

Taxonomic Study on *Inocybe* in Korea

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Dried specimens of the genus *Inocybe* collected from mountain areas throughout the Korean country from 1982 to 1998 and preserved in NIAST were investigated. Out of them, *Inocybe hystrix* were confirmed as an unrecorded species in Korea. In 1991 Lee *et al.*, previously recorded *Inocybe kasukayamensis* only with its scientific name and Korean common name. In this study we report it with full descriptions of morphological characteristics and diagnosis of micro-structures of this species.

KEYWORDS: *Inocybe hystrix*, *Inocybe kasukayamensis*

The genus *Inocybe* having brown spores, without an apical germ pore, pileipellis consisting of cutis of elongate or filamentous hyphae and with or without corti inner veil belongs to the family Cortinariaceae, order Agaricales, subclass Hymenomycetidae, and subdivision Basidiomycotina.

In Korea, Lee and Lee (1957) reported at first three species of *Inocybe* in their report "A list of the Korean fungi (1)". Ten years later, one species of *Inocybe* was added by Lim (1968). Kim *et al.* (1978) listed up to 8 species of *Inocybe* in their report "Standard Korean Names of Mushrooms in Korea". After this report, a lot of mycologists of Korea have intensively worked on the classification and identification of mushrooms. A total of 28 species belonging to *Inocybe* had been reported from 1957 to 1994. Park (1994) had identified 27 species of *Inocybe* in Korea in her MS thesis including ten unrecorded species with full descriptions and illustrations, except for 10 species lacking specimens although they were already reported in Korea.

For the diversity of *Inocybe* in Korea, dried specimens deposited in the NIAST's herbarium were investigated by authors from March to November in 1999. Out of them, two species, *Inocybe hystrix* and *Inocybe kasukayamensis*, were confirmed as new species to Korea and registered here with full English descriptions, illustrations and Korean names.

Materials and Methods

For the observation of the macroscopic and microscopic features of basidiomes, measurements of the fruitbody, characters of the pilus, lamellae, stipe and etc. were investigated based on the method of D. L. Largent *et al.* (1977). Value of spores excluding ornamentations and the value of basidia excluding sterigmata and also value of metuloids excluding

crystals were measured. The color terms used here are those from Kernerup and Wanscher (1978) and also from Munsell notation. For the identification and classification of *Inocybe*, the concept and system of Singer (1987) were applied.

The monographs, illustrations and colored illustrations of Alessio (1980), Kuyper (1986), Stangl (1989), Imazeki and Hongo (1987) and other papers were employed for the detailed descriptions and identification. All specimens examined here are deposited in NIAST's herbarium.

Descriptions

1. 털보땀버섯 (신칭) *Inocybe hystrix* (Fr.) Karst. in Bidrag Kannedom Finlands Natur Folk 32 : 453, 1879

Syn. : *Agaricus hystrix* Fr. Epicrisis: 171. 1838

Pileus 16~37 mm wide, at first campanulate to broadly campanulate, then becoming plano-convex, finally plane, often with low umbo, surface fawn (7E4), somalis (7E5) to eye brown (7F6) or dark brown recurved to erected fibrillose squarrose, but somewhat fibrous scales just near the margin when fully expanded on the yellowish white ground color and paler towards margin. context white, unchanged when cut. odor spermatic, taste indistinct.

Lamellae adnate, close, somewhat narrow, at first whitish to pallid later becoming yellowish umber to pale greyish brown, edge whitish, subfimbriate, lamellulae 1 - 3-tiers.

Stipe 22~54×2.5~4.5 mm, cylindrical, equal to slightly thickened towards base, surface eye brown (7F6), concolorous with the pilous, entirely covered with erected to recurved squamose, but except the stipe apex, with cob-webby inner veil in young, later forming evanescent zone at apex. context (6B3) at apex, elsewhere whitish, unchanging when cut.

Spore print none observation, spores 8.3~12.4×5.2~6.4 μ m, smooth, subamygdaliform, with tapered or subconical apex. **Basidia** 23.6~31.6×7.5~9.5 μ m, normal clavate, 4-spored.

Pleurocystidia 48.7~70.3×8.4~19.5 μ m, subcylindrical with

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broadly rounded or subcapitate apex, sublageniform, somewhat thick-walled, almost hyaline. **Cheilocystidia** $17.5\sim 36.5\times 10.4\sim 16\ \mu\text{m}$, subclavate to clavate, abundant, clusters, thin-walled and frequently appearing **pleurocystidia** like metuloids cystidia. **Hymenophoral trama** parallel. **Pileipellis** palisade trichodermium, $5.4\sim 16.7\ \mu\text{m}$ in diam. **Caulocystidia** $15.4\sim 31.5\times 6.3\sim 15.7\ \mu\text{m}$, short clavate, thin walled, abundant clusters and sometimes metuloid like cystidia $32.4\sim 62.1\times 16\sim 27.8\ \mu\text{m}$, at apex.

