

## Notes on *Hemimycena* from European Russia

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A study of the genus *Hemimycena* in European Russia has revealed 19 taxa. Ten species are recorded for the first time in this territory and three new species (*Hemimycena globulifera*, *H. stiriispora*, and *H. tanjae*) are proposed. All species examined are described in detail and fully illustrated. Also a identification key to delimit the studied species is provided.

**Key words:** Agaricales, *Hemimycena*, new species, European Russia, taxonomy.

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Studiem rodu *Hemimycena* v evropské části Ruska bylo zjištěno 19 taxonů. Deset druhů bylo v této oblasti nalezeno poprvé; navíc jsou popsány tři nové druhy (*Hemimycena globulifera*, *H. stiriispora*, *H. tanjae*). Všechny studované taxony jsou podrobně popsány a ilustrovány a je navržen klíč k jejich určování.

### INTRODUCTION

In this paper we report new records and new species of *Hemimycena* of European Russia. *Hemimycena* Singer (1938) is a genus of agaricoid fungi with small, delicate, usually white, mostly partly pruinose to pubescent fruit bodies. Distinctive microscopic characters of the genus are inamyloid, thin-walled spores, a well-differentiated pileipellis in the form of a cutis with commonly diverticulate hyphae, and neither amyloid nor dextrinoid tissue. Most species of the genus occur in grassland communities and broad-leaved forests, more rarely in coniferous forests.

Due to contributions made by Kühner (1938), Cejp (1938), Smith (1947), Kühner and Romagnesi (1953), Kühner and Valla (1972), Redhead (1982), Meusers and Meusers (1985), Elborne et al. (1992), Romagnesi (1992), Gröger (1994), Watling and Turnbull (1998), a considerable volume of information on the genus has been accumulated. The recent very important monographic study on *Hemimycena* by Antonín and Noordeloos (2004) has summarised the knowledge on the genus in Europe to the present day.

However, there is fragmentary information about *Hemimycena* species in European Russia. The work by Karsten (1879) was the first one in which species of this genus (*Mycena gypsea* (Fr.) Quél. [= *H. cucullata* (Pers.: Fr.) Singer]; *M. lactea* (Pers.) Fr. [= *H. lactea* (Pers.: Fr.) Singer]) were reported from Russia. *H. pseudocrispula* (Kühner) Singer and *H. pseudolactea* (Kühner) Singer were reported for the Leningrad Region and *H. candida* for the Caucasus by Singer (1943). *H. angustispora* (Joss. ex P. D. Orton) Singer, *H. crispula* (Quél.) Singer, *H. delectabilis* (Peck) Singer, *H. gracilis* (Quél.) Singer, *H. gypsella* (Kühner) Elborne et Læssøe, *H. lactea*, *H. mauretana* (Maire) Singer, *H. pseudolactea*, and *H. rickenii* (A.H. Sm.) Singer were mentioned in some regional check-lists (Shubin and Krutov 1979, Vishnevsky 1998, Kovalenko and Morozova 1999, Marina 2006, Malysheva and Malysheva 2008, Perevedentseva 2008).

The aim of the present work is to make a contribution to the knowledge of the diversity and distribution of the genus *Hemimycena* in the territory of European Russia. Most material examined has been obtained during an investigation of macrofungi in grassland communities for the last five years. The *Hemimycena* collection of the Mycological Herbarium of the Komarov Botanical Institute was revised as well. A total of 49 specimens were studied, belonging to 19 species. The presence of 9 previously reported taxa (*H. candida*, *H. crispula*, *H. cucullata*, *H. delectabilis*, *H. gracilis*, *H. lactea*, *H. mauretana*, *H. pseudocrispula*, and *H. pseudolactea*) were confirmed, 10 species are reported for the first time in European Russia, and three species (*Hemimycena globulifera*, *H. stiriispora*, and *H. tanjae*) are described as new in the present paper.

#### MATERIALS AND METHODS

The specimens were collected in several localities of the European part of Russia (from north to south: Karelia Republic, Leningrad, Vologda, Pskov, Novgorod, Tula, Samara, Rostov Regions, and Krasnodar Territory) mainly from June 2003 to October 2008.

Different types of grassland vegetation and some sites of deciduous and coniferous forests were studied. All material studied is deposited in the Mycological Herbarium of the Komarov Botanical Institute (LE).

The specimens were collected, documented and preserved using standard methods. All descriptions are based on the studied material. Data on species distribution are given mostly according to annotations to the specimens examined (LE), but information from literature sources is also cited. Macroscopic descriptions are based on a study of the material in fresh and dried conditions as well as an analysis of the photos. The dried material was examined using standard microscopic techniques. Microscopic structures were observed in squash preparations

of small parts of the basidiome in 5 % KOH and 1 % Congo Red in concentrated  $\text{NH}_4\text{OH}$ . Microscopic measurements and drawings were made with Micmed 2–2 and AxioImager A1 microscopes. Basidiospore dimensions are based on an observation of 20 spores. In spore descriptions,  $Q^*$  is the medium value of spore length to width ratios.

## RESULTS AND DISCUSSION

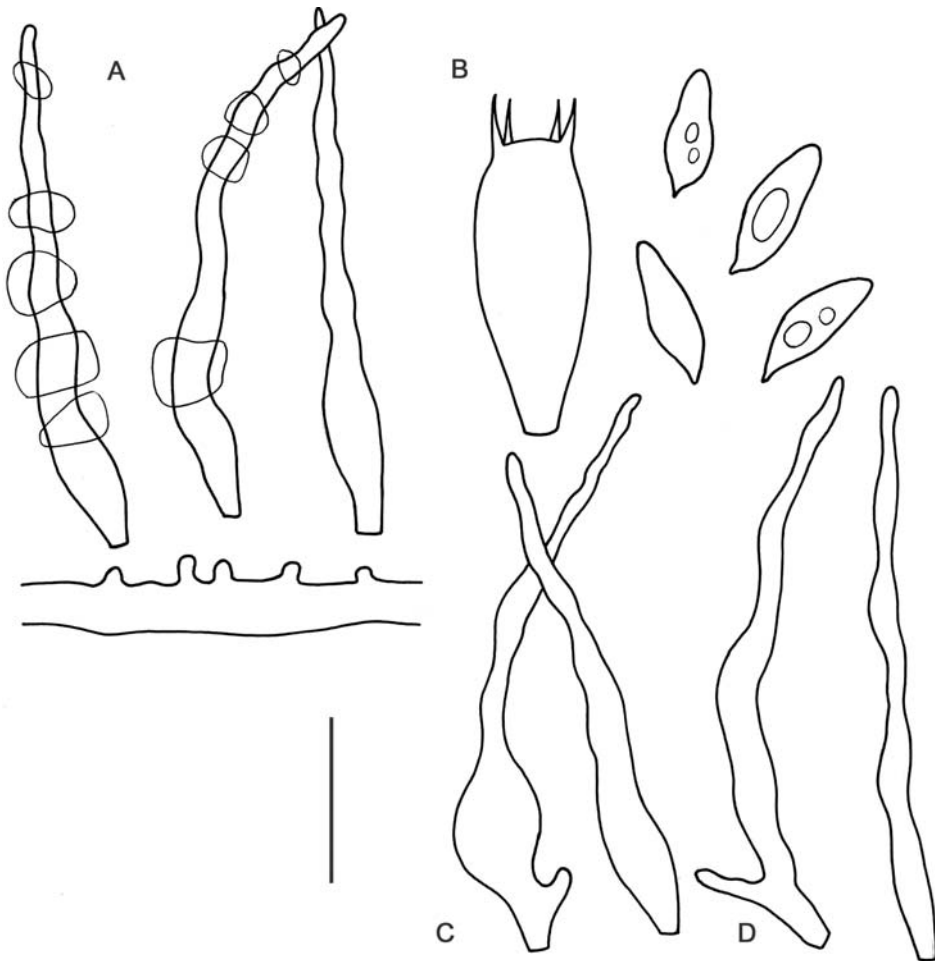
**Key to species of *Hemimycena* from European Russia**

1a	Basidiocarps mycenoid with more or less conical pileus and well-developed lamellae .....	2
1b	Basidiocarps with different pileus shape, usually not conical, lamellae vein-like or reduced .....	4
2a	Lamellae very crowded, pileocystidia not capitate .....	<i>H. cucullata</i>
2b	Lamellae distant, pileocystidia capitate or subcapitate .....	3
3a	Spores $6.3\text{--}7.8 \times 2.6\text{--}4.3 \mu\text{m}$ .....	<i>H. pseudolactea</i>
3b	Spores $8.6\text{--}14 \times 2.8\text{--}4.6 \mu\text{m}$ .....	<i>H. lactea</i>
4a(1)	Caulocystidia long and narrow, awl-shaped and often thick-walled (setiform), or capitate .....	5
4b	Caulocystidia shorter and not setiform .....	11
5a	Basidia 2-spored, clamp connections absent .....	<i>H. subtilis</i>
5b	Basidia 2- or 4-spored, clamp connections present .....	6
6a	On remnants of <i>Symphytum officinale</i> stems .....	<i>H. candida</i>
6b	On other substrates .....	7
7a	Pileo- and caulocystidia capitate .....	8
7b	Pileo- and caulocystidia not capitate .....	9
8a	Spores narrowly ellipsoid, narrowly fusoid or almost cylindrical .....	<i>H. mauretunica</i>
8b	Spores distinctly lemon-shaped .....	<i>H. cephalotricha</i>
9a(7)	Lamellae almost reduced, spores $6.8\text{--}10.4 \times 3.5\text{--}5 \mu\text{m}$ .....	<i>H. crispula</i>
9b	Lamellae developed.....	10
10a	Pileocystidia present .....	<i>H. subimmaculata</i>
10b	Pileocystidia absent .....	<i>H. pseudocrispula</i>
11a(4)	Spores broadly ellipsoid or broadly fusoid, $Q^* < 2$ .....	12
11b	Spores narrowly fusoid, cylindrical, $Q^* > 2$ .....	15
12a	Pileus with brown and grey tinges .....	13
12b	Pileus white or yellowish without dark tinges .....	<i>H. delectabilis</i>
13a	Pileocystidia absent .....	14
13b	Pileocystidia present. Basidia 2-spored, clamp connections absent .....	<i>H. tanjae</i>
14a	Basidia 4-spored, clamp connections present .....	<i>H. mairei</i>
14b	Basidia 2-spored, clamp connections absent .....	( <i>H. juncicola</i> )
15a(11)	Lamellae reduced, pileus umbilicate .....	<i>H. epichloë</i>
15b	Lamellae well-developed .....	16
16a	Basidia 2- or 4-spored, clamp connections absent .....	17
16b	Basidia 2- or 4-spored, clamp connections present .....	19
17a	Basidia 2-spored only .....	18
17b	Basidia 2- and 4-spored, spores $12.0\text{--}16.6 \times 2.6\text{--}3.8 \mu\text{m}$ .....	<i>H. stiriispora</i>
18a	Spores $7.8\text{--}9 \times 2.9\text{--}3.2 \mu\text{m}$ .....	<i>H. pseudocrispata</i>
18b	Spores $10.3\text{--}12(13) \times 2.7\text{--}3.9 \mu\text{m}$ .....	<i>H. globulifera</i>
19a(16)	Spores $8\text{--}11 \times 2.7\text{--}3.4 \mu\text{m}$ .....	<i>H. persimilis</i>
19b	Spores $10.8\text{--}13.8 \times 2.7\text{--}3 \mu\text{m}$ .....	<i>H. gracilis</i>

## DESCRIPTIONS OF THE STUDIED TAXA

***Hemimycena candida*** (Bres.) Singer, Ann. Mycol. 41: 121. 1943. Pl. 1A, Fig. 1

Pileus 3–6 mm in diameter, hemispherical to convex, with slightly depressed centre, with straight to slightly sinuous and involute margin, hygrophanous, translucently striate up to one third of radius when moist, white, ± pubescent. Lamellae well-developed, distant, reaching the pileus margin, deeply decurrent, white. Stipe 15–30 × 0.5–1 mm, very slender, almost filiform, straight, sometimes curved, glabrous or pubescent (only visible with lens), white.



**Fig. 1.** *Hemimycena candida* (LE 253408): A – hypha of pileipellis and pileocystidia, B – basidium and spores, C – cheilocystidia, D – caulocystidia; scale bar 10  $\mu$ m.



**Pl. 1.** A – *Hemimycena candida*, photo by O. Morozova. B – *Hemimycena crispula* var. *crispula*, photo by O. Morozova.



**Pl. 2.** A – *Hemimycena cucullata*, photo by O. Morozova. B – *Hemimycena delectabilis* var. *delectabilis*, photo by T. Svetasheva.

Spores  $7.6\text{--}10 \times 3.3\text{--}4.6 \mu\text{m}$ ,  $Q^* = 2.2$ , narrowly fusoid or slightly limoniform, elongated to one tip, thin-walled, hyaline. Basidia  $18\text{--}22 \times 8\text{--}9 \mu\text{m}$ , 4-spored, clavate. Cheilocystidia  $22\text{--}40 \times 3\text{--}4 \mu\text{m}$ , narrowly fusoid (or sublageniform) with long neck, cylindrical with mucronate apex or awl-shaped, often curved with undulate walls and variable in shape excrescences at base, hyaline, slightly thick-walled. Pleurocystidia absent. Pileipellis a cutis consisting of radially arranged, hyaline, thin-walled, cylindrical,  $4\text{--}6 \mu\text{m}$  wide hyphae with scattered, digitate, up to  $3 \mu\text{m}$  wide excrescences. Pileocystidia  $15\text{--}28 \times 2.7\text{--}4 \mu\text{m}$ , abundant, similar in shape to cheilocystidia, slightly thick-walled, sometimes covered with lacerated mucilaginous layer. Caulocystidia  $15\text{--}35 \times 2.7\text{--}4 \mu\text{m}$ , awl-shaped, narrowly cylindrical, with undulate walls and excrescences, slightly thick-walled. Clamp connections present.

Habitat: On the base of *Symphytum officinale* stems.

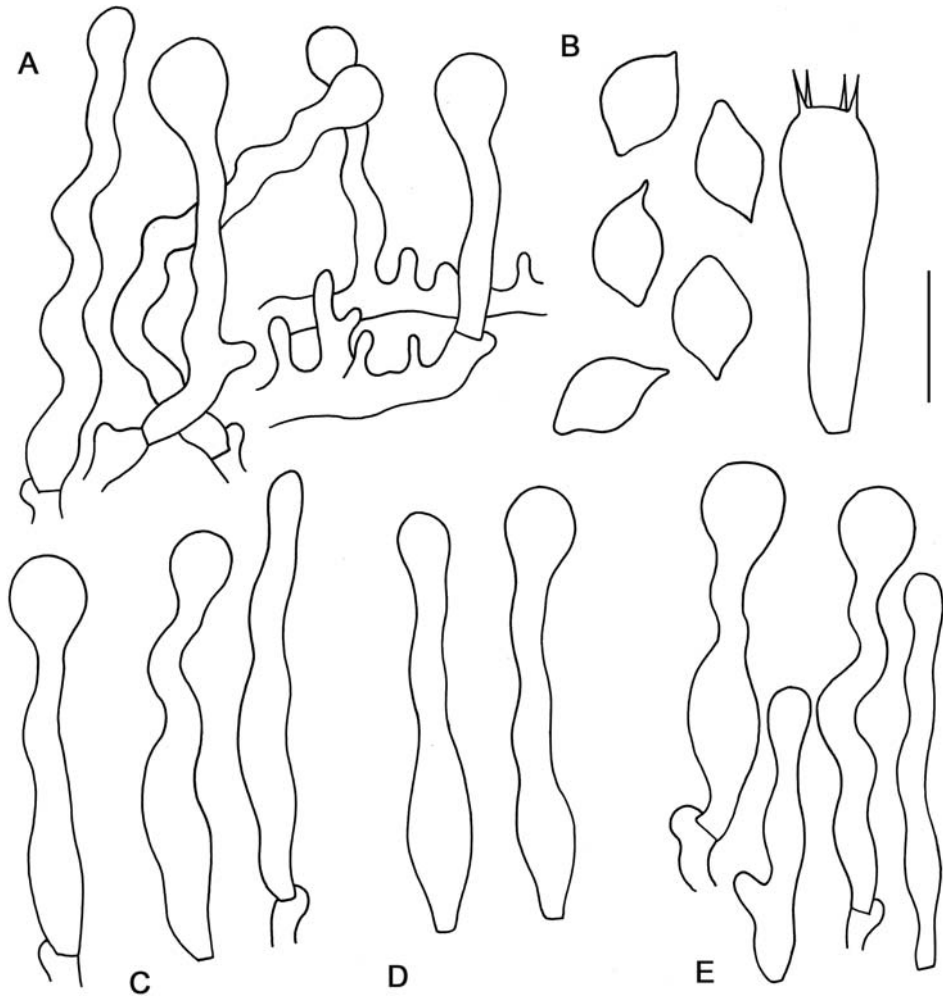
Distribution: Known in the studied territory from one locality in the Rostov Region. It was reported by Singer (1938) from the Caucasus.

Material examined: Rostov Region, vicinities of Veshenskaya, flood plain forest, on remnants of *Symphytum officinale*, 10 Oct. 2006, leg. and det. O. Morozova (LE 253408).

***Hemimycena cephalotricha*** (Joss. ex Redhead) Singer, Agar. Mod. Taxon.: 397. 1986. Fig. 2

Pileus  $1\text{--}5 \text{ mm}$  in diameter, hemispherical to convex or almost applanate, often slightly depressed at centre, with straight margin, hygrophanous, pruinose to tomentose, with droplets of exudate when fresh, white. Lamellae well-developed, distant, reaching the pileus margin, broadly adnate to decurrent, white. Stipe  $7\text{--}15 \times 0.1\text{--}0.5 \text{ mm}$ , often eccentric, pruinose to tomentose, with droplets of exudate when fresh, white.

