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WPLYW ODWADNIANIA OLKUSKICH KOPALŃ RUD CYNKU I OŁOWIU NA STOSUNKI WODNE W PIĘTRZE JURAJSKIM

Impact of the Zn-Pb mines dewatering in Olkusz ore district on the groundwater regime within Jurassic aquifer

ABSTRACT. Long-lasting drainage of the Zn-Pb mines in the Olkusz ore district has led to transformation of the hydrodynamic condition within Jurassic and also Palaeozoic aquifers, hydraulically connected with drained Triassic aquifer. Analysis of the possible influences of the Zn-Pb mines dewatering on the groundwater condition changes within Jurassic aquifer has been delineated in this paper. The main importance in this problem has an geological or structural constraint, connected with occurrence of the non-permeable rocks, deposited between Jurassic and Triassic aquifers.

KEY WORDS: Zn-Pb mines, Olkusz ore district, dewatering impacts, Jurassic aquifer

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SUMMARY

Long-lasting drainage of the Zn-Pb mines in the Olkusz ore district has led to transformation of the hydrodynamic condition within Jurassic and also Palaeozoic aquifers, hydraulically connected with drained Triassic aquifer. Analysis of the possible influences of the Zn-Pb mines dewatering on the groundwater condition changes within Jurassic aquifer has been delineated in this paper. The main importance in this problem has an occurrence of the non-permeable rocks, deposited between Jurassic and Triassic aquifers. In the areas with isolation this aquifer through both Keuper mudstone and Jurassic marls, the influence of the Zn-Pb mines dewatering system on the Jurassic aquifer is non-noticeable or non-occurred. Similar impact of the Zn-Pb mines dewatering is observed in the areas with Jurassic marls, serve as confining bed, underlying of the Jurassic aquifer. Highest impact of the Zn – Pb mines' dewatering on the Jurassic aquifer is occurring in the direct hydraulic contact zones between Jurassic and Triassic aquifers, i.e. a few hydrogeological windows. In connection with relatively small areas of the hydrogeological windows the zones of the significant Jurassic aquifer water table changes has also a small extent. It's also possible that Jurassic aquifer is impacted by Zn-Pb mines dewatering system in the zones of the indirect connection with dewatered Triassic aquifer through permeable Palaeozoic (Devonian-Carbon) limestone rocks.

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**OCENA NATURALNEJ PODATNOŚCI WÓD PODZIEMNYCH
NA ZANIECZYSZCZENIE ANTROPOGENICZNE W REJONIE
OJCOWSKIEGO PARKU NARODOWEGO**

**Assessment of intrinsic vulnerability of groundwater
to anthropogenic contamination in the area of Ojców National Park**

ABSTRACT. Basing on the analysis of the time of vertical seepage of polluted water from the ground surface to groundwater, a differentiated vulnerability of Upper Jurassic aquifer to contamination in the area of Ojców National Park was determined. In the area of Kraków Jura occupied by limestone outcrops, time of vertical seepage does not exceed 1,6 years, locally 4,4 years, whereas in the area covered by Quaternary and Cretaceous overburden it usually reaches 20 years. In general, high natural vulnerability to anthropogenic pollutants of fissure-karst waters is connected with a hydraulic structure of the area studied – combined hydraulic system, large velocities of water flow in the system of fissures and caverns, and temporal retention of water in matrix.

KEY WORDS: Ojców National Park, vulnerability of fissure-karst waters to contamination, hydraulic structure

SUMMARY

Vulnerability assessment of the Upper Jurassic karst – fissured aquifer was calculated according to empirical formulae taking into account seepage time of water and pollutants from the surface to the Jurassic aquifer. In this paper groundwater vulnerability to the surface contamination evaluated in the map by the empirical formulae has been confronted with results of field experiments of vertical seepage time through the aeration zone. The results of evaluation of the Jurassic aquifer in vicinity of Ojców National Park shows its various vulnerability. In the area occupied by limestone outcrops, time of vertical seepage does not exceed 1,6 years, locally 4,4 years, whereas in the area covered by Quaternary and Cretaceous overburden it ranges from 3,0–100 years, mainly 20 years. The Upper Jurassic aquifer forms one hydraulic system. Rock matrix blocks are treated as storage elements and fissures and karstic channels separating them – as transmissivity elements. Open porosity of the Upper Jurassic limestone in vicinity of Ojców National Park is from 0,8 to 18,9%; geometric mean value is 4,6%. Gravity drainage capacity is from 0 to 3,9% and geometric mean is 0,5%. Fracture porosity of limestone within aeration zone, according to field measurements in quarries, is from 0,1% to 1,84%, what corresponds with hydraulic conductivity of fracture permeability from $5,28 \times 10^{-5}$ to $3,36 \times 10^{-3}$ m/s. Cavern porosity of limestone within aeration zone is from 0,8% to 3,1%, but within saturation zone is probably less than 1%. Upper Jurassic aquifer in the area of Ojców National Park is mainly unconfined and shows high specific vulnerability to anthropogenic contamination, which is conditioned by its hydraulic structure. Complex hydrogeological conditions of the karst area and human impact to underground hydrosphere require continuation of hydrogeological investigations. They should aim in better recognition of the occurrence of fissure-karst waters which would result in proper management and protection of their resources.

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JAKOŚĆ WÓD ŹRÓDLANYCH W ZLEWNI PRĄDNIKA

Spring water quality in the catchment of Prądnik

ABSTRACT. Water quality classification of 22 springs placed in the upper part of Prądnik catchment was made. There was a significant difference in water quality between springs placed within Ojców National Park and springs situated at its surroundings. The element which lowered the classification were nitrates. The presence of the pollutants in spring-water is related to the agriculture activity in the catchment and poorly operated waste-disposal systems in rural areas.

KEY WORDS: springs, Prądnik catchment, Ojców National Park, water quality, pollution, hydrology

Skład chemiczny wód źródłanych kształtowany jest przez szereg czynników o charakterze oddziaływań naturalnych, jak i pod wpływem antropopresji. Informacja o klasie jakości wód źródłanych na danym obszarze stanowi syntetyczny opis stanu czystości źródeł. Pogorszenie jakości wody w źródle zwykle jest skutkiem zanieczyszczeń obszarowych – związanych np. z opadem atmosferycznym, opadem pyłów, gazów lub nawożeniem. Na obszarach gęsto zaludnionych źródła narażone są dodatkowo na oddziaływanie czynników o charakterze lokalnym, związanych np. z brakiem kanalizacji na obszarach wiejskich. Wymogi ochrony przyrody w parkach narodowych sprzyjają zwykle ograniczeniu wpływu tych lokalnych ognisk zanieczyszczeń na jakość wód źródłanych. Znacznie trudniej jednak wyeliminować oddziaływanie wielkoskalowe, obejmujące cały obszar zasilania źródeł. Analiza zróżnicowania przestrzennego jakości wód w dolinie Prądnika pozwala wskazać na główne zagrożenia źródeł oraz wnioskować o skuteczności ochrony ich wód w Ojcowskim Parku Narodowym.

