

Reconnaissance observations on heterogeneous succession within the Menilite beds (Oligocene) at Skrzydlina, Outer Carpathians

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The quarry outcrop at Skrzydlina near the southern margin of the Silesian Nappe central sector (Polak 2000) exposes a heterogeneous succession that occurs within the Menilite beds (Oligocene). The aim of this work is to present preliminary observations on details of lithological, sedimentological and structural development of this sequence.

The discussed succession belongs to a structure identified as the Skrzydlina scale, and is underlain by the classic lithological association of the Menilite beds present in the region that shows the predominant palaeocurrent directions towards the SW: dark brown siliceous menilite shales, thin-bedded and fine-grained turbidite sandstones associated with black siliceous shales and ferroan concretions (Polak 2000). This is overlain by siliceous sandstones with shales and intercalations of marl.

The observations presented here document several previously unpublished details of ca. 50 metres thick succession that comprises the following complexes (in stratigraphically ascending order): (i) sandstone, medium grained, totally devoid of mudstone layers and composed of massive amalgamated beds; (ii) dark shales with very thin sandstone interbeds characteristic for the Menilite beds; (iii) thin- to medium-bedded light grey weathering marls passing upwards into laminated marls; (iv) chaotic

polymictic conglomerate/sedimentary breccia (ca 17 m thick), matrix- to clast-supported, which rests upon the underlying marl unit with a pronounced erosional contact; (v) massive, channel-fill sandstone with thickness changing laterally from 2 to 1 meter; (vi) three turbidite sequences: fining upwards (F-U) to medium and thin-bedded sandstones with subordinate mudstones that pass to a coarsening upwards (C-U) succession of massive, amalgamated sandstone beds (the most “proximal” facies type), which grades into a F-U sequence.

The characteristic sedimentary features of this succession include:

- features of some turbidite beds that are characteristic for supply from hyperpycnal flows;
- occurrences of linked debrites (turbidite beds succeeded by co-genetic debrite);
- slump beds and creep-deformed sandstone dykes;
- slide sheets of intrabasinal rocks;
- large-scale debris flow beds (olistostrome beds) containing blocks as large as ca. 2 metres across.

Structurally, these strata are deformed by networks of joints, which show density and orientation differing between individual lithological complexes. This probably reflects variations in competence of compositionally and texturally different units, eg. the marl complex labelled (iii) above the overlying debris flow deposit (iv).

The above features suggest that the discussed succession originated as a result of interplay of mass-transport deposition (MTD) and sedimentation out of a variety of turbidite flows. This conclusion expands the earlier interpretation of this association as an olistostrome intercalated within the Menilite beds of the Skrzydlina area advanced by Cieszkowski et al. (2012) and Cieszkowski (2006). The features outlined above imply the position in the basin proximal to a tectonically active, elevated source area and supply by combination of debris flows, slumping, slab-sliding, and periodic contribution of terrigenous detritus directly from a fluvial system on the adjacent land.

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