

The *Boletes* of Taiwan (VII)

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ABSTRACT: Four boletes of the genus *Boletus* are recorded as new to Taiwan, the specimens are described and illustrated. They are *Boletus auripes* Peck, *Boletus nigricans* Zang, Yuan et Gong, *Boletus ornatipes* Peck and *Boletus violaceo-fuscus* Chiu, respectively.

KEY WORDS: *Boletus*, Taiwan.

INTRODUCTION

Genus *Boletus* is distinctly fleshy, soon riddled by insect larvae or decaying pore fungus. Basidiocarp consists of a pileus, hymenophore and stipe. Context of pileus is firm, color whitish or yellowish, sometimes partly reddish; some species turn blue when wounded. Stipe is thick, cylindrical or bulbous; its surface is covered with a distinct network or grains, less frequently smooth. Hymenophore is tubular and the pores are wide and angular to minute and round. Spore print shows olive with a brown tint. Spores are elongate-inequilateral in face view and over 10 μm in length. Tube trama is of bilateral type. Clamp connections are absent. They are known to have mycorrhizal association with woody plants, especially fagaceous forest but also with conifers. Various organisms of the genus *Boletus* have been published from Taiwan following Kida (1937), who first recognized three species in the genus. Recently, Yeh and co-workers (1980, 1981, 1982, 1983) in the "The Boletes of Taiwan" series clarified and recognized twelve species and one variety. All specimens recorded previously were collected from alpine and temperate forests of this island. In the present paper, we add four new records to the inventory of this group of fungi in Taiwan.

MATERIALS AND METHODS

Fresh fruiting bodies were collected and examined in fresh condition. Spore prints were made from segments of fruiting bodies placed on white paper. Subsequently the fruiting bodies were dried in warm air and deposited in the mycological lab. of the Taiwan Endemic Species Research Institute (TESRI). Conventional mycological techniques for examination of specimens were used throughout this study (Largent, 1977). Fruiting bodies were sectioned with free hand and mounted in mixture of 1% aqueous phloxine and 3% KOH solution for microscopic examination.

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RESULTS AND DISCUSSION

1. *Boletus auripes* Peck, Rept. N.Y. St. Mus. 50: 107, 1897.

Figs. 1 & 5

Pileus 3.5-7 cm broad, pulvinate to flattened, surface siccous, subtomentose to pruinose, color yellow-brown to gold when young. Context yellowish, color unchanging when bruised. Tubes 0.4-0.8 cm long, bright yellow. Pores circular to angular, 0.5-0.8 mm broad, concolorous with tubes or paler. Stipe 4-8 cm long, 6-10 mm broad, bulbous to equal, solid, bright golden yellow, surface finely reticulate on the upper half and longitudinally fibrous on the lower half. Spore print yellowish olive brown. Spores 10-12 x 6-7 μm , melleous, ellipsoid-cylindric with slightly narrowed apical half, also subfusoid. Basidia 32-45 x 10-16 μm , clavate, sterigmata two or four, 5-7 μm long. Pleurocystidia 43-46 x 10-12.5 μm , hyaline, usually ampullaceous or irregularly cylindrical.

This species had been described by Murrill (1938) as *Ceratomyces aureissimus* which was certified to *B. auripes* by Singer (1947). However Murrill recognized that *B. auripes* was a mere synonym of *B. edulis*. But the latter with context white and stipe without yellow is distinct from the former.

Habitat: Solitary under *Quercus* plants.

Distribution: Taiwan, China (Yunnan, Sichuan, Guangdong, Kwangsi, Hunan), Japan, North America.

Specimens collection: Shanlinhsi, alt. 1750 m, Sept. 6, 1995. *Huang Hsiu-Wen* (1375).

