

First evidence for Silurian Magmatism in the Serbo-Macedonian Massif, northern Greece

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Together with the Rhodope Massif, the Serbo-Macedonian Massif (SMM) forms a large basement complex in the internal hinterland of the alpine Hellenides. These units were originally considered to be an old, possibly Precambrian crustal block, which was subjected to an alpine metamorphic overprint. More recent studies favour a younger age of crustal formation, but geochronological data are scarce and mainly based on Ar dating thus representing cooling ages after the alpine event.

The SMM can be subdivided into the Vertiskos and Kerdillion units. This study is focused on the timing of magmatism in the northern Vertiskos unit, which consists of a variety of ortho- and paragneisses, which are intruded by granites and amphibolitized mafic intrusive rocks. The samples are granites and orthogneisses from the northern Vertiskos and Kerkini mountains. Intrusion ages were obtained by single zircon Pb-Pb evaporation method. Crystal morphology and cathodoluminescence studies confirm the igneous origin of the zircons. Five samples yielded intrusion ages ranging from 436.9 ± 1.9 Ma to 423.1 ± 8.8 Ma with a mean age of 433 ± 4.2 Ma. These Silurian ages are the first evidence for a magmatic event in the SMM at that time.

Minor granitic to dioritic intrusions in the north-eastern Vertiskos mountains were dated at 309.0 ± 13.0 Ma and 294.0 ± 10 Ma. The ages of these intrusions correspond to the timing of magmatism in the Pelagonian and Rhodope units, whereas the Silurian phase is not recorded there, suggesting that the SMM had an individual evolution prior to 300 Ma. Therefore the SMM is not part of the Rhodope Massif, which is more similar to the Pelagonian Zone in the West. We conclude from this age distribution that the Serbomacedonian with its complex magmatic and polymetamorphic evolution forms an independent terrane in the Aegean region

Pore water dissolved organic carbon fluxes from boreal lake sediments

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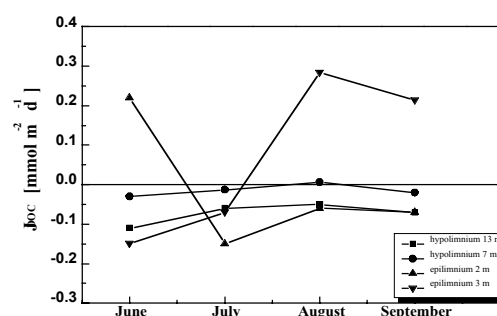
The pore water dissolved organic carbon (DOC) fluxes were determined in Lake 658 at the Experimental Lakes Area in northwest Ontario, Canada during the period from June to September, 2001.

Gradient calculation

To calculate the DOC concentration gradient, the upper twelve centimetres of a DOC profile were fit using a second order polynomial (Holcombe et al., 2001). The diffusive flux, J , across the sediment-water interface was determined from Fick's first law:

$$J_{\text{DOC}} = -\Phi D_{\text{sed}} [\Delta\text{DOC}/\Delta x]$$

Figure 1. Variations of DOC fluxes at the sediment-water interface from June-September, 2001.



Conclusions

Pore water profiles from epilimnetic cores show greater variability in DOC fluxes than hypolimnetic sediment cores. Profiles of shallower areas in the lake indicate that there is a net influx of DOC to the sediment pore water during the summer. However, further investigation is needed to validate these preliminary conclusions and to better understand the effect of DOC in the sedimentary carbon cycle.

References

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