

Original Article

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A contribution to the knowledge of ascomycetes in eastern Serbia

*Iskra Kajevska¹, Marjan Kuštera², Ivana Cvijetan³*¹*Faculty of Sciences and Mathematics, University of Niš, Višegradska 33, 18000 Niš, Serbia*²*Mycological Society Naissus, Dvanaeste srpske brigade 7, 18000 Niš, Republic of Serbia*³*Mycological Society of Niš, Bul. Svetog cara Konstantina 37/34, 18000 Niš, Republic of Serbia** *E-mail: iskra.kajevska@pmf.edu.rs***Abstract:****Kajevska, I., Kuštera, M., Cvijetan, I.: A contribution to the knowledge of ascomycetes in eastern Serbia. *Biologica Nyssana*, 9 (2). December, 2018: 77-88.**

Mycological field research conducted from 2015 - 2018 in the eastern part of Serbia resulted with a registration of a new data on 9 insufficiently known or new ascomycetes for the country: *Cordyceps militaris*, *Ophiocordyceps gracilis*, *Peziza phyllogena*, *Neottiella vivida*, *Scutellinia legalie*, *S. trechispora*, *Plectania melastoma*, *Pseudoplectania nigrella* and *Urnula mediterranea*. All species are presented with color photos of fresh specimens, microscopic morphology and notes on their taxonomy, ecology and distribution in the country.

Key words: ascomycetes, Serbia**Apstrakt:****Kajevska, I., Kuštera, M., Cvijetan, I.: Prilog poznavanju askomiceta istočne Srbije. *Biologica Nyssana*, 9 (2). Decembar, 2018: 77-88.**

Mikološko terensko istraživanje obavljeno u periodu od 2015. do 2018. godine u istočnom delu Srbije rezultiralo je registracijom novih podataka o 9 nedovoljno poznatih ili novih askomiceta za područje ove države: *Cordiceps militaris*, *Ophiocordyceps gracilis*, *Peziza phyllogena*, *Neottiella vivida*, *Scutellinia legalie*, *S. trechispora*, *Plectania melastoma*, *Pseudoplectania nigrella* i *Urnula mediterranea*. Sve vrste su predstavljene fotografijama svežih uzoraka, mikroskopskom morfologijom i podacima o njihovoj taksonomiji, ekologiji i distribuciji u Srbiji.

Ključne reči: askomicete, Srbija**Introduction**

Although the interest in mycology, especially regarding fungal diversity is steadily increasing in

Serbia, the knowledge of the distribution of ascomycetes in Serbia is scarce and limited. The eastern part of Serbia is characterized with biologically rich land ecosystems but in terms of

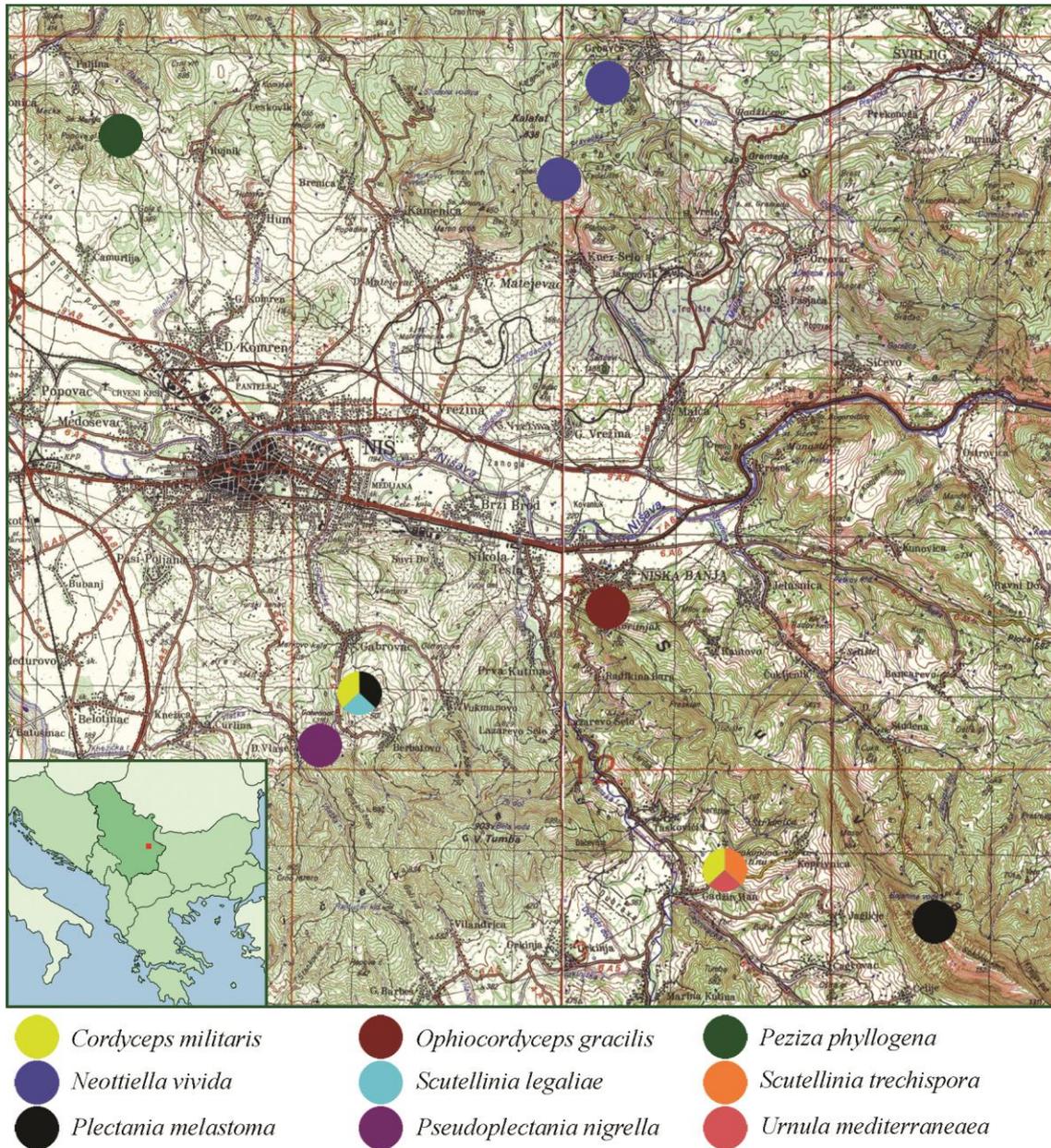


Fig. 1. Map of vicinity of the city of Niš in Serbia with marked sites where species have been registered

