

Prądnik. Prace Muz. Szafera	5	9–20	1992
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JÓZEF PARTYKA

Ojcowski Park Narodowy
32-047 Ojców

**ŚRODOWISKO ABIOTYCZNE WYŻYNY
KRAKOWSKO-CZĘSTOCHOWSKIEJ**

The abiotic environment of the Kraków-Częstochowa Upland

ABSTRACT. The paper describes the particular elements of the abiotic environment of the Kraków-Częstochowa Upland, i.e. its geological structure, relief, climate, water relations, and provides a physiographic background for other reports prepared within the framework of the CPBP program 04.10.05.02. Most attention was concentrated on precipitation in the period 1986-1990, characterized on the basis of data from 17 rainfall stations distributed over the Upland.

KEY WORDS: Kraków-Częstochowa Upland, abiotic environment, geological structure, relief, water relations, temperature, precipitation.

SUMMARY

The Kraków-Częstochowa Upland extends from Kraków in the south to the gorge of the River Warta near Częstochowa in the north. It covers about 2000 km². From the south, its border is formed by the Krzeszowice Trough and from the west by a distinct escarpment, built mainly of Upper Jurassic limestones. The gorge of the River Warta constitutes the northern border near Częstochowa. While on the east is boarded by a denuded Jurassic escarpment built of Cretaceous formations.

The Upland is built chiefly of Upper Jurassic limestones, which cover a palaeozoic bedrock and occur in three lithological forms – plate, massive, and bedded limestones. Thanks to the system of crevices allowing a free flow of water, these limestones have developed various karstic forms.

Distinct regional differences occur within the Upland area, resulting from its geological structure and diversified relief. The southern part (Kraków Upland), lying between Kraków and the line Olkusz-Wolbrom, includes ridges, horst hillocks, and numerous deep karstic ravines. North of the line Olkusz-Wolbrom extends the Częstochowa Upland reaching to the gorge of the River Warta near Częstochowa. Here there is a different relief. The surface is slightly undulating and inclinations do not on the whole exceed 2%. Groups of monadnocks rise above the plain, most of them occurring in the vicinity of Kroczyce, Ogrodzieniec, and Smoleń.

The river system of the Upland is among the poorest in Poland, but the distribution

is not uniform. Most of the river occurs in the southern part of the Upland, their density being 0.30 km/km², on the average and locally even 1.0 – 1.5 km, while in the Częstochowa Upland they are a rarity – 0.11 km/km².

According to Romer, the climate of the Kraków-Częstochowa Upland is of a type characteristic of the Central Uplands, or more precisely of the Silesian-Kraków region. The mean annual temperature is 8°C but local differences exist. In the environs of Częstochowa it amounts 7.6°C and Kraków to 8°C; the higher parts of the Upland and the valley bottoms are much cooler (6.0°C), and the peripheries warmer.

The mean annual precipitation is 700 mm and also varies depending on the region. The western edge of the Upland and its southern part receive the most precipitation. The eastern part lying in the so-called “precipitation shade” receives less i.e. by 200 mm. The number of days in the year with precipitation over 0.1 mm was about 160 on the average.

In the period 1986-1990 a downward tendency in precipitation was observed. While the annual total in the Upland region is 700 mm on the average, in the study period it was only 638 mm, i.e. 62 mm less. The difference is still greater (95 mm) if one takes into account data for the period 1958-1967. During the study period the highest precipitation was recorded in 1987 – 719 mm, in 1988 – 628 mm, and in 1989 – 583 mm.

Westerly winds prevail in the Upland; directions SW, W, and NW constitute ca. 40% of the observations. Southerly winds are rarest. Windless weather constitutes ca. 20% of the records.

The characteristic feature of the abiotic environment of the Upland are local climatic differences caused mainly by its diverse relief. These differences mainly concern deep valleys, particularly their bottoms and northern slopes, and find expression in different numbers of days with snow cover, amount of precipitation, or temperatures.

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JANKLEIN

Zakład Ochrony Przyrody i Zasobów Naturalnych PAN
ul. Lubicz 46, 31-512 Kraków

**STOSUNKI TERMICZNO-WILGOTNOŚCIOWE
DOLINY SĄSPOWSKIEJ W OJCOWSKIM PARKU NARODOWYM**

**Thermal and humidity conditions of the Sąspów Valley
in the Ojców National Park**

ABSTRACT. The paper describes the results of studies conducted in 1987-1988 on the thermal and humidity conditions of the Sąspów Valley. The results obtained are compared with data for the period 1964-1967. Weather anomalies of the study period, in relation to multi-annual means are stressed. The concern both temperature and the fall in precipitation.

KEY WORDS: thermal and humidity conditions, weather, anomalies, Poland.

SUMMARY

The years 1987 and 1988 were characterized by anomalous weather conditions. Thermal anomalies were particularly marked in winter and early spring (Fig. 1). In comparison with the mean values for the period 1964 – 1967, January 1987 was particularly frosty (below – 11°C), contrary to the extremely warm January 1988 with a mean temperature above 0°C.

