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Lichens of the Holy Hill orthodox sanctuary in Grabarka (NE Poland)

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The Holy Hill Grabarka is one of the most important orthodox sanctuaries in Poland. The sanctuary is situated in Podlasie region between Bug and Narew rivers. It grew in the shade of well developing (in the first centuries of the second millennium) towns Mielnik and Drohiczyn. The most striking thing is that the church is surrounded by a forest of thousands of crosses brought by pilgrims. The study present 64 species of epiphytic, epixylic, epilythic and epigeic lichens. Among 64 lichen species 11 are considered to be threatened in Poland.

Key words: lichenized fungi, biota, Holy Hill sanctuary

INTRODUCTION

The Holy Hill Grabarka is the most significant Orthodox sanctuary in Poland. The sacred place is situated 12 km away from Siemiatycze, 0,5 km from the Grabarka village in Podlaskie province, Siemiatyckie district, commune Nurzec-Stacja. The Holy Hill is found on Wysoczyzna Drohicka High Plain, in the south part of Nizina Północnopodlaska Lowland (Kondracki 1994). In the close neighborhood there is the river Moszczona, which falls into the river Bug, 7 km further to the south. The surrounding woods had been formerly included in the Mielnicka Forest, which is known as the Lasy Nurzeckie Forests.

STUDY AREA

The Holy Hill Grabarka acquired its fame for a miracle which occurred in the beginning of 1710 in the time of cholera epidemic, which decimated the population of Podlasie. As legend says, at that time, an old man from Siemiatycze had a revelation according to which it was possible to be protected from the disease and be saved only on the Grabarka Hill. After the faithful from Siemiatycze had arrived and placed there a cross, a miracle occurred. The sick started to recover and nobody died afterwards. When the news spread, people from that region arrived at the Holy Hill

in hundreds. In 1710, in summer, about 10 thousand people gathered in this place. In the same year, a wooden temple was erected there as gratitude of those who were saved. The Holy Grabarka Hill is also known as the Hill of Crosses- the name comes from sacrificial crosses with epitaphs written in Cyrillic alphabet, which are placed around the Transfiguration Orthodox Church. The crosses which surround the small church have become the symbol of the Holy Hill. It is a real forest of crosses with narrow paths to walk along (Radziukiewicz 2001).

At present, approximately 10 thousand crosses tower on the hill – wooden, metal, stone, small and big. The crosses have been traditionally brought by the faithful for hundreds of years. The pilgrims place them next to the sanctuary throughout the year, however the most crosses occur the day before the Transfiguration Holiday (Lechowski 2004).

Behind the amazing forest of crosses, a cemetery and buildings of the St. Martha and St. Mary are found. The nunnery was established in 1947 and the Holy Virgin Patroness and Succor Orthodox church was erected in 1957. Construction of stone wall to enclose the Holy Hill was begun in 1999 as a result of benediction of His Eminence Metropolitan Sawa (Radziukiewicz 2000).

The objective of the present paper has been the floristic and ecological analysis of lichen biota of the Holy Grabarka Hill and its surrounding for the purpose of presenting its variety considering the habitat conditioning.

MATERIAL AND METHODS

The investigations in the area of the Holy Hill orthodox sanctuary in Grabarka and its surroundings were carried out in the years 2006-2007. The alphabetical list of lichen species has been compiled (Tab. 1). Several lichen species from the Grabarka surroundings (stand 1182 - *Alnus glutinosa* over flow, sandy slope, *Pinus sylvestris*) have been reported by Cieśliński (2003a). The species confirmed by our own studies on that stand have been marked (also Cieśliński 2003a). The species which have not been identified in the course of our own studies have been marked Cieśliński (2003 a). The species have been named according to Santesson et. al. (2004), genera *Bryoria* and *Usnea* according to Bystrek (1986, 1994) and genus *Melanelia* according to Blancoet al. (2004).

The lichen material has been deposited at the Herbarium of the Institute of Biology, University of Białystok.