fungi, especially in Ascomycota diversity, so far is the least - explored area. Therefore, the main aim of this study is to provide a contribution to the mycological knowledge of some ascomycetes collected from the eastern part of Serbia which are insufficiently known or represent new species for the country. In scientific literature, a small number of mycological papers is dealing with species diversity of Ascomycota in Serbia. Significant contribution to the research on Ascomycota was made on NP Fruška Gora, situated in the northern part of Serbia, representing a checklist and a database of fungi (Savić, 2016; <http://www.naturefg.com/pages/fu-ascomycota.htm>). Some valuable published data

regarding on distribution of this fungal phylum are as follows: Ranojević (1910, 1914), Ivančević & Beronja (2004), Marjanović et al. (2010), Karaman et al. (2012); Sadiković & Kuštera (2013); Ivančević (2016), Milosavljević (2016), Savić et al. (2016), Savić & Karaman (2016), Vukojević et al. (2016).

Material and methods

Sources of information for this paper were available as unpublished data of ascomycetes registered during field surveys conducted in various habitats of selected locations in the eastern part of Serbia. Informations of research notes, revised exsiccates

Table 1. Taxonomic review of investigated species of ascomycetes in eastern Serbia

Class	Order	Family	Species
Sordariomycetes	Hypocreales	Clavicipitaceae	<i>Cordyceps militaris</i>
		Ophiocordycipitaceae	<i>Ophiocordyceps gracilis</i>
Pezizomycetes	Pezizales	Pezizaceae	<i>Peziza phyllogena</i>
		Pyrenomataceae	<i>Neottiella vivida</i>
			<i>Scutellinia legaliae</i>
			<i>Scutellinia trechispora</i>
		Sarcosomataceae	<i>Plectania melastoma</i>
	<i>Pseudoplectania nigrella</i>		
		<i>Urnula mediterranea</i>	



Fig. 2. *In situ* macro-photos of the examined species. **a)** *Scutellinia legalie*, ph.: I. Kajevska; **b)** *Peziza phyllogena*, ph.: S. Lazarević; **c)** *S.trechispora*, ph.:I. Kajevska; **d)** *Ophiocordyceps gracilis*; ph.: S. Lazarević; **e)** *Pseudoplectania nigrella*, ph.: I. Kajevska; **f)** *Plectania melastoma*, ph.: S. Lazarević, V. Lilić; **g)** *Cordyceps militaris*, ph.: G.Taskov, S. Lazarević; **h)** *Urnula mediterranea*, ph.: I. Kajevska; **i)** *Neottiella vivida*, ph.: S.Lazarević.

and references of those previously reported taxa from the country are also provided. Collection of fungi was made from 2015 - 2017 by members of the Mycological Society of Niš and Mycological Society Naissus, Niš. Laboratory analyses were obtained with the use of Optika N - 400M and Leica DM 1000 microscopes, and by examination and measuring of spores and other elements of fresh and dry material in water, 5% KOH, Lugol, Cotton blue and Melzer's reagents. The descriptions of macro- and micro

characters are based exclusively on the collected material. All specimens are preserved in the private fungal collection of the Society (M.S.N.). The location of the sites was determined using a GPS receiver and all examined localities are provided with geographical coordinates. The sites where the taxa were registered are marked on a map (Fig. 1). Specimens were identified according to the following taxonomical books and keys: Dennis (1960), Breitenbach & Kränzlin (1981), Moser (1983),

Medardi (2006), Hansen & Knudsen (2000). Names of the species have been modified according to Index Fungorum (<http://www.indexfungorum.org>) and Mycobank (<http://www.mycobank.org>).

The following abbreviations are used: Mt. - mountain, r. - river, v. - village, * - new species for Serbia.

Results and discussion

The biodiversity of Ascomycota in Serbia is unknown for the most part. Field research on mycodiversity conducted from 2015 - 2018 in the eastern part of Serbia resulted with a registration of the following new and noteworthy taxa for the country: *Cordyceps militaris*, *Ophiocordyceps gracilis*, *Peziza phyllogena*, *Neottiella vivida*, *Scutellinia legalie*, *S. trechispora*, *Plectania melastoma*, *Pseudoplectania nigrella* and *Urnula mediterranea* (Tab. 1, Fig. 2).

Macro- and microscopic descriptions, notes on ecology and diversity in the country are provided exclusively on the collected material. Data on presence in the country of *Cordyceps militaris*, *Peziza phyllogena*, *Scutellinia trechispora* and *Plectania melastoma* hasn't been reported in scientific literature up to now and scattered information were known only from web, macroscopic photos and personal communications. *Neottiella vivida*, *Ophiocordyceps gracilis*, *Scutellinia legalie* and *Pseudoplectania nigrella* are reported for Serbia for the first time. A second country record is confirmed for the rare European species *Urnula mediterranea*.

Fam.: Clavicipitaceae (Lindau) Earle

Cordyceps militaris (L.) Link

Description: Stroma 10 - 70 x 2 - 10 mm wide, solitary or in small groups, club-shaped, cylindrical, bright orange to orange-red with abundant perithecia. Stem 10 - 25 x 3 - 5 mm, smooth, wavy, paler and whitish at base (Fig. 2.g). Perithecia 500 - 720 x 300 - 480 µm, ovoid, usually 2/3 submersed in the stroma, paler in colour. Asci 300 - 510 x 3.5 - 5 µm, narrow, cylindrical, not staining blue in iodine. Ascospores elongate, filiform, multiseptate, breaking into bacilliform cell fragments with dimension of 2 - 4.5 x 1 - 1.5 µm (Fig. 3).

Specimen examined: Gabrovac v., near St. Trojica Monastery (Niš), Seličevica Mt., deciduous forest, on a lepidopteran pupae half buried in soil, among moss, 316 m, N 43°15'55", E 21°55'28", 25/12/2015, M.

