

Lichenicolous fungi from the Czech Republic. 1. *Weddellomyces xanthoparmeliae* Calatayud et Nav.-Ros.

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The parasitic lichenicolous fungus *Weddellomyces xanthoparmeliae* Calatayud et Nav.-Ros., recently described from *Xanthoparmelia* cf. *protomatra* (Calatayud et Navarro-Rosinés 1998) is now reported also from central Europe from the Czech Republic. It has been collected in several localities on *Xanthoparmelia conspersa* (Ehrh. ex Ach.) Hale and *X. somloensis* (Gyelnik) Hale. *Weddellomyces xanthoparmeliae* occurs in great quantity in all the Czech and Moravian localities and therefore it seems possible to find it without difficulties also in other warm areas in situations with rather xerothermic habitats where the hosts are commonly present.

Key words: Dothideales, Dacampiaceae, *Weddellomyces xanthoparmeliae* Calatayud et Nav.-Ros., lichenicolous fungi, taxonomy, *Xanthoparmelia*.

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Parazitická lichenikolní houba *Weddellomyces xanthoparmeliae* Calatayud et Nav.-Ros. (Ascomycetes, Dothideales) nedávno popsaná z *Xanthoparmelia* cf. *protomatra* (Calatayud et Navarro-Rosinés 1998) je nyní známa také ze střední Evropy z České republiky. Na českých a moravských lokalitách se vyskytuje na *Xanthoparmelia conspersa* (Ehrh. ex Ach.) Hale a *X. somloensis* (Gyelnik) Hale vždy v hojném množství. Je pravděpodobné, že bez větších obtíží bude nalezena i v jiných teplých oblastech, především na lokalitách s poněkud xerothermním rázem, kde jsou oba hostitelské lišejníky rozšířené.

INTRODUCTION

Nine species are currently known in the genus *Weddellomyces* D. Hawksw. Navarro-Rosinés and Roux (1995, 1997), who described four species of them as new to science delimited this genus, originally established by Hawksworth (1986) as monotypic for *Weddellomyces epicallospisma* (Weddell) D. Hawksw., only for those species which are characterized above all in having cephalothecoid plates on the upper part of the ostiolate ascomata, (4-)6-8-spored bitunicate asci, a hamathecium of pseudoparaphyses with lacking periphysoids and transversely septate brown spores fitted usually with distinct pores at the septa. Until the description of *W. xanthoparmeliae* (Calatayud and Nav.-Ros. 1998) all the species have been found only on crustaceous or crustaceous placodioid lichens of the genera *Caloplaca*, *Aspicilia* and *Protoblastenia* on calcareous substrates.

MATERIAL AND METHODS

Macroscopic features were examined with a MST 131 stereomicroscope (up to 48x). Microscopic characters were studied in squash preparations and hand cut sections in water, lactophenol Cotton Blue, 10 % KOH, Lugol's iodine solution and BCr under an Olympus BX-50 microscope (up to 1000x) fitted with Nomarski differential interference contrast. Macrophotographs and microphotographs were taken with an Olympus PM 10 and Fuji 200 ASA film; macrophotographs on an Olympus SZH 10 stereomicroscope and microphotographs on an Olympus BX-50 microscope.

Weddellomyces xanthoparmeliae Calatyud et Nav.-Ros.

Figs. 1-10

Description

Mycelium immersed in host thallus, pale yellow-brown, but hyphae emerging from ascomata red-brown, 3-4 μm thick.

Ascomata perithecioid, arising singly or in small groups from the thallus and the thalline margin of the apothecia of the host, at first immersed, later lifting the cortical layer, splitting it and making the upper part of the ascoma becoming reflexed as black stars, subglobose, 150-230 μm diam., ostiolate, ostium 15-20 μm wide in transversal section. Ascomatal wall formed of blocks of cephalothecioid plates clearly visible in surface view but only at low magnification (200x) under a light microscope in the upper half of the ascoma only. Peridium in vertical section dark red-brown, 25-30 μm thick, composed of 5-8 layers of compressed pseudoparenchymatous cells with lumina 8-12 \times 2-5 μm , below ostium only around 20 μm thick and composed of subglobose or irregularly shaped cells with lumina 4-6 \times 2-4 μm . Pigment of the cells finely granulose when observed in KOH solution.

