EARLY PALEOZOIC MICROFOSSILS FROM THE INNER WESTERN CARPATHIANS (GEMERICUM, FORAMINIFERA, PSAMMOSPHAERACEA)

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Abstract: In the metamorphic series of the Gemericum, in the Vlachovo and Bystrý potok Formations of the Gelnica Group, a rich foraminiferal associations were obtained for the first time. The foraminifers occur as a numerous spherical tests attributing to the several species of psammosphaerids, saccamminids and thuramminids.

Key words: Inner Western Carpathians, Gemericum, Early Paleozoic, arenaceous foraminifers.

Introduction

Occurrences of foraminifers in the Early Paleozoic formations are not so common, much less those in the metamorphic series. Therefore, their findings in the metamorphic rocks of the Gemericum are very valuable from the point of view of taxonomic evaluation and biostratigraphic implication. Moreover, the foraminiferal fauna provides a new data for correlation of the Gemericum with another units known for the presence of the Early Paleozoic foraminifera (e.g. Grauwackenzone, Barrandian).

Geological setting

The Gelnica Group of the Gemericum consists of three formations, defined from the bottom upwards: the Vlachovo Formation, the Bystrý potok Formation and the Drnava Formation. Their age has been inferred from palynomorphs, acritarchs and kerogene (Snopková, 1964; Čorná, 1972; Čorná & Kamenický, 1976; Snopková & Snopko 1979; Ivanička et al., 1989, etc.). In the Vlachovo Formation, there is two lithostratigraphic divisions: lower part is formed by metagreywackes, cryptobedded phyllites and lenticular beds of lydites (Cambrian – Ordovician), which became a more sandier and turbiditic in upper part (metaflysch, carbonates, lydites and porphyroids – Lower to Middle Silurian). The Bystrý potok Formation consists of siliciclastic metasandstones with horizons of acid to intermediate volcanoclastic turbidites and lydites (Late Silurian). Lithology of

the Drnava Formation is simmilar (metasandstones, phyllites, metavolcanites, lydites), but the age seems to be younger (Lower Devonian). Lydites of the Gelnica Group have been sampled, providing a microfossil findings from all three formations: Vlachovo Fm. (Henclová), Bystrý potok Fm. (Široká dolina) and Drnava Fm. (Jedlinky).

Foraminiferal assemblages

The extracts from the Gemeric lydites are rich in sphaerical microfossils. In some extractions they form even monoassociations (e.g. at the Jedlinka locality comprising of 70 individual tests), in thin sections they are practically rock-forming fossils (e.g. Henclová locality). Similar spherical forms were already described from the locality Betliar. Ondrejíčková & Snopko (1986) consider them as a radiolarians close to the genus *Pylentonema* DEFLANDRE. Betliar's specimens, which exhibit a meshwork wall structure, presence of "pylum" and tiny dimensions (80 - 100 μ), are not identical with spherical fossils described herein (Dr. A. Ondrejíčková also refused them to be radiolarians).

Sphaerical microfossils from the Gemeric lydites are more likely a single-cell foraminifers of the family Psammosphaeridae or Saccamminidae. Their appurtenance to forminifers is proved by arenaceous tests, large-size dimensions (up to 1 mm) and mainly the presence of flat or also neck-like shaped aperture. In foraminiferal association, there is a predominance of two psammosphaerid species, which substantially differ in size and structure of agglutination. Larger forms respond to the species *Psammosphaera cava* MOREMAN, having the thicker and coarsely agglutinated walls with spongy-like exterior surface. Smaller forms of psammosphaerids, which tests are finely agglutinated up to subgranular, smoothly-walled and misty tranculent, belong to the species *Psammosphaera micrograna* EISENACK. The psammoshaerid tests have no definite aperture (only interstitial pores that serve as aperture). The foraminifers with recognizable aperture respond to the genus *Saccammina,* and that to the following two taxa: *Saccammina glenisteri* CRESPIN (forms with simple rounded aperture) and *Saccammina silurica* EISENACK (forms with raised apertural neck). Some saccamminid forms show an indication of symmetrical spiny-like protuberances (*Amphitremoida tubulosa* EISENACK) or lemon-like outlined protuberances (*Amphitremoida citriniforma* EISENACK). Beside of single-cell forms there is also a small bilocular tests, which recall a some thuramminid species (e.g. *Thuramminoides aff. sphaeroidalis* PLUMER).

Conclusions

Gemeric associations of arenaceous foraminifera are closely simmilar to those described form the Barrandien (Bubík 1996, 1997, Holcová 1999), Grauwackenzone in the Alps (Kristan-Tollmann 1970, 1971), North-Rhine-Westphalia (Reigraf & Niemeyer 1996), etc. In these regions, the associations with predominance of psammosphaerid and thuramminid species (*Psammosphaera cava*, *Thuramminoides sphaeroidalis*) are known mainly from the Ordovician (Llanvirnian) sediments. The Silurian associations of arenaceous foraminifera are, however, also completed by younger taxa of Ammodiscidae, Trochamminidae, Tolypamminidae, etc., which are missing in lydites of the Gemericum. The abundance of psammosphaerids and saccamminids, i.e. flysch-type assemblage of agglutinated foraminifers (cf. Kuhnt et al. 1989), indicates a deep-water character of the Gelnica Group formations.

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Fig. 1 Morphotypes of arenaceous foraminifera from the Early Paleozoic sediments of the Gemericum (this study) and the Barrandian (Holcová 1999).

Gemeric specimens
of arenaceous foraminifera

Barrandian specimens
of arenaceous foraminifera
(Holcová 1999)