



NEW DATA ON PYRENOAMYCETOUS FUNGI OF BULGARIA

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Abstract. New records and/or plant substrata of 16 saprophytic pyrenomycetous fungi of *Botryosphaeriaceae* (*Botryosphaeria visci*), *Gnomoniaceae* (*Apiognomonium veneta*, *Gnomonia betulina*, *G. comari*, *G. geranii*, *G. gnomon*, *G. leptostyla*, *G. setacea*, *Hypospilina pustula*, *Plagiostoma inclinatum*), *Phaeosphaeriaceae* (*Leptosphaeria doliolum*, *Nodulosphaeria dolioloides*, *N. modesta*), *Pleosporaceae* (*Pleospora herbarum*), *Melanconidaceae* (*Melanconis modonia*) and *Montagnulaceae* (*Paraphaeosphaeria glauco-punctata*) are recorded in Bulgaria. *Leptosphaeria doliolum* is reported on dead stems of *Agrimonia eupatoria*. All taxa are presented with brief chorological data and notes on their distribution in the country. Some are briefly described.

Key words: ascomycetes, *Melanconis*, *Paraphaeosphaeria*, *Pleospora*, saprotrophs

INTRODUCTION

The research of the pyrenomycetes (*s. lat.*) in Bulgaria dates back to the beginning of the 20th century (ATANASOV & PETROV, 1930). Those investigations were related with the development of the phytopathology in Bulgaria until 70's. In the last 30 years systematic researches on some pyrenomycetous groups has begun, e.g. *Erysiphales*, some genera of *Diaporthales* (*Apiognomonium*, *Apioplagiostoma*, *Gnomonia*, *Plagiostoma*, *Pseudovalsa*, etc.), *Dothideales* (*Mycosphaerella*, *Pleospora*, *Leptosphaeria*, *Nodulosphaeria*), etc. (FAKIROVA, 1978, 1982, 1985, 1991, 1992, 1993a, b, 1994, 1995a, b, 1996, 1997; STOYKOV, 2004, STOYKOV & ASSYOV, 2006; STOYKOV & DENCHEV, 2006, etc.).

Some pyrenomycetes, mainly in their anamorphic stages, cause serious economic diseases affecting ornamental plants or plant crops: *Apiognomonium veneta* (ROSNEV 1981), *G. leptostyla* (ROSNEV & TSANOVA, 1980), *Melanconis modonia*, *Cryphonectria parasitica* (ROSNEV & ZAHOV, 1982; PETKOV & ROSNEV, 2001), etc.

MATERIALS AND METHODS

All specimens are kept in the Mycological Collection of the Institute of Botany at the Bulgarian Academy of Sciences (SOMF). Their accession numbers are given in brackets at the end of each record.

The studies were carried out on dried specimens, rehydrated in water. Microscopic features were observed and measured in lactophenol and in distilled water with cotton blue (KIRK *et al.*, 2001). The measurements of the ascomata, asci and ascospores are given in the text in the following manner: min-max. New to Bulgaria substrata of the fungi are marked in the text with an asterisk. Microphotographs were taken on *Amplival* Carl Zeiss and on *Boeco* BM-180/T/SP microscopes with *Canon* PS A640. Taxonomic treatments, regional monographs and contributions on the fungi have been used for the determination of the taxa (WEHMEYER, 1941; ARX & MÜLLER, 1954; MUNK, 1957; BARR, 1978; MONOD, 1983; SIVANESAN, 1984; SHOEMAKER, 1984a, b; SHOEMAKER & BABCOCK, 1985; SHEARER *et al.*, 1990). The taxonomy of the families and genera follows the latest *Outline of Ascomycota* (LUMBSCH & HUHNDORF, 2007).

RESULTS

Due to the studies carried out in different regions of Bulgaria the following pyrenomycetous fungi were recorded:

Botryosphaeriaceae Theiss. & H. Syd.