Hamathecium of two different types of interascal anastomosed and ramificated filaments, 1-1.5 and 3-4 μm thick respectively, I+ yellow. Periphyses s.l. lacking. Only these thick and short-celled filaments were seen to occur in primordia of ascomata without asci. Like Navarro-Rosinés and Roux (1995) in a related species. I also was unhappy to be unsuccessful in finding of the origin of these filaments generally seen as attached to the base and to the upper part of the ascomatal cavity only finally observed free in the upper part. Later with developing asci also the other thin and long-celled filaments becoming visible. These are often growing irregularly through the ascomatal cavity up into the ostium and resemble paraphysoids in the sense of Hawksworth et al. (1995). They were found in ascomata in both fresh and dried material in contrast to the observations by Navarro-Rosinés et Roux (1995), who found them only in dried herbarium material of a related species.

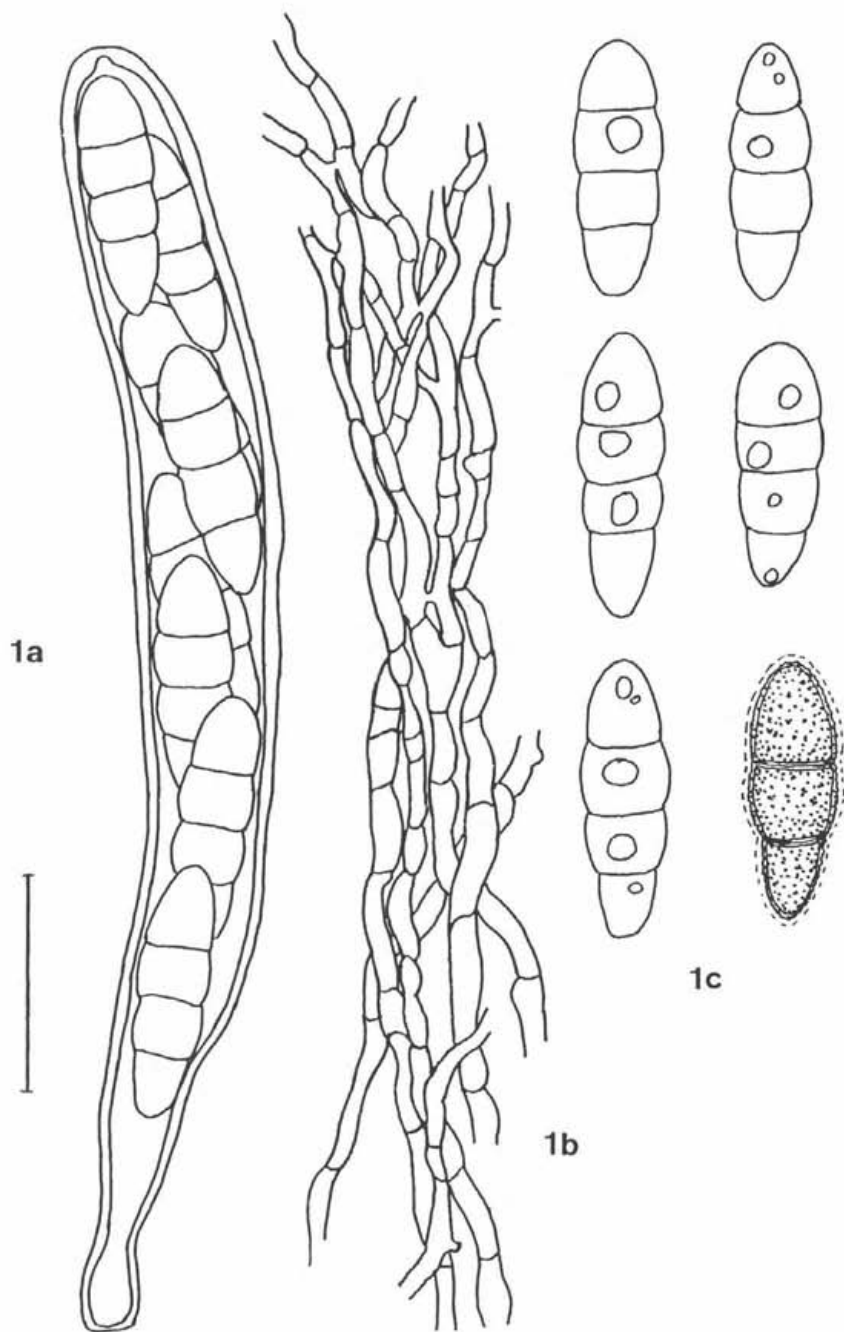


Fig. 1. *Weddellomyces xanthoparmeliae* a. Ascus. b. Thick short-celled interascal filaments. c. Ascospores (Scale = 20 μ m.)

