

A contribution to the study of Leptosphaeriaceae and Phaeosphaeriaceae (Pleosporales) in Bulgaria. I

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Abstract. Seven species of Pleosporales (*Leptosphaeria linearis*, *L. macrospora*, *Nodulosphaeria megalospora*, *N. modesta*, *N. pellita*, *Phaeosphaeria emilii*, *P. juncicola*) are recorded for the first time from Bulgaria; three species (*Leptosphaeria agnita*, *L. doliolum*, *Nodulosphaeria dolioloides*) are reported on substrata new for Bulgaria; five species are recorded from new localities.

Key words: Bulgaria, Leptosphaeriaceae, new records, Phaeosphaeriaceae, Pleosporales

Introduction

Fungi of the Phaeosphaeriaceae and Leptosphaeriaceae (Pleosporales) are mainly saprotrophs rarely hemibiotrophs on herbaceous stems, leaves and floral parts of different plants. Members of these families usually possess single papillate, immersed or erumpent perithecial ascomata, sometimes aggregated in small stromata, bitunicate cylindrical asci and hyaline to brown, transversely septate ascospores. Records for these two families in Bulgaria have been previously published by Klika (1926), Nannizzi (1938), Sameva (1978, 1981, 1982, 1985), and Fakirova (1982, 1985, 1994, 1996).

As a result of revision of specimens in the Mycological Collection of the Institute of Botany, Bulgarian Academy of Sciences (SOMF) seven species, marked with an asterisk (*) in the text, were established as new for Bulgaria, five were reported from new localities in Bulgaria, and three on substrata new for Bulgaria.

Materials and Methods

The specimens cited in this article are preserved in the Mycological Collection of the Institute of Botany (SOMF). The fungi were identified using semipermanent slides with

lactophenol and cotton blue, according to Hawksworth (1974). The system of the Pleosporales is in accordance with Eriksson *et al.* (2003). For the determination of the fungi regional monographs, taxonomic studies, and nomenclatural works were used such as Müller (1950), Holm (1957), Leuchtmann (1984), Shoemaker (1984a, b), Sivanesan (1984), Shoemaker & Babcock (1989), Crane & Shearer (1991), Khashnobish *et al.* (1995). Drawings were made with a camera lucida on an Amplival-Carl Zeiss microscope.

Results

Leptosphaeriaceae

Leptosphaeria agnita (Desm.) Ces. & De Not., Comment. Soc. Crittog. Ital. 1: 236, 1863.

On overwintered stems of *Eupatorium cannabinum* L. Central Stara Planina Mts: near the town of Teteven, 16 May 1975, V. Fakirova (VF) (SOMF 13 758); Vitosha region: Mt Vitosha, Simeonovo, 24 Jun 1989, VF & K. Borovanska (SOMF 20 379) & VF (20 841).

On overwintered stems of *Prenanthes purpurea* L. Rila Mts: Borovets, alt. ca 1400 m, 22 Jul 1993, leg. VF, det. D. Stoykov (DS) (SOMF 22 145).

Note: *Eupatorium cannabinum* and *P. purpurea* are new substrata of *L. agnita*. *Leptosphaeria agnita* was reported in

Bulgaria on *Carduus* sp. and herbaceous stems from the Central Rhodopes by Sameva (1981).

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

On overwintered stems of *Heracleum sibiricum* L. Vitosha region: Mt Vitosha, Salzitsa hut, 19 Sep 1992, leg. VF, det. DS (SOMF 22 139).

On overwintered stems of *Cirsium* sp. Valley of River Strouma: General Todorov village, Pchelina locality, 3 May 1996, DS (SOMF 22 140).

On overwintered stems of *Angelica* sp. Rila Mts: Borovets, alt. ca 1400 m, 6 Aug 1992, VF (SOMF 21 274).