Botryosphaeria visci (Kalchbr.) Arx & E. Müll., Beitr. Kryptogamenfl. Schweiz **11**: 41, 1954 [Anamorph: *Sphaeropsis visci* (Alb. & Schwein.) Sacc., *Michelia* **2**(6): 105, 1880]

Black Sea coast (northern): Varna distr., Kamchiyski pyasatsi, near Skorpilovtsi, 29 July 2008, B. Assyov (SOMF 26721); Black Sea coast (southern): Burgas distr., Ropotamo reserve, 10 September 2008, D.Y. Stoykov & B. Assyov (SOMF 26739). On dead leaves, petioles and fruits of *Viscum album* L.

Note. This is the first report of the fungus on fruits of *V. album*. Known only from Pirin Mt. and Silistar (Southern Black Sea coast) (STOYKOV & ASSYOV, 2008).

Gnomoniaceae G. Winter

Apiognomonia veneta (Sacc. & Speg.) Höhn., Ann. Mycol. **16**: 51, 1918

Sofia region: Sofia, Stochna Gara locality, nearby Tsaritsa Yoana hospital, 5 June 2003, D.Y. Stoykov (SOMF 25384). On overwintered leaves of *Platanus* hybr.

Note. Recently reported from Strouma valley by STOYKOV & ASSYOV (2006).

Gnomonia betulina Vleugel, Svensk Bot. Tidskr. **11**: 305, 1917

Rila Mts: Blagoevgrad distr., along the road to Ribnite ezera lakes, 19 July 1998, V. Fakirova (SOMF 22566); along the track from Kirilova Polyana to Vodniya Chal, 28 July 2002, D.Y. Stoykov (SOMF 25118). On overwintered leaves of *Betula pendula* Roth.

Note. Previously reported from Forebalkan, Sofia region, Vitosha region, West Frontier and Sredna Gora Mts (see STOYKOV & ASSYOV, 2006; STOYKOV & DENCHEV, 2006, etc.).

G. comari P. Karst., Mycol. Fenn. **2**: 122, 1873

Black Sea coast (southern): Burgas distr., between Primorsko and Kiten seaside resorts, 27 July 2006, D.Y. Stoykov (SOMF 26399); Stara Planina Mts: Sofia region, Vitinya pass, along the highway, 30 June 2002, D.Y. Stoykov (SOMF 25366). On dead stems of *Agrimonia eupatoria* L.

Known distribution: Forebalkan, Sofia region, Vitosha region, Slavyanka and Western Sredna Gora Mts, Thracian Lowland (Besaparski hills) (STOYKOV & DENCHEV, 2006, etc.)

G. geranii Hollós, Anns Mus. Nat. Hung. **7**: 52, 1909

Black Sea coast (southern): Burgas distr., Silistar, alt. ca 0 m., 25 May 2007, D.Y. Stoykov (SOMF 26842); Rila Mts: Blagoevgrad distr., along the road from Rilski monastery to the grave of St. Ivan Rilski, 6 July 2005, D.Y. Stoykov (SOMF 26717). On dead stems of *Geranium sanguineum* L.

Known distribution: Black Sea coast (northern), Vitosha region, Slavyanka, Pirin and Sredna Gora Mts (STOYKOV & DENCHEV, 2006, etc.).

G. gnomon (Tode : Fr.) J. Schröt., Krypt.-Fl. Schles. **3**: 390, 1894

Black Sea coast (northern): Dobrich distr., from Balchik to Ovtsharovski beach, near the old marine, alt. ca 0 m, 3 June 2006, D.Y. Stoykov (SOMF 26737, 26795, 26740); Strandzha Mt.: Burgas distr., along the road to Brashlyan village, 26 May 2007, D.Y. Stoykov (SOMF 26754). On dead leaves of *Corylus avellana* L.

Known distribution: Forebalkan, Sofia region, Vitosha region, West Frontier Mts, Belasitsa, Slavyanka, Pirin, Rila, Sredna Gora and Rhodopi Mts (STOYKOV & DENCHEV, 2006, etc.).

