



CHĘCINY–KIELCE LANDSCAPE PARK — AN EXAMPLE OF OFFICIALLY NOT PROCLAIMED GEOPARK

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Abstract. Chęciny–Kielce Landscape Park was established in 1996 in order to protect the geological values on the area which has undergone extensive anthropogenic modifications due to prolonged mineral resources exploitation. Substantial values of this area are: occurrence of sedimentary rocks of various lithology and age, outcrops of structural discordances and microtectonical forms, hydrothermal mineralisation, remnants of historical mining and quarrying, as well as structural morphology with interesting elements of relief. In local economy predominates agriculture and mineral industry but tourism and recreation have also developed recently. Geological, historic and cultural values, state of their preservation and management, as well as economical and social situation suggest inclusion of the Ch-KLP to the European Geopark Network.

Key words: geodiversity, geoconservation, geopark, Poland.

Abstrakt. Chęcińsko-Kielecki Park Krajobrazowy został utworzony w 1996 r., przede wszystkim w celu ochrony wartości geologicznych. Obejmuje on obszar wielowiekowej eksploatacji kopalni, który uległ znacznym przemianom antropogenicznym. Do najważniejszych wartości tego obszaru należą: obecność skał osadowych o różnej litologii i wieku, odsłonięcia niezgodności strukturalnych, form mikrotektonicznych, przejawów mineralizacji hydrotermalnej, ślady historycznego górnictwa, a także morfologia strukturalna z ciekawymi elementami rzeźby. W gospodarce obszaru dominuje rolnictwo oraz wydobywanie i przeróbka kopalni; zyskuje jednak na znaczeniu także turystyka i rekreacja. Wartości geologiczne, historyczne i kulturowe, sposób ich ochrony i administrowania oraz przesłanki ekonomiczno-społeczne przemawiają za włączeniem Ch-KPK do sieci Europejskich Geoparków.

Słowa kluczowe: georóżnorodność, geochrona, geopark, Polska.

INTRODUCTION

The Świętokrzyskie (Holy Cross) Mts., Central Poland, is the only region in Poland where Lower and Upper Palaeozoic, Mesozoic and Cenozoic sedimentary rocks crop out at the surface. The region was shaped during the Caledonian, Variscan and Alpine tectonical cycles what resulted in heterogeneous geological structure. Since the human existence in this area, numerous mineral resources have been excavated

here. In consequence, the Świętokrzyskie Mts. have been one of the first area in Poland investigated by geologists for more than two hundred years. Now, this region also plays an important role in geological research works and in education of earth sciences (Urban, 1990; Urban, Wróblewski, 1999; Wróblewski, 2000a).

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THE IDEA OF THE “CHĘCINY–KIELCE GEOLOGICAL LANDSCAPE PARK”

The south-eastern part of the region, situated near Kielce and Chęciny towns, has been permanently populated since at least the beginning of the Polish state. Excavation of mineral resources, initially lead ores, copper ores and marbles, now stones and mineral products for chemical industry, has been concentrated in this area. It has caused extensive changes of relief and nature. Historical mining and quarrying produced hundreds of shafts and galleries, small open-pits as well as other artificial depressions, whereas recent rock excavation developed large quarries covering several hundreds hectares and several tens of meters deep, as well as large dumps of mineral waste, locally dominating in the landscape. Lowering of the ground water table is another effect of quarrying (Rubinowski, 1976). Therefore, the present state of landscape and biotic elements of nature do not give sufficient arguments for protection of this area as “normal” landscape park, although picturesque elements of relief (e.g. crags) as well as remnants of various, mainly xerothermic, flora and fauna assemblages have been preserved here and legally protected.

Due to intensive quarrying in the past and recently, the rocks, their structures and other geological phenomena crop

out in numerous exposures. Therefore, the Chęciny–Kielce area is very well accessible and interesting for geological research works and education. Geological studies of this area started at the end of XVIII century, whereas traditions of educational and tourist function of the area reach back to the beginning of XX century. Scientific and educational importance of the area was the reason that the Chęciny–Kielce area was proposed for nature protection, despite of anthropogenic impact on the landscape and biotic elements (Rubinowski, 1976; Wróblewski, 1991, 1995, 1997). The Chęciny–Kielce Landscape Park (Ch-KLP) was established by local authority in December 1996. But the name of the park, adequate to its natural, scientific and educational values and promoted by specialists, was “Chęciny–Kielce Geological Landscape Park” because the main object of protection is the geological structure and its elements. Thus — unlike in other landscape parks — occurrence of numerous geological outcrops, even artificial, increases its scientific values (Wróblewski, 1991, 1995, 1997, 2000b). This proposal was not accepted by local authority, motivated by lack of suitable law.

