roze; Kaburagi, 1940, p. 354; Lee and Lee 1957, p. 10; Lee, 1957; Lim and Kim, 1972, p. 13; Lee and Jeong, 1972, p. 62; Cooke, 1883, p. 10; (Illus. t. 12); Christensen, 1955, p. 24; Imazeki, and Hongo, 1965, p. 45; Ito, 1959, p. 234; Singer, 1962, p. 428; Imazeki, and Hongo, 1970, p. 79; Tosco, and Fanelli, 1972, p. 25; Charles, and Macadam, 1973, p. 28—29.

Edibility: Edible

Habitat: On the ground in woods and on margins of woods, under trees, in shaded grassy places. Sometimes in open stubble and pastures.

Locality: Kwangneung, Suweon, Mt. Hanla, Mt. Chiri, Yeongdong district.

Distribution: Korea, Japan, Worldly wide.

10. *Amanita nivalis* Grev.

Amanitopsis nivalis (Grev.) Rea; Kaburagi 1940, p. 353; *Amanitopsis vaginata* (Bull.) Roze, var. *alba* (Fr.) Gill; Lee, and Lee, 1958, p. 7; Lee, J.Y. 1957; Lee et al. 1959, p. 36; Lim, J.H. 1968; Lim, and Kim, 1972, p. 13; Lee, and Jeong, 1972, p. 63; Cooke, 1883, S. 1104; Ito, 1959, p. 235; Singer, 1962, p. 427; Imazeki, and Hongo, 1970, p. 79; Imazeki, and Hongo, 1971, p. 41; Charles, and Macadam, 1973, p. 29.

Edibility: Edible

Habitat: Solitary or Scattered on the ground in woods.

Locality: Kwangneung, Suweon, Mt. Hanla, Mt. Chiri, Taekwanryung.

Distribution: Korea, Japan, Europe, North-America.

11. *Amantia farinosa* Schw.

Lim, 1968, p. 5; Lim, and Jeong, 1972, p. 13; Lee, and Jong 1972, p. 63; Imazeki, and Hongo, 1957, p. 44; Ito, 1959, p. 236; Singer, 1962, p. 427; Charles, and Macadam, 1973, p. 31.

Edibility: Poisonous (?)

Habitat: On the ground in the woods.

Locality: Suweon, Kwangeung, Mt. Hanla, Mt. Chiri.

Distribution: Korea, Japan, North-America.

12. *Amanita melleiceps* Hongo

Lee, 1973, p. 28; Imazeki, and Hongo, 1970 p. 82
Edibility: Uncertain (This mushroom was recorded as uncertain in many studies, but in Korea people have used it to kill houseflies.

Habitat: Gregarious or scattered on the ground in woods.

Locality: Kwangneung, Suweon, Mt. Hanla, Mt. Chiri, Yeongdong districts.

Distribution: Korea, Japan.

13. *Amanita virosa* Secr.

Takagi, 1943, p. 32; Lee, 1957; Lee, and Jeong, 1972, p. 63; Lee, 1975, p. 28; Cooke, 1883, p. 6, (Illus't. 1.); Ito, 1959, p. 236; Smith, 1963, p. 175; Singer, 1962, p. 428; Imazeki, and Hongo, 1970, p. 80; Imazeki, and Hongo, 1971, p. 40; Tosco, and Fanelli, 1972, p. 19; Charles, and Macadam, 1973, p. 6.

Edibility: Poisonous

Habitat: In woods. August to October.

Locality: Kwangneung, Suweon, Mt. Chiri, Yeongdong district.

Distribution: Korea, Japan, Europe, North-America.

14. *Amanita verna* (Fr.) Vitt.

Amanita phalloides (V.) Fr. var. *verna* (C.) Fr.; Lee, 1959; p. 3; Lim, 1968; Lim, and Kim, 1972, p. 13; Lee, and Jeong, 1972, p. 63; Cooke, 1883, p. 7 (Illus. t. 3.); Smith, 1949, p. 406; Christensen, 1955, p. 23; Ito, 1969, p. 238; Smith, 1963, p. 175; Singer, 1962, p. 429; Imazeki and Hongo, 1970, p. 80; Imazeki, and Hongo, 1971, p. 40; Tosco, and Fanelli, 1972, p. 19; Charles, and Macadam, 1973, p. 9.

Edibility: Poisonous

Habitat: In woods, Spring to Summer

Locality: Kwangneung, Suweon, Mt. Hanla, Mt. Chiri, Yeongdong district.

Distribution: Korea, Japan, Europe, North-America, Austria,

15. *Amanita phalloides* (Fr.) Secr.

Kaburagi, 1940, p. 358; Takagi, 1943, p. 32; Lee, and Lee, 1957, p. 7; Lee, 1957; Lee, et. al. 1957, p. 38; Lim, 1968; Lim, and Kim, 1972, p. 13; Lee, and Jeong, 1972, p. 63; Cooke, 1883, p. 6, (Illus. t. 2.); Smith, 1949, p. 420; Christensen, 1955, p. 239; Smith, 1963, p. 175; Singer, 1962, p. 428; Imazeki and Hongo, 1970, p. 80; Tosco, and Fanelli, 1972, p. 18; Charles, and Macadam, 1973, p. 7.