Note: *Heracleum sibiricum*, *Angelica* sp., and *Cirsium* sp. are new substrata to *Leptosphaeria doliolum* for Bulgaria. *Leptosphaeria doliolum* has been reported from Sofia region (Fakirova 1982), Central Stara Planina Mts, Vitosha region, Southern Pirin Mts, and Mt Sredna Gora (Sameva 1978, 1982).

Leptosphaeria haematites (Roberge ex Desm.) Niessl in Rabenh., Hedwigia 22: 10, 1883. (Fig. 1)

Ascocarps 250-300 µm in diam, immersed, subepidermal, black, globose, with flat base, in groups in the stems. **Beak** 40-60 × 60-80 µm, central, truncate-conical. **Asci** 65-70 × 10-11 µm, cylindrical, short stalked, 8-spored. **Ascospores** 16.5-24 (-31) × 4.4-7 µm, ellipsoidal, 3 septate, constricted at the middle, second cell enlarged, overlapping biseriolate in the ascus, yellowish.

On dead stems of *Clematis vitalba* L. Mt Sredna Gora: Mt Lozenska Planina, Kokalyane village, 25 Mar 1995, VF (SOMF 21 545).

Note: *Leptosphaeria haematites* was known in Bulgaria on *Clematis vitalba* from Rila Mts (Klika 1926).

**Leptosphaeria linearis* (Sacc.) E. Müller, Sydowia 4: 258, 1950. (Fig. 3)

Ascocarps 250-300 µm in diam, 250-300 µm high, scattered, subglobose to flattened at the base, immersed, subepidermal to erumpent, often in one row. **Beak** 40-50 × 50-60 µm, truncate-conical, slightly flattened at the top. **Asci** 100-115 × (8-) 9-11 (-12) µm, clavate, broadly rounded at the tip, short stalked, 8-spored. **Ascospores** (21-) 24-30 (-33) × 4.4-5 (-5.5) µm, fusiform, straight or slightly curved, 5-7 (-8) septate, third cell from apex enlarged, yellowish brown, overlapping biseriolate to triseriate in the ascus.

On overwintered stems of *Poa nemoralis* L. Rila Mts: Parangalitsa Reserve, 25 Aug 1975, leg. N. Andreev, det. VF (SOMF 21 259).

**Leptosphaeria macrospora* (Fuckel) Thüm., Hedwigia 21: 83, 1882. (Fig. 4)

Ascocarps 250-300 (-350) µm wide, 150-180 µm high, scattered, immersed to superficial, depressed globose, smooth. **Beak** 40-50 × 45-55 µm, central, terete, cylindrical, smooth. **Asci** 90-110 × 5-7 µm, oblong, short stalked, 8-spored.

Ascospores 22-26 × 4-5.5 µm broadly ellipsoidal to fusiform, 3 (-5) septate, pointed at the ends, second (third) cell enlarged towards base, central cells slightly shorter but longer than wide, pale yellowish brown, not guttulate, smooth, without appendages or gelatinous sheath, overlapping biseriolate in the ascus.

On overwintered stems of *Senecio nemorensis* L. Vitosha region: Mt Vitosha, Aleko hut, 8 Oct 1993, VF (SOMF 21 410).

Leptosphaeria millefolii (Fuckel) Niessl in Rabenh., Herb. Viv. Mycol., edn nov., Ser. 2, Cent. 23, no. 2239, 1876.

On overwintered stems of *Achillea millefolium* L. Rila Mts: Borovets, 29 May 1994, VF (SOMF 21 417).

Note: *Leptosphaeria millefolii* has been recorded in Bulgaria from Vitosha region (Fakirova 1994).

Phaeosphaeriaceae

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

On overwintered stems of *Achillea* sp. Mt Sredna Gora: Mt Lozenska Planina, near Dolni Lozen village, 16 May 1992, VF (SOMF 20 599).

On overwintered stems of *Artemisia* sp. Mt Sredna Gora: Mt Lozenska Planina, German village, 15 Apr 1979, VF (SOMF 20 588).

Note: *Nodulosphaeria dolioloides* has been reported in Bulgaria from Southern Pirin Mts on herbaceous stems by Sameva (1981, as *Leptosphaeria dolioloides*). Substrata of genera *Achillea* and *Artemisia* are established as new for that country to this fungus.