G. leptostyla (Fr. : Fr.) Ces. & De Not., Comment. Soc. Crittog. Ital. **1**: 232, 1863

Black Sea coast (northern): Dobrich distr., Balchik town, Sborna Myasto locality, 3 June 2006, D.Y. Stoykov (SOMF 25925). On leaves of *Juglans regia* L.

Note. Known from Northeastern Bulgaria, Forebalkan, Stara Planina Mts, Sofia region, West Frontier Mts, Strouma valley, Slavyanka, Pirin, Sredna Gora and Rhodopi Mts, Thracian Lowland (STOYKOV & DENCHEV, 2006; DIMOVA, 2007, etc.). According to ROSNEV & TSANOVA (1980) this species is supposed to be widespread throughout the country.

G. setacea (Pers. : Fr.) Ces. & De Not., Comment. Soc. Crittog. Ital. **1**: 232, 1863

Forebalkan: Lovech distr., Golyama Zhelyazna village, 4 May 2008, D.Y. Stoykov (SOMF 26843), on dead leaves of **Quercus rubra* L.; Znepole region: Sofia distr., above Berende Izvor village, 24 April 2006, D.Y. Stoykov (SOMF 25892); Chepan Mt, northern slopes, along the road, 24 April 2006, D.Y. Stoykov (SOMF 26199); Strandzha Mt.: Burgas distr., Tisovitsa locality, between the villages of Kondolovo and Gramatikovo, 24 May 2007, D.Y. Stoykov (SOMF 26365). On dead leaves of *Q. cerris* L.

For account of the distribution see STOYKOV & DENCHEV (2006).

Hypospilina pustula (Pers. : Fr.) M. Monod, Beih. Sydowia **9**: 189, 1983

Black Sea coast (southern): Burgas distr., Maslen Nos cape, 20 June 2004, B. Assyov (SOMF 25735), on dead leaves of *Quercus cerris*; Ropotamo reserve, on the left river bank, 10 September 2008, D.Y. Stoykov (SOMF 26738), on dead leaves of *Q. robur* L.; Znepole region: Sofia distr., Chepan Mt., northern slope, near the road, 24 April 2006, D.Y. Stoykov (SOMF 25894), on dead leaves of *Q. dalechampii* Ten.; River Mesta valley: Blagoevgrad distr., about 5 km away from Beslen village, close to the border with Greece, 29 June 2008, Hr. Pedachenko (SOMF 26724), on dead leaves of *Castanea sativa* Mill.; Strandzha Mt: Burgas distr., Marina Rjaka protected area, 28 May 2006, B. Assyov (SOMF 25458), on dead leaves of *Q. hartwissiana* Stev.

Note. Widespread in Bulgaria (see STOYKOV & DENCHEV, 2006, etc.).

Plagiostoma inclinatum (Desm.) M.E. Barr, Mycol. Mem. **7**: 115, 1978

Znepole region: Sofia distr., Chepan Mt., northern slope, near the road, 24 April 2006, D.Y. Stoykov (SOMF 25891). On dead leaves of *Acer campestre* L.

For account of the distribution see STOYKOV & DENCHEV (2006).

Melanconidaceae G. Winter

Melanconis modonia Tul., Ann. Sci. Nat. Bot. Ser. 4, **5**: 111, 1856 [Anamorph: *Coryneum modonium* (Sacc.) Griffon & Maubl., Bull. Soc. Mycol. Fr. **26**: 379, 1910] Fig. 1.

Circular pustules 500-1500 µm in diam. **Ascomata** 450-600 µm in diameter, globose. **Asci** (115–) 130-150 × 12-15 (–18) µm, cylindric-clavate, 8-spored. **Ascospores** (20–) 24-26 (–30) × 7.5-9 µm, biseriate to irregularly uniseriate, ellipsoid to ellipsoid-fusoid, two celled, rounded at the ends, brownish. **Conidia** 35– 45-52 × (12–) 15-18 µm, 5–8-celled.