Spores  $6.1\text{--}8.3 \times 4.1\text{--}5.5 \mu\text{m}$ ,  $Q^* = 1.5$ , amygdaliform to limoniform, hyaline, thin-walled. Basidia  $20\text{--}23 \times 7.3\text{--}8.1 \mu\text{m}$ , 4-spored, clavate. Cheilocystidia  $21\text{--}37 \times 2.7\text{--}6 \mu\text{m}$ , cylindrical, fusoid or lageniform, often flexuose, with capitate apex ( $3.4\text{--}6.6 \mu\text{m}$  in diameter), hyaline, thin- or slightly thick-walled. Pleurocystidia  $24\text{--}31.6 \times 3\text{--}5.3 \mu\text{m}$ , similar to cheilocystidia in shape, with capitate apex up to  $5.5 \mu\text{m}$  in diameter, scattered or absent. Pileipellis a cutis consisting of radially arranged, hyaline, thin- or slightly thick-walled, diverticulate hyphae of up to  $5.5 \mu\text{m}$  wide. Pileocystidia  $25\text{--}51 \times 3\text{--}4.7 \mu\text{m}$ , abundant, cylindrical or narrowly fusoid, flexuose, often twisted, with distinct capitate apex ( $4\text{--}7 \mu\text{m}$  in diameter), sometimes with excrescences near the base, hyaline, thin- or slightly thick-walled. Stipitipellis consisting of hyaline parallel hyphae with scarce short excrescences. Caulocystidia  $20\text{--}60 \times 2.7\text{--}3.2 \mu\text{m}$ , abundant, similar in shape and size to pileocystidia, sometimes diverticulate, capitulum up to  $6 \mu\text{m}$  in diameter, hyaline, thin- or slightly thick-walled. Clamp connections present.



**Fig. 2.** *Hemimycena cephalotricha* (LE 253596): A – hypha of pileipellis and pileocystidia, B – basidium and spores, C – cheilocystidia, D – pleurocystidia, E – caulocystidia; scale bar 10  $\mu$ m.

**Habitat:** On decaying wood and bark of *Quercus* sp.

**Distribution:** Rare, known from two localities in the Krasnodar Territory.

**Notes:** Our specimens corresponds well with the description given by Antonín and Noordeloos (2004), but differs by presence of scattered pleurocystidia over the entire lamella in one specimen and twisted pileo- and caulocystidia. The characteristic droplets on the pileus and stipe surfaces in fresh condition were observed in both collections.



Material examined: Krasnodar Territory, Tuapse District, Shage-Shatan Mountains, on trunk of *Quercus* sp., 16 Oct. 1997, leg. and det. O. Morozova (LE 226562). – Same locality, vicinities of Agoy, on decaying trunk of *Quercus* sp., 19 Oct. 1997, leg. and det. O. Morozova (LE 253596).

***Hemimycena crispula*** (Quél.) Singer, Ann. Mycol. 41: 121. 1943.

Key to the varieties of *H. crispula*

- 1a Basidia 2-spored ..... var. *crispula*  
1b Basidia 4-spored ..... var. *tetraspora*

***Hemimycena crispula* var. *crispula***

Pl. 1B, Fig. 3

Pileus 2–3 mm in diameter, hemispherical to convex, sometimes with small central umbo, with straight margin, hygrophanous, white, pubescent to hairy. Lamellae almost reduced, very distant, not reaching the margin of pileus, white. Stipe 7–10 × 0.3–0.5 mm, filiform, pubescent to white hairy.

Spores 6.8–10.4 × 3.5–4.5 µm, broadly ellipsoid, ovoid, thin-walled, hyaline. Basidia 20–27 × 5.5–7 µm, 2-spored, clavate. Hymenial cystidia absent. Pileipellis a cutis consisting of radially arranged, hyaline, slightly thick-walled, cylindrical, 3–5 µm wide hyphae with numerous short excrescences. Pileocystidia 40–65 × 3–4 µm, abundant, awl-shaped, narrowly fusoid with mucronate apex, often with undulate walls and irregularly shaped excrescences, thick-walled, hyaline. Caulocystidia 40–80 × 5.5–8 µm, abundant, similar in shape to pileocystidia, thick-walled, hyaline. Clamp connections present.

Habitat: On plant remnants in grasslands.

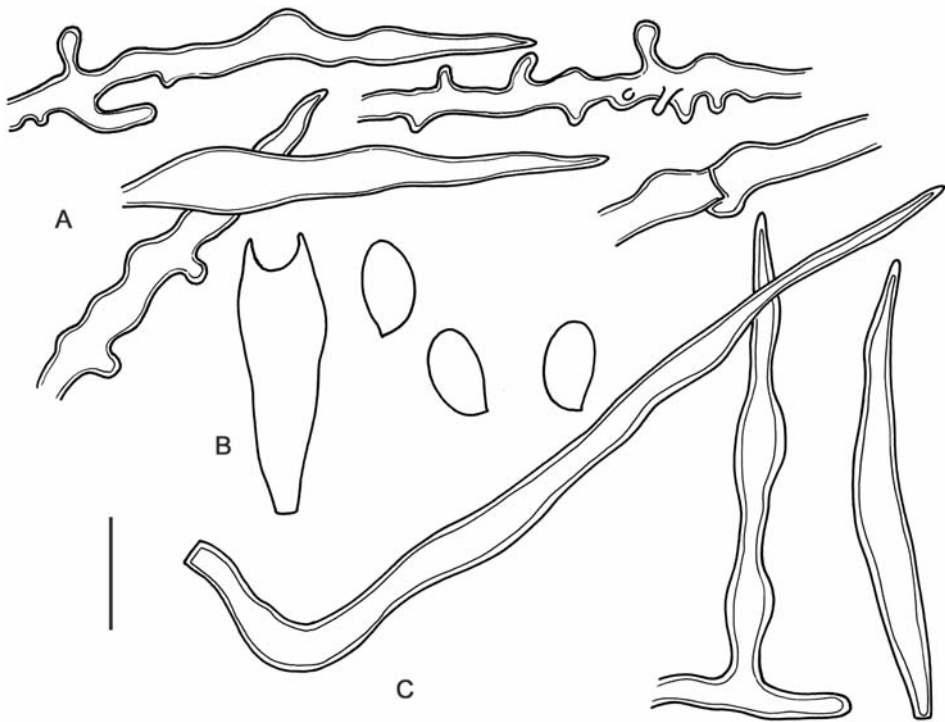
Distribution: Rare, known in the studied territory from the Leningrad Region. It was also mentioned for the Moscow Region (Vishnevsky 1998, as *H. hirsuta* (Tode: Fr.) Singer).

Material examined: Leningrad Region, Volosovo District, Dontso, meadow overgrown with *Juniperus*, on grass debris, 5 Oct. 2005, leg. E. Popov, det. E. Malysheva (LE 231625). – Same region, Gatchina District, Pudost', meadow with *Inula salicina*, on burnt stem of plant, 8 Sept. 2006, leg. and det. O. Morozova (LE 226549).

***Hemimycena crispula* var. *tetraspora*** Antonín et Noordel., A monograph of the genera *Hemimycena* etc. in Europe: 63. 2004.

Pileus 2 mm in diameter, convex with straight margin, hygrophanous, white, pubescent to hairy. Lamellae almost reduced, very distant, not reaching the margin of pileus, white. Stipe 8 × 0.2 mm, filiform, pubescent to hairy, white.

Spores 7.5–8.6 × 4–5 µm, Q\* = 1.8, broadly ellipsoid, ovoid, thin-walled, hyaline. Basidia 20–27 × 5.5–7 µm, 4-spored, clavate. Hymenial cystidia absent. Pileipellis a cutis consisting of radially arranged, hyaline, slightly thick-walled, cylindrical, 3–6 µm wide hyphae with numerous short excrescences. Pileocystidia 60–100 × 3–6 µm, abundant, awl-shaped, narrowly fusoid with mucronate apex,



**Fig. 3.** *Hemimycena crispula* var. *crispula* (LE 231625): A – elements of pileipellis and pileocystidia, B – basidium and spores, C – caulocystidia; scale bar 10  $\mu$ m.

often with undulate walls and irregular shaped excrescences, thick-walled, hyaline. Caulocystidia 25–70  $\times$  3–8  $\mu$ m, abundant, similar in shape to pileocystidia, thick-walled, hyaline. Clamp connections present.

**Habitat:** On plant remnants in grasslands.

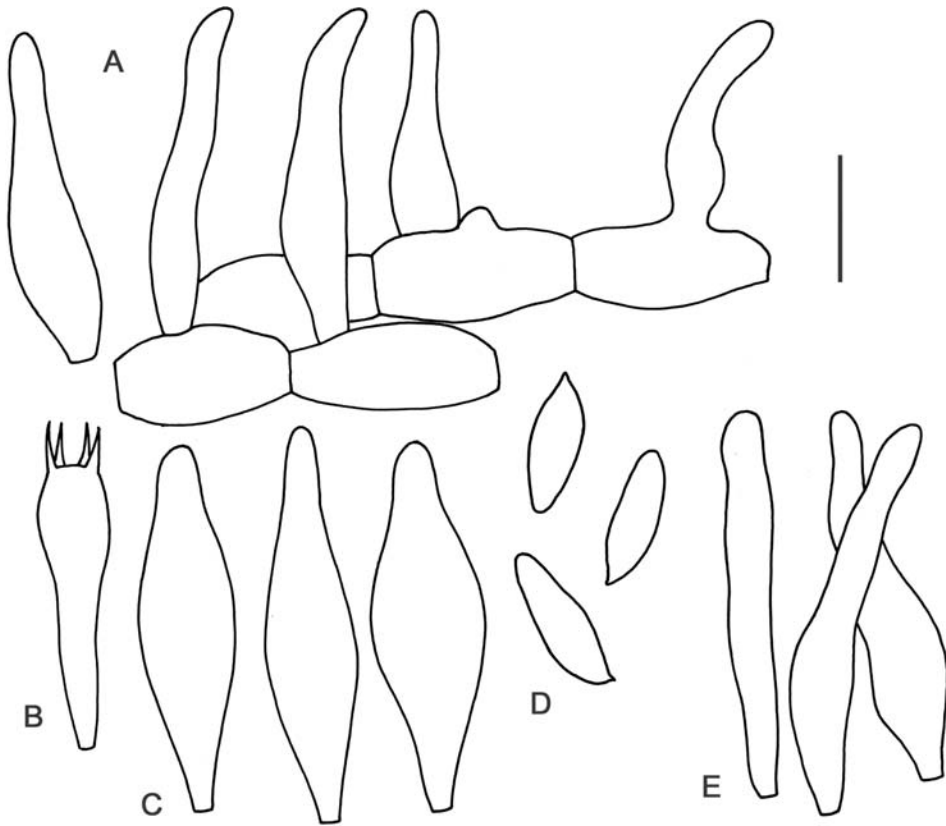
**Distribution:** It was found in the studied territory once in the Leningrad Region.

**Notes:** Our specimen differs from typical var. *crispula* by distinctly 4-spored basidia as well as longer pileocystidia. The descriptions of both varieties are rather similar in the other features.

**Material examined:** Leningrad Region, Volosovo District, Dontso, meadow with *Calamagrostis*, in decaying herb layer, 7 Sept. 2005, leg. O. Morozova, det. E. Malysheva (LE 226557).

***Hemimycena cucullata*** (Pers.: Fr.) Singer, Persoonia 2: 20. 1961. Pl. 2A, Fig. 4

Pileus 6–13 mm in diameter, conical at first, convex to campanulate-convex with age, with obtuse or distinct central umbo, with straight to slightly sinuous



**Fig. 4.** *Hemimycena cucullata* (LE 227615): A – pileipellis, B – basidium, C – cheilocystidia, D – spores, E – caulocystidia; scale bar 10  $\mu$ m.

margin, hygrophanous, translucently striate at margin, white or cream-coloured at centre, finely pubescent. Lamellae well-developed, crowded, reaching the pileus margin, adnate to stipe with tooth, white. Stipe 20–35  $\times$  0.5–1.5 mm, cylindrical, straight, finely tomentose to pubescent in upper half, covered with hairs in lower part, white.

Spores 10.3–11.7  $\times$  4–5  $\mu$ m,  $Q^* = 2.4$ , broadly fusoid, thin-walled, hyaline. Basidia 20–27  $\times$  6–8  $\mu$ m, 4-spored, narrowly clavate. Cheilocystidia 25–31  $\times$  4–7  $\mu$ m, (broadly) fusoid, lageniform, with obtuse apex, hyaline, thin-walled. Pleurocystidia absent. Pileipellis a trichoderm consisting of erect, hyaline, thin-walled, cylindrical or fusoid cells 20–40  $\times$  5.5–8.5  $\mu$ m in size. True pileocystidia absent. Caulocystidia 26–30  $\times$  5–6  $\mu$ m, variable in appearance, cylindrical, narrowly clavate or fusoid, hyaline, thin-walled. Clamp connections present.

**Habitat:** On plant remnants in litter or on soil in deciduous or mixed forests.

**Distribution:** Not rare, known in the studied territory from the Leningrad, Tula and Samara Regions.

**Material examined:** Leningrad Region, Volosovo District, Dontso, left bank of Oredez River, edge of mixed forest, in litter, 7 Sept. 2005, leg. and det. O. Morozova (LE 231627). – Same region, Kirovsk District, Vasilkovo, right bank of Lava River, edge of mixed forest, on soil, 29 Sept. 2006, leg. and det. O. Morozova (LE 231626). – Tula Region, Zaoksky District, Dvoryaninovo, broad-leaved forest, in litter, 24 Aug. 2003, leg. and det. T. Svetasheva (LE 234992). – Samara Region, Zhigulevsky Nature Reserve, vicinities of Bakhilova Polyana, *Alnus glutinosa* flood plain forest, in litter, 24 Aug. 2003, leg. and det. E. Malysheva (LE 227615).

***Hemimycena delectabilis*** (Peck) Singer, Ann. Mycol. 41: 121. 1943.

Key to the varieties of *H. delectabilis*

- 1a Basidia 4-spored, clamp connections present ..... var. *delectabilis*  
 1b Basidia 2-spored, clamp connections absent ..... var. *bispora*

***Hemimycena delectabilis* var. *delectabilis***

Pl. 2B, Fig. 5

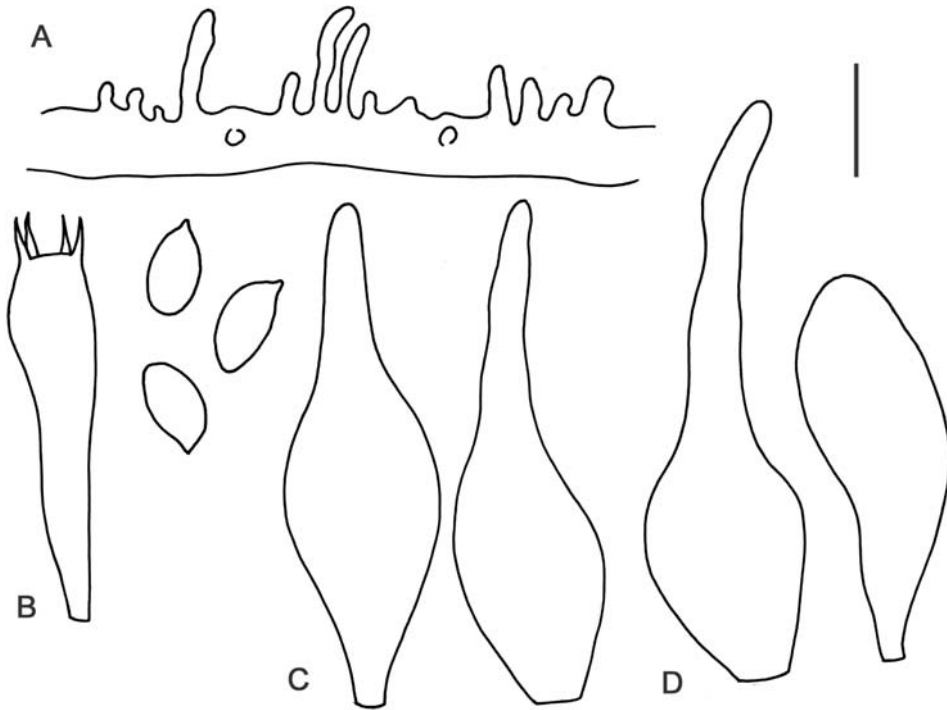
Pileus 3–8 mm in diameter, hemispherical to convex or almost applanate, with slightly depressed or umbonate centre, with straight to slightly involute and sinuous margin, hygrophanous, translucently striate at margin when moist, white to yellowish with age, glabrous to finely tomentose. Lamellae well-developed, distant, reaching the pileus margin, decurrent, white. Stipe 8–15 × 0.5–1.5 mm, very slender, cylindrical or slightly broadened at base, straight, finely pubescent, pubescent at base, white.

Spores 7.6–9.5 × 3.8–5 µm, Q\* = 1.9, broadly ellipsoid or slightly lacrymoid, thin-walled, hyaline. Basidia 27–33 × 7–8 µm, 4-spored, clavate with clamps at base. Hymenial cystidia 27–45 × 6.5–12 µm, lageniform, fusoid with long neck, hyaline, thin- or slightly thick-walled. Pileipellis a cutis consisting of radially arranged, hyaline, thin-walled, cylindrical, up to 6.5 µm wide hyphae with numerous, cystidioid excrescences up to 25 µm long and 5 µm wide. True pileocystidia absent. Caulocystidia 15–55 × 5.5–11 µm, scanty or numerous, variable in shape, cylindrical, fusoid, clavate or lageniform, sometimes with subcapitate apex, hyaline, thin-walled. Clamp connections present.

