

**Arthonia pragensis spec. nov. (Ascomycetes, Arthoniales),
a new lichenicolous fungus from the Czech Republic**

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Horáková J. (1994): *Arthonia pragensis* spec. nov. (Ascomycetes, Arthoniales), a new lichenicolous fungus from the Czech Republic. *Czech Mycol.* 47: 139–143

Arthonia pragensis Horáková, a new lichenicolous fungus (Ascomycetes, Arthoniales) is described from xerothermic area growing on diabase rocks in Prague in the Czech Republic. This is also the first published report of a lichenicolous fungus from the territory of Prague.

Key words: *Arthonia*, lichenicolous fungi, Czech Republic, taxonomy

Horáková J. (1994): *Arthonia pragensis* spec. nov. (Ascomycetes, Arthoniales), nová lichenikolní houba z České republiky. *Czech Mycol.* 47: 139–143

Arthonia pragensis Horáková je nová lichenikolní houba (Ascomycetes, Arthoniales) popsaná z xerothermních diabasových skal v Praze v České republice. Jedná se o první publikovaný údaj lichenikolní houby na území Prahy.

INTRODUCTION

At present the genus *Arthonia* (Ascomycetes) includes 44 lichenicolous or parasitic species (incl. *Conida* and *Celidium*). This very rich group needs a new taxonomic revision, which should include the nature of the ascus structure. Only the recent research underline amyloidity of ascoapical structures in some lichenized and lichenicolous species of *Arthonia* (Coppins 1983, 1989; Triebel 1989; Alstrup et Hawksworth 1990) and it points out two different ascus types in this genus (Alstrup et Hawksworth 1990).

The species described below, collected once on sunny diabase rocks from xerothermic area in Prague at the elevation cca 310 m above sea level, belongs to those species of *Arthonia* having this aspect of amyloidity.

***Arthonia pragensis* Horáková spec. nov.**

Fungus lichenicolus. Ascocarpia apothecia, conferte congregata vel continua, brunneoatra, agglomerationes subglobosae apothecioideae, sessiles, dispersae, 0,5–0,7 mm diam., apothecia solitaria 0,25–0,35 mm lata. Stratum epithecioideum bruneo-nigrum, 7–12 μ m altum, K+ olivaceum, stratum ascigerum pallide fuscum, K+ flavoviridis, hypothecium brunneum, K+ rufum vel vinaceum. Paraphysoides

1,5 μm crassae, cohaerentes, septatae, ramosae et plus expresse versus partem superiorem anastomosantes, pallide fuscae, versus partem superiorem atrofuscae, apicibus capitatis usque ad 3 μm crassis. Asci 8-sporei, fissitunicati, incolorati, lateobovati, 30–35 \times 20–25 μm . Ascosporeae 1-septatae, hyalinae, non curvatae, in septo constrictae, laeves, crasse tunicatae cum tunica ad 0,8 μm incrassata, 13–18,5 (–20) \times 5,5–8 μm magnaе.

Holotypus: Bohemia centr., urbs Praha, in valle Dalejské údolí, in clivo meridionali insolato apud loco Arethusinová rokle dicto, in thallo crustaceo areolato fuscoviridi indefiniti, alt. 310 m s.m., 17.1. 1993, leg. J. Horáková, PRM 842917.

Apothecia formed in tuberculate clusters, blackbrown, mat, individual fruit-bodies well distinguishable only in the study under (light) microscope. Clusters dispersed, 0.5–0.7 mm diam., apothecia 0.25–0.35 mm diam. Epithecium very dark brown, 7–12 μm tall, hymenium pale brown, hypothecium brown.

Asci fissitunicate, mostly broadly obovate, thick-walled, with an internal apical beak, 30–35(–50) \times 20–25 μm , 8-spored. Ascospores hyaline, 1-septate, constricted at the septum, smooth-walled, wall 0.8 μm thick; cells unequal, the upper cell (according to order in ascus) subglobose or oblong-ovoid, the lower cell two times longer than broad, 13–18.5(–20) \times 5.5–8 μm .

Paraphysoids coherent, distinct in Cotton blue only, branched and anastomosing especially towards the apex, septate, somewhat constricted at the septa, subhyaline below, becoming pale to dark brown towards the apex (plasmatic pigmentation), 1.5 μm thick. Apices capitally thickened to 3 μm diam. Pycnidia not found.

Reactions: K+: epithecium olive-green, hymenium yellow-green, hypothecium orange-red to vinaceus. I(Lugol)+: hymenium instantly pink-red, in a few days the colour of asci changes towards blue colour, the colouring of other parts of the hymenium being indistinct (wholly fades away). KI + blue hymenium, vegetative hyphae and amyloid ring around apex of asci, a content of asci and spores yellow to orange-red.