Forebalkan: Lovech distr., Golyama Zhelyazna village, Lakite locality, 12 August 2008, SOMF (26722, 26726, 26734). *Anamorph*: Forebalkan, ibid., 26 September 2008, D.Y. Stoykov (SOMF 26773, 26775). On dead twigs of *Castanea sativa* Mill.

Note. Previously reported only from Stara Planina, Rhodopi and Strandzha Mts (ROSNEV & ZAHOV, 1982).

Pleosporaceae Nitschke***Pleospora herbarum*** (Pers. : Fr.) Rabenh., Herb. Mycol. 2: 547, 1854

Black Sea coast (southern): Burgas distr., Rezovo village, by the village, in meadows, 25 May 2007, D.Y. Stoykov (SOMF 26329), on dead stems of **Cichorium intybus* L.; Silistar, at the sand dunes, alt. ca 0 m, 25 May 2007, D.Y. Stoykov (SOMF 26745), on dead stems of **Eryngium maritimum* L.

Note. Known from Northeastern Bulgaria, Stara Planina Mts, Sofia region, Belasitsa, Rila, Sredna Gora and Rhodopi Mts (SAMEVA, 1978, etc.).

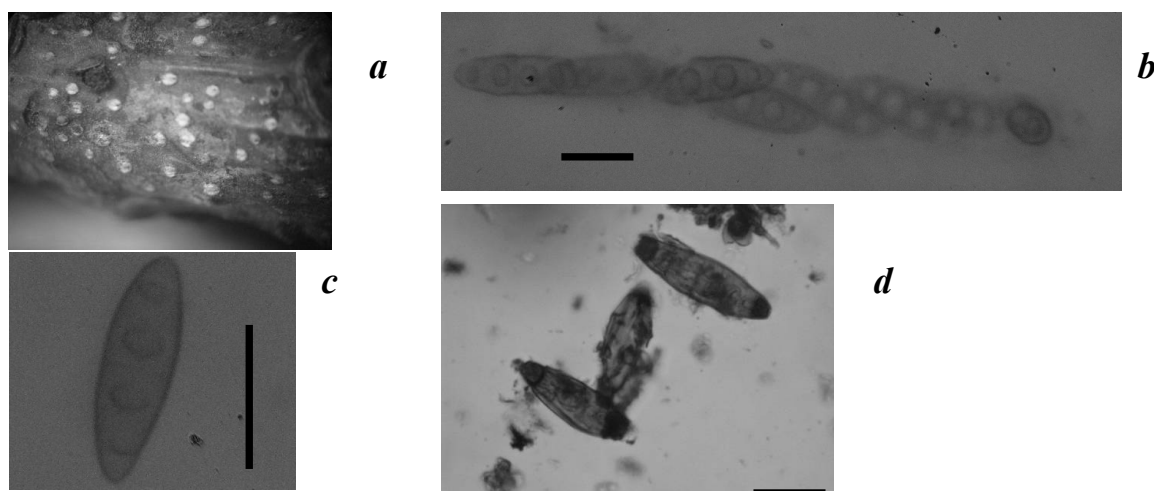


Fig. 1. *Melanconis modonia*: a – stromata; b – ascus; c – ascospore; d – conidia (Scale bar = 20 μ m)

Montagnulaceae M.E. Barr

Paraphaeosphaeria glauco-punctata (Grev.) Shoemaker & C.E. Babc., Can. J. Bot. 63: 1286, 1985 (Fig. 2)

Black Sea coast (northern), Balchik, the Botanical Garden, 6 June 2006, D.Y. Stoykov (SOMF 22112, 26183); Black Sea coast (southern), Primorsko, between the beach of MMC and Kiten, in mixed oak forest, 26 July 2006, D.Y. Stoykov (SOMF 26743); Primorsko, along the track to Maslen Nos cape, 9 September 2008, D.Y. Stoykov & B. Assyov (SOMF 26747); Sofia region: Sofia, in the garden between the Sofia University and the Parliament, 25 June 2007, D.Y. Stoykov (SOMF 26308). On dry cladodia of *Ruscus aculeatus* L.