Edibility: unknown

Habit and Habitat: Summer, scattered or a few grouped under the forests of *Quercus* sp. scattered with *Pinus* species, very Rare in Korea.

Distribution: Korea, widespread in northern Europe, North America

Materials examined: Huibang-sa, Soback-san, Chungbuk, Oct., 1st. 1995 (ASI : 3087)

Observation: Our descriptions made from several specimens collected from one site around Huibang-sa Temple showed some variation in size and color of this species compared to reported descriptions. However, this specimens (ASI : 3087) coincides well with *Inocybe hystrix* reported by Karsten (1879). This taxa is distinguished from other

species of *Inocybe* by the pileus and stipe with umber and prominent scales.

2. 광택줄기담버섯 *Inocybe kasugayamensis* Hongo in Mem. Shiga. Univ. vol. 13 1963

Pileus $8\sim 21.5\ \text{mm}$ in diam. at first hemispherical later convex to plane, with a distinct or indistinct obtuse umbonate around center. surface dry, sericeous to subfibrillose, pale yellow to yellowish white (4A2-3), orange white to pale orange (5A2-3) or greyish orange (5B3) in young, then becoming cinnamon brown (6C-D5-6) to brownish orange to light brown (7C-D5-6) when old, Context thin, whitish, however pale reddish brown in stipe, odor faint, indistinct (earth-like in literature), taste indistinct or mild.

Lamellae emarginate, subdistant, 3 broad, at first yellowish white, later pale cinnamon, edge finely pruinose, lamellulae 1- to 3-tiers.

Stipe $26\sim 42\times 2\sim 3\ \text{mm}$, cylindric, equal, slender, very often flexure, surface dry, pruinose, at first whitish, becoming reddish brown to reddish when touched or old, in young solid, later somewhat hollowed. Annulus corti, fugacious.

Spore print brown. Spore $7.2\sim 9.3\times 4.8\sim 6.2\ \mu\text{m}$, somewhat angular with nodulose, fulvous-ochraceous under the microscope, inamyloid in Melzer's reagent. **Basidia** $18.9\sim 23.5\times 6.2\sim 6.8\ \mu\text{m}$, typically 4-spored, with clamp connection at base. **Cheilocystidia** $30.5\sim 58.4\times 12.5\sim 16.8\ \mu\text{m}$, fusoid-ventricose, subclavate, encrusted at apex, metuloid, numerous.

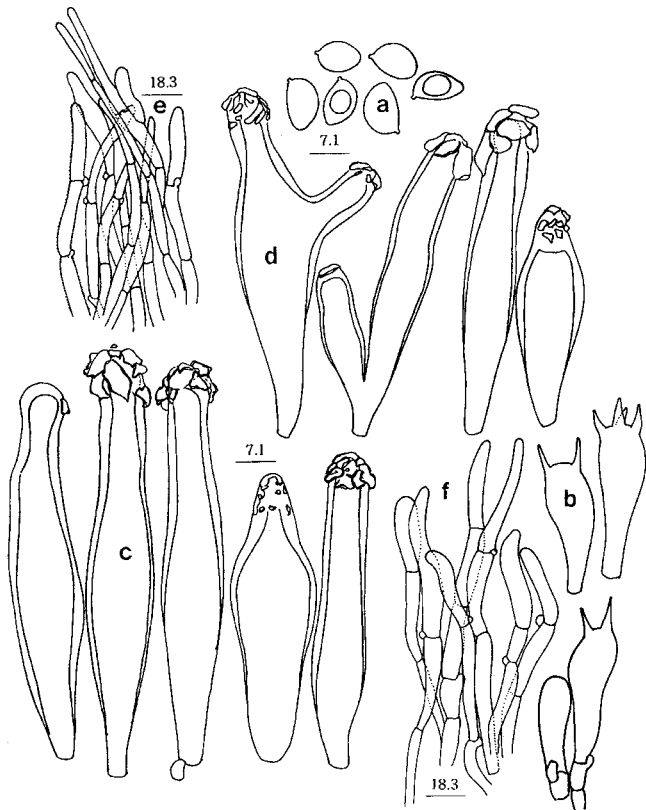


Plate 1. Microscopic structures of *Inocybe hystrix* a. spores ($\times 100$) b. basidia ($\times 100$) c. pleurocystidia ($\times 100$) d. cheilocystidia ($\times 100$) e. pileipellis ($\times 40$) f. stipitipellis ($\times 40$).