Warstwą wodonośną zasilającą źródła w Ojcowski Parku Narodowym są jurajskie margle, wapienie skaliste i płytowe, które stopniowo zapadają w kierunku NE. Utwory czwartorzędowe występują na wierzchołkach w postaci pokryw lessowych oraz w dnach dolin w postaci aluwii. Krążenie wód podziemnych w obrębie jurajskiego zbiornika szczelinowo-krasowego uwarunkowane jest lokalnymi systemami drenażu (Rózkowski 1990).

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SUMMARY

Based on research carried out from 1999 to 2001 a spring-water classification of 22 springs placed in the Prądnik catchment was made. Most of the springs in The Ojców National Park had spring-water of the second quality class (*good*). The springs situated out of the OPN, in the dense populated upper parts of the valley, were classified in the third class (*satisfactory*). In most cases, the classification was lowered by high nitrate concentration. The nitrate origin was connected with the agriculture activity in the upper part of spring drainage area, and the pollution of rain-water, as well. The highest nitrate concentration was probably the effect of the leakage of the pollutants from household waste-disposal systems in rural areas.

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ZANIECZYSZCZENIE POWIETRZA OJCOWSKIEGO PARKU NARODOWEGO

Air pollution of the Ojców National Park

ABSTRAKT. Lichen *Hypogymnia physodes* (L.) Nyl. was used for the estimation of air pollution by heavy metals and sulphur dioxide in Ojców National Park. During two summer seasons 2001, 2002 and two winter seasons 2001/2002, 2002/2003 lichens were transplanted to 27 sites located in ONP. Also *H. physodes* from 9 sites in natural environment was collected. The obtained data indicate still high air contamination by heavy metals and sulphur dioxide of ONP.

KEY WORDS: Ojców National Park, air pollution, *Hypogymnia physodes*, heavy metals, sulphur

WSTĘP

Ojcowski Park Narodowy należy do najbardziej zanieczyszczonych parków narodowych w Polsce (Grodzińska i in. 1990; Sawicka-Kapusta, Rakowska 1993, Lubczyński 1998, Sawicka-Kapusta i in. 2005a). Ze względu na swoje niekorzystne położenie geograficzne, pomiędzy dwoma silnymi ośrodkami miejsko-przemysłowymi – Górnośląskim i Krakowskim, a także w związku z bliskim sąsiedztwem Olkusza, Jaworzna i Trzebini przez wiele dziesięcioleci narażony był na szkodliwe oddziaływanie emisji przemysłowych. Brak realnej strefy buforowej i duży ruch turystyczny dodatkowo powoduje bezpośrednią, silną antropopresję.

Wykonana w 1998 r., przy pomocy bioindykacji, ocena zanieczyszczenia powietrza parków narodowych wykazała wysokie koncentracje metali ciężkich i dwutlenku siarki na terenie OPN i zaliczyła go do grupy parków zdegradowanych (Sawicka-Kapusta i in. 2005a). Do badań tych wykorzystano, często stosowany w biomonitoringu, epifityczny porost *Hypogymnia physodes* (L.) Nyl., występujący powszechnie na terenie całej Polski. Wyniki otrzymane dla OPN oparte były na niewielkim materiale, ponieważ porost ten znaleziono tylko na sześciu stanowiskach. Aby sprawdzić wiarygodność uzyskanych wcześniej informacji, w latach 2001–2003 wykonano kompleksowe badania, również z zastosowaniem

Summary

For a long time Ojców National Park belonged to the most contaminated national park in Poland. The aim of the study was to find out if the situation has been improved during last few years. Air pollution caused by heavy metals and sulphur dioxide was estimated using the epiphytic lichen *Hypogymnia physodes* as a bioindicator. During two summer seasons 2001, 2002 and two winter seasons 2001/2002, 2002/2003 lichens from a clean area of Borecka Forest were transplanted to 27 sites located in ONP. Also *H. physodes* from 9 sites in natural environment was collected. Concentrations of Cd, Pb, Cu, Zn and S were determined in lichen samples collected after six months of an exposition and in lichens occurred in their natural ecosystem. The higher accumulation of lead and cadmium were found in both summer seasons when compared with winter. The lowest accumulations of both toxic metals were found in last winter season 2002/2003. Copper showed the same pattern. Zinc accumulations were very similar in the both summer seasons, while the highest accumulation was noticed in winter season 2002/2003. Sulphur accumulation was higher in the winter season 2002/2003 than in the previous one. There were significant effects of heating season on sulphur accumulation in transplanted lichens. Heavy traffic was the main reason of lead, cadmium and copper accumulation in lichens during summer season. Concentrations of the metals and S in the lichens collected from natural environment were very high. The results from transplanted and collected lichens from natural condition still confirmed the high air contamination of ONP.

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**KRAJOBRAZY I ROŚLINNOŚĆ OJCOWSKIEGO PARKU
NARODOWEGO W DAWNEJ I OBECNEJ FOTOGRAFII
ORAZ NIEKTÓRE ZAGADNIENIA ICH OCHRONY**

**Landscape and vegetation of the Ojców National Park in ancient and
present photographs and some problems of nature conservation**

ABSTRACT. This paper contains selected old and new photographs from the Ojców National Park (ONP), and some descriptions of presented sites and situations. The features of landscape and vegetation from various years are compared and the examples of active nature conservation presented and discussed.

KEY WORDS: Photographs, Ojców National Park, vegetation, succession, active nature conservation

SUMMARY

The Ojców National Park (ONP) has a rich photographic documentation made by various authors from the end of XX c. until now. The present paper contains 28 selected examples of those pictures, from various places (Fig. 1), with information about landscapes, vegetation and active nature conservation. Photographs taken into account are the following (Roman numbers as in Polish text):

I. Vicinity of Cracow Gate „Brama Krakowska”. Sawmill (liquidated years ago) and tree balls (Photo 1) are pointing at forest exploitation; state of landscape and forests regeneration in condition of National Park was documented later (Photo 2)

II. Isolated rock „Igła Deotymy” and surroundings. Forest clearing (on the second plan) existing in the past (Photo 3) and landscape, with vegetation, after years (photo 4). At present the Deotyma Rock is overgrown by Virginia creeper.

III. The valley of Prądnik river near Grodzisko in the time of intensive agricultural use (Photo 5) and at present, trees were partially planted (Photo 6).

IV. View from the castle in Ojców towards the valley of rivulet Prądnik about the middle of XX c. (Photo 7); on the left side forests with domination of fir, which declined later upon influence of air pollution.

V. The rocks „Skały Czyżówki” nearly 50 years ago (Photo 8); low vegetation on their top is shaded at present by shrubs and trees. Old homes do not exist now and vegetation on foreground is distinctly changed (Photo 9).

VI. Meadows in the valley of Prądnik – typical aspect near Grodzisko, connected with mowing of vegetation (Photo 10) and present state of that meadow not so intensively used (Photo 11).

VII. Central area of the Ojców National Park with the rock Skała Krukowskiego – locality of *Stipa joannis* (Photo 12) and part of the same rock after cutting of trees (Photo 13).

VIII. The rocks Panieńskie Skały about 40 years ago (Photo 14) and to-day (Photo 15); in place of the removed thickets some xerothermic grassland is developed.

