

Volvariella caesiotincta P. D. Orton, a new species in the mycobiota of Poland

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The article presents the first record of *Volvariella caesiotincta* P.D. Orton in Poland. Fruit body of the species was found on 22nd July 2002 in an oak-hornbeam/elm-ash municipal wood in the eastern part of Wrocław. The saproxylic *Volvariella caesiotincta* produced its carpophore on the base of rotten log of *Quercus robur*. The article brings closer taxonomic profile, ecological requirements and distribution pattern of the species. It also describes macroscopic and microscopic characteristics of the discovered specimens and presents the specification of habitat the fungus concerned.

Key words: *Volvariella caesiotincta*, macromycetes, urban greenery, Wrocław, SW Poland

INTRODUCTION

The genus *Volvariella* Speg. includes fungi with pluteoid habit of the carpophores, forming distinctive saccate velum universale at the base of central stipe. The saccate velum forms distinct membranous volva, that usually breaks up into lobes with time (Boekhout 1990; Skirgiełło 1999). The genus includes species which are saprotrophic, terrestrial, wood occupying, or living on decaying agarics, cosmopolitan, or nearly so fungi. There are c. 50 described *Volvariella* species worldwide and 13 of them occurring in Europe (Kirk et al. 2008; Horak 2005; Singer 1986; Kriegelsteiner 2003). There have been reported 9 species of the genus from Poland so far, i.e.: *V. bombycina* (Schaeff.: Fr.) Singer, *V. gloiocephala* (DC.: Fr.) Boekhout & Enderle, *V. hypopithys* (Fr.) M. M. Moser, *V. media* (Schumach.: Fr.) Singer, *V. murinella* (Quél.) M. M. Moser, *V. pusilla* (Pers.: Fr.) Quél., *V. surrecta* (Knapp) Singer, *V. taylorii* (Berk. & Broome) Singer, and *V. volvacea* (Bull.: Fr.) Singer (Wojewoda 2003). Seven of the species mentioned above are on the red list of the macrofungi in Poland (Wojewoda, Ławrynówicz 2006). *Volvariella caesiotincta* P.D. Orton has never previously been

found in Poland. However it should be noted, that after the author's record, *V. caesiotincta* was reported at least from one other (not legitimately published) locality within Polish area (Puszcza Niepołomska Forest; Karasiński 2006).

METHODS

Material was gathered within urban greenery of Wrocław. The investigated habitat was illustrated with a phytosociological record. The floristic composition and diversity of the forest community were studied using the Brown-Blanquet method. The nomenclature of forest communities follows Matuszkiewicz (2007); that of vascular plants follows Mirek et al. (2002). Microscopical slides of dried material were prepared with 5% NH₄OH and Congo red in 1% ammonia. The microcharacters of one recorded basidioma were observed and measured under a standard light microscope. Morphological measurements were quoted according to Breitenbach & Kränzlin (1991). Terminology of morphological and anatomical elements was adapted from Vellinga (1988). Size of spores, basidia, cheilocystidia and pleurocystidia, as well as pileipellis elements dimensions were correspondingly based on: 51, 31, 31, 21 and 21 measurements. Drawings were made with the aid of a drawing tube under an oil-immersion objective. The collected specimen is deposited in the Herbarium of the Museum of Natural History, Wrocław University, Wrocław (WRSL).

RESULTS

The occurrence of *Volvariella caesiotincta* carpophore was discovered on 12th July 2002 in Las Wojnowski municipal forest. The forest area where the fungus occurred is surrounded by fields under cultivation and is situated in the eastern part of Wrocław (Fig. 1). A potential plant community there in the area is elm-ash community (Matuszkiewicz 2007). Analysis of phytosociological relevés made within the area did not allow to determine an unambiguous association character of the forest community. Representative plants of *Ficario-Ulmetum minoris* Knapp 1942 em. J. Mat. 1976 association have been left their stamp on floristic composition profile, but distinct participation of key species from *Carpinion betuli* Issl. 1931 em. Oberd. 1953 alliance is evident too. The dominant species of the tree layer at the community where the fungus occurred are: *Carpinus betulus*, *Fraxinus excelsior*, *Quercus robur* and *Tilia cordata*. The shrub layer includes mainly: *Carpinus betulus*, *Corylus avellana*, *Sambucus nigra* and *Padus avium*. In the herb layer, *Ficaria verna*, *Anemone nemorosa*, *Milium effusum* and *Maianthemum bifolium* grow abundantly during spring season.

