Taxonomic study on Korean Aphyllorhales (IV)
- on some unrecorded wood-rotting fungi -

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한국산 민주름버섯목의 분류학적 연구 (IV)
- 수종 미기록 목재부류균류에 대하여 -

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ABSTRACT: Wood-rotting fungi of the Aphyllorhales were collected through field trips to mountain areas of the country from January to December of 1997. Through the observation and identification of specimens, two genera, *Meruliopsis* (type species = *M. taxicola*) and *Pseudomerulius* (type species = *P. aureus*), and four species, *Phanerochaete calotricha*, *Phanerochaete chrysorhiza*, *Meruliopsis corium*, and *Pseudomerulius aureus* were confirmed as new wood-rotting fungi to Korea and are registered here with descriptions.

KEYWORDS: Aphyllorhales, Unrecorded fungi

During the period from January to December of 1997, fresh fungi were surveyed and collected through 35 field trips to seven national parks, one provincial park, one county park, two national tourist resorts, two local areas, five Kyunggi areas, and four suburban metropolitan areas throughout the country from January to December of 1997. Through periodical collection trips, 550 specimens of higher fungi were collected, among which more than four fifths of specimens belonged to the Aphyllorhales of the Basidiomycota were technically examined. Systematic and taxonomic studies on collected materials were then carried out to discover unrecorded or native species of Korean wood-rotting Aphyllorhales.

In result, about 100 taxa of the Basidiomycota were temporarily identified to the species through the observation of morphological and microscopic structures of basidiospores. For the observation of specimens, laboratory techniques of Largent et al. (1977) and microscopic methods of Jung (1987) were employed. Among the third report on the taxonomic study on Korean Aphyllorhales (Jung, 1996), two genera, which were *Meruliopsis* (type species: *M. taxicola*) and *Pseudomerulius* (type species: *P. aureus*), and four species, which were *Phanerochaete calotricha*, *Phanerochaete chrysorhiza*, and *Meruliopsis corium* of the Corticiaceae, and *Pseudomerulius aureus* of the Coniophoraceae were confirmed as new wood-rotting fungi to Korea and are registered here with Korean names and English descriptions.

Taxonomy

For the taxonomy of the Aphyllorhales, Donkian concept (1964) was adopted, and the classification system of Eriksson (1958) and Eriksson et al. (1973-1984) and the systematics of Parmasto (1968) were referred for the corticioid fungi of the present study. And the memoir of Gims and Lefebvre (1993) was consulted for merulioid and coniophoroid fungi. The colored illustrations of Breitenbach and Kränzlin (1986) and the description keys of Jülich and Stalpers (1980) were very useful for the detailed descriptions of specimens and were frequently consulted for identification.

Jung (1994) once reported the fungal flora of Korean wood-rotting fungi based on the specimens collected from 15 national parks, 7 local areas, and 2 islands for two years from the spring of 1990. In the report, he listed 98 genera, 217 species, and 1 variety for the wood-rotting fungal flora belonging to the Aphyllorhales. And then, in his first to third reports (Jung, 1995, 1996a, 1996b) for the taxonomic studies on the Korean Aphyllorhales published in series, he renewed the previous list by adding 2 genera 7 species, 1 genus 6 species, and 1 genus 6 species respectively. Including above-listed 4 genera and 19 species as well as 2 unrecorded genera and 4 unrecorded
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species counted here, currently confirmed wood-rotting fungi of the Korean Aphyllorhizales amount to 17 families, 104 genera, 240 species, and 1 variety.

Corticiaceae 고악버섯과


Fruiting annual, resupinate, usually soft when fresh, membranous when dry, more or less detachable, vivid and various in color; hymenial surface smooth or tuberculate; margin fimbriate, fringed, or sometimes rhizomorphic; hyphal system monomitic, hyphal system distinct, subhymenial hyphae simple-septate, thin-walled, richly branched, intertwined, subicular hyphae occasionally nodose-septate, thick-walled, infrequently branched, and straight; cystidia usually conspicuous and numerous, varying in shape and nature; basidium narrowly clavate, with 4 sterigmata; basidiospores narrowly ellipsoid to allantoid, smooth, not amyloid.