**Habitat:** On vegetal debris in grassland vegetation or on dead wood in forest litter.

**Distribution:** Not rare, known in the studied territory from the Novgorod and Tula Regions. It was also mentioned for the Karelia Republic (Shubin and Krutov 1979), Leningrad (Kovalenko and Morozova 1999), Moscow (Vishnevsky 1998), Sverdlovsk (Marina 2006), and Perm (Perevedentseva 2008) Regions.

**Material examined:** Novgorod Region, Vostochno-Ilmensky Sanctuary, vicinities of Pavlovo, meadow, on plant debris in litter, 28 Sept. 2005, leg. and det. E. Malysheva (LE 234300). – Tula Region, Schekino District, Museum-Estate of Leo Tolstoy “Yasnaya Polyana”, broad-leaved forest, in litter, 14 Jun. 2003, leg. and det. T. Svetasheva (LE 234994). – Same region, Kireevo District, vicinities of Bykovka, meadow, on debris of *Poaceae*, 15 Oct. 2008, leg. T. Svetasheva, det. E. Malysheva (LE 231756).

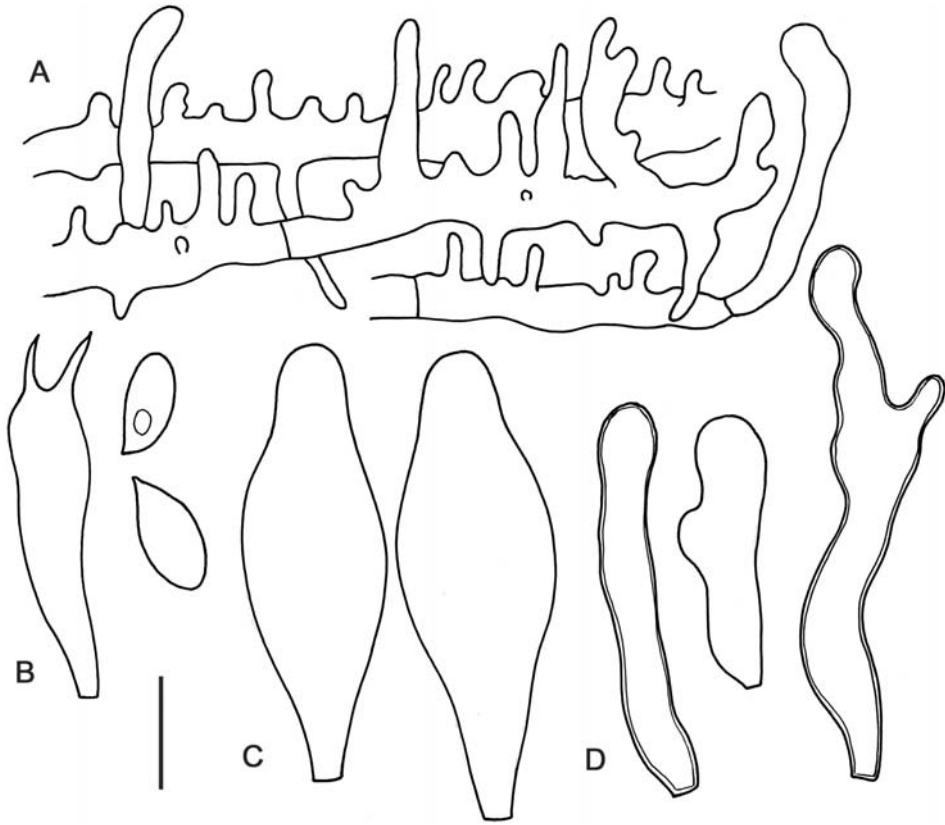


**Fig. 5.** *Hemimycena delectabilis* var. *delectabilis* (LE 234994): A – hypha of pileipellis, B – basidium and spores, C – cheilocystidia, D – caulocystidia; scale bar 10  $\mu$ m.

***Hemimycena delectabilis* var. *bispora*** (Kühner) Antonín in Antonín et Škubla, *Fungi non delineati* 11: 18. 2000. Fig. 6

Pileus 2–4 mm in diameter, conical to convex, with small umbo, with straight striate margin, hygrophanous, surface white to cream-coloured and yellowish with age, finely pubescent. Lamellae well-developed, distant, reaching the pileus margin, decurrent, white. Stipe 10–15  $\times$  0.3–0.5 mm, very slender, almost glabrous, pubescent at base, white.

Spores 6.2–8  $\times$  4.0–5.5  $\mu$ m,  $Q^* = 1.6$ , broadly ellipsoid or slightly lacrymoid, thin-walled, hyaline. Basidia 27–33  $\times$  7–8  $\mu$ m, 2-spored, narrowly clavate. Hymenial cystidia 35–55  $\times$  8–11  $\mu$ m, clavate, broadly fusoid, thin-walled, hyaline. Pileipellis a cutis consisting of radially arranged, hyaline, thin-walled, cylindrical, up to 8  $\mu$ m wide hyphae with numerous cystidioid excrescences of up to 25  $\mu$ m long and 5.5  $\mu$ m wide. True pileocystidia absent. Caulocystidia 13–40  $\times$  5.5–9  $\mu$ m, variable in shape, cylindrical, fusoid, clavate, often with irregular excrescences, hyaline, thin- or slightly thick-walled. Clamp connections absent.



**Fig. 6.** *Hemimycena delectabilis* var. *bispora* (LE 234325): A – pileipellis, B – basidium and spores, C – cheilocystidia, D – caulocystidia; scale bar 10  $\mu$ m.

**Habitat:** On vegetal debris in litter in grassland and forest vegetation.

**Distribution:** Rare in the studied territory. Known from the Samara Region.

**Material examined:** Samara Region, Zhigulevsky Nature Reserve, vicinities of Bakhilova Polyana, meadow, in litter, 1 Aug. 2005, leg. and det. E. Malysheva (LE 234325).

**Notes:** Our specimens does not completely correspond with the descriptions of var. *bispora* given by other authors (Kühner and Valla 1972, Antonín and Noordeloos 2004). They differ from other collections mainly by the smaller spores. However, *H. delectabilis* is known to be a species characterised by a wide range of morphological variability, which may also relate to spore size. The main features of this variety are the 2-spored basidia and the absence of clamp connections in all tissues.

Besides, there are several specimens in our collections that strongly differ from the typical description of var. *bispora* by the shape of their caulocystidia. This material may belong to a new variety of *H. delectabilis*. Deficit of specimens and the variability of the entire species do, however, not enable us to describe a new taxon.

Below we give a description of these specimens.

***Hemimycena delectabilis* cf. var. *bispora***

Pileus 2–6 mm in diameter, conical or convex, with small umbo, with straight striate margin, hygrophanous, surface white to cream-coloured and yellowish with age, finely pubescent. Lamellae well-developed, distant, reaching the margin of pileus, decurrent, white. Stipe 10–20 × 0.5–0.8 mm, very slender, almost glabrous, pubescent at base, white.

Spores 7.0–9.0 × 4.8–6.2 μm, Q\* = 1.5, broadly ellipsoid or broadly lacrymoid, thin-walled, hyaline. Basidia 20–33 × 5.5–7.0 μm, 2-spored, clavate. Hymenial cystidia 30–60 × 12–20 μm, clavate, cylindrical, broadly fusoid, thin-walled or slightly thick-walled, hyaline. Pileipellis a cutis consisting of radially arranged, hyaline, thin-walled, cylindrical, up to 10 μm wide hyphae with rare cylindrical short out-growths and also cystidioid excrescences of up to 15 μm long and 4 μm wide. True pileocystidia absent. Caulocystidia 12–55 × 5.5–9.0 μm, very abundant, variable in shape, cylindrical, fusoid, clavate, lageniform with acute or subcapitate apex, awl-shaped, often with irregular excrescences at base, hyaline, thin-walled. Clamp connections absent (fig. 7).

**Habitat:** On vegetal debris in litter in grassland vegetation.

**Distribution:** Known in the studied territory from the Leningrad and Novgorod Regions.

**Material examined:** Leningrad Region, Vyborg District, Bolshoi Berezovyi Island, vicinities of Rybachie, on grass debris in litter, 1 Oct. 2005, leg. O. Morozova (LE 231736). – Novgorod Region, Novgorodsky Sanctuary, grassland, on twigs in litter, 25 Sept. 2005, leg. E. Malysheva (LE 234314).

In addition, it is necessary in the future to pay special attention to collection and investigation of more material of *H. delectabilis* on the Russian territory to delimit the species more exactly and to establish features of its infraspecific taxa.

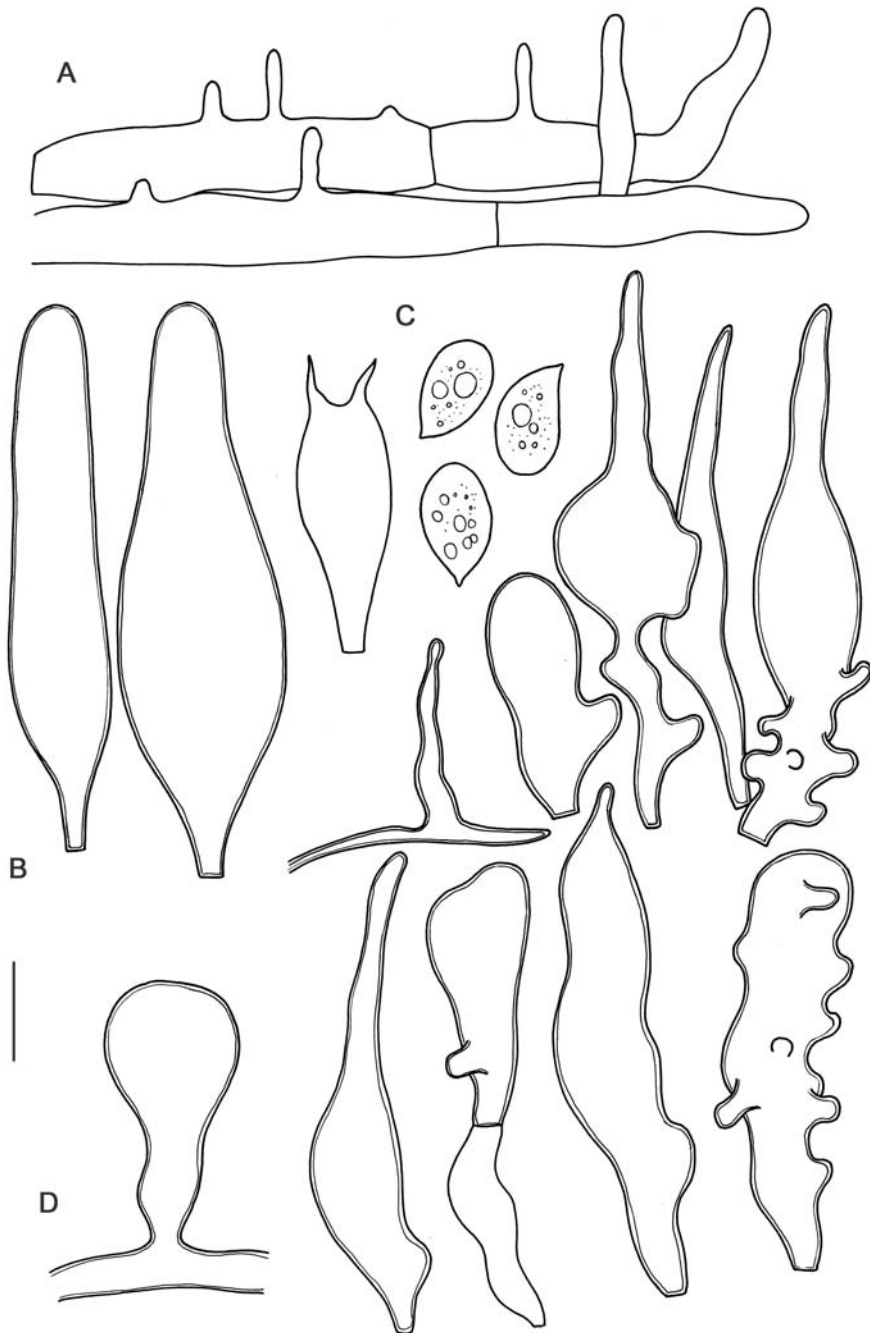
***Hemimycena epichloë* (Kühner) Singer, Ann. Mycol. 41: 121. 1943. Pl. 3A, Fig. 8**

Pileus 2–4 mm in diameter, distinctly umbilicate, with reflexed and sinuous margin, hygrophanous, not translucently striate, white, glabrous. Lamellae badly developed, vein-like, not reaching the pileus margin, decurrent, white. Stipe 8–15 × 0.5 mm, very slender, filiform, translucent, finely pubescent, white.

Spores 8–11 × 2.7–4 μm, Q\* = 2.7, cylindrical, fusoid or narrowly lacrymoid, thin-walled, hyaline. Basidia 18–22 × 6–8 μm, 4-spored, clavate with clamps at base. Hymenial cystidia absent. Pileipellis a cutis consisting of radially arranged, hyaline, thin-walled, cylindrical, 4–8 μm wide hyphae with numerous, cylindrical or narrowly clavate excrescences up to 10 μm long and 3 μm wide. True pileocystidia absent. Caulocystidia 13–60 × 3–6.5 μm, variable in shape, cylindrical, narrowly clavate, flexuous, hyaline, thin-walled. Clamp connections present and abundant.

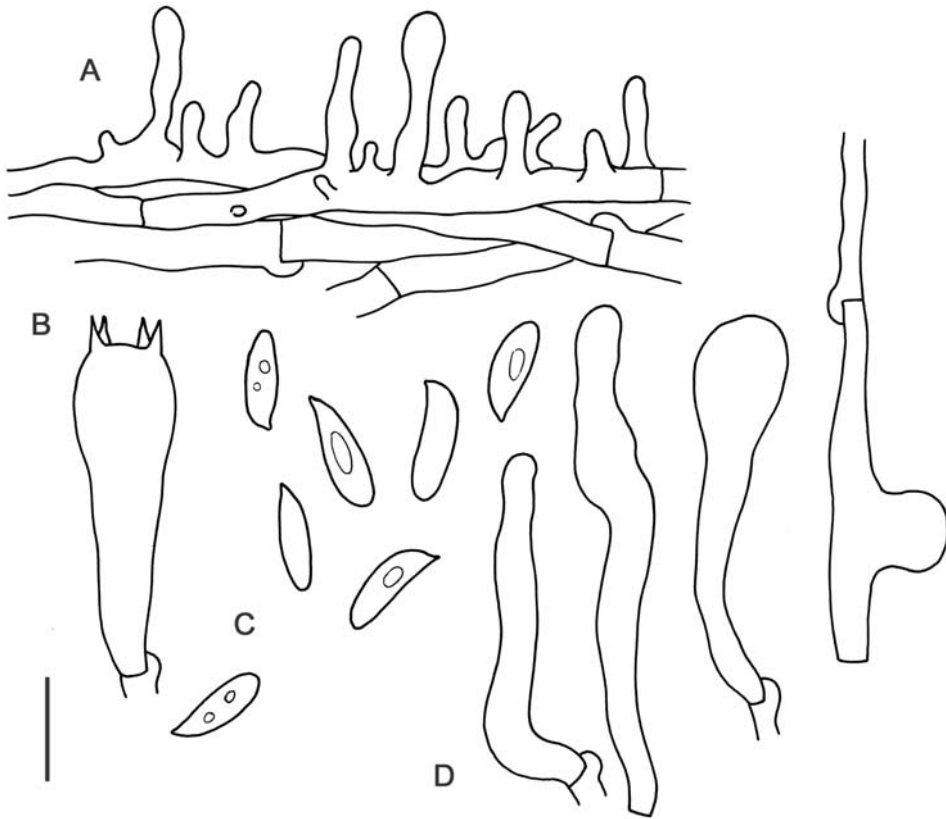
**Habitat:** On dead stems and leaves of grasses in wet places.

**Distribution:** Rare, possibly because of being overlooked. Known from the Leningrad and Pskov Regions.



**Fig. 7.** *Hemimycena delectabilis* cf. *bispora* (LE 231736): A – pileipellis, B – cheilocystidia, C – basidium and spores, D – caulocystidia; scale bar 10  $\mu$ m.





**Fig. 8.** *Hemimycena epichloë* (LE 231806): A – pileipellis, B – basidium, C – spores, D – caulocystidia; scale bar 10  $\mu$ m.

**Notes:** This species is easily recognised in the field by the small size of its basidiomes, the typical umbilicate pileus and reduced lamellae.

