

CALOPLACA MONACENSIS (TELOSCHISTACEAE, LICHENIZED ASCOMYCOTA), A SPECIES NEW FOR POLAND

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Abstract. *Caloplaca monacensis* (Leder.) Lettau is reported as a new lichen species for Poland. It is an old species of the *Caloplaca cerina* group, forgotten for decades and resurrected most recently. This epiphytic species is characteristic for open habitats such as roadside trees. The new records are from northern (Pojezierze Olsztyńskie lakeland) and southern (Carpathians) Poland. Brief taxonomic remarks and data on habitat preferences and the known distribution are provided.

Key words: biodiversity, distribution, endangered species, epiphytic species, lichenized fungi, *Ulmus*

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INTRODUCTION

At present the genus *Caloplaca* s.l. is represented by 81 species in Poland (Wilk 2012, 2015; Szczepańska *et al.* 2013; Frolov *et al.* 2016). Most recently, two new species were described (*C. micromontana* Frolov, Wilk & Vondrák, *C. microstepposa* Frolov, Nadyeina, Khodos. & Vondrák; Frolov *et al.* 2016), based in part on material from Poland published previously under the name *C. atroalba* (Tuck.) Zahlbr. (Wilk 2011, 2012). Various ecological groups of the genus are not evenly investigated in Poland. Saxicolous representatives of the genus occurring on calcium-rich substrate were the subject of detailed taxonomic studies (Wilk 2012). Saxicolous taxa occurring on acidic rock have not been covered by a detailed taxonomic survey so far; nor have corticolous, terricolous and muscicolous species. Around 13 corticolous species have been reported from Poland (Fałtynowicz 2003), most of them are rare species included in the Red List of lichens in high risk categories, e.g., *Athallia cerinella* (Nyl.) Arup, Frödén & Søchting [= *C. cerinella* (Nyl.) Flagey], *Calogaya lobulata* (Flörke) Arup, Frödén

& Søchting [= *C. lobulata* (Flörke) Hellb.], *Caloplaca lucifuga* G. Thor and *Cerothallia luteoalba* (Turner) Arup, Frödén & Søchting, (Turner) Th. Fr. [= *Caloplaca luteoalba* (Turner) Th. Fr.]; (Cieśliński *et al.* 2006; Kubiak & Zalewska 2009).

This paper reporting a newly recorded corticolous species *C. monacensis* (Leder.) Lettau is part of a project evaluating epiphytic lichen diversity in one of the last *Ulmus* avenues in the Pojezierze Olsztyńskie lakeland, conducted by the first author. Tree avenues play an important role in the conservation of rare and endangered lichen species. The mass extinction of *Ulmus* brought on by an epidemic of Dutch elm disease, combined with the cessation of new elm planting (Napierała-Filipiak *et al.* 2014), created a threat to many lichen species preferring *Ulmus* bark (Watson *et al.* 1988). In view of the valuable biocenotic role elm plays, this tree should be used more frequently in all kinds of plantings.

During a field survey in the Pojezierze Olsztyńskie lakeland in 2015, *C. monacensis* was found on the bark of *Ulmus laevis* Pall. Later, an examination of herbarium material yielded additional specimens of *C. monacensis* originating from three

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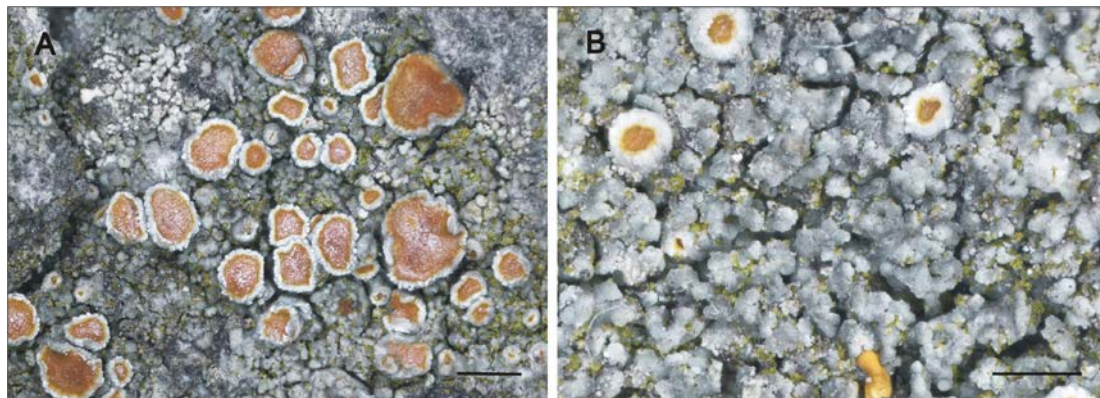