Type species: Phanerochaete velutina (Fr.) Karst.

Remarks: Phanerochaete is rather easily recognized both macroscopically and microscopically by its bright color of fruitbodies, frequent to numerous distinct cystidia, and thick-walled subicular hyphae with occasional conspicuous clamps.


Fruiting resupinate, effused, thin, becoming membranaceous, more or less detachable, thin, less than 0.3 mm thick; hymenial surface white, then turning yellowish or pale ochraceous, smooth, somewhat cracking on drying; margin variable but often partly fibrillose and with whitish rhizomorphs.

Hyphal system monomitic; subhymenial hyphae simple-septate, thin-walled, 2-3 μm wide, richly and irregularly branched; subicular hyphae infrequently nodose-septate, somewhat thick-walled, 4-6 μm wide, sometimes up to 10 μm wide, sparsely branched, somewhat horizontally arranged; cystidia abundant, more or less subulate, 43-51×4-6 μm, commonly projecting; basidium narrowly clavate, without basal clamp, 23-26×4-6 μm, with 4 sterigmata; basidiospores narrowly ellipsoid, straight or adaxially somewhat convex, 3.8-4×2.2-2.5 μm, smooth, generally with two oil-drops, inamyloid.

Habitat: on a fallen twig of an unknown hardwood

Remarks: Due to the conspicuous orange fruitbody with subulate spines and rhizomorphic cords, this fungus is easily identified with the naked eye. Microscopically, it has encrusted hyphae, leptocystidia, and spores typical of the genus Phanerochaete.


Meruliaceae 아교버섯과


Fruiting annual, resupinate, effused, effused-reflexed, to slightly pileate, membranaceous; hymenial surface whitish to ochraceous, even, becoming merulioid; hyphal system monomitic; hyphal system simple-septate, thin- to somewhat thick-walled; cystidia sometimes present, cylindrical; basidium narrowly clavate, with 4 sterigmata; basidiospores cylindrical to narrowly ellipsoid, smooth, hyaline, inamyloid.

Type species: Meruliposis taxicola (Per.) Bond. apud Parm.

Remarks: According to Jülich and Stalpers (1980), this genus is synonymous with genera Byssomerulius and Ceraceomerulius. It has a typical meruloid hymenium and several characters that agree with the genus Phanero-
chaete in nature of hyphae, basidia, and spores (Eriksson and Ryvarden, 1973).

3. **Meruliosis corium** (Fr.) Ginns, Canad. J. Bot. 54: 126, 1976 (한가족아교버섯 (신청))

Fruitybody resupinate, effused-reflexed to somewhat semipileate, growing in patches, 0.5-1 mm thick, membranaceous; pilei projecting outward to the side, forming narrow and continuous edges; upper surface whitish to creamish, fibrillo-se-tomentose, inconspicuously zoned; lower surface whitish to ochreish, initially smooth, then reticulate-poroid to merulioid, verrucose; margin finely byssoid; texture leathery membranaceous, rather tough.

Hyphal system monomitic; generative hyphae simple-septate, thin-to-thick-walled, 2.5-4.5 µm wide, commonly branched and intertwined; cystidia none; basidia slenderly clavate, without basal clamp, 25-30×4-6 µm, with 4 sterigmata; basidiospores narrowly ellipsoid, 4-5×2-3 µm, smooth, inamyloid.

Habitat: on a fallen twig of *Prunus sargentii*

Remarks: This species is called *Byssomerulius corium* depending on authors (Eriksson and Ryvarden, 1973). Its fruitybody is rather various from resupinate to semipileate forms in shape but is very simple and has no particular characters under the microscope. Its relationship with other merulioid fungi is uncertain but the species is placed in the Meruliaceae for the present (Imazeki et al., 1988).