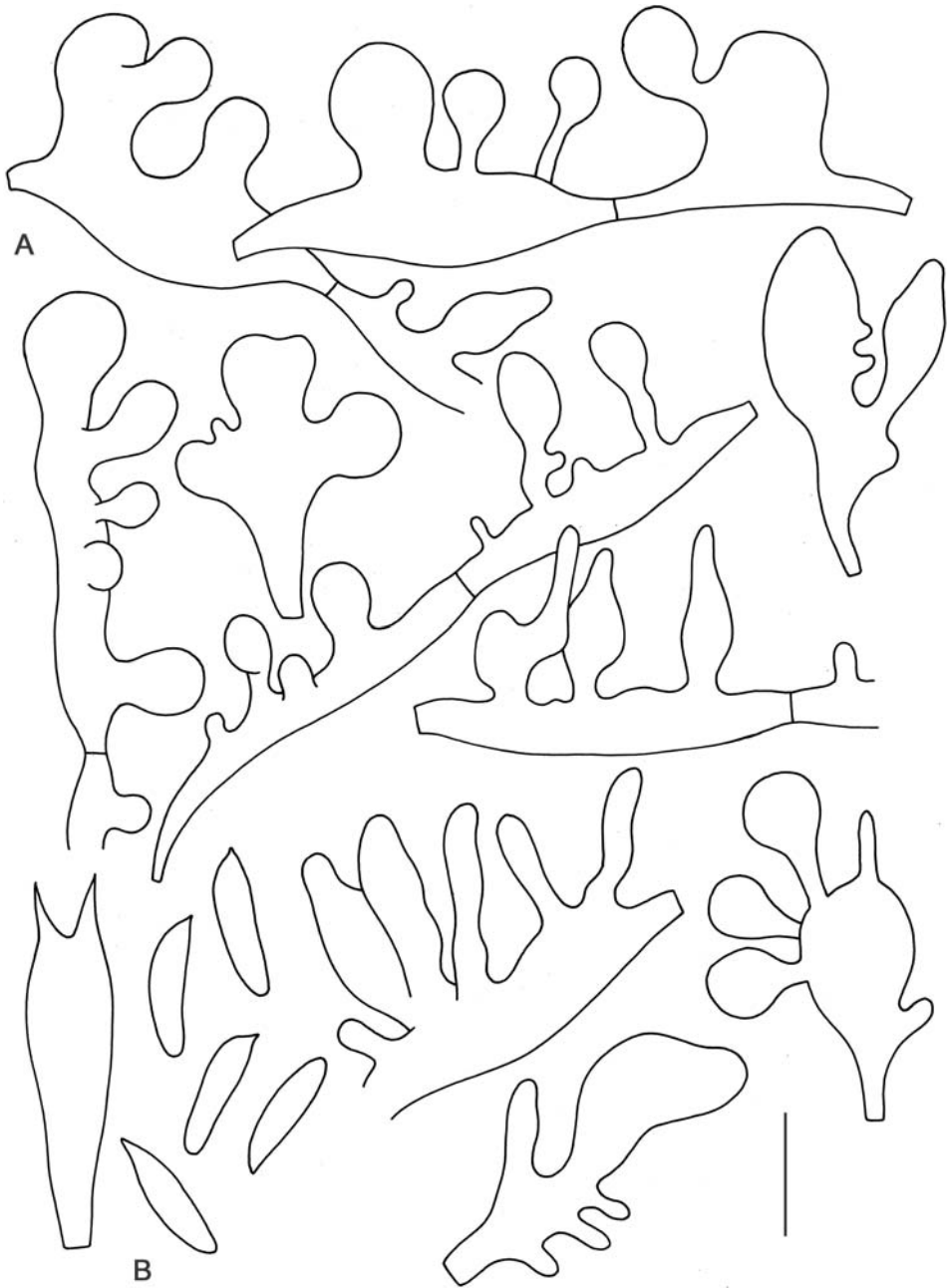
**Material examined:** Leningrad Region, Lodeinoye Pole District, Nizhne-Svirsky Nature Reserve, vicinities of Kut-Lakhta, meadow with *Deschampsia cespitosa*, on grass debris, 2 Aug. 2004, leg. A. Kovalenko, det. E. Popov (LE 247160). – Pskov Region, Pechora District, Izborsk, flood plain grassland, on grass debris, 17 Jul. 2007, leg. and det. O. Morozova (LE 231806).

***Hemimycena globulifera* E. F. Malysheva et O. V. Morozova spec. nov.**

Figs. 9, 10

(MycoBank MB513508)

Pileus 2–4 mm latus, initio hemisphaericus postea convexus, translucente striatus, hygrophanus, pruinosis, albus. Lamellae distantes, arcuatodecurrentes, albae. Stipes 10–20  $\times$  0,2–0,5 mm, filiformis, albus, sursum pruinosis. Sporae 10,3–12(13)  $\times$  2,7–3,9  $\mu$ m, cylindricae vel fusiformes, interdum contractae. Basidia 19–28  $\times$  6–8  $\mu$ m, 2-spora, clavata. Cheilocystidia desunt. Hyphae pileipellis 3–11  $\mu$ m



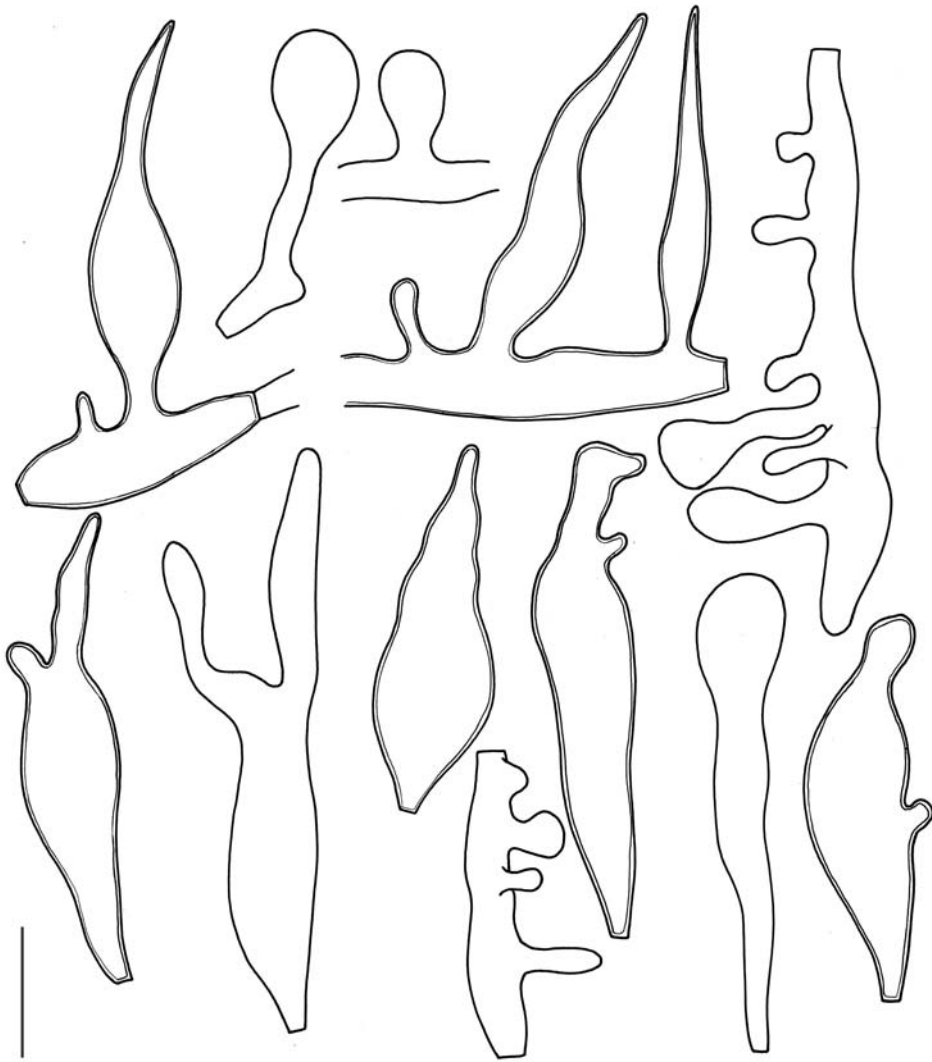
**Fig. 9.** *Hemimycena globulifera* (LE 253485): A – hyphae of pileipellis with pileocystidia, B – basidium and spores; scale bar 10  $\mu$ m.



**Pl. 3.** A – *Hemimycena epichloë*, photo by A. Kovalenko. B – *Hemimycena gracilis*, photo by O. Morozova.



**Pl. 4.** A – *Hemimycena mauretunica* var. *cystidiata*, photo by O. Morozova. B – *Hemimycena pseudocrispula*, photo by O. Morozova.



**Fig. 10.** *Hemimycena globulifera* (LE 253485): Elements of stiptipellis and caulocystidia; scale bar 10  $\mu$ m.

latae, diverticulis globuliformibus etiam clavatis vel irregularibus. Pileocystidia 12–45  $\times$  8–11  $\mu$ m, tenuiparietalia, diversiformia, clavata vel cylindrica, diverticulis globuliformibus. Caulocystidia 8–40  $\times$  5–11  $\mu$ m, numerosa, diversiformia, clavata vel fusiformia, diverticulata, tenui- vel crassiparietalia. Fibulae non visae. Ad herbas destructas in prato graminoso-variiherboso.

**Holotypus:** Russia, regio Leningradensis, in valle fl. Lava, Vassilkovo, in prato graminoso-variiherboso, ad herbas destructas, 26. IX. 2006, O. Morozova (LE 253485).

**Etymology:** *globulifera* (Latin), pileipellis hyphae and pileocystidia possess spherical excrescences.

Pileus 2–4 mm in diameter, hemispherical to convex, with straight margin, hygrophanous, translucently striate, pruinose or smooth, white. Lamellae well-developed, distant, arcuate, decurrent, white. Stipe 10–20 × 0.2–0.5 mm, filiform, pruinose in upper part, white.

Spores 10.3–12(–13) × 2.7–3.9 µm,  $Q^* = 3.5$ , cylindrical, narrowly fusoid, slightly flexuous and often slightly constricted, hyaline, thin-walled. Basidia 19–28 × 6–8 µm, 2-spored, clavate. Hymenial cystidia absent. Pileipellis a cutis consisting of radially arranged, hyaline, thin-walled, ventricose, 3–11 µm wide hyphae with numerous excrescences variable in shape, but most often spherical, utriform or broad-clavate, 8–25 × 3–9 µm. Pileocystidia and pileocystidioid terminal elements 12–45 × 8–11 µm, very variable in shape, clavate or cylindrical with spherical or irregular excrescences, hyaline, thin-walled. Stipitipellis consisting of parallelly arranged, slightly thick-walled, up to 10 µm wide hyphae with variable excrescences of up to 17 µm long and 7 µm wide. Caulocystidia 8–40 × 5–11 µm, abundant, single or in clusters, very variable in shape, irregular, but most often fusiform or clavate with excrescences, hyaline, thin- or slightly thick-walled. Clamp connections not observed.

**Habitat:** On herb remnants in grass community.

**Distribution:** Only known from the type locality.

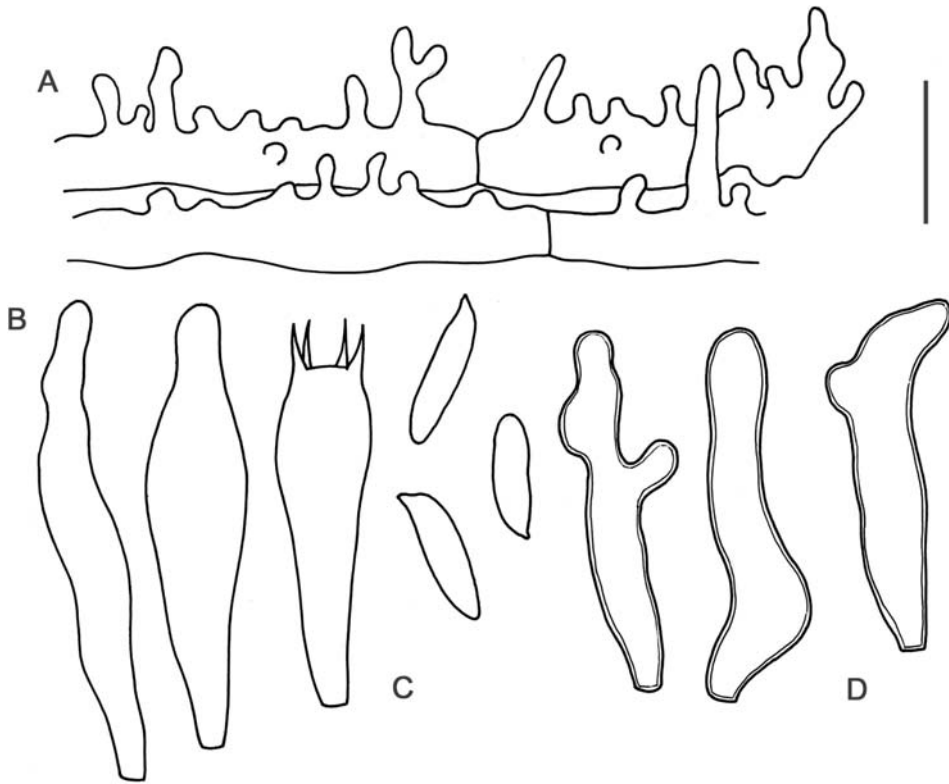
**Notes:** *Hemimycena globulifera* is characterised by having very small and delicate basidiomes, developed lamellae and especially by the hyphae of pileipellis and pileocystidia containing spherical, utriform or broad-clavate excrescences, and numerous thick-walled caulocystidia.

**Material examined:** Leningrad Region, Kirovsk District, vicinities of Vasilkovo, right bank of Lava River, meadow, in litter on grass remnants, 26 Sept. 2006, leg. O. Morozova (LE 253485, holotype).

***Hemimycena gracilis*** (Quél.) Singer, Ann. Mycol. 41: 121. 1943. Pl. 3B, Fig. 11

Pileus 5–8 mm in diameter, hemispherical to convex or almost applanate, with slightly depressed or umbonate centre, with straight to slightly crenulate margin, hygrophanous, translucently striate almost up to centre, white, finely pubescent. Lamellae well-developed, distant, reaching the margin of pileus, decurrent, white. Stipe 20–35 × 0.5–1 mm, filiform, almost glabrous to pubescent above, pubescent at base, white.

Spores 10.8–13.8 × 2.7–3 µm,  $Q^* = 4.4$ , cylindrical, often weakly allantoid, thin-walled, hyaline. Basidia 20–25 × 7–8 µm, 2- or 4-spored, narrowly clavate. Cheilocystidia 20–33 × 4–7 µm, narrowly clavate, cylindrical, fusoid or irregular, thin-walled, hyaline. Pleurocystidia absent. Pileipellis a cutis consisting of radially arranged, hyaline, thin-walled, cylindrical, 4–8 µm wide hyphae with numerous branched excrescences of up to 3 µm wide and cystidioid elements of up to 15 µm long and 3.5 µm wide. Caulocystidia 13–20 × 3–5.5 µm, variable in shape, often ir-



**Fig. 11.** *Hemimycena gracilis* (LE 231715): A – pileipellis, B – cheilocystidia, C – basidium and spores, D – caulocystidia; scale bar 10  $\mu$ m.

regular, cylindrical, narrowly clavate, fusoid, often with excrescences, hyaline, slightly thick-walled, sometimes with mucous cap at apex. Clamp connections present.

**Habitat:** On spruce needles and vegetal debris in litter or on soil in different types of vegetation.

**Distribution:** Not rare in the studied area. Known from the Leningrad, Vologda and Pskov Regions. It was also mentioned from the Moscow (Vishnevsky 1998), Sverdlovsk (Marina 2006) and Perm (Perevedentseva 2008) Regions.

**Notes:** There are some deviations in our specimens from the typical characteristics of this species. In specimen LE 231715 there were larger spores and 2-spored basidia, which, however, agrees with the revision of the type-specimen of *Agaricus immaculatus* Peck (Antonín and Noordeloos 2004). The fruiting on humus is neither typical. Another specimen (LE 202387) is characterised by smaller spores [(6.2–)7–8.4  $\times$  2.7–3.3  $\mu$ m, Q = 2.6] and absence of pileocystidia. Basidio-spore measurements of this collection fit the lower limit of size length reported

for *H. gracilis* (Antonín and Noordeloos 2004, Læssøe and Elborne 2008). However, a small spore size has been mentioned in some collections (Josserand 1937, Kühner and Valla 1972, Breitenbach and Kränzlin 1991) and distinct pileocystidia were often not observed (Josserand 1937, Kühner 1938, Meusers and Meusers 1985, Kühner and Valla 1972, Breitenbach and Kränzlin 1991).

Material examined: Leningrad Region, Volosovo District, vicinities of Bolshoye Zarechie, meadow with *Calamagrostis*, on soil, 5 Oct. 2005, leg. O. Morozova, det. E. Malysheva (LE 231715). – Vologda Region, Kirillov District, “Russky Sever” National Park, *Picea abies-Betula* sp. forest, on spruce needles, 20 June 2004, leg. and det. O. Kirillova (LE 246115). – Pskov Region, Strugi Krasnye District, Tuzherino, mixed forest, in litter, 23 Jul. 1994, leg. A. Kovalenko, det. O. Morozova (LE 202387).

***Hemimycena lactea*** (Pers.: Fr.) Singer, Ann. Mycol. 41: 121. 1943.

Key to the varieties of *H. lactea*

1a Basidia 4-spored. Spores  $8.0\text{--}10.8 \times 2.7\text{--}3.5 \mu\text{m}$  ..... var. *tetraspora*  
 1b Basidia 2-spored. Spores  $8.6\text{--}14.0 \times 2.8\text{--}4.6 \mu\text{m}$  ..... var. *lactea*

***Hemimycena lactea* var. *lactea***

Fig. 12

Pileus 3–8 mm in diameter, hemispherical to convex or almost applanate, with slightly depressed centre, with straight or sinuous margin, often reflected-uplifted, hygrophanous, translucently striate at margin when moist, white to yellowish at centre with age, pruinose to finely tomentose. Lamellae well-developed, distant, reaching the margin of pileus, broadly adnate, white. Stipe 10–25 × 0.5–1 mm, cylindrical, straight, almost glabrous to pubescent in upper part, pubescent at base, white.