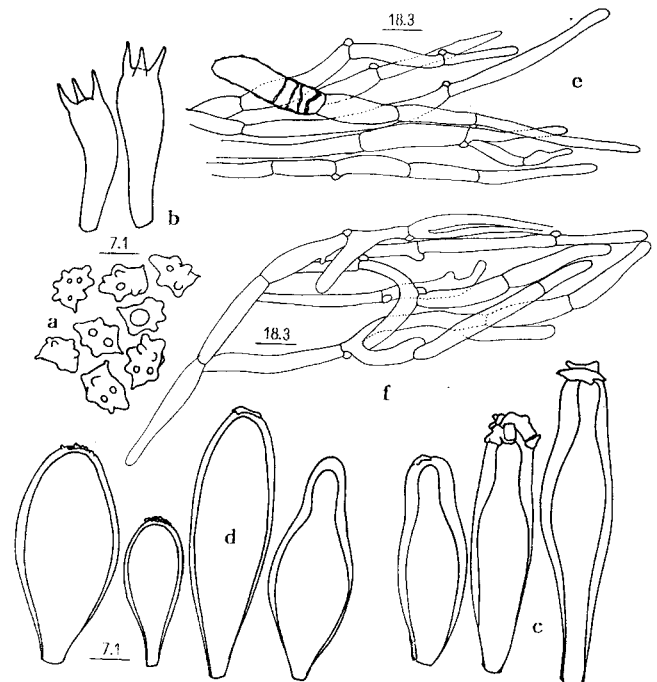


Plate 2. Microscopic structures of *Inocybe kasugayamensis* a. spores ($\times 100$) b. basidia ($\times 100$) c. pleurocystidia ($\times 100$) d. cheilocystidia ($\times 100$) e. pileipellis ($\times 40$) f. stipitipellis ($\times 40$).

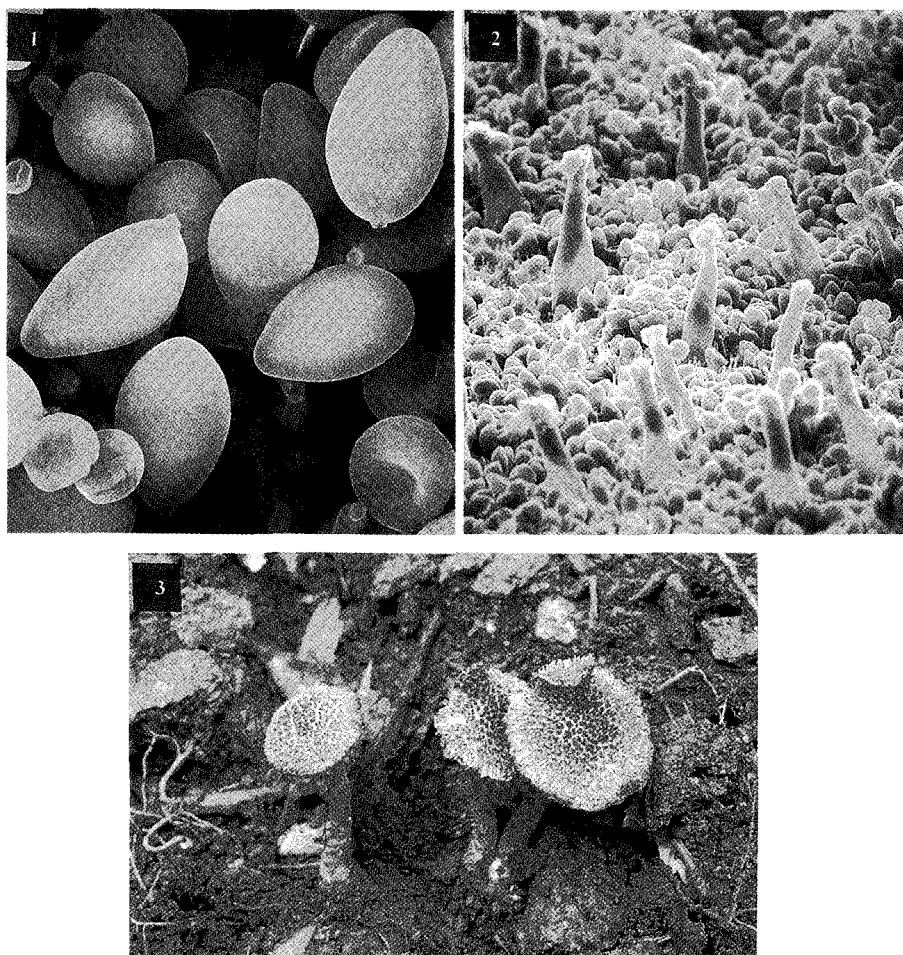


Fig. 1. Morphological characteristics of Genus *Inocybe*. *Inocybe hystrix* : 1. spores ($\times 5,000$) 2. cystidia ($\times 800$) 3. carpophore.