Also the deviations of mean maximum and minimum temperatures (Fig. 2), in minus in 1987 and in plus 1988, are indicative of the different thermal regime of these years.

Air humidity (and particularly saturation deficit) was higher in the cooler years (1987), especially in summer (Table 2).

The total precipitation (Table 3) markedly decreased, on the average by 82,5 mm in the valley bottom, and by as much as 169,3 mm on the slope.

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JANKLEIN

Zakład Ochrony Przyrody i Zasobów Naturalnych PAN
ul. Lubicz 46, 31-512 Kraków

**RADIACYJNE CZYNNIKI KLIMATU I PAROWANIE W OJCOWSKIM
PARKU NARODOWYM (NA PRZYKŁADZIE DOLINY SĄSPOWSKIEJ)**

**Radiational climatic factors and evaporation in the Ojców National Park
(exemplified by the Sąsów Valley)**

ABSTRACT. The distribution of total solar radiation and isolation in 1987 and 1988 was determined in relation to the extent of cloud cover. Evaporation was measured with Piche's evaporimeter, at two climatological stations (valley bottom, north slope), in a period without frost. The results obtained are shown in five tables.

KEY WORDS: radiation, evaporation, climatology, limestone upland, Poland.

SUMMARY

This paper deals with the results of studies on the values of total solar radiation and insolation (on a horizontal surface). They were related to the extent of cloudiness (Table 1) which determines the amount of insolation.

Insolation (Table 2) differed widely in the particular months of the study period, e.g. in July 1988 – 261.0 sunny hours were noted, while in December 1988 only 12.8 hours.

The monthly total radiation reached its highest value in June 1987 – 38.76 KJ/cm², and its lowest in December 1988 – 3.38 KJ/cm² (Table 3).

Differences between the values of precipitation and evaporation during the study period show a marked decrease in comparison with the period 1964 – 1967 of 79.9 mm on the average in the valley bottom, and 93.2 mm on the north slope, this having an adverse effect on the water balance of the Ojców National Park. It explains to some extent the observed drying up of springs in the Park area.

Prądnik. Prace Muz. Szafera	5	35–45	1992
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JAN KLEIN

Zakład Ochrony Przyrody i Zasobów Naturalnych PAN
ul. Lubicz 46, 31-512 Kraków

**MIKROKLIMAT JASKINI CIEMNEJ
W OJCOWSKIM PARKU NARODOWYM
W WARUNKACH ZIMOWYCH**

The microclimate of Ciemna Cave in the Ojców National Park (in winter)

ABSTRACT. The thermic and moisture conditions of Ciemna Cave, which is one of the biggest caves in the Ojców National Park, were described. It represents a type of static caves. Measurements were made in open area as well as on the transect inside the cave. It has been found that the air temperature grows towards the interior of the cave, reaching at its back a value equal to the mean many years' air temperature on the upland (8-9°C). An interesting phenomenon is the thermic stratification of a main chamber as well as the ice forms occurring in the entrance opening of the cave.

KEY WORDS: microclimate, caves, limestone upland, Poland.

SUMMARY

There are about 210 caves in the Ojców National Park. Only in five caves does the length of corridors exceed 100 m. Among them Ciemna Cave is placed third in this respect (Fig. 1). The Ojców caves have been explored since the 19th century – mainly by archeologists and paleontologists. Much later these caves aroused the interest of geographers, and biologists.

The microclimate of the Ojców caves is practically unknown. Only air temperatures sporadically were measured when different naturalists carried out their own studies. Ciemna Cave represents a type of static caves, characterized by air immobility. Its narrow entrance opening makes the free circulation of air as well as the deeper penetration of light impossible. Only near the entrance are the greater oscillations of air temperatures observed (Figs 3, 7, and 9). In winter air temperatures grow towards the interior of the cave and at the stoop they are by 6°C higher than at the entrance.

The most interesting changes in temperature occur at the entrance itself (Fig. 5) where the cool air forcing into the cave comes into contact with the warm air pushing out of it. As a result there formed characteristic thickenings on the bars of a grill closing the entrance. Among other interesting ice forms we can mention the so called "chłopki" (peasants) and icicles originated due to the melting of snow covering ledges above the entrance opening (Figs 2, 5, and 6).

In the main chamber there occurs the clear static stratification of air (Fig. 8). The cooler and heavier air stagnates near the warp, while the warmer (lighter) air fills the space near the roof of the cave.

The mean annual air temperature prevailing in the deep parts of caves approximates the average many years' temperature of the upland and it amounts to 8-9°C.