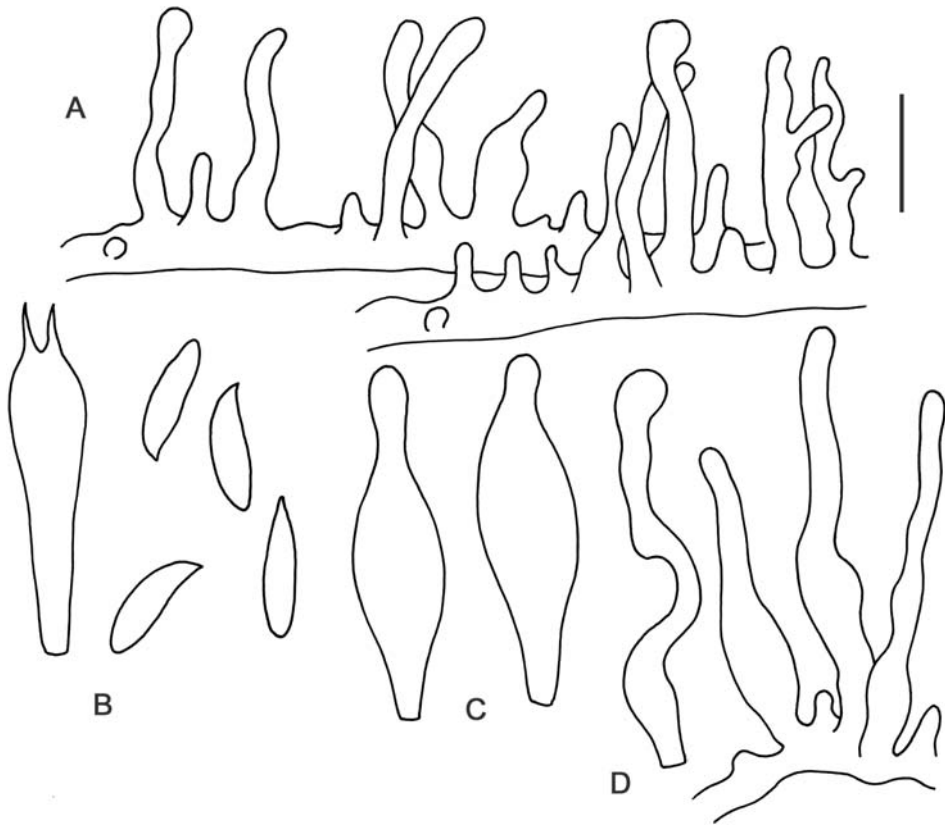
Spores  $8.6\text{--}14 \times 2.8\text{--}4.6 \mu\text{m}$ ,  $Q^* = 3.4$ , narrowly fusoid, slightly flexuous, thin-walled, hyaline. Basidia 18–23 × 6–8 μm, 2-spored, narrowly clavate. Cheilocystidia 19–30 × 5.5–6 μm, lageniform, fusoid with short neck and subcapitate apex, hyaline, thin-walled. Pleurocystidia resembling cheilocystidia in size and shape. Pileipellis a cutis consisting of radially arranged, hyaline, thin-walled, cylindrical, 4–8 μm wide hyphae with numerous cylindrical or branched excrescences of up to 3 μm wide and also with cylindrical cystidioid elements of up to 20 μm long and 4 μm wide with capitate apex. Caulocystidia 13–60 × 3–6.5 μm, scanty, variable in shape, often irregular, cylindrical, narrowly clavate with capitulum and sinuous walls, hyaline, thin-walled. Clamp connections present.

Habitat: On decaying wood in forests or in litter of grassland.

Distribution: Rare in the studied area. Known from the Karelia and Leningrad Region for which it was mentioned before (Shubin and Krutov 1979, Kovalenko and Morozova 1999). It was also recorded in the Moscow Region (Vishnevsky 1998).

Material examined: Karelia, Valaam Island, Kedron River, mixed forest (*Picea abies*, *Populus tremula*, *Betula pendula*), on decaying wood, 20 Sept. 1995, leg. A. Kovalenko, det. O. Morozova (LE 203075). – Leningrad Region, Volosovo District, Dontso, meadow with *Calamagrostis*, in litter, 5 Oct. 2005, leg. O. Morozova, det. E. Malysheva (LE 226554).



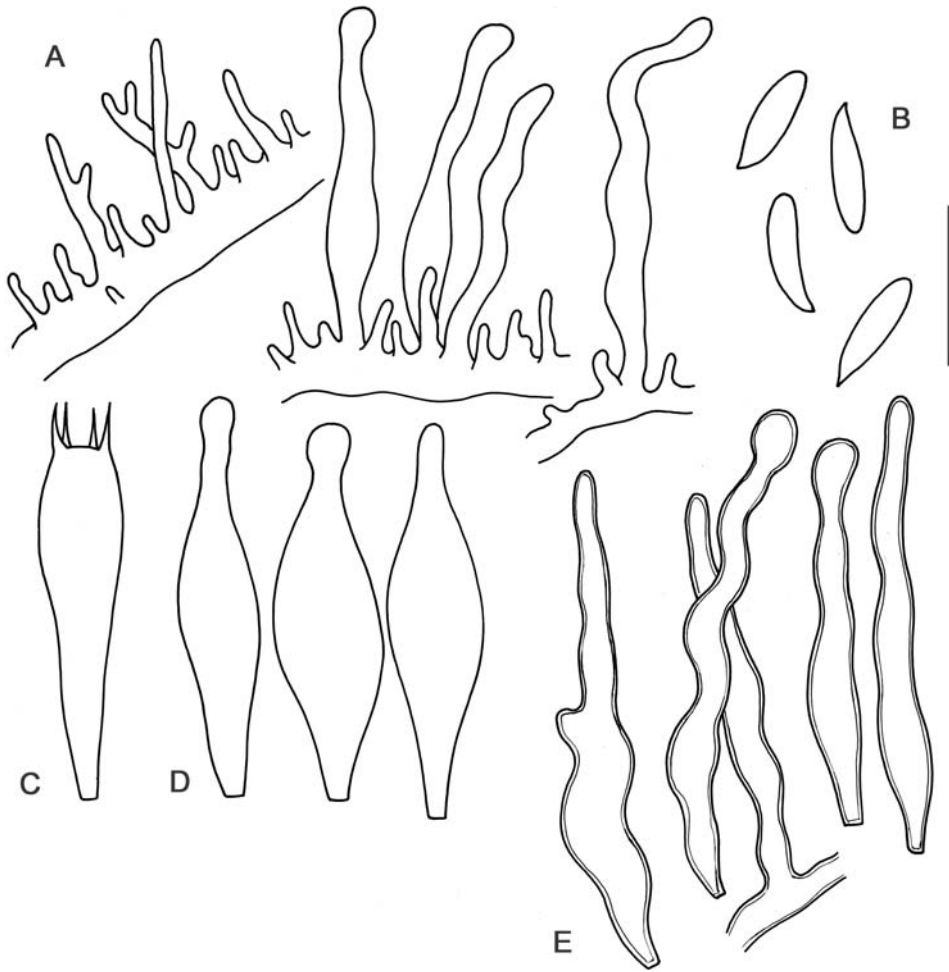


**Fig. 12.** *Hemimycena lactea* var. *lactea* (LE 203075): A – pileipellis, B – basidium and spores, C – hymenial cystidia, D – caulocystidia; scale bar 10  $\mu$ m.

***Hemimycena lactea* var. *tetraspora*** (Kühner et Valla) Courtec., Doc. Mycol. 16(62): 24. 1986. Fig. 13

Pileus 3–6 mm in diameter, convex to applanate, with slightly depressed centre, with straight or sinuous margin, hygrophanous, translucently striate at margin when moist, white to yellowish at centre with age, pruinose to finely tomentose. Lamellae well-developed, distant, reaching the margin of pileus, broadly adnate, white. Stipe 10–15  $\times$  0.5–1 mm, cylindrical, straight, glabrous in upper part and distinctly pubescent in lower half, white or slightly yellow at base.

Spores 8–10.8  $\times$  2.7–3.5  $\mu$ m,  $Q^* = 3.1$ , narrowly fusoid, slightly flexuous, hyaline, thin-walled. Basidia 21–28  $\times$  5.5–8  $\mu$ m, 4-spored, narrowly clavate. Cheilocystidia 16–26  $\times$  5.5–7  $\mu$ m, lageniform, fusoid with short neck and subcapitate apex, hyaline, thin-walled. Pleurocystidia not found. Pileipellis a cutis



**Fig. 13.** *Hemimycena lactea* var. *tetraspora* (LE 226563): A – hypha of pileipellis and pileocystidia, B – spores, C – basidium, D – cheilocystidia, E – caulocystidia; scale bar 10  $\mu$ m.

consisting of radially arranged, hyaline, thin-walled, cylindrical, 4–8  $\mu$ m wide hyphae with numerous cylindrical or branched excrescences of up to 3.5  $\mu$ m wide. Pileocystidia 13.5–20  $\times$  2.5–3.5  $\mu$ m, cylindrical or narrowly fusoid with capitate apex, hyaline, thin-walled. Caulocystidia 16–45  $\times$  2.7–4.5  $\mu$ m, numerous, variable in shape, often irregular, cylindrical, narrow-fusoid with capitulum and sinuous walls, hyaline, thin-walled. Clamp connections present.

**Habitat:** On needles and litter in coniferous forests.

**Distribution:** Rare in the studied area. Known from the Krasnodar Territory.

Material examined: Krasnodar Territory, Tuapse District, vicinities of Olginka, *Pinus brutia* var. *pityusa* grove, on needles and twigs of *Pinus brutia*, 23 Oct. 1997, leg. O. Morozova, det. E. Malysheva (LE 226563). – The same place, on needles of *Pinus brutia*, 23 Oct. 1997, leg. O. Morozova, det. E. Malysheva (LE 226564).

***Hemimycena mairei*** (E.-J. Gilbert) Singer, Ann. Mycol. 42: 53. 1943. Fig. 14

Pileus 5 mm in diameter, conical-convex, with straight, striate margin, brownish grey, glabrous. Lamellae well-developed, distant, reaching the pileus margin, adnate with tooth, pale grey. Stipe 15 × 1 mm, cylindrical, straight, glabrous in upper part, pubescent at base, white.

Spores 6.2–8.6 × 4.4–5.5 μm, Q\* = 1.6, ovoid or slightly almond-shaped, hyaline, thin-walled. Basidia 27–33 × 5.5–7 μm, 4-spored, narrowly clavate. Hymenial cystidia absent. Pileipellis a cutis consisting of hyaline, thin-walled, cylindrical, 2.7–6.5 μm wide hyphae with scattered cylindrical or rarely branched excrescences of up to 8 μm long and 3.5 μm wide. Pileocystidia absent. Caulocystidia 6–30 × 3.5–8 μm, narrowly cylindrical, narrowly clavate or irregular shape with projections, often flexuous, slightly thick-walled, single, abundant. Clamp connections present.

Habitat: On strongly decaying wood of deciduous tree in broad-leaved forest.

Distribution: Known from one locality in the Samara Region.

Notes: This species is characterised by its coloured pileus. It is commonly found on soil or grass debris in grassy places. Probably it was found on wood for the first time.

Material examined: Samara Region, Zhigulevsky Nature Reserve, *Tilia cordata*–*Acer platanoides* forest, on decaying wood, 18 Aug. 2004, leg. E. Malysheva and O. Morozova, det. E. Malysheva (LE 227470).

***Hemimycena mauretanic*** (Maire) Singer, Ann. Mycol. 41: 121. 1943.

Key to the varieties of *H. mauretanic*

- 1a Caulo- and pileocystidia with capitate apex ..... 2
- 1b Caulo- and pileocystidia without capitate apex ..... (var. *mauretanic*)
- 2a Cheilocystidia present ..... var. *cystidiata*
- 2b Cheilocystidia absent ..... var. *microcephala*

***Hemimycena mauretanic*** cf. var. ***cystidiata*** Antonín et Noordel., A monograph of the genera *Hemimycena* etc. in Europe: 55. 2004. Pl. 4A, fig. 15

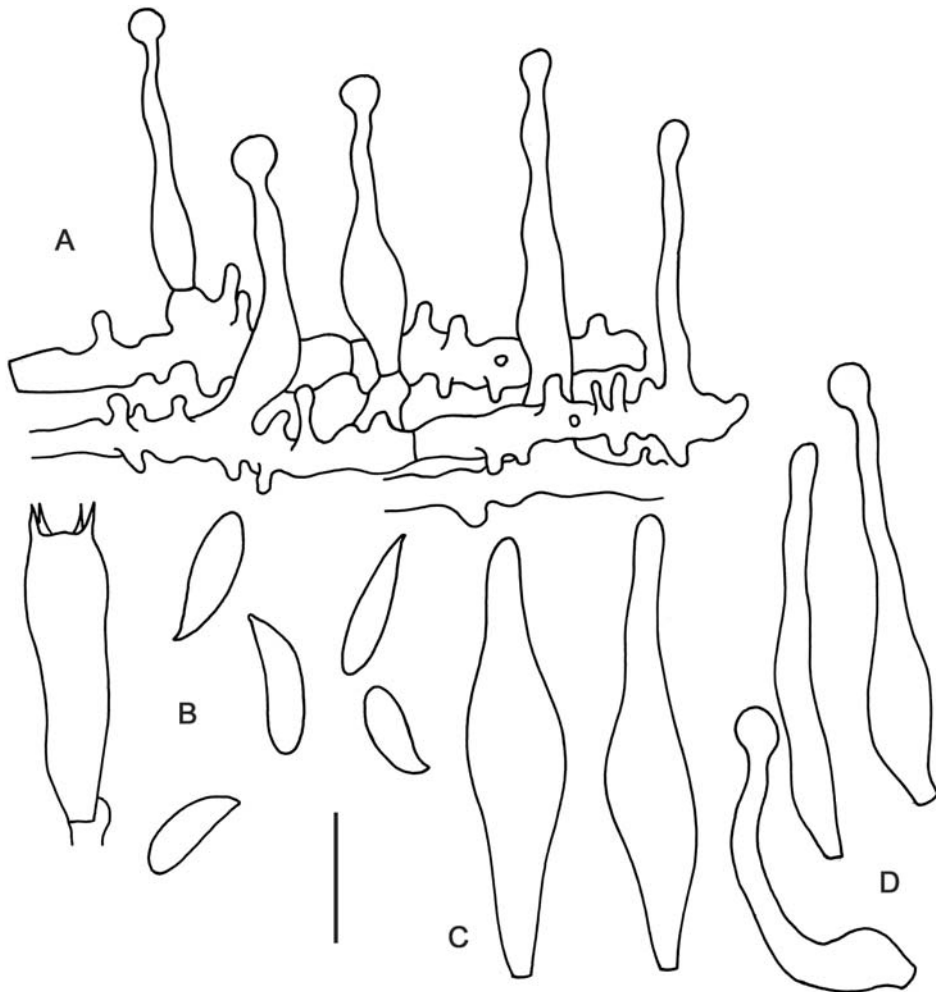
Pileus 1–2 mm in diameter, hemispherical to convex or almost appanate, with small umbo or slightly depressed at centre, with straight to later crenulate and sinuous margin, hygrophanous, translucent, white, pruinose to pubescent. Lamellae not fully developed, very distant, not reaching the pileus margin, decurrent, white. Stipe 7–15 × 0.1–0.3 mm, very slender, almost filiform, pubescent (only visible with lens), white.



**Fig. 14.** *Hemimycena mairei* (LE 227470): A – pileipellis, B – basidium and spores, C – stipitipellis and caulocystidia; scale bar 10  $\mu\text{m}$ .

Spores 6.2–8.4  $\times$  2.0–2.7  $\mu\text{m}$ ,  $Q^* = 3$ , narrowly ellipsoid, narrowly fusoid or almost cylindrical, thin-walled, hyaline. Basidia 18–20  $\times$  5–7  $\mu\text{m}$ , 4-spored, clavate. Cheilocystidia 25–35  $\times$  5.5–6  $\mu\text{m}$ , fusoid, lageniform, hyaline, thin-walled. Pleurocystidia absent. Pileipellis a cutis consisting of radially arranged, hyaline, thin-walled, cylindrical, up to 5.5  $\mu\text{m}$  wide hyphae with numerous short, narrow cylindrical excrescences. Pileocystidia 16–54  $\times$  4–5.5  $\mu\text{m}$ , abundant, cylindrical or narrow-fusoid with distinctly capitate apex (up to 3.5  $\mu\text{m}$  in diameter), hyaline, thin-walled. Stipitipellis consisting of parallel, hyaline hyphae with numerous short excrescences. Caulocystidia abundant, similar in shape and size to cheilocystidia, hyaline, thin-walled. Clamp connections present.

**Habitat:** On plant remnants in litter or on grass rhizomes in grassland vegetation.



**Fig. 15.** *Hemimycena mauretanic* var. cf. *cystidiata* (LE 227677): A – pileipellis, B – basidium and spores, C – cheilocystidia, D – caulocystidia; scale bar 10  $\mu$ m.

**Distribution:** Rare in the studied area. Known from the Leningrad and Samara Regions.

**Notes:** The studied specimens differ from the first description of var. *cystidiata* (Antonín and Noordeloos 2004) by a significantly smaller spore size. This feature comes close to the variety *microcephala* Kühner, having spores 6.5–8  $\times$  2–4  $\mu$ m in size. However, the presence of cheilocystidia in all our specimens forced us to identify the material as being close to *H. mauretanic* var. *cystidiata*.

Material examined: Leningrad Region, Vyborg District, Gogland Island, Kiiskinkylä, 10 Aug. 2006, leg. and det. O. Morozova (LE 226550). – Samara Region, Zhigulevsky Nature Reserve, vicinities of Bakhilovo, overgrown grassland, on rhizome of grass plant, 20 Aug. 2004, leg. E. Malysheva and O. Morozova, det. E. Malysheva (LE 227677). – Ibid., in litter, 5 Jul. 2005, leg. and det. E. Malysheva (LE 234327). – Ibid., in litter, 13 Sept. 2006, leg. and det. E. Malysheva (LE 214898).

