Tectonics of the Klippen Belt and Magura Nappe in the eastern part of the Pieniny Mts. (western Carpathians, Poland and Slovakia) – new approaches and results

Oszczypko N.[1], Jurewicz E.[2] and Plašienka D.[3]

[1]*Institute of Geological Sciences, Jagiellonian University, Oleandry 2a, PL-30-063, Kraków, Poland, nestor.oszczypko@uj.edu.pl*
[2]*Faculty of Geology, University of Warsaw, Żwirki i Wigury 93, PL-02-089 Warszawa, Poland, edyta.jurewicz@uw.edu.pl*
[3]*Department of Geology and Palaeontology, Faculty of Natural Sciences, Comenius University, Mlynská dolina, SK-842 15 Bratislava, Slovakia, plasienka@fns.uniba.sk*

The Pieniny Klippen Belt (PKB) is a suture zone, which separates the Central Carpathians from the Outer Carpathians. The PKB successions are built up of the Lower/Middle Jurassic to Upper Cretaceous, dominantly pelagic and flysch deposits. The traditional multi-stage tectonic model of the PKB assumes that during the Palaeocene, retro-thrusting followed by subsidence and deposition of the "Magura Autochthonous Palaeogene" took place. Recently, we have studied the structural relationship of these deposits in the PKB, and we came to the conclusion that they belong to two formations with different tectonic positions. The Kremná Formation (?Oligocene – Lower Burdigalian) belongs to the Magura succession and appears in a tectonic window, beneath the Grajcarek thrust-sheet and the Czorsztyn (Sub-Pieniny) Nappe, while position of the Złatne Beds, which occur inside the Pieniny Nappe, is not clear. In the Slovak part the calcareous flysch sediments of the Jarmuta-Proč Formation described earlier as a "klippen mantle" form the youngest sedimentary member of the lowermost tectonic unit of the PKB, named here as the Fakľovka Unit. These youngest deposits are involved in tectonics of the PKB and document that final folding and thrusting of the PKB took place in the late Early Miocene (after Eggenburgian), corresponding to folding and thrusting of the Magura Nappe.

Calcareous nannoplankton biostratigraphy of the terminal sediments of the Magura basin – a case study of the polish sector (outer western Carpathians)

Oszczypko-Clowes M.

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

The Oligocene to Early Miocene closing of the northern sector of the Outer Carpathian sedimentary area is manifested by deposition of the Krosno synorogenic lithofacies in the Grybów-Dukla-Silesian/Sub-Silesian/Skole and Boryslav-Pokuttya basin system. The analogous Malcov synorogenic lithofacies is typical for the Pieniny Klippen Belt and Magura Basin. These lithofacies comprise the fining and thinning upwards sequences. Towards the top, the sedimentary sequences are dominated by marly pelites. In the Pieniny Klippen Belt, as well as in the Krynica and Rača zones of the Magura Basin, the deposition of the Malcov lithofacies was initiated during the NP24 and persisted to NP25 Zone. In the northern part of the Magura Basin (Siary Zone) the youngest deposits (so called Supra-Magura beds) belong to the NP24 Zone. The most important species to determine the NP24 zone in the region is *Cyclicargolithus abisectus*, and for NP25 – *Sphenolithus conicus*. During the Late Oligocene (NP25/NN1) the frontal part of Magura Nappe were thrust northwards onto the terminal Krosno flysch basin. The clastic material derived from eroded front of the Magura Nappe has been found in the Krosno shally facies of the Silesian Basin. The northwards thrusting of the Magura Nappe was also accompanied by formation of the piggy-back basin on the Magura Nappe, filled with synrogenic turbidites of the Zawada and Kremná formations – NN1 and NN2 zones. These nannofossil associations are characterised by the presence of *Sphenolithus*

delphix (NN1) and *Sphenolithus disbelemnos* (NN2) while the species of *Dictyococcites bisectus* is absent. At the same time the level of reworked species is high.