IX. The foot of the rocks Rękawica on Góra Koronna, formerly (cfr. Photo 2) and recently (Photo 16). The clearings are there exceptionally waste, but the regeneration of shrubs and trees make difficult the maintenance of open, herbaceous vegetation (Photo 17).

X. Mixed forest with fir, other conifers and deciduous trees on higher parts of the area – plateau – covered by loess (Photo 18); fir began to decline 15 to 20 years later in time of air pollution (Photo 19, 20).

XI. Still existing mixed forests with bilberry: small fragment in central part of the ONP (Photo 21), more extensive plots at the peripheries of the Park – on western side with domination of beech (Photo 22) and at eastern border (Photo 23).

XII. The ruins of a castle from XIV c. in Ojców. Previous state (Photo 24) and the appearance after forest clearings on the adjacent slopes (Photo 25, 26).

XIII. The Renaissance castle Pieskowa Skała in former state of surroundings (Photo 27) and at present (Photo 28).

Final remarks

Some changes of land management in the Ojców National Park (e.g. abandonment of mowing of meadows and pasturage of home animals on the slopes) stimulate the succession to forest on previously open places. To arrest such changes the active nature conservation is applied, consisting mainly on removal of shrubs and trees. Results of those actions and other features of the area presented on the enclosed photographs are discussed briefly (together with some objections) in the last part of Polish text. In Polish text are also information about the forests and quotations of adequate, most important positions of literature.

The major part of ancient photographs in the present paper was made by Dr. Wiktor Medwecki (Photo 29).

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**MCHY OJCOWSKIEGO PARKU NARODOWEGO
NA TLE PRZEMIAN SZATY ROŚLINNEJ**

**Mosses of the Ojców National Park
against the background of changes of the vegetation**

ABSTRACT: This paper presents the results of studies on the moss flora of Ojców National Park (S Poland). The flora under discussion consists of 152 species (15 of them were recorded for the first time in this area). The analyses of some ecological features and influence of anthropopression are presented. Also the group of montane species is discussed.

KEY WORDS: mosses, vegetation, frequency, geographical and ecological groups, Ojców National Park

SUMMARY

The briological study compares 21 localities in the area of Ojców National Park. The moss flora consist of 152 species, including 15 new to mentioned region. This paper contains a general characterization of this flora (frequency, geographical and ecological groups) and their changes conected with transformation of the vegetation. Wastages of bryoflora (63 unconfirmed species) and mosses of anthropogenic habitats (54 species) are also discussed.

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**WPŁYW GOSPODARCZEJ DZIAŁALNOŚCI CZŁOWIEKA
NA FLORE OJCOWSKIEGO PARKU NARODOWEGO
I JEGO OTULINY**

**The Influence of Human Economy on the Flora
of the Ojców National Park and Its Protection Zone**

ABSTRACT. An analysis of the impact of human economy on the flora of the Ojców area during the last two centuries shows that two periods differing in the nature of the changes can be distinguished. From the early 19th century to about 1960, the number of oligothermal, shade-loving and hygrophilous species decreased with some becoming extinct, replaced by xerothermic, mesophilous and photophilous species. During this period, 36 species (4% of the flora) went extinct, including 21 growing on wet meadows and 7 in shady forests.

After the Ojców National Park was established in 1956, with the accompanying reduction of forest use and agriculture (elimination of grazing and mowing), the previous trends in flora transformations were reversed. During this period, some 45-50 species (5-6% of the flora) became extinct, mainly xerothermic and photophilous, growing in grasslands, meadows and loose scrubs.

KEY WORDS: anthropogenic changes of vascular plant flora, species extinction, active protection, Ojców National Park

SUMMARY

The vascular plants of the vicinity of Ojców have been the subject of thorough research since the beginning of the 19th century (Besser 1809, Bardau 1859a,b; Jelenkin 1901). The detailed studies resumed after the establishment of the Ojców National Park and covered all the vascular plants of the area (Michalik 1987) and selected groups of species (Michalik 1979a, 1983). The comparison of floral data from different periods permitted the evaluation of anthropogenic changes in the flora of the vicinity of Ojców (Michalik 1974, 1990a,b, 1991a,b, 1993a, 1996).

The analysis of the influence of human economy on the flora of the surroundings of Ojców in the last 200 years shows two periods which differ in the character of changes.

The period of 150 years from the beginning of the 19th century to 1960 is distinguished by the vanishing of oligothermal, shade-loving and hygrophilous flora and the expansion of xerothermic, mesophilous and photophilous species. It was mainly connected with forest felling on the slopes and the drainage of water-logged meadows on the valley floors. During the discussed period about 4% of flora vanished and the number of 32% of it decreased significantly. The expanding species made up 23% of flora including 4% of alien, mainly synanthropic species which are new to the investigated area.

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**PRZEMIANY ROŚLINNOŚCI KSEROTERMICZNEJ
NA POWIERZCHNI BADAWCZEJ „GRODZISKO”
W OJCOWSKIM PARKU NARODOWYM**

**Changes of xerothermic vegetation in the study area “Grodzisko”
in Ojców National Park**

ABSTRACT. The article shows the results of research conducted in the "Grodzisko" established study area in the years 2001–2005. The research aimed at determining the present state of xerothermic vegetation as well as at making the comparison of the composition and surface participation of plant communities in relation to collected earlier archival material. The observations also included the assessment of the effectiveness of protection measures on grass recreation. The research findings confirm the presence of 11 plant communities in the "Grodzisko". The occurrence of the majority of them was already proved in the years 1963, 1986 and 1991. The study also shows that using protection measures, especially in the case of *Origano-Brachypodietum*, has a very positive influence on the preservation of xerothermic grasses in the discussed area.

KEY WORDS: xerothermic vegetation, established study areas, protection measures, Ojców National Park

SUMMARY

Phytosociological research conducted in the “Grodzisko” observation area in the years 2001–2005 established the occurrence of 11 plant communities. The existence of the majority of them in the discussed area was earlier determined by Michalik (1990c, 2003). The comparative analyses of changes in the area occupied by the communities described herein based on the latest vegetation map (2005) and the archival maps of 1963, 1986 and 1991 indicate that the major changes concern the proportion of forest and shrub communities participation in relation to different types of xerothermic grasses. Even towards the end of the 1980s the process of overgrowing grasses was a common occurrence, with the result that the area of grass decreased systematically. After putting the protection measures into practice the situation changed and the most threatened with extinction *Origano-Brachypodietum* started to regenerate – Tab. 5, 7. Thus, the protective action undertaken so far needs to be absolutely continued, furthermore, it should be extended to the area occupied by rock grasses *Festucetum pallentis* and thermophilous shrubs *Potentillo albae-Quercetum*. Only such extensive protection will guarantee the existence of xerothermic communities which have the role of refuges to many rare and endangered domestic species.