Asci subcylindrical to elongate-clavate, (4-)6-8-spored, $100-140 \times 14-18 \mu\text{m}$, with truncate base, I+ orange.

Ascospores irregularly to distichously arranged in the asci, ellipsoid, tending to taper towards the base, with the upper end rounded and lower end attenuated, with developed outer perispore as distinct gelatinous sheath $0.5-1.5 \mu\text{m}$, (1-)3-septate, slightly constricted at the septa, central pore in the septa almost invisible, gold brown, verruculose, guttulate, $23-29 \times 8-9(-10) \mu\text{m}$, inner perispore I+ and BCr+ blue.

Observations

In contrast to our observations Calatayud and Nav.-Ros. (1998) did not observe any positive reaction of inner perispore with I and BCr, which was present in our specimens when the reagents were several times readded.

According to Calatayud and Navarro-Rosinés this species is most similar to *W. erythrocarpae* by a very fine ornamentation of inner perispore and prominent torus of young spores.

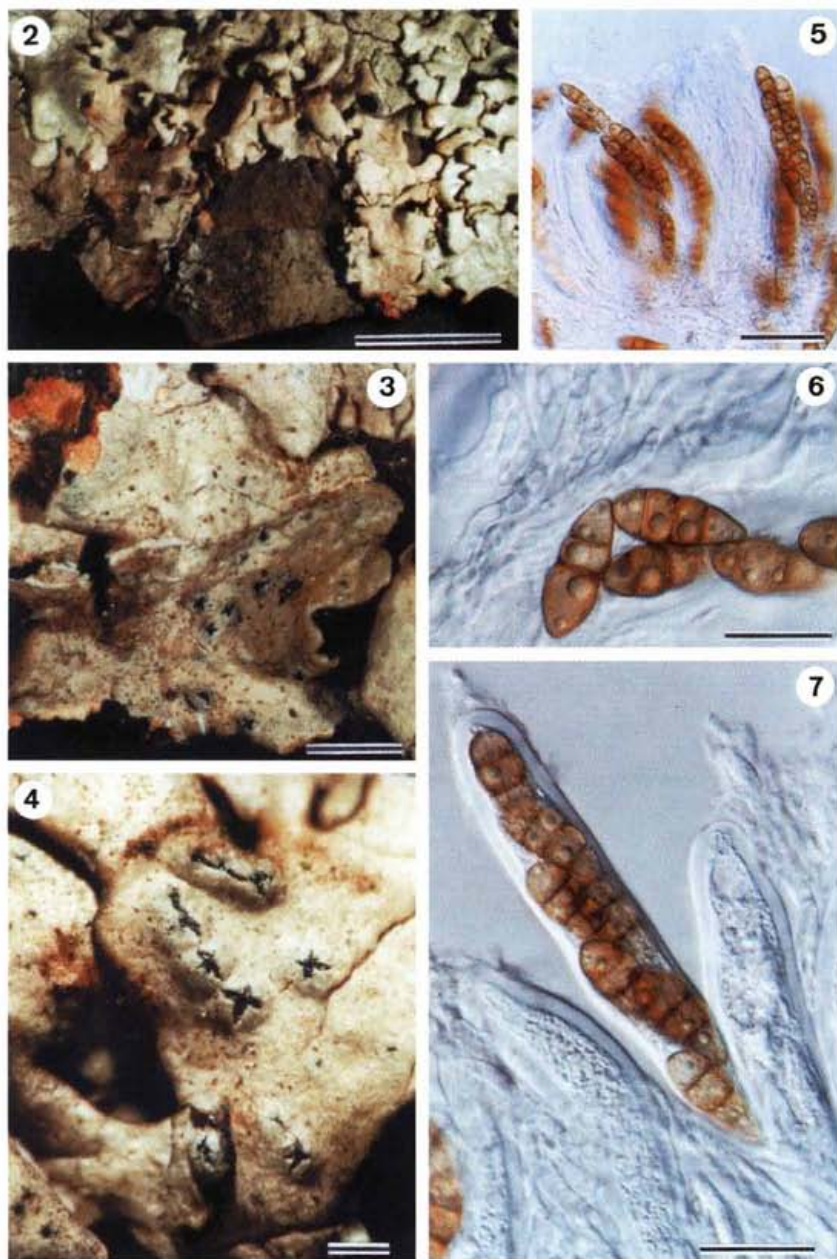
It strongly resembles also the type species *Weddellomyces epicallopisma* in the similar size of spores, which are slightly wider and more broadly rounded at both ends, its ascomata being much larger and asci wider. The last species occurs on calcicolous lichens as *Caloplaca* gr. *aurantia*, *Caloplaca* gr. *variabilis* and *Protoblastenia rupestris* in contrast to the occurrence of *Weddellomyces xanthoparmeliae* on *Xanthoparmelia conspersa* and *X. somloensis* which are growing on acid substrates.

