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Hymenochaete carpatica, an inconspicuous fungus growing on chips of bark of *Acer pseudoplatanus*

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The chips of bark of *Acer pseudoplatanus* L. are colonized by *Hymenochaete carpatica* Pilát that appears to be the highly specialized species. Its taxonomy, mode of life and competitive adaptations are described.

Key words: *Hymenochaete*, *Acer*, rhytidomata, Poland

INTRODUCTION

A plane-tree maple (*Acer pseudoplatanus* L.) is known to have an average number of fungi (Bevan and Greenhalgh 1983; Chlebicki 1988; Farr et al. 1989). Among them several fungi grow on bark. While the tree is young the bark is rather smooth but when it reaches adulthood the bark splinters into irregularly shaped plates similar to the sycamore tree (*Platanus*).

Chips of bark are composed of many fellem layers and tissues containing crystals. Reticulate crackings of the bark are caused by enlargement of trunk (Hejnowicz 1999). Originated after 5-30 years arcuate rhytidomata (Holdheide 1951) are thicker in its basal part. They gradually separate and finally fall off with time. These distinctly visible chips of bark are inhabited by some fungi such as *Hysterium pulicare* Pers.: Fr., *Melanomma pulvis-pyrius* (Pers.: Fr.) Fuckel, *Lycoperdon pyriforme* Schaeff.: Pers. and resupinate basidiocarps of *Hymenochaete carpatica* Pilát. On living trunks of a plane-tree maple were noted also other common fungi such as *Bjerkandera adusta* (Willd.: Fr.) P. Karst. and *Cerrena unicolor* (Bull.: Fr.) Murrill. *Hymenochaete carpatica* appears to be the most interesting and highly specialized fungus restricted to the chips of bark of *A. pseudoplatanus*.

DESCRIPTION AND COMMENTS

Hymenochaete carpatica Pilát
Hedwigia Beibl. 70: 123, 1930.

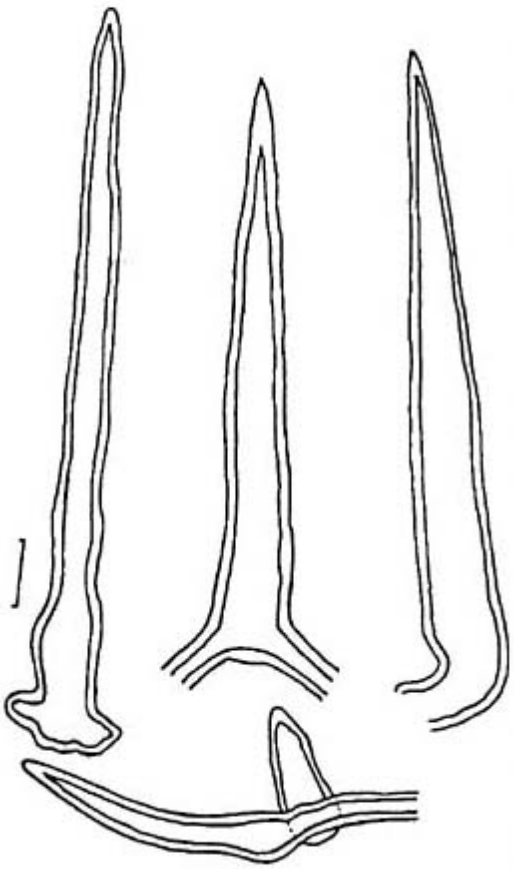

Fig. 1. *Hymenochaete carpatica*: tapered setae, bar = 10 μm.

Basidiocarps resupinate, attached to the bark, contour mostly oval or irregular, setae brown, tapered 65-100 x 7-9 μ μm, stand out of the hymenium 40-70 μm, density 170-200 per mm^2, basidiospores oval, hyaline ca 5 μm diam., hyphal system monomitic, inside trama crystals visible (Figs 1, 2A, B, C, D).

Host: *Acer pseudoplatanus* L.