Stratigraphy and Larger Foraminifera of the Eocene Shallow-Marine and Olistostromal Units of the Southern part of Thrace Basin, NW Turkey

Özcan E.[1], Less Gy.[2], Okay A.I.[3], Baldi-Beke M.[4], Kollanyi K.[4] and Yılmaz İ.Ö.[5]

[1]*İTÜ, Faculty of Mines, Department of Geology, Maslak 34469, İstanbul, Turkey, ozcanerc@itu.edu.tr*
[2]*University of Miskolc, Department of Geology and Mineral Resources, H−3515, Miskolc−Egyetemváros, Hungary*
[3]*İTÜ, Eurasia Institute of Earth Sciences and Faculty of Mines, Department of Geology, Maslak 34469, İstanbul, Turkey*
[4]*Geological Institute of Hungary H-1143, Budapest, Stefánia út 14, Hungary*
[5]*METU, Department of Geological Engineering, 06531, Ankara, Turkey*

The Eocene marine sequence in the southern part of the Thrace Basin (NW Turkey) involves a variety of platform and deep-marine olistostromal units, the stratigraphies of which have been highly debated in the past. A detailed analysis of larger foraminifera in these either foraminifera or foraminifera-coral-coralline algae-dominated platform and associated comparatively deeper-marine units permits us to establish a high-resolution biostratigraphy in the context of shallow benthic zonation (with SBZ Zones) of Tethyan Paleogene.The oldest Zone (SBZ 5 corresponding to the basal Ypresian) was observed only in olistoliths. An old erosional remnant of a transgressive shallow marine to basinal sequence (Dişbudak sequence; late Ypresian-? middle Eocene) was recognised below the the regionally most widespread carbonate platform unit, Soğucak Formation. The Dişbudak sequence, previously considered to belong to the Soğucak Formation and formally introduced recently, contains the foraminifera, such as orthophragmines, nummulitids and alveolinids in its shallow-marine package referred to SBZ 10 (late Ypresian). The Soğucak Formation, which oftenly exhibits patchy reef developments, contains a rich and diverse assemblages of orthophragmines (*Discocyclina*, *Orbitoclypeus* and *Asterocyclina*), nummulitids (reticulate and other *Nummulites*, *Assilina*, *Operculina*, *Heterostegina* and *Spiroclypeus*), and other benthic taxa (*Silvestriella*, *Pellatispira*, *Chapmanina*, *Orbitolina*, *Linderina*, *Gyroidinella*, *Fabiania*, *Halkyardia, Eoannularia, Sphaerogypsina, Asterigerina, Planorbulina* and *Peneroplis*). Their assemblages, referred to SBZ 15/16, 17, 18, 19 and 20 Zones, provide a precise tool for recording the history for marine events having resulted in the deposition of Soğucak Formation during mainly four periods. The spatial distribution of them, recorded as Late Lutetian, Early Bartonian, Late Bartonian and Priabonian, within the present paleogeography, suggest a marine inundation from W-SW to E-NE. The Çengelli flysch sequence overlying the Soğucak Formation in a limited area to the east of Gelibolu peninsula, contains the benthic foraminifera mainly in the limestone olistoliths, mostly derived from the Soğucak Formation, and also in the turbiditic levels. The assemblages in the olistoliths reveal the existence of various shallow-marine limestone sequences ranging in age between (late) Bartonian and early Priabonian.

An Investigation of Biogeochemical Anomalies for Li and Sr in the Kırka (Eskişehir -Turkey) Borate Mining Area

Özdemir Z.[1], Zorlu S.[2] and Akyildiz M.[3]

[1]*Mersin Üniversity, Depertment of Geological Engineering, Mersin/Turkey, zozdemir@mersin.edu.tr*
[2]*Çukurova Üniversity, Depertment of Geological Engineering, Adana/Turkey, ksemiha@hotmail.com*
[3]*Çukurova Üniversity, Depertment of Geological Engineering, Adana/Turkey, akyildizm@cu.edu.tr*

Biogeochemistry was founded by V.I. Vernadsky in the 1926. But a few journals were able to report all of the important developments in biogeochemistry in the 1950's. Recently,