GEOLOGICAL VALUES OF THE CHĘCINY–KIELCE AREA

The Ch-KLP covers a relatively large area (205 km²) but constitutes less than 2% of the whole region area. It is situated in the border zone of two general geological units of the region: Palaeozoic core representing Caledonian–Variscan structure, and Mesozoic cover developed during Alpine cycle. Geodiversity of its area determines location of the Park. The main value of the Park is occurrence of sedimentary rocks representing wide spectrum of stratigraphical units, from Cambrian to Quaternary (Tertiary fills the karst forms), in which litho-stratigraphical sequences, sedimentary structures and fossils have been thoroughly studied (Wróblewski, 1991, 1995, 1997; Urban, Wróblewski, 1999). The most important geological features of the Ch-KLP are as follows:

- outcrops of interesting geological formations: Middle and Upper Devonian limestones and dolomites representing mainly biogenic deposits of shallow sea, Lower Carboniferous sediments with abundant fauna, diverse Upper Permian terrestrial and marine sediments, Middle Triassic carbonate rocks, Upper Jurassic limestones, as well as Quaternary deposits and glacial forms of relief (Kotański, 1959; Kutek, Głazek, 1972; Lindner, Kowalski, 1974; Rubinowski 1976; Racki, 1993; Szulczewski, 1995; Migaszewski, Zbroja, 1995; Skompski, Szulczewski, 2000);

- outcrops of Variscan–Alpine discordance usually represented by palaeosurfaces of Devonian rocks covered by Permian–Lower Triassic deposits, as well as other tectonical forms representing Caledonian, Variscan and Alpine movements (Kotański, 1959; Bednarczyk *et al.*, 1971; Stupnicka, 1972; Kutek, Głazek, 1972; Kowalski, 1975; Głazek, Romanek, 1978);

- hydrothermal veins with calcite-barite-galena mineralisation and deposit of copper ore (Rubinowski, 1971; Migaszewski *et al.*, 1996; Urban in print);

- numerous karst forms representing Permian–Triassic and Cenozoic terrestrial periods: fossil forms, caves from several meters to more than 3 km long, relict and recent surface forms; Pleistocene palaeontological localities in the karst forms (Studies., 1972; Głazek, 1989; Złonkiewicz, 1994; Urban *et al.*, 1997; Wierzbowski 1997; Urban, 2002, 2004);

- numerous remnants of historical mining and quarrying (shafts, depressions, dumps, quarries of marble) documenting history of human activity within the nature (Rubinowski, Wójcik, 1978; Wróblewski, 1979; Paulewicz, 1992);

- apparent relation between geological structures and morphology — structural morphology (Kotański, 1959; Ołędzki, 1976);

- rocky forms, limestone crags on hill ridges (Rubinowski, 1976; Wróblewski, 1995).

Also influence of abiotic elements on the assemblages of flora and invertebrate fauna is a matter of protection in the Park.

The most interesting geological and geomorphological elements of the Park are protected in nature reserves and as nature monuments or documentary sites (Fig. 1). The following short presentation of the nature reserves shows the most valuable elements of the Park (Urban, 1990; Wróblewski, 1995, 2000a): Karczówka (Devonian limestones, historical lead ore mines), Moczydło (Devonian limestones, historical lead ore mines, karst), Chelosiowa Jama (Devonian limestones and Permian/Triassic clastics, Variscan/Alpine discordance, Perm-

