

## ***Gnomoniaceae* ON PLANT SUBSTRATES OF *Alnus* Mill. IN BULGARIA**

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***Gnomoniaceae* on plant substrates of *Alnus* Mill. in Bulgaria; Proceeding of 6<sup>th</sup> Symposium on Flora of the Southeastern Serbia, Sokobanja, 2000: 15-20.**

One species and one variety of *Gnomoniaceae* (*Diaporthales*) on *Alnus* substrate are reported as new to Bulgaria: *Apiognomonia alniella* (P. Karst.) Höhn. var. *alniella* Barr, *Gnomonia nervisequa* (Wallr.) Fuckel. *Alnus glutinosa* is found as a new substrate of *Gnomonia setacea* (Pers.: Fr.) Ces. & De Not. A key for determination of Bulgarian *Gnomoniaceae* is proposed.

### **INTRODUCTION**

The fungi from *Gnomoniaceae* family (*Diaporthales*) are mainly saprotrophs and to a lower degree biotrophs. They participate actively in the first stages of the biodestruction of the leaf litter, and they help for the mineralization of the remnants of the plants in the Nature.

The fruit bodies of the fungi are of perithecial type and are formed solitary or more rarely in groups on different vegetable organs - overwintered leaves, petioles, floral calices, herbaceous stems or apical branches of deciduous trees and shrubs. More rarely the perithecia are formed in stromatic tissues of the vegetable substrate.

Up to now 3 species of *Gnomoniaceae* on alder (*Alnus* Mill.) substrate are reported in Bulgaria: *Ditopella ditopa* (Fr.) Schröt., *Gnomoniella tubaeformis* (Fr.) Sacc. and *Plagiostoma alneum* (Fr.) v. Arx (Fakirova, 1982, 1994; Sameva, 1981).

Until now for the Balkan Peninsula just 3 species are reported only by Bontea (1985, 1986) - *Ditopella ditopa* (Fr.) Schröt., *Ditopella fusispora* De Not. and *Gnomoniella tubaeformis* (Tode) Sacc.

## MATERIALS AND METHODS

In the period of 1998 - 2000 investigations have been carried out for the determination of *Gnomoniaceous* fungi. Available herbarium specimens from SOMF have been studied.

For the identification of the fungal taxa semipermanent slides have been made with lactophenol and cotton blue and standard comparative morphological methods have been used. The drawings have been done with drawing apparatus on Amplival microscope. Voucher specimens have been deposited in the Herbarium of the Institute of Botany, Bulgarian Academy of Sciences (SOMF).

For the determination of the fungus of *Gnomoniaceae* family taxonomic studies and monographs of Munk (1957), Kobayashi (1970), Barr (1978), Monod (1983), Merezhko, Smyk (1991) have been used.

## RESULTS AND DISCUSSION

In this article 2 new taxa to Bulgaria from *Gnomoniaceae* are reported on *Alnus* Mill. substrate: *Apiognomonium alniella* var. *alniella* and *Gnomonia nervisequa*. For other 4 species new data is shown: *Gnomonia setacea* – a new substrate, *Gnomonia ditopa*, *Gnomoniella tubaeformis* and *Plagiostoma alneum* are reported with new localities. Brief descriptions with original metric data are made for the new taxa. A key for determination of the Bulgarian representatives of *Gnomoniaceae* on *Alnus* substrate is presented. All taxa are illustrated by original microdrawings (Fig. 1-6). Comparison of the ascospores of three *Gnomonia* species is proposed (Fig. 7).

We think that these taxa - *A. alniella* var. *alniella*, *G. nervisequa* and *G. setacea* are new for the Balkan region.

***Apiognomonium alniella* (P. Karst.) Höhn. var. *alniella* Barr**, Mycol. Mem.7: 25-26. 1978. – Fig. 2.

Perithecia 190-300 µm in diam., black, globose, immersed, in groups on the leaf blade, mostly hypophyllous, with clypeiform papilla on both sides of the leaf. Beaks 175 x 60-75 µm, straight, short, central, always on the lower surface of the leaf. Asci (27-)31-39(-42) x (6.6-)7-9 µm, clavate, 8-spored, with overlapping biserial ascospores and apical annulus measured 1.5 µm. Ascospores (11-)12.8-15.4(-16.5) x (3.3-)3.5-3.9(-4.5) µm, two celled, ellipsoid fusoid, septum at 1/3 to 1/4 of length, bigger cell towards the apical annulus of the ascus, smaller cell thinner. Mature spores with or without guttules.

