

## Notes on *Poria* from Korea

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### 韓國產 *Poria*屬에 대한 小考

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#### ABSTRACT

The present genus, once applied as an all-round taxon on resupinate polypores, was considered on account of its common occurrence throughout the world and outstanding wood-rotting nature. In Korea two species, *P. vaporaria* (but even this seems misjudged) and *P. cocos* have been known. The authors used to examine tentatively the materials formerly preserved in dried state. Among about 40 collections half of them was recognized as *P. cocos* and 4 unrecorded species, *P. versipora*, *P. subacida*, *P. medulla-panis*, and *P. eupora*, which are newly registered to Korea in this article.

#### INTRODUCTION

The genus *Poria* belongs to the Polyporaceae which is a family of the Aphyllophorales, of Basidiomycetes, whose hymenium is lining the interior of pores or similar depressions in the fructification. At first this genus was adopted to include all species which are entirely resupinate upon the substratum. Usually they are encrusting, thin, membranaceous, coriaceous, fleshy, or corky, and they may never be reflexed. Upon this reason simply young or abnormal forms of other pileate genera were frequently confused with this genus. Once about 700 species were described, but nowadays there are not more than 200 tenable species including confirmed tropical ones (Cunningham, 1947; Lowe, 1963). Also the members of *Poria* consist of destructive wood-decay fungi, so cultural studies have been carried out by some foreign workers in view of their economical importance.

Available methods of recent classification are largely based on microscopic features, such as systems and series of context hyphae, their color, presence or absence of clamp connections, basidial types, and modified hyphal elements like cystidia or setae. Those features were considered here for more exact identification. For microscopy freehand sections were enough for routine observation. When mounting sections 5% KOH solution or 10% ammonia was dropped for the purpose of reswelling the shrunk tissues and then formalin-glycerine water (1:1 v/v) was followed for using the prepared slides a number of times. And in bibliography domestic records were simply listed within parentheses.

#### DESCRIPTIONS

*Poria* Pers. per S.F. Gray emend. Cunningham

구멍버섯屬(新稱)

S.F. Gray in Nat. Arr. Brit. Pl. 1: 639, 1821;

Neuman, Polypor. Wisc. 45, 1914; Rea, Brit. Basid. 598, 1922; Cunningham, Dept. Sci. Ind. Res. Pl. Dis. Div. Bull. 72 : 5, 1947; Ito, Myc. Fl. Jap. 2(4) : 212, 1955; Donk, Persoonia 1 : 266, 1960 & Persoonia 5 : 50, 1937.

(Lee *et al.*, p. 93, 1959; Lee & Jung, p. 36, 1973)

TYPE SPECIES : *P. vulgaris* (Fr.) S. F. Gray.

Cunningham again emended with "Hymenophore entirely resupinate, encrusting, discrete or effused; pores poroid or daedaloid, in one or several layers; basidial types meruloid, honeycomb or clavate; spores variously shaped, hyaline, smooth or seldom roughened."

1. *Poria versipora* (Pers.) Romell 구멍버섯 (新稱)  
Romell in Sv. Bot. Tidsk. 20 : 15, 1926; Cunningham, Dept. Sci. Ind. Res. Pl. Lis. Div. Bull. 72 : 29, pl. 7, f. 3, 1947; Ito, Myc. Fl. Jap. 2(4) : 214, 1955; Lowe & Gilbertson, Mycologia 53 : 494, 1961; Lowe, Mycologia 55 : 468, 1963.

Basidiocarp annual, initially from islets, soon confluent and widely effused, sulphureous buff, bright alutaceous buff, to creamy buff, very thin, only up to 0.7 mm thick, drying fragile; subiculum concolorous, less than 0.2 mm thick; margin indeterminate, —2 mm wide, adnate, inseparable, sterile, pruinose to pubescent, or byssoid, whitish or creamy; pores small, (3—) 5—7/mm, round, subangular or irregular, often labyrinthiform, commonly with dentate or splitted dissepiments; tubes —1 (sometimes up to 2) mm long, shallow, not zoned.

Spores 3.3—5.5 x 2.8—4  $\mu$ , hyaline, subglobose to broad ellipsoid, smooth; basidia 12—14 x 4—5  $\mu$ , forming a dense palisade, with 4 sterigmata; cystidia 20—50 x 1.5—3.5  $\mu$ , numerous in tufts, encrusted. Skeletal hyphae up to 4  $\mu$  wide, moderately thick-walled, aseptate; generative hyphae 1.5—3.5  $\mu$  wide, thin to moderately thick-walled, clamped, branched.

HABITAT : on dead trunks or logs of *Quercus* or other broad-leaved trees.

