FIVE LICHEN SPECIES NEW TO THE CROATIAN FLORA

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Five species of epiphytic lichens from Risnjak National Park (Candelariella reflexa, Chaenotheca brunneola, Placynthiella icmalea, Usnea diplotypus and Usnea subfloridana) are reported for the first time in the Croatian lichen flora. For each species, a short description with notes on ecology and distribution are given.

Key words: biodiversity, lichens, flora, Risnjak, Croatia

INTRODUCTION

The knowledge of south European and Mediterranean lichen flora is largely insufficient (NIMIS, 1996). The first records on the Croatian lichen flora date back to the second part of the 19th century. Noë (1858) states fifty-six and Matković (1879) states fifty-eight species from the North Adriatic coastal area. In the beginning of the 20th century Schuler (1902) published a good contribution to the knowledge of the lichen flora of Rijeka and Gorski kotar. In this period Zahlbruckner (1901) started with a description of the lichen material collected in Dalmatia. Servit (1910) also took part in the lichen studies. The main Croatian lichenologist Fran Kušan did extensive research into the lichen flora in Croatia (Kušan, 1928; 1930), and summarized the papers on lichens from former Yugoslavia including many references for Croatia (Kušan, 1953). Since that compilation there have been only very few publi-
cations referring to lichens from Croatia (Christensen, 1987, 1988; Christensen & Hansen, 1994), due to the paucity of field studies in recent decades.

In this paper five species, found during two lichenological surveys within Risnjak National Park in 1997 and 1998 (Ozimec, 1999) are reported as being new to the lichen flora of Croatia.

MATERIAL AND METHODS

Risnjak National Park (45° 26' N, 14° 39' E) is located in Gorski kotar, a highland region in western Croatia (Fig. 1). It is the most densely forested part of the country, with 60 percent of its area covered by forests. The park has an area of 64 km² and includes the source of the Kupa River and the massifs of Risnjak (1528 m a.s.l.) and Snježnik (1506 m a.s.l.), which belong to the western parts of the Dinaric Mountains. The climate is perhumid, with a maritime precipitation regime (3500 mm average), high air humidity (85%), short vegetation period and thick snow cover; the mean annual temperature is 3.0 °C. Due to the predominant limestone bedrock a typical karst relief with the characteristic morphology has developed.

![Fig. 1. Map of Croatia with the position of Risnjak National Park](image-url)

The area is covered by mixed beech and fir forests, subalpine beech forests, spruce forests and mountain pine (Pinus mugo) scrubs. Such communities are char-
characteristic of Gorski kotar, other parts of Croatia and neighbouring Slovenia and Bosnia.

The lichen specimens are deposited in the herbarium of Botanical Institute, Faculty of Sciences in Zagreb (ZA). Locality, altitude, substratum, date of collection and MTB coordinates are given for each sample. Small portions of the Usnea species thallus were analyzed by thin-layer chromatography (TLC) in accordance with WHITE & JAMES (1985). For each species, a short description with brief comment on ecology and geographic distribution is given.


THE SPECIES

_Candelariella reflexa_ (Nyl.) Lettau

Markov brlog, by the path to Medvjeđa vrata, 940 m a.s.l., in _Abieti-Fagetum dinaricum_ Treg., on _Acer pseudoplatanus_, 16. XI. 1997, MTB 0553/4.

Leska valley, by the »Horvatova staza« path to Podi, 740 m a.s.l., in _Abieti-Fagetum dinaricum_ Treg., on _Acer pseudoplatanus_, 17. XI. 1997, MTB 0554/3.

Bijela Vodica valley, by the road, 680 m a.s.l., on open standing _Acer pseudoplatanus_, near the entrance sign, 13.VIII. 1998, MTB 0554/3.

A yellow, crustose lichen with a K – thallus of minute squamules. Squamules up to 1 mm diam., rounded, flattened, citrine-yellow; the margins braking down into fine-granular soredia.

This southern-temperate species occurs in areas with high precipitation, on slightly nutrient-enriched habitats (WIRTH, 1995). It is frequent on the mineral-rich, subneutral bark of broad-leaved, often isolated trees. This moderately shade and pollution tolerant lichen is widespread from the Mediterranean region to southern Norway. It was reported from Snežnik (GRUBE et al., 1995) and Trnovski gozd (PRÜGGER et al., 2000) in Slovenia.