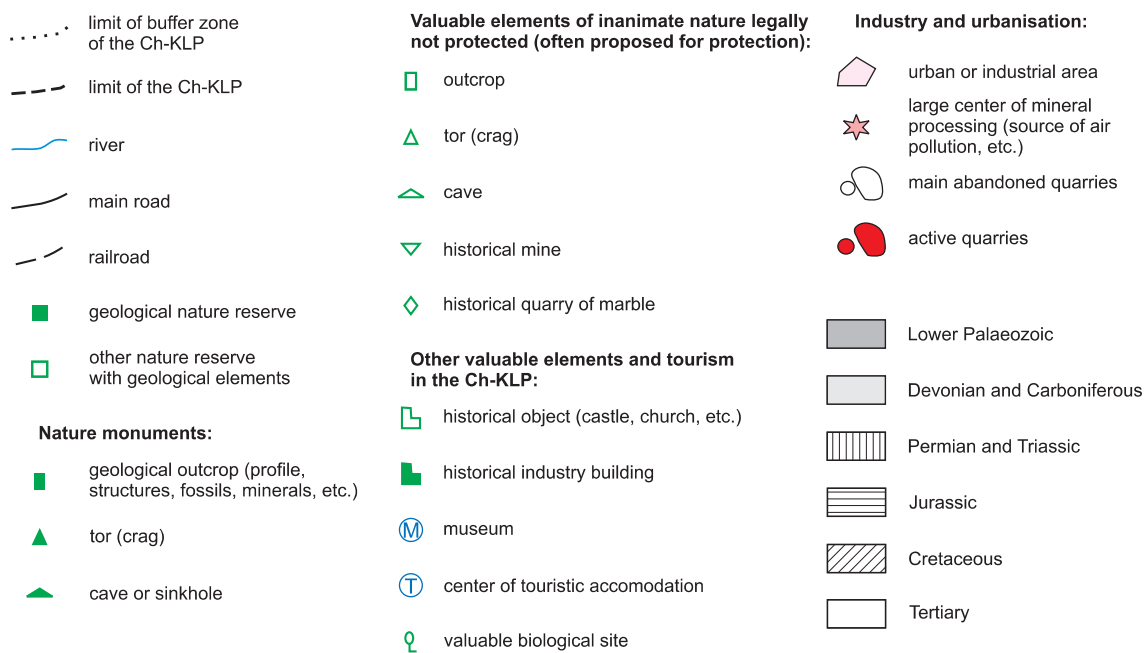
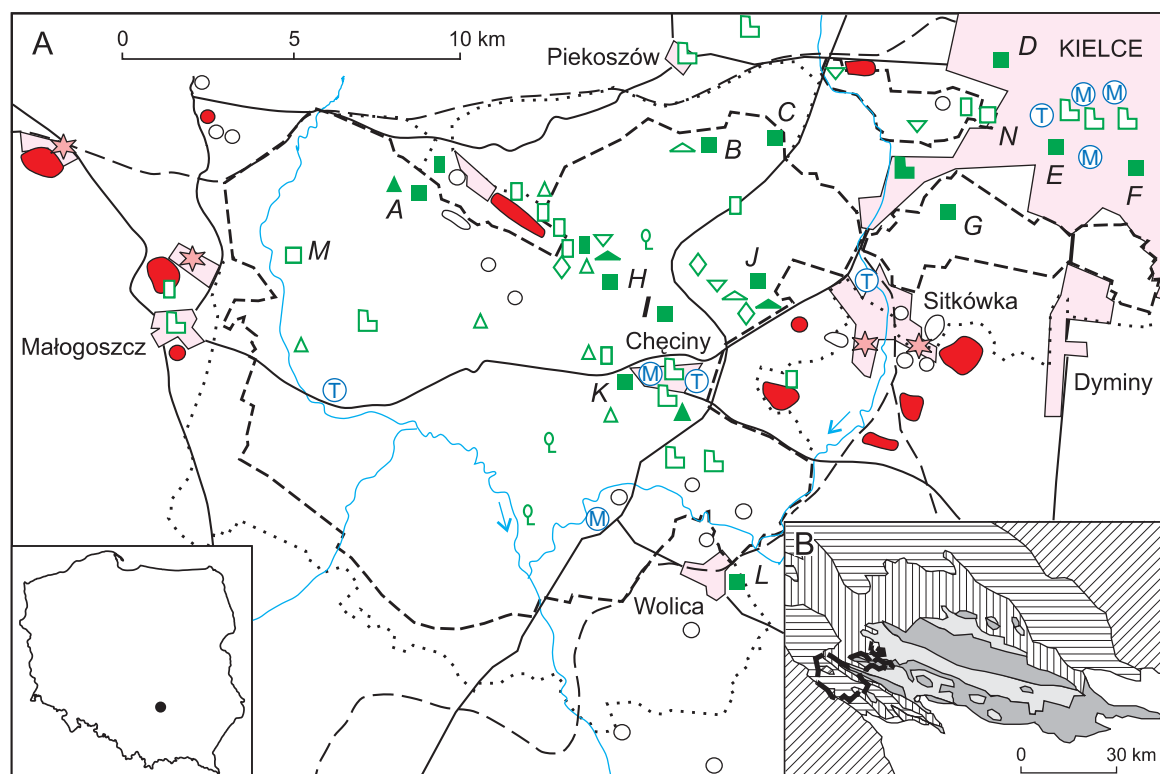


Fig. 1 A. Natural values and economy of the Chęciny–Kielce Landscape Park and its vicinity (A) and location of the Park within the geological structure of the region (B)

