

Facial relationship of the Middle Jurassic crinoidal limestones in the Pieniny Klippen Belt, West Carpathians.

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The Pieniny Klippen Belt is one of the most complicated zones in the West Carpathians which was affected by both Laramian and Savian phases of the Alpine folding. The last one acted as a large sinistral strike-slip which caused the complete disintegration of the previous nappe building. Thus the reconstruction of the Mesozoic sedimentary area is very difficult.

So far the reconstructed position of the Pieninic units has been arranged from the shallowest to the deepest zones as follows: Czorsztyn Unit, Czertezik U., Pruské U., Kysuca U. and Pieniny Unit. During Bajocian and Bathonian time sedimentation of crinoidal limestones took part in this region. The crinoidal detritus originated on the Czorsztyn elevation and has been subsequently transported downwards into the deeper parts of the basin e.g. into the sedimentary areas of the four deeper units. The limestones in the Czorsztyn Unit are predominantly massive; a distinct layering occurs within the Czertezik Unit. Crinoidal flysch is a typical feature in the Pruské Unit, with only thin distal interferences to the basinal facies of the Kysuca and Pieniny units. In the shallowest parts of the Czorsztyn Unit a cliff breccias together with frequent neptunian dykes originated due to the extensional tectonism causing the elevation of the Czorsztyn Ridge.

Clasts of the breccia as well as the matrix are represented by the crinoidal limestone. However, at some sites several generations of the submarine cements evolved: 1. cyanolith crusts, 2. isopachous radiaxial fibrous calcite, 3. clear blocky calcite. Instead of the last one, in the more opened interstitial spaces following sedimentary filling occurred: 4. crinoidal detritus, 5. final filling - micrite with ostracods *Pokornyopsis feifeli* (TRIEBEL) which recent descendants are inhabitants of the anchialine caves. Carbon and oxygen isotopes revealed that all the cements precipitated from the marine waters.