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BEATA BABCZYŃSKA-SENDEK, TADEUSZ KIMSA, STANISŁAW WIKA

Katedra Geobotaniki i Ochrony Przyrody Uniwersytetu Śląskiego
ul. Jagiellońska 28, 40-032 Katowice

**SZATA ROŚLINNA WYŻYNY KRAKOWSKO-CZĘSTOCHOWSKIEJ
W WARUNKACH ANTROPOPRESJI**

**Vegetation of the Kraków-Częstochowa Upland
in circumstances of anthropopressure**

ABSTRACT. The vegetation of the Kraków-Częstochowa Upland is rich in plant species and communities owing to very differentiated geomorphology and specific habitats. The characteristic feature of the region is the occurrence of elements of xerothermic and mountain vegetation and flora. The anthropogenic impact (exploitation of minerals, degradation of ground waters, air and soil population, tourism) effects the richness of the flora, plant population process, and succession trends.

KEY WORDS: Kraków-Częstochowa Upland, forests, grassland vegetation, xerothermic vegetation, biodiversity, anthropopressure, rare species, secondary succession.

SUMMARY

The Kraków-Częstochowa Upland is geomorphological highly differentiated. Very different habitats occur there – from rocks to sands and from xerothermic places to peat bogs. This leads to a great richness of flora and plant communities.

The total number of vascular plant species found in the region is about 1600 (Michalik 1974). A specific feature of the flora is the high percentage of xerothermic and mountain plants.

The number of plant communities is also high (Medwecka-Kornaś 1952; Michalik 1972; Wika 1986). For the Kraków-Częstochowa Upland, communities of the mountain and xerothermic character are very typical. To the first group belong eutrophic beech forests (*Dentario glandulosae-Fagetum* and *Dentario enneaphyllidis-Fagetum*) and *Phyllitido-Aceretum* forest. On the warm and dry habitats occur orchid beech forest *Carici-Fagetum* and a dry subassociation of the oak-hornbeam forest *Tilio-Carpinetum melittetosum*.

Most of the area of the Kraków-Częstochowa Upland is, however, covered by non forest communities, mainly of anthropogenic origin (Babczyńska-Sendek 1984; Kornaś 1957; Michalik 1980; Wika 1986). Very characteristic are xerothermic grassland communities, in particular occurring on the rocks. The most at risk in the region are peat bog communities.

The vegetation of the Kraków-Częstochowa Upland is under strong anthropopressure.

The most important factors are:

- changes in the geomorphology (above all exploitation of limestone and sand)
- disturbances in the hydrological and hydrogeological systems (degradation of the quantity and quality of ground waters)
- air pollution (large plants and coal mines in surrounding areas)
- soil pollution (overfertilization)
- tourism, road and rail, communication.

The reaction of vegetation to the anthropopressure is different on particular levels of ecosystems. As for the flora, both reduction and unification have been observed. In the present century about 5% of plant species have become extinct (Michalik 1976; Wika 1986), while many more are endangered. Besides, stenotopic and at the same time mostly rare species are diminishing in cover. Instead, eurhytopic species and anthropofites extend their range. Plant populations react to the human impact in different ways. Some of them react by decreasing in density, sometimes very rapidly (*Drosera rotundifolia* for example) while others, such as the investigated *Dentaria enneaphyllos*, are more stable. Anthropopressure also affects succession processes. This could especially be observed on meadows and peat bogs. The drying up result in the degeneration of this type of vegetation within a few years. Coniferous forests are also very sensitive to pollution. Michalik (1979) analysed these processes in the Kraków Upland.

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KRZYSZTOF JĘDRZEJKO, HENRYK KLAMA, JAN ŻARNOWIEC

Zakład Botaniki Farmaceutycznej Śląskiej Akademii Medycznej
ul. Jagiellońska 4, 41-200 Sosnowiec

MSZAKI WYŻYNY KRAKOWSKO-CZĘSTOCHOWSKIEJ

Bryophytes of the Kraków-Częstochowa Upland

ABSTRACT. In this paper the current state of research on the flora of bryophytes of the Kraków-Częstochowa Upland is presented. Special attention has been paid to the biogeographic separateness of this region. The effect of anthropopressure on the flora of bryophytes is discussed.

KEY WORDS: Kraków-Częstochowa Upland, bryophytes, liverworts, mosses, anthropopressure.

SUMMARY

In the paper the bryological characteristics of the Kraków-Częstochowa Upland are described. From this region, 418 species of *Bryophyta* are known, including 100 species of liverworts and 318 species of mosses, constituting almost 46% of the Polish bryoflora. As many as 133 mountain species were found i.e. 54 liverworts and 79 mosses. In the elaboration, the share of geographical elements and rare and calciphilae species of the bryoflora were discussed, as well as the share of bryophytes in the structure of plant communities and the effect of anthropopressure on the bryophyte flora.

As a result of human activity in the area, 47 species of *Bryophyta* are endangered (34 moss species and 13 species of liverwort).

