Geophysical Research Abstracts
Vol. 14, EGU2012-683, 2012
EGU General Assembly 2012


# Burdigalian turbid water patch reef environment revealed by larger benthic foraminifera

V. Novak, W. Renema, and Throughflow-project
NCB Naturalis, P.O. box 9517, 2300 RA Leiden, The Netherlands (vibor.novak@ncbnaturalis.nl)

Ancient isolated patch reefs outcropping from siliciclastic sediments are a trademark for the Miocene carbonate deposits occurring in East Kalimantan, Indonesia. They develop in transitional shelf sediments deposited between deltaic and deep marine deposits (Allen and Chambers, 1998). The Batu Putih Limestone (Wilson, 2005) and similar outcrops in adjacent areas have been characterized as shallow water carbonates influenced by high siliciclastic input, showing low relief patch reefs in turbid waters. Larger benthic foraminifera (LBF) are excellent markers for biochronology and paleoenvironmental reconstruction. This study aims to reveal age and paleoenvironment of a shallow water carbonate patch reef developed in mixed depositional system by using LBF and microfacies analysis.
The studied section is located near Bontang, East Kalimantan, and is approximately 80 m long and 12 m high. It is placed within Miocene sediments in the central part of the Kutai Basin. Patch reef and capping sediments were logged through eight transects along section and divided into nine different lithological units from which samples were collected. Thin sections and isolated specimens of larger benthic foraminifera were analyzed and recognized to species level (where possible) providing age and environmental information. Microfacies analysis of thin sections included carbonate classification (textural scheme of Dunham, 1962) and assemblage composition of LBF, algae and corals relative abundance. Three environmentally indicative groups of LBF were separated based on test morphology, habitat or living relatives (Hallock and Glenn, 1986).
Analysed foraminifera assemblage suggests Burdigalian age (Tf1). With use of microfacies analysis nine successive lithological units were grouped into five facies types. Paleoenvironmental reconstruction of LBF fossil assemblage indicate two cycles of possible deepening recorded in the section. Based on high muddy matrix ratio in analyzed thin-sections we still cannot conclude whether they were deeper water assemblage, or that they occurred in shallower water and influenced by turbid conditions as the result of terrigenous input. According to preliminary analysis and siliciclastic content in the sediments the later one should be more likely. Further work will include additional fossil groups analysis (corals, algae and bryozoans), detailed petrographical analysis and Strontium isotope stratigraphy.

Allen, G.P., and Chambers, J.L.C. (1998): Sedimentation in the Modern and Miocene Mahakam Delta. Indonesian Petroleum Association, Jakarta, Indonesia, 236 p.
Dunham, R.J. (1962): Classification of carbonate rocks according to their depositional texture. In: Ham, W.E., ed., Classification of Carbonate Rocks: American Association of Petroleum Geologists Memoir, v. 1, p. 108–121.
Hallock, P. and Glenn, C.E. (1986): Larger Foraminifera: A tool for paleoenvironmental analysis of Cenozoic carbonate depositional facies. Palaios 1, 55–64.
Wilson, M.E.J. (2005): Development of equatorial delta-front patch reefs during the Neogene, Borneo. - Journal of Sedimentary Research, 75(1): 114-133.