



# Секція “Екологія”

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## Occurrence of ecological niches in areas of strongly transformed landscapes exemplified by Dąbrowa Górnicza

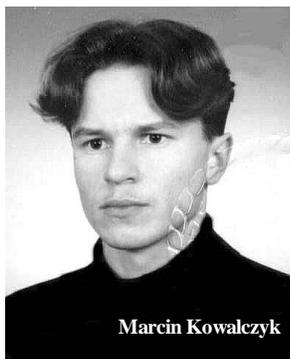
Робота присвячена особливим місцям земної поверхні, які знаходяться поблизу індустріальних районів і при цьому зберігають свої природні цінності, більш того замість негативної реакції на забруднення ці місця генерували на своїй території рідкісні види рослин і тварин. Автори виділяють їх, як окремі екологічні ніші величезної цінності, зважаючи на складні умови середовища, до яких їм було необхідно пристосуватися.

Upper Silesian Industrial region (Górnośląski Okręg Przemysłowy) is situated almost in full on Katowice Upland (341.13), which is a mezoregion of Cracow & Silesian Upland (341.1) stretching in south of Poland (Kondracki, 1994). It is a fragment of monocline erected from carbon layers of early Carboniferous with insertions of Mesozoic limestones, which are situated comparatively shallow. Carbons exploited here are found under little overlay of postglacial formations and compositions and quaternary alluvium, mostly sands (Klimaszewski, 1972).

Geologic formation of the area permits on exploitation of raw materials in form of carbon with abyssal method. The exploitation of carbon on a large scale was followed by further branches of heavy industry: energetic, metallurgies, machinery industry, etc. Continuous industrialization of the area intensified in times of socialism lead utterly to degradation of environment. Stands of chimneys, hummocked coke and metallurgic ashes, output shafts and after exploitation harms as dumps and mining subsidences became a visiting card of USIR (GOP). Lately there joined them mountains of garbage and polluted rivers. Devastated landscape.

In consciousnesses, not only of inhabitants of Poland but also of neighbouring countries, USIR (GOP) is a place where natural elements of landscape are not permitted to exist. This is an industrial desert without plants, animals, clean air and waters. This is not a place where one can live freely breathing and looking at the clear sky.

Nevertheless it is possible. At the area of USIR (GOP), both of Upper Silesia and Śląsko – Dąbrowskie Zagłębie (Basin) there exists terrains where nature lives in its own rhythm. There are areas where life is richer than in few forests. Those places are in significant number however they are a little percentage of general surface of the area. Those often are little, large, forgotten recesses, in which there are sites of rare species of plants and of animals.



One of the cities in the Basin (Śląsko - Dąbrowskie Zagłębie) is Dąbrowa Górnicza. The city differs a bit than others regarding appearance and character. Close to great centres of heavy industry such as metallurgical works „Huta Katowice”, or numerous mines and housing estates we can meet there large quantity of green grounds, forests, meadows, etc. In general there is 5 monumental trees, 3 ecological uses, 1 monument of nature in the shape of well-head area, 1 nature and landscape park, and set of landscape parks. Summing up there are 10 legally protected natural objects. Moreover there are yet several fragments of not changed landscape typical for Silesian Upland. Among others they include the area of morass and peat swamps situated in the valley of Trzebyczka river where natural vegetation, the environment for many rare not only in the region but also in Poland animals is preserved. This fragment of the town – Antoniów belongs, considering its natural environment, to very valuable areas in the scale of the whole region. Scientific documentation of Antoniów swamps done by research workers of Silesian University is a base to create a nature reserve over there. However the most important feature of the area described above for which there is planned the natural reserve, is the presence of unique vegetations. Either flora of vascular plants or bryoflora is represented by a great number of species that include some protected, rare species. Vegetation of the area includes mostly of low and temporary peat swamps, pine forests, meadow and complexes of riverine forests. The very important role performs: moss (Bryophytes) forming strongly developed mossy layers of higher plant communities being often their dominating prevailing element.

Flora of vascular plants on examined ground includes 352 species, of which 17 are protected. Beside them we meet there species proposed for putting into the list of protected species and also form so called. „the red list of species dying out in Poland” (following: Jędrzejko, Żarnowiec, Węgierek 1993).