Fig. 1. *Caloplaca monacensis* (Leder.) Lettau (*D. Kubiak*, OLTC L-3574): A – habit, B – details of thallus with vegetative propagules. Scale bars: A = 1 mm; B = 0.5 mm.

collecting sites in the Polish Western Carpathians and from the bark of *Fraxinus excelsior* L. and wood. Taxonomically, *C. monacensis* belongs to the well-delimited *C. cerina* group (Šoun *et al.* 2011), whose members produce typical lecanorine apothecia. Four *Caloplaca* species of that group are known from Poland: *C. cerina* (Hedw.) Th. Fr. s.l., *C. chlorina* (Flot.) Sandst., *C. isidiigera* Vězda and *C. stillicidiorum* (Vahl.) Lynge s.l. Only one of them, *C. cerina*, is an epiphytic species. Here we provide information on the most characteristic features of *C. monacensis*, its habitat preferences and known geographical range, and discuss its taxonomic affinities.

MATERIAL AND METHODS

The study is based on material from OLTC and KRAM. Morphology and anatomy were observed using standard light microscopy techniques. Anatomical measurements were made from hand-cut sections and squash preparations mounted in water. The granulation of anatomical structures was observed in polarized light. The solubility of granules/crystals was tested with 25% KOH (K) and 65% nitric acid (N). The same chemicals were used for color reactions.

THE SPECIES

Caloplaca monacensis (Leder.) Lettau Figs 1–3
Hedwigia 52: 240. 1912. ≡ *Pyrenodesmia monacensis*
Leder., Bericht. Bayr. Botan. Gesellsch. 4: 26. 1896.

This species is a member of the *C. cerina* group (Šoun *et al.* 2011). It was poorly known and often misidentified as *C. cerina* (Hedw.) Th. Fr. s.l. Recently the species was resurrected and circumscribed by Šoun *et al.* (2011), and is easier to recognize at present.

The studied specimens of *C. monacensis* have a distinctive grey thallus consisting of coarse granules, small squamules and isidia, and truly lecanorine apothecia. The apothecia are abundant and large, up to 1.5 mm in diameter; the apothecial disc is orange, often pruinose. The apothecial cortex is paraplectenchymatous, very thick, ca 170 µm wide in the lower part of the margin, with some crystals in the upper part (pol+ white, insoluble in K, soluble in N). The ascospores are polarilocular, ellipsoid, with dimensions 11.5–15.0 × 6.0–8.0 µm, and the septum is 4.0–6.0 µm wide.

Among the species of *Caloplaca* s.l. occurring in Poland, *C. monacensis* may be confused with *C. cerina* s.l., but the latter species differs in having a smooth, cracked areolate thallus without any vegetative propagules, and ascospores with a distinctly thicker septum [(5–) 6.7 ± 1.2 (–10) µm; Šoun *et al.* 2011]. Another similar species, *C. chlorina*, differs from *C. monacensis* in having a distinctly areolate thallus (granular in *C. monacensis*, rarely with distinct areoles), soredia and blastidia, and it occurs mainly on rock. The poorly known species *C. virescens* (Sm.) Coppins also seems to resemble *C. monacensis* but it differs in having

a well developed, areolate, rarely fertile thallus with a thick layer of small granules on its surface. The North American species *C. ulmorum* (Fink) Fink is closely related to *C. monacensis*. It differs from *C. monacensis* in having a more developed areolate thallus with marginal and regular granules (Šoun *et al.* 2011).