RESULTS

64 species of lichens, out of 35 genera have been identified on the area of the Holy Grabarka Hill and its neighborhood. The most abundant are genera *Cladonia* – 8 species, *Lecanora* – 7, *Caloplaca* – 4. The lichens occur in all basic morphological forms. Crustose thalus species remarkably dominate (45%). There are less macrolichens – foliose (29%) and fruticose (25%). Of the 64 lichen species identified in the Holy Hill orthodox sanctuary in Grabarka and its environs, 11 species have been put on the Red List of extinct and vulnerable lichens of Poland (Cieśliński et al. 2003), including 3 species in the endangered category – EN (*Bryoria crispa*, *Flavoparmelia caperata*, *Pleurosticta acetabulum*), 6 species in the vulnerable category – VU

(*Cetraria islandica*, *Parmelina tiliacea*, *Porpidia rugosa*, *Tuckermanopsis chlorophylla*, *Usnea filipendula*, *U. hirta*), 2 species in the category of near threatened – NT (*Evernia prunastri*, *Hypogymnia tubulosa*), as well as 2 species on the Red List of lichens vulnerable in North-Eastern Poland (Cieśliński 2003 b), including 1 species in the category EN (*Flavoparmelia caperata*), 1 – LC (*Porpidia rugosa*).

Lichens which are protected by law constitute 27% of the total lichen biota, including strict environmental protection species – 20%, and partial protection – 6%. Zones of protection within a radius of 50 m from the rim of the species locality should be specified in regard to *Usnea hirta* and *Usnea filipendula* (Dz. U. Nr 168, poz. 1765).

Epiphytic lichens. The most abundant are epiphytic lichens (31 species), out of which 11 are obligatory. They occur on the bark of *Pinus sylvestris*, *Betula pendula*, *Quercus robur*, *Acer platanoides*, *Alnus glutinosa* and *Juniperus communis*. Considering floristic differentiation and abundance, the richest is lichen biota *Pinus sylvestris* (11 species), *Acer platanoides* and *Betula pendula* (10 of each). Fruticose species, generally perishing in Poland – *Usnea hirta*, *U. filipendula*, *Pseudeuernia furfuracea* as well as foliose *Hypogymnia physodes* occur in considerable amount on the bark of pine – and birch – trees. The lower parts of the trunks are mainly colonized by the lichens of *Cladonia* genus (*C. chlorophaea*, *C. coniocraea*, *C. fimbriata*). The bark of numerous trunks, including the crown, is profusely overgrown with lichens thalus. 11 species, exclusively *Flavoparmelia caperata* (Cieśliński 2003a), *Lecanora carpinea*, *L. pulicaris*, *Pleurosticta acetabulum* (Cieśliński 2003b) were identified on the bark of alders growing on the stream. Species composition of the lichens of pine – trees growing in the nearest woods is remarkably scantier. Common species such as *Hypogymnia physodes*, *Hypocnomyce scalaris*, *Cladonia coniocraea* significantly dominate, and *Imshaugia aleurites* and *Lecanora conizaeoides* are found relatively often.

Epixylic lichens. These lichens are included in the second, regarding the number, habitat group. They are represented by 24 species, out of which only 3 (*Lecanora varia*, *Parmelina tiliacea*, *Placynthiella icmalea*) are exclusive epixylic lichens. They mainly grow on the wooden crosses which surround the church. Quite frequently they form big groups composed of a dozen or so – several dozens specimens. Mainly epiphytic species occur among epixylic species. The most abundant are foliose thalus *Platismatia glauca*, *Parmelia sulcata*, *Hypogymnia physodes*, *Parmelina tiliacea*, *Melanelixia fuliginosa*, *Imshaugia aleurites* as well as fruticose thalus *Pseudeuernia furfuracea*, *Evernia prunastri*, *Usnea hirta*, *U. filipendula*, *Cladonia fimbriata*, *C. coniocraea*. Wood left to rot after the cut down trees form the second breeding ground overgrown by epixylic lichens, such as *Hypogymnia physodes* or *Imshaugia aleurites*, *Lepraria* sp., *Parmelia sulcata*, *Placynthiella icmalea*.

Epilithic lichens. 24 species have been identified, out of which 19 exclusive. Lichens of the Holy Grabarka Hill are connected with natural breeding ground (erratic blocks, stones, tombstones, stone wall) – 15 species, out of which *Caloplaca holocarpa*, *Candelariella aurella*, *Lecanora albescens*, *L. dispersa*, *Physcia caesia*, *Protoparmeliopsis muralis*, *Xanthoria parietina* and *X. polycarpa* grow also on calcium breeding ground, on concrete structures mainly (tombstones). 9 species were identified exclusively on breeding ground of calcium substrate. In the Grabaraka vicinity, Cieśliński (2003a) identified *Porpidia rugosa* (individual without apothecium) on

