

STRATIGRAPHIC AND TECTONIC POSITION OF CRETACEOUS DEPOSITS FROM PODHALE BASIN SUBSTRATUM (POLISH CARPATHIANS).

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The Cretaceous sediments have been recognised in 5 of the deep wells drilled in the Podhale Basin (Wieczorek & Olszewska, 1999). In the Chochołów PIG-1 well, at the depths of 3076-3132 m occur dark limestones containing numerous *Calpionella alpina* Lorenz (abundant), *Calpionella grandalpina* Nagy and *Crassicollaria brevia* Remane. These Lower Berriasian sediments represent typical Fatricum succession known from the Bobrowiec unit (Krizna nappe). In the Furmanowa PIG-1 well, at the depth of 2035 m, occur grey marls and limestones which contain: *Calpionella alpina* Lorenz (abundant), *Crassicollaria intermedia* (Durand Delga), *Tintinopsella carpathica* (Murgeanu et Filipescu), *Remaniella cadischiana* (Colom) indicating Early Berriasian age. Lower Cretaceous succession in the Bukowina Tatrzańska PIG-1 well begins with limestones containing *Calpionella alpina* Lorenz (abundant), *Calpionella grandalpina* Nagy, *Crassicollaria brevis* Remane, *Crassicollaria parvula* Remane (depth 3139 m), through biopeloidal packstones with *Protomarssonella kummi* (?Valanginian, depths 3099-3101 m) to bioclastic packstones with *Palorbitolina lenticularis* (Barremian- Lower Aptian, depth 3061 m). These deposit also represent Fatricum succession.

In the Bańska IG-1 well (Sokołowski, 1992) the Cretaceous sediments build the Bańska unit (Fig. 1) lying in normal position. The Cretaceous deposits, mainly marls and limestones, were recognized at the depths: 3345-4003 m. In the interval 3345- 3428 m occur conglomerates of ? Senonian age (Sokołowski, 1992). It is possible that they form intercalations in marly succession of Bańska unit or rather they form Senonian cover of this unit. The upper part of Cretaceous succession is built of marls with intercalating sandstones. The presence of *Marginotruncana marginata* (Reuss) proves their Turonian age (depth 3505-3508 m). At the depth of 3649.8 m *Rotalipora* cf. *brotzeni* (Sigal) indicate Cenomanian. Late Albian is indicated by - *Rotalipora apenninica* (Renz), *Heterohelix moremani* (Cushman), *Hedbergella planispira* (Tappan), *Pithonella ovalis* (Kaufmann), *Pithonella sphaerica* (Kaufmann).

The Early Cretaceous (Barremian-Aptian) age of the underlying limestones is suggested by numerous foraminifera: *Pfenderina neocomiensis* (Pfender), *Debarina hahounerensis* Fourcade, *Nautiloculina bronnimanni* Arnaud-Vanneau et Peybernes, *Nezzazata isabellae* Arnaud-Vanneau et Sliter and calcareous dinocysts. The transitional Jurassic/Cretaceous marly limestones (3966-4003 m) contain rare *Calpionella alpina* and *Tintinopsella carpathica* and numerous radiolarians.

The Jurassic - Cretaceous sediments, which occur at interval 4132-4484 m. represent another unit (fig. 1) probably detached from the main body of the Banska unit during overthrust movements.

The Banska unit, ca. 800 m thick, composed mainly of marls have been recognised also in the Poronin PAN- 1 well (Wieczorek in Jaromin et al.1992). Cores and well-log analysis provides evidence to identifying 4 members (fig. 2): 1. marls (2455-2745 m.), 2. marls with sandstone intercalations (2112-2455 m.), 3. spotty marls (2012-2112 m.), 4. marls (1917 - 2012 m). This marly succession is underlain by micritic-to-microncolithic limestones (2745-2887 m) of Tithonian - Berriasian age documented by calpionellid assemblages with numerous *Crassicollaria* and *Calpionella alpina*, *Crassicollaria brevis* Remane, *Crassicollaria parvula* Remane, *Saccocoma* sp. The Aptian-Cenomanian age of lower part of marly succession (member 1) is suggested by assemblages: *Hedbergella* sp., *Rotalipora brotzeni* (Sigal), *Rotalipora* aff. *gandolfi* Luterbacher et Premoli-Silva, *Praglobotruncana gibba* Klaus, *Praeglobotruncana stephani* (Gandolfi), *Guembeltria cenomana* (Keller). Unfortunately the youngest part of the marly succession is deprived of diagnostic fossils.

Another small scale, probably detached from the main body of the Banska unit, built of marly Cretaceous sediments have been recognised at depths: 1855-1894 m.

The Cretaceous sediments of Banska unit differ considerably in lithology from typical Fatricum and Tatricum successions known in the Tatra Mountains (Wieczorek, 2000). Fatricum succession ends with Albian or even older deposits and Tatricum ends with Lower Turonian ones (Olszewska & Wieczorek, 1995).

The presence of 600-800 m thick marly succession with turbidites (Albian-Turonian) which is characteristic of the Banska unit, shows some similarities to Cretaceous succession (Butkov Marl Formation - Praznov Formation) of Manin unit (Kysela, Marschalko & Samuel, 1982, Michalik,1994).

It is important to stress that the Bańska unit (Fig.3) is overthrust by the Biały Dunajec unit built of Triassic carbonates and underlain by different units of Križna nappe (Fatricum).

This implies post-Senonian thrust movements which follow the main post- Early Turonian nappe thrusting. The presence of Manin-type units sandwiched between Fatricum units could be essential for determination of palaeogeographic position of the Manin unit (Plasienska, 1995). Fatricum-related position of Manin-unit seems to be more plausible in the light of the results of the Podhale substratum exploration.

It is also important to notice that to the north of Banska IG-1 well at the contact between the Podhale Basin and the Pieniny Klippen Belt there occurs a very narrow Maruszyna scale (Fig. 3) composed of the Late Santonian - Late Middle Eocene pelagic deposits (Kostka, 1993), ca. 30 m. thick, which is significantly different from the coeval sediments of Myjava basin. During Late Cretaceous time this basin was situated to the north of the pile of overthrust Inner Carpathian units, however, its exact palaeogeographic position is still a matter of discussion.

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