Prądnik. Prace Muz. Szafera	5	75–93	1992
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KRZYSZTOF JĘDRZEJKO, JAN ŻARNOWIEC HENRYK KLAMA

Zakład Botaniki Farmaceutycznej Śląskiej Akademii Medycznej
ul. Jagiellońska 4, 41-200 Sosnowiec

**ZBIOROWISKA MSZYSTE WYBRANYCH REZERWATÓW PRZYRODY
NA WYŻYNIE KRAKOWSKO-CZĘSTOCHOWSKIEJ**

**Bryophyte communities of selected nature reserves of the
Kraków-Częstochowa Upland**

ABSTRACT. This paper presents the participation of terrestrial bryophytes in the structure of 13 vascular plant phytocoenoses occurring within the areas of the following nature reserves: Dolina Raclawki, Michałowice, Panieńskie Skały, Skała Kmity, and Wąwóz Bolechowicki. Six associations and six moss communities occurring in five types of microhabitat were distinguished. An analysis concerning the effect of anthropopressure on the moss phytocoenoses developing in this area was carried out.

KEY WORDS: Bryophytes, phytosociology, ecology, anthropopressure, nature reserves.

SUMMARY

Investigations were made in 1989-1990 in the region of the Kraków-Częstochowa Upland in 5 nature reserves – Dolina Raclawki, Michałowice, Panieńskie Skały, Skała Kmity, and Wąwóz Bolechowicki.

The participation of terrestrial bryophytes in 13 phytocoenoses of vascular plants was analysed (Tables 2-4). The richest in terrestrial bryophytes were the following plant communities: *Tilio-Carpinetum* – 33 species, *Festucetum pallentis* – 24, and *Dentario glandulosae-Fagetum* – 23. The poorest were: *Aegopodio-Petasitetum hybridi* – 2 species, *Lolio-Cynosuretum* – 6, *Carici-Fagetum* – 9, and *Luzulo pilosae-Fagetum* – 11.

In the investigated area 6 associations and 6 communities of bryophytes were also distinguished (Tables 5-10). Threatened bryocoenoses whose area of occurrence is being reduced owing to anthropopressure are: *Neckero-Anomodontetum viticulosi*, a community with *Porella playtyphylla*, *Seligerio-Fissidentetum pusilli*, *Pellio-Concicephaletum*, *Orthodicraneto-Hypnetum filiformis* and *Ptilidietum pulcherrimae*. Bryophyte communities, which are expanding owing to the degradation of biotops, are: a community of *Schistidium apocarpum-Tortella tortuosa-Enclalpta streptocarpa*, a synusia with *Brachythecium velutinum*, and a synusia with *Atrichum undulatum*.

The epilithic and epiphytic bryophytes are most threatened by anthropopressure.

Prądnik. Prace Muz. Szafera	5	95–108	1992
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KRZYSZTOF JĘDRZEJKO*, STANISŁAW WIKA**

*Zakład Botaniki Farmaceutycznej Śląskiej Akademii Medycznej
ul. Jagiellońska 4, 41-200 Sosnowiec

** Katedra Geobotaniki i Ochrony Przyrody Uniwersytetu Śląskiego
ul. Jagiellońska 28, 40-032 Katowice

**MSZAKI PROJEKTOWANEGO REZERWATU PRZYRODY
„GÓRA STOŁOWA” W JAROSZOWCU (PŁASKOWYŻ OLKUSKI)**

**Bryophytes of the projected “Góra Stołowa” nature reserve
in Jaroszewiec (Olkusz Upland)**

ABSTRACT. This paper contains the result of bryofloristic and synecological investigations carried out in the phytocoenoses of 5 forest and 2 non-forest associations in the projected nature reserve “Góra Stołowa” near Jaroszewiec (Kraków-Wieluń Upland). The authors describe the framework of the moss layer in the well-known associations of vascular plants and also performed an ecological analysis of the related bryocoenoses overgrowing special habitats, such as rotting wood, limestone rocks, epiphytic habitats, and intermediate substrata (altogether 30 synusial bryocoenoses) (e.g. terrestrial-epiphytic or terrestrial-rocky; see Tables 1 and 2).

KEY WORDS: bryophytes, mosses, liverworts, synecology, nature protection, Olkusz Upland, south Poland.

SUMMARY

In this article, a bryological and synecological description of the projected “Góra Stołowa” nature reserve is presented. The investigations were performed in the period 1985-1987. An analysis was made of the participation of terrestrial and other ecological groups of bryophytes in 5 forest (*Leocobryo-Pinetum*, *Phyllitido-Aceretum*, *Dentario enneaphyllidis-Fagetum*, *Carici-Fagetum*, *Luzulo pilosae-Fagetum*) and 2 non-forest associations (*Lolio-Plantaginetum*, *Prunello-Plantaginetum*) of the vascular vegetation (see Table 1).

In the investigated area also distinguished and described were 2 bryo-associations (*Neckero-Anomodontetum viticulosi* and *Seligerio-Fissidentetum pusilli*) and 28 synusial bryocoenoses (*inter alia*: *Porella platyphylla-Homalothecium sericeum*, *Tortella tortuosa-Ditriichum flexicaule*, and others living on limestone rocks and rotting wood etc.). Figs 2 to 5 show the ecological of bryophytes in order of frequency and number of species in forest phytocoenoses in terrestrial and specific microclimates.