Note. Previously reported only from Rhodopi and Strandzha Mts (KLIKA, 1926; SAMEVA, 1982).

Phaeosphaeriaceae M.E. Barr

Leptosphaeria doliolum (Pers. : Fr.) Ces. & De Not., Comment. Soc. Crittog. Ital. 1: 234, 1863.

Ascomata 300-450 μ m, gregarious, hemispherical, flattened at the base, papillate. **Asci** 85-100 \times 6.5-8 μ m, cylindrical, 8-spored, short stipitate. **Ascospores** 18-24 (–27) \times 4.5-6 μ m, fusoid, 3-septate, yellowish brown, overlapping uniseriately.

On overwintered stems of **Agrimonia eupatoria* L. Forebalkan: Lovech distr., Patreshko village, Vasilkovoto locality, 9 August 2004, D.Y. Stoykov (SOMF 25418). Western Stara Planina Mts: Vitinya pass, along the highway, 30 June 2002, D.Y. Stoykov (SOMF 25366).

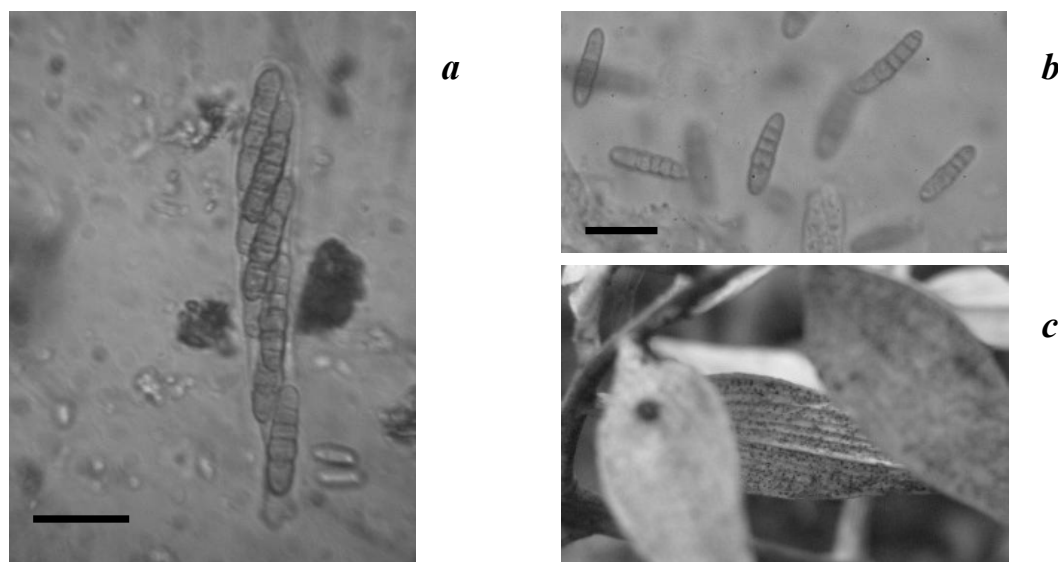


Fig. 2. *Paraphaeosphaeria glauco-punctata*: a – ascus; b – spore; c – ascomata in surface view on dry cladodia of *Ruscus aculeatus* (Scale bar = 20 µm)

On overwintered stems of **Clematis vitalba* L. Forebalkan: Lovech distr., Golyama Zhelyazna village, 3 September 2004, D.Y. Stoykov (SOMF 25422).

On dead stems of **Sambucus racemosa* L. Cenral Stara Planina Mts: Ribaritsa locality, 28 August 1978, D.A. Reid (SOMF 25430).

On overwintered stems of *Urtica dioica* L. Forebalkan: Lovech distr., Golyama Zhelyazna village, Lakite locality, 17 March 2007, D.Y. Stoykov (SOMF 26210), along with *Phoma hoehnelii* Kesteren var. *urticae*; Top Koriya locality, 12 July 2007, D.Y. Stoykov (SOMF 26746).