In the course of field working only one specimen of *Volvariella caesiotincta* was found. The carpophore of the fungus occupied the base part of distinct rotten log of *Quercus robur*. Further observations at the investigated site were conducted in July

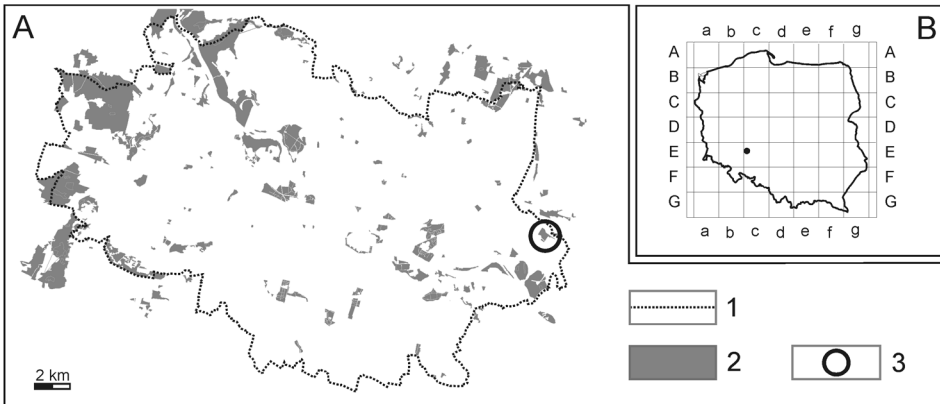


Fig. 1. The location of the *Volvariella caesiotincta*: A – site in Wrocław; B – in Poland (based on a 100 km ATPOL grid); 1 – urban boundary, 2 – municipal forests and parks, 3 – locality of the species.

2003 and July 2004, but no *V. caesiotincta* carpophores were observed. The location of the species has been carefully marked and will be monitored in the future.

DESCRIPTION OF THE SPECIMENS

Volvariella caesiotincta P.D. Orton, Bull. mens. Soc. linn. Lyon 43: 319. 1974. – *Pluteaceae*, Agaricales, Agaricomycetidae, Agaricomycetes, Basidiomycota, Dikarya, Fungi (Kirk et al. 2008; Hibbett et al. 2007).

MACROSCOPIC AND MICROSCOPIC CHARACTERS. Pileus $44 \times 39 \times 11.5$ mm, applanate, with an obtuse umbo and slightly inflexed margin, fleshy, surface finely radially fibrillose at margin to nearly strigose at the central part, dry and mat, \pm white, greish white, paler towards margin, with slight olivaceous tinge at the central part. Lamellae crowded, free, thin, broadly ventricose, rounded at margin of pileus, flesh-pink, with whitish flocculose edge. Stipe 52×5.0 mm, tapering upwards, with slightly bulbous base (up to c. 9.5 mm wide) enclosed by 3-lobed, greyish white to greyish brown, membranous volva (up to c. 21 mm high), solid, extremely fragile, glabrous to fibrillose-striate, translucent white. Context in pileus and stipe quite compact, fragile, whitish (Fig. 2). Smell rather strong, reminding *Geranium robertianum* odour. Taste moderately strong, unpleasant, rather astringent. Colour of spore print was not recorded.

Spores $(6.2) 6.7 \pm 0.3 (7.7) \times (4.2) 4.6 \pm 0.3 (5.4) \mu\text{m}$, $Q = (1.21) 1.46 \pm 0.08 (1.64)$, ellipsoid, oblong to oblong-ovoid, not ornamented. Basidia $21\text{--}28 \times 6.5\text{--}9.0 \mu\text{m}$, clavate, with 4 sterigmata, without basal clamp. Cheilocystidia $34\text{--}65 \times 9.6\text{--}19 \mu\text{m}$, \pm clavate, frequently with apical papilla or up to 15 μm long, finger-like appendage, or lageniform to utriform. Pleurocystidia $35\text{--}46 \times 10\text{--}25 \mu\text{m}$, clavate, lageniform to utriform, very rare. Pileipellis: a cutis, made up of cylindrical elements (15–27 μm width), with intracellular, pale (yellow) pigment (Fig. 3). Observed septa without clamps.

