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Pyrenomycetous fungi on a birch (*Betula pendula*) substratum in Bulgaria

Abstract

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18 species of pyrenomycetous fungi, both xylophilous and foliicolous, are reported as growing on birch (*Betula pendula*) in Bulgaria, 10 of which are narrow specialists of this particular substrate. These 10, half of which are new records for S.E. Europe, are described and illustrated.

Introduction

This paper results from a special-purpose investigation of fungal species developing on birch (*Betula pendula* Roth), especially pyrenomycetous fungi – both xylophilous and foliicolous. No similar studies had so far been carried out in our country.

Results

In total, 18 species were found (Table 1). Some we had often found on other host plants as well, i.e., they may be considered to be ubiquists, showing wide plasticity with respect to their nutrient substrate. Conversely, we have noted 10 species exclusively on a birch substratum so far, in conformity with what has been recorded by other authors (Barr 1968, Dennis 1978, Glawe & Jensen 1986, Glawe & Rogers 1984, Kobayashi 1970, Monod 1983, Müller & Arx 1962, Munk 1957, Rappaz 1987, Sivanesan 1984, Tomilin 1979). We therefore must consider these species as closely specialized saprobes. Brief descriptions, with original metric data, as well as illustrations (Fig. 1-10) have been prepared for the 10 birch specialist species. Five of them (*Diaportella aristata*, *Gnomonia betulina*, *Diatrype undulata*, *Diatrypella betulina*, *Mycosphaerella harthensis*) had not previously been recorded from S.E. Europe. Voucher specimens have been deposited in the herbarium of the Institute of Botany, Bulgarian Academy of Sciences (SOM).