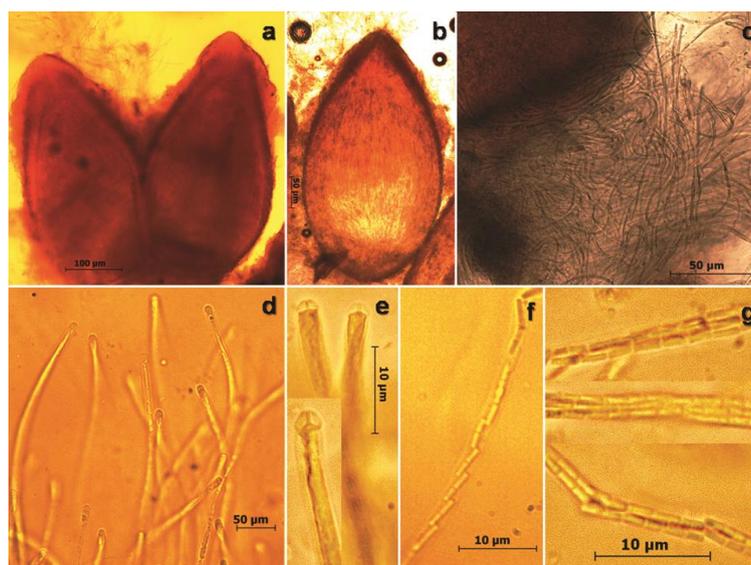


Fig. 3. Microscopic photographs of *Cordyceps militaris*, **a**) Perithecia in Melzer's reagent (MLZ); **b**) perithecium in Lugol's solution (IKI); **c**) asci in IKI; **d**) asci in MLZ; **e**) asci tips in IKI; **f**) spores in MLZ (x400); **g**) Spores in IKI (x1000). Photo – I. Kajevska.

Kuštara, M.S.N. 25/12/15 - 104; Gabrovac v., above St. Trojica Monastery (Niš), Seličevica Mt., *Quercus cerris* and *Carpinus orientalis* forest, on a lepidopteran pupae, 400 m, N 43°16'13", E 21°55'12", 09/5/2017, N. Pavković, M.S.N. 09/05/17 - 195; Gadžin Han town, above, Suva Planina Mt. (Niš), *Quercus cerris* forest with *Carpinus orientalis*, on larvae, 631 m, N 43°12'25", E 22°03'05", 01/06/2017/18, I. Kajevska, M.S.N. 01/06/17 - 190.

Claviceps militaris is a type species of the genus with a worldwide distribution. This entomopathogenic species parasites insect larvae or pupae of several genera of Lepidoptera and Hymenoptera order (Webster & Weber, 2007). There are several species of the genus recorded in the northern part of Serbia (more on this in Savić et al., 2016). However, the cosmopolitan species *C. militaris* has not been reported in scientific literature for the mycobiota of Serbia thus far. Unpublished data with exsiccate and *in situ* photographs from the eastern part of Serbia, were also kindly provided from Grozdan Taskov (pers.comm.): four well developed fruiting bodies found on lepidopteran pupae in *Pinus nigra* plantings, near the city of Pirot (N 43°10'18" E 22°36'56"; 11/2016). Our material was collected in deciduous forests, all found on a lepidopteran pupae half buried in soil, except for one collection with small fruiting bodies emerging from larvae. As indicated above, we do not consider it as a rare species.

Fam.: Ophiocordycipitaceae G. H. Sung, J.M. Sung, Howel-Jones & Spatafora

****Ophiocordyceps gracilis* (Grev.) G. H. Sung, J.M. Sung, Howel-Jones & Spatafora**

(Syn: *Cordyceps gracilis* (Grev.) Durieu & Mont.)

Description: Stroma 8 x 4 mm wide, solitary, capitata, dark yellow to orange with abundant dark orange perithecial ostioles; flesh thick and paler than surface. Stem 35 x 2.5 mm unfertile part of the stroma, cylindrical, faintly floccose, somewhat wavy, sulphur yellow at base, paler and whitish near the fertile part of the stroma (**Fig. 2.d**). Perithecia (550)630 - 750 x 210 - 270 μm , ovoid, completely immersed in the stroma, paler in colour. Asci 370 - 500 x 3 - 5 μm , narrow, cylindrical, not staining blue in iodine, swollen at the apex. Ascospores elongate, filiform, multiseptate, breaking into bacilliform cell fragments with dimension of (3)5 - 8 x 1 - 1.5 μm (**Fig. 4**).

Specimen examined: Niška Banja city municipality (Niš), Suva planina Mt., deciduous forest (*Populus tremula*, *P. nigra*, *Salix alba*), on lepidopteran larva, humid place, 200 m, N 43°18'14", E 21°59'52", 13/04/2018, *S. Lazarević* (leg. *D. Vučić*), M.S.N. 13/04/18 - 228.

Ophiocordyceps gracilis is a cosmopolitan but rarely reported species throughout the world. No occurrence for Serbia is cited for this species, commonly known as *Cordyceps gracilis* and this record is possibly the first for the country. A single stroma of *O. gracilis* has been found on lepidopteran larva emerging from the host completely covered by sulphur yellow mycelial strands in deciduous forest, predominantly polars. Macro - and microscopically the examined material is in accordance with the description given by Mains (1951, 1958), Eckblad (1967), Allard (1998), Breitenbach & Kränzlin (1984), Hansen and Knudsen (eds.) (2000).

Fam.: Pezizaceae Dumort.

***Peziza phyllogena* Cooke**

Description: Apothecia 5 - 45 mm in diameter, cup-shaped to disk-shaped, often irregularly shaped when mature; hymenium smooth, wrinkled in the center, brown with violet tinge; the outer surface

is granular, brown to lilac, purplish at base; margin with purplish granules, slightly involute, and undulate; flesh thick and pale violet (**Fig. 2.b**). Asci 220 - 300 x 12 - 16 μm , cylindrical, amyloid, operculate, 8 - spored, apex obtuse or truncate, ascus base with croziers. Paraphyses 310 - 370 x 3 - 4 μm , cylindrical, septate, slightly enlarged at apex 4 - 6 μm . Ascospores (13)17 - 19(21) x 6 - 11 μm , ellipsoid to narrowly ellipsoid, hyaline, structure with fine warts sometimes forming small ridges. Medullary excipulum of *textura intricata*, with