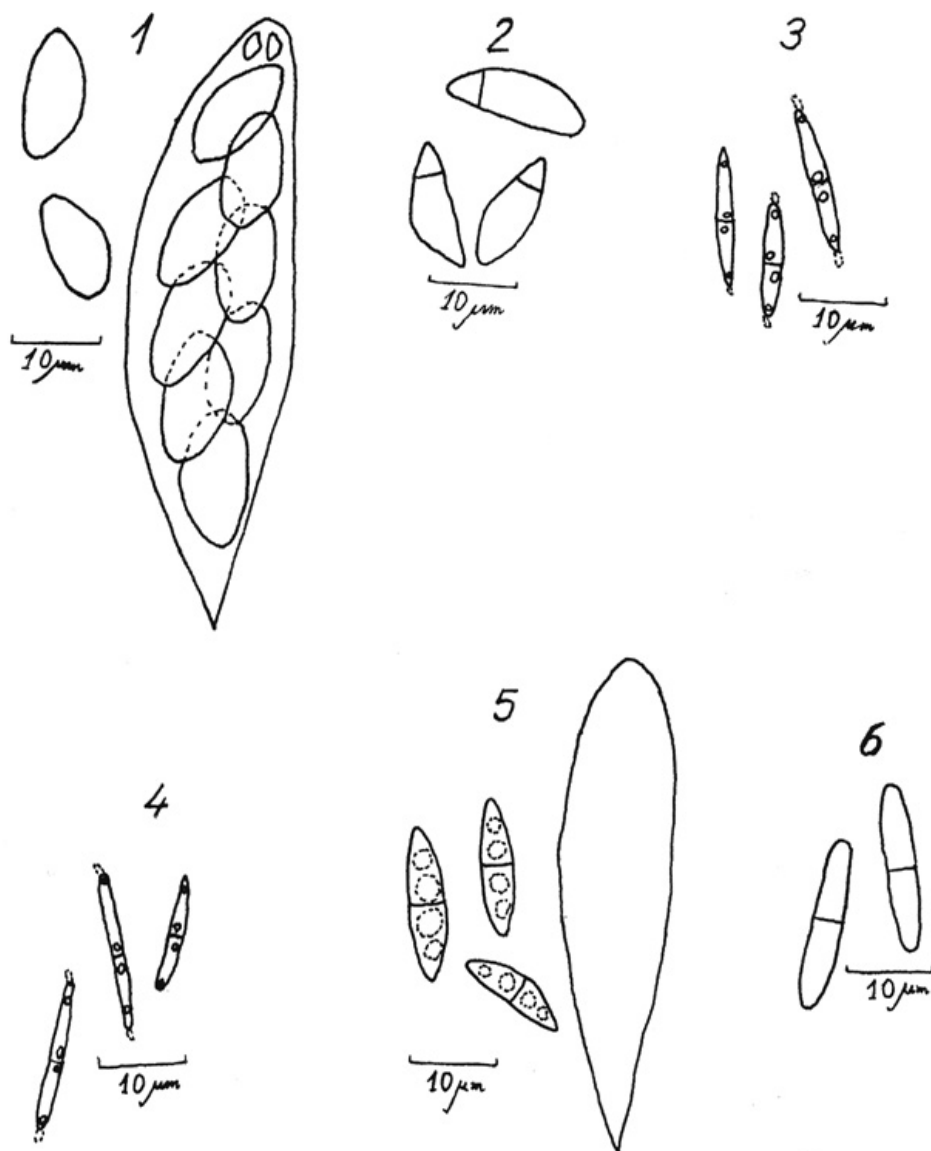


Figure 1-6. Ascospores and asci of *Gnomoniaceous* fungi specialized on alder

1. *Gnomoniella tubaeformis*; 2. *Apiognomonium alniella* var. *alniella*; 3. *Gnomonia setacea*;

4. *G. nervisequa*; 5. *Plagiostoma alneum*; 6. *G. ditopa*

On overwintered leaves of *Alnus* sp., Sredna Gora western, Lozenska Planina, Germanski Monasterium, 23 Apr. 1999, D. Stoikov (SOMF 22509).