The fungi from the genus *Hymenochaete* colonize wood, hardwood, bark and limbs of many trees. There are some species recorded on various species of the genus *Acer*, as *Hymenochaete agglutinans* Ellis, *H. corrugata* (Fr.: Fr.) Lév., *H. episphaeria* (Schwein.: Fr.) Massee, *H. fusca* (P. Karst.) Sacc., *H. spreta* Peck, *H. tabacina* (Sowerby: Fr.) Lév. and *H. carpatica*. *H. agglutinans* also occurs on bark. But it is pathogenic fungus noted on many host plants (Farr et al. 1989).

Taxonomical notes: According to Léger (1998) *H. carpatica* belongs to the section *Gymnochaete*. Other species from this section as widespread *Hymenochaete corrugata* and rare *H. subfuliginosa* (Bourd. et Galzin) Bourd. et Galzin have very similar basidiocarps. But Boidin (1998) pointed out the discordance of these classification with ribosomal internal transcribed spacers (ITS) data and placed *H. carpatica* with *H. borbonica* Lég. et Lanq. in a separate clade. The latter species was noted on *Cryptomeria japonica* D. Don (*Taxodiaceae*) in Réunion.

Ecology: The fungus grows on the inner side of chips of bark composed of fellem layers of different ages (Figs 3, 4, 5A). Fungal hyphae were visible inside fellem cells, tissue with crystals and cavity inside fellogen (Fig. 5.B). Old and dead resupinate basidiocarps were visible in the distal parts of the chips that have been exposed earlier (Figs 3, 4). The oldest basidiocarps were distinctly destroyed and mostly devoid of the setae.

The edge of chips can be considered as place of competition between the fungus and lichens as well as aerophytic algae (Fig. 2 C, D). Setae are important protection against competitors (Figs 2B, 5A, B, D). Dense and tapered tops stand out of the hymenium ca 40-70 μm and can kept off various propagules preventing their deve-