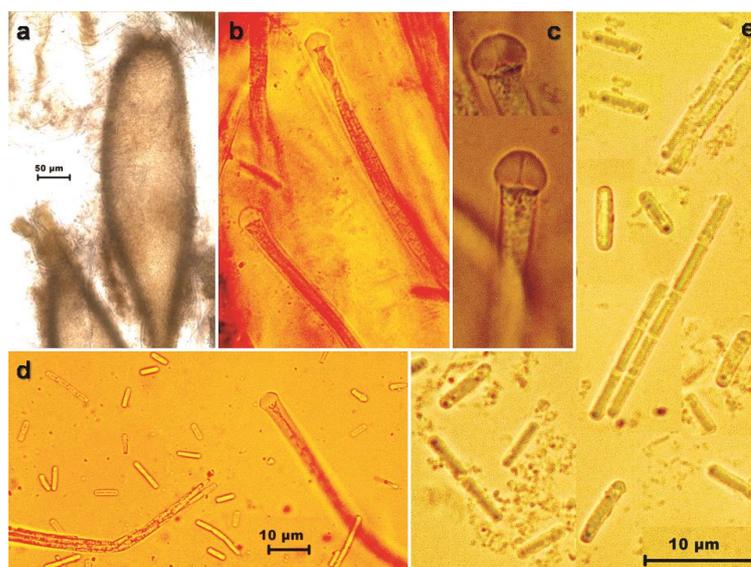


Fig. 4. Microscopic photographs of *Ophiocordyceps gracilis*, **a**) Perithecia in (IKI); **b**) asci in Congo Red (CR); **c**) asci tips (x1000) in CR; **d**) ascus and spores (x400) in CR; **e**) spores (x1000) in CR. Photo – I. Kajevska.

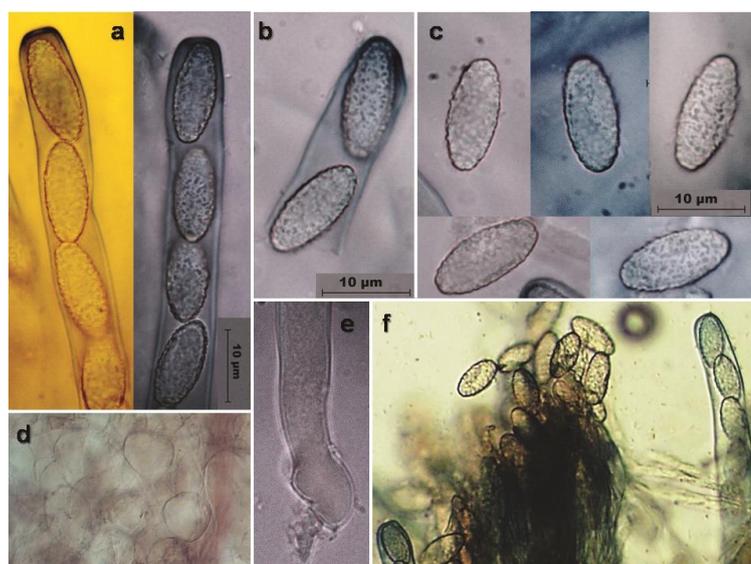


Fig. 5. Microscopic photographs of *Peziza phyllogena*. **a**) Ascus in MLZ and LPCB; **b**) ascus apex in LPCB; **c**) spores (x400) in LPCB; **d**) excipulum in MLZ; **e**) ascus base in LPCB; **f**) hymenium (asci and spores) in LPCB. Photo – I. Kajevska.

hyaline cylindrical cells. Ectal excipulum of *textura globulosa-angularis* with cells of 20 - 40 µm wide (Fig. 5).

Specimen examined: Popova glava hill, between Hum v. and Rujnik v. (Niš), Kalafat Mt., *Quercus* sp. and *Carpinus orientalis* forest, on soil and wood debris, 700 m, N 43°23'25", E 21°53'44", 09/05/2016/7/8, I. Kajevska (leg. S. Lazarević), M.S.N. 09/05/17 - 116.

No published record is reported from Serbia for this species and so far, we managed to register only one locality of *P. phyllogena* (Popova glava hill) in this part of the country. On this locality, in 2016 large quantity of this species was observed, but during the next two years these populations were with scattered number of fruiting bodies. This humus saprotroph may be confused with *P. badia* but its occurrence in late autumn and its reticulate spores removes any suspicion (Pfister, 1987; Elliot & Kaufert, 1974).

Fam.: Pyronemataceae Corda

****Neottiella vivida* (Nyl.) Dennis**

Description: Apothecia 2 - 13 x 3 - 8 mm in diameter, disk - shaped to cup-shaped; hymenium smooth or wrinkled with maturity, bright orange to dark orange-red when dry; excipulum concolorous with the hymenium or paler, villose with white soft and tender (delicate) hairs (up to 3.5 mm) which are

mostly concentrate at the margin; margin entire or lobed, somewhat eroded; flesh thick and white. Stem central if present, villose and thick (Fig. 2.i). Asci 150 - 270 x 15 - 18 µm, cylindrical, 8 - spored, uniseriate, apex obtuse or truncate, not staining blue in iodine, ascus base with croziers. Paraphyses 170 - 300 x 2 - 3 µm, narrowly cylindrical, swollen at the apex (5 - 6 µm) and often wry, filled with orange granules vivid in Cotton Blue or becoming greenish in Melzer's reagent. Ascospores 21 - 25(-27) x 14 - 15(-17) µm, hyaline, thick-walled, ellipsoid, usually contains 1 - 2 large globose oil drops (7 - 10(18) µm); ornamentation verrucose on oil immersion, with small isolated warts but some are connected and form also isolated ridges. Hairs 170 - 300 x 4 - 8 µm, hyaline or greenish in Melzer's reagent, usually with 2 - 3 septa, thickened walls, base of hair with somewhat clavate widening but mostly wry and widened (4 - 10 µm) with median constriction, tips obtuse. Ectal excipulum of *textura angularis-intricata*, with cells of 20 - 40 µm wide. Medullary excipulum of *textura intricata*, with hyphae 3 - 7 µm wide, hyaline, with thin walls (Fig. 6).

Specimen examined: Grbavče v., Svrljiške Planine Mt. (Svrljig), deciduous forest (*Carpinus orientalis*, *Quercus* spp., on moss rhizoids of *Polytrichum* spp., 550 m, N 43°23'54", E 22°00'36", 29/09/2016, I. Kajevska (leg. N. Pavković), M.S.N. 29/09/16 - 101; Gradac resort, above Knez Selo v. (Niš), Kalafat Mt., *Fagus* forest, on moss rhizoids, 450 m, N 43°23'21", E 21°00'06", 18/10/2016, I. Kajevska (leg. N. Pavković and S. Lazarević), M.S.N. 18/10/16 - 102.

