

Lower Eocene flysch deposits with horizon of bentonitized tuffites in the Subsilesian Nappe (Outer Carpathians, Poland)

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In the Outer Carpathians the Subsilesian Nappe is overthrust by the Silesian Nappe. In the western sector of Polish Carpathians both these units northwardly thrust over the Miocene deposits filling the Carpathian Foredeep, and in the eastern sector both thrust over the Skole Nappe. Cretaceous and Palaeogene Deposits of the Silesian Nappe crop out on the surface at front of the Silesian Thrust as well as in numerous tectonic windows formed in the Silesian Nappe. Lastly in the Subsilesian Nappe was found sedimentary complex with numerous thin layers of bentonitized tuffites (Cieszkowski at al. 2008, *Ann. Soc. Geol. Pol.* 76, 2: 197-214). They occur in the upper part of green shales and in the lower part of the Lipowa beds that consist mainly of muddy turbidites represented by green or green-brownish shales with rare intercalations of sandstones. The bentonitized tuffites, composed of almost pure dioctahedral motmorillonite, form numerous thin layers and laminae, only occasionally exceeding 5 cm. Tuffite bearing complex, Lower Eocene in age was called by authors the Glichów Tuffite Horizon. Outcrops of the green shales and Lipowa Beds with the Glichów Tuffite Horizon are known from the Żywiec Tectonic Window as well as from several tectonic windows of the Lanckorona-Żegocina Structural Zone.

The age of the tuffite bearing deposits was estimated as the Early Eocene (*Glomospira* div. sp. and *Saccamminoides carpathicus* zones) on the base of micropaleontological investigations. Three groups of foraminiferal assemblages have been divided here. The first group includes assemblages typical for the Zone *Glomospira* div. sp. with numerous specimens of *Glomospira*. *Glomospira* genus is represented by 5 species. The most frequent species *Glomospira charoides* (Jones et Parker) and *Glomospira gordilais* (Jones et Parker) compose together about 70% of every assemblage. There occasionally arrive also typical Eocene species e.g. *Saccamminoides carpathicus* Geroch. In the second group the assemblages of *Glomospira* div. sp. Zone occur together with Paleocene foraminifera. These assemblages are almost the same like in the first group, but include also separate examples of Paleocene taxons characteristic for older Zone *Rzehakina fissistomata*. In the third group occur assemblages represented the *Saccamminoides carpathicus* Zone with numerous index taxon. Here the specimens of *Glomospira*, *Paratrochamminoides* and *Recurvoides* genus are not so numerous like in assemblages typical for the *Glomospira* div. sp. Zone.

It is possible that the Glichów Tuffite Horizon could be correlate with deposits of similar age containing tuffites which are known from the Silesian, Magura and Skole nappes. The Lipowa Beds show lithological similarities to the Early Eocene deposits with intercalations of bentonitized volcanic ashes from the Antherin section (Egger et al., 1997, 2000) located in the Eastern Alps in Austria close to Salzburg. It is very probable that both these positions could be equivalents. Anyway it is worth to conclude that there exist significant similarities between the Upper Cretaceous, Paleogene and Lower Eocene deposits of Ultrahelvetetic Unit of Eastern Alps and the Subsilesian Unit of the Outer Carpathians.

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