On dry herbaceous stems. Eastern Forebalkan: Golyama Zhelyazna village, Gachevski Ogradi locality, 3 September 2004, D.Y. Stoykov (SOMF 25411).

Note. Previously known from Stara Planina Mts, Sofia region, Vitosha region, Strouma valley, Pirin, Rila and Sredna Gora Mts on a wide range of host plants (FAKIROVA 1982; SAMEVA 1978, 1982; STOYKOV, 2004, etc.).

Nodulosphaeria modesta (Desm.) Munk ex L. Holm, Symb. Bot. Upsal. **14**: 80. 1957.

On overwintered stems of *Cirsium* sp., Vitosha region: Vitosha Mt., along the track from Reznjovete to Scoparnika, 11 July 2004, D.Y. Stoykov (SOMF 26841); on dead stems of *Prenanthes purpurea* L., Pirin Mts: Blagoevgrad distr., between Yavorov chalet and Razlog town, 17 June 2002, V. Fakirova (SOMF 25919).

Note. Known from Rila Mts (STOYKOV, 2004).

Nodulosphaeria dolioloides Auersw. in Rabenh., Herb. Viv. Mycol., edn 3, Cent. 6, no. 547, 1863 (Fig. 3)

Ascomata up to 300-350 μm in diam, scattered, immersed, later becoming exposed, globose to subglobose. **Beak** barely erumpent, papillate, truncate-conical, central. **Asci** 65-85 \times 11-13 μm , clavate to oblong-cylindrical, short stalked, 8-spored. **Ascospores** 30-45(-50) \times 4.5-6.5 μm , narrowly fusiform, straight to slightly curved, 8-septate, fourth cell from apex enlarged towards the base, yellowish brown, overlapping uniseriate to triseriate in the ascus.

Vitosha region: Vitosha Mt., along the track from Reznjovete to Scoparnika, 11 July 2004, D.Y. Stoykov (SOMF 26841), mixed with *N. modesta*. On overwintered stems of *Cirsium* sp.

Note: *Nodulosphaeria dolioloides* has been reported in Bulgaria from Black Sea coast, Pirin and Sredna Gora Mts (SAMEVA, 1981; STOYKOV, 2004, etc.). According to OTANI & MIKAWA (1971) it is a common species on stems of various *Asteraceae*. The authors noted that the European specimens have usually 8-septate, exceptionally 9-septate ascospores in comparison with the North American ones, which often bear 10-11 septa per spore, but this fact was not confirmed later by SHOEMAKER (1984b).