***Hemimycena mauretana* var. *microcephala*** Kühner in Kühner et Valla, Trav. Lab. Jaysinia 4: 68. 1972. Fig. 16

Pileus 1–2 mm in diameter, hemispherical to convex or almost applanate, with slightly umbonate centre, hygrophanous, translucent, white, pruinose or pubescent. Lamellae not fully developed, very distant, not reaching the pileus margin, white. Stipe 7–10 × 0.1–0.2 mm, filiform, pubescent (only visible with lens), white.

Spores 7.6–9 × 2.6–3.1 µm,  $Q^* = 2.9$ , narrowly ellipsoid, narrowly fusoid or almost cylindrical, thin-walled, hyaline. Basidia 18–20 × 5–7 µm, 4-spored, clavate. Hymenial cystidia absent. Pileipellis a cutis consisting of radially arranged, hyaline, thin-walled, cylindrical, up to 7 µm wide hyphae with numerous short, narrow cylindrical excrescences. Pileocystidia 16–60 × 4–5.5 µm, abundant, cylindrical or narrowly fusoid with distinct capitate apex (up to 3.5 µm in diameter), hyaline, thin-walled. Stipitipellis consisting of hyaline, parallelly arranged hyphae with numerous short excrescences. Caulocystidia abundant, similar in shape and size to pileocystidia, hyaline, thin-walled. Clamp connections present.

Habitat: On grass remnants in litter in grassland vegetation.

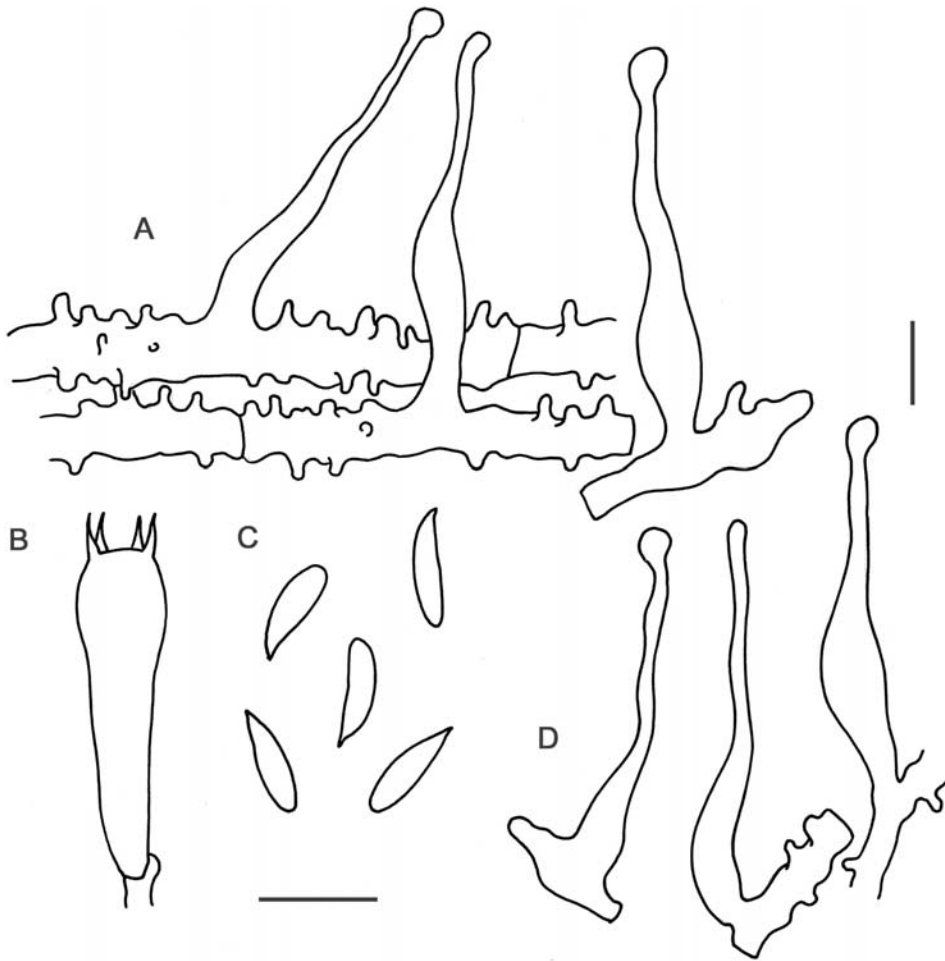
Distribution: Known from the Leningrad Region. It was also reported from the Sverdlovsk Region (Marina 2006). It is probably not rare in the studied area, but overlooked.

Material examined: Leningrad Region, Volosovo District, Dontso, meadow, on grass remnants in litter, 7 Sept. 2005, leg. O. Morozova, det. E. Malysheva (LE 226548). – Ibid., meadow overgrown with *Juniperus*, on grass remnants in litter, 5 Oct. 2005, leg. and det. O. Morozova (LE 231705).

***Hemimycena persimilis*** (Malençon ex Redhead) Antonín et Noordel., A monograph of the genera *Hemimycena* etc. in Europe: 114. 2004. Fig. 17

Pileus 2–4 mm in diameter, hemispherical to convex and convex-applanate, with slightly umbonate centre, with straight margin, hygrophanous, translucently striate at margin, white or with slightly yellowish centre, minutely pubescent to almost glabrous. Lamellae well-developed, distant, concave, reaching the pileus margin, adnate, white. Stipe 10–20 × 0.5–1 mm, very slender, almost filiform, entirely pubescent, white. Some specimens had a weak smell of chlorine.

Spores 8–11 × 2.7–3.4 µm,  $Q^* = 3.1$ , narrowly ellipsoid, fusoid or lacrymoid, thin-walled, hyaline. Basidia 18–25 × 5–7 µm, 4-spored, rarely 2-spored, clavate. Hymenial cystidia 23–25 × 6–7 µm, cylindrical, narrowly clavate or fusoid with obtuse apex, hyaline, thin-walled. Pileipellis a cutis consisting of radially arranged,



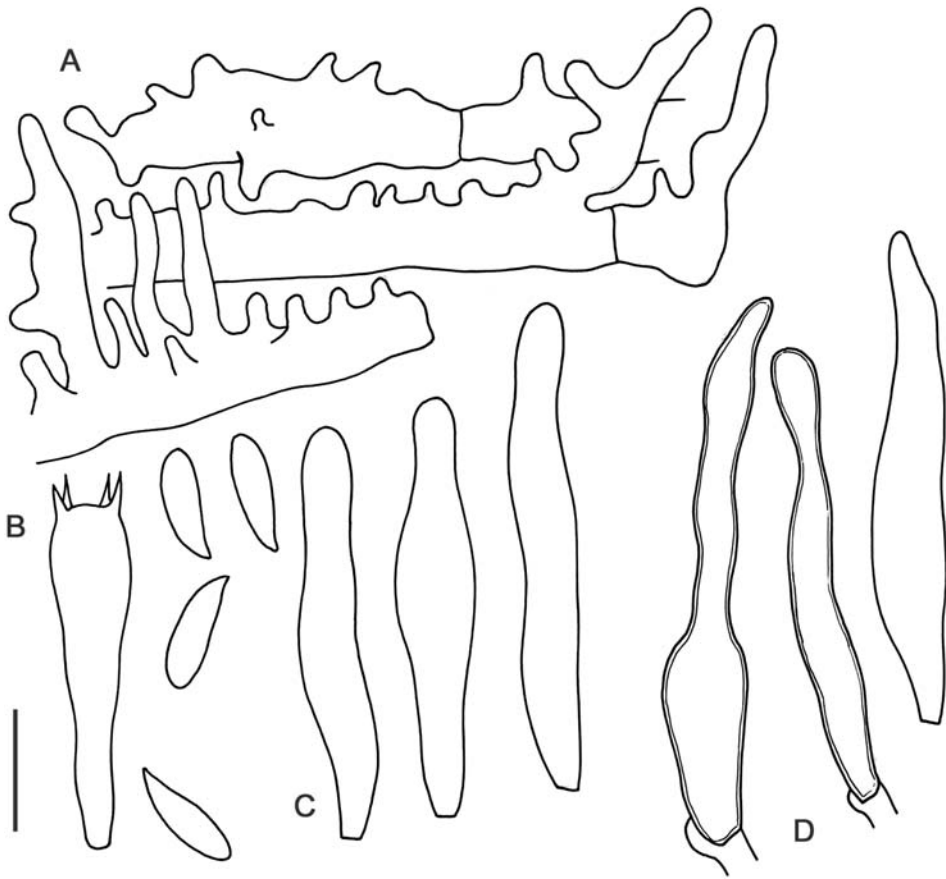
**Fig. 16.** *Hemimycena mauretanic* var. *microcephala* (LE 231705): A – pileipellis, B – basidium, C – spores, D – caulocystidia; scale bars A, D – 10  $\mu$ m; B, C – 10  $\mu$ m.

hyaline, up to 8  $\mu$ m wide hyphae with numerous short, narrow excrescences. Pileocystidia 18–30  $\times$  4–6  $\mu$ m, variable, cylindrical, clavate, coralloid, or irregular, hyaline, thin-walled. Caulocystidia 13–70  $\times$  2.5–7  $\mu$ m, abundant, single or in clusters, cylindrical, fusoid, narrowly clavate, hyaline, thick-walled. Clamp connections present.

**Habitat:** On leaf or wood remnants in litter or in soil in different habitats.

**Distribution:** Known from the Leningrad and Samara Regions.

**Material examined:** Leningrad Region, Kingisepp District, Kurgalsky peninsula, Veino, *Betula pendula*–*Picea abies* forest, on leaf remnants in litter, 13 Sept. 1997, leg. O. Morozova, det. E. Malysheva (LE 215015). – Same region, Kirovsk District, vicinities of Vasilkovo, bank of Lava River,



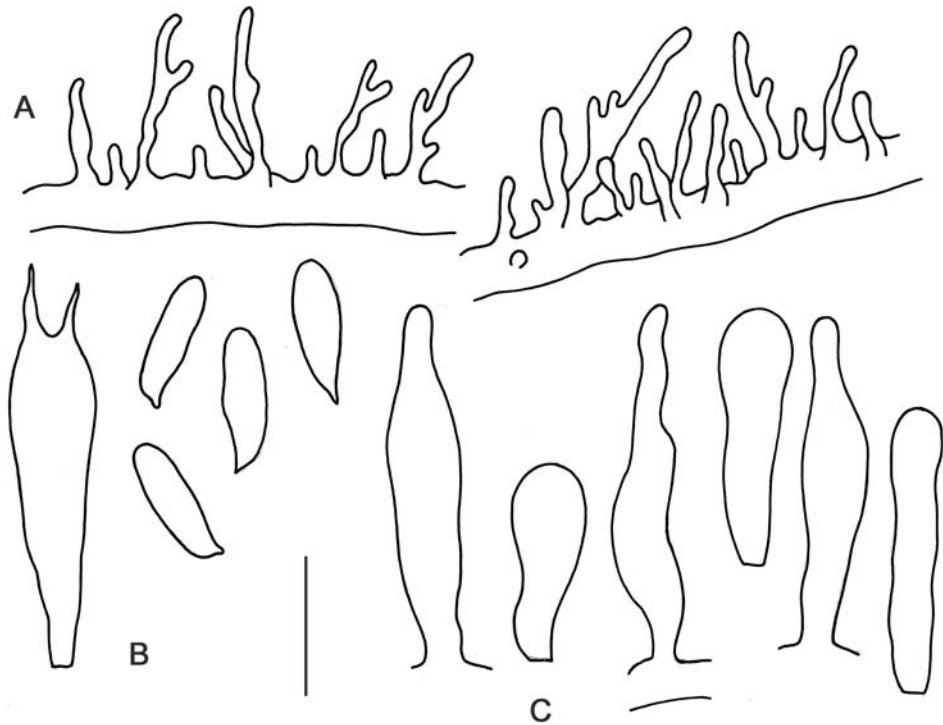
**Fig. 17.** *Hemimycena persimilis* (LE 234324): A – pileipellis, B – basidium and spores, C – cheilocystidia, D – caulocystidia; scale bar 10  $\mu$ m.

meadow, in litter, 26 Sept. 2006, leg. O. Morozova, det. E. Malysheva (LE 253486). – Samara Region, Zhigulevsky Nature Reserve, vicinities of Bakhilovo, overgrown grassland, on wood in soil, 5 Jul. 2005, leg. and det. E. Malysheva (LE 234324). – Ibid., on twig, 10 Jul. 2004, leg. and det. E. Malysheva (LE 246058).

***Hemimycena pseudocrispata*** (Valla) Maas Geest., Proc. Kon. Ned. Akad. Wetensch. Ser. C 84: 473. 1981. Fig. 18

Pileus 2.5–3 mm in diameter, hemispherical to convex, with small wide umbo at centre, with crenulate margin, hygrophanous, translucently striate, white, pruinose to tomentose. Lamellae well-developed, distant, reaching the pileus margin, slightly decurrent, white. Stipe 10–25  $\times$  0.3–0.5 mm, filiform, entirely pubescent, white.





**Fig. 18.** *Hemimycena pseudocrispata* (LE 231757): A – pileipellis, B – basidium and spores, C – caulocystidia; scale bar 10  $\mu\text{m}$ .

Spores  $7.8\text{--}9 \times 2.9\text{--}3.2 \mu\text{m}$ ,  $Q^* = 2.8$ , cylindrical, narrowly fusoid or narrowly lacrymoid, thin-walled, hyaline. Basidia  $16\text{--}22 \times 5\text{--}6 \mu\text{m}$ , 2-spored, narrow-clavate. Hymenial cystidia absent. Pileipellis a cutis consisting of radially arranged, hyaline, thin-walled,  $5\text{--}7 \mu\text{m}$  wide hyphae with numerous narrowly cylindrical, narrowly clavate or irregular excrescences of up to  $11 \mu\text{m}$  long and  $3 \mu\text{m}$  wide. Pileocystidia absent. Caulocystidia  $8\text{--}22 \times 4\text{--}7 \mu\text{m}$ , abundant, single or in clusters, cylindrical, narrowly fusoid, lageniform with obtuse apex, hyaline, thin-walled. Clamp connections absent.

**Habitat:** On dead leaves in litter.

**Distribution:** Rare in the studied area. Known only from the Leningrad and Novgorod Regions.

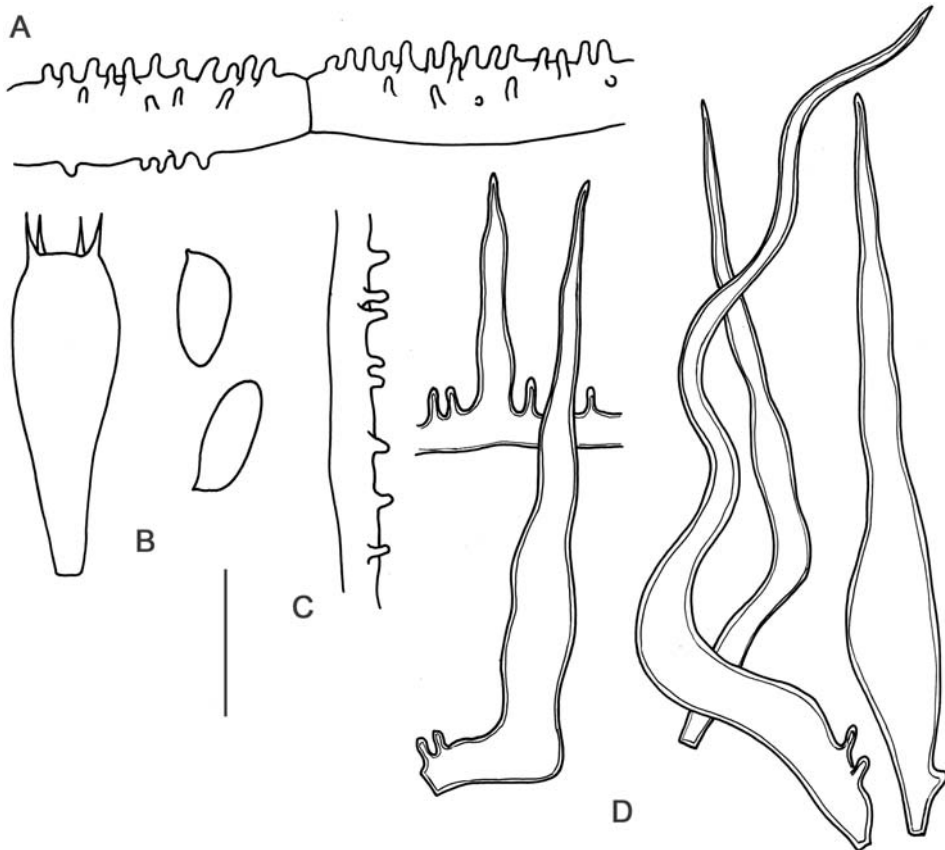
**Material examined:** Leningrad Region, Volosovo District, Dontso, meadow with *Calamagrostis*, in litter, 7 Sept. 2005, leg. E. Popov, det. E. Malysheva (LE 226547). – Novgorod Region, Valdaisky National Park, Seredei, mixed forest, in litter, 3 Aug. 2001, leg. O. Morozova, det. E. Malysheva (LE 231757).

*Hemimycena pseudocrispula* (Kühner) Singer, Ann. Mycol. 41: 121. 1943.

Pl. 4B, Fig. 19

Pileus 3–4 mm in diameter, hemispherical to convex, with slightly depressed centre, with crenulate and strongly sinuous margin, hygrophanous, white, glabrous to tomentose. Lamellae well-developed, distant, not reaching the pileus margin, slightly decurrent, white. Stipe 10–30 × 0.2–0.4 mm, very slender, almost filiform, glabrous or slightly pubescent at base (only visible with lens), white.