Pleurocystidia similar to cheilocystidia in shape and size, but sparse. Hymenophoral hyphae irregular. Hyphae septa with clamp connection.

Edibility: unknown

Habit and Habitat: in Summer, solitary to scattered on the ground in broad leaved forest.

Specimens examined: Songni-san, Chungbuk, Oct., 1st. 1995 (ASI : 5845)

Distribution: Korea, Japan

Observation: This taxa is characterized by the pallid whitish pileus and stipe, which later turn to red, when touched or old. Stipe rather slender and spores are angular with nodulose. It's closely related to *Inocybe trechispora* (Berk.) Karst., but it's easily distinguished by the reddish staining of pileus and stipe. In 1991 Lee *et al.*, previously recorded *Inocybe kasukayamensis* as an unrecorded national species, which gave only its scientific name and korean common name, without any descriptions of characters. In this study we report with full descriptions of morphological characters and the diagnosis of micro-structures of this species.

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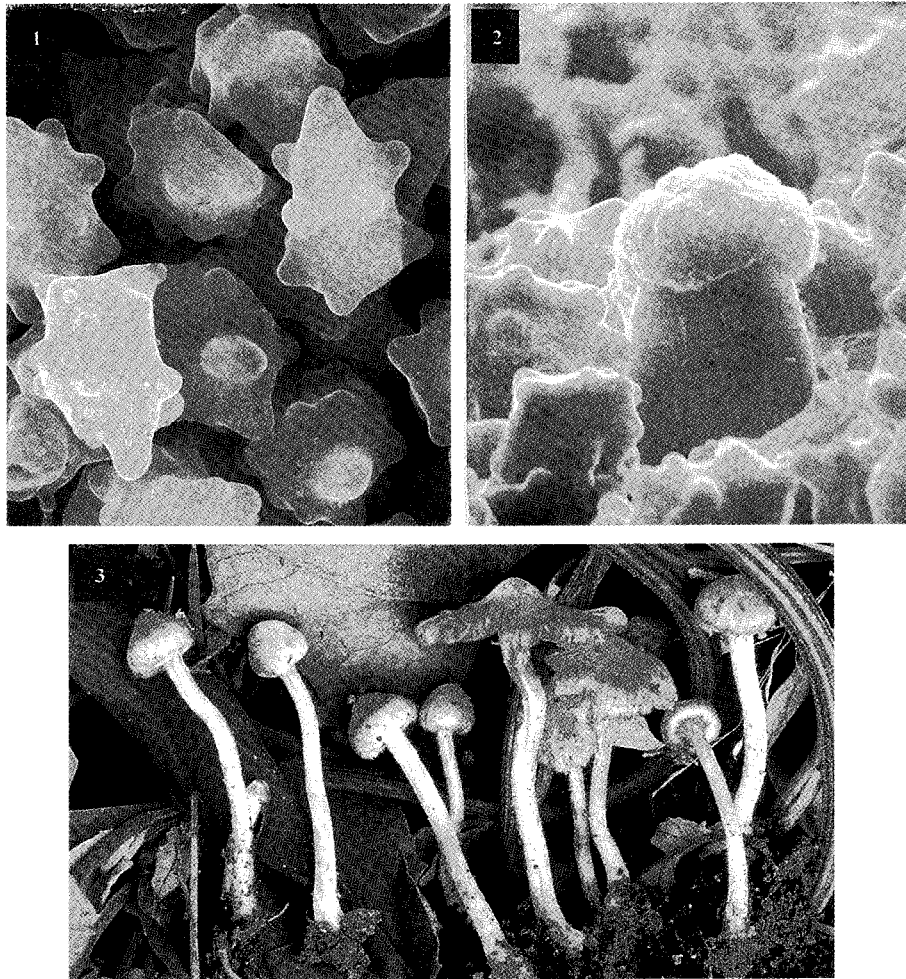


Fig. 2. Morphological characteristics of Genus *Inocybe*. *Inocybe kasugayamensis* : 1. spores ($\times 6,000$) 2. cystidia ($\times 6,000$) 3. carpophore.

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