Table 1
Lichens recorded on the Holy Hill in Grabarka

SPECIES	SUBSTRATUM	NOTES
<i>Acarospora fuscata</i> (Schrad.) Th. Fr.	erratic blocks, stone wall	also Ciesliński (2003a)
<i>Amandinea punctata</i> (Hoffm.) Coppins & Scheid.	trunk of <i>Acer platanoides</i>	
<i>Bryoria crispa</i> (Mot.) Bystr.	trunk of <i>Pinus sylvestris</i>	
<i>Caloplaca citrina</i> (Hoffm.) Th. Fr.	concrete tombstones	
<i>Caloplaca decipiens</i> (Arnold) Blomb. & Forssell	concrete tombstones	
<i>Caloplaca holocarpa</i> (Hoffm. ex Ach.) A. E. Wade	stones, stone wall, concrete tombstones	
<i>Caloplaca saxicola</i> (Hoffm.) Nordin	concrete tombstones	
<i>Candelariella aurella</i> (Hoffm.) Zahlbr.	concrete tombstones, stone wall	
<i>Candelariella vitellina</i> (Hoffm.) Müll. Arg.	concrete tombstones	
<i>Candelariella xanthostigma</i> (Ach.) Lettau	trunk of <i>Acer platanoides</i>	
<i>Cetraria aculeata</i> (Schreb.) Fr.	soil	also Ciesliński (2003a)
<i>Cetraria islandica</i> (L.) Ach.	soil	also Ciesliński (2003a)
<i>Cladonia arbuscula</i> (Wallr.) Flot. ssp. <i>mitis</i> (Sandst.) Ruoss	soil	also Ciesliński (2003a)
<i>Cladonia chlorophaea</i> (Flörke ex Sommerf.) Spreng.	soil	also Ciesliński (2003a)
<i>Cladonia coniocraea</i> (Flörke) Spreng., nom cons.	soil, trunk of <i>Pinus sylvestris</i> , <i>Betula pendula</i> , wooden crosses, decaying wood	also Ciesliński (2003a)
<i>Cladonia fimbriata</i> (L.) Fr.	soil, trunk of <i>Pinus sylvestris</i> , wooden crosses, decaying wood	also Ciesliński (2003a)
<i>Cladonia furcata</i> (Huds.) Schrad. (ssp. <i>furcata</i>)	soil	also Ciesliński (2003a)
<i>Cladonia phyllophora</i> Hoffm.	soil	also Ciesliński (2003a)
<i>Cladonia rangiformis</i> Hoffm.	soil	also Ciesliński (2003a)
<i>Cladonia subulata</i> (L.) Weber ex F. H. Wigg.	soil	also Ciesliński (2003a)
<i>Evernia prunastri</i> (L.) Ach.	trunk of <i>Alnus glutinosa</i> , <i>Acer platanoides</i> , <i>Betula pendula</i> , wooden crosses	also Ciesliński (2003a)
<i>Flavoparmelia caperata</i> (L.) Hale	trunk of <i>Alnus glutinosa</i>	Ciesliński (2003a)
<i>Hypocnomyce scalaris</i> (Ach.) M. Choisy	trunk of <i>Alnus glutinosa</i> , <i>Pinus sylvestris</i> , <i>Betula pendula</i> , wooden crosses	also Ciesliński (2003a)
<i>Hypogymnia physodes</i> (L.) Nyl.	trunk of <i>Alnus glutinosa</i> , <i>Pinus sylvestris</i> , <i>Acer platanoides</i> , <i>Betula pendula</i> , <i>Quercus robur</i> , <i>Juniperus communis</i> , wooden crosses and bench, decaying wood	also Ciesliński (2003a)
<i>Hypogymnia tubulosa</i> (Schaer.) Hav.	trunk of <i>Betula pendula</i>	
<i>Imshaugia aleurites</i> (Ach.) S.L.F. Meyer	trunk of <i>Pinus sylvestris</i> , wooden crosses, decaying wood	also Ciesliński (2003a)
<i>Lecanora albescens</i> (Hoffm.) Branth & Rostr.	stones, stone wall, concrete and stone tombstones	
<i>Lecanora carpinea</i> (L.) Vain.	trunk of <i>Alnus glutinosa</i>	
<i>Lecanora conizaeoides</i> Nyl. ex Cromb.	trunk of <i>Alnus glutinosa</i> , <i>Pinus sylvestris</i> , wooden crosses	also Ciesliński (2003a)
<i>Lecanora dispersa</i> (Pers.) Sommerf.	stones, stone wall, concrete and stone tombstones	
<i>Lecanora polytropa</i> (Ehrh. ex Hoffm.) Rabenh.	stone wall	

Tab. 1 cont.

