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## A new cyanescent species of *Gyroporus* from China

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A new bolete species discovered from Guangdong Province of China, *Gyroporus brunneofloccosus*, is formally described and illustrated. Type (HMIGD 4920) is deposited in the Herbarium of Guangdong Institute of Microbiology (HMIGD), Guangzhou.

**Key words:** basidiomycetes, Boletales, *Gyroporus brunneofloccosus*.

### Introduction

More than 30 species and varieties of *Gyroporus* have been described, including 7 reported taxa occurring in China (Chiu, 1957; Tai, 1979; Ying and Zang, 1994; Li and Song, 2000). Among these, *G. cyanescens* (Bull: Fr.) Quél. is one of the most common species. Recently, the authors re-examined some of the Chinese materials and discovered many collections previously labeled as '*Gyroporus cyanescens*' are not completely identical to that European taxon and other known taxa. A new species is therefore proposed as follows. The colour description is according to Kornerup and Wanscher (1978).

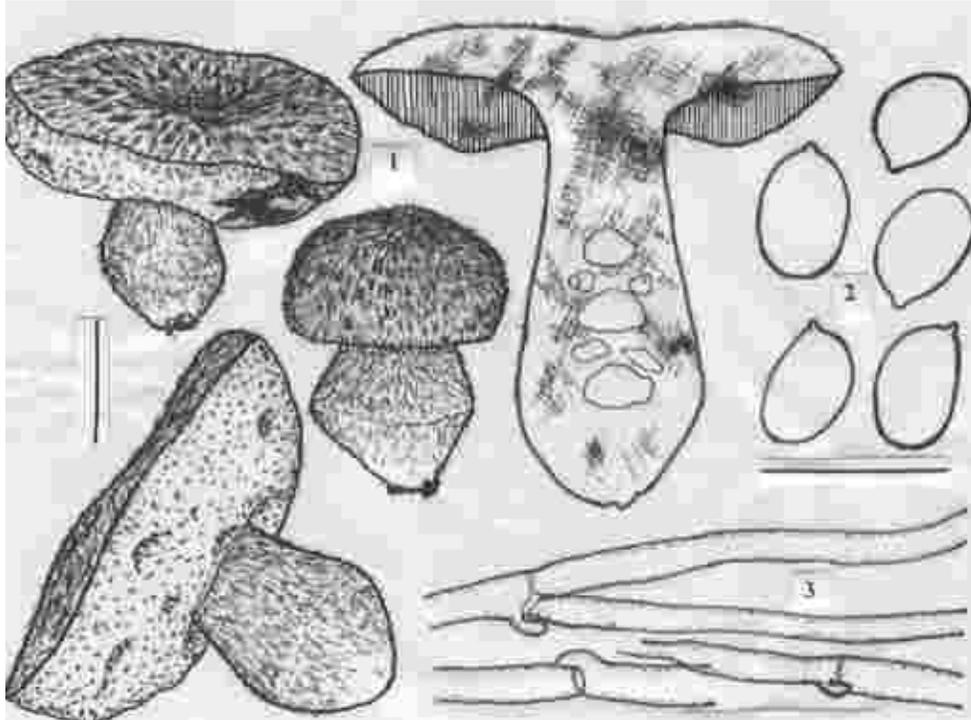
***Gyroporus brunneofloccosus* T.H. Li, W.Q. Deng & B. Song, sp. nov.**

(Figs. 1-3)

*Pileus* (3.5-)5-8 cm latus, juvenili hemisphericus vel convexus, deinde plano-convexus vel planus, brunneolo-aurantiacus vel dilute brunneus, siccus, fibrillosus, floccoso-squamulosus, crinitus vel villosus. *Contextus* albus, tactu viride caerulescens, odor et sapor indistinctus. *Tubuli* ad 3-8 mm longi, adnati, breviter subdecurrentes vel depressi ad stipitem, flavido-albidis, caerulescens, separabiles; pori concolores, tactu viride caerulescens, 1-2 per mm, subangulares vel angulares. *Stipes* fusioideus vel obclavatus, 3-5(-7) cm longus, 1-2 cm crassus apice, saepe amplificatus centro vel ad basem, subtomentosus, subpruinosis vel minute furfuraceus, impolitus, haud reticulatus, concolor cum pileo, apice paulum dilutior; plerumque obscure fibrilloso-annulatus, tomentosus vel fibrillosus, juvenili floccoso-squamulosus, crinitus vel villosus deorsum, vetero cavus. *Basidiosporae* 5-8.5(-9.5) × 4-5.3(-6)µm, late ellipsoideae,

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**Figs. 1-3.** *Gyroporus brunneofloccosus*. 1. Basidiocarps. 2. Basidiospores. 3. Clamp connections. Bar: 1 = 2 cm; 2 = 10  $\mu$ m; 3 = 50  $\mu$ m.

laeves, hyalinae vel flavidae. *Basidia* 20-30  $\times$  8-10.5  $\mu$ m, clavata. *Cheilocystidia* 30-40  $\times$  8-10  $\mu$ m, abunda, clavata. *Pleurocystidia* haud observabiles. *Trama hymenophori* subparallela vel leviter divergens. *Pileipellis* trichodermio cum hyphis brunneis, elementis terminalibus ad 90-160  $\mu$ m longis, 7.5-12  $\mu$ m latis. *Hyphae* fibulatis.

