

# SZCZYRZYC SYNCLINORIUM IN THE SILESIAN UNIT, OUTER CARPATHIANS, POLAND – CASE STUDY

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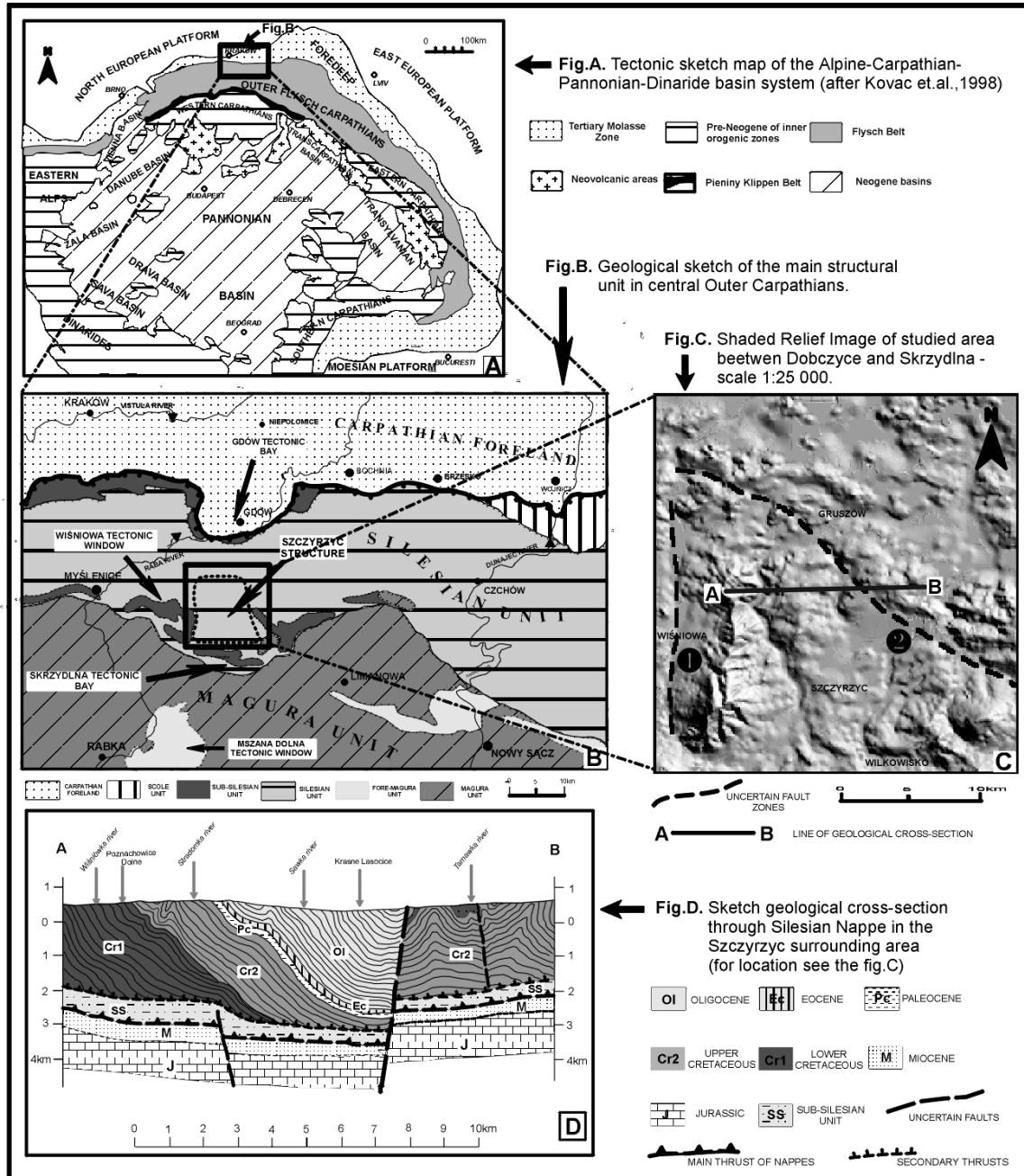
**Abstract:** The Szczyrzyc synclinorium presents a part of the Silesian Nappe. It is located between the Gdów tectonic bay and Skrzydlina tectonic bay. Relatively to main fold structure of the Outer Carpathians its axis is transversal. The Szczyrzyc synclinorium is bordered by two dislocation zones rooted probably in the basement of the Flysch Carpathian nappes.