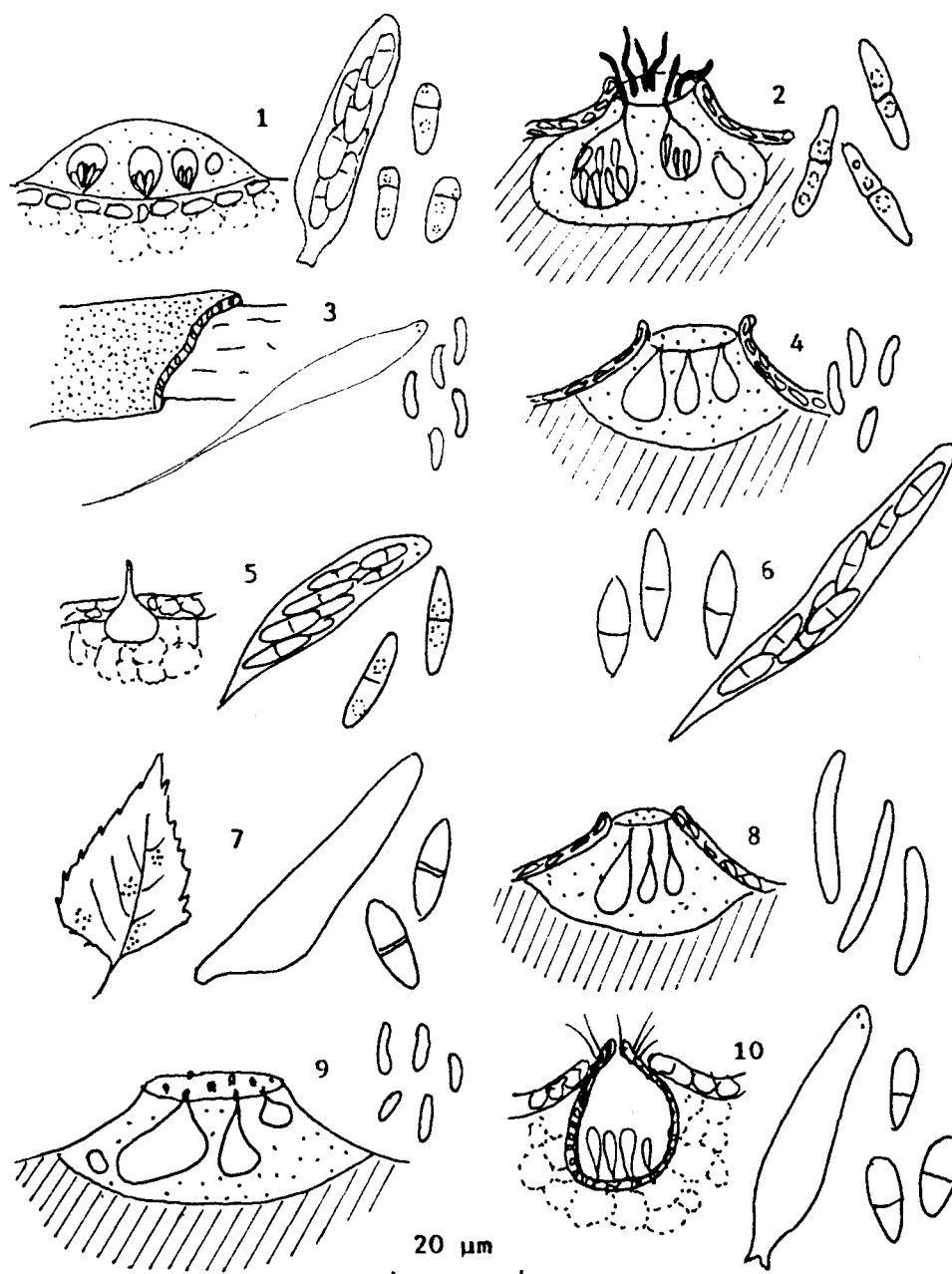


Fig. 1-10. Details of Bulgarian pyrenomycetes specialized on birch. – 1, *Atopospora betulina* (stroma, ascus, ascospores); 2, *Diaporthella aristata* (stroma, ascospores); 3, *Diatrype undulata* (stroma, ascus, ascospores); 4, *Diatrypella betulina* (stroma, ascospores); 5, *Gnomonia betulina* (perithecium, ascus, ascospores); 6, *Melanconis stilbostoma* (ascus, ascospores); 7, *Mycosphaerella harthensis* (perithecia, ascus, ascospores); 8, *Ophiovalsa betulae* (stroma, ascospores); 9, *Valsa betulina* (stroma, ascospores); 10, *Venturia ditricha* (stroma, ascus, ascospores).

Atopospora betulina (Fr.) Petr. in Ann. Mycol. 23: 101. 1925. – Fig. 1.

Stroma 0.6 mm in diam., subcuticular, black, with several ascogenous globose locules in a single layer. Asci 30-45 × 8-13 µm, cylindrical-clavate, 8-spored. Ascospores 9-11 × 3-5 µm, ellipsoidal to cylindrical, septate towards the upper end of the spore, not or very slightly constricted at the septum, initially hyaline, becoming yellowish to olivaceous when mature.

Stara planina, Saranci, on overwintered leaves, 01 Apr 1980 (SOM 20396-M).

Diaporthella aristata (Fr.) Petr. in Ann. Mycol. 22: 30. 1924. – Fig. 2.

Stroma 2-6 mm in diam., erumpent through the periderm. Perithecia spherical, immersed in the upper bark layers. Perithecia necks long, projecting above the surface for 1 mm but soon breaking off. Asci 55-68 × 10-12 µm, broadly clavate. Ascospores 15-20 × 3.5-5 µm, elongate-fusoid, 2-celled, hyaline, slightly constricted at the septum.

Rodopi mountains, Siroka laka, on dead branches, 15 Jun 1978 (SOM 13806-M).

Diatrype undulata (Pers. : Fr.) Fr., Summa Veg. Scand. 2: 385. 1849. – Fig. 3.

Stroma 0.5 mm thick, erumpent through the bark, widely spreading, surface reddish brown, with deep transverse fissures. Perithecia 0.2 mm in diam., in one layer, ostioles protruding slightly from the layer. Ascospores 75-95 × 5-7 µm, spindle-shaped, long stipitate, with refractive apical rings, 8-spored. Ascospores 5-7.5 × 1-1.3 µm, allantoid, slightly to moderately curved, pale olivaceous.

Vitoša region, Zeleznica, on dead branches, 20 May 1975 (SOM 20980-M).

Diatrypella betulina (Peck) Sacc., Syll. Fung. 1: 208. 1882. – Fig. 4.

Stroma 2-4 × 1.5-3 mm, oval to elliptical, erumpent through the bark, black. Perithecia 6-10 in one layer, entostromatic region, between the perithecial necks, with olive-green pseudoparenchymatous tissue. Asci 140-230 × 8-10 µm, spindle-shaped, long stipitate, many-spored. Ascospores 5-8.8 × 1.3-1.9 µm, allantoid, slightly curved, subhyaline to pale olivaceous.

Vitoša region, Simeonovo, on dead branches, 13 Jan 1991 (SOM 20741-M).

Gnomonia betulina Vleugel in Svensk Bot. Tidskr. 11: 305. 1917. – Fig. 5.

Perithecia 350-500 µm in diam., depressed-globose, immersed in the host tissue, beaks erumpent from either leaf surface, eccentric or lateral. Asci 40-46 × 10-11.5 µm, oblong-ellipsoidal, with apical annulus, 8-spored. Ascospores 15-17.5 × 2.5-3.3 µm, ellipsoidal, hyaline, 1-septate, septum median, usually with 2 globules per cell, with terminal appendages.

Vitoša region, Simeonovo, in overwintered leaves, 28 Jun 1992 (SOM 20660-M).