<i>Lecanora pulicaris</i> (Pers.) Ach.	trunk of <i>Alnus glutinosa</i>	also Cieśliński (2003a)
<i>Lecanora varia</i> (Hoffm.) Ach.	wooden crosses	
<i>Lecidella elaeochroma</i> (Ach.) M. Choisy	trunk of <i>Alnus glutinosa</i>	
<i>Lecidella stigmatea</i> (Ach.) Hertel & Leuckert	concrete tombstones	
<i>Lepraria</i> sp.	trunk of <i>Acer platanoides</i> , <i>Alnus glutinosa</i> , <i>Quercus robur</i> , <i>Pinus sylvestris</i> , <i>Juniperus communis</i> , wooden crosses, decaying wood	
<i>Melanelixia fuliginosa</i> (Duby) O. Blanco et al. ssp. <i>glabratula</i> (Lamy) J. R. Laundon	trunk of <i>Alnus glutinosa</i> , wooden crosses	
<i>Parmelia sulcata</i> Taylor	trunk of <i>Alnus glutinosa</i> , <i>Acer platanoides</i> , <i>Quercus robur</i> , <i>Betula pendula</i> , wooden crosses and bench	also Cieśliński (2003a)
<i>Parmelina tiliacea</i> (Hoffm.) Hale	wooden crosses	
<i>Parmeliopsis ambigua</i> (Wulfen) Nyl.	trunk of <i>Pinus sylvestris</i> , wooden crosses	also Cieśliński (2003a)
<i>Pertusaria amara</i> (Ach.) Nyl.	trunk of <i>Acer platanoides</i>	
<i>Phaeophyscia nigricans</i> (Flörke) Moberg	concrete tombstones	
<i>Phaeophyscia orbicularis</i> (Neck.) Moberg	stones, stone tombstones	
<i>Phlyctis argena</i> (Spreng.) Flot.	trunk of <i>Acer platanoides</i> , <i>Alnus glutinosa</i>	
<i>Physcia adscendens</i> H. Olivier, nom. cons	concrete tombstones	
<i>Physcia caesia</i> (Hoffm.) Fürnr.	stones, stone and concrete tombstones	
<i>Physcia dubia</i> (Hoffm.) Lettau	wooden crosses, stone wall	
<i>Placynthiella icmalea</i> (Ach.) Coppins & P. James	decaying wood	also Cieśliński (2003a)
<i>Platismatia glauca</i> (L.) W.L. Culb. & C.F. Culb.	bark of <i>Betula pendula</i> , wooden crosses	
<i>Pleurosticta acetabulum</i> (Neck.) Elix & Lumbsch in Lumbsch, Kothe & Elix	trunk of <i>Alnus glutinosa</i>	Cieśliński (2003a)
<i>Porpidia crustulata</i> (Ach.) Hertel & Knoph in Hertel	stone wall	
<i>Porpidia rugosa</i> (Taylor) Coppins & Fryday [= <i>P. glaucophaea</i> (Körb.) Hertel & Knoph]	erratic blocks	Cieśliński (2003a)
<i>Protoparmeliopsis muralis</i> (Schreb.) M. Choisy	wooden crosses, stone and concrete tombstones	also Cieśliński (2003a)
<i>Pseudevernia furfuracea</i> (L.) Zopf	trunk of <i>Pinus sylvestris</i> , <i>Juniperus communis</i> , wooden crosses	
<i>Scoliciosporum chlorococcum</i> (Graewe ex Stenh.) Vězda	trunk of <i>Alnus glutinosa</i> , <i>Quercus robur</i> , <i>Betula pendula</i> , wooden crosses	also Cieśliński (2003a)
<i>Trapeliopsis granulosa</i> (Hoffm.) Lumbsch	soil	also Cieśliński (2003a)
<i>Tuckermanopsis chlorophylla</i> (Willd.) Hale	trunk of <i>Pinus sylvestris</i> <i>Betula pendula</i> , wooden crosses	also Cieśliński (2003a)
<i>Usnea filipendula</i> Stirt.	trunk of <i>Pinus sylvestris</i> , <i>Betula pendula</i> , wooden crosses	
<i>Usnea hirta</i> (L.) F. H. Wigg.	trunk of <i>Pinus sylvestris</i> , <i>Betula pendula</i> , wooden crosses	
<i>Verrucaria muralis</i> Ach.	concrete tombstones	
<i>Verrucaria nigrescens</i> Pers.	concrete tombstones	
<i>Xanthoparmelia conspersa</i> (Ach.) Hale	stones	also Cieśliński (2003a)
<i>Xanthoria polycarpa</i> (Hoffm.) Th. Fr. ex Rieber	trunk of <i>Juniperus communis</i> , concrete tombstones, stone wall	also Cieśliński (2003a)

erratic block in shaded and moist place. It is a very rare species, growing in very few stations on the Polish lowland.