MATERIAL : 27-VIII-1964, Lee(R-8); 3-IX-1964, Lee(R-5); 15-IX-1964, Kim(R-7, R-9); 5-VII-1971, Jung(R-13); 26-VII-1971, Hong(R-21); 28-V-1972, Hong(R-12); 1-V-1972, Park(R-

10); 8-VI-1972, Hong(R-11); 15-VII-1972, Hong(R-3); 5-X-1972, Hong(R-20).

DISTRIBUTION : Korea (Seoul, Gwangneung, Mt. Naeyeon, DMZ), Australia, New Zealand, Europe, North America, Alaska.

Exactly speaking above-mentioned cystidia are the skeleto-cystidia which proceed and recurve toward the hymenium directly from skeletal hyphae and they are fairly common in the Polyporaceae.

2. *Poria subacida* (Peck) Sacc. 금빛구멍버섯 (新稱)  
Saccardo in Syll. Fung. 6 : 325, 1888; Neuman, Polypor. Wisc. 52, 1914; Graham, Mush. G. Lakes, 100, 1944; Aoshima, Rep. Gov. For. Exp. St. 46 : 157, 1950; Ito, Myc. Fl. Jap. 2(4) : 214, 1955; Lowe & Gilbertson, Mycologia 53 : 496, 1961; Lowe, Mycologia 55 : 464, 1963.

Basidiocarp annual or perennial, widely effused, creamy ochre to ochraceous buff, often with a pinkish tint, 3—7 mm thick, tough and coriaceous; subiculum thin to moderately thick up to 3 mm, whitish or alutaceous, margin 3 mm wide, adnate or somewhat separated on drying, determinate, (paler) concolorous, often tomentose, sterile, soon fertile; pores small, 3—5/mm, round or subangular, with entire or dentate dissepiments; tubes often oblique, —4 mm thick, 3—6(—9) mm long, straight, often inconspicuously zoned.

Spores 4—6 x 3—4  $\mu$ , hyaline, subglobose or broad ellipsoid, smooth, shortly apiculate; basidia 12—15 x 5—7  $\mu$ , clavate, with 4 sterigmata; cystidia none. Hyphae 1—3.5  $\mu$  wide, thick-walled; septa and branching not observed.

HABITAT : on trunks of *Pinus* or other coniferous woods.

MATERIAL : 5-VII-1971, Jung(R-13-1); 19-III-1972, Lee(R-1); 5-X-1972, Hong(R-19), Choi(R-2, R-2-1, R-4).

DISTRIBUTION : Korea (Seoul, Mt. Jiri, Mt. Hanra, DMZ), Japan, Mexico, North America, Alaska.

Characters often deviate from other descriptions, that is, in thicker subiculum (cf. Ito, 0.3—1 mm thick) and longer tubes (cf. Aoshima, 3 mm long or so). And there are evidences of zonation having

revived 2–3 times, but this is not always obvious. However generally from various aspects and keys it can be confirmed as the present fungus.

3. *Poria medulla-panis*(Jacq. ex Fr.) Cooke

백색구멍버섯(新稱)

Cooke in Grev. 14 : 109, 1886; Neuman, Polypor. Wisc. 52, 1914; Rea, Brit. Basid. 599, 1922; Graham, Mush. G. Lakes, 99, 1944; Ito, Myc. Fl. Jap. 2(4) : 214, 1955.

Basidiocarp widely effused, pure white when fresh, later a little soiled, 1–7mm thick, tough and coriaceous; subiculum narrow, 0.5mm thick, white; margin defined, obtusely ridged, somewhat undulate, adnate, —2 exceptionally up to 6mm sterile then fertile, glabrous or finely pruinose; pores typically angular, variable in size, 2–4/mm, with entire, pubescent or somewhat dentate dissepiments; tubes straight or oblique, —5mm long, alutaceous.

Spores 4–6 x 2–3  $\mu$ , ellipsoid, often truncate at one end, hyaline, smooth; basidia 15–20 x 4.5–5  $\mu$ , collapsed, gelatinized, with 4 sterigmata; cystidia none. Hyphae uniform, 3–4  $\mu$  wide, simple-septate; walls less than 1  $\mu$  thick.

HABITAT : on dead stump of broad-leaved tree

MATERIAL : 15-VI-1974, Jung(R-17).

DISTRIBUTION : Korea (Suweon), Japan (Honshu), Philippines, Australia, Europe, North America.

As compared with the rare occurrence this species can be easily identified by the characteristic spores.