Neottiella vivida is bryoparasitic species which occurs with stipe base attached to moss rhizoids predominantly on *Polytrichum* spp. Important microscopic character of *N. vivida* which distinguishes it from other *Neottiella* species is its warted spores (Senn - Irlet, 1989; Yao & Spooner, 1996a; Eckstein et al., 2014). Distinguishable feature can also be the hair bases with its widened base and median constriction. Its occurrence in Europe is widespread but it is rarely reported. Also, available literature search indicates no published data of this species from Serbia. During field studies held in September and October 2016 in the eastern part of Serbia, two localities of this species have been recorded (Svrljiške Planine Mt. and Gradac resort) and are reported here as new for the country. All findings have been observed at altitude bellow 700 m in

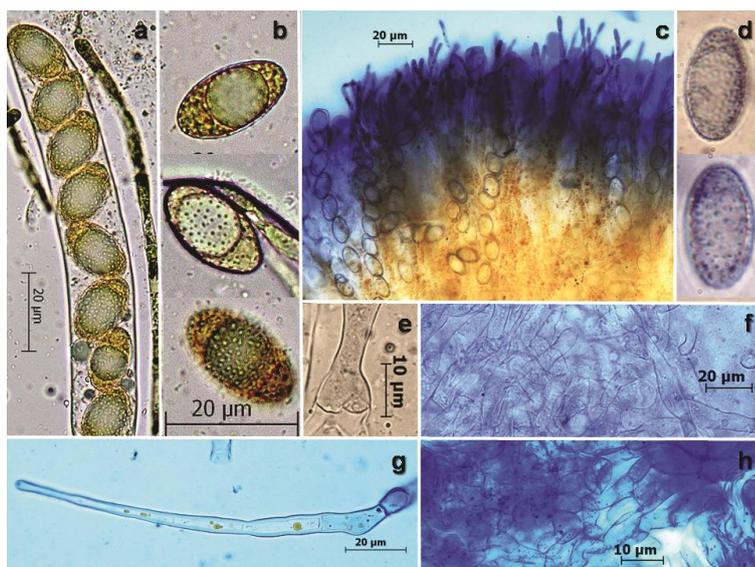


Fig. 6. Microscopic photographs of *Neottiella vivida*, **a)** Ascus with spores and paraphysis in IKI; **b)** Spores in IKI (x400); **c)** Hymenium (asci, ascospores, and paraphyses) in lactophenol cotton blue solution (LPCB); **d)** spores in LPCB (x1000); **e)** ascus base in IKI; **f)** medullary excipulum in LPCB; **g)** hair in LPCB; **h)** ectal excipulum in LPCB. Photo - I. Kajevska.

xeric to mesic deciduous forest associations, predominantly *Quercus* spp.

****Scutellinia legaliae* Lohmeyer & Häffner**

Description: Apothecia 2 - 8 mm in diameter, disc-shaped, hymenium dark orange and red, smooth; the outer surface covered with short dark brown thick hairs; margin distinct, covered with thick pointed or tapered hairs; flesh thick and yellowish (**Fig. 2.a**). Asci 200 - 310 x 18 - 23 μm , inamyloid, cylindrical, operculate, 8-spored, apex obtuse, ascus base with croziers. Paraphyses 270 - 330 x 3 - 4 μm , cylindrical, septate, filled with orange carotenoid crystals, enlarged tips 6 - 12 μm . Hairs: 350 - 650 μm , septate, mostly simple and bifurcate at base. Ascospores 15.5 - 17.5 μm , globose, hyaline, surface covered with acuminate spines 2 - 5 μm long. Medullary excipulum of *textura intricata*, with hyaline hyphae of 5 - 15 μm wide. Ectal excipulum of *textura globulosa* with cells of 20 - 50 μm wide (**Fig. 7**).

Specimen examined: Above Gabrovac v., near St. Trojica Monastery (Niš), Seličevica Mt., *Quercus cerris* forest with *Carpinus orientalis*, on wet clay soil, 450 m, N 43°15'40.6", E 21°55'25.6", 04/06/2017, I. Kajevska (leg. S. Lazarević), M.S.N. 04/06/17 - 199.

According to Schumacher (1990), *S. legalie* is a rarely recorded species in Europe. For Serbia it is reported for the first time. Material examined was found on wet soil along forest pathway in *Quercus cerris* forest on humid and open place unlike *S. trechispora* which obviously prefers humid but shaded places. Although it is referred as more south European species preferring warm climates (Schumacher 1990; Matočec et al. 1995), hitherto our field studies from the eastern part characterized by warmer climate have resulted in only one data of this species consisting of four small fruiting bodies (two of them in its initial phase).

***Scutellinia trechispora* (Berk. & Broome) Lambotte**

Description: Apothecia 3 - 10 mm in diameter, disc-shaped, hymenium dark orange and red, smooth; the outer surface covered with short dark brown thick hairs; margin distinct, covered with densely thick and sharply pointed hairs; flesh thick and white (**Fig. 2.c**). Asci 270 - 320 x 20 - 25 μm , inamyloid, cylindrical,

operculate, 8-spored, apex obtuse, ascus base with croziers. Paraphyses 250 - 330 x 2 - 4 μm , cylindrical, few septas, filled with orange carotenoid crystals well vivid in Congo Red, enlarged tips 6 - 9 μm . Hairs: 500 - 1700 μm , septate, sharply pointed, mostly bifurcate at base. Ascospores 15 - 18 μm , globose,