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**PRÓBA WYTYPOWANIA RELIKTOWYCH POPULACJI SOSNY
ZWYCZAJNEJ NA TERENIE OJCOWSKIEGO PARKU
NARODOWEGO**

**An attempt to select relict Scots pine populations on the territory
of Ojców National Park**

ABSTRACT: The study presents results of variation in respect to 7 morphological needles traits in three *Pinus sylvestris* L. populations localized in Ojców National Park. The obtained results point to distinct character of Scots pine from Skały Wernyhory found on difficult to reach rocks and cliffs. The Scots pine from the hill called Grodzisko possess the set of needle traits, in part, similar to the third groups of trees growing on Skały Katarzyńskich.

KEY WORDS: *Pinus sylvestris*, Ojców National Park, relict population, needle morphological traits.

SUMMARY

Seven morphological needle traits were used for comparative analysis of three populations of the Scots pine (*Pinus sylvestris* L.) from the Ojców National Park. Based on testing significant differences in the mean value of the traits describing the number of stomata, the result of the analysis proves the distinction of the population found in “Skały Wernyhory”. Trees of the distinguished population are found on a difficult to reach rock cliff and may constitute the remains of relict forests of the Scots pine. However, similar in the investigated traits, populations: “Grodzisko” and “Skały Katarzyńskich” that are found in areas anthropogenically modified to a large degree may come as a result of natural succession that has been observed over the last several years (“Grodzisko”), and are likely to be the consequence of planned reforestation (“Skały Katarzyńskich”).

Translated by the authors

Prądnik. Prace Muz. Szafera	16	125–134	2006
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**JĘZYCZNIK ZWYCZAJNY *PHYLLITIS SCOLOPENDRIUM* (L.)
NEWM. W OJCOWSKIM PARKU NARODOWYM
– ROZMIESZCZENIE, OCENA LICZEBNOŚCI,
STRUKTURA I DYNAMIKA POPULACJI***

**Common hart's tongue *Phyllitis scolopendrium* (L.) Newm.
in the Ojców National Park – distribution, number estimation,
structure and dynamics of population**

ABSTRACT. The present distribution and occurrence conditions of the fern *Phyllitis scolopendrium* in the Ojców National Park are presented in the paper. Frequency of its occurrence, the area covered by the species, the size structure and age structure of the population has been estimated. The dynamic tendency of the fern growing within borders of the Park – in relation to previous investigations – also has been given.

KEY WORDS: pteridophytes, vascular plants, demography, distribution, protected and rare species, size structure

SUMMARY

Research shows that at the present time there are 5 localities, with 21 distinct conglomerations, of common hart's tongue *Phyllitis scolopendrium* within boundaries of the Ojców National Park (Fig. 1). Only one locality in Pieskowa Skała has not been found, and probably it has to be accepted as a non-existent one. In the area of the Cracow-Częstochowa Jura this species is mainly associated with rock outcrops, and in the Ojców National Park as many as 63% of conglomerations found, occupy calcareous rock walls, 26% occupy their bases, and only 11% are present on steep slopes. Generally these are the sites of northern or northeastern exposure, and large slope inclination, even up to 75% (Fig. 2).

The demographic studies show that there are at least 6157 individuals of common hart's tongue within the park boundaries, covering a total area of 3821 m². This is 1/3 of resources of this species in the entire Jura. The average size of a hart's tongue conglomeration is 182 m² (min. 1 m², max. 1900 m²), and the average number of individuals in a single

conglomeration is 293 plants (min. 1, max. 2500). The population density varies from 0.25 to 4.9 individuals per 1 m², and its maximum values have been found on rock walls as well as on steep slopes. A comparative analysis, conducted on permanent study plots, shows that during the last 9 years (1993–2002) the numbers of common hart's tongue in the Ojców National Park have increased from 153% in Wąwóz Ciasne Skalki to 207% on Chełmowa Góra. The highest number increase has occurred among juvenile individuals (from 280% to 322%), while that of mature individuals has been from 43% to 224%. In none of the hart's tongue locality symptoms of population growing old have been observed, although in many localities senile individuals have been found (Fig. 3–4).

This study shows that common hart's tongue in the Ojców National Park is not an endangered species. A proper stage structure of the population, and a good condition of plants, provide basis for the optimistic forecast of the future.

Translated by the authors

Prądnik. Prace Muz. Szafera	16	135–140	2006
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**STAN LICZEBNOŚCI *STIPA JOANNIS* CEL.
W OJCOWSKIM PARKU NARODOWYM**

The number of *Stipa joannis* Cel. in the Ojców National Park

Abstract: The number of tufts, generative shoots and careopses of *S. Joannis* on the Jonaszówka, Skała Krukowskiego, Skały Kawalerskie, and Góra Koronna was estimated in 2005 and 2006.

Key words: rare species, *Stipa joannis*, Ojcowski Park Narodowy, number of population

SUMMARY

Stipa joannis is an endangered species that grows in a few locations in Ojców National Park. The number of tufts on the Jonaszówka in 2005 was 14, in 2006 33 whilst on the Skała Krukowskiego 33 and 55 respectively, on the Skały Kawalerskie 11 and 38, on the Góra Koronna 14 and 10. Tufts formed different number of generative shoots – generally 1 or 2. The number of careopses on the generative shoots was not constant but most often it was 7.

Translated by the authors

Prądnik. Prace Muz. Szafera	16	141–145	2006
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**OPRACOWANIE METODY PRZERYWANIA SPOCZYNKU NASION
ORAZ OTRZYMYWANIA MATERIAŁU ROZMNOŻENIOWEGO
U WYBRANYCH GATUNKÓW RODZAJU *STIPA***

**The method of breaking dormancy
and obtaining plant material of some *Stipa* species**

ABSTRACT. *Stipa* species belong to rare and endangered plants because of low ability to restore their populations. This is why these species have been included into so called “red book” collecting all Polish species which are threatened. This fact stimulates attempts to find an efficient method of germinating seeds of the species and culture young plants for numerous purposes like breeding, reintroduction into natural environment or for further scientific researches.

KEY WORDS: *Stipa joannis*, *Stipa pulcherrima*, endangered species, breaking dormancy, embryos isolation.

SUMMARY

Stipa species belong to endangered plants included in the “Polish Red Book of Plants”. They are threatened mainly because of natural succession. The aim of these studies was to check the germination ability of *S. joannis* and *S. pulcherrima* seeds and in a case of dormancy to overcome it. The temperature of six months’ storage had no significant effect on seed germination, although the higher temperature helps germination of *S. joannis*. It was shown that the *Stipa* seeds’ dormancy can be broken by isolation of embryos. The mean percentage of filled caryopsis was observed. That fact is considered to be one of the reasons of low reproduction success of *Stipa* species and also can explain why they are endangered despite a succession.

Translated by the authors

Prądnik. Prace Muz. Szafera	16	147–152	2006
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**WIREK ŁĄDOWY – *MICROPLANA TERRESTRIS* (O.F. MÜLLER, 1774)
W OJCOWSKIM PARKU NARODOWYM**

**The land planarian – *Microplana terrestris* (O.F. Müller, 1774)
in the Ojców National Park**

ABSTRACT. Presence of land planarians of the *Microplana terrestris* (*Platyhelminthes*, *Tricladida*, *Terricola*) in the Ojców National Park (Poland).