A


B

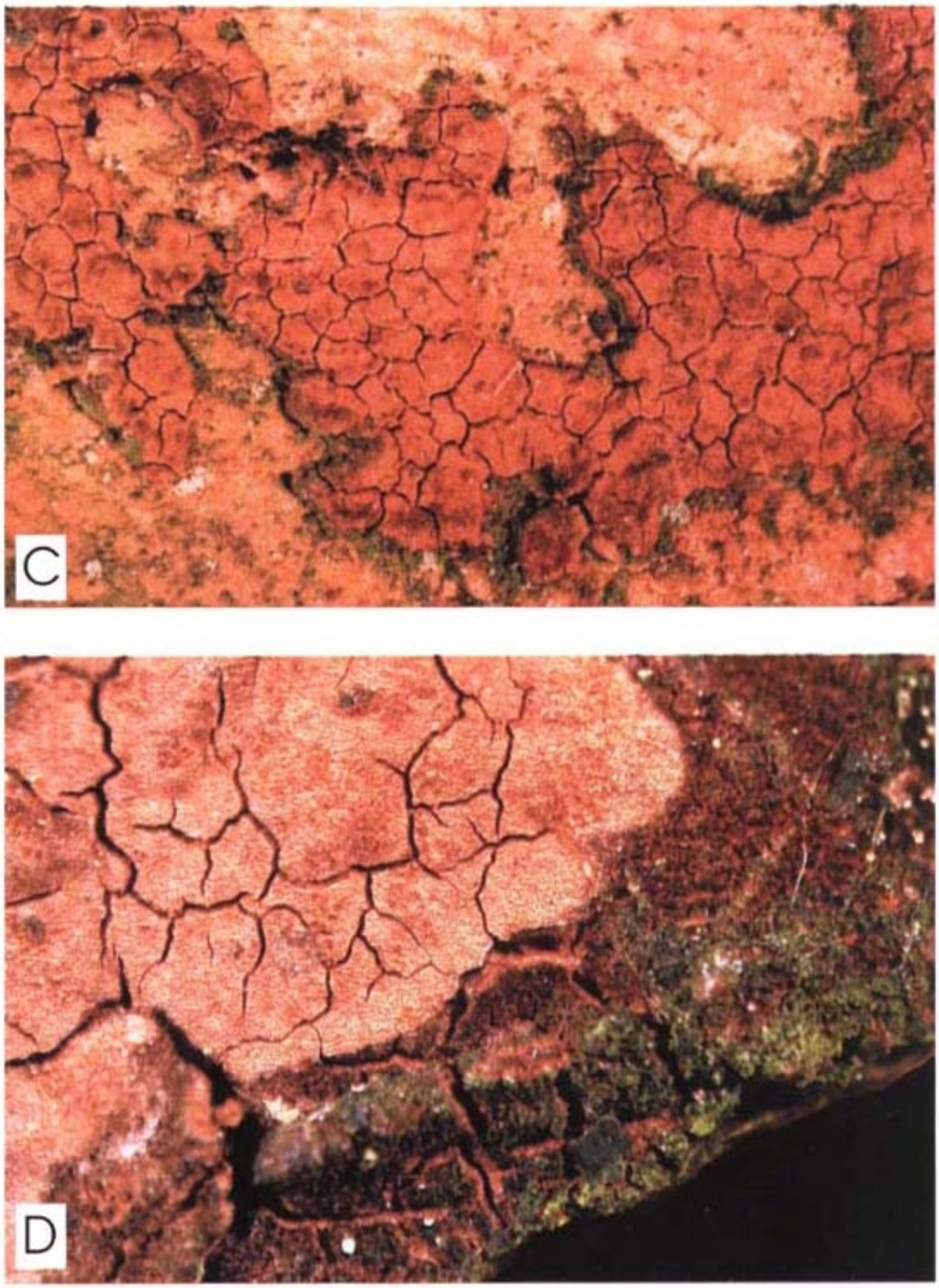

Fig. 2. *Hymenochaete carpatica* growing on chips of bark of *Acer pseudoplatanus*: A – basidiocarp covering bark and attached elements, B – setae keeping off various propagules, C – *H. carpatica* in competition with aerophytic algae, D – margin of living basidiocarp and aerophytic algae growing on previous year's, dead basidiocarp.

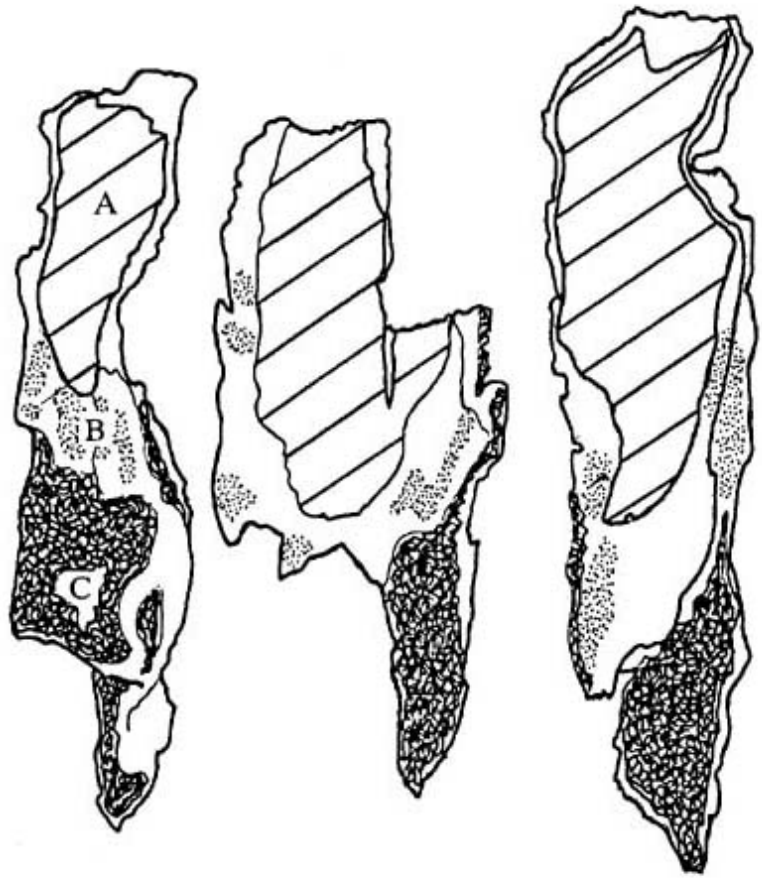

Fig. 3. Inner side of chips of bark of *Acer pseudoplatanus*: A – fellem surface attached to the bark, B – living basidiomata of *H. carpatica* covering freshly exposed fellem area, C – old and dead basidiomata of *H. carpatica* visible on sooner exposed fellogen area.