Geological nature reserves: A — Góra Miedzianka, B — Moczydło, C — Chelosiowa Jama, D — J. Czarnocki Nature Reserve (Śluchowice), E — Kadzielnia, F — Wietrzna Z. Rubinowski Nature Reserve, G — Biesak–Białogon, H — Góra Żakowa, I — Góra Zelejowa, J — Raj Cave, K — Góra Rzepka, L — Wolica; **other nature reserves with geological elements:** M — Milechowy, N — Karczówka

ian–Triassic and Cenozoic palaeokarst, one of the longest caves in Poland — Chelosiowa Jama–Jaskinia Jaworznicka, 3670 m, with unique calcite forms), Biesak–Białogon (profile and tectonics of Cambrian and Ordovician), Góra Miedzianka (historical copper ore mines, rocky hill ridge formed of Devonian limestones, caves, Pleistocene glacial accumulation), Milechowy (rocky crags formed of Jurassic limestones, caves), Jaskinia Raj (Devonian limestones, cave with speleothems and Late Pleistocene palaeontological and archaeological locality), Góra Żakowa (Devonian limestones, open shafts of historical lead ore mines), Góra Zelejowa (Devonian limestones, hill ridge with recent karst karrens, calcite veins, Variscan/Alpine discordance, palaeokarst), Góra Rzepka (Devonian dolomites, historical lead ore mines, calcite veins, palaeokarst). Four geological nature reserves are situated outside the Park, but close to its margins. Some other objects are also suggested for protection (Fig. 1).

THE CHEĆCINY–KIELCE AREA AS A GEOPARK

There is no doubt that Ch-KLP fulfils the requirements of general definition of “UNESCO GEOPARK” concept. Principles of the Ch-KLP maintaining are also in accordance with those stated in the Charta of European Geoparks (see Patzak, Eder, 1998; Eder, 2000; Alexandrowicz, Alexandrowicz, 2004; www.europeangeopark.org). The Park includes numerous geological elements and features of special scientific importance, representative for the region, illustrative and instructive for earth sciences education, often aesthetically attractive. The geological structure has determined human activity since the beginning of people settlement here, thus it has been our geological heritage at least for several hundreds years, initially in economical sense, later in economical and scientific meaning, now regarding also wider, natural (environmental) and cultural aspects.

The Park Area is under legal protection which makes possible scientific, educational-tourist and limited economical activity of people, however, the most valuable fragments, protected in nature reserves are practically excluded from human activity. Ch-KLP is managed by local (communal) authorities and special administration responsible for protection. Type of essential protected elements and objectives of protection stimulates character of human activity and economical development of the Park area. For example, quarrying is not forbidden here but is restricted and subordinated to management consistent with sustainable development as well as with scientific values and educational use of the Park. Limited mineral industry (quarrying) is in line with the main objectives of the Park be-

cause it gives an opportunity for geological research works and develops our geological knowledge. Moreover, properly managed abandoned quarries may gain aesthetic values.

Occurrence of active large quarries and centres of mineral industry, which are — according to initial project of the Park — situated outside its area, but often at direct neighbourhood of the Park boundary, is still providing significant problems for environment protection (air and water pollution, landscape). The first step to solve these problems was organisation of geoecological monitoring station within the Park territory (Kowalkowski, 1993; Józwiak, Kozłowski, 1999).

Local socio-economical situation is connected with macroeconomy of the region and the needs for the country improvement. Promotion of geological values of the Ch-KLP and its tourist-recreation abilities should create commercial activities and employment. The main occupation of people living within Ch-KLP area is still work in the industry (local mineral industry and factories in Kielce agglomeration) and farming, but educational and tourist function of the area have been also considerably developed during the last several tens of years. In the Park area, field training for students groups of numerous geological and geographical faculties of Polish universities have been carried out each year. Warsaw University has its field research and training station there.

Each year at least several excursions of national/international geological or geographical conferences are organised within the Park area and its vicinity. Some sites of natural and cultural (historical) importance Raj Cave, Chećciny castle and old town, ethnographical museum in Tokarnia, etc. (Wróblewski, 1995), are prepared for public access. Numerous other sites situated on tourist or didactic trails (e.g. Janowski *et al.*, 1996) are visited by individuals or school children and other groups (Janowski, 2000). As it was stated above, geotourism gives a chance for economical development of the area in a future.

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The Ch-KLP requires now a formal decision to be included to European Geopark Network. The application dossier (www.europeangeopark.org) should contain: identification of the area, its scientific and economical description, programme of development policy (also in context of geotourism) and — the most important — arguments justifying nomination as an European Geopark. The arguments were briefly presented above, description of the area, of its scientific and natural values, and of its economical situation are included in Ch-KLP management plan (completed in 1998), which also precise development policy. Based on this plan, the application should be easily prepared by the Park manager (Head Office of the Świętokrzyskie and Nadnidziańskie Landscape Parks).

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