

The role of rock mining for maintaining *Dauco carotae-Crepidetum rhoeadifoliae* Hejny et Grull in Hejny *et al.* 1979 – a new to Poland plant association

Research Article

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Abstract: This work presents the *Dauco carotae-Crepidetum rhoeadifoliae* plant association, which is new to Poland. The association has been observed in industrial reclamation areas in the vicinity of carbonate mineral excavation sites in the central part of the Opole region. In the vast majority of cases, plots of this association developed in reclaimed areas. The majority of diagnostic species for the association was found within surveyed plots, including *Verbascum thapsus*, *V. densiflorum* and *Bryum argenteum*. Taxa characteristic of the alliance were also constantly present, *i.e.* *Daucus carota*, *Melilotus alba*, *M. officinalis*, *Echium vulgare* and *Erysimum hieracifolium*. This association belongs to the rarest syntaxa in Poland included in the *Dauco-Melilotion* alliance of ruderal communities with a predominance of hemicryptophytes, therophytes and perennials. The main diagnostic species - *Crepis rhoeadifolia*, belongs to very rare elements of Polish flora. It has been observed only in the southern part of the country in approx. 20 sites. *Crepis rhoeadifolia* had not been observed in Silesia for approx. 40 years, which is why it was considered to be an extinct taxon in this region. Rediscovering of the species allowed for diagnosing the *Dauco-Crepidetum rhoeadifoliae* association. This association is an example of a pioneer phytocenosis of, most likely, anthropogenic origin in Silesia.

Keywords: *Crepis foetida* • Asteraceae • Plant community • Rare species • Vegetation ecology • Opole Silesia • SW Poland

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1. Introduction

1.1 Mineral excavations and post-mining reclamation areas as a focal point of floristic studies

The Silesian region is of exceptional importance for rock mining. This is caused by a variety of rock masses of differing age presenting nearly the entire history of the Earth's crust development from the Precambrian Era. In the vast majority of cases, rock materials are excavated by means of strip mining. The so-called Opole District of Carbonate Mineral Excavation established in 1976 is an example of intensive excavation of carbonate minerals, leaving behind numerous strip excavation sites [1] and is based on Triassic and Cretaceous formations. The district includes 16 geologically documented deposits with several dozen quarries, out of which approx. 70% are now disused [2].

Mineral excavations, both disused and currently exploited ones, are convenient habitats for numerous plant species [e.g. 3,4]. Quarry flora and vegetation was researched in the United States, [5,6] showing, among others, a range of rare and vanishing species (=sozophytes *sensu* Nowak A. [7]) at national scale. In Germany, rare and receding species were observed in quarries by Mückschel [8] and other authors. In Silesia, research concerning mineral excavations has been conducted with moderate intensity. Such research was performed by Stojanowska [9], Badora *et al.* [10], Kompała-Bąba & Błońska [11], as well as by Nowak A. [12,13] and Kasowska [14,15] and others.

1.2 *Crepis rhoeadifolia* M. Bieb. [= *Crepis foetida* L. subsp. *rhoeadifolia* (M. Bieb.) Čelak] in Poland

Crepis rhoeadifolia is easy to distinguish from other species of its genus. It has outer involucre bracts

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