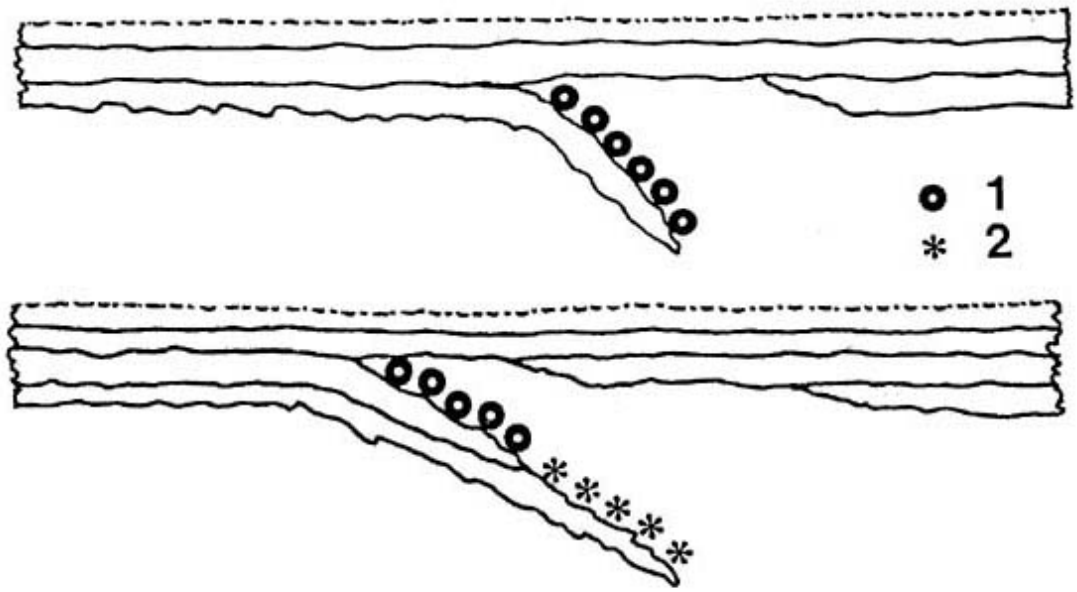

Fig. 4. Diagramatic bark section showing succession of *H. carpatica*: 1 – living basidiomata, 2 – dead basidiomata.