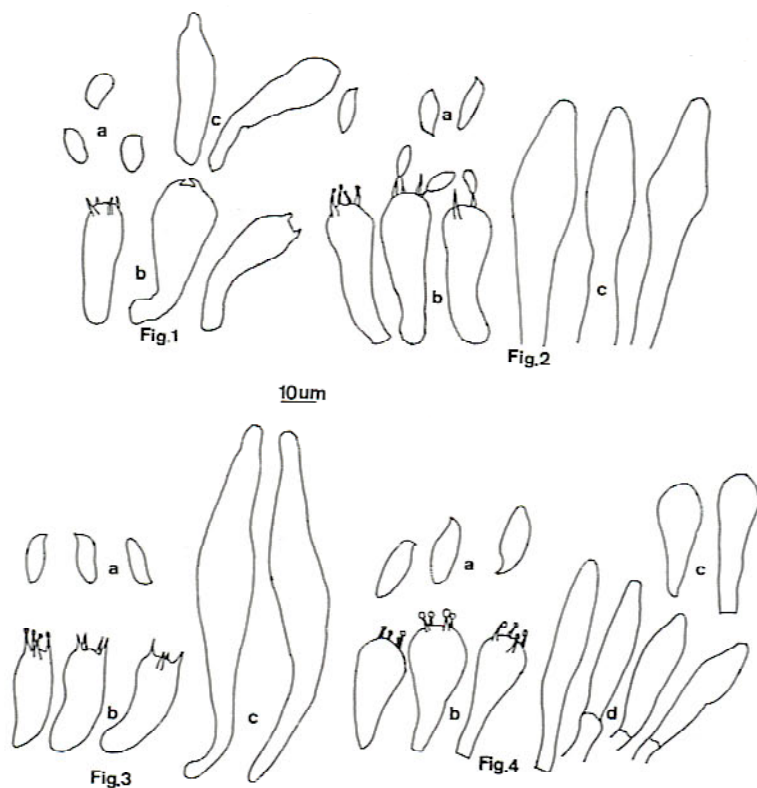


Fig. 1. *Boletus auripes*. Fig. 2. *Boletus nigricans*. Fig. 3. *Boletus ornatipes*. Fig. 4. *Boletus violaceo-fuscus*. a: basidiospores; b: basidia; c: pleurocystidia; d: cheilocystidia.

2. *Boletus nigricans* Zang, Yuan *et* Gong, Act. Myc. Sin. **12** : 278, 1993. Figs. 2 & 6

Pileus 4-9 cm broad, surface siccous, smooth to mound-shaped bump, tomentose and finely areolate, nigricant. Context 0.5-2 cm thick, hyginous brown, quickly nigrescent when bruised. Tubes 0.6-0.9 cm thick, badius, becoming nigricant in age, adnate to adnexed. Pores angular or irregular, 1-1.1 mm broad. Stipe 5.5-7.5 cm long, 0.5-2 cm thick, clavate to subequal, with blackish mycelium around base, surface reticulate very clearly, especially in upper part. Spore print olivaceous brown. Spores 12-13 x 5-5.6 μm , ellipsoid, smooth, pallid yellow, luteo-brunneous in Melzer's. Basidia 42-47 x 12-14.5 μm , clavate, sterigmata two or four, 5.5-7 μm long. Pleurocystidia 65-72 x 15-19 μm , clavate to ventricose-rostrate. Clamp connections absent.

This species is similar to *B. nigerrimus* Heim. Besides ellipsoidal spores and reticulate stipes, it is distinguished by the carpophore, context and hymenium are all blackish, not with purple tint like the latter.

Habitat: Scattered under *Rhododendron formosanum* Hemsal. forest.

Distribution: Taiwan, China (Sichuan).

Specimens collection: Shanlinhsi, alt. 1750 m, July 4, 1993. *Chen Chien-Ming* (916).

3. *Boletus ornatipes* Peck, Ann. Rept. N. Y. St. Mus. **29**: 67, 1878. Figs. 3 & 7

Suillus ornatipes Kuntze, Rev. Gen. Pl. **3**: 536, 1898.