KEY WORDS: *Microplana terrestris*, *Rhynchodemus*, *Terricola*, *Tricladida*, *Platyhelminthes*, distribution, Ojców National Park, Poland

SUMMARY

Student Naturalists Club of UAM in Poznan (A. Mickiewicz University) held a research ‘camp’ in Ojcow National Park in southern Poland. Field investigations resulted in the discovery of a significant and rare species of terrestrial flatworm (*Turbellaria*), *Microplana terrestris* (O.F. Muller 1774). The new site is in the gorge of Korytania (leg. et det. J. Kolasa). The species has been previously reported from Ojcow in the area of Chelmowa hill.

The establishment of a strict nature reserve in the gorge of Korytania, along with the closure of the nearby road from automobile circulation, offers guarantees of preservation of natural habitats, including those necessary for *Microplana* to thrive. The road closure is particularly important because of the lay of the land that permits surface overflow of rain waters from the tarmac road, which would otherwise spread harmful chemicals into the flatworm inhabited areas.

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Prądnik. Prace Muz. Szafera	16	153–164	2006
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**AKAROFAUNA OJCOWSKIEGO PARKU NARODOWEGO
NA TLE POZOSTAŁYCH PARKÓW NARODOWYCH W POLSCE**

**Acarofauna of the Ojców National Park
in comparison to the rest of national parks in Poland**

ABSTRACT. The paper is summing up the state of investigation of mites (Acari) with the special account on soil species in the Ojców National Park. The park, despite its relatively small area, has a big richness of acarofauna. There has been stated more than 300 of species of mites from different systematic groups, so far. The most numerous groups are Gamasida (=Mesostigmata) – 129 species and the oribatid mites (Oribata) – 106 species.

KEY WORDS: aracofauna, mites, National Parks

SUMMARY

State of investigation of mites in particular national parks in Poland is varied. The analysis of data from the literature and from the author's own studies indicates that Ojcowski National Park, despite its small area, is one of the richest national parks in the country as regards the number of species of mites.

One of the best studied groups of mites in ONP are Gamasida with 129 species, that places this park as regards the number of species of this group, on the second position after Białowiecki National Park. Oribatid mites (106 species) have been also investigated very well here. The rest of groups have been studied slightly so far as well as in the most of national parks. One of the most interesting things is the occurrence of two species from genus *Labidostomma* (Acari: Actinedida): *L. luteum* i *L. denticulata*, which reaches in this area adequately the south and the north range limit.

Translated by the authors

Prądnik. Prace Muz. Szafera	16	165–168	2006
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***PHAULODIASPIS ADVENA* (TRÄGARDH, 1992) – INTERESUJĄCY
ROZTOCZ Z JASKIŃ OJCOWSKIEGO PARKU NARODOWEGO
(ACARI: MESOSTIGMATA)**

***Phaulodiaspis advena* (Trägårdh, 1992) an interesting mite from the caves
of the Ojców National Park**

ABSTRACT. The authors present the ecology and distribution of one species of mite occurring in caves of the Ojców National Park – *Phaulodiaspis advena* (Trägårdh, 1992).

KEY WORDS: *Phaulodiaspis advena*, mites, caves

SUMMARY

Phaulodiaspis advena (Trägårdh, 1992) is a troglophilous species of mite which is known in Poland from only few caves and hovels in the Ojców and Tątry National Parks. This rare and interesting species are in danger because of the evanescence of bats colonies which are the main habitat of this species.

Translated by the authors

Prądnik. Prace Muz. Szafera	16	169–172	2006
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**WKŁAD PROF. JANA RAFALSKIEGO W POZNANIE AKAROFAUNY
OJCOWSKIEGO PARKU NARODOWEGO**

**The Professor's Jan Rafalski contribution to the investigation
of acarofauna of the Ojców National Park**

ABSTRACT. The authors present the contribution of Professor Jan Rafalski to the development of investigations of acarofauna of the Ojców National Park.

KEY WORDS: acarofauna, Ojców National Park, Jan Rafalski

SUMMARY

Authors introduce the contribution of Professor Jan Rafalski, the creator of Polish acarology, in the study on acarofauna of Ojcowski National Park. Professor Rafalski is the first person who after the second war have made the valuation of state of investigation arachnids in this park: spiders (*Aranei*), harvestmen (*Opiliones*), pseudoscorpions (*Pseudoscorpioniodea*) and mites (*Acari*).

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Prądnik. Prace Muz. Szafera	16	173–178	2006
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**PRZEGLĄD BADAŃ NAD FAUNĄ KLESZCZY (*ACARI: IXODIDA*)
WYŻYNY KRAKOWSKO-CZĘSTOCHOWSKIEJ**

**The review of researches on the fauna of ticks (*Acari: Ixodida*)
in the Kraków-Częstochowa Upland**

ABSTRACT. The historical review of researches on the fauna of ticks (*Acari: Ixodida*) in the Kraków-Częstochowa Upland since the studies of Waga (1855, 1857) until the end of 2004 was made. Seven of total 19 ticks Polish ticks species is reported to dwell the Upland. Non-nidicolous species: *Ixodes ricinus* and *I. trianguliceps*, and nidicolous ticks: *Argas polonicus*, *Carios vespertilionis*, *Ixodes crenulatus*, *I. hexagonus*, *I. vespertilionis*.

KEY WORDS: *Ixodida*, ticks, *Ixodes*, *Carios*, *Argas*, Kraków-Częstochowa Upland, fauna of Poland

SUMMARY

Following paper contains the historical review of studies on the fauna of ticks (*Acari: Ixodida*) in the Kraków-Częstochowa Upland – since the studies of Antoni Waga (1855, 1857) until the end of 2004. Currently seven of the total of nineteen ticks species in Poland occur in the Upland. *Carios vespertilionis*, *Ixodes vespertilionis* – parasiting bats and *Ixodes crenulatus* dwell Upland's caves. *Ixodes trianguliceps* is a frequent parasite of small mammals. *Argas polonicus* and *Ixodes hexagonus* have been reported from a few localities.

The most common species in the Kraków-Częstochowa Upland is *Ixodes ricinus* (99 confirmed localities). The occurrence and the number of ticks in certain localities is different. The number of ticks reported from the confirmed localities in the Upland varied from 1 to 75 specimens per 100 m².

I. ricinus is the species of the biggest importance in the epidemiology of transitive diseases. Recent researches conducted in the Upland revealed that the prevalence of *I. ricinus* infestation with *Borrelia burgdorferi* s. lato spirochetes varies from 14.3% to 66.7% with the average 26.8%.

Translated by the authors

Prądnik. Prace Muz. Szafera	16	179–183	2006
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**MSZYCE (*HEMIPTERA*, *STERNORRHYNCHA*, *APHIDINEA*)
ZWIĄZANE Z ROŚLINAMI UPRAWIANYMI NA TERENIE
OJCOWSKIEGO PARKU NARODOWEGO**

**Aphids (*Hemiptera*, *Sternorrhyncha*, *Aphidinea*) related to plants cultivated
in the area of the Ojców National Park**

ABSTRACT. During the research on aphids (*Hemiptera*, *Sternorrhyncha*, *Aphidinea*) of the Ojców National Park, 34 species of aphid superfamilies *Phylloxeroidea* and *Aphidoidea* related to 34 species of crop plants or breed plants were recorded. Among those aphids, 23 species were also recorded from 95 species of other plants, growing in various habitats. Clear correlation between floristic element and number of aphid species is not observed. The growing number of polyphagous and oligophagous aphids, as well as species with wide ecological spectrum may suggest increasing pressure on natural and seminatural habitats protected in the Park.