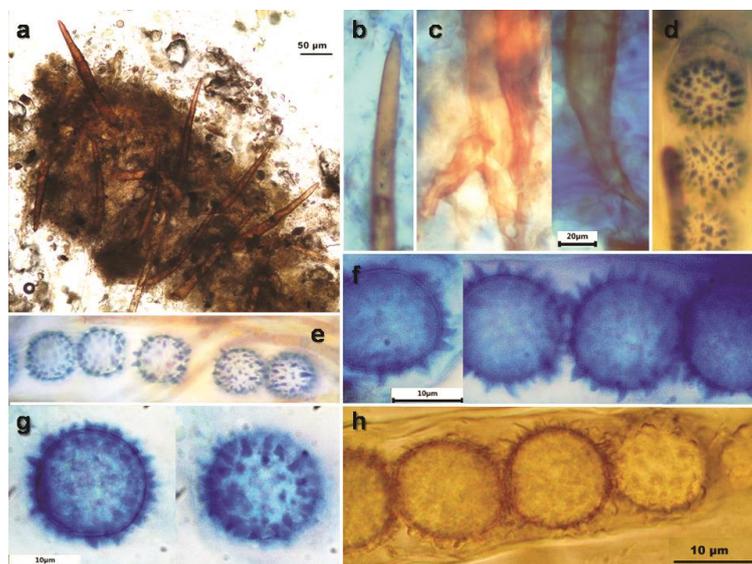


Fig. 7. Microscopic photographs of *Scutellinia legalie*, **a**) Hairs (x100) in IKI; **b**) hair tip in LPCB; **c**) hair base in LPCB; **d**) ascus apex in LPCB; **e**) ascus with spores in LPCB; **f**) spores within ascus (x1000) in LPCB; **g**) spores (x1000) in LPCB; **h**) spores (x1000) in IKI. Photo – I. Kajevska.

hyaline, surface covered with truncate spines 2 - 4 μm high and 1 - 2 μm wide. Medullary excipulum of *textura intricata*, with hyaline hyphae of 5 - 15 μm wide. Ectal excipulum of *textura globulosa* and *angularis* with cells of 20 - 50 μm wide (**Fig. 8**).

Specimen examined: Above Gadžin Han town (Niš), Suva planina Mt., *Quercus cerris* forest, on wet soil, under leaf litter and wood debris, by a stream, 600 m, N 43°12'25", E 22°03'04", 01/06/2017, I. Kajevska, M.S.N. 01/06/17 - 213.

No published data of this common European species have been reported for Serbia up till now. It can be easily delimited from other taxa of the genus by its truncate spores (Lohmeyer & Häffner, 1983; Schumacher, 1990; Matočec et al., 1995; Yao & Spooner 1996b). Macro- and microscopically, our collection was consistent with published descriptions, except for the length of the hairs which is somewhat shorter than those noted by Schumacher (1990). Ecologically is also in accordance with the indications given by the aforementioned authors. Our specimens consisting of five well-developed fruiting bodies have been found on wet soil in oak forest, barely visible among the humid leaf litter.

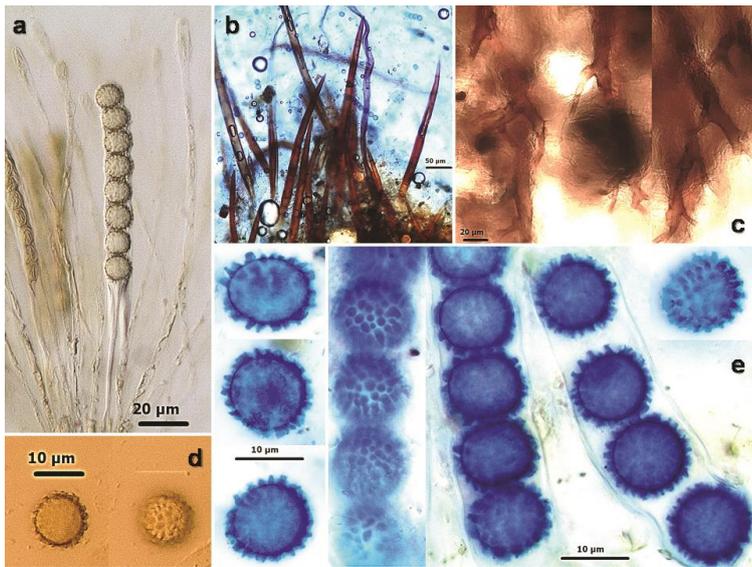


Fig. 8. Microscopic photographs of *Scutellinia trechispora*. **a)** Ascus with paraphyses in IKI; **b)** hairs (x200) in LPCB; **c)** hair base in IKI; **d)** spores (x1000) in IKI; **e)** spores (x1000) in LPCB. Photo – I. Kajevska.

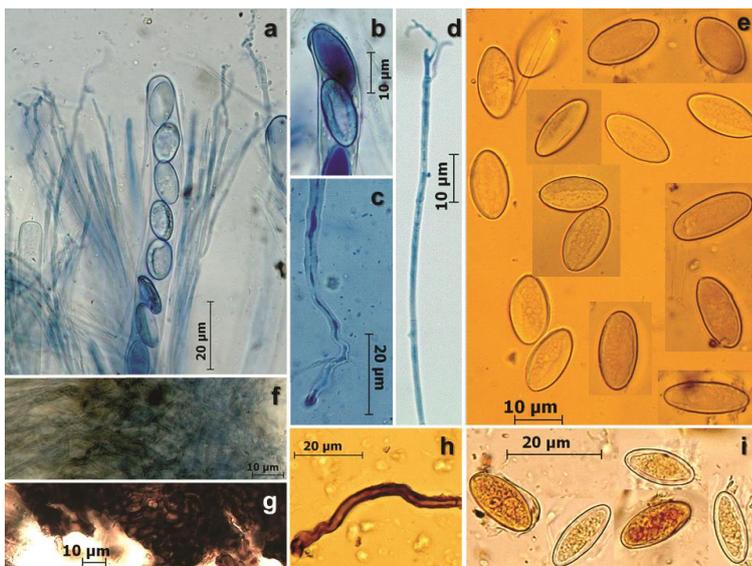


Fig. 9. Microscopic photographs of *Plectania melastoma*, **a)** Hymenium (asci, ascospores, hymenial hairs/seta and paraphyses) in LPCB; **b)** ascus apex in LPCB; **c)** ascus base in LPCB; **d)** paraphysis (branching) in LPCB; **e)** spores in MLZ (x400); **f)** medullary excipulum in LPCB; **g)** ectal excipulum in LPCB; **h)** basal hyphae in MLZ; **i)** spores in IKI (x400). Photo – I. Kajevska.