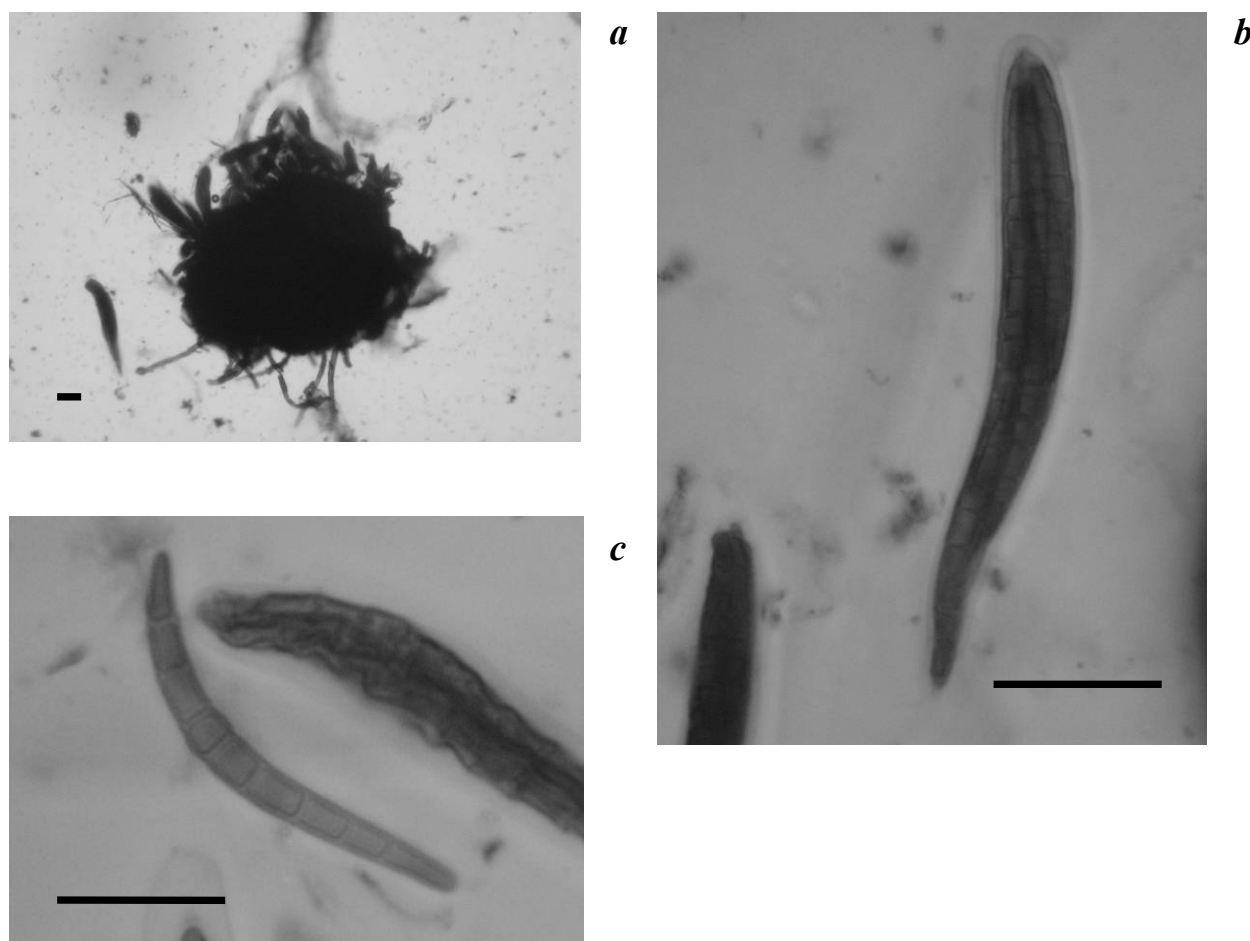


Fig. 3. *Nodulosphaeria dolioloides*: a – ascoma; b – ascus; c – ascospore
(Scale bar = 20 μm)

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НОВИ ДАННИ ЗА ПИРЕНОМИЦЕТНИТЕ ГЪБИ В БЪЛГАРИЯ

Димитър Й. Стойков, Борис Г. Асьов

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(Резюме)

Нови находища и/или растителни субстрати на 16 сапрофитни пиреномицетни гъби от: сем. *Botryosphaeriaceae* (*Botryosphaeria visci*), сем. *Gnomoniaceae* (*Apiognomonia veneta*, *Gnomonia betulina*, *G. comari*, *G. geranii*, *G. gnomon*, *G. leptostyla*, *G. setacea*, *Hypospilina pustula*, *Plagiostoma inclinatum*), сем. *Phaeosphaeriacerae* (*Leptosphaeria doliolum*, *Nodulosphaeria dolioloides*, *N. modesta*), сем. *Pleosporacerae* (*Pleospora herbarum*), *Melanconidaceae* (*Melanconis modonia*) и сем. *Montagnulaceae* (*Paraphaeosphaeria glaucopunctata*) са установени в страната. Видът *Leptosphaeria doliolum* се съобщава за първи път по мъртви стъбла от лечебен камшик (*Agrimonia eupatoria* L.) от две находища от флористичните райони Западна Стара планина и Предбалкан. Установените таксони са представени с кратка хорологична информация, бележки върху разпространението и биологията им. Материалите са депозирани в микологичната колекция (*SOMF*) на Института по Ботаника, БАН. Представени са макроскопски и микроскопски снимки на някои от характерните видове.