Edibility: Poisonous

Habitat: Solitary or scattered on the ground or on rotten wood, usually in deciduous forests and groves, August to November.

Locality: Kwangneung

Distribution: Worldly.

16. *Amanita citrina* S.F. Gray

Lee, et al. 1959, p. 38; Lim, 1968; Kaburagi, 1940, p. 358; Takagi, 1943, p. 32; Lee and Lee, 1957, p. 7; Lee, 1957, p. 7; Lee, 1975; Lim, and Kim, 1972, p. 13; Lee, and Jeong, 1972, p. 63; Cooke, 1883, p. 7, (Illus. t. 312); Christensen, 1955, p. 240; Smith, 1963, p. 181; Singer, 1962, p. 429; Imazeki, and Hongo, 1970, p. 81; Tosco, and Fanelli, 1972, p. 23; Charles, and Macadam, 1973, p. 7.

Edibility: Poisonous

Habitat: Gregarious and scattered on the ground in coniferous and mixed woods.

Locality: Kwangneung, Suweon, Mt. Chiri, Taekwanryung.

Distribution: Korea, Japan, North-Hemisphere, Australia.

17. *Amanita porphyria* (Fr.) Secr.

Lee 1957; Lee, and Jeong, 1972, p. 63; Lee, p. 28; Ito, 1959, p. 241; Singer, 1962, p. 429; Imazeki, and Hongo, p. 81; Imazeki, and Hongo, 1971, p. 41.

Edibility: Poisonous

Habitat: In woods. Summer to Autumn.

Locality: Kwangneung, Suweon.

Distribution: Korea, Japan, North-America, Asia.

18. *Amanita pseudoporphyria* Hongo

Kim, Kim, Park and Hongo, 1976; Ito, 1959, p. 243; Imazeki, and Hongo, 1971, p. 40.

Edibility: Poisonous (?)

Habitat: Scattered to gregarious on the ground in the coniferous and deciduous forests, Summer to fall.

Locality: Kwangneung, Suweon.

Distribution: Korea, Japan.

19. *Amanita rubescens* (Fr.) S.F. Gray

Lee and Lee, 1958, p. 7; Lee, et al, 1959, p. 36; Lim, 1968, Lim, and Kim, 1972, p. 13; Lee, and Jeong, 1972, p. 63; Cooke, p. 63; Cooke, 1883, p. 8, (Illus. t.9.); Smith, 1949, p. 1949, p. 418; Christensen, 1955, p. 21; Imazeki, and Hongo, 1957, p. 46; Ito, 1959, p. 244; Singer 1962, p. 429; Imazeki, and Hongo, 1970, p. 82; Imazeki, and Hongo, 1971, p. 42; Tosco, and Fanelli, 1972, p. 22; Charles, and Macadam, 1973, p. 21.

Edibility: Edible

Habitat: Solitary or Scattered in deciduous or mixed woods, occasionally on open ground.

Locality: Kwangneung, Suweon, Mt. Hanla, Mt. Chiri, Yeongdong district.

Distribution: World wide.

20. *Amanita spissacea* Imai

Lee, 1975, p. 28; Ito, 1959, p. 247; Imazeki, and Hongo, 1970, p. 83; Imazeki, and Hongo, 1971, p. 42.

Edibility: Poisonous (?)

Habitat: on the ground in woods, Summer to fall.

Locality: Suweon, Kwangneung, Taekwanryung.

Distribution: Korea, Japan, North-America, Australia.

21. *Amanita agglutinata* (Bark. et Curt.) Sing.

Kim, Kim, Park, and Hongo, 1976, Imazeki, and Hongo, 1957, p. 45; Ito, 1959, p. 249; Singer, 1962, p. 428; Imazeki, and Hongo, 1970, p. 80; Charles, and Macadam, 1973, p. 32.

Edibility: Uncertain (This mushroom is recorded as uncertain in most literature (Imazeki and Hongo), but they have been eaten in Korea Suweon).

Habitat: On the ground in woods. Summer to Autumn.

Locality: Kwangneung, Suweon.

Distribution: Korea, Japan, Northern-hemisphere.

22. *Amanita griseofarinosa* Hongo

Imazeki, and Hongo, 1971, p. 43; Kim, Kim, Park and Hongo, 1975, p. 31—33.

Edibility: Uncertain

Habitat: On the ground in deciduous woods, Summer to fall.

Locality: Suweon, Kwangneung.

Distribution: Korea, Japan.

Unrecorded species of the Genus *Amanita*.

23. *Amanita vaginata* (Fr.) Vitt. var. *punctata* (Cleland & Cheel) Gilbert. (新稱 큰우산버섯)

(*Amanitopsis puncta* Cleland & Cheel) Imazeki, and Hongo, 1971, p. 40.

