3RD INTERNATIONAL WORKSHOP

NEOGENE OF CENTRAL AND SOUTH-EASTERN EUROPE

CLUJ-NAPOCA, MAY 20-24 2009

ABSTRACT VOLUME

EDITED BY SORIN FILIPESCU

Presa Universitară Clujeană

Descrierea CIP a Bibliotecii Naţionale a României
NEOGENE OF CENTRAL AND SOUTH-EASTERN EUROPE. SIMPOZION INTERNAŢIONAL (3; 2009; CLUJ-NAPOCA)
3rd International Workshop Neogene of Central and South-Eastern Europe: Cluj-Napoca, May 20-24 2009: Abstract volume / Edited by Sorin Filipescu. - Cluj-Napoca: Presa Universitară Clujeană, 2009
Bibliogr.
ISBN 978-973-610-873-0
I. Filipescu, Sorin (ed.)
55(063)

Babeş-Bolyai University
Cluj University Press
Manager: Codruţa Săcelean
51, Hasdeu st.
400371 Cluj-Napoca, Romania
Tel./Fax: (+40)-264-597.401
E-mail: editura@editura.ubbcluj.ro
http://www.editura.ubbcluj.ro/

Revised Middle Miocene datum for initial marine flooding of North Croatian Basins (Pannonian Basin System, Central Paratethys)

Stjepan ĆORIĆ[1], Davor PAVELIĆ[2], Fred RÖGL[3], Oleg MANDIC[3], Sejfudin VRABAC[4], Radovan AVANIĆ[5], Lazar JERKOVIĆ[6], Alan VRANJKOVIĆ[2]

[1] *Geological Survey of Austria, Neulingg. 38, A-1030 Wien, Austria (stjepan.coric@geologie.ac.at)*

[2] *Faculty of Mining, Geology and Petroleum Engineering, University of Zagreb, Pierottijeva 6, HR-10000 Zagreb, Croatia (dpavelic@rgn.hr; avranjko@rgn.hr);*

[3] *Geological-Paleontological Department, Natural History Museum Vienna, Burgring 7, A-1010 Wien, Austria (fred.roegl@nhm-wien.ac.at; oleg.mandic@nhm-wien.ac.at);*

[4] *Department of Geology, Faculty of Mining, Geology and Civil Engineering, University of Tuzla, Univerzitetska 2, BIH-75000 Tuzla, Bosnia and Hercegovina (jvrabac@yahoo.com);*

[5] *Croatian Geological Survey, Sachsova 2, P.O. Box 268, HR-10000 Zagreb, Croatia (radovan.avanic@hgi-cgs.hr);*

[6] *Faculty of Sciences, University of Podgorica, 81000 Podgorica, Montenegro 202-444 rue Poudriere, Verdun, PQ, H4G 3L9, Canada (doboj@estart.com).*

The Pannonian Basin System originated during the Early Miocene as a result of extensional processes between the Alpine-Carpathian and the Dinaride Orogenic Belts. The Paratethys Sea flooded the new basins successively during the Karpatian (late Burdigalian, Early Miocene) and the Early Badenian (middle Langhian, Middle Miocene). The North Croatian Basins occupied the south-western margin of the Pannonian Basin System and the Central Paratethys Sea. Their initial marine flooding has until now been dated as Karpatian in age. The transgression into the North Croatian Basins invaded a lacustrine environment therein, representing the northern prolongation of the vast Dinaride Lake System extending southwards as far as the Adriatic Plate. We reinvestigate two sections from opposite margins of the NBS - from Mt. Medvednica on the west and from Mt. Požeška on the east - including corresponding lowermost marine Miocene deposits to critically examine the Karpatian datum.

All investigated samples from Čučerje (Mt. Medvednica) and the uppermost sample from Sokolovac (Mt. Požeška) indicate nannoplankton Zone NN5, with the zonal marker species *Sphenolithus heteromorphus* DEFLANDRE (1953). Nannoplankton assemblages with blooms of helicoliths and small reticulofenestrids indicate a nearshore, nutrient-rich environment. This coincides with the results from the benthic and planktic foraminiferal assemblages. *Uvigerina macrocarinata* PAPP & TURNOVSKY, *Pseudogaudryina lapugyensis* (CUSHMAN), *P. sturi* (KARRER), *Amphistegina mammilla* (FICHTEL & MOLL), and *Orbulina suturalis* BRÖNNIMANN characterize the Lower Lagenidae Zone of the Badenian in the Vienna and Styrian Basins. Additionally, the presence of the microfossil *Bolboforma moravica* REDINGER, together with the mass occurrence of the planktonic gastropod "*Spirialis*", confirm the Early Badenian age. The diatom flora with *Truncatulus tortonicus* (HAJOS) SUTO determined from the transitional part of the section Sokolovac points to a Badenian age. The pectinid bivalve *Flabellipecten solarium* (LAMARCK) from Section Čučerje also indicates Badenian age.

The assemblages point to a Badenian age correlated with the upper part of the Lower Lagenidae Zone. The first occurrence of *Orbulina suturalis* BRÖNNIMANN, dated at 14.74 Ma and found at about 5 m of the Section Čučerje, demonstrates a much higher stratigraphic level for the succession than previously considered. The depositional evolution in both sections suggests a position above the maximal flooding surface and within the High Stand

2.4. The age of the marine transgression lies within the lower part of nannoplankton Zone NN5, having its base at 14.91 Ma. That places the initial marine sedimentation in the North Croatian Basins at least 1 m.y. above the Middle Miocene lower boundary.

The transition from the lake deposits to the marine environment was observed in the section Sokolovac. There is no sedimentological break between the lacustrine and marine deposits, suggesting continuous sedimentation throughout the Lower Badenian. Based on a time interval of 1 m.y., the resulting mean sedimentation rate for freshwater sedimentation would be 0.45 mm/y.

Our new biostratigraphic data – integrating calcareous nannoplankton, planktic and benthic foraminifera, diatom and mollusk records – have substantially revised the previous interpretation. The presence of a calcareous nannoplankton assemblage of the NN5 Zone and the planktic and benthic foraminifera of the regional Lower Lagenidae Zone now place the transgression into the main Early Badenian transgressive pulse of the Central Paratethys. Consequently, the initial marine transgression correlates accurately with the middle part of the Early Badenian, which is more than 2 m.y. younger than the previously inferred datum and at least 1 m.y. younger than the lower boundary of the Badenian and the Middle Miocene, respectively. Finally, the basal lacustrine infill of the North Croatian Basins, previously dated as Ottnangian (middle Burdigalian, Early Miocene) and continuously grading into marine deposits, has to be reconsidered as Early Badenian as well.