KEY WORDS: Ojców National Park, Kraków-Częstochowa Upland, *Aphidinea*, faunistic research

SUMMARY

Aphids are phytophagous hemipterans closely related with their host plants. Even regarded as pests, these insects are also important elements of biocoenoses. There are 705 species of aphids recorded from Poland, but data on these insects inhabiting area of the Ojców National Park (OPN) are extremely scarce. During the research on aphids of the OPN, 34 species of aphid superfamilies *Phylloxeroidea* and *Aphidoidea* related to 34 species of crop plants or breed plants were recorded. Among those aphids, 23 species were also recorded from 95 species of other plants, growing in various habitats (Table 1). The most common aphid species was *Aphis fabae* (28.7% of all specimens collected) recorded on apophytes, as well as kenophytes and archaeophytes. High ratio of polyphagous and oligophagous aphid species (76%) and relatively high ratio of heteroecious species could be related to human activity in the OPN area. Most aphid species are recorded on antropophytes, number of species collected on apophytes, and archaeophytes and kenophytes are similar. Clear correlation between floristic element and number of aphid species is not observed. Explicit assessment of the synanthropization degree of aphid fauna in the area of OPN is not possible at this moment. However, some observed tendencies and processes, e.g. growing number of polyphagous and oligophagous aphids, and species with wide ecological spectrum could suggest increasing pressure on natural and seminatural habitats protected in the Ojców National Park area.

Translated by the author

Prądnik. Prace Muz. Szafera	16	185–188	2006
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**STAN POZNANIA LĄDOWYCH PLUSKWIAKÓW
RÓŻNOSKRZYDŁYCH (*HEMIPTERA: HETEROPTERA*)
OJCOWSKIEGO PARKU NARODOWEGO**

**State of knowledge of the terrestrial bugs (*Hemiptera: Heteroptera*)
of the Ojców National Park**

ABSTRACT. The article presents actual knowledge of *Heteroptera* of the Ojców National Park and nearby areas. Basing on literature data, the paper presents the occurrence of some true bugs in the Park. Biodiversity of plant assemblages and many diverse microhabitats on the area of the Ojców National Park make a contribution to a high number of species, but for many years only a few species have been found in the Park.

KEY WORDS: Ojców National Park, Kraków-Częstochowa Upland, *Heteroptera*, faunistic research

SUMMARY

Ojców National Park is situated in the southern part of the Kraków-Częstochowa Upland. The first data concerning the true bugs (*Heteroptera*) of this area were reported by Waga during the Naturalist's First Trip to Ojców in 1854. The number of collected species was relatively small (7 species). Other authors (Smreczyński 1906,1954; Stobiecki 1915; Strawiński 1936; Lis 1989, 1990) reported on approximately 12 more species of terrestrial true bugs in Ojców National Park.

Diversity of plant assemblages and many diverse microhabitats within the area of the Park are conducive to the richness and variety of insect fauna. This faunistic research in Ojców National Park has been conducted for three seasons and confirms the diversity of *Heteroptera*.

Translated by the authors

Prądnik. Prace Muz. Szafera	16	189–197	2006
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**ZRÓŻNICOWANIE GATUNKOWE ROŚLINIAREK
(HYMENOPTERA: SYMPHYTA)
W OJCOWSKIM PARKU NARODOWYM**

**Species diversity of the sawflies (*Hymenoptera: Symphyta*)
in the Ojców National Park**

ABSTRACT. The paper present the results of research on the species diversity of the sawflies (*Hymenoptera: Symphyta*) of the Ojców National Park. 134 species representing 10 families were recorded: *Cephidae*, *Megalodontesidae*, *Pamphiliidae*, *Siricidae*, *Xiphydriidae*, *Argidae*, *Cimbicidae*, *Diprionidae*, *Tenthredinidae*, and *Xyelidae*. The information on the food plants is given for each and every sawfly species. The comparison between the species recorded in the Park and the number of species known from Poland is also made.

KEY WORDS: Ojców National Park, Kraków-Częstochowa Upland, *Hymenoptera*, *Symphyta*, faunistic research

SUMMARY

The research on the species diversity of the sawflies (*Hymenoptera: Symphyta*) of the Ojców National Park were carried out during the years 1998–2000 and 2002–2003. As the result of the studies 134 species representing 10 families were recorded: *Cephidae*, *Megalodontesidae*, *Pamphiliidae*, *Siricidae*, *Xiphydriidae*, *Argidae*, *Cimbicidae*, *Diprionidae*, *Tenthredinidae*, and *Xyelidae*. The authors have also checked the collection of the Museum of the Upper Silesia in Bytom and the species housed in the collection are also included in the present paper. The information on the food plants is given for each and every sawfly species (tab.1). The comparison between the species recorded in the Park and the number of species known from Poland is also made (tab. 2).

Translated by the authors

Prądnik. Prace Muz. Szafera	16	199–208	2006
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NIETOPERZE OJCOWSKIEGO PARKU NARODOWEGO – STAN POZNANIA

Bat fauna of the Ojców National Park – status of recognizing

ABSTRACT. Known the bats' positions were surveyed on terrain of Ojców National Park and its buffer zone. It was showed occurrence of 17 bats species: *Rhinolophus hipposideros*, *R. ferrumequinum*, *Myotis myotis*, *M. bechsteinii*, *M. nattereri*, *M. emarginatus*, *M. mystacinus*, *M. brandtii*, *M. dasycneme*, *M. daubentonii*, *Eptesicus nilssonii*, *E. serotinus*, *Nyctalus noctula*, *N. leisleri*, *Plecotus auritus*, *P. austriacus* and *Barbastella barbastellus*. The most important bats' positions are: Ciemna Cave, Łokietka Cave and the caves of Jamki Ravine.

KEY WORDS: *Chiroptera*, bat localities, Ojców National Park

SUMMARY

It was showed occurrence of 17 bats' species in Ojców National Park and its buffer zone: *Rhinolophus hipposideros*, *R. ferrumequinum*, *Myotis myotis*, *M. bechsteinii*, *M. nattereri*, *M. emarginatus*, *M. mystacinus*, *M. brandtii*, *M. dasycneme*, *M. daubentonii*, *Eptesicus nilssonii*, *E. serotinus*, *Nyctalus noctula*, *N. leisleri*, *Plecotus auritus*, *P. austriacus* and *Barbastella barbastellus*. The largest number of positions was affirmed for *Rhinolophus hipposideros* and *Myotis myotis*. They make up group of comparatively in great number affirmed bats' species: *M. daubentonii*, *P. auritus* and *B. barbastellus*. One of the smallest number of positions (< 5) noted down for: *R. ferrumequinum* (1), *N. leisleri* (1), *P. austriacus* (1), *M. bechsteinii* (2), *M. emarginatus* (3), *N. noctula* (3) and *E. nilssonii* (4). Exchanged species with except *N. noctula* and *P. austriacus*, belong to species rare and endangered in whole country. Decided majority of the bats' positions in Ojców National Park come from winter period, data with summer period are very few and fragmentary.