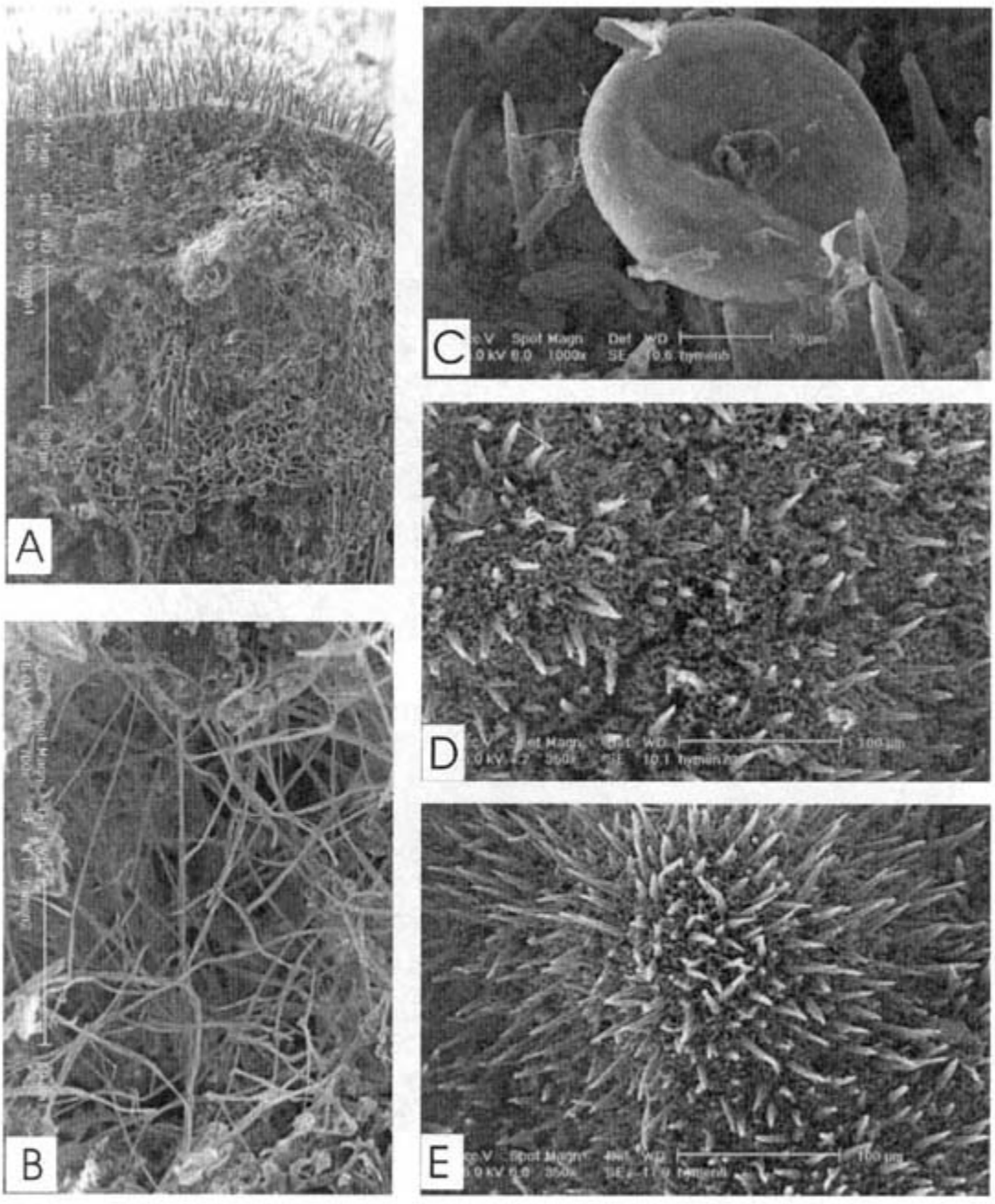

Fig. 5. *Hymenochaete carpatica*: A – longitudinal section of basidiocarp and bark, fellem cells and fungal hyphae penetrating cavity inside fellogen visible; B – fungal hyphae penetrating the cavity inside fellogen; C – propagule kept off by fungus setae; D – surface of fungus with setae. *Hymenochaete subfuliginosa*: E – surface of fungus with setae. SEM, scale bars: A=200 μm, B=50 μm, C=20 μm, D-E=100 μm.

lopment (Fig. 5C). The young fungus hymenium usually covers the bark surface with many attached elements such as dead insects, excrements, eggs and dead fungi. It is the reason of a very irregular surface of the hymenium (Fig. 2 A). The continuous hy-

menium protects the fungus against competitors. The fungus can also inhibit the growth of lichens in their contact zone with the mycelium.

On dead hymenium of *H. carpatica* were noted black hysterothecia of *Hysterium pulicare* Pers.: Fr. The latter fungus is a cosmopolitan species occurring on bark of living trees as well as on decorticated wood of *Betula*, *Cornus*, *Eucalyptus*, *Malus* and *Quercus* (Farr et al. 1989). *H. pulicare* was noted in Poland by Eichler (1904), Schroeter (1908) and Chlebicki (2002). Its presence on basidiomata of *H. carpatica* can be considered as accidental. Also common *Melanomma pulvis-pyrius* was noted on old basidiomata devoid of setae.

Hymenochaete carpatica grows both in the lowlands and in the mountains. According to Tomšovský (2001) its vertical distribution in the Czech Republic vary from 290 to 1220 m above sea level. In Poland its localities were found at an altitude 460-1000 m.

Distribution: The fungus has been reported only from Europe. The European distribution area includes mountain regions of France, Switzerland, Austria, Germany, Czech Republic, Slovakia and Ukraine (Baici and Léger 1988; Tomšovský 2001).