Arthonia pragensis is a lichenicolous, parasitic or parasymbiotic fungus. Direct influence resulting in damage of the host thallus was not observed. The hyphae cover closely the algal cells, but haustoria are not formed. Host thallus unidentified, sterile, brown-green, crustose, thin, areoles irregularly angular, almost adjacent, 0.2–0.4 mm diam., flat, uneven. The colour of the thallus may be caused by overcovering of colonies of some *Nostoc*. Host thallus with cocal green alga with a central chloroplast, individual cells 5–12.5 μm .

Lecidella carpathica s.l. is found in close vicinity of the infected thallus. The thalli are separated by a black-blue prothallus. *Lecidella carpathica* has a different type of irregularly shaped alga 11.5–20 μm in diam.

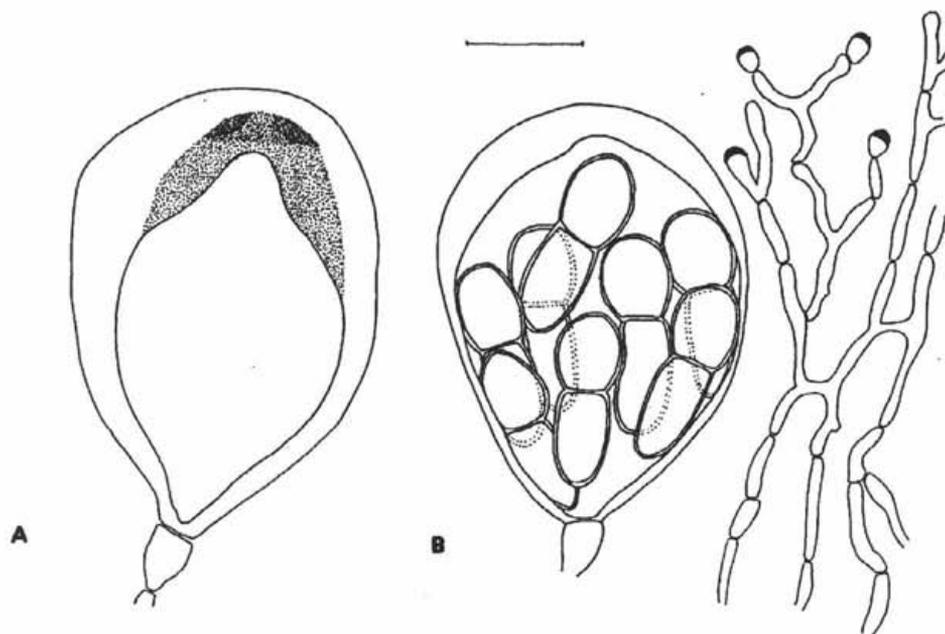


Fig. 1. *Arthonia pragensis*, holotype
 A: Young ascus in Lugol's iodine. B: Mature ascus with ascospores and paraphysoids.
 Scale 10 μ m.

DISCUSSION

Arthonia pragensis differs from all lichenicolous species of the genus *Arthonia*, except *Arthonia cohabitans* Coppins and *Arthonia neglectula* Nyl., by orange-red to vinaceous reaction of hypothecium in KOH solution.

Arthonia neglectula has, in comparison with *Arthonia pragensis*, much smaller 8–10 \times 3–3.5 μ m spores, a coal-black epithelial layer and host spectrum of other genera viz. *Baeomyces carneus* Flörke, *Bacidia inundata* (Fr.) Körb. and *Amygdalaria panaeola* (Ach.) Hertel et Brodo (Triebel 1989: 224). *Arthonia cohabitans* Coppins, a commensalistic or weakly parasitic species on thallus of the corticolous *Arthothelium reagens* P. James, is characterized by somewhat shorter, but much narrower spores, 10.5–14 \times 4–5 μ m, with upper cell broader and longer than the lower one and in full maturity by brown colour and the warted spore-wall (Coppins 1989: 213). Both mentioned species have brown hypothecium with yellow-orange background.

The same size of spores and colour of hypothecium is present in *Arthonia peltigerae* Th. Fr. known from *Peltigera* and *Solorina* (Clauzade et al. 1989: 29).

The following lichenicolous *Arthonia* are recorded from the territory of the former

Czechoslovakia: *Arthonia epiphyscia* Nyl., *Arthonia fuscopurpurea* (Tul.) R. Sant. and *Arthonia intexta* Almq.

