

Position of the Grybów nappe in the Polish Outer Carpathians

MARTA OSZCZYPKO-CLOWES and NESTOR OSZCZYPKO

Institute of Geological Sciences, Jagiellonian University, Oleandry 2a, 30-063 Cracow, Poland;
m.oszczypko-clowes@uj.edu.pl; nestor.oszczypko@uj.edu.pl

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In the Polish sector of the Magura nappe eleven tectonic windows were recognized. These windows belong to the Grybów nappe of the Fore-Magura group of units. This group of units, occupied the intermediate position between the Silesian and Magura nappes and contains transitional lithofacies, which linked the Silesian and Magura Basins (Książkiewicz, 1977; Oszczypko-Clowes and Oszczypko, 2004, 2011). The Grybów nappe has been found also, beneath the Magura nappe, in several boreholes. The most southern occurrences of this unit are limited by following boreholes: Oravska-Polhora 1 (Orava, Slovakia), Obidowa IG-1, Czarny Potok 1 near Krynica. In the following tectonic windows (Mszana Dolna, Szczawa, Grybów, Ropa and Świątkowa Wielka) in Poland we found the Oligocene strata belonging to the Sub-Grybów Beds, Grybów Marl Formation (GMF) and Krosno Beds. All these strata occur above the Sub-Menilite Globigerina Marls. The lower part of the Grybów succession, belonging to the Sub-Grybów Beds, is dominated by non-calcareous grey and greenish mudstones and shales, with packets of the black and brown Menilite-type shales. The most typical deposits of the tectonic windows belong to the GMF. This formation is composed of the dark grey, black and dark brown muddy marls. In the lower part of the formation the marls with intercalations of thin- to medium-bedded turbidite sandstones are present, while the upper part is dominated by thick-massive marl and thick-bedded Cergowa-type sandstones. Subordinately, this formation contains lenses or beds of the ferruginous dolomitic limestones. In the Szczawa, Grybów and Ropa tectonic windows the thickness of the formation is up to 200 m, while in the Świątkowa Wielka and Smilno tectonic windows (Nemčok et al., 1990) the thickness oscillated around 100 m. The lower boundary of the formation is transitional, while the upper boundary is represented by a horizon of hornstones. The upper part of the succession is occupied by shaly facies of the Krosno Beds at least 100 m thick. The Grybów succession correlates well with the succession

of the Smilno tectonic window in Eastern Slovakia (Nemčok, 1990; Kováčik et al., 2011). The Rupelian sequences of the Grybów succession were deposited during the TA4 supercycle, resulting in a gradual rise of the relative sea level. The overthrusting of the Magura nappe over the Grybów succession was probably realized under the submarine condition (Oszczypko-Clowes and Oszczypko, 2004) and caused the appearance of an over pressure and development of zone of the tectono-sedimentary breccias along the contact between the Magura, Grybów and the Dukla nappes. The successive Magura nappe overthrusting during the Middle Miocene against the Grybów and Dukla nappes was formed as a classical contraction inter-thrust duplex between the Magura and Dukla nappes (Mastella and Rubinkiewicz, 1998). The post nappe collapse of the Magura nappe was accompanied by the development of the normal transversal faults.

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