POLAND: Sudetes: Bialskie Mts., on standing *Acer pseudoplatanus* growing on the bank of Biała Lądecka River, ca 1 km below Puszcza Śnieżnej Białki Reserve, 21 April 2002, coll.: A. Chlebicki; Bialskie Mts., Puszcza Śnieżnej Białki Reserve, 21 April 2002, coll.: A. Chlebicki; Bystrzyckie Mts., Niemojów, on the bank of Dzika Orlica River, 2 May 2002, coll.: A. Chlebicki; Bystrzyckie Mts., on N slope of Mt. Bochniak near the road to Lesica, on standing *Acer pseudoplatanus*, 2 May 2002, coll.: A. Chlebicki; Bystrzyckie Mts., Gniewoszów, on standing *Acer pseudoplatanus*, 2 May 2002, coll.: A. Chlebicki; Śnieżnik Range, 1,5 km from Jodłów towards Mt. Śnieżnik, ca 1000 m above sea level, 1 May 2002, coll.: A. Chlebicki; Śnieżnik Range, Puchaczówka Pass near Idzików, on standing *Acer pseudoplatanus*, 22 April 2002, coll.: A. Chlebicki; Złote Mts., on the W slope of Mt. Jawornik Wielki, 674 m above sea level, 3 May 2002, coll.: A. Chlebicki; Złote Mts., Lądek Zdrój, the environs of Jadwiga Spring, on standing *Acer pseudoplatanus*, 21 April 2002, coll.: A. Chlebicki; Złote Mts., Lutynia, on standing *Acer pseudoplatanus*, 21 April 2002, coll.: A. Chlebicki; Złote Mts., E slope of Mt. Haniak, on standing *Acer pseudoplatanus* near the road to Złoty Stok, ca 500 m above sea level, 3 May 2002, coll.: A. Chlebicki; Złote Mts, near the road to Orłowiec N501 22' E161 50', ca 460 m above sea level, on standing *Acer pseudoplatanus*, 1 May 2002, coll.: A. Chlebicki.

Carpathians: Beskid Żywiecki Mts., near the bank of Biała Woda River, ca 1 km E of Jaworki, on standing *Acer pseudoplatanus*, 15 June 2002, coll.: A. Chlebicki; Tatra Mts., Kościeliska Valley, 1 km N of the mouth of the valley, 26 July 2002, coll.: A. Chlebicki; Kalatówki, near the cable railway station, on standing *Acer pseudoplatanus*, 29 July 2002, coll.: A. Chlebicki; Beskid Niski Mts., Tylawa, on standing *Acer pseudoplatanus* near the road, 6 October 2002, coll.: A. Chlebicki

All the specimens mentioned above are preserved in KRAM-F.

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Hymenochaete carpatica, niepozorny grzyb rosnący na płatach kory jaworu *Acer pseudoplatanus*

Streszczenie

Kora jaworu jest specyficznym siedliskiem dla grzybów, porostów i glonów aerofitycznych. Odnotowano występowanie takich gatunków grzybów jak: *Bjerkandera adusta*, *Cerrena unicolor*, *Hymenochaete carpatica*, *Hysterium pulicare*, *Lycoperdon pyriforme* i *Melanomma pulvis-pyrius*. Najbardziej wyspecjalizowanym gatunkiem okazał się grzyb *Hymenochaete carpatica*, występujący głównie na spodniej stronie płatów kory jaworu. Płaty zbudowane są z wielu warstw martwicy korkowej. Dzięki stycznym pęknięciom odsłaniane są kolejne warstwy nowo tworzonej martwicy korkowej. Żywe owocniki *H. carpatica* występują głównie na świeżo odsłoniętych powierzchniach płatów. Na płatach kory można prześledzić kolejne stadia sukcesji grzyba. Obecność grzybni w komórkach korka odległych od owocników sugeruje niekoniecznie saprotroficzny tryb życia grzyba. *H. carpatica* odznacza się też właściwościami konkurencyjnymi w stosunku do porostów i glonów zajmujących te same siedliska. Grzybnia w strefie kontaktu z plechą porostu powoduje jej miejscowe obumieranie (nekrozę). Propagule glonów aerofitycznych są zatrzymywane przez gęsto ustawione szczeciny. Dopiero stare owocniki ze zniszczonymi szczecinami są kolonizowane przez porosty i glony aerofityczne.