Translated by the authors

Prądnik. Prace Muz. Szafera	16	209–214	2006
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**NIETOPERZE I ICH PASOŻYTY
Z OJCOWSKIEGO PARKU NARODOWEGO I OKOLIC
W BADANIACH STUDENTÓW BIOLOGII
KOŁA NAUKOWEGO PRZYRODNIKÓW UAM W POZNANIU**

**Bats and their ectoparasites found in the Ojców National Park
and in its surroundings – results of studies of the Scientific Circle
of Student Naturalists, Adam Mickiewicz University, Poznań**

ABSTRACT. W pracy dokonano przeglądu gatunków nietoperzy i ich pasożytów zewnętrznych zebranych podczas badań przeprowadzonych przez studentów biologii z Koła Naukowego Przyrodników UAM z Poznania w latach 1971 i 1984.

KEY WORDS: *Chiroptera*, *Nycteribiidae*, *Spinturnicidae*, Ojców National Park, Poland

SUMMARY

In our article we described species of bats and their ectoparasites found in Ojców National Park and surroundings in two years 1971 and 1984. At 10 localities 118 bats belonging to 7 species were found (Table 1). The most numerous were *Myotis myotis* and *Rhinolophus hipposideros* (they were also found in the most number of localities). Basing on the above data and the data coming from earlier studies, we can conclude that *M. myotis* and *R. hipposideros* are the most common bat species in ONP and in its surroundings.

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**BADANIA PALEONTOLOGICZNE C. F. ROEMERA I O. GRUBEGO
NA TERENIE OJCOWSKIEGO PARKU NARODOWEGO. SZCZĄTKI
KOSTNE SSAKÓW W KOLEKCJI ZAKŁADU PALEOZOologii,
INSTYTUTU ZOOLOGICZNEGO UNIWERSYTETU
WROCŁAWSKIEGO**

**C. F. Roemer's and O. Grube's palaeontological studies
in the Ojców National Park. Mammalian bone remains in the collection
of the Palaeontology Department, Institute of Zoology, Wrocław University**

ABSTRACT. The paper presents preliminary results of re-examination of the collection of mammals from excavations of C. F. Roemer, mineralogy professor of Wrocław University, and O. Grube, director of the Upper Silesian Prussian Mining Agency, published in the paper *Die Knochenhöhlen von Ojców in Polen* in 1883 (*Palaeontographica*, no. 29, pp. 195–233, 12 figs). The state of preservation of the bones and the result of preliminary osteometric of a part of the material are described.

KEY WORDS: Mammals, Pleistocene, Ojców, fossil collections

SUMMARY

The paper presents preliminary results of re-examination of the collection of mammals from excavations of C. F. Roemer, mineralogy professor of Wrocław University, and O. Grube, director of the Upper Silesian Prussian Mining Agency, published in the paper *Die Knochenhöhlen von Ojców in Polen* in 1883 (*Palaeontographica*, no. 29, pp. 195–233, 12 figs). The state of preservation of the bones and the results of preliminary osteometric studies of a part of the material are described. The material includes over 350 bone remains representing 10 mammal species: cave bear *Ursus spelaeus* ROSENMÜLLER ET HEINROTH, 1784, mammoth *Mammuthus primigenius* (BLUMENBACH, 1799), horse *Equus caballus* (LINNAEUS, 1758), reindeer *Rangifer tarandus* (LINNAEUS, 1758), roe deer *Capreolus capreolus* (LINNAEUS, 1758), red deer *Cervus elaphus* LINNAEUS, 1758, aurochs *Bos primigenius* BOJANUS, 1827 and *Bison priscus* (BOJANUS, 1827) and domestic cattle *Bos taurus* (LINNAEUS, 1758). Remains of other mammal species (29) from Roemer's material (insectivores, bats, rodents, other carnivores) will be subject to further analyses.

Translated by the authors

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**PRESJA OSADNICZA ZAGROŻENIEM KRAJOBRAZU
OJCOWSKIEGO PARKU NARODOWEGO I JEGO OTULINY**

**Settlement Pressure Threatens the Landscape
of Ojców National Park and Its Protection Zone**

ABSTRACT. The rapidly increasing settlement pressure on the Ojców National Park protection zone including the areas adjacent to its borders poses a threat to maintaining the diverse biological and landscape values which conservation was the main reason for establishing the Park. The causes of the problem lie in the insufficient effectiveness of legal regulations concerning landscape protection, unsatisfactory ecological awareness among both the local society and authorities, lack of rational controls on the construction industry in the districts surrounding the Park as well as inadequate financial support of landscape conservation. The change of the current situation requires implementing the regulations contained in the ratified by Poland European Landscape Convention at all levels of the state and local authorities.

KEY WORDS: national park, landscape protection, threats, settlement

SUMMARY

One of the most considerable threat to the landscape of the Ojców National Park is the dramatically growing settlement pressure on its protection zone including directly bordering the Park areas – attractive to both individual investors and development companies.

Threats posed to the unique landscape of the Park by the settlement pressure accompanied by infrastructure should be considered from ecological, cultural and physiognomic aspects. The existing and potential effects of this pressure have already led to (or will lead to) occupying the habitat and feeding grounds of many species of animals which home ranges include both the Park and its protection zone. There will also be other ecological consequences of the discussed situation such as the process of narrowing and breaking ecological corridors, the growing isolation of the Park from biologically active areas and changes in abiotic and biotic environments. Furthermore, introducing styleless and uncharacteristic of the region buildings combined with converting and increasing the density of historical arrangements will result in chaotic land development.

The present-day situation arises, first of all, from lax legal regulations applying to landscape protection, insufficient ecological awareness among the local society and authorities, lack of a rational policy on the construction industry in the districts adjoining the Park as well as limited financial support of landscape conservation.

The actions potentially increasing the effectiveness of landscape protection should consist in the enforcement of regulations contained in the ratified by Poland European Landscape Convention at all levels of the state and local authorities. The most important thing is that the action should include: enacting the Ojców National Park protection plan [the Minister of Environment]; drawing up the delimitation of the province determining the areas to be protected against uncontrolled building development and increasing spatial chaos (the regional government); formulating the policy of landscape conservation and planning aimed at national welfare and benefits (local governments).

Translated by A. Krukierek

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**KULTUROWO-PRZYRODNICZE UKSZTAŁTOWANIE
KRAJOBRAZU MIKROREGIONU ROWU KRZESZOWICKIEGO¹**

**Cultural and natural configuration of the landscape
of micro region of Krzeszowicki Through**

ABSTRAKT. The issue of landscape shaping of micro-region of Krzeszowicki Through was presented in this paper. The form of the landscape is shaping by medieval origin, particular period accumulation and natural elements linked with topography and existing suburban residences.

