

# Some noteworthy *Agaricales* and *Cantharellales* from Bulgaria

Melania M. Gyosheva, Boris Assyov & Dimitar Y. Stoykov

Department of Plant and Fungal Diversity and Resources, Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences, Acad. G. Bonchev St., bl. 23, 1113 Sofia, Bulgaria, e-mail: gyosheva@bio.bas.bg (corresponding author), bassyoff@hotmail.com, stoykovdimitar@gmail.com

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**Abstract.** The paper presents five uncommon and noteworthy larger fungi from Bulgaria: *Cantharellus melanoxeros*, *Melanoleuca decembris*, *Mycena tubarioides*, *Tubaria dispersa* and *Xerula melanotricha* (= *Oudemansiella melanotricha*). Four of them are new country records – *C. melanoxeros*, *M. decembris*, *M. tubarioides*, and *X. melanotricha*. The species are described and illustrated on the basis of the Bulgarian specimens.

**Key words:** Bulgarian mycota, *Cantharellaceae*, *Inocybaceae*, *Mycenaceae*, *Physalacriaceae*, *Tricholomataceae*

## Introduction

Although studies of the Bulgarian mycota date more than a century back, the discovery of species new for the country is still not an infrequent event and new larger fungi are constantly being added to the national checklists (Dimitrova & Gyosheva 2009, 2010; Denchev & Assyov 2010). Some rare and less known larger *Basidiomycetes*, found during the authors' studies into the country's fungal diversity, are described and illustrated below.

## Material and methods

Air-dried specimens of the fungi are preserved in the Mycological Collection of the Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences (SOMF).

The samples are documented with color photographs and/or a concise description. Colour notations in the descriptions below refer to the British Fungus Flora Colour Chart (Anonymous 1969; abbreviated as 'BFF'), whenever possible. Microscopic features have been observed in water and 5% KOH and mea-

sured from dried specimens in tap water under Nikon Eclipse 50i and Amplival LM, with magnification  $\times 1000$ . Measurement values for basidiospores, when in statistically relevant numbers, are presented below in the following manner: (min–) mean $\pm\sigma$  (–max); for the rest of the structures the minimum and the maximum values are noted. Iodine reaction was tested by Melzer's solution (recipe after Kirk & al. 2008).

Abbreviations of the authors of fungal names follow Kirk & Ansell (2004). A list of essential literature sources used for determination is added below every particular species.

## Descriptions of the species

***Cantharellus melanoxeros*** Desm., in Duby, *Botanicon gallicum* 2: 799 (1830) (Figs 1, 2)

Literature: Pegler *et al.* (1997), Watling & Turnbull (1998).

**Basidiomata** stipitate turbinate. **Pileus** up to 4 cm in diameter, almost flat or slightly depressed in the center, honey-coloured; surface smooth to finely fibrillose, margin initially incurved, often irregularly undulate. **Stipe** 3–6  $\times$  0.3–0.5 cm, obconical or cylindri-



Fig. 1. Basidiomata of *Cantharellus melanoxeros* in situ (photo I. Assyova).

cal, usually hollow, pale-yellow or concolorous with the cap, surface smooth or slightly fibrillose. **Context** whitish-cream, thin, blackening; odour agreeable, not distinctive; taste agreeable. **Hymenium** subdecurrent, with irregularly branching and anastomosing veins and ribs, pale-pinkish violaceous. **Basidia** up to  $97.5 \times 10 \mu\text{m}$ , elongate clavate. **Cystidia** absent. **Basidiospores** (8-)  $10.5 \pm 1.1$  (-12)  $\times$  (7-)  $7.7 \pm 0.4$  (-8)  $\mu\text{m}$  (n=20), length/width ratio (1.2-)  $1.4 \pm 0.1$  (-1.5), ellipsoid to broadly ellipsoid, guttulate.

**Specimen examined:** Southwest Bulgaria, Mt Belasitsa, Petrich distr., along the road from Belasitsa chalet to Kongur chalet, in a Sweet Chestnut – Beech forest, ca 850 m a. s. l.;  $41^{\circ}21'53.4''\text{N}$ ,  $023^{\circ}11'40.8''\text{E}$ , 29.09.2009, leg. I. Assyova, B. Assyov & D. Stoykov, det. B. Assyov (SOMF 29359).