*Gnomonia ditopa* (Fr.) Monod, Sydowia Beih. 9: 88. 1983. – Fig. 6.

Perithecia 250-600  $\mu\text{m}$  in diam., black, globose, immersed in the leaf blade, petioles and apical branches. Clypeus forming thick like zone around the base of the beak. Beaks 200-300 x 70-120  $\mu\text{m}$ , short papillate, central. Asci (58-)61-70(-80) x (12-)14-15(-17)  $\mu\text{m}$ , broad ellipsoid to cylindric, 16-24(-30)-spored, apical annulus measured 3  $\mu\text{m}$ . Ascospores (13.6-)14-15.3(-20.4) x (2.5-)2.8-3.4(-3.7)  $\mu\text{m}$ , two celled, elongate ellipsoid, hyaline, straight, with median septum, without appendages. Each cell contents numerous guttules.

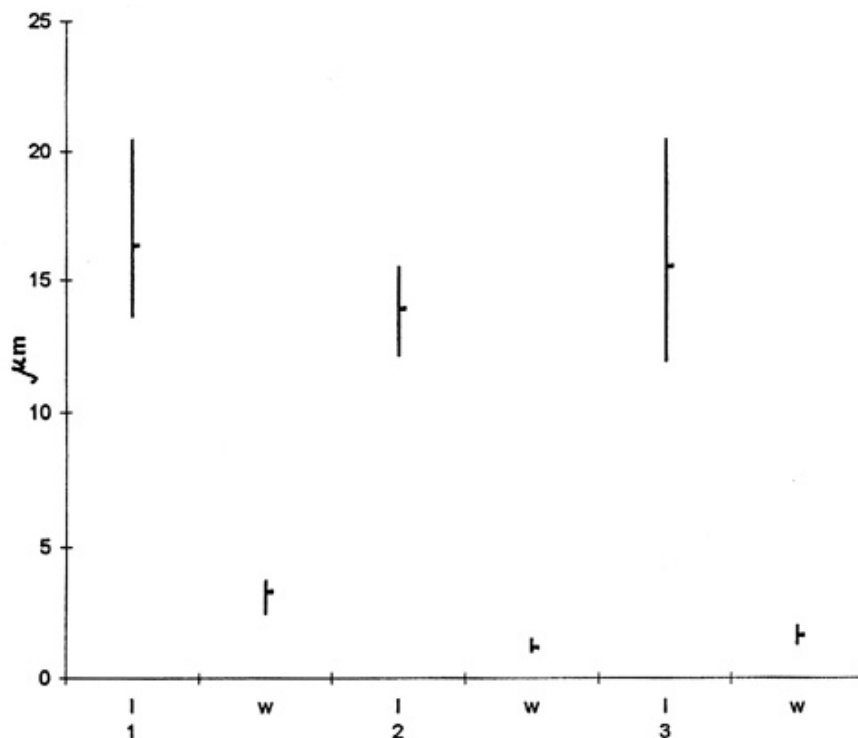


Figure 7. Comparison of length (l), width (w) and average of the ascospores of *Gnomonia* species

1. *G. ditopa*; 2. *G. nervisequa*; 3. *G. setacea*

On overwintered apical branches of *Alnus glutinosa* (L.) Gaertn., Vitosha region, Zheleznica, 26 July 1993, V. Fakirova (SOMF 21111); on overwintered leaves of *Alnus glutinosa* (L.) Gaertn., Sredna Gora western, Lozenska Planina, near Babreka lake, 7 July 1999, D. Stoikov (SOMF 22476).

*Note:* This species has been reported for the first time as *Ditopella ditopa* (Fr.) Schröt. by Fakirova (1982) without description.

