New age data on the ophiolites from the Central Serbia: Implication for the Jurassic evolution of the Vardar ocean

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Middle to Upper Jurassic radiolarites are of special interest for the reconstruction of Neo-Tethys oceanic domain, the Jurassic geodynamic history of the western Tethyan realm and the palaeogeographic evolution of the Inner Dinarides.

Near Kragujevac (Velike Pčelice section) occur in the ophiolitic mélange a basalt block with its 23 m thick sedimentary cover sequence, mainly claystones and radiolarites, which were studied for their biostratigraphic age and their lithofacies to reconstruct the depositional setting. Directly on top of the basalt predominantly siliceous claystones were deposited. Upsection follow a more and more radiolaritic succession with 3-5 cm thick radiolarite beds in the lower part and 1-3 cm thick radiolarite beds in the upper part of the section with cm-thick claystone intercalations. The lower part of the section is characterized by quartz-filled hydrothermal veins missing in its upper part. In contrast, the upper part of the section is bioturbated, deformed and with increasing clay content.

The preservation of the radiolarians in the different parts of the section is poor to moderate, but yielded determinable age diagnostic radiolarian assemblages. The lowermost 4.5 m of the section contain *Hemicryptocapsa marcucciae* (Cortese), *Cinguloturris carpatica* Dumitrica and *Williriedellum crystallinum* Dumitrica (sample VP 3), higher up appear *Gongylothorax favosus* Dumitrica (sample VP 5), and in the highest part of the section *Praewilliriedellum robustum* (Matsuoka), *Cinguloturris carpatica* Dumitrica, and *Williriedellum crystallinum* Dumitrica (sample VP 6). In total, the age of the radiolarites is Callovian to lower Oxfordian, indicating a very rapid deposition of this radiolarite succession, different to known Triassic Steinmann Trinities from the Neo-Tethys ocean floor, which are in few cases preserved in the ophiolitic mélanges of the Inner Dinarides, but mostly scattered to different blocks consisting of Middle and Late Triassic radiolarites and the Neo-Tethys ophiolites.

However, this Callovian block of Neo-Tethys ophiolites (most probably SSZ-ophiolites) with its cover sequence is the first direct proof of Jurassic ophiolites in the Inner Dinarides. Similar Middle Jurassic blocks are known from Albania (e.g., Chiari, Marcucci & Prela, 1994), Greece (Baumgarter, 1984) and the Guevgueli Ophiolite Complex/Axios Zone (Republic of Macedonia, Kukoč et al., 2014). The only Late Jurassic (Early Oxfordian) age date for the siliceous mudstones within the extrusive sequence of the Guevgueli Ophiolite (northern Greece) is given in Danelian et al. (1996).

According to the geological map of Kragujevac the ophiolitic mélange is sealed by the Early Cretaceous paraflysch, which led to following geodynamic reconstruction: Middle to Early Late Jurassic ophiolite obduction on the wider Adria plate was followed by Tithonian-Berriasian mountain uplift and unroofing. During this process the ophiolitic mélange in the Kragujevac area was transported to the east of the metamorphic dome and sealed in its position by the paraflysch (Berriasian to Aptian).

References

Baumgartner P.O. 1984. A Middle Jurassic–Early Cretaceous lowlatitude radiolarian zonation based on Unitary Associations and age of Tethyan radiolarites. Eclogae Geol. Helv. ,77 (3): 729–837.

Chiari M., Marcucci M. & Prela M. 1994. Mirdita ophiolites Project: 2- Radiolarian assemblages in the cherts at Fusche Arrez and Shebaj (Mirdita area, Albania). Ofioliti, 19 (2a): 313–318.

Danelian T., Robertson A.H.F., Dimitriadis S. 1996. Age and significance of radiolarian sediments within basic extrusives of the marginal basin Guevgueli ophiolite (northern Greece). Geol. Mag., 133: 127–136.

Kukoč D., Goričan Š., Košir A., Belak M., Halamić J. & Hrvatović H., 2014. Middle Jurassic age of basalts and the post‑obduction sedimentary sequence in the Guevgueli Ophiolite Complex (Republic of Macedonia). Int. J. Earth Sci., 104: 435–447.

***Keywords:*** Middle-Late Jurassic, Radiolarians, Neo-Tethys ophiolites.