The species was accepted here in accordance with Pegler & al. (1997) and Watling & Turnbull (1998). Breitenbach & Kränzlin (1986) considered under this name a fungus with non-blackening flesh, pinkish tinted stipe and somewhat larger basidiospores, actually corresponding to *Cantharellus ianthinoxanthus* (Maire) Kühner. Knudsen & al. (1997) listed *C. ianthinoxanthus* as a synonym of *C. melanoxeros*, but they described a fungus with blackening flesh, i. e. *C. melanoxeros*.

*Cantharellus melanoxeros* is a relatively well documented species and one of the fungal candidates for inclusion in Appendix I of the Bern Convention (Dahlberg & Kroneborg 2003). In the neighboring countries, it has been recorded in Greece, Serbia and Romania (Dahlberg & Kroneborg 2003; Pál-Fám 2006; Uzelac 2009).

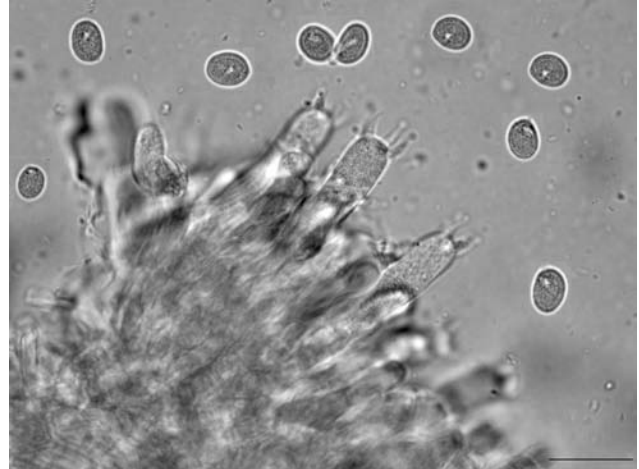


Fig. 2. Basidia and basidiospores of *Cantharellus melanoxeros*. Scale bar = 10  $\mu\text{m}$ .

***Melanoleuca decembris* Métrod ex Bon, Bull. Trim. Féd. Mycol. Dauphiné-Savoie 25(102): 22 (1986) (Fig. 3)**

Literature: Kühner & Romagnesi (1974), Bon (1991), Courtecuisse & Duhem (1995), Gminder & Kriegelsteiner (2001a), Uzelac (2009).

**Pileus** 3–6 cm in diameter, initially convex, subsequently almost flat or slightly depressed with a small umbo; surface matt, dark-brown to grayish-brown, darker in the center. **Stipe** 3–6  $\times$  0.3–0.5 cm, cylindrical, widening at the base, surface brownish, paler below, fibrillose striate. **Context** white or whitish, thin; odour not distinctive. **Gills** close, white to ochraceous. **Basidia** clavate. **Cystidia** absent. **Basidiospores** 7.5–8(–9)  $\times$  5–6  $\mu\text{m}$ , ellipsoid to broadly ellipsoid, finely verrucose, guttulate.

**Specimen examined:** Western Balkan Range (Mt Murgash), Sofia distr., above Zhelyava village, under

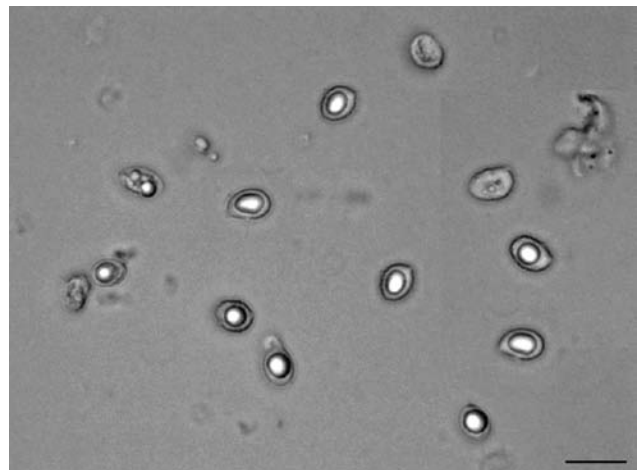


Fig. 3. Basidiospores of *Melanoleuca decembris*. Scale bar = 10  $\mu\text{m}$ .

*Pinus sylvestris* L., 24.11.2007, leg. A. Grozdranov, det. M. Gyosheva (SOMF 29311).