Biology

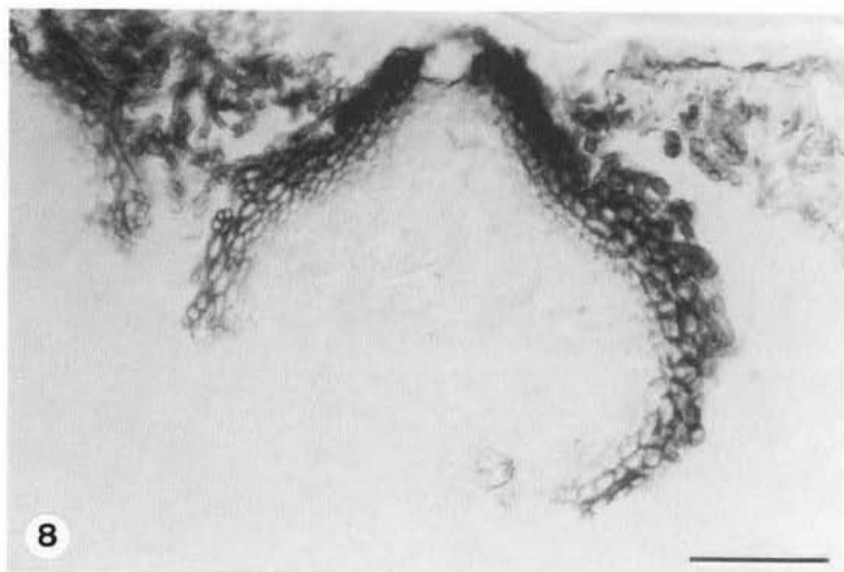
Weddellomyces xanthoparmeliae is parasitic fungus as regarding its biology and has a clearly destructive effect on the host thallus. The infection spots are very conspicuous, pink-orange, at first 0.5-1 cm large. They develop in the middle of the thallus or at its margin. The medulla of the infected host becoming intensive orange, the apothecia of the hosts are reduced in size. Later the spots extend concentrically up to 2-3 cm, the central necrotic part becoming fragmented and soon breaking off.

Distribution

So far the species has been known from Spain only now it is reported also from the Central Europe from the Czech Republic.



Figs 2-7. *Weddellomyces xanthoparmeliae*. **2.** Concentric expansion of infection spot, destroyed part of thallus is broken off. Scale = 100 mm. **3.** Intensively orange coloured medulla of the infected part of the host thallus showing ascomata splitting cortex. Scale = 100 mm. **4.** Ascomata splitting cortex of *Xanthoparmelia conspersa* at higher magnification. Scale = 25 mm. **5.** Part of hamathecium and asci. Scale = 50 μ m. **6.** Thick interascal filaments and slightly verruculose spores. Scale = 20 μ m. **7.** Asci in different stages of development. Scale = 20 μ m. (All preparations in water.)



Figs 8-10. *Weddellomyces xanthoparmeliae*. **8.** Vertical section of ascoma. Pseudoparenchymatous ascomatal wall. Scale = 50 μm . **9.** Surface view showing cephalothecioid plates at lower magnification. Scale = 50 μm . **10.** Ascus showing the bitunicate structure and internal apical beak. Scale = 20 μm . (All preparations in water.)