_Chaenotheca brunneola_ (Ach.) Müll. Arg.

Cajtnik, by the path ascending to Veliki Risnjak, 1380 m a.s.l., in _Homogyno alpinae-Fagetum_ (Horv.) Borh., on a decaying _Fagus_ trunk with moss cover, 4. X. 1997, MTB 0553/4.

Thallus crustose, immersed. Apothecia 0.6–1.6 mm tall, stalked. Stalks shiny black, often branched, carrying 2–5 globose dark-brown heads. Thallus _Pd_ + yellow.

This species occurs mostly on bark and lignum of decaying conifers and deciduous trees, in shaded and humid situations of the montane and subalpine belt (WIRTH, 1995).

The species is known from Herzegovina (KUŠAN, 1953; MURATI, 1993), and Slovenia (Mayrhofer et al., 1996).
**Placynthiella icmalea** (Ach.) Coppins & P. James


Thallus crustose, of isidiate to minutely coralloid green-brown granules. Apothecia 0.2–0.6 mm diameter, scattered, with a distinct, paler, true exciple.

Thallus K–, KC + red, C+r e d, Pd–. The small specimen was collected on lignum of the trunk of a dead fir tree, together with Cladonia fimbriata.

The genus *Placynthiella* was resurrected by Coppins & James (1984) to accommodate the *Lecidea uliginosa* group. The four species of the genus occur on a wide range of acidic substrata in Europe and North America: on dead bark and lignum of fallen trees and stumps, worked timber, peaty ground and plant debris in heathland and forest clearings.

*Placynthiella icmalea* is widespread through Europe, except in dry Mediterranean regions.

**Usnea diplotypus** Vainio

Bijela Vodica valley, by the road, 680 m a.s.l., on open standing Acer pseudoplatanus, near the entrance sign, 13.VIII. 1998, MTB 0554/3.

Thallus 2.5 cm tall, subpendulous with anisotomic-dichotomous ramifications, minute tuberculate and richly isidiate soralia. Medulla K + yellow, C/KC + red, Pd + yellow. Chemistry: usnic and alectorialic acid.

The small specimen, associated with Cladonia fimbriata, Evernia prunastri, Hypogymnia physodes, Lobaria scrobiculata, Parmelia acetabulum, P. caperata, P. pastillifera, Pertusaria albescens, Pseudevernia furfuracea and Ramalina fastigiata, was collected on an open standing sycamore growing in the valley. According to Clerc (1987), *Usnea diplotypus* has been wrongly considered as being exclusively saxicolous. It is frequent in more or less continental areas of Scandinavia and central Europe, but it is rare in southern and western Europe.

The occurrence of this species on the eruptive rocks in Bulgaria and its central European distribution was noted by Murati (1993). *Usnea diplotypus* was recently reported from Trnovski gozd in Slovenia by Prügger et al. (2000).

**Usnea subfloridana** Stirton

Leska valley, near the educational trail, 700 m a.s.l., in Blechno-Abietetum Horv., on Abies alba, 13.VIII. 1998, MTB 0554/3.

Thallus 5.3 cm tall, shrubby, slightly tufted, attached by a compact holdfast. Branching isotomic-dichotomous. Surface grey-green, conspicuously blackened at the base with minute transverse cracking without interconnecting longitudinal cracks.

Main branches densely papillose, terminal parts and fibrils smooth with scattered papillae and pseudocyphellae, giving rise to tuberculate, irregularly rounded

MURATI (1993) reported the occurrence of this lichen on the bark of various trees on high mountains in Slovenia and Macedonia. It was recently reported from Snežnik (GRUBE et al., 1995) and Trnovski gozd (PRÜGGER et al., 2000) in Slovenia.

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**SAŽETAK**

**Pet novih vrsta lišaja u flori Hrvatske**

S. Ozimec


Premda su ovi lišaji prilično česti i u susjednim područjima, činjenica da su do sada bili nezabilježeni odražava potrebu daljih istraživanja u svrhu potpunijeg upoznавanja flore lišaja kao sastavnice ukupne biološke raznolikosti Hrvatske.
Ozimec, S.: Five lichen species new to the Croatian flora