Anuário do Instituto de Geociências - UFRJ
ISSN 0101-9759 Vol. 29 - 1 / 2006 p. 377-378

FORAMS 2006

Paleoenvironmental reconstruction of the middle Eocene Pazin Basin (Croatia)

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Assemblages of benthic foraminifera from two clastic successions from the Pazin Basin (central Istria, Croatia) were investigated to reconstruct paleoenvironmental conditions during the middle Eocene time. Sections are composed of hemipelagic/*Globigerina* Marls which are conformably overlain by Flysch. The Graèišæe section is located in the southern part of the Pazin Basin comprising E9 to E12 planktonic foraminiferal Zones whereas the Ipši section, situated in the northern part of the Pazin Basin, includes E12 and E13 Zones. Planktonic percentages are mostly high (80-98%). Benthic foraminiferal assemblages comprise calcareous and agglutinated taxa (up to 22%). The prevalence of epifaunal foraminifera indicates good ventilation of the bottom water caused by the morphology of the basin, which was elongated and open on both sides enabling the undisturbed flow of the water all the way through. The depth of deposition is inferred from the bathymetric distribution of the individual taxa and estimated to be 200-300 m in the lowermost part of the *Globigerina* Marls in the Graèišæe section where *Lenticulina* spp., *Oridorsalis umbonatus*, *Cibicidoides* spp. and *Bulimina* spp. prevail. Increased abundances of *Nuttallides truempyi*, *Anomalinoides capitatus*, *Cibicidoides barnetti*, *C. praemundulus*, *C. grimsdalei* etc. in the lower part of Flysch deposits indicate deepening to more than 500 m. Flysch from the upper parts of both sections was estimated to be even deeper environment, possibly middle bathyal, which is indicated by high abundances of tubular taxa (*Bathysiphon* sp. and *Rhabdammina robusta*), *Uvigerina hispidocostata*, *Haplophragmoides* sp., and absence or very low abundances of *Lenticulina* spp. Diversities of the benthic foraminiferal assemblages are high and dominances low in the most samples from the Graèišæe section (except for the lowermost part of the section). The abundances of the most common foraminiferal taxa (*Cibicidoides* spp., *Oridorsalis umbonatus, Bulimina* spp., *Stilostomella* spp., *Osangularia* spp., *Nuttallides truempyi*, etc.) within the *Globigerina* Marls (E9-E10 Zones) from the Graèišæe section are quite variable while the proportions of *Lenticulina* species remain more or less constant.

Such assemblages imply generally mesotrophic environmental conditions with variable organic flux. The transition to flysch-type sedimentation (E11 Zone) is marked by a strong decrease in abundance of *Lenticulina* spp., *Osangularia* spp., *Bulimina* spp., *Bolivina* spp. but increased numbers of tubular taxa, *Dentalina* spp. and *Uvigerina* spp. These composition changes were probably caused by the input of irregular supply of more partially degraded and suspended organic matter carried from the shelf by turbidity currents. The assemblages from the Ipši section are less diversified and show higher dominance with the prevalence of *Cibicidoides* spp. and juvenile or small specimens of epifaunal foraminifera. In the lower part of the Ipši section, within the *Globigerina* Marls (E12 Zone) and lower part of Flysch (lower E13 Zone), *Buliminella* sp. and *Chilostomella* spp. make up an important part of the assemblage (8-28%). These species reflect higher organic flux, although high percentages of epifaunal foraminifera don't support the low oxygen conditions that might have developed as its result. Upwards (upper E13 Zone), abundances of *Cibicidoides* species decrease while numbers of thin walled small specimens of epifaunal taxa increase, as well as the abundances of infaunal *Dentalina* spp., *Stilostomella* spp. and *Uvigerina* spp. These characteristics of foraminiferal assemblages indicate decreased oxygenation that might have been a result of the reduced circulation caused by the beginning of the closure of the basin at the end of E13 Zone.

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