Fam.: Sarcosomataceae Kobayasi

***Plectania melastoma* (Sowerby) Fuckel**

Description: Apothecia 0.3 - 17 x 0.5 - 15 mm diam., at first roughly spherical with hollow opening, becoming cup-shaped, concave; hymenium smooth, shining, dark brown or black; excipulum wrinkled, concolorous with the hymenium, covered with orange granules when young especially in the upper

part but seldom or missing when mature; flesh tough, gelatinous when wet, gray; margin entire, incurved and covered abundantly with orange granules especially when young. Stem 0.2 - 0.5 mm, if present than central, thick, at base covered with black mycelial threads (**Fig. 2.f**). Asci 270 - 430 x 9 - 13 µm, cylindrical, long attenuated, 8 - spored, uniseriate, thick - walled, apex obtuse or truncate but with somewhat eccentric operculum, not staining blue in iodine, ascus base flexuous and tapered. Paraphyses 270 - 400 x 2 µm, filiform, often forked or branched, flexuous, septate. Hymenial hairs 260 - 410 x 2 - 3 µm, cylindrical, with obtuse apex and one septum at the base. Ascospores (20) 21 - 24(27) x 9 - 10(12) µm, hyaline, elliptic, fusiform, slightly thick-walled, multiguttulate with small oil drops; smooth or barely visible ornamentation on oil immersion. Medullary excipulum of *textura intricata*, with hyphae 2 - 5 µm wide, smooth, hyaline, cylindrical, immersed in a gel. Ectal excipulum of *textura globulosa-angularis*, with cells of 10 - 13 µm wide, thick - walled, brownish. *Tomentum* (basal hyphae) 6 - 8 µm wide, flexuous, with scarce septa, encrusting pigments, thick - walled, dark brown (**Fig. 9**).

Specimen examined: Gabrovac v., near St. Trojica Monastery (Niš), Seličevica Mt., *Quercus pubescens* and *Q. cerris* forest, on wet fallen oak branches of small diameter, 330 m, N 43°15'16", E 21°44'75", 28/02/2015, M. Kuštera & I. Cvijetan (leg. V. Lilić), M.S.N. 28/02/15 – 106; Bojanine vode resort, above Gornja Studena v., Suva planina Mt., *Fagus* forest, on fallen branches and small sized decaying organic matter, 700 m, N 43°13'18", E 22°07'20", 24/04/2015, M. Kuštera & I. Cvijetan (leg. N. Pavković), M.S.N. 24/05/15 - 107.

Plectania melastoma is well distinguishable from other species of the genus by the presence of the orange granules on the excipulum surface of the fruiting bodies which may last for centuries as noted by Agnello & Carbone (2011). Same authors also point out that spores are not quite smooth but has exclusively fine ornamentation (Agnello & Carbone, 2011). *P. melastoma* is widespread species but also reported as rare in many

European countries and listed in many national red-lists of fungi (Gierczyk et al., 2010). This saprotrophic fungus had not been reported before in scientific literature for Serbia. Data on *P. melastoma* published in this paper comes from two localities (Gabrovac vill. and Bojanine Vode resort). Investigated specimens were found in the base of a slope where lot of organic matter is accumulated in mixed deciduous forests (*Carpinus orientalis*, *Quercus cerris*, *Acer campestre*, *Fagus sylvatica*, *Robinia pseudoacacia*), humid for a long time. The species was found for the first time in 2015. and all records occur from the southern mountain hills at altitude bellow 700 m. Glejdura et al. (2011) states that in Slovakia *P. melastoma* occurs at altitude of 280 – 750 m and its occurrence is confined on small diameter branches, humid places and on localities with no or low sign of human activity and these parameters are in accordance with our findings too.

****Pseudoplectania nigrella* (Pers.) Fuckel**

Description: Apothecia 10 - 25 x 5 - 15 mm in diameter, cup - shaped to disk-shaped; hymenium shiny black or dark brown, smooth or wrinkled with maturity; the outer surface dark brown to blackish, tomentose - with dark brown to blackish, convolute and thick hairs, margin entire or undulate, also with hairs which are light - brown when young; flesh thick, white and grayish (Fig. 2.e). Asci 280 - 320 x 10 - 14 μ m, inamyloid, cylindrical, operculate, 8 - spored, thick - walled, apex obtuse or truncate, base attenuated. Paraphyses 270 - 330 x 2 - 3 μ m, filiform, septate, irregularly wry tips, some branched. Hymenial hairs: 280 - 350 x 2 - 4 μ m, narrowly cylindrical, straight, with one septum at base. Ascospores (9-)10 - 12 μ m, spherical, smooth, hyaline, thick - walled, with gelatinous outer layer, inside contains many small globose oil drops. Hairs (outher surface): 4 - 9 μ m in diameter, cylindrical and curved, dark brown, thick-walled, septate. Ectal excipulum of *textura angularis*, with dark - brown cells of 18 - 25 μ m wide. Medullary excipulum of *textura intricata*, with hyaline hyphae of 4 - 8 μ m wide. *Tomentum* (basal hyphae): 4 - 9 μ m wide, cylindrical, curved, dark - brown, thick - walled, few septas (Fig. 10).

Specimen examined: Between Gabrovac v. and Gornje Vlase v. (Niš), Seličevica Mt., *Pinus sylvestris* plantings, on soil, among moss, 398 m, N 43°16'6.34", E

21°55'7.04", 24/02/2017, I. Kajevska, M.S.N. 24/02/17 - 158.

Pseudoplectania nigrella has not been previously reported from Serbia and these are new data for the country. It has been found at four different localities, all from the eastern part of the country but exsiccate has been preserved only from the vicinity of Gabrovac vill., with two well-developed fruiting bodies. Macro- and microscopically specimens are in accordance with the descriptions given by Saver (1913), Le Gal (1953), Paden (1983), Breitenbach & Kränzlin (1984), Korf & Zhuang (1991), Hansen and Knudsen (eds.) (2000), Medardi (2006), Carbone et al. (2012). Data of this species in Serbia comes from coniferous forests: 2 collections from fir forest and 2 from pine plantations. Ascomata from all collections have been observed at the edge of the forests, about 1-2 m near the conifer trees, on an open area and amongst moss and fallen needles.