*Melanoleuca decembris* is a seldom recorded species, formerly placed in subgenus *Acystis* (Bon) Bon and characterized by lack of proper cystidia (Bon 1991). Recently it was proven to reside in subgenus *Urticocystis* Boekhout according to ITS phylogenetic study (Vizzini & al. 2012). It is recognized by the dull-coloured pileus with matt or slightly velutinous surface, more or less concolorous and fibrillose stipe, equal or longer than the pileal diameter, and ellipsoid to broadly ellipsoid spores.

***Mycena tubarioides* (Maire) Kühner**, *Encycl. Mycol.* 10: 256 (1938)

Literature: Cejp (1936), Smith (1947), Kotlaba (1953, as *Mycena typhae*), Kühner & Romagnesi (1974), Moser (1978), Lisiewska (1987), Gminder & Krieglsteiner (2001b), Emmett et al. (2008).

**Pileus** up to 0.5 cm in diameter, convex or slightly depressed in the disk, subsequently almost flat; surface slightly sulcate, pale-brownish-red or ochraceous-pink. **Stipe** 0.5–1 × 0.07–0.1 cm, slightly thickened at the base, whitish or concolorous with the pileus. **Context** thin, ochraceous-pink; smell not distinctive. **Gills** pale-brownish-pink, distant, broad. **Basidia** 4-spored. **Cheilocystidia** clavate. **Basidiospores** 14–16 × 3–5 μm, ellipsoid, strongly elongated, amyloid.

**Specimen examined:** Northeast Bulgaria, Silistra distr., Malak Preslavets Protected Area, on a dry stem of *Typha latifolia* L., 07.05.2004, leg. V. Vulchev, det. M. Gyosheva (SOMF 29309).

*Mycena tubarioides* is a seldom recorded species, with scattered findings in the Czech Republic, Denmark, Finland, France, Germany, Netherlands, Norway, and Poland. Outside Europe, it is known from few sites in Canada (Redhead 1984, 1997). It is apparently an uncommon fungus, which has not been treated by Robich (2003) in his recent monograph on the genus.

*Mycena juncicola* (Fr. : Fr.) Gillet and *M. riparia* Maas Geest. are similar and occur in the same habitat (leaves and culms of tall wetland monocots). They are relatively reliably set apart by the smaller basidiospores, generally less than 10 μm long and with average quotient less than 2. The two species are also distinguished by their differently shaped cheilocystidia (broadly clavate to subglobose with apical projections in *M. juncicola* and somewhat clavate, with irregular projections in *M. riparia*).

***Tubaria dispersa* (Berk. & Broome) Singer**, *Persoonia* 2: 22 (1961) (Fig. 4)

Literature: Moser & Jülich (1988), Bon (1992), Gminder (2003), Vesterholt (2008a).

**Pileus** 1–2 cm in diameter, convex, flat to slightly depressed, dry, finely velvety and with floccose remnants of the veil, not hygrophanous and not translucently striate, pale-buff to yellowish-buff. **Stipe** up to 45 × 1–2 mm, cylindrical or slightly tapering below, in the upper parts ± floccose, whitish to cream or pale-buff. **Gills** distant or medium spaced, broadly adnate, for a long time remaining persistently yellow-cream, subsequently yellowish-buff. **Basidia** clavate. **Cheilocystidia** up to 30 × 10 μm, cylindrical to clavate. **Pleurocystidia** absent. **Basidiospores** (7–) 7.7±0.6 (–9) × (4.5–) 5.0±0.6 (–6) μm (n=10), ellipsoid to amygdaloid, finely rugulose.

**Specimen examined:** Sofia region, Sofia city, Zapaden Park, in the litter under *Crataegus* sp., 14.10.2008, leg. & det. B. Assyov (SOMF 29358).

Apart from the macroscopic and micromorphological features, the species is also recognized by its characteristic association with Hawthorn (*Crataegus* spp.), the fruit bodies being apparently attached to the litter (buried rotting fruits) of those shrubs. It has been seldom found too under other trees and shrubs producing berries, e. g. *Cotoneaster*, *Amelanchier* and even *Ilex* (see Legon & Henrici 2005).

*Tubaria dispersa* is an uncommon fungus, occasionally collected in Austria, Belgium, Bulgaria, Czech Republic, Denmark, France, Germany, Hungary, Italy, Luxemburg, Norway, Portugal, Poland, Romania, Spain, Sweden, Switzerland, and the United Kingdom. This is the second Bulgarian collection of this species,



Fig. 4. Basidiomata of *Tubaria dispersa* in situ.

the earlier one dating back to 1987 (Dimcheva & al. 1992). Although it is considered rare and even threatened in some countries, it is yet unclear whether this is a true rarity. Quite possibly it is merely under-recorded, given its small-sized ephemeral fruitbodies. For example, Legon & Henrici (2005) report it as common and widespread in South England.

