Slovak Geol. Mag., 6, 2-3(2000)

Middle Miocene lignoflora in the Southern Apuseni (Romania), and its paleogeographical significance

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The geological history of the Apuseni Mountains during Neogene is rather complex, marked by the formation of some large gulfs in the western part and some small intramontane basins, and also by the triggering of a volcanic activity with a dominant calc-alkaline andesitic composition, in their southern part. Newer studies on the Tertiary volcanic evolution in Apuseni Mountains, revealed in Zarand area (Southern Apuseni), absolute ages of 12.4(+/-0.7) to 13.4(+/-0.6) m.y. (Rosu et al., 1995, 1997). The tested enrooted eruptive rocks from here, were preceded and accompanied by volcano-sedimentary and dominant pyrrhoclastic rocks with lava flows intercalated, gradually passing into volcano-sedimentary and sedimentary rocks, to the eastern, northern and western part, with paleontologically established age, attributed to the Middle Miocene, up to Pannonian time. Paleogeographically, these formations deposited in a marginal-insular and/or insular area represent, a strato-volcanic structure in which a basal volcano-sedimentary complex is followed by a big pyrrhoclastic stack with lava flows intercalated, that buried the remains of a rich arboreal flora. In Zarand area, the pre- and post-volcanic sediments in lake facies, were attributed by the previous quoted authors to the Lower Badenian and, respectively, to the Upper Sarmatian (Lower Bassarabian), probably discontinuous, with respect with the pyrrhoclastic formation attributed grosso modo to the Badenian-Sarmatian(?) interval by Berbeleac et al. (1984), and restricted to Upper Kossovian - Lower Volhinian interval by Rosu et al. (1995, 1997).

The fossil wood identified up to now, provenant from this rich in plant-remains formation, in Prăvăleni-Ociu area, outline an association of trees, some of them with tropical-subtropical extant correspondents. We talk about species of some genera, here described by Iamandei (2000a, b, c, in press), Iamandei & Iamandei (1998, 1999, 2000a, b, in press): *Magnolioxylon, Carapoxylon, Platanoxylon, Liquidambaroxylon, Ternstroemioxylon, Paraphyllanthoxylon, Piranheoxylon, Tetraclinoxylon, Chamaecyparixylon, Sequoioxylon* and *Pinuxylon*, added to some previous identification made by Nagy & Mârza (1969), Petrescu & Nutu (1969a, b, 1970, 1972), as species of *Magnolioxylon, Icacinoxylon, Laurinoxylon, Perseoxylon, Juglandoxylon, Alnoxylon, Taxodioxylon,* and *Sequoioxylon.*

The average temperatures diagrams given by Ticleanu (1995) and Givulescu (1997) for the continetal realm, based on the Neogene associations of Tracheophytae in Romania (from leaves imprints and palynological studies), confirm that the pyrrhoclastic fossiliferous formation from Prăvăleni-Ociu area can be only Badenian, as Rosu et al. (1995, 1997) suggested. However it is very probable that the uppermost part of the Kossovian is absent, because at the boundary Badenian-Sarmatian there was a drastic cooling of the climate, that determined the disparition of the termophilic flora, which included some typical tropical-subtropical arboreal species of **Icacinaceae, Lauraceae, Meliaceae, Theaceae, Euphorbiaceae** identified here, in the eastern part of the Zarand basin.

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Coralline algal limestones and rhodoliths from olisthostromes of the Krosno Beds (Oligocene, Polish Flysch Carpathians) - preliminary results

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Within olisthostromes of the Krosno Beds (Oligocene) in Skawinki near Lanckorona exotic pebbles/boulders of coralline algal limestones and rhodoliths were found. Skawinki are localised in Żegocina - Lanckorona Zone, at southern part of the Silesian nappe, Polish Flysch Carpathians. The presence of olisthostromes in the Krosno Beds (shaly-sandstones turbidites) is connected with activity of the Silesian Cordillera and suggest existence of acretionary prism in the nearest vicinity (*cf.* Cieszkowski & Polak, 1998).

Exotics of coralline algal limestones from Skawinki reach diameters up to 30 cm. Generally these limestones represent rhodolith facies. Packstone/grainstone limestones bearing rhodoliths and coralline algal crust debris contain also fragments of macrofossils: molluscs, bryozoans, echinoderms, polychaetes and rare fragments of colonial corals (*Aulopora* sp, *Actinacis* sp., *Astreopora* sp, *Polytremacis* sp). In some pebbles quartz grains are also present. Among large foraminifera occurring within the matrix, orthophragminids such as *Discocyclina varians*, *Discocyclina* sp. *Asterocyclina* sp. were identified. Nummulitidae are represented by small size forms and *?Assilina alpina.* Preliminary studies on larger foraminifera suggest a Middle-Upper Eocene age. Small benthic foraminifera are represented by *Biloculina*, *Triloculina*, *Quinqueloculina* (Milioidae) and *Textularia* sp.

Coralline red algae are the main components of the studied limestones. Species identification is difficult since latest studies of fossil corallines indicate that fossil taxa need a systematic revision and neophylocological approach (e.g. Bassi, 1998). Corallinaceae (Rhodophyta, Corallinales) are represented by the subfamilies Melobesioideae (*Mesophyllum*, *Lithothamnion*) and Mastophoroideae (*Lithoporella*, *Spongites*, *Neogoniolithon*). The family Sporolithaceae is represented by *Sporolithon.* Rhodoliths are mainly ellipsoidal and spheroidal in shape and show up to 7 cm in diameter. Within the rhodoliths encrusting foraminifera and bryozoans are also present. Coralline specimens show high bioerosion and abrasion suggesting long residence time on the sediment-water interface and possible low sedimentation rates.

The presence of coralline red algae is known from Paleocene - Eocene flysch deposits of the Polish Flysch Carpathians. Usually the corallines occur as biodetritical material within sandstones (Golonka, 1974) or as calcarenite and calcuridite algal limestones (Rajchel & Myszkowska, 1998). Much less commonly rhodoliths and coralline pebbles with better preserved coralline crusts occur (Leszczyński, 1978).

Paleogene coral-algal reefs are know from Slovakia (Samuel *et al.*, 1972). The coralline algal limestones of the Polish Carpathians do not show evidences of possible genetic relationships with reef development.

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