And the existing cultural and natural elements supported numerous analysis (made mainly in situ) should have a big influence for forming of adequate attitudes which has direct influence for life quality of residents, planning decision and protection of heritage of this area.

KEY WORDS: cultural heritage, stress, natural and cultural elements, landscape exposure, suburban residences

SUMMARY

The heritage of every nationality is strongly connected with cultural and natural resources even the smallest micro regions. The care of it and documentation of existing situation is a obligation of our contemporaries. The scope of landscape research is a micro area of Krzeszowicki Trough which is located on the Jura Krakowsko-Częstochowska region. It belongs to Cracow's suburban zone and it is inscribed in characteristic configuration of area. It consist of eleven summer residence, two sacred centres (Rudawa, Bolechowice), transport net and other elements which creating unique spatial construction of this area.

And the existing cultural and natural supported numerous analysis (made mainly in situ) should have a big influence for forming of adequate attitudes which has direct influence for life quality of residents, planning decision and protection of heritage of this area.

Translated by the author

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**ZAMEK W OJCOWIE. HISTORIA, TERAŹNIEJSZOŚĆ,
MOŻLIWOŚCI REWALORYZACJI I WYKORZYSTANIA OBIEKTU**

**The Castle of Ojców. The History, the Present and the Possibilities
for the Restoration and the Use of the Object**

ABSTRACT. The short story of Ojców castle presented in the article focuses on its defensive values and the realistic chances of its restoration offered by the surviving descriptions and iconography. The author concentrates on the rebuilding of the existing parts of the castle such as the palace and fortifications, and discusses the modernization of the exposition and the use of the castle for tourism and education.

KEY WORDS: castle at Ojców, Starosty, defensive line, fortifications, restoration, tourism, education

SUMMARY

With its rich history and picturesque setting the castle of Ojców fully deserves recognition as a unique component of the Ojców National Park cultural heritage. Its importance arises from the function the castle had in the past as a residence of royal starosts and a major point of the defensive line which passed through the hills of the Krakow-Częstochowa Upland since the Middle Ages to the time of the Swedish “Deluge”. The origins of Ojców castle are traditionally linked with King Kazimierz the Great, however, its location lets assume that the castle hill was fortified even earlier.

The castle of Ojców shows all distinctive features of a medieval stronghold. Situated over a natural narrowing in the form of a rocky gate the castle guarded the route leading along the whole valley. The road to the fortress ran across a wooden bridge supported by stony pillars and built over a dry, cut in rock moat. The brick multi-storey gate on a rectangular plan had the outer and inner acute-arched openings. Situated nearby the gate were a spacious residential building and a tall tower [dungeon]. High walls enclosed an extensive courtyard containing outbuildings and a deep, cut in rock well. The complete contour of the fortress with the distinctive mansard roof of the palace and the tall tower survived as long as the middle of the 19th century. Then the state of the castle gradually deteriorated.

The surviving ruins of the castle are beautifully situated on rock uplifts in the narrowing of the river Prądnik valley. Currently, the fortress is in a very bad state and needs an immediate repair and conservation work.

In theory, the chances of restoration are high. The existing descriptions and iconography as well as the knowledge of the castle acquired during research and field works enable a faithful reconstruction. However, a bad condition of the remaining stony walls and a shortage of funds are the obstacles. What should be done without further delay is to protect and partially rebuild the surviving buildings such as the palace and the defensive walls, and to introduce some improvements to the exposition and the use of the castle for tourism and education.

Translated by A. Krukierek

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**PROJEKTY ODBUDOWY DWORU ORAZ REWALORYZACJI
ZAŁOŻENIA PARKOWEGO ELEONORY WODZICKIEJ
W KORZKWI**

**The Plans of the Reconstruction of the Manor and the Restoration
of Eleonora Wodzicki's Park Landscaping in Korzkiew**

ABSTRACT. The paper discusses problems presented by the reconstruction of the currently non-extant manor situated nearby a knightly castle at Korzkiew, a village in the county of Krakow. The author indicates some threads posed by working out the plans of the reconstruction of the building and the management of its surrounding. He also shows the influence of the presented proposal on the environment and suggests the tourist use of the whole arrangement, that is an English park and, especially, the reconstructed manor.

KEY WORDS: Korzkiew, manor, reconstruction, restoration, preservation, park

SUMMARY

The village of Korzkiew and the nearby castle lie in the valley of the stream Korzkiewka, the left tributary of the river Prądnik, around 13 km north of the centre of Krakow in Zielonki rural district, the county of Krakow. The previous relevant publications were mainly devoted to the castle, a residence of the estate owner, and the existence of the nearby manor was only mentioned.

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**MOŻLIWOŚCI OCHRONY OJCOWSKIEGO PARKU NARODOWEGO
POPRAZECZY WYKORZYSTANIE DZIEDZICTWA KULTUROWEGO
W AKTYWIZACJI TURYSTYCZNEJ JEGO OTOCZENIA**

**The ways of protection of the Ojców National Park
by using cultural heritage in tourist activation of its surroundings**

ABSTRACT. The article includes two suggestions on how to use the cultural assets of the buffer zone of the Ojców National Park and the nearby Landscape Parks. These proposals help to reduce tourist pressure within the OPN by encouraging tourists to visit the areas beyond the Park boundaries. The author suggests marking out two new tourist trails, combining the cultural advantages of the OPN and its surroundings, which can supplement the tourist offer of the area.

KEY WORDS: tourist attractions, cultural heritage, tourism, cultural trails, tourist advantages

SUMMARY

The Ojców National Park (OPN), which is situated in the southern part of the Cracow and Częstochowa Jura, in the unique Valley of Prądnik, has been a very popular tourist destination for a long time. At present it is estimated that about 400 thousand people visit the Park every year. Excessive tourist pressure and increased traffic connected with the influx of visitors have many negative consequences such as noise, litter scattered all over the area, the trampling and widening of the tourist trails, damage to the roads and verges and the excessive emission of fumes.

The immediate neighbourhood of the OPN encompasses its buffer zone and Jurassic Landscape Parks. Although the area is very attractive from the tourist point of view, it is rarely visited, because tourism is concentrated in the OPN. It would be advisable to take action to promote the natural and cultural features of the surroundings of the OPN in order to facilitate the more balanced development of tourism.

The article includes two suggestions for the new tourist trails, combining the cultural assets of the OPN and its surroundings. One of them is the Trail of Castles and Manors and the second is the Trail of the Virgin Mary's Pictures. The area prides itself on the numerous medieval castles and their ruins, as well as the 18th and 19th century manor-houses. The beauties of the landscape surrounding these buildings are an additional advantage of the first of the suggested trails. In the churches situated in the vicinity of the OPN there are many pictures of the Virgin Mary, which are well-known for the local cult. Some of these pictures have artistic value, therefore it is worth following the Trail of Virgin Mary's Pictures, not only for religious reasons. The suggested trails have a lot to offer to visitors interested in hiking and cycling.

It is hoped that the trails marked out in the immediate neighbourhood of the OPN will become an alternative and a complement to the tourist offer of the Park. The tourist activation of the surroundings of the OPN could protect the smallest national park in Poland against the devastation of its natural and cultural assets.

Translated by Dorota Tutka