Pileus 5-11 cm broad, pulvinate to convex, expanding to nearly plane, surface dull and minutely tomentose, when moist subviscid to the touch, color fuscous when young, later becoming dark olive-gray in age. Context 0.7-1.3 cm thick, chrome-yellow, taste slightly bitterish, with FeSO_4 no reaction, with KOH bleaching yellow to a paler tone. Tubes 5-9 mm long, adnate to subdecurrent, lemon-yellow staining orange-yellow. Pores small, 1-2 mm broad, lemon-yellow staining orange-brown when bruised. Stipe 5-9 cm long, 0.9-1.5 cm thick, equal to narrowly clavate, solid, chrome-yellow throughout, becoming dingy yellow-brown where bruised, surface lacerate-reticulate to base, yellow overall. Spore print dark yellow-brown. Spores 14-15 x 5-6.5 μm , fusiform with apex obtuse. Basidia 24-33 x 11-13 μm , cylindrical, sterigmata four, 5-5.5 μm long, hyaline to yellowish in KOH. Pleurocystidia 90-115 x 12-16 μm , ventricose-rostrate, abundant, thin-walled, surface smooth, as revived in KOH with a strongly pigmented, ochraceous, amorphous mass occupying most of the ventricose part and in Melzer's this body strongly dextcrinoid. Tube trama gelatinous, divergent from a central strand.

This species may be confused at times with *B. griseus* in age. Both context and tubes of *B. ornatipes* always yellow from the beginning of carpophoral formation. But the tubes of *B. griseus* is whitish at first and reticulation of stipes is relative inconspicuous. Therefore Peck (1878) recognized both as distinct species. The other side Singer (1947) regarded this species as *B. retipes* or *Pulveroboletus retipes*. For the latter two original description, the pileus should be "sicco, luteo-pulverulento", which wasn't seen in this specimen. Therefore we consider this specimen as *B. ornatipes*.

Habitat: Solitary under broad-leaved forest.

Distribution: Taiwan, China (Yunnan. Fujian. Yhainan Island), Japan, North America.

Specimens collection: Shanlinhsi, alt. 1750 m, June 1, 1994. *Huang Hsiu-Wen* (184).



Fig. 5. *Boletus auripes*. Fig. 6. *Boletus nigricans*. Fig. 7. *Boletus ornatipes*. Fig. 8. *Boletus violaceo-fuscus*.

4. *Boletus violaceo-fuscus* Chiu, Mycologia 40: 210-211, 1948.

Figs. 4 & 8

Pileus 4-9 cm broad, convex to applanate, blue violet to dark purple, surface smooth, minutely velvety, viscid when wet. Context whitish, color unchanging when bruised. Tubes sinuate or free, depressed around stipe, at first white, becoming yellowish. Pores minute circle, 0.5-1 mm broad, white becoming yellowish with age or bruised. Stipe 6-8 cm long, 1-1.5 cm broad, cylindric, tapered toward apex, concolorous with pileus or paler, surface distinctly reticulate with white veins. Spore print olivaceous brown. Spores 19-21 x 6.5-9 μm , subfusiform. Basidia 31-37 x 14-17 μm , clavate, sterigmata four, 3-4 μm long. Pleurocystidia 35-40 x 10-13 μm , clavate. Chilocystidia 38-61 x 9-12 μm , ventricose-rostrate.

This species collected from Kunming market in 1948 was first studied and described by Chiu (1948). It is quite distinct in appearance, i.e. dark violet color and conspicuously white reticulation on the stipe, to distinguish it from the white-tubed boletes. However this species

ordinarily happened in China. The microscopic features of this specimen were met with those collected from Yunnan, Sichuan Province of China (Ying and Zang, 1994).

Habitat: Scattered under *Gordonia*, *Quercus* etc.

Distribution: Taiwan, China (Kwangtung, Kwangsi, Guizhou), Japan.

Specimens collection: Shanlinhsi, alt. 1750m, July 1, 1994. Huang Hsiu-Wen (187).

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摘 要

本文報導在台灣首次發現的四種牛肝菌屬新紀錄種，分別是黃肉牛肝菌 (*Boletus auripes* Peck)、黑牛肝菌 (*Boletus nigricans* Zang, Yuan *et* Gong)、金黃牛肝菌 (*Boletus ornatipes* Peck)、紫褐牛肝菌 (*Boletus violaceo-fuscus* Chiu)。

關鍵詞：牛肝菌屬，台灣。

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