Spores 8–10.4 × 3–5.2 μm, ovoid or narrowly fusoid, hyaline, thin-walled. Basidia 25–30 × 7–8 μm, 4-spored, clavate. Hymenial cystidia absent. Pileipellis a cutis consisting of radially arranged, hyaline, thin-walled, 5.5–14 μm wide hyphae with numerous short cylindrical excrescences of up to 4 μm long.



**Fig. 19.** *Hemimycena pseudocrispula* (LE 226560): A – pileipellis, B – basidium and spores, C – stipitipellis hypha, D – caulocystidia; scale bar 10 μm.

Pileocystidia absent. Stipitipellis consisting of parallelly arranged, hyaline, cylindrical up to 5  $\mu\text{m}$  wide hyphae with scattered short, simple excrescences. Caulocystidia 40–170  $\times$  3–9  $\mu\text{m}$ , numerous, in clusters or single, awl-shaped, narrowly cylindrical or narrowly fusoid, often with irregular excrescences at base, hyaline, thick-walled. Clamp connections present.

**Habitat:** On herb remnants in grassland.

**Distribution:** Rare, in the studied territory only known from the Leningrad Region, from which it was mentioned before (Singer 1943).

**Material examined:** Leningrad Region, Gatchina District, Pudost', meadow, in litter, 5 Sept. 2001, leg. and det. O. Morozova (LE 253484). – Same region, Volosovo District, Dontso, meadow, in litter, 28 Jul. 2005, leg. E. Popov, det. E. Malysheva (LE 226560).

***Hemimycena pseudolactea*** (Kühner) Singer, Ann. Mycol. 41: 121. 1943. Fig. 20

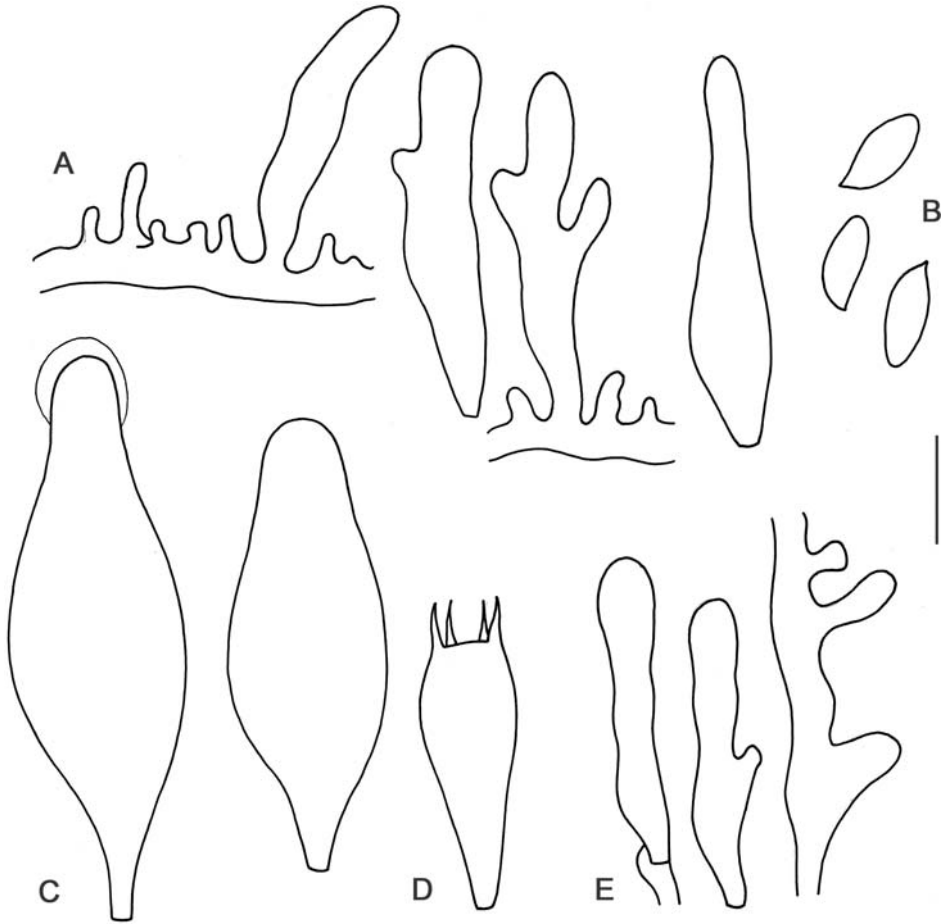
Pileus 3–10 mm in diameter, convex or convex-appanate, with slightly undulate margin, hygrophanous, translucently striate at margin, white with ochre centre, almost glabrous. Lamellae well-developed, distant, reaching the pileus margin, narrowly adnate, white. Stipe 10–30  $\times$  0.7–1 mm, cylindrical, pruinose to almost glabrous, pubescent only at base, white.

Spores 6.3–7.8  $\times$  2.6–4.3  $\mu\text{m}$ ,  $Q^* = 2.3$ , narrowly ellipsoid, slightly flexuous, thin-walled, hyaline. Basidia 16–22  $\times$  5.5–7  $\mu\text{m}$ , 4-spored, clavate. Hymenial cystidia 25–60  $\times$  8–15  $\mu\text{m}$ , utriform, broadly fusoid, tapering towards base, hyaline, often with mucous cap at apex, thin-walled. Pileipellis a cutis consisting of radially arranged, thin-walled, hyaline, 3.5–4.5  $\mu\text{m}$  wide hyphae with numerous short cylindrical excrescences. Pileocystidia 15–35  $\times$  4–8  $\mu\text{m}$ , numerous, variable in shape, clavate or cylindrical, often branched, hyaline, thin-walled. Caulocystidia 8–35  $\times$  5–7  $\mu\text{m}$ , abundant, very variable in shape, hyaline, sometimes with mucous cap, thin-walled. Clamp connections present in all tissues.

**Habitat:** On wood or litter in meadows and deciduous forests.

**Distribution:** Not rare and known from the Leningrad, Novgorod and Samara Regions. For the Leningrad Region it was also recorded before (Singer 1943). It is further known from the Moscow Region (Vishnevsky 1998).

**Material examined:** Leningrad Region, Gatchina District, Pudost', meadow, 4 Aug. 2003, leg. O. Morozova, det. E. Malysheva (LE 226553). – Novgorod Region, Nasakino, meadow, 26 Aug. 2003, leg. O. Morozova, det. E. Malysheva (LE 226552). – Samara Region, Zhigulevsky Nature Reserve, vicinities of Shiryaevo, Kamennaya Chasha, birch forest, on wood of deciduous tree, 17 Aug. 2004, leg. and det. E. Malysheva (LE 227460). – Ibid., Khmelevoy ravine, meadow, on litter, 21 Aug. 2004, leg. O. Morozova, det. E. Malysheva (LE 227559).

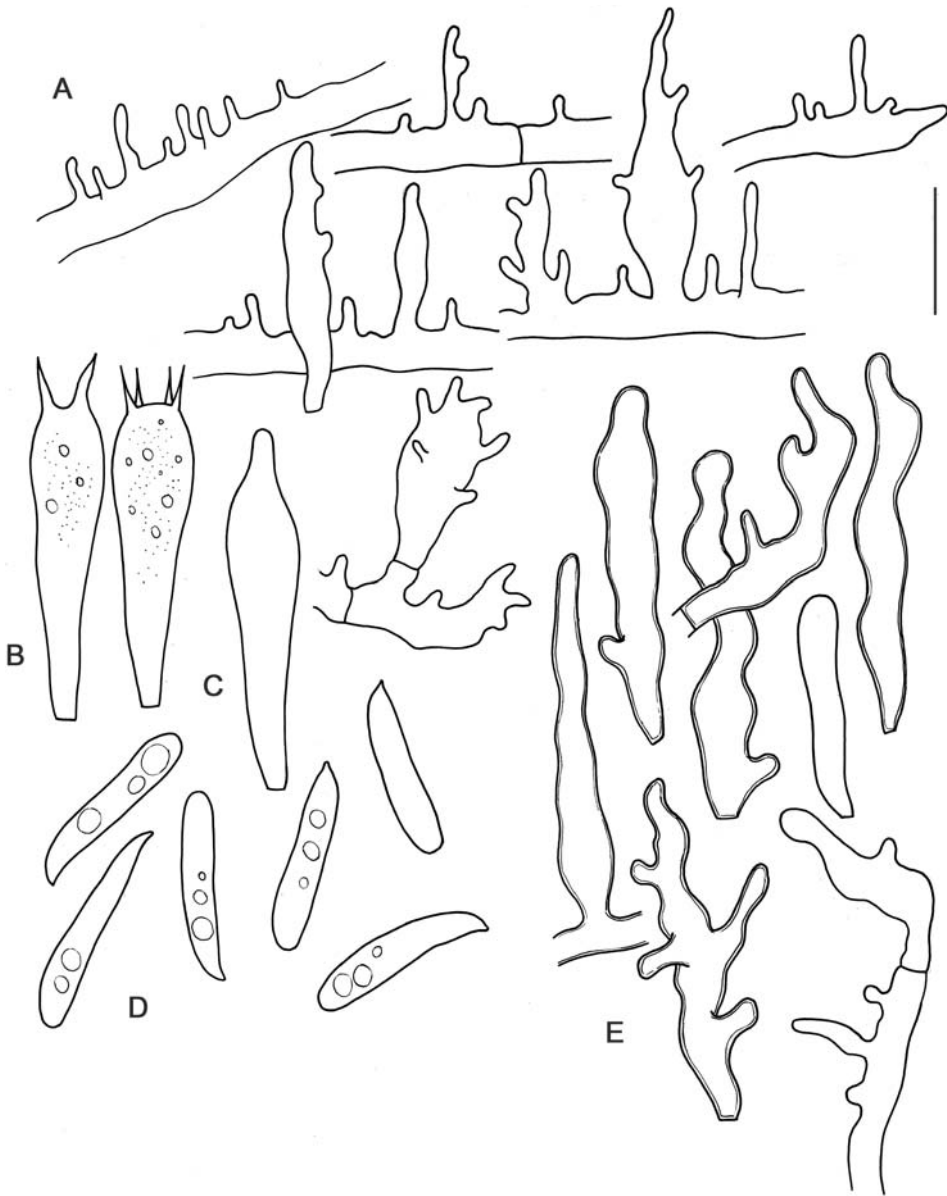


**Fig. 20.** *Hemimycena pseudolactea* (LE 227559): A – elements of pileipellis with pileocystidia, B – spores, C – cheilocystidia, D – basidium, E – caulocystidia; scale bar 10  $\mu$ m.

***Hemimycena stiriispora* E. F. Malysheva et O. V. Morozova spec. nov. Fig. 21**

(Mycobank MB513509)

Pileus 3–6 mm latus, convexus, centro depresso, translucenter striatus, hygrophanus, pruinosis, albus. Lamellae distantes, decurrentes, albae. Stipes 7–15  $\times$  0,5–1 mm, aequalis, albus, tomentosus. Sporae 12–16,6(20,7)  $\times$  2,6–3,8  $\mu$ m, cylindricae vel fusiformes, ad basin sensim attenuatae. Basidia 19–28  $\times$  6–8  $\mu$ m, 1–4-spora, clavata. Cheilocystidia 22–29  $\times$  6–7  $\mu$ m, non numerosa, clavata, lageniformia. Hyphae pileipellis 5–7  $\mu$ m latae, diverticulatae. Pileocystidia 8–18  $\times$  3–8  $\mu$ m, diversiformia, clavata, fusiformia, cylindrica vel subcylindrica, diverticulata, tenuiparietalia. Caulocystidia 8–43  $\times$  3–7,5  $\mu$ m, numerosa, diversiformia, cylindrica, clavata vel fusiformia, diverticulata, crassiparietalia. Fibulae desunt. Ad herbas destructas in prato graminoso-variiherboso.



**Fig. 21.** *Hemimycena stiriispora* (LE 253483): A – elements of pileipellis with pileocystidia, B – basidia, C – cheilocystidia, D – spores, E – caulocystidia; scale bar 10  $\mu$ m.

Holotypus: Russia, regio Leningradensis, in valle fl. Oredezh, Dontso, in prato graminoso-variherboso, ad herbas destructas, 28. VII. 2005, O. Morozova (LE 253483).

Etymology: stiria (Latin) – icicle; *stiriispora* – spores like icicles.

Pileus 3–6 mm in diameter, convex with slightly depressed centre, with straight to sinuous, striate margin, hygrophanous, pruinose to glabrous, white. Lamellae well-developed, distant, reaching the pileus margin, arcuate, decurrent, white. Stipe 7–15 × 0.5–1 mm, cylindrical, pubescent to tomentose, white.

Spores 12–16.6(–20.7) × 2.6–3.8 µm,  $Q^* = 4.4$ , cylindrical, narrowly fusoid, slightly flexuous and attenuated towards apex, hyaline with some light-refracting drops, thin-walled. Basidia 19–28 × 6–8 µm, 1-, 2- and 4-spored, clavate. Cheilocystidia 22–29 × 6–7 µm, very rare, not forming a sterile layer, narrowly clavate or lageniform with short neck, rarely diverticulate at apex, hyaline, thin-walled. Pleurocystidia absent. Pileipellis a cutis consisting of radially arranged, hyaline, thin-walled, cylindrical 5–7 µm wide hyphae with numerous cylindrical or diverticulate excrescences of up to 8 µm long and 3.5 µm wide. Pileocystidia 8–18 × 3–8 µm, very variable in shape, clavate, fusiform or cylindrical, often irregular, with numerous excrescences, hyaline, thin-walled. Caulocystidia 8–43 × 3–7.5 µm, abundant, single or in clusters, variable in shape, cylindrical, narrowly clavate, fusiform or irregular with excrescences and flexuous walls, hyaline, thick-walled. Clamp connections absent.

**Habitat:** On herb remnants in grass communities.

**Distribution:** Only known from type locality.

**Note:** This species is close to *H. gracilis* and *H. persimilis* in many microscopic features except of spore size and shape. It also resembles *H. subtilis* and *H. tatrensis* in having long, narrow spores, but distinctly differs from them by other macro- and microscopic features.

**Material examined:** Leningrad Region, Volosovo District, Dontso, left bank of Oredezh River, meadow, on grass remnants, 28 Jul. 2005, leg. O. Morozova (LE 253483, holotype).

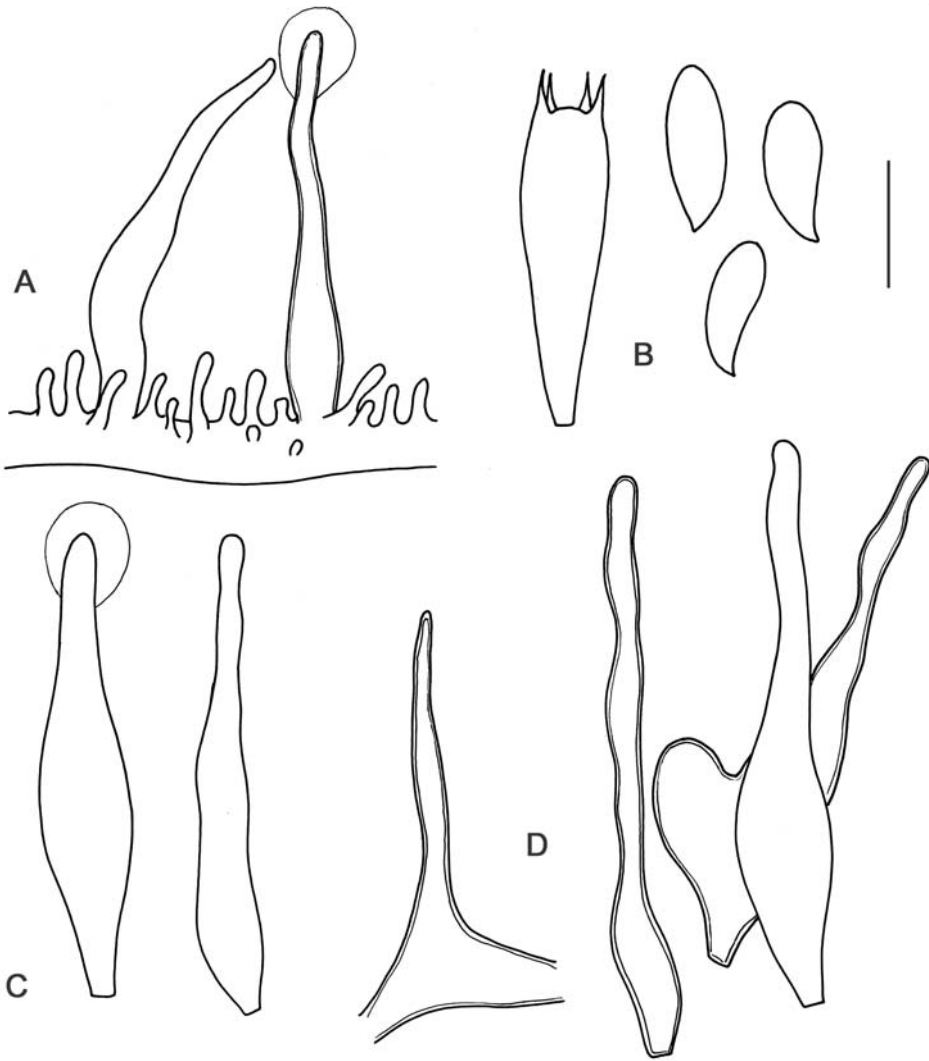
***Hemimycena subimmaculata*** (Murrill) Elborne et Læssøe, Nord. J. Bot. 11(4): 478. 1991. Fig. 22

Pileus 3 mm in diameter, convex, with straight margin, hygrophanous, white, glabrous. Lamellae very distant, deeply decurrent, white. Stipe 15 × 0.2 mm, filiform, pruinose to almost glabrous, white.