Pileus 12—14cm. wide, grayish brown to pale brown, and covered with remnants of the volva on the surface, margin prominently dark-gray. Stipe 12cm. long, tapering slightly upward, and covered with dark-gray mealy scale. Volva cup-shaped, entirely buried in the soil. Spores spherical, 12—12 μ .

Edibility: Edible(?)

Habitat: On the ground in deciduous forests, Summer and Fall.

Locality: Suweon.

Distribution: Korea, Japan, Australia, New Zealand

24. *Amanita vaginata* (Fr.) Qué! var. *fulva* (Fr.) Gill. (新稱 곶동색우산버섯)

Smith, 1949, p. 396; Imazeki, and Hongo, 1957, p. 45; Ito, 1959, p. 233; Singer, 1962, p. 428; Smith, 1963, p. 172; Charles, and Macadam, 1973, p. 29.

Pileus 5—7cm. wide, thin, fragile, glossy, smo-

oth except in rare instances where a few fragments of the volva adhere to it for a time, deeply and distinctly striate on the margin, sometimes umbonate. Flesh white, in the dark forms grayish under the skin. Stem ringless, sometimes smooth, but generally mealy floccose, hollow stuffed with a cotton-like pith, not bulbous at the base. Volva long, thin, non fragile, closely sheathing yet free from the stem, except at the lower part, easily detachable and frequently remaining in the ground when the plant is pulled.

Color variable, generally mouse-gray, sometimes livid, tawny-yellow or white. Spores globose, 8-10μ wide.

Edibility: Uncertain

Habitat: On the soil in the mixed woods.

Locality: Suweon, Kwangneung, Mt. Hanla.

Distribution: Korea, Japan, Europe, North-America.

25. *Amanita flavipes* Imai. (新稱 노란대광대버섯)

Ito, 1959, p. 231; Imazeki, and Hongo, 1971, p. 41.

Pileus 4-6. 5cm. at first hemispheric, later plane, viscid when moist, belt-brownish yellow in the disc, yellow in the margin, scattered with golden powder or the surface of the pileus. Flesh thin, white, appearing slightly brown under the surface. Gills free, white or pale yellow, crowded. Stipe 7-10cm. long, 7-10cm. wide, bulbous at the base of the stipe, pale yellow, densely covered with yellowish powder on the lower side of the ring. Ring pale yellow, membranous. Volva yellowish salmon, scattered with yellowish powder around the bulb. Spores broad ellipsoid, 8-9-×6-7μ amyloid,

Edibility: Doubtful

Habitat: On the ground in woods. Summer and Fall.

Locality: Suweon, Kwangneung

Distribution: Korea, Japan.

26. *Rhodophyllus murrii* (Berk. et Curt.)

Sing. f. *albus* (Hiroe) Hongo (新稱 흰꼭지버섯)

Imazeki and Hongo, 1965, p. 77.

General descriptions of *Rhodophyllus murrii* f. *albus* are the same as *Rhodophyllus murrii*. It is different that the color of the pileus surface is yellowish white.

Edibility: : uncertain.

Habitat: On the ground in the mixed forest.

Locality: kwangneung.

Distribution: Korea. Japan. Europe, North-America.

摘 要

本研究는 우리나라에 發生하는 野生버섯의 分布狀을 調査하기 위해 1972년부터 1976년까지 水原 (光陵, 大關峯, 智異山) 및 漢拿山 等地에서 一次的으로 毒性이 강한 버섯들이 屬해있는 韓國產 광대버섯 屬에 對하여 施行한 結果, 새로이 檢討된 韓國未記錄 3種 [*Amanita vaginata* (Fr.) vtt. var. *puncta* (Cleland & Cheel) Gilbert, *A. vaginata* (Fr.) Quél. var. *fulva* (Fr.) Gill., *A. flavipes* Imai]이 添附되어 광대버섯 25種을 分類하였고, 광대버섯 25種을 3亞屬에 配置記載하였다. 그의 (*Rhodophyllus murrii*(Berk. et Curt.) Sing. f. *albus* (Hiroe) Hongo)이 韓國未記錄種으로 分類되었다.

韓國未記錄 4種에 對하여 우리나라 이름을 命名하였다.

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Explanation of the plates

- | | |
|---|-------------|
| A. <i>Amanita flavipes</i> Imai | (a. spores) |
| B. <i>Amanita vaginata</i> (Fr.) Quél, var. <i>fulva</i> (Fr.) Gill | (b. spores) |
| C. <i>Amanita vaginata</i> (Fr.) Vitt. var. <i>puncta</i> (Cleland & Cheel) Gilbert | (c. spores) |
| D. <i>Rhodophyllus murrii</i> (Berk. et Curt.) Sing. f. <i>albus</i> (Hiree) Hongo | (d. spores) |



A



B



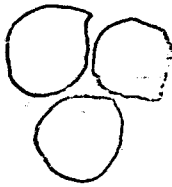
C



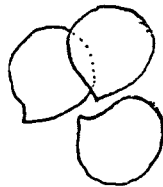
D



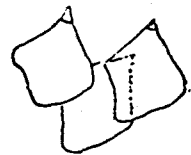
a



b



c



d