In the natural rocky-forest area, which has typical jurassic environment (great limestone rocks, slopes with thermophilous grassy vegetation and forest communities of beech – which are dominant here) altogether 80 species and their infraspecific taxa of bryophytes (*Bryophyta*) were collected. Among them there were 5 species of liverwort (*Hepaticopsoda*). In the group of very rare and rare species within the Kraków-Wieluń Upland region were, *inter alia*, the mosses: *Anomodon attenuatus*, *Brachythecium reflexum*, *Cirriphyllum crassinervium*, *Dicranum polysetum*, *Encalypta vulgaris*, *Fissidens pusillus*, *Homalia trichomanoides*, *Mnium marginatum*, *Neckera* sp. div., *Platydictya jungermannioides*, and *Pylaisiella polyantha*, and from the group liverworts: *Chiloscyphus pallescens* and *Porella platyphalla*. The epilytic are the most threatened by industrial pollution from the Upper Silesian Industrial Region and large emitters of the towns Bukowno and Olkusz.

Prądnik. Prace Muz. Szafera	5	109–148	1992
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MAREK KOSIŃSKI

Institut Botaniki UJ
Zakład Taksonomii Roślin i Fitogeografii
ul. Lubicz 46, 31-512 Kraków

**FLORA NACZYNIOWA SKAŁ, MURAW I ZAROŚLI
KSEROTERMICZNYCH DOLINY BĘDKOWSKIEJ**

Vascular flora of rocks, xerothermic grasslands, and scrubs of the Będkowska Valley

ABSTRACT. A list of the vascular plant species, which occur on rocks, and xerothermic habitats of the Będkowska Valley – one of the karstic ravines of the Kraków Upland – is presented. A characteristic feature of this flora is the great wealth of xerothermic (112 species) and montane (12 species) elements. The greatest curiosity is a stand of *Saxifraga paniculata* – the only in the Kraków Upland. An analysis of the distribution of ecological elements in the valley, the threats to the xerothermic flora, and the ways of protecting it, are presented.

KEY WORDS: Będkowska Valley, xerothermic species, montane species, xerothermic grasslands, natural succession, protection of vegetation.

SUMMARY

The Będkowska Valley is one of the most interesting Jurassic karstic ravines in the Kraków Upland. This area is rich in species stands of rocky and xerothermic flora. It was found, that 322 species of vascular plant grow here. The number of xerothermic species amounted to 112, and montane ones to 12. among curious and rare species of the Kraków Upland in the Będkowska Valley can be found: *Carex pediformis*, *Melica transsilvanica*, *Anemone sylvestris*, *Orobancha lutea*, *Verbascum chaixii* subsp. *austriacum*, *Thesium linophyllum*, *Gentiana cruciata* (xerothermic species), *Dentaria glandulosa*, *Lunaria rediviva*, *Valeriana tripteris* (montane species). The rarest is a rich stand of *Saxifraga paniculata* – unique in the Kraków Upland.

The distribution of xerothermic and montane species depends on the microclimatic conditions (mainly insolation), which are greatly differentiated. Xerothermic species occur in most insolated places, on the upper parts of cliffs and S and SW slopes. Conversely montane species grow on shady, wet and cool cliffs and northern slopes, mostly close to the bottom of the valley.

The rocky vegetation of the middle and northern part of the valley is the most natural. Here are the largest rock massifs and owing to their inaccessibility, the flora was able to survive here without harmful human interference. On the other hand, xerothermic grasslands, which occur in the extreme southern part of the valley, are of anthropogenic origin. The felling of forests on the slopes enabled pastures to be established. Their existence was maintained due to continuous pasturage. They are very rich in species and many plants have here their only stands in the valley.

The main threat to the rocky and xerothermic flora of the Będkowska Valley is natural succession, this concerning mainly semi-natural associations. Also unorganized tourism is an important factor of degradation of flora brought about by people walking on the grasslands, littering of the valley, and picking of flowers. In order to protect the natural values of the Będkowska Valley it is necessary to established a nature reserve in this area.

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ANDRZEJ SZEPTYCKI, ELŻBIETA WARCHAŁOWSKA-ŚLIWA

Instytut Systematyki i Ewolucji Zwierząt PAN
ul. Sławkowska 17, 31-016 Kraków

**CHARAKTERYSTYKA FAUNY
WYŻYNY KRAKOWSKO-CZĘSTOCHOWSKIEJ**

Characteristics of the fauna of the Kraków-Częstochowa Upland

ABSTRACT. The paper concerns the general characteristics of the fauna of the Kraków-Częstochowa Upland, a territory inhabited by more than half the animal species recorded in the Polish fauna. The reasons for this peculiar diversity (ecological and historical) are discussed. The dangers for the fauna resulting from human interference and their results are described and some protection activities proposed.