Spores 8–11 × 2.7–3.5 µm,  $Q^* = 3.2$ , ellipsoid, lacrymoid, slightly flexuous, thin-walled, hyaline. Basidia 16–27 × 5.5–7 µm, 4-spored, clavate. Hymenial cystidia 20–35 × 6–7 µm, narrowly fusoid, hyaline, sometimes with mucous cap, thin-walled. Pileipellis a cutis consisting of radially arranged, hyaline, thin-walled, up to 7 µm wide hyphae with numerous short cylindrical excrescences. Pileocystidia 15–35 × 2.7–4 µm, numerous, fusoid, cylindrical, often with mucous cap, hyaline, thin- or thick-walled. Caulocystidia 27–45 × 5–11 µm, abundant, fusoid, almost cylindrical with broad base, hyaline, thick-walled. Clamp connections present.

**Habitat:** On plant remnants in grassland vegetation.

**Distribution:** It was found once in the studied area, in the Leningrad Region.



**Fig. 22.** *Hemimycena subimmaculata* (LE 231675): A – pileipellis with pileocystidia, B – basidium and spores, C – hymenial cystidia, D – caulocystidia; scale bar 10  $\mu$ m.

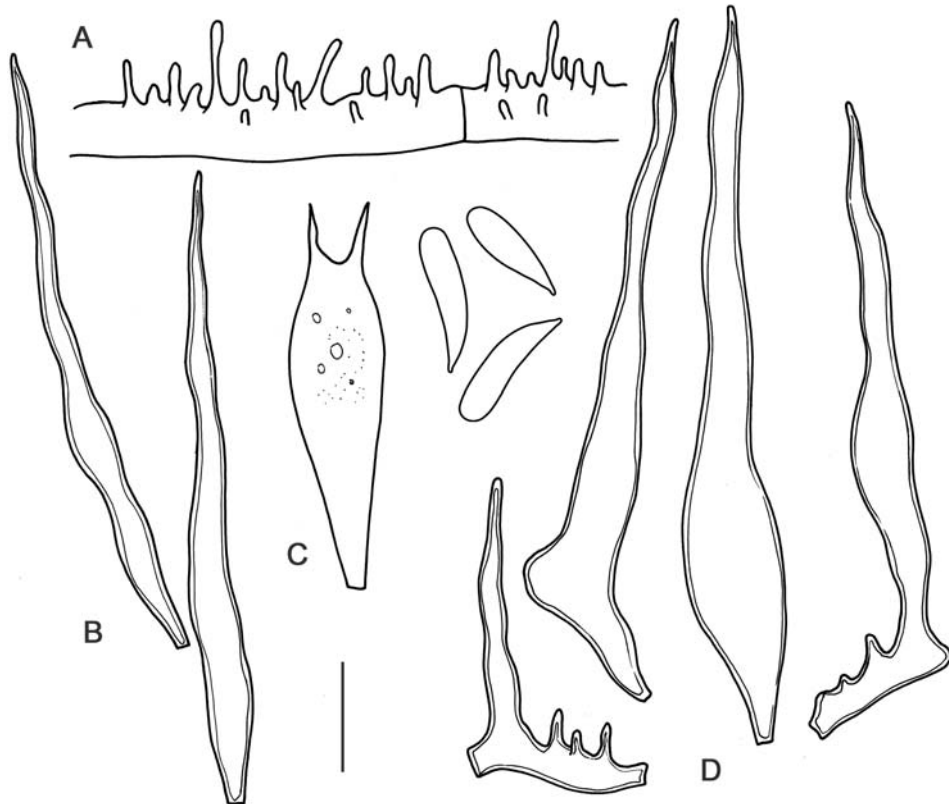
**Note:** The studied specimen differs from the descriptions by Antonín and Noordeloos (2004) and Læssøe and Elborne (2008) in having smaller spores, but it agrees in this feature with the material described by Kühner and Valla (1972), Romagnesi (1992) and Elborne, Læssøe and Østmoe (1992).

**Material examined:** Leningrad Region, Kirovsk District, Vasilkovo, bank of Lava River, meadow, in litter, 29 Nov. 2006, leg. O. Morozova, det. E. Malysheva (LE 231675).

***Hemimycena subtilis*** (Velen.) Antonín, Czech Mycol. 54: 230. 2003. Fig. 23

Pileus 2–4.5 mm in diameter, hemispherical, convex or convex-applanate with slightly depressed centre, with straight and striate margin, hygrophanous, white, glabrous to pubescent. Lamellae absent or present as veins not reaching the margin. Stipe 5–30 × 0.1–0.3 mm, filiform, smooth or slightly pubescent, white.

Spores 10.4–16 × 2.7–4.0 μm,  $Q^* = 4.4$ , narrowly lacrymoid, broadly to narrowly fusoid, slightly flexuous, thin-walled, hyaline. Basidia 22–28 × 5.5–7 μm, 2-spored, narrowly clavate. Hymenial cystidia absent. Pileipellis a cutis consisting of hyaline, thin-walled, up to 10 μm wide hyphae with numerous cylindrical excrescences of up to 6 μm long. Pileocystidia 22–55 × 2.7–4 μm, numerous, awl-shaped, fusoid with inflated base, hyaline, thick-walled. Stipitipellis consisting of slightly thick-walled hyphae of up to 7 μm wide with excrescences. Caulocystidia 25–60 × 3–8 μm, abun-



**Fig. 23.** *Hemimycena subtilis* (LE 226546): A – element of pileipellis, B – pileocystidia, C – basidium and spores, D – caulocystidia; scale bar 10 μm.



dant, similar in shape to pileocystidia, often with undulate walls and excrescences at base, hyaline, thick-walled. Clamp connections present or absent.

**Habitat:** On plant remnants or on rhizomes of grass plants in treeless habitats.

**Distribution:** Rare in the studied area. Known only from the Leningrad Region.

**Notes:** Several basidiomes of one collection differ from the type description (Antonín and Noordeloos 2004) by the presence of clamps in the tissue, whereas other specimens have no clamps. However, they are similar in the other features.

**Material examined:** Leningrad Region, Volosovo District, Dontso, bank of Oredezh River, 28 Jul. 2005, leg. and det. O. Morozova (LE 226545). – Ibid., on rhizome of grass plant, 7 Sept. 2005, leg. N. Psurtseva, det. E. Malysheva (LE 226546).

***Hemimycena tanjae* E. F. Malysheva et O. V. Morozova spec. nov.** Fig. 24

(Mycobank MB513510)

Pileus 3–8 mm latus, hemisphaericus vel convexus, sulcatus, hygrophanus, glaber, ochraceobrunneus, margine diluto. Lamellae distantes, decurrentes, dilute ochraceo-griseae. Stipes 5–10 × 0,5–1 mm, aequalis, ochraceotinctus, minute pruinosis, glabrescens. Sporae 8,4–10,8 × 4,6–5,6 µm, latae inaequaliter ellipsoideae vel oblongae ad amygdaliformes. Basidia 16–32 × 5,5–7 µm, 4-sporea, clavata. Cheilocystidia 20–27 × 5,5–8 µm, clavata, fusiformia vel forma irregulari. Hyphae pileipellis 5–7 µm latae, diverticulatae. Pileocystidia 10–18 × 3,5–4,5 µm, clavata vel subcylindrica, crassiparietalia. Caulocystidia 8–35 × 5–7 µm, numerosa, clavata vel subcylindrica, crassiparietalia. Fibulae desunt. Lignicola in silva frondosa.

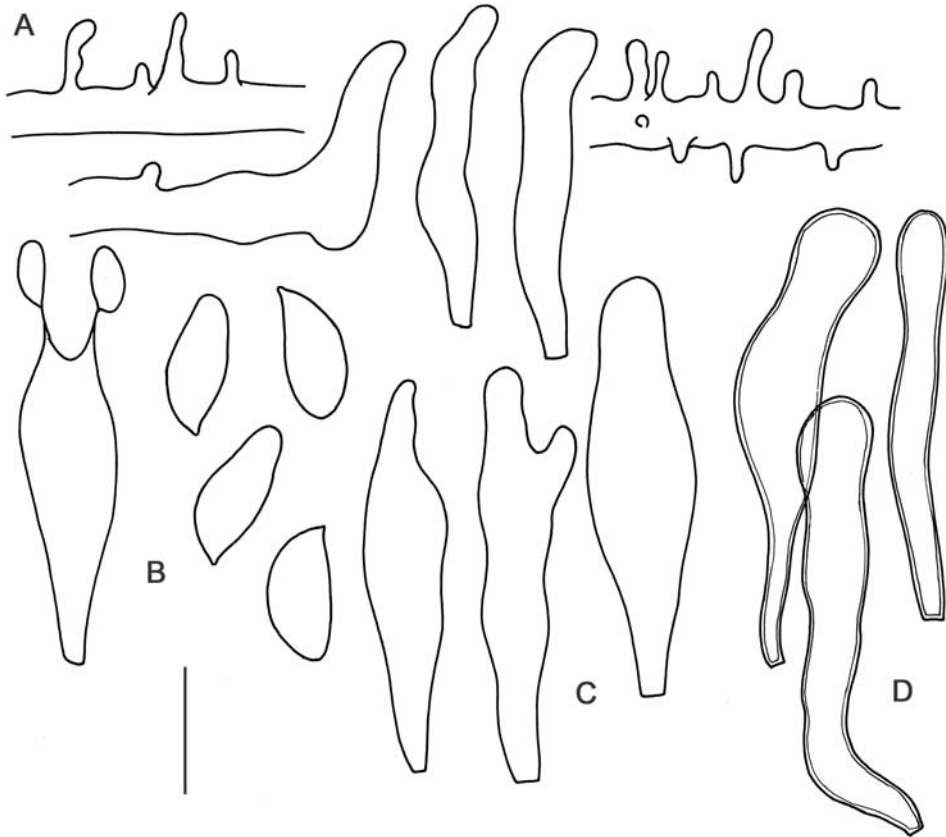
**Holotypus:** Russia, regio Samarensis, reservatio Zhigulevsky, Bakhilova Polyana, in silva frondosa, ad ligna *Tiliae cordatae*, 12. IX. 2006, E. Malysheva (LE 246007).

**Etymology:** Tanja, Russian female name.

Pileus 3–8 mm in diameter, hemispherical to convex, with slightly depressed centre, with weakly sinuous margin, hygrophanous, sulcate up to the centre, glabrous, yellow-brownish at centre and pale at margin. Lamellae well-developed, distant, reaching the pileus margin, weakly decurrent, yellowish grey. Stipe 5–10 × 0.5–1 mm, cylindrical, glabrous or pruinose, pale-ochre, almost whitish.

Spores 8.4–10.8 × 4.6–5.6 µm, Q\* = 1.9, broadly lacrymoid, broadly ellipsoid, often attenuated towards apex, slightly amygdaliform, thin-walled, hyaline. Basidia 16–32 × 5.5–7 µm, 2-spored, clavate. Cheilocystidia 20–27 × 5.5–8 µm, numerous, variable in shape, narrowly clavate, fusoid, cylindrical, or irregular, with undulate walls and excrescences of variable shape, hyaline, thin-walled. Pleurocystidia absent. Pileipellis a cutis consisting of radially arranged, hyaline, thin-walled, cylindrical, 5–7 µm wide hyphae with numerous cylindrical or clavate excrescences of up to 11 µm long and 3.5 µm wide. Pileocystidia 10–18 × 3.5–4.5 µm, clavate or cylindrical, hyaline, slightly thick-walled. Caulocystidia 8–35 × 5–7 µm, abundant, single or in clusters, cylindrical, narrowly clavate with broad or narrow base, hyaline, slightly thick-walled. Clamp connections absent.

**Habitat:** On dead wood of broad-leaved tree in forest.



**Fig. 24.** *Hemimycena tanjae* (LE 246007): A – elements of pileipellis with pileocystidia, B – basidium and spores, C – cheilocystidia, D – caulocystidia; scale bar 10  $\mu$ m.

**Distribution:** Only known from type locality.

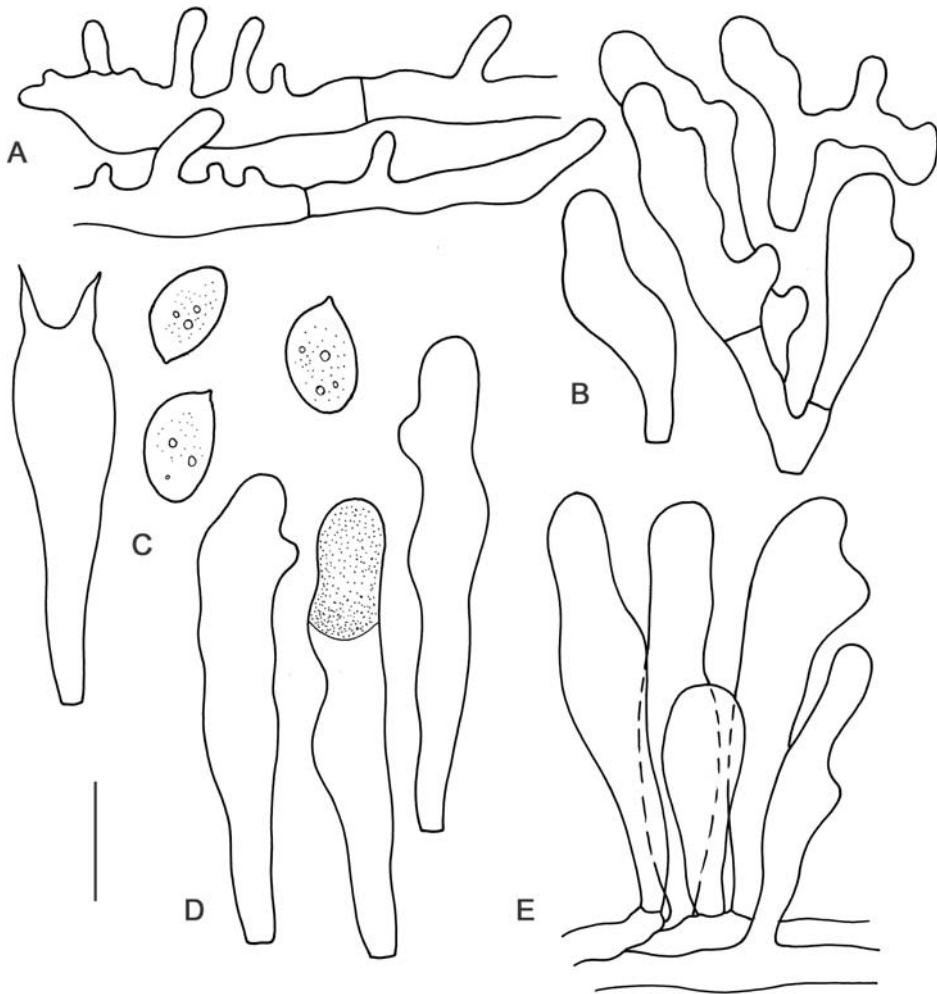
**Note:** Of all coloured species, this species demonstrates the strongest resemblance to *H. juncicola* Noordel. et Antonín. Both species have similar basidiomes, cheilocystidia, caulocystidia and are also characterised by having 2-spored basidia and lacking clamp connections. However, *H. tanjae* strongly differs from *H. juncicola* in having pileocystidia, in spore shape and size and in its ecology.

**Material examined:** Samara Region, Zhigulevsky Nature Reserve, vicinities of Bakhilova Polyana, Lomovoi ravine, broad-leaved forest, on wood of *Tilia cordata*, 12 Sept. 2006, leg. and det. E. Malysheva (LE 246007, holotype).

***Hemimycena* cf. *tanjae***

Fig. 25

In our collection we have one more specimen (one basidiome) which quite well fits the description given above with the exception of spore size and shape as well as the shape of its pileocystidia. It dif-



**Fig. 25.** *Hemimycena* cf. *tanjae* (LE 253405): A – elements of pileipellis, B – pileocystidia, C – basidium and spores, D – cheilocystidia, E – caulocystidia; scale bar 10  $\mu$ m.

fers from the other similar species *H. juncicola* in having well distinguished pileocystidia and in its spore size. It may represent a new taxon, but we need more material to draw a definitive conclusion.

Pileus 6 mm in diameter, convex-applanate, with striate margin, hygrophanous, with pruinose surface, yellow-brownish with darker centre. Lamellae well-developed, distant, with lamellulae, reaching the pileus margin, weakly decurrent, white. Stipe 7  $\times$  1.5 mm, cylindrical, glabrous, pubescent at base, yellowish.

Spores 7.8–9  $\times$  4–5.5  $\mu$ m,  $Q^* = 1.7$ , ovoid, almond-shaped, thin-walled, hyaline. Basidia 27–35  $\times$  5.5–7  $\mu$ m, 2-spored, clavate. Cheilocystidia 20–34  $\times$  5.5–7  $\mu$ m, numerous, variable in shape, narrowly clavate, fusoid, cylindrical or irregular, bifurcate at apex or with lateral excrescences, with undulate walls, often containing light-refracting matter, thin-walled. Pleurocystidia absent. Pileipellis a cutis consisting of radially arranged, hyaline, thin-walled, cylindrical, 5–7  $\mu$ m wide hyphae with numerous

cylindrical or clavate excrescences of up to 8 µm long and 5.5 µm wide. Pileocystidia 10–20 × 3.5–7 µm, clavate or cylindrical, often irregular or diverticulate, hyaline, slightly thick-walled. Caulocystidia 12–30 × 5.5–8 µm, abundant, in clusters, cylindrical, narrowly clavate, with excrescences, hyaline, slightly thick-walled. Clamp connections absent.

Specimen: Rostov Region, Kalininsky, broad-leaved forest, on dead wood, 6 Oct. 2006, leg. E. Malysheva (LE 253405).

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