Ecology

The fungus was present in all the studied localities in rich quantities. All collections were made in warm or thermophytic areas in Central Bohemia and Southern Moravia in localities with increased air humidity due to the proximity of water sources but exposed to the sun from the south or west or at most partly shaded. It was several times found in a mixed infection with *Echinothecium reticulatum* auct., *Abrothallus caerulescens* Kotte, *Stigidium xanthoparmeliarum* Hafellner, *Lichenoconium usneae* (Anzi) D. Hawksw. and *Cornutispora* sp.

Possible confusion

Lichenoconium usneae and *Cornutispora* sp. were seen to cause similar symptoms of infection on the thalli of *Xanthoparmelia* in our collections. Thalli damaged by *Lichenoconium usneae* are bleached for a great part and also become pale orange. The coelomycete fungus *Cornutispora* sp. with irregularly formed conidia and mostly more than three appendages was also found to cause bleaching of large parts of the thallus of *Xanthoparmelia conspersa*. But *W. xanthoparmeliae* is easily recognized already in the field by occurrence of very large black ascomata. When the large ascomata are developed and are also splitting the thallus and reflexing as black stars than the fungus may also resemble another lichenicolous fungus *Neolamya xanthoparmeliae* Kocourková ined., but here the colour of affected parts of thalli never turns to orange. The last new species will be described soon. A bit similar type of infection is caused also by *Marchandiomyces corallinus* in forming concentric expanding spots similar to those caused by *W. xanthoparmeliae*, but the symptoms are only similar until the easily recognized deep pink sclerotia are developed.

Specimens collected

Central Bohemia, Distr. Rakovník, LPA Křivoklátsko, Krakovec, on SW slope below the Krakovec castle, on shale rocks, 430 m, on *Xanthoparmelia conspersa*, MTB 5947; 10. IV.1999, coll. P. K. (PRM 758559). – Distr. Rakovník, LPA Křivoklátsko, on slope of Čertova skála rock, on spilite, on *Xanthoparmelia* sp. (th.), 290 m, MTB 6048; 28. IX.1996, coll. J. H. (PRM 892559, together with *Echinothecium reticulatum* auct.). – Distr. Rakovník, LPA Křivoklátsko, between the villages of Skryje and Šlovice, on spilite by the river Berounka, on *Xanthoparmelia somloensis*, 290 m, MTB 6048; 26. VII.1998, coll. J. K. and P. K. (PRM 892558). – Distr. Rakovník, LPA Křivoklátsko, nature reserve Stříbrný luh, on W slope of rhyolite rocks above the river Berounka, on *Xanthoparmelia conspersa* (th.), 280 m, MTB 5949; 13. VII.1998, coll. J. K. and P. K. (PRM 892556). – Distr. Beroun, LPA Křivoklátsko, below the castle Točnick, on porphyritic rock, on

Xanthoparmelia somloensis, 370 m, MTB 6149; 6. VII.1998, coll. J. K. and P. K. (PRM 892557). – Ibid.: on *X. somloensis* (PRM 758514, specimen of *Stigmidium xanthoparmeliarum*, together with *Weddellomyces xanthoparmeliae* and *Lichenocodium usneae*). – The city of Praha, near Pitkovice, in the valley of the brook Pitkovický potok, nature reserve Pitkovická stráň, on shale, on *Xanthoparmelia somloensis*, 280 m, MTB 5953; 11. IX.1998, coll. J. K. (PRM 892560, together with *Abrothallus caerulescens* and *Echinothecium reticulatum* auct.). – Southern Moravia, Distr. Znojmo, Chvalatice, the Vranov reservoir, near Chvalatická zátoka, on the S slope, on granite boulder scree; on *Xanthoparmelia conspersa*, 360 m, MTB 7060; 6. IX.1998, coll. J. K. (PRM 758529). – Distr. Znojmo, National Park Podyjí, Vranov n. Dyjí ca 4 km SE of the village, ca 4 km SE of the village, on the top of ridge above the river, on shale rocks, on *Xanthoparmelia conspersa*, 490 m, MTB 7160; 4. IX.1998, coll. J. K. (PRM 757414).

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