KEY WORDS: Kraków-Częstochowa Upland, fauna, changes.

SUMMARY

The Kraków-Częstochowa Upland is an area of especially rich and varied fauna, more than half the species known from Poland having been recorded here. The great diversification of the habitats (microclimate, soil type, etc.), the peculiar history in the Pleistocene, and long human activity are the most important reasons for this diversity.

The most interesting group of species living in the area constitutes relicts of different climatic periods. Many of them are represented by very few (or even single) populations, strongly isolated from the main distribution area. The groups of montane and xerothermic species are the most important between them. On the Upland area there are also many interesting species which have spread here as the result of very ancient human activity (agriculture, sheep herding, deforestation etc.).

Many of the species are currently endangered, this being brought about various factors, the most important of which seem to be local activities (building, melioration work, cultivation of wasteland, the use of pesticides and fertilizers, etc.) and the far – reaching effect of heavy industry and mining in the neighbouring areas of Silesia and the Olkusz region. The changes in the hydrological relations caused by the last-mentioned appear to be the most significant. In the protected areas there is the problem of uncontrolled plant succession destroying the (natural or anthropogenic?) grassland habitats.

The effects of heavy industry and mining are very difficult to prevent but control of the local factors is still possible. Of prime importance are the awakening of ecological consciousness in the inhabitants of the area and certain legal restrictions.

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ELŻBIETA WARCHAŁOWSKA-ŚLIWA,
ANNA MARYAŃSKA-NADACHOWSKA, DARIUSZ KOSTIA

Instytut Systematyki i Ewolucji Zwierząt PAN
ul. Sławkowska 17, 31-016 Kraków

**PROSTOSKRZYDŁE (*ORTHOPTERA*)
WYŻYNY KRAKOWSKO-CZĘSTOCHOWSKIEJ**

Orthoptera of the Kraków-Częstochowa Upland

ABSTRACT. During three years of field investigations in the Kraków-Częstochowa Upland 39 species of *Orthoptera* were recorded. The distribution and density of the species from the diversity environmental conditions and may be subject to various climatic and anthropogenic factors. Faunistically unique features are represented in the Ojców National Park.

KEY WORDS: *Orthoptera*, Kraków-Częstochowa Upland

SUMMARY

1. During three years of field investigations in the region of the Kraków-Częstochowa Upland 39 species of *Orthoptera* were recorded. Their distribution varied to a certain extent, in the northern part only 24 species being recorded, while in the middle and southern parts 28 species were found. It seems that such distribution is connected with the greater environmental variation of the latter parts, which are economically used very intensively.

2. The absence of some species can be explained by:

- a) the fact that their determination in the investigations from the 19th and 20th centuries may have been incorrect,
- b) the environmental changes such as overgrowing of grasslands, as well as changes in the character of exploitation of the area,
- c) the short and of necessity incomplete investigations made in the whole Jurassic region.

3. Changes of *Orthoptera* density in the places under investigations may be connected with climatic variations as well as with those resulting from human economic activities.

It was found that was a succession of various *Orthoptera* species depending on the degree of plant coverage development on the waste-heaps of the zinc and lead mines in Bolesław.

4. As far as the area characteristics and the progress of faunal investigations are concerned the Ojców National Park can be regarded as a unique area.

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WALDEMAR CELARY

Instytut Systematyki i Ewolucji Zwierząt PAN
ul. Sławkowska 17, 31-016 Kraków

**WPLYW ANTROPOPRESJI NA FAUNĘ DZIKICH PSZCZOŁOWATYCH
(HYMENOPTERA, APOIDEA) WYŻYNY
KRAKOWSKO-CZĘSTOCHOWSKIEJ**

**Influence of anthropopressure on the wild bee fauna (*Hymenoptera*, *Apoidea*)
of the Kraków-Częstochowa Upland**

ABSTRACT. The effect of various anthropopressure factors on the wild bee fauna (*Apoidea*) in the Kraków-Częstochowa Upland is analysed. The condition of the *Apoidea* fauna according to the degree of anthropopressure in particular parts of the region is presented.

KEY WORDS: anthropopressure, *Apoidea*, Kraków-Częstochowa Upland

SUMMARY

In the Kraków-Częstochowa Upland altogether 262 species of *Apoidea* have been recorded. Current studies showed the absence of 28 species known from the end of the 19th and beginning of the 20th century (e.g., *Anthopora pubescens* Fabr., *Epeolus shummeli* Schill., *Eucera interrupta* Baer, *Meliturga clavicornis* Latr., *Tetralonia macroglossa* Ill., *Xylocopa violacea* L.), and at the same time the occurrence of 35 species new for the region, including 6 new for the fauna of Poland (*Lasioglossum bavaricum* Blüth., *L. podolicum* Nosk., *Nomada bispinosa* Mocs., *N. castellana* Dusc., *N. facilis* Schwarz, and *N. sheppardana* (Kby)).