***Gnomonia nervisequa* (Wallr.) Fuckel**, Symb. Mycol.: 122. 1870. – Fig. 4.

Perithecia 154-280 µm in diam., black, globose, immersed in the leaf blade and petioles. Beaks 630-1100(-1400)x25-65µm, straight or curved, central. Asci (20.5-)22-27(-37) x (5-)5.5-8 µm, spindle cylindric, 8-spored, with parallel and at different height ascospores, apical annulus measured 1-1.5 µm. Ascospores (12-)13.5-14.3(-16) x 1-1.3(-1.5) µm, two celled, spindle elongate, hyaline, straight, with median septum and hyaline appendages on both ends. Each cell contents two guttules.

On overwintered leaves of: *Alnus glutinosa* (L.) Gaertn., Black Sea coast northern, Kranevo, Batova valley, 20 May 1999, D. Stoikov (SOMF 22515), Vitosha region, Bistrica, 30 May 1994, V. Fakirova (SOMF 21385); *Alnus viridis* Lam. et DC., Rila Mountain, Borovec, 27 May 1994, V. Fakirova (SOMF 21394), *Alnus* sp., Sredna Gora western, Lozenska Planina, near Babreka lake, 7 July 1999, D. Stoikov (SOMF 22516).

***Gnomonia setacea* (Pers. : Fr.) Ces. & De Not.**, Comment. Soc. Critt. Ital. 1(4): 232. 1863. – Fig. 3.

On overwintered leaves of *Alnus glutinosa* (L.) Gaertn., Sredna Gora western, Lozenska Planina, near Babreka lake, 26 June 1999, D. Stoikov (SOMF 22516).

***Gnomoniella tubaeformis* (Fr.) Sacc.**, Syll. Fung. 1: 413. 1882. – Fig. 1.

On overwintered leaves of *Alnus glutinosa* (L.) Gaertn., Sredna Gora western, Lozenska Planina, Dolni Pasarel, along Rakita river, 28 May 1999, D. Stoikov (SOMF 22514).

***Plagiostoma alneum* (Fr.) v. Arx**, Antonie van Leeuwenhoek 17: 264. 1951.– Fig. 5.

On overwintered leaves and petioles of: *Alnus glutinosa* (L.) Gaertn., Vitosha region, Bistrica, 23 Apr. 1995, V. Fakirova (SOMF 22564), Vitosha region, between Bistrica and Zheleznica, 11 July 1998, D. Stoikov (SOMF 22561); *Alnus* sp., Black Sea coast northern, Kranevo, Batova valley, 20 May 1999, D. Stoikov (SOMF 22560), Sredna Gora western, Lozenska Planina, near Babreka lake, 26 July 1999, D. Stoikov (SOMF 22517), Sredna Gora western, Lozenska Planina, Dolni Pasarel, along Rakita river, 28 May 1999, D. Stoikov (SOMF 22562).

#### KEY TO BULGARIAN *Gnomoniaceae* ON *Alnus*

- |  |  |
|--|--|
| 1. Beak central.....                                     | 2  |
| 1*. Beak lateral .....                                   | <i>Plagiostoma alneum</i>                          |
| 2. Ascospores one celled .....                           | <i>Gnomoniella tubaeformis</i>                     |
| 2*. Ascospores two celled .....                          | 3  |
| 3. Septum submedian (at 1/3 to 1/4 of spore length)..... |  |
| .....  | <i>Apiognomonium alniella</i> var. <i>alniella</i> |
| 3*. Septum median.....                                   | 4  |

4. Asci 8-spored..... 5  
4\*. Asci 16-20(-30)-spored ..... *Gnomonia ditopa*  
5. Ascospore dimensions 12-16 x 1-1.3(-1.5)  $\mu\text{m}$ , beaks  
length 630-1100 (-1400)  $\mu\text{m}$ ; length/width ratio 11.9 ..... *Gnomonia nervisequa*  
5\*. Ascospore dimensions 12-20 x 1.3-2  $\mu\text{m}$ , beaks  
length 650-700 $\mu\text{m}$ ; length/width ratio 9.6 ..... *Gnomonia setacea*

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