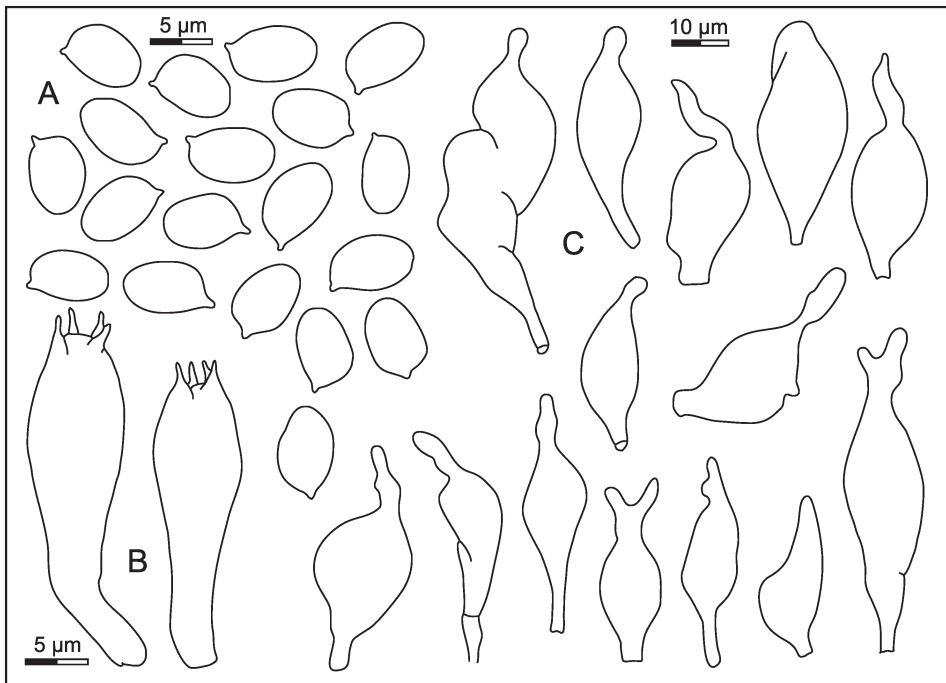


Fig. 3. A – spores; B – basidia; C – cheilocystidia of *Volvariella caesiointincta* recorded in Wrocław (drawn by M. Halama).

MATERIAL EXAMINED. Wrocław (Poland), Las Wojnowski Forest, distinctly rotten log of *Quercus robur*, 12.07.2002, coll. M. Halama, WRSL.

TAXONOMICAL REMARKS. Nearly identical carpophores produces *V. murinella*, which can be separated with certainty from *V. caesiointincta* only on the base of microscopic characters. As it was emphasized by Breitenbach et Kränzlin (1995), in contrast to *V. caesiointincta*, *V. murinella* has cheilocystidia without the conspicuous finger-like and occasionally forked apical projection. Moreover, there is an ecological difference between the two species, i.e. *V. caesiointincta* grows on wood or is associated with wood, while the latter occurs on humus rich soil or remains of leaves or plants and among grass. *Volvariella pusilla* var. *taylorii* (Berk. & Broome) Boekhout also resembles *V. caesiointincta*, from which it mainly differs in habitat (terrestrial fungus occurs mainly in grasslands on clayey soil), sweet and fungoid smell, indeterminate taste, and smaller size of carpophores (cf. Boekhout 1990; Skirgiełło 1999).

HABITAT AND GENERAL DISTRIBUTION. Carpophores of *Volvariella caesiointincta* almost exclusively appears in summer to early fall season (July-September), solitary or more rarely gregarious, on distinctly rotten wood (of optimal and terminal decay phase) of broadleaved trees, i.e. on logs and stumps of *Carpinus*, *Fagus*, *Tilia*, *Ulmus*, *Fraxinus* and *Quercus* (Boekhout 1990; Krieglsteiner 2003).

Volvariella caesiointincta is reported from North Africa (Marocco) and Europe. In Europe it is widely distributed and is known from Spain, Italy, France, Liechtenstein, Austria, Hungary (Krieglsteiner 2003), Holland (Boekhout 1990), Great

Britain (B.M.S. 2004), Switzerland (Breitenbach, Kränzlin 1995), Czech Republic (Antonín et al. 1995), Slovakia (Lizoň 2001), Germany (Krieglsteiner 1991), Denmark (Vesterholt et al. 1998), Sweden (Gärdenfors 2005), Norway (Bendiksen et al. 1999) and Finland (Rassi et al. 2001). The fungus is recognized all over as a rare species (Krieglsteiner 2003) and is included in the red lists of number of European countries. For example, in Sweden it is included in indeterminate category of threat (DD) (Gärdenfors 2005), in Slovakia – in near threatened category (LR) (Lizoň 2001), in Denmark and Norway – in vulnerable category (V) (Vesterholt et al. 1998; Bendiksen et al. 1999), in Finland – is treated as critically endangered species (category CR) (Rassi et al. 2001) and in Germany it appears in group of very rare species (category R) (Benkert et al. 1992).

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Volvariella caesiotincta, nowy gatunek dla mikrobioty Polski

Streszczenie

W artykule przedstawiono pierwsze w Polsce stanowisko pochwiaka błękitnawego *Volvariella caesiotincta*. Dnia 22 lipca 2002 roku znaleziono owocnik *V. caesiotincta* na silnie zbutwiełej kłodzie *Quercus robur* w zbiorowisku grądowo-łęgowym na terenie lasu Lasu Wojnowskiego we Wrocławiu. W pracy przedstawiono charakterystykę cech makroskopowych i mikroskopowych zebranego okazu, zaprezentowano charakterystykę siedliskową odnotowanego stanowiska, a także przybliżono specyfikę taksonomiczną, ekologiczną i chorologiczną odnotowanego gatunku.



Fig. 2. Fruitbody of *Volvariella caesiotincta* recorded in Wrocław (22. July 2002; photo and scans by M. Halama).