4. *Poria vaporaria*(Fr. non Pers.) Cooke

술털구멍버섯

Cooke in Grev. 14 : 111, 1886; Neuman, Polypor. Wisc. 54, 1914; Rea, Brit. Basid. 602, 1922; Ito, Myc. Fl. Jap. 2(4) : 216, 1955; Lowe & Gilbertson, Mycologia 53 : 498, 1961; Lowe, Mycologia 55 : 462, 1963; Lombard & Gilbertson, Mycologia 57 : 71, 1965.

(Kaburagi, p.366, 1940; Lee, J. Y., 1957 & p. 37, 1973; Lim, J. H., p.16, 1968; Lim & Kim, p. 17, 1972; Lee & Jung, p. 52, 1972).

HABITAT : on trunks in coniferous woods.

DISTRIBUTION : Korea, Japan, Europe, North

America, Philippines, Alaska.

Often *Poria versipora* was mistook for the present fungus which usually fissures on drying and has allantoid spores. However the authors are not familiar with this species.

5. *Poria eupora*(Karst.) Cooke 살색구멍버섯(新稱).

Cooke in Grev. 14 : 110, 1886; Rea, Brit. Basid. 600, 1922; Cunningham, Dept. Sci. Ind. Res. Pl. Dis. Div. Bull. 72 : 28, pl. 6, f. 1, 1947; Aoshima, Rep. Gov. For. Exp. St. 46 : 157, 1950; Ito, Myc. Fl. Jap. 216, 1955; Lowe & Gilbertson, Mycologia 53 : 496, 1961; Lowe, Mycologia 55 : 461, 1963; Lombard & Gilbertson, Mycologia 58 : 834, 1966 —*Poria attenuata* Cooke in Grev. 14 : 110, 1886; Neuman, Polypor. Wisc. 51, 1914.

Basidiocarp annual, effused, separable, pinkish ochre to ochraceous buff, —2.5mm thick, often fissured when dry, coriaceous then somewhat horny corky on drying; subiculum less than 0.5mm thick, alutaceous; margin extending up to 4mm, whitish, subpruinose, sterile, often separated when dry; pores small, 5–8/mm, round, with entire to laciniate thin dissepiments; tubes sometimes oblique, —2mm long, concolorous.

Spores 4–5 x 2.5–3.5  $\mu$ , broad ellipsoid, hyaline, smooth; basidia 12–18 x 5–6  $\mu$ , collapsed, laterally cemented in a palisade; cystidia rare, 7–8 $\mu$  wide, generally embedded, with a sheath densely encrusted. Skeletal hyphae 2–3  $\mu$  wide, moderately thick-walled, aseptate, rarely branched.

HABITAT : on truncate stumps of broad-leaved trees.

MATERIAL : 14-V-1972, Hong(R-16); 8-I-1973, Jung(R-16-1).

DISTRIBUTION : Korea (Gwangneung), Japan (Honshu), Australia, New Zealand, Europe, North America.

Rare occurrence of cystidia and larger spores keep away the authors from drawing a conclusion, but the other characters satisfy the conditions for identification. It seems that rare or abundant cystidia may depend on every different collection as Cunningham suggests.

6. *Poria cocos*(Schw.) Wolf 茯苓

Wolf in Jour. Elischa Mitch. Soc. 38 : 127, 1922; Kawamura, Ic. Jap. Fung. 104, f. 102, 1954; Ito, Myc. Fl. Jap. 2(4) : 218, f. 173, 1955; Lowe & Gilbertson, Mycologia 53 : 492, 1961; Lowe, Mycologia 55 : 456, 1963.

(Murata, 1934; Jung, T.H., 1936; Lee, J.Y., 1957 & p.37, 1973; Lim, J.H., p. 16, 1968; Lim & Kim, p. 17, 1972; Lee & Jung, p.52, 1972).

Sclerotium associated with *Pinus* root under the ground, globose, ellipsoidal, 5—7cm in diam, with fragmentary bark over the surface, chestnut-brown to sooty, rugose; cortex hardened, 0.2—0.5mm thick; contents whitish to creamy pink, limy, often radially cracked, composed of granules and hyphae mostly 2—4  $\mu$  wide, sometimes spread with thin mucilage, positive on iodine.

Context hyphae narrow to wide, commonly 2—6  $\mu$  in diam, often up to 10  $\mu$  wide and ochraceous, thin- to thick-walled, adventitiously branched, aseptate. Spores 6—8.5 x 2.5—3.2 $\mu$ , oblong to ellipsoid, sparsely sway-backed, hyaline, smooth.

HABITAT : on the roots of *Pinus*.

MATERIAL : 29-VIII-1966, Hong(R-44, R-51).

DISTRIBUTION : Korea (Gwangneung), Japan, China, North America.

The authors could not observe the pores and tubes of basidiocarp which seemed collapsed, but the spores were detected under the cortex. This peculiar fungus has been utilized as a Chinese medicine from old times.