Protected species:

**Full protection:**

1. *Chimaphila umbellata*
2. *Daphne mezereum*
3. *Drosera anglica*
4. *Drosera intermedia*
5. *Drosera X obovata*
6. *Drosera rotundifolia*
7. *Epipactis latifolia*
8. *Epipactis palustris*
9. *Liparis Loeselii*
10. *Listera ovata*
11. *Malaxis paludosa*

12. *Orchis latifolia*
13. *Orchis maculata*

**Particular protection:**

1. *Centaurium umbellatum*
2. *Frangula alnus*
3. *Ledum palustre*
4. *Viburnum opulus*

There occur 9 species of liverish chaps, 74 species, 4 phylum and 1 form of mosses. 9 % of those list there are species dying out in Poland, and 61 % are dying out on Silesian Upland. The flora of *Bryophyta* is most threatened group of plants of this area but also the most important group considering their value for bioindicator plants. Occurrence of those plants in the environment points to almost natural preserved condition on the area that had been significantly modified. Among them we can find a very interesting group of postglacial mosses.

The threaten species:

**Liverish chaps:**

1. *Cladopodiella fluitans*
2. *Drepanocladus lycopodioides*

**Mosses:**

1. *Hylocladum blendowii*
2. *Hypnum pratense*
3. *Sphagnum molle*
4. *Tomenthypnum nitens*

Species threaten and the dying out in Poland:

1. *Calliergon trifarium*
2. *Leptodictyum kochii*

Postglacial mosses:

1. *Calliergon trifarium*
2. *Drepanocladus lycopodioides*
3. *Helodium blendowii*
4. *Hypnum pratense*
5. *Tomenthypnum nitens*

These are plants connected with seats of high level of water dominating over mesophile and xerophyte species there. The flora is of not forest character what can be proved by supremacy of meadow and peatbog species and communities over others; there had been found 17 complexes and 4 plant communities of vascular vegetation. Most of them include very often a rich admixture of *Bryophyta*. A very special attention should be paid for following clusters of vegetation:

1. Rhynchosporium albae
2. Eriophoro angustifolii – Sphagnetum recurvi
3. Utricularia vulgaris – Heleocharis acicularis
4. Caricetum davallianae
5. Menyanthes trifoliata – Comarum palustre
6. Vaccinio uliginosi – Pinetum
7. Betuletum palustris

The planned natural reserve is to be a shelter for protected species of animals. The most important groups are beetles (*Carabus*) and also bumblebees (*Bombus*). There were found there a very rare butterflies (*Papilio machaon*). Vertebrates (*Vertebrata*) are also represented by protected species. The hematothermal ones are represented by a group of birds in highest numerosity, especially *Gallinago gallinago*. One can meet there several of protected species of mammalians: *Mustela nivalis*, *Erinaceus europeus*, *Talpa europea*, *Meles meles*.

The area is a very unique ecological niche of dying out species in scale of the whole region. Its value is the bigger when considering its adjustment to very difficult conditions of environment. Continuous pollution of air, waste material of industry and hydrological relations a subject to frequent, unprofitable changes influence negatively not only the whole Silesia and Basin.

Such ecological niches often come into being near big industrial plants meaning there, where nobody would expect them. There comes out a question: is it well that those wild shelters are localised right over there? From certain reasons the answer is: yes. Natural ecosystems have the ability of filtering impurities of industrial and anthropogenic origin what makes their existence indispensable. On the other hand, continuously changing conditions that once could have influenced the natural ecosystems profitably may, under impact of transformations connected with industrial activity, surrender to change on less profitable, and even destructive for nature. Therefore it would be profitable to undertake ventures aiming to save the last chance of rebuilding of the natural environment in USIR (GOP) and on the whole Silesian Upland before it is completely destroyed.

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## Hydrological characteristics and changes in water quality in catchment area of the river

### Kłodnica

Розглядається вплив людської діяльності на системи і якість водних потоків у дренажному регіоні річки Кłodnica. Автори досліджують негативні наслідки близького кореляційного співвідношення між промисловими процесами в межах дренажної території та рівнем трансформації водних умов.

#### Location

Due to the physic-geographic division by J. Kondracki (1994) the catchment area of the river Kłodnica is a part of two mesoregions: Katowice Upland (Wyżyna Katowicka) (341.13) and Racibórz Valley (Kotlina Raciborska) (318.59). The southernmost part of Silesian Plain (Nizina Śląska) is Racibórz Valley (Kotlina Raciborska), which spreads far into the valleys of the rivers Kłodnica, Bierawka and Ruda.

Within the area of Upper-Silesian Coal Basin (Górnos Śląskie Zagłębie Węglowe), coal-mining, heavy industry and urbanisation have been developed so intensively, that forms of terrain, water conditions, soils and flora have been entirely transformed.

Borders of the catchment area of Kłodnica are watersheds of 2<sup>nd</sup> order, and partly a watershed of 1<sup>st</sup> order in the east, but the water parting of 1<sup>st</sup> order is unclear in the terrain, as it crosses the highly urbanised area.



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