Epigeic lichens. The terricolous lichens grow in the Holy Hill vicinity in pine – tree forests. 10 species of terricolous lichens were identified on the soil, including 7 exclusive species (*Cetraria aculeata*, *C. islandica*, *Cladonia arbuscula* subsp. *mitis*, *C. furcata*, *C. phyllophora*, *C. rangiformis*). *Trapeliopsis granulosa* grows on sandy road side – space.

CONCLUSIONS

There is no data concerning the lichen biota of Holy Grabarka Hill. Several species of lichens from the forests surrounding the Hill have been described by Cieśliński (2003a). Specific character of the Holy Hill, which is situated among forests has inclined to study its lichen biota, and varied stand of trees, wooden crosses, tombstones and stones have suggested that rare and interesting species of lichens can occur there. Despite of a small area, differentiation of habitats and phorophits is so big that 64 species were identified there. During our own studies the occurrence of *Flavoparmelia caperata*, *Pleurosticta acetabulum* and *Porpidia rugosa*, which were mentioned by Cieśliński (2003a), was not confirmed. The lichens form a significant group of organisms in the scenery of the Holy Grabarka Hill. Their presence at all accessible substrata demonstrates positive results of syntropization. One of the distinctive features are wooden crosses overgrown abundantly by lichen thalus.

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Porosty Świętej Góry, prawosławnego sanktuarium w Grabarce

Streszczenie

W pracy przedstawiono wyniki badań nad porostami Świętej Góry, prawosławnego sanktuarium w Grabarce. Święta Góra Grabarka jest najważniejszym sanktuarium prawosławnym w Polsce. Położona jest w Polsce Północno-Wschodniej, na Podlasiu, między Bugiem a Narwią, na Wysoczyźnie Drohickej, w południowej części Niziny Północnopodlaskiej.

Święta Góra Grabarka zasłynęła z cudu, jaki miał miejsce na początku 1710 roku podczas epidemii cholery, która dziesiątkowała ludność na terenie Podlasia. Święta Góra Grabarka nazywana jest Górą Krzyży. Nazwa ta wywodzi się od krzyży ofiarnych z epitafiami pisanyymi cyrylicą otaczającymi cerkiew Przemienienia Pańskiego. Krzyże stojące wokół niewielkiej, drewnianej cerkwi stały się symbolem Świętej Góry. Dziś na wzgórzu wznosi się około 10 tysięcy krzyży – drewnianych, metalowych, kamiennych, małych i wielkich. Krzyże tradycyjnie przynoszone są przez wiernych od setek lat. Pątnicy stawiają je obok sanktuarium przez cały rok, jednak najczęściej krzyży przybywa w przeddzień Święta Przemienienia Pańskiego (19 sierpnia). Za lasem krzyży znajduje się cmentarz oraz kompleks zabudowań klasztoru świętych Marty i Marii. Żeński klasztor prawosławny powstał w 1947 roku, a w 1957 została wzniesiona cerkiew p. w. Matki Bożej Wspomożycielki i Opiekunki.

Na terenie Świętej Góry Grabarki i jej okolic odnotowano 64 gatunki porostów (Tab. 1), z 35 rodzajów. Najliczniej reprezentowane są rodzaje *Cladonia* – 8 gatunków, *Lecanora* – 7, *Caloplaca* – 4. Porosty występują we wszystkich podstawowych formach morfologicznych. Najliczniej reprezentowane są porosty epifityczne. 11 gatunków umieszczonych jest na Czerwonej liście porostów wymarłych i zagrożonych w Polsce (Cieśliński et al. 2003), w tym 3 gatunki w kategorii wymierających – EN (*Bryoria crispa*, *Flavoparmelia caperata*, *Pleurosticta acetabulum*), 6 w kategorii narażonych – VU (*Cetraria islandica*, *Parmelina tiliacea*, *Porpidia rugosa*, *Tuckermanopsis chlorophylla*, *Usnea filipendula*, *U. hirta*), 2 – w kategorii bliskich zagrożeniu – NT (*Evernia prunastri*, *Hypogymnia tubulosa*).