Caloplaca monacensis is characteristic for solitary trees such as roadside trees or single trees in pastures or other types of agricultural landscape, as well as for open deciduous or mixed forests. It grows on bark of a variety of broadleaved trees (e.g., *Acer*, *Fagus*, *Fraxinus*, *Juglans*, *Malus*, *Ostrya*, *Pistacia*, *Populus*, *Pyrus*, *Quercus*, *Salix*, *Tilia*, *Ulmus*; Šoun *et al.* 2011; Muchnik *et al.* 2014). The species has been collected rarely from bark of *Larix* and rotten wood (Šoun *et al.* 2011; Hauck *et al.* 2013), and exceptionally was found growing on limestone (Vondrák *et al.* 2009). At the collecting site in the Pojezierze Olsztyńskie lakeland, *C. monacensis* occurs on *Ulmus laevis* (97 cm DBH) in an old tree avenue composed of *Fraxinus* and *Ulmus*. It grew on the southern side of a tree trunk at 150–170 cm height. The species was accompanied by the following lichens: *Bacidia rubella* (Hoffm.) A. Massal., *Buellia punctata* (Hoffm.) A. Massal., *Candelariella xanthostigma* (Pers. ex Ach.) Lettau, *Lecanora expallens* Ach., *L. persimilis* (Th. Fr.) Arnold, *Phaeophyscia orbicularis* (Neck.) Moberg, *Phlyctis argena* (Ach.) Flot., *Physcia adscendens* (Fr.) H. Olivier,

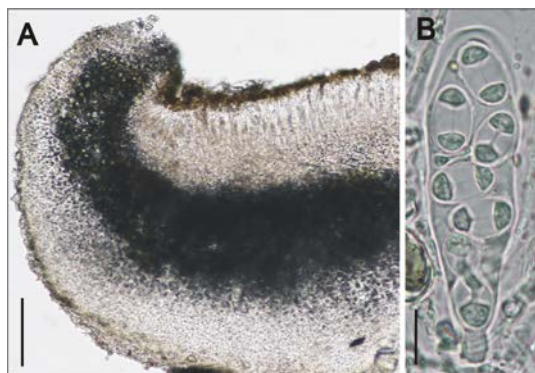


Fig. 2. *Caloplaca monacensis* (Leder.) Lettau (J. Nowak, KRAM L-68117): A – vertical section of apothecium, B – ascus with spores. Scale bars A = 100 μ m; B = 10 μ m.

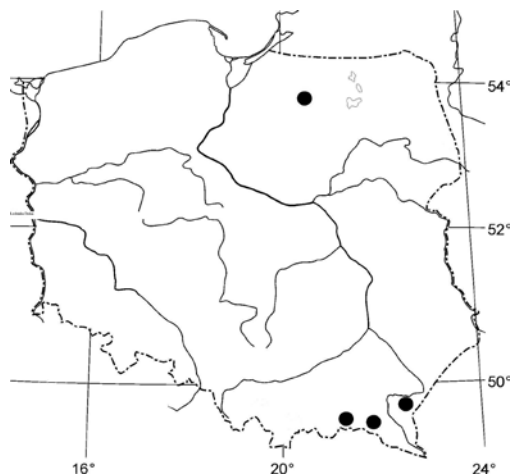


Fig. 3. Known distribution of *Caloplaca monacensis* (Leder.) Lettau in Poland.

P. tenella (Scop.) DC., *Physconia grisea* (Lam.) Poelt, *Pseudoschismatomma rufescens* (Pers.) Ertz & Tehler and *Xanthoria parietina* (L.) Th. Fr. At the sites in the Western Carpathians (Pogórze Przemyskie foothills and Beskid Niski Mts.) the species occurred in sunny places, on roadside *Fraxinus excelsior* trees and on a wood shingle of a house roof.

Caloplaca monacensis is known throughout temperate and Mediterranean Europe, and Asia (see Šoun *et al.* 2011). The species is perhaps widespread but still under-recorded. Most recently it was reported from Romania (Malíček *et al.* 2015), central European Russia (Muchnik *et al.* 2014), Kazakhstan (Hauck *et al.* 2013) and Iran (Kazemi & Safavi 2014).

SPECIMENS EXAMINED. POLAND. POJEZIERZE OLSZTYŃSKIE LAKELAND. Bartąg village, 53°42'57"N, 20°28'29"E, ATPOL-Be52, on *Ulmus laevis*, 9 May 2015, D. Kubiak (OLTC L-3574). WESTERN CARPATHIANS. BESKID NISKI MTS: Jasło County, Czarne near Nieznajowa village, alt. ca. 470 m, on wood shingle of house roof, 4 Oct. 1979, J. Nowak (KRAM L-32489); Jaśliska village, on *Fraxinus excelsior*, 2 Sept. 1977, J. Nowak (KRAM L-68117) [the specimen will be part of the next fascicle (XI) of *Lichenes Poloniae Meridionalis Exsiccati*]. – POGÓRZE PRZEMYSKIE FOOTHILLS. Łodzinka Dolna village, near church by the road to Bircza, on *Fraxinus excelsior*, 29 June 1986, J. Kiszka & J. Piórecki (KRAM L-55816).

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