An increase in anthropopressure during the last 50 years has resulted in great changes of the *Apoidea* fauna. Studies undertaken in recent years (1986-90) showed a considerable decrease in species diversity of the wild bee fauna in central parts of the Kraków-Częstochowa Upland (especially in the Olkusz Industrial Region). The strong industrial pressure in this area result in distinct changes in the landscape (e.g. appearance of waste-heaps and this disappearance of grassland communities. The lack of the mosaic landscape is responsible for the decay of habitats for the nesting of bees. It is probably the principal factor reducing species diversity in the region.

The emission of heavy metals and SO₂ also resulted in a distinct decrease in the wild bee differentiation. Studies undertaken on the frequency of the bumble bee (*Bombus*) and some species of the genus *Psithyrus* showed that at the locality Pomorzany the number of specimens found was only 60-70% of the localities in the southern and northern parts of the Kraków-Częstochowa Upland.

In the southern and northern parts the following factors have negative effects on the condition of the wild bee fauna: burning of grass, overgrazing and afforestation of grasslands, a lack of wooden buildings, and increased use of chemicals in the agriculture.

Prądnik. Prace Muz. Szafera	5	191–222	1992
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ANDRZEJ WŁADYSŁAW SKALSKI

Wyższa Szkoła Pedagogiczna
ul. Waszyngtona 4/8, 42-200 Częstochowa
Korespondencyjny: 42-218 Częstochowa, skr. poczt. 743

ZMIANY FAUNY MOTYLI DZIENNYCH WYŻYNY
CZĘSTOCHOWSKIEJ

Changes in butterfly fauna of the Częstochowa Upland

ABSTRACT. Between 1985 and 1990 the distribution of butterfly in the Częstochowa Upland was investigated. The results were compared with data in the literature as well as with material kept in museums and private collections. From a total of 116 species previously recorded 91 were found. Long term changes during the past 135 years in the butterfly fauna of this area are discussed in detail.

KEY WORDS: Częstochowa Upland, butterfly fauna, *Rhopalocera* annual and long-term changes, fluctuating species, expansion and migrations, species extinction.

SUMMARY

Between 1985 and 1990 the distribution of butterflies in the Częstochowa Upland and its neighbouring area was investigated. The distribution pattern of each species was summarized using a map with the UTM grid. The results were compared with literature data published in the period 1855-1966 (mainly from 1914-1936). Also materials kept in museum and private collections supplemented the study. Amongst a total of 116 butterfly species recorded in this area during the past 135 years, 91 were found in the course of the present field study (Table 1). Of the 25 species not found, 7 had become extinct, while the status of the remaining 18 is uncertain. Judging from the literature data (Table 2) the distribution range of some species has decreased dramatically. The probable causes of extinction and decrease in range of some species are shown in Table 3.

On the other hand, one species is clearly extending its range. The population density of some other species are much higher at present than that which can be judged from the old literature data.

The qualitatively and quantitatively richest butterfly fauna inhabits the xerothermic grass biotops.

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JACEK SZWEDO

Katedra Zoologii Uniwersytetu Śląskiego
ul. Bankowa 9, 40-007 Katowice

**PIEWIKI (*HOMOPTERA*, *AUCHENORRHYNCHA*) WYBRANYCH
ZBIOROWISK ROŚLINNYCH OJCOWSKIEGO PARKU
NARODOWEGO**

**Leafhoppers (*Homoptera*, *Auchenorrhyncha*) of selected plant communities in
the Ojców National Park**

ABSTRACT. The paper reports on 163 leafhoppers species collected within the area of the Ojców National Park. Two species, *Tremulicerus vitreus* (F.) and *Eupteryx immaculatifrons* (Kbm), are new to Polish fauna. The author analyses the composition and chorological character of leafhopper associations.

KEY WORDS: *Auchenorrhyncha*, leafhopper associations, Ojców National Park, chorology.

SUMMARY

Within the area of the Ojców National Park 154 *Auchenorrhyncha* species were collected including 31 new to the fauna of the Kraków-Wieluń Upland and 2 new to Polish fauna (*Tremulicerus vitreus* and *Eupteryx immaculatifrons*). Thus, the total number of the leafhopper species reported from the Park amounts now to 163 constituting 31% of Polish fauna.

It proved possible to define leafhopper groups in certain plant communities. Characteristic species were determined for the groups in forest and thicket communities of the class *Quercus-Fagetum*, meadow communities of the class *Molinio-Arrhenatheretea* and xerothermic ones of the class *Festuco-Brometea*. It was also possible to define distinctive species of the leafhopper groups in typical forest growing on dry land (*Erythria montandoni* and *Eupteryx immaculatifrons*), in marshy meadows (*Sagatus punctifrons* and *Kybos rufescens*) among rushes (*Chloriona smaragdula*), and in thistle meadows (*Cicadula saturata*). Further quantitative investigations must be made before the distinctive species can be defined for the remaining plant communities under analysis.

