

Low energy coral bioconstructions from the Upper Eocene–Lower Oligocene of the Transylvanian Basin

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The Transylvanian Basin is an intra-Carpathian basin belonging to the Central Paratethys. The post-tectonic cover of marine and continental Paleogene deposits of the Transylvanian Basin comprise up to 1800 meters of sediments, including the Eocene–Oligocene shallow-marine successions. Previous studies (e.g. by I. Bucur, S. Filipescu, B. Popescu, I. Prica, E. Săsăran) revealed a relatively diversified shallow-marine carbonate facies in the Jibou area, the Salaj district, Romania in north-western part of the Transylvanian Basin. The present studies are focused on coral bioconstructions attributed to the Upper Eocene–Lower Oligocene of the Cozla Formation outcropping in abandoned quarries in Băbeni-Cuciulat and Letca. Until now Eocene–Oligocene coral reefs and smaller coral bioconstructions have not been studied in this part of the Paratethys.

The sections in Letca (40 meters) and Băbeni-Cuciulat (50 metres) consist of shallow-water deposits mostly limestones: bioclastic (mainly coralline algae) wackestones to packstones, rarely rhodolith and nummulitic packstones interbedded with some coral bioconstructions. Locally, dark, marly intercalations with plant remnants occur. Coral biostromes and low relief bioherms attain from 4 to 10 m. Scleractinian corals are common, however poorly diversified. They are dominated by thin (even 2 mm) sheet-like colonies (*Actinacis*, *Bacarella*), ramose, branching colonies (*Actinacis rollei*, *Acropora*, *Goniopora*), thin branching, quasi-colonial (phaceloid) forms (*Caulastrea*). Rarely, corals are small massive colonies (*Antiguastrea*) or have thick phaceloid growth form (*?Euphyllia*). Neither vertical nor lateral succession/zonation was recognized: thin platy colonies and branching corals co-occur closely. Coralline and peyssonneliacean red algae both encrusting and non-geniculate forms are common, while dasycladacean green algae are rare. Apart of algae, corals are encrusted by foraminifera (e.g. *Miniacina multiformis*), bryozoans and serpulids. Moreover, nummulitid, textulariid and miliolid foraminifera, as well as ostracods occur in sediment matrix. Associated macrofauna are rare and represented by bivalves (oysters, pectenids), echinoid plates and spines and small crustacean

appendages. Borings of sponges and bivalves are only locally common.

The studied bioconstructions are type of matrix-supported reefs and can be classified as spaced cluster reefs or coral carpets because corals usually do not fuse to each other, directly or by coralline algae. Low diversity of corals and other macrobiota indicates on relatively unfavorable environment for their development. Shallow and quiet-water environment is inferred based on the sedimentary sequence, dominant coral growth forms and their good preservation, the lack of rigid framework as well as fine-grained sediment matrix. Although marly intercalations are rare and low energy regime dominated, fine-grained carbonate sediment could be resuspended what resulted in increased turbidity. Branched morphotypes and quasi-colonial phaceloid corals (azooxanthellate?) are effective sediment removers or cope well with high sedimentation, and sheet/platy corals are adapted to low-light conditions. Furthermore, *Actinacis rollei* is believed to be a species tolerant to low temperature (Bosellini & Stemann, 1996 and literature herein). The studied area during the Late Eocene–Early Oligocene was located at around 43° N, thus represents one of the most northerly located coral bioconstructions in the Paratethys. Contrasting opinions exist concerning palaeogeographic control on reef distribution during discussed time interval: (1) general slight constriction in coral reef distribution; (2) significantly lower temperatures during the Priabonian (Late Eocene) favoured increased coral growth in the northern Tethys and led to the recovery of the coral fauna in the southern Tethys (see Höntzsch et al., 2013 and literature herein). The study of nummulites from the studied sequence will precise the age, providing stratigraphic framework for interpretation of local versus global/regional impact on development of the bioconstructions studied.

Bosellini, F.R., Stemann, T.A. (1996): Bull Soc Paleont Ital, Spec Vol 3: 31-43.

Höntzsch, S., Scheibner, C., Brock, J.P., Kuss, J. (2013): Turk J Earth Sci, 22: 891-918.