Melanconis stilbostoma (Fr.) Tul. in Ann. Sci. Nat., Bot., ser. 4, 5: 109. 1856. – Fig. 6.

Stroma 1-2 mm in diam., immersed, later erumpent, elevated as a conical disc. Perithecia clustered, embedded in the bark tissue, globular, 450-800 µm in diam., with a pro-

longed black neck at the top. Asci 70-100 × 14-20 µm, clavate to cylindrical-clavate, 8-spored. Ascospores 18-24 × 7-10 µm, ellipsoidal to fusoid, 2-celled, hyaline, slightly constricted at the septum.

Vitoša region, Zeleznica, on dead branches, 20 May 1975 (SOM 13901-M).

Mycosphaerella harthensis (Auersw.) Mig., Krypt.-Fl. Deutschl., Pilze 3: 289. 1912. – Fig. 7.

Perithecia 80-100 µm in diam., globose, scattered or solitary, immersed in the host tissue, later erumpent, with a papillate ostiole, black. Asci 44-60 × 9-13 µm, ventricose, subsessile, 8-spored. Ascospores 13-16(-19) × 3.8-5.5 µm, septate in the middle, slightly constricted at the septum, hyaline.

Sredna Gora, Koprivstica, in overwintered leaves, 25 May 1993 (SOM 20679-M).

Ophiovalsa betulae (Tul.) Petr. in Sydowia 19: 275. 1966. – Fig. 8.

Stroma 1-2 mm in diam., immersed in the bark, circular, convex to subconical, dark brown to black. Perithecia 4-5, circinate embedded within the bark tissue, with elongate, cylindrical, 250-300 µm long necks, collectively erumpent through the disc, often confluent. Asci (80-)100-120 × 11-13 µm, cylindrical-clavate, 8-spored. Ascospores 24-39 × 4.5-6.5 µm, unicellular, cylindrical to obtusely crescent-shaped, finely granular, hyaline.

Vitoša region, Zeleznica, on dead branches, 20 May 1975 (SOM 20695-M).

Valsa betulina Nitschke, Pyrenomyc. Germ.: 210. 1870. – Fig. 9.

Stroma 1-1.5 mm in diam., superficial, conical-pulvinate, containing 3-10 perithecia. Disc roundish, 200-300 µm in diam., greyish or whitish, ostioles black, erumpent along the edge of the disc, never in the central cushion. Perithecia 400-500 µm in diam., strongly depressed. Asci 44-55(-60) × 6-8(-10) µm, clavate, 8-spored. Ascospores 11-14(-15) × 2-2.2 µm, allantoid, hyaline.

Vitoša region, Simeonovo, on dead twigs, 03 Sep 1989 (SOM 20396-M).

Venturia ditricha (Fr.: Fr.) P. Karst. in Bidrag Kännedom Finlands Natur Folk 23: 188. 1873. – Fig. 10.

Stroma 130-150 µm in diam., globose, grouped in darkened spots, immersed, setose in a ring around the apical pore, setae blackish brown, simple, straight, up to 60 µm long. Asci 37-47 × 8-13 µm, saccate, 8-spored. Ascospores 12-16 × 4-7 µm, ellipsoidal-clavate, septate in the middle or slightly below, constricted, pale olivaceous.

Struma valley, Sandanski, on overwintered leaves and petioles, 01 Apr 1980 (SOM 20743-M).

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Table 1. A summary of pyrenomycetous fungi found on leaves or wood of birch in Bulgaria (System of orders essentially according to Hawksworth & al. 1983)..

Taxon:	on birch only (*)		on birch & other plants (+)	
	on leaves	on wood	on leaves	on wood
<i>Diaporthales</i>				
<i>Diaportella aristata</i>		*		
<i>Gnomonia betulina</i>	*			
– <i>cerastis</i> (Riess) Auersw.			+	
– <i>setacea</i> (Pers.) Ces. & De Not.			+	
<i>Melanconis stylbostoma</i>		*		
<i>Ophiovalsa betulae</i>		*		
<i>Valsa ambiens</i> (Pers.) Fr.				+
– <i>betulina</i>		*		
<i>Diatrypales</i>				
<i>Diatrype disciformis</i> (Hoffm.) Fr.				+
– <i>undulata</i>		*		
<i>Diatrypella betulina</i>		*		
<i>Dothideales</i>				
<i>Atopospora betulina</i>	*			
<i>Hysterium pulicare</i> Pers.				+
<i>Mycosphaerella harthensis</i>	*			
<i>Venturia ditricha</i>	*			
<i>Sphaeriales</i>				
<i>Hypoxyton fragiforme</i> (Pers.) Kickx				+
– <i>fuscum</i> (Pers.) Fr.				+
– <i>multiforme</i> Fr.				+

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