Specimens: Naesang-ri, Gunwi, Gunwi-gun, Gyungsangbuk-do, SNU 970918-1

**Coniophoraceae** 버짐버섯과

*Pseudomerulius* Jüll, Persoonia 10(3): 330, 1979 주름버짐버섯속

Fruitybody annual, resupinate, effused to effused-reflexed, adnate to separable, soft and ceraceous when fresh, firm and brittle when dry; hymenial surface yellow to yellow brown, darkening with time, merulioid; hyphal system monomitic; hyphae nodose-septate, richly branched or densely united; cystidia absent; basidia clavate, usually with 4 sterigmata; basidiospores cylindrical, smooth, somewhat colored, with thickening walls, inamyloid, cyanophilous.

Type species: *Pseudomerulius aureus* (Fr.) Jüll.

Remarks: *Pseudomerulius* has an irregularly netted hymenophore and is closely related to *Leucogyrophana* in sharing colored and cyanophilous spores of thickening walls and leaving too small differences to differentiate from the latter genus (Eriksson et al., 1981).

4. **Pseudomerulius aureus** (Fr.) Jüll. Persoonia 10(3): 330, 1979 주름버짐버섯 (신청)

Fruitybody resupinate, effused or partly reflexed, about 1 mm thick, adnate, becoming loosely attached and separable on drying, orbicular, often confluent; hymenial surface yellow, yellow orange, or yellow brown, becoming dark on touching or aging, irregularly folded into a net of composed pores, pores 1-2 mm wide; margin distinct, white or yellow, narrow.

Hyphal system monomitic; hyphae nodose-septate, thin-walled, somewhat thick-walled in the subiculum, 2-3 µm wide in the subhymenium, 3-5 µm wide in the subiculum, richly branched; cystidia none; basidia clavate, with basal clamp, 15-20×4-5 µm, with 4 sterigmata; basidiospores cylindrical, adaxially straight or slightly curved, 3-3.5×1.5 µm, smooth, cyanophilous, inamyloid.

Habitat: on a fallen twig of *Pinus densiflora*

Remarks: This fungus is easily recognized because of its brightly colored fruitybody and irregularly composed
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pores in the field. Ampullate clamps and cyanophilous spores are helpful characters under the microscope. Basidiospores of the SNU specimen are rather small, compared with those in literature of Eriksson et al. (1981).

Specimens: Wang-san, Wangoan-ri, Mohyun-myeon, Yongin, Kyunggi-do, SNU 970927-4

Conclusion

From seven national parks, one provincial and one country parks, two national tourist and two local areas, and five Kyunggi and four suburban areas throughout the country, total 550 specimens of higher fungi were regularly searched and collected from January to December of 1997 and identified to the species according to recent classification systems. Fungi belonging to the Aphyllophorales of the Basidiomycotina which took more than four fifth of collections were systematically studied for the discovery of unrecorded or native species of Korean wood-rotting Aphyllophorales.

Among identified species, two genera, Meruliposip and Pseudomerulius, and four species, Phanerochaeta calotricha, Phanerochaeta chrysorhiza, Meruliposip corium, and Pseudomerulius aureus were confirmed as new taxa to Korea. When unrecorded fungi of the first to third reports on the taxonomic study on Korean Aphyllophorales published in 1995 and 1996 and those of the present study are added to the list prepared by Jung through the second fungal floral study of Korean wood-rotting fungi in 1994, total confirmed wood-rotting fungi of the Korean Aphyllophorales amount to 17 families, 104 genera, 240 species, and 1 variety.

The unrecorded species of the present study were collected from Naerang-ri, Daemo-san, and Wang-san. Among them, Phanerochaeta calotricha and P. chrysorhiza were found on unknown hardwoods, Meruliposip corium on Prunus sargentii, and Pseudomerulius aureus on Pinus densiflora. Two species were collected from Naerang-ri of Gyungsangbuk-do and two other species from the suburbs of Seoul like Daemo-san and Wang-san. Although there had been no fungal surveys from Gunwi area before and the area had been polluted by local industries, Gunwi area seemed to have a unique fungal flora of its own and, following the third report of Jung (1996), Seoul and its surrounding areas of Kyunggi Province again showed a variety of fungal flora. Gunwi and Seoul areas were apparently suitable localities for the floral study of the Aphyllophorales in relation to the industrial pollution.

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References