

Summary

This doctoral dissertation concerns a detailed sedimentological and facies analysis of the selected sections of the Upper Cretaceous–Paleocene Ropianka Formation (Skole Nappe, Carpathians). The study area includes two sedimentary successions located in the more external part of the Skole Nappe, which refers to primarily more proximal part of the depositional system (Łapcik, 2018, in press), and one located closer to its basin axis (Łapcik, 2017). The main purpose of the presented collection of publications is the detailed characterization of the vertical succession of deep-water sedimentary facies in the studied sections along with their interpretive attribution to the specific sub-environments of the depositional system. An interpretation of depositional environment development in the context of dynamic stratigraphy was carried out for the two sedimentary successions (Łapcik, 2017, in press). In addition, the collected data were elaborated statistically and for the thickest, the over 400 m-thick Hucisko Jawornickie succession, the analysis of facies transition trend by means of the embedded Markov chain method (Łapcik, in press) was conducted.

The results obtained show a wide variety of deep-water sedimentary facies in the individual sections. A more detailed sedimentological analysis of numerous lithologically similar deposits implies various mechanisms of deposition. In addition to abundant deposits of high- and low-density turbidity currents, cohesive and non-cohesive debris flow, hemipelagites and pelagites, deposits suggesting genesis from hybrid currents (so-called ‘slurry flows’ *sensu* Lowe & Guy, 2000) are present, as well as deposits of hyperpycnal and traction currents (e.g., contour currents or deep-sea tidal currents). In the studied sedimentary successions, the facies associations which deposits accumulated in architectural elements, such as distributary channels, depositional lobes, channel levees, and as basin plain deposits, interlobe deposits, crevasse splays, and slope deposits, were distinguished for the first time.

The described facial changes of various magnitudes testify to the dynamics of depositional environment. In the studied successions, the observed changes range from local lateral migration and aggradation of architectural elements to the progradation and retrogradation of the entire depositional system. Eustatic influences are likely, but difficult to ascertain with poor biostratigraphic data. It was estimated that the distance between the more distant environment of the unchanneled depositional lobes in the Słonne area (Łapcik, 2017) and the relatively proximal channels and lobes at Hucisko Jawornickie and Manasterz (Łapcik, 2018) was originally ~25-35 km. The Hucisko Jawornickie succession displays the most complete record of sedimentation in the transitional area for migrating zones of deposition referred to the described architectural elements.

A siliciclastic source containing a high contribution of plant detritus is probably related to some deltas or paralic environments. To provide sufficient amount of sandy material to formation of the distinguished channels and depositional lobes, the source should be referred to deltas located along the margin of the basin slope. Marly deposits occurring at different frequencies come from a periodically active carbonate source, probably located on the shelf. The carbonate source have had to coexist in close proximity to the clastic one; this is emphasized by the presence of plant detritus in the marlstone.

Until now, the view on the distribution of sedimentary material distribution parallel to the axis of the Skole Basin prevailed (Książkiewicz, 1962, Bromowicz, 1974, Kotlarczyk, 1978). The proposed alternative resulting from the presented data is the formation of a sandy belt along the axis of the narrow basin by merging of aprons or fans which spread along the slope in the phase of their maximum expansion. At the same time, the described sedimentary bodies could be partially rotated in response to increase in local accommodation space and to progradation, according to the inclination of the basin axis.