**Nodulosphaeria megalospora* (Auersw. & Niessl) L. Holm, Svensk Bot. Tidskr. 55: 74, 1961.

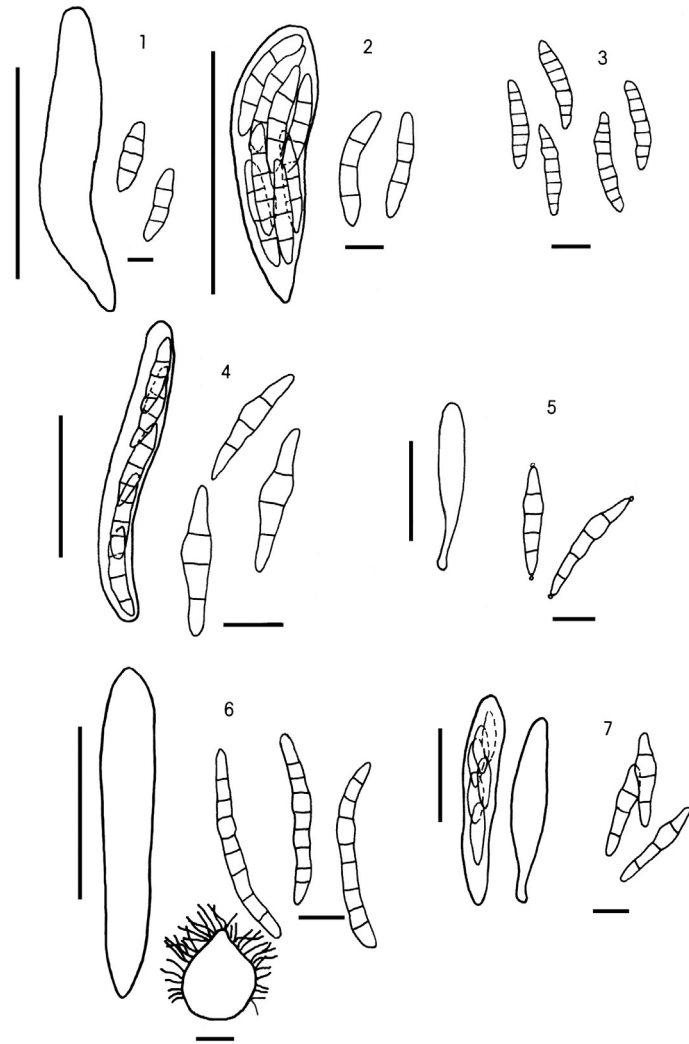
Ascocarps 250-300 µm in diam, scattered, immersed beneath the epidermis, depressed globose, black. **Beak** 40-80 × 60-90 µm, central, truncate-conical. **Asci** 100-120 × 12-14 µm, cylindrical, short stalked, 8-spored. **Ascospores** 58-72 × 4.4-5.5 µm, oblong fusiform, mostly 12 (-14) septate, first septum constricted, fifth or sixth cell from apex short and enlarged towards base, broadly rounded at ends, yellowish brown, with gelatinous sheath.

On overwintered stems of *Sambucus nigra* L. Vitosha region: Mt Vitosha, Simeonovo, 6 Jun 1993, VF (SOMF 21 118).

**Nodulosphaeria modesta* (Desm.) Munk ex L. Holm, Symb. Bot. Upsal. 14(3): 80, 1957. (Fig. 5)

Ascocarps 150-300 µm in diam, scattered, at first immersed, later becoming exposed, globose to subglobose. **Beak** 30-50 × 80-120 µm, papillate, truncate-conical, central. **Asci** 80-100 × 7-11 µm, clavate to oblong-cylindrical, short stalked, 8-spored. **Ascospores** 25-33 × 3-5 µm, narrowly fusiform, straight to slightly curved, 4 septate, second cell from apex short and enlarged towards base, yellowish brown, with hyaline gelatinous sheath at both ends, overlapping uniseriate to triseriate in the ascus.