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## Explanation of Plates

Plate 1. Microscopic elements.

Fig. 1. *Poria subacida*(A. spores; B. basidia; C. hyphae).

Fig. 2. *Poria versipora*(A. spores; B. basidia; C. hyphae; D. cystidia).

Fig. 3. *Poria medulla-panis*(A. spores; B. basidia; C. hyphae).

Fig. 4. *Poria eupora* (A. spores; B. basidia; C. cystidia; D. hyphae).

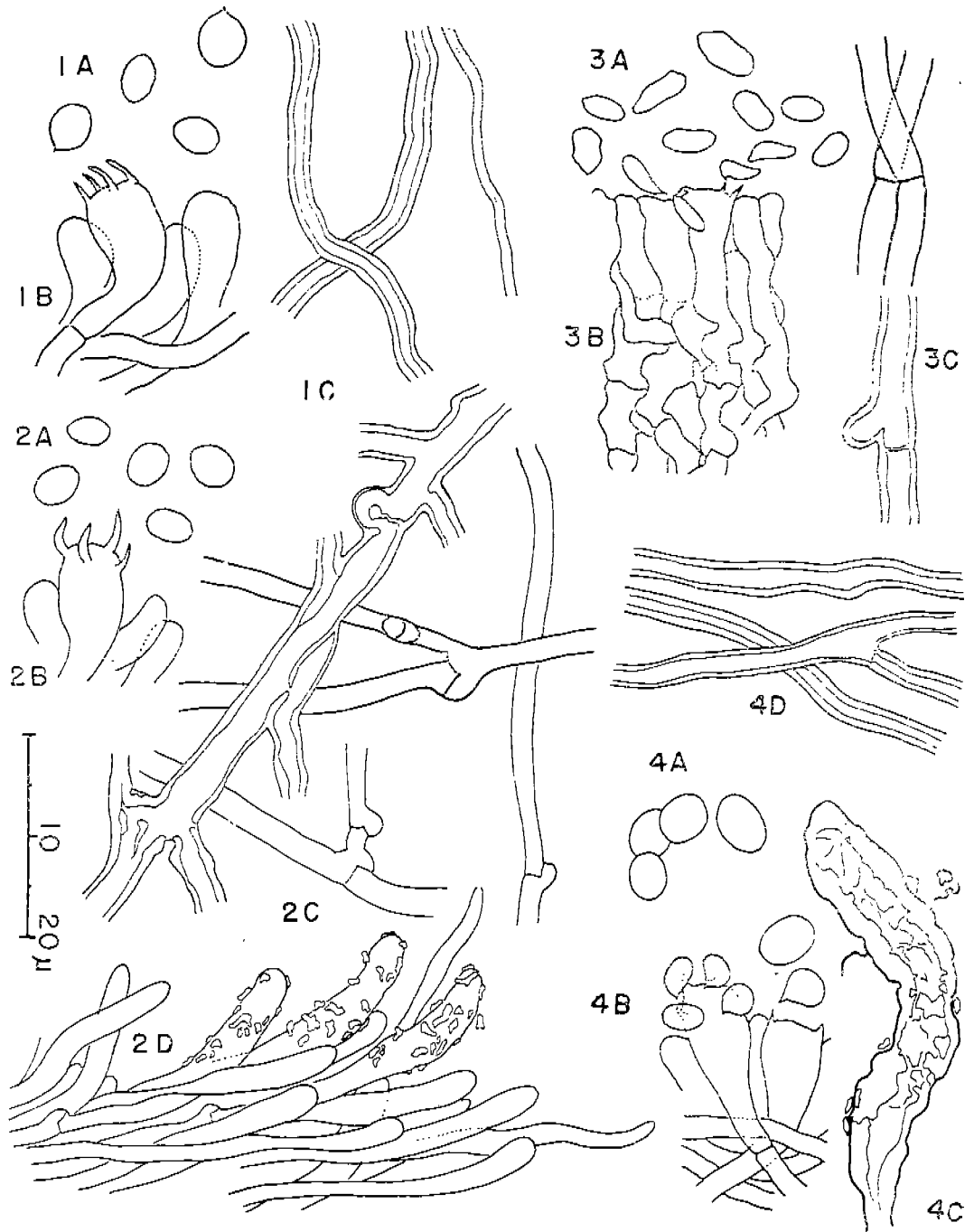
Plate 2. Basidiocarps.

Fig. 1. *Poria versipora*.

Fig. 2. *Poria medulla-panis*.

Fig. 3. *Poria subacida*.

Fig. 4. *Poria eupora*.



— Plate 1 —