*Pileus* (3.5-)5-8 cm broad, hemispherical, convex to plane, brownish-orange to light brown, i.e. caramel-brown (6C6), sahara-brown (6D5) to cinnamon (6D6), dry, not viscid, pileus and stipe fibrillose, floccose-scaly to coarsely tomentose, with long hairs or villose. *Flesh* white, becoming light turquoise (24A3, 24A4) at first, then to dark turquoise (24F8) or dark blue (23F8) when exposed, odour and taste not distinctive, 6-10 mm thick at stipe. *Tubes* up to 3-8 mm deep, yellowish-white (4A2) to light yellow (4A4), cyanescent, adnate to short decurrent or depressed around the stipe, separable from the flesh; pores yellowish-white (4A2) to light yellow (4A4), 1-2 per mm, subangular to angular, becoming light turquoise (24A3, 24A4) at first, then to dark turquoise (24F8) or dark blue (23F8) where injured. *Stipe* central, 3-5(-7) cm long, 1-2 cm thick at apex, stout and usually enlarged at the middle portion or near the base, fusoid to obclavate, usually with an obscure fibrillose ring around the thickest portion, concolourous with pileus, tomentose to appressed-

**Table 1.** Comparison of the new species and its similar taxa.

| Species or variety              | <i>G. brunneofloccosus</i>  | <i>G. cyanescens</i> var. <i>cyanescens</i>  | <i>G. cyanescens</i> var. <i>violaceotinctus</i>   | <i>G. phaeocyanescens</i>   |
|---------------------------------|---|--|--|---|
| Pileus characters               | (3.5-)5-8 cm, caramel brown, sahara brown to cinnamon, fibrillose, floccose-scaly to coarsely tomentose, with long hairs or villose | About 5.1- 12.7 cm (2-5 unc), pale, straw-coloured, subfuliginous, velvety scaly, fibrillose to coarsely velvety | 4-12 cm, pale straw coloured, appressed fibrillose, fibrils and squamules cinnamon-buff to clay coloured | Up to 4.5 cm, fulvous to snuff brown, fibrillose-rough, tomentose |
| Discolouration                  | Becoming light turquoise at first, then to dark turquoise or dark blue  | Becoming blue green, dark blue or cyanescent   | Immediately to dark licaceous, then indigo, finally deep blue  | Blueing to indigo, lack of intermediate violet discolouration     |
| Basidiospores ( $\mu\text{m}$ ) | 5-8.5(-9.5) $\times$ 4-5.3(-6); L/W* $\approx$ 1.45   | (7-)9-11 $\times$ 4.5-6; L/W $\approx$ 1.8-1.9   | 8-10 $\times$ 5-6; L/W $\approx$ 1.64  | 9.3-14.7 $\times$ 5.3-6.7; L/W $\approx$ 2                        |
| Type locality                   | Asia (China)  | Europe (France)  | N. America (USA)   | S. America (Guatemala)  |
| Data cited from                 | Present paper   | Fries (1821); Watling (1970)   | Watling (1969); Smith and Thiers (1971)  | Singer <i>et al.</i> (1983); Both (1993)                          |

\* L/W: rough mean ratio of length to width of the basidiospores.

fibrillose, floccose-scaly when young especially in lower part, not reticulate, fleshy, cavernous-hollow when mature, blueing when cut. *Basidiospores* 5-8.5(-9.5)  $\times$  4-5.3(-6)  $\mu\text{m}$ , broadly ellipsoid, smooth, yellowish. *Basidia* 20-30  $\times$  8-10.5  $\mu\text{m}$ , clavate, 4-spored. *Cheilocystidia* 30-40  $\times$  8-10  $\mu\text{m}$  abundant, clavate. *Pleurocystidia* not observed. *Hymenophoral trama* subparallel to slightly divergent, yellowish. *Pileipellis* a trichodermium with tufts of radially parallel brown hyphae, terminal elements tubular, up to 90-160  $\mu\text{m}$  long, 7.5-12  $\mu\text{m}$  wide. *Clamp connections* regularly present.

*Material examined:* CHINA, Guangdong Province Dinghu Shan Nature Reserve, scattered, gregarious to subcaespitose on soil under mixed forests or pine forests, near *Pinus massoniana*, 5 September 1980, C. Li (Herbarium of Guangdong Institute of Microbiology (HMIGD) 4588); 16 May 1981, C. Li and J.Q. Liang (HMIGD 4920, **holotype designated here**); July-August 1981, J.Q. Liang (HMIGD 4925); 7 July 1982, Y.Z. Wang and J.Q. Liang (HMIGD 5673); 31 August 1984, T.H. Li and Z.S. Bi (HMIGD 7781); 23 May 1987, T.H. Li and Z.S. Bi (HMIGD 11771); 28 July 1995, T.H. Li (HMIGD 1978); 8 September 1983, M.Z. Lian (HMIGD 20357); 29 June 1983, Lian M.Z. (HMIGD 20358); 16 May 2001, T.H. Li (HMIGD 20388).

*Notes:* The new species is undoubtedly similar to *G. cyanescens* in discolouration and some other aspects, and many collections cited herewith were originally identified as the latter (Bi *et al.*, 1993). When comparing the specimens of the two taxa, however, the first author discovered that they are obviously different in colour. The colour of the European taxon is variable to a certain extent, but it is generally much paler with a pale yellowish-white, straw-coloured to subfuliginous pileus (Fries, 1821; Watling, 1970; Alessio, 1985). Macroscopically it is most close to the variety *G. cyanescens* var. *violaceotinctus* Watling with a similar fibrillose pileus, but the latter becomes instantly indigoblue (Watling, 1969; Smith and Thiers, 1971). The dark blueing discolouration is perhaps also similar to that of *G. phaeocyanescens* Sing. & Ivory (Singer *et al.*, 1983; Both, 1993), but the basidiospores are clearly different in shape and size. Microscopically the basidiospores from all the examined collections of the new species are constantly smaller than those of the other three taxa mentioned above.

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