Fig. 1. Ascus and ascospores of *Leptosphaeria haematites*. **Fig. 2.** Ascus and ascospores of *Phaeosphaeria juncicola*. **Fig. 3.** Ascospores of *Leptosphaeria linearis*. **Fig. 4.** Ascus and ascospores of *L. macrospora*. **Fig. 5.** Ascus and ascospores of *Nodulosphaeria modesta*. **Fig. 6.** Ascus, ascospores, and perithecium of *N. pellita*. **Fig. 7.** Asci and ascospores of *Phaeosphaeria emilii*. Scale bars = 200 μm for perithecia, 50 μm for asci, and 10 μm for ascospores



On overwintered stems and leaves of *Lactuca* sp. Rila Mts: Borovets, alt. ca 1400 m, 22 Jul 1993, VF (SOMF 22 147).

**Nodulosphaeria pellita* (Fr. : Fr.) Shoemaker, Canad. J. Bot. 46: 1144, 1984 (Fig. 6)

Ascocarps (150–) 200–350 \times (290–) 360–450 (–500) μm in diam, scattered, black, deeply immersed, later becoming exposed, globose to subglobose, with hairs at base. **Beak** 130–170 \times 65–80 μm , central, truncate-conical, smooth, with bluntly pointed brown hairs around the ostiole. **Asci** 85–100 \times 13–20 μm , clavate, short stalked, 8-spored. **Ascospores** 50–66 \times 4.4–5.5 μm , narrowly fusiform, straight, 8 septate, fourth cell from apex short and enlarged towards base, first septum constricted, yellowish brown, with small guttules, not echinulate, without gelatinous sheath, with conic to clavate hyaline appendages at both ends, overlapping biseriata in the ascus.

On overwintered stems of *Senecio nemorensis* L. Vitoshka region: Mt Vitoshka, Aleko hut, 29 Jun 1994, VF (SOMF 21 425).

**Phaeosphaeria emilii* Shoemaker & C.E. Babco., Canad. J. Bot. 67: 1524, 1989. (Fig. 7)

Ascocarps 60–100 \times 60–100 μm , scattered, subepidermal, subglobose, smooth. **Beak** 15–20 \times 25–30 μm , central, papillate, truncate-conical, smooth. **Asci** 70–90 \times 10–13 μm , oblong fusoid, short stalked, 8-spored. **Ascospores** (19.5–) 22–24 \times 4.4–5.5 μm , narrowly fusiform, straight or slightly curved, 3 septate, slightly constricted at first septum, second cell from apex enlarged at the base, central cells short, yellowish brown, without guttules, overlapping biseriata, or, in shorter asci, tetraseriate in the ascus.

On overwintered stems of *Carex* sp. Vitoshka region: Mt Vitoshka, Simeonovo, 6 Jun 1993, leg. VF, det. DS (SOMF 22 141).

**Phaeosphaeria juncicola* (Rehm) L. Holm, Symb. Bot. Upsal. 14(3): 129, 1957 (Fig. 2)

Ascocarps 150–200 \times 80–130 μm , scattered, immersed, subglobose, smooth. **Beak** up to 15 μm high, 20–30 μm wide, central, conical to truncate-conical. **Asci** 40–55 (–65) \times 14–

17 µm, ellipsoidal, short stalked, 8-spored. **Ascospores** (28–) 31–38 (–42) × 4–6.6 µm, yellowish brown, narrowly fusiform, straight or slightly curved, 3 septate, without dots at the ends of septa, slightly constricted at first septum, second cell from apex swollen at the base, central cells short, without guttules, with thin gelatinous sheath, overlapping biseriate, or, in shorter asci, tetraseriate in the ascus.

On overwintered stems of *Juncus inflexus* L. Vitoshka region: Mt Vitoshka, near Zheleznitsa village, 27 May 1995, leg. VF, det. DS (SOMF 22 144).

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