*Tubaria autochtona* (Berk. & Broome) Sacc. is often considered synonymous, but when so the name would have priority over *T. dispersa*, being an earlier valid combination.

***Xerula melanotricha* Dörfelt**, Feddes Repert. 90: 367 (1979) (Fig. 5)

Literature: Dörfelt (1979), Pegler & Young (1986), Breitenbach & Kränzlin (1991), Gminder & Krieglsteiner (2001c), Ronikier (2003), Vesterholt (2008b), Antonín (2009).

**Pileus** 2.5–6 cm in diameter, initially campanulate or convex, subsequently flattened; surface grayish-brown, olive-brown, chocolate-brown, velvety tomentose, covered with dark-brown hairs (macrosetae); margin incurved for a long time, then even, villose. **Stipe** 5–13 × 0.5–1 cm, cylindrical, thickened at the base (up to 1–1.5 cm), fusiform, rooting, concolourous with the pileus, hairy tomentose. **Flesh** whitish, thin. **Gills** white to ochraceous, distant, broad, narrowly adnate. **Basidia** 4-spored, clavate. **Cheilo- and pleurocystidia** mostly fusiform, some incrustated apically, incrustation soluble in KOH 5%. **Basidiospores** 8–13 × 8–11 µm, subglobose, smooth, hyaline, gutulate. **Pileipellis** hymeniderm, consisting of rounded or pyriform elements and

projecting macrosetae. **Hairs (macrosetae)** on the pileus and the stipe up to 0.2–0.3 cm long, dark-brown, thick-walled, pointed at the apex.

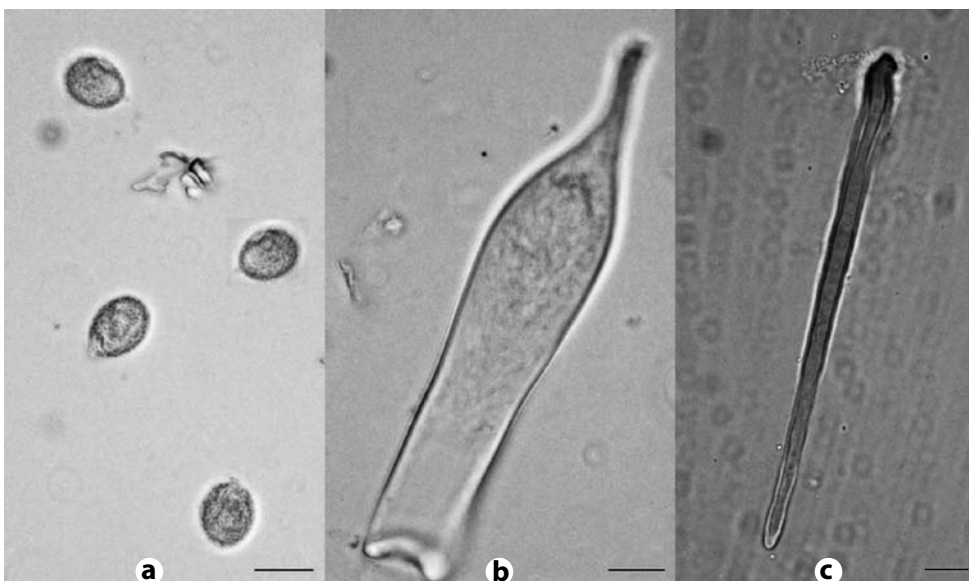
**Specimen examined:** Rila Mts, Borovets locality, at 1200 m a.s.l., in a coniferous forest of *Picea abies* (L.) Karst. and *Abies alba* Mill., 18.10.2007, leg. & det. M. Gyosheva (SOMF 29310).

*Xerula melanotricha* is similar to the more widespread *X. pudens* (Pers.) Singer and is distinguished by its darker coloured fruit bodies, longer macrosetae and mostly thin-walled cystidia with incrustation soluble in 5% KOH. For a comparative morphological study of the two species consult Ronikier (2003).

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**Fig. 5.** *Xerula melanotricha*: a – spores, b – cystidium, c – macroseta. Scale bars = 10 µm.

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