

A short note on the Middle Miocene (Badenian) brachiopods from the southwestern margin of the Central Paratethys, Croatia

MARIJA BOŠNJAK¹, KORALJKA BAKRAČ², JASENKA SREMAC³,
SANJA JAPUNDŽIĆ¹ and TOMISLAV MALVIĆ⁴

1 – Croatian Natural History Museum, Demetrova 1, Zagreb, Croatia; e-mail: marija.bosnjak@hpm.hr

2 – Croatian Geological Survey, Sachsova 2, Zagreb, Croatia

3 – University of Zagreb, Faculty of Science, Department of Geology, Horvatovac 102a, Zagreb, Croatia

4 – University of Zagreb, Faculty of Mining, Geology and Petroleum Engineering, Pierottijeva 6, Zagreb, Croatia

Fossil brachiopods are recorded in the Middle Miocene (Langhian/Serravalian – Badenian) deposits in Northern Croatia, Medvednica Mt. near Zagreb, which paleogeographically belonged to the southwestern margin of the Central Paratethys (e.g., Rögl 1998; Kováč et al. 2007; Piller et al. 2007; Sremac et al. 2022). The Badenian brachiopods from Northern Croatia are for the first time mentioned in Gorjanović-Kramberger (1908), and described by Kochansky (1944) and Kochansky-Devidé (1957). Since then, there have been no papers on the Badenian brachiopods from Croatia, except one unpublished Master Thesis by K. Bakrač (Sinković 1994). Specimens described in the above-mentioned papers are today housed in the Croatian Natural History Museum and we decided to conduct their revision.

A revision is based on the taxonomical review and biometry of the brachiopod specimens. In this paper we present preliminary results of this ongoing study. Brachiopods are represented by the class Rhynchonellata, with more than 700 specimens from the orders Rhynchonellida and Terebratulida, and the latter one prevails. Brachiopod assemblage from Northern Croatia shows similarity with the Miocene terebratulid record from Slovenia (e.g., Mikuž 2011 and references therein), and also comprises the species *Megerlia truncata* (Linnaeus, 1767), common in the Miocene deposits of the Central Paratethys (e.g., Bitner & Dulai 2004 and references therein). Several other brachiopod species, from the terebratulid family Megathyrididae, common in the Miocene of the Central Paratethys, e.g., *Argyrotheca cuneata* (Risso, 1826), *Megathiris detruncata* (Gmelin, 1790) and *Joania cordata* (Risso, 1826) (after e.g., Bitner & Dulai 2004 and references therein; Bitner et al. 2013 and references therein) are not recorded so far from the Miocene deposits of Northern Croatia. Study of the here presented brachiopod fauna could give further insight into the brachiopod biogeographical provinces and open marine connections in this area of the Central Paratethys during the Badenian Stage.

Acknowledgement: This research is part of the project “Mathematical researching in geology VII” (PI: Professor T. Malvić, University of Zagreb, Faculty of Mining, Geology and Petroleum Engineering) and the Croatian Science Foundation Project IP-2019-04-7042 (Sedimentary paleobasins, water corridors and biota migration, PI: Professor M. Kovačić, University of Zagreb, Faculty of Science).

References:

- Bitner, M.A. & Dulai, A. 2004. Revision of Miocene brachiopods of the Hungarian Natural History Museum, with special regard to the Meznerics collection. *Fragmenta Palaeontologica Hungarica*, 22, 69–82.
- Bitner, M.A., Zágoršek, K. & Hladilová, Š. 2013. Deep-water brachiopod assemblage from the Middle Miocene of Kralice nad Oslavou, Moravia, southeastern Czech Republic. *Comptes Rendus Palevol*, 12, 81–89.

- Gorjanović-Kramberger, D. 1908. Geologijska prijedlogna karta k. Hrvatske i Slavonije. Tumač geologijskoj karti Zagreb (Zona 22, Col. XIV) [Geologische Übersichtskarte des königsreiches Kroatien-Slavonien. Erläuterungen zur geologischen Karte von Agram (Zone 22, Col. XIV)]. *Naklada Kr. zemaljske vlade, Odjela za unutarne poslove, Zagreb*.
- Kochansky, V. 1944. Fauna morskog miocena južnog pobočja Medvednice (Zagrebačke gore) [Miozäne marine Fauna des südlichen Abhanges der Medvednica, Zagreber Gebirge]. *Vjesnik Hrv. drž. geol. zav. i Hrv. drž. geol. muz.* II/III, 171–280 (in Croatian with German summary).
- Kochansky-Devidé, V. 1957. O fauni morskog miocena i o tortonskom "šliru" Medvednice (Zagrebačke gore) [Ueber die Fauna des marinen Miozäns und über den tortonischen "Schlier" von Medvednica, Zagreber Gebirge]. *Geol. vjesnik* X (1956), 39–50 (in Croatian with German summary)
- Kováč, M., Andreyeva-Grigorovich, A., Bajraktarević, Z., Brzobohatý, R., Filipescu, S., Fodor, L., Harzhauser, M., Oszczytko, N., Nagymarosy, A., Pavelić, D., Rögl, F., Saftić, B., Ljubomir, S. & Studencka, B. 2007. Badenian evolution of the Central Paratethys Sea: Paleogeography, climate and eustatic sea-level changes. *Geologica Carpathica*, 58, 579–606.
- Mikuž, V. 2011. Brachiopods from Miocene beds near Šentilj in Slovenske Gorice, Northeast Slovenia. *Folia Biologica et Geologica*, 52, 3, 29–46.
- Piller, W.E., Harzhauser, M. & Mandic, O. 2007. Miocene Central Paratethys stratigraphy—Current status and future directions. *Stratigraphy*, 4, 151–168.
- Rögl, F. 1998. Palaeogeographic Considerations for Mediterranean and Paratethys Seaways (Oligocene to Miocene). *Ann. des Nat. Mus. Wien*, 99A, 279–310.
- Sinković, K. 1994. Karpatski sedimenti i fosili na lokalitetu Plaz (jugoistočna Medvednica) [Karpatian sediments and fossils at the Plaz locality (southeastern part of the Medvednica Mt.)]. University of Zagreb, Faculty of Science and Faculty of Mining, Geology and Petroleum Engineering, Master Thesis, unpubl., 1–21.
- Sremac, J., Bošnjak, M., Velić, J., Malvić, T. & Bakrač, K. 2022. Nearshore pelagic influence at the SW margin of the Paratethys sea – examples from the Miocene of Croatia. *Geosciences*, 12, 120.