**Key words:** Outer Carpathians, Silesian Nappe, Szczyrzyc synclinorium, lithostratigraphy, Cretaceous, Paleocene, tectonics

## **Introduction:**

The Szczyrzyc synclinorium (cf. Książkiewicz 1972) is one of the most interesting structures of the West Outer Carpathians (fig.A). This structure presents a part of the Silesian Nappe and is located about 20km ESE of Myślenice, between Dobczyce and Wilkowisko villages. Generally Silesian Nappe formed into bend convex towards the NNE, but north of Szczyrzyc synclinorium, the northern margin of this nappe is retreated about 8km to south and created there the Gdów tectonic bay. From south the Silesian Nappe is overthrust by the Magura Nappe. South of the Szczyrzyc synclinorium Magura Nappe is retreated too and forms its margin the Skrzydlina tectonic bay. West of the studied structure is located the Wiśniowa tectonic window - a structural element of the Lanckorona-Żegocina antyclinal zone. The main fold structures of the Outer (Flysch) Carpathians extend W – E but relatively to them the axis of Szczyrzyc synclinorium is transversal (fig.B). This synclinorium is clearly marked on the geological maps. The initial investigations proved that in the Szczyrzyc structure occur smaller folds, thrusts, slices and faults. We can observe there dip and diagonal faults and strike-slip faults. The shaded relief image of the studied area made in scale 1:25 000 (fig.C) shows two big fault zones. These fault zones could have an influence on the image of the Szczyrzyc synclinorium. They could be rooted in the basement of the Flysch Carpathian nappes. One of faults (1) oriented with N-S direction run along

Wiśniówka river. Another fault (2) has got NW-SE orientation. The study of data e.g. GTOPO30 (Global Digital Elevation Model DEM) helped to distinguish the photolineaments which could be related to the large fault zones in the basement.



The studied part of the Silesian Nappe presents the Beskid Mały facies zone (Burtan, 1978). Lithostratigraphic section of the sedimentary sequence of the Silesian nappe in the Ciecień-Grodzisko mountain range (western part of the studied area) consists of: the Lgota Beds (lower Cretaceous; shales and sandstones), the Godula Beds (upper Cretaceous; sandstones and shales), the Malinka conglomerate (upper Cretaceous, shales, sandstones and

conglomerates), the lower Istebna Beds (upper Cretaceous; sandstones and shales), the lower Istebna Shales (upper Cretaceous; shales with horizons of variegated shales), the upper Istebna Beds (Paleocene; sandstones and conglomerates), the upper Istebna Shales (Paleocene), the Ciężkowice Sandstones (Eocene; sandstones with variegated shales), the Variegated Shales (Eocene), the Hieroglyphic Beds (Eocene; shales and sandstones), the Menilite Shales with Jasło Limestones (Oligocene) and the Krosno Beds (Oligocene; sandstones and shales). Along the Ciecień-Grodzisko mountain range is possible to observe a flexure zone (fig.D) with thinning beds. Within the eastern part of the Szczyrzyc structure, we can observe the Krosno Beds (Oligocene) tectonically contact to the Grodziszczce Beds and to upper Cieszyn Shales (Early Cretaceous). Probably the Menilite Beds, the Hieroglyphic Beds and the Ciężkowice Sandstone (Eocene), the Malinka conglomerate and the lower Istebna Shales are reduced. Maybe an overturned antycline with reduced western anticlinal flank is formed there. There is the Grodziszczce and Cieszyn beds of the core of this anticline arrives on surface.

The geology of the Szczyrzyc synclinorium and its surroundings area is documented also by the deep boreholes: Wiśniowa IG-1, Wiśniowa-6, Wolica-1, Kamionka-1, Stadniki-1, Skrzydlna1,2,3, Jaworzna-1, Kamyk-1, Leszczyna1,2,3,4; Trzebunia IG-1 and other.

*This researches has been supported by Jagiellonian University – proj. UJ DS./V/ING/1/02*

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