***Urnula mediterranea* (M. Carbone, Agnello & Baglivo) M. Carbone, Agnello & P. Alvarado**

(Syn.: *Plectania mediterranea* M. Carbone, Agnello & Baglivo)

Description of studied specimen: Apothecia 10 - 50 x 7 - 30 mm in diameter, cup - shaped, hymenium brownish, medium reddish shade of brown, smooth

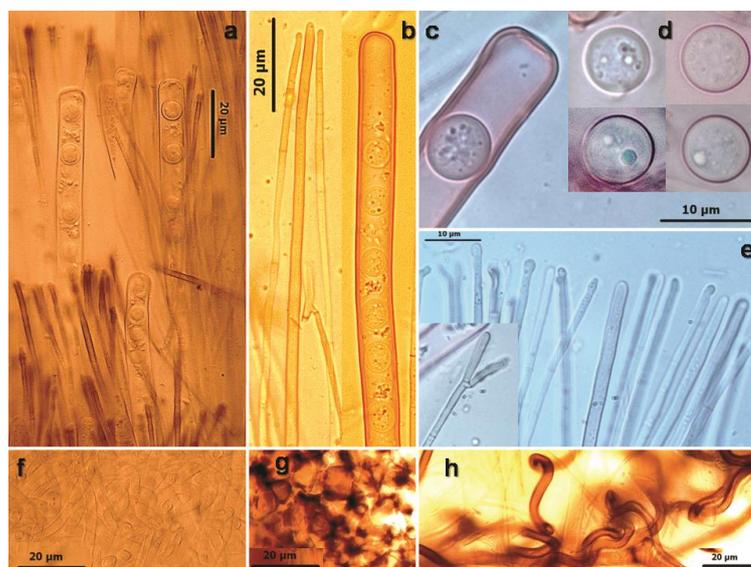


Fig. 10. Microscopic photographs of *Pseudoplectania nigrella*, **a)** Hymenium (asci, ascospores, hymenial hairs/seta and paraphyses) in IKI; **b)** hymenial hair (in middle) and paraphyses, and ascus with spores in IKI; **c)** ascus apex in CR; **d)** spores (x1000) in CR; **e)** hymenial hairs with paraphyses in CR; **f)** medullary excipulum in IKI; **g)** ectal excipulum in IKI; **h)** basal hyphae in IKI. Photo – I. Kajevska.

at first and wrinkled later; the outer surface is dark brown, rough in touch, covered with densely dark brown and thick hairs; margin crenate; flesh gelatinous, grayish (**Fig. 2.h**). Stem 5 - 20 mm, central, concolorous with the apothecia, with densely dark hairs. Asci 450 - 550 x 12 - 15 μm , inamyloid, cylindrical, operculate, 8 - spored, apex obtuse or truncate, ascus base without croziers. Paraphyses 400 - 570 x 2 - 4 μm , cylindrical, septate, many with curved tips. Hymenial hairs 450 - 600 x 3 - 4 μm , cylindrical, straight, apex obtuse. Ascospores 22 - 27(29) x 10 - 14 μm , globose, hyaline, surface covered with truncate spines 2 - 4 μm high and 1 - 2 μm wide. Medullary excipulum of *textura intricata*, with hyaline hyphae of 3 - 7 μm wide. Ectal excipulum of *textura globulosa* to *angularis* with brownish cells of 8 - 15 μm wide. *Tomentum* (basal hyphae): 4 - 8 μm wide, cylindrical, curved, dark-brown, thick - walled, septate (**Fig. 11**).

Specimen examined: Above Gadžin Han town (Niš), Suva planina Mt., *Quercus cerris* forest, on wet soil, under leaf litter and wood debris, by a stream, 600 m, N 43°12'25", E 22°03'04", 01/06/2017, I. Kajevska, M.S.N. 01/06/17 - 213.

Urnula mediterranea is a recently described species (Carbone et al., 2009) and it is an extremely rare European species. So far it is registered only from: Italy, Spain, France, Serbia and Greece (Kaounas et al., 2015; Milosavljević, 2017). The first record of this Mediterranean species in Serbia has been surprisingly reported from the central region of the country, a discovery which also represents the first record from the Continental Europe, and the species was found precisely in 2014, a year followed by heaviest rainfall, floods and temperatures above the average since 1951 (Milosavljević, 2017). Here we report the second record of *U. mediterranea* for Serbia, located in the eastern part of the country (above Gadžin Han town, Suva planina Mt.). Specimens on this locality have been registered in 2017 which was normal and dry in a relation of precipitation unlike 2014, but apothecia were found on a very humid place in *Quercus cerris* forest under *Carpinus orientalis*. Our collection conforms well to the description given in Carbone et al. (2009), although the length of spores has been quite smaller and did not exceed 30 μm but Carlo Agnello indicates that the dimension of spores is quite variable in this species (pers. comm.).

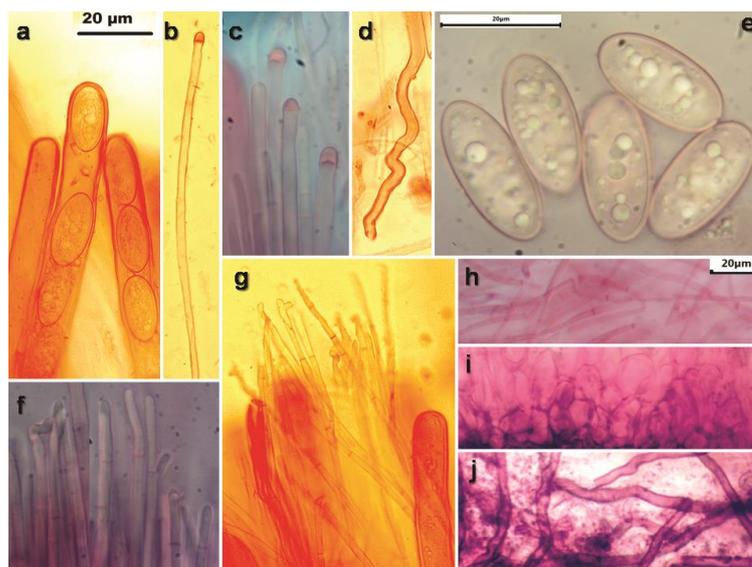


Fig. 11. Microscopic photographs of *Urnula mediterranea*, **a**) Asci (x400) in CR; **b**) hymenial hair (x400) in CB; **c**) hymenial hair tips in CR; **d**) ascus base in CR; **e**) spores (x1000) in CR; **f**) paraphyses tips in CR; **g**) paraphyses in CR; **h**) medullary excipulum; **i**) ectal excipulum (x250) in CR; **j**) basal hyphae (x250) in CR. Photo – I. Kajevska.

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