Within the area of the Ojców National Park the leafhopper species of wide distribution (i.e. Palearctic and Euro-W. Siberian) form the most numerous group, constituting 42,9%; also European (27%) and Holarctic (19,6%) elements are quite frequent.

Prądnik. Prace Muz. Szafera	5	235–245	1992
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KRZYSZTOF SIUDA*, KRZYSZTOF SOLARZ*, ANTONI DERYŁO*,
ALICJA BUCZEK*, TADEUSZ SADOWSKI**,
SŁAWOMIR KWIATKOWSKI*

* Katedra i Zakład Biologii i Parazytologii Śląskiej Akademii Medycznej
ul. Medyków 18, 40-752 Katowice

** II Zakład Higieny i Epidemiologii Śląskiej Akademii Medycznej
ul. Medyków 18, 40-752 Katowice

**BADANIA NAD KLESZCZAMI (*ACARI:IXODIDA*)
WYŻYNY KRAKOWSKO-CZĘSTOCHOWSKIEJ ZE SZCZEGÓLNYM
UWZGLĘDNIENIEM WYSTĘPOWANIA I LICZEBNOŚCI POPULACJI
IXODES RICINUS (L.) (*IXODIDAE*) NA OBSZARACH
W RÓŻNYM STOPNIU ZMIENIONYCH ANTROPOPRESJĄ**

**Studies on ticks (*Acari:Ixodida*) from the Kraków-Częstochowa Upland
with particular consideration of the occurrence and quantity of the population
of *Ixodes ricinus* (L.) (*Ixodidae*) on the territories affected at various
stages of anthropopressure**

ABSTRACT. 7 species of *Ixodida* are known to exist in the Kraków-Częstochowa Upland, the most common being *Ixodes ricinus*. From 1986-1990 the density and distribution of *I. ricinus* was studied. In spite of similar ecological conditions there is a marked variation in the population density of *I. ricinus*, which decreases from East to West where the territory is subjected to strong pressure from Upper Silesian and Olkusz industry. During the last 20 years the extent and intensity of the invasion by *I. ricinus* and *Ixodes trianguliceps* of small mammals have remained unchanged.

KEY WORDS: *Ixodida*, Kraków-Częstochowa Upland, anthropopressure.

SUMMARY

In the period 1986-1990 the fauna of *Ixodida* from the Kraków-Częstochowa Upland, including the Ojców National Park, was investigated. Seven of 20 species of tick permanently existing in Poland were recorded, i.e. *Agras polonicus* Siuda, Hoogstraal, Clifford et Wassef, 1979, *Argas vespertilionis* (Latreille, 1802), *Ixodes trianguliceps* Birula, 1895, *Ixodes crenulatus* Koch, 1844, *Ixodes hexagonus* Leach, 1815, *Ixodes vespertilionis* Koch, 1844, and *Ixodes ricinus* (Linnaeus, 1758).

Special attention was paid to the density and distribution of the populations of *Ixodes ricinus*, which is the commonest tick species in Poland and has great medical and veterinary importance.

The method of collection of ticks from 100m² fields was applied.

In spite of similar ecological conditions there is a marked variation in the population density of *I. ricinus*, which decreases from East to West where the territory under strong pressure from Upper Silesian and Olkusz industry.

In comparison with similar investigations made 20 years ago the extensity and intensity of invasion of small mammals by *Ixodes ricinus* and *I. trianguliceps* in the Ojców National Park were unchanged.

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LEON KOWALEWSKI

Wyższa Szkoła Pedagogiczna
ul. Waszyngtona 4/8, 42-200 Częstochowa

HERPETOFAUNA WYŻYNY CZĘSTOCHOWSKIEJ I JEJ PRZEMIANY W UBIEGŁYM 20-LECIU

Herpetofauna of the Częstochowa Upland and its changes during the last 20 years

ABSTRACT. The results of investigation of 12 amphibian and 6 reptilian species at the Częstochowa Upland are given, and changes in herpetofauna of this area during the last 20 years are discussed. Air and water pollution, drainage of the wet habitats, rapid development of motorization and mass tourism are recognized as the main factors causing disappearance of several species.

KEY WORDS: herpetofauna, changes, Częstochowa Upland.

SUMMARY

The paper presents the results of environmental investigations carried out during the last 20 years and concentrated on the occurrence of amphibians and reptiles in the area of the Częstochowa Upland. Evaluations are given of size and density of the population of 12 amphibian and 6 reptile species living in different environments, i.e. forests, parks, unforested and water habitats. Special attention has been paid to the transformations of the herpetofauna during the last two decades caused by anthropogenic disturbance in many land and water ecosystems. The main negative factors causing the disappearance of amphibians and reptiles are: pollution of the air, the surface waters, and the soil a constant all in the ground water level, drainage of the wetlands, rapid development of motorization, and mass tourism on the "Orle Gniazda" Trail.