Arthonia epiphyscia Nyl. (Vězda 1970: 223, Clauzade et al. 1989: 29) has smaller ascospores $10-13 \times 4-5 \mu\text{m}$ and different hosts (*Physcia*, *Phaeophyscia*, *Xanthoria*). *Arthonia fuscopurpurea* (Tul.) R. Sant. has hyaline hypothecium, poorly branched paraphyses, narrower asci $25-45 \times 10-20 \mu\text{m}$, ascospores $10-18 \times 3-6 \mu\text{m}$, is parasitic on *Peltigera* and *Solorina* and is a species occurring in mountains or high mountains. The last mentioned species, *Arthonia intexta* Almq., is parasitic in fruit-bodies of the genus *Lecidella*. Hertel (1969: 210, 1971) suggested that there is a complex of small species (microspecies), separated by e.g. number of septa and size of spores correlated with host species. *Arthonia intexta*, which infects *Lecidella carpathica* is characterized by small 2-3 celled spores, smaller than average spores size in species of the complex of *Arthonia intexta* ($12.5-4.4 \mu\text{m}$) on other hosts. At present *Arthonia intexta* is mentioned as a possible synonym of *Arthonia glaucomaria* (Nyl.) Nyl. (Clauzade et al. 1989: 30), a species found solely on *Lecanora rupicola* s.l. *Arthonia intexta* occurs in mountains or high mountains. The localities known in the former Czechoslovakia are in Slovak Republic near Prešov on the type specimen of *Lecidella carpathica* and in the High Tatra mountains in Skalné Vráta Mt. near Belá on the thallus of *Lecidella endolitheae* Lynge.

In my own collection, *Lecidella carpathica* occurs together with the host thallus of *Arthonia pragensis* mentioned above. The similarity of clusters of apothecia of *Lecidella carpathica* with clusters of apothecia of *Arthonia pragensis* led originally to the erroneous hypothesis, that clusters of apothecia of *Arthonia pragensis* are really apothecia of *Lecidella carpathica* infected by *Arthonia intexta*. This hypothesis was soon abandoned due to disclosure of the structure of the host thallus mentioned above. Clusters of apothecia belong to the lichenicolous fungus only.

Because amyloidity of ascal apex structure was found in a number of species of the genus *Arthonia*, it was re-examined also in the type-specimen of *Arthonia oligospora* Vězda.

In *Arthonia oligospora* Vězda an evident ring structure was found in the ocular chamber, which is of the same shape as in asci of *Arthonia pragensis*. The fact that this structure exists in many species of lichenized and lichenicolous species of the genus *Arthonia* was documented with the KI reaction. Alstrup et Hawksworth (1990) demonstrated, that species exhibiting wine-red reaction with Lugol's solution are also positive blue in KI, what is in agreement with our observations on *Arthonia pragensis* and *Arthonia oligospora*.

When examining *Arthonia oligospora* there were observed some additional characters supplementing the type description of this species: olive-green to dark brown epithecium, dark brown to black hypothecium, broad clavate to obovate, 4-6 spored asci, all structures in sections of apothecia K-; hymenium I(Lugol)+

wine-red; KI hymenium deep blue, inner part of asci in full maturity red-brown, ring structure blue, vegetative hyphae merely pale blue.

Examined specimen of *Arthonia oligospora* Vězda:

Bulgaria. Pontus, distr. Balchik: in vicinitate pagi Tuzla, 10 m s.m. In saxosis maritimis cretaceis. – 19.7. 1971., leg. A. Vězda, Lich. Sel. Exs. 1154, Isotypus, PRM 732089.

Acknowledgements

I wish to thank to Dr. V. Alstrup and Dr. Z. Pouzar for their critical reading of the manuscript and to Dr. Z. Pouzar I wish also to thank for his valuable comments during the preparation of this paper.

REFERENCES

- ALSTRUP V. and HAWKSWORTH D.L. (1990): The lichenicolous fungi of Greenland. – Medd. Gronl., Biosc. 31: 1–90.
- CLAUZADE G., DIEDRICH P. and ROUX C. (1989): Nelikenigintaj Fungoj Likenologaj. Ilustrita determinlibro. – Bull. Soc. Linn. Prov., Num. spec. 1: 1–142.
- COPPINS B.J. (1983): A taxonomic study of the lichen genus *Micarea* in Europe. – Bull. Brit. Mus. – Nat. Hist. 11 (2): 17–214.
- COPPINS B.J. (1989): Notes on the Arthoniaceae in the British Isles. – Lichenologist 21(3): 195–216.
- HERTEL H. (1969): *Arthonia intexta* Alm., ein vielfach verkannter fruchtkörperloser Flechtenparasit. – Ber. Deutsch. Bot. Ges., 82: 209–220.
- HERTEL H. (1971): Über holoarktische Krustenflechten aus den venezuelanischen Anden. – Willdenowia, 6: 225–272.
- TRIEBEL D. (1989): Lecideicole Ascomyceten. Eine Revision der obligat lichenicolen Ascomyceten auf lecideoiden Flechten. – Bibliotheca Lichenologica 35, 278 pp., Berlin. Stuttgart.
- VÉZDA A. (1970): Příspěvek k poznání lichenikolních hub v Československu III. – Čes. Mykol. 24(4): 220–229.