MIDDLE PANNONIAN SUBLITTORAL OSTRACOD FAUNA FROM THE LOCALITY SOPRON (HUNGARY)

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Abstract

Dlhoveké panónske jazero bolo rozsiahlym vodným telesom, ktoré existovalo v strednej Európe počas vrchného miocénu. Dôsledkom izolácie jazera od mediteránnej oblasti sa v jazere vyvinula brakická endemická fauna. Paleontologické štúdiá sa zaoberali rozdielnymi ekologickými parametrami, ktoré mohli hrať úlohu v osídlení vodných biotopov. Tento príspevok je zameraný na vertikálnu distribúciu taxónov (druhov, rodov, čeľadí) v sublitorálnych ílovitých a prachovitých sedimentoch lokality Šoproň (47°40'51"N and 16°37'21"E), ktorá patrí do Šoproňsko-Eisenstadtskej panvy a korešponduje s maximálnou extenziou jazera a magnetostratigraficky datovanej do intervalu C5n (11,04–9,78 mil. r.), biostratigraficky do biozóny Lymnocyrdium soproniense (Magyar et al. 2007). Porovnávali sme abundanciu jednotlivých rodov lastúrničiek s litológiou a celkovým obsahom uhlíka (TC), obsahom organického uhlíka (TOC), obsahom inorganického uhlíka (TIC) a s obsahom $CaCO_3$.

The long-lived Lake Pannon was a huge water body, which existed during the Late Miocene in central Europe. As a result of lake´s isolation from the Mediterranean a diversified brackish endemic fauna evolved in the lake. The paleontological studies have examined the different ecological parameters which could play a role in settlement of the water biotopes. This contribution is focused on vertical distribution of the taxa (speceis, genera, families) in the sublittoral clayey and silty deposits at the locality Sopron (47°40'51"N …and 16°37'21"E) in the Sopron-Eisenstadt Basin and corresponding with maximal extension of the lake and dated magnetostratigraphically to interval C5n (11.04 to 9.78 Ma) and biozone Lymnocardium soproniense (Magyar et al. 2007). We compare the abundance of the ostracod individuals with lithology and total carbon (TC), total organic carbon (TOC), total inorganic carbon (TIC), and $CaCO_3$.

Material and methods

The samples with a thickness 1 cm were taken each 20 cm of the profile. Fifty grams were naturally dried in the laboratory and successively washed on sieve mesh 0.08 mm for quantitative micropaleontological analyses and study of the taxonomy, species composition and distribution of the taxa. Additionally, several grams of the original sample were dried, homogenized and analyzed for the total carbon (TC), total organic carbon (TOC), total inorganic carbon (TIC) and $CaCO_3$.

Due a morphological similarity between the juvenile stages, mainly of the subfamily Candoninae, the quantitative analysis was performed only for the genera and families, separately for juveniles and adults.

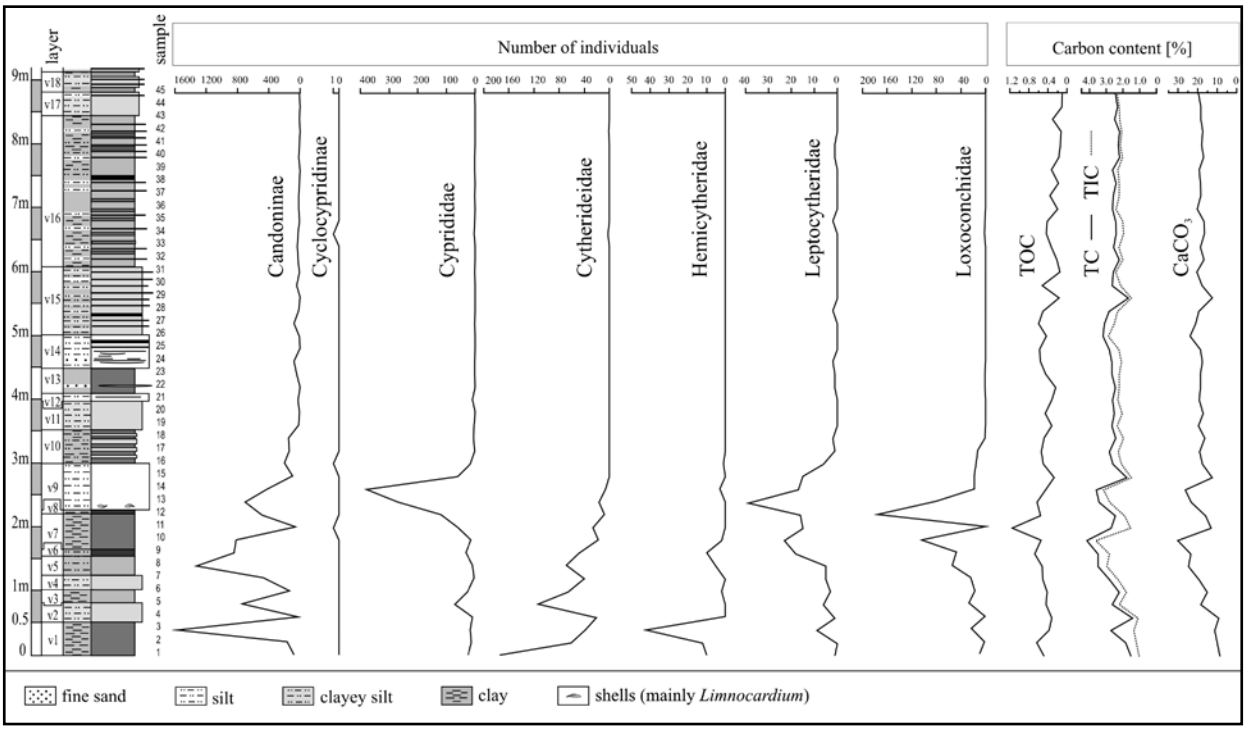

Fig. 1: Sedimentary facies at the outcrop Sopron, abundance of the preserved ostracod valves by family and content of total organic carbon (TOC), total carbon (TC), total inorganic carbon (TIC) and content of $CaCO_3$ in the deposits.

Results

Sedimentary environment

The sedimentary sequence reflects a part of a lacustrine–deltaic environment in which the delta deposits gradually prograded to the mud-rich sublitoral lake environment.

Mud deposition of grayish-blue to grayish-brown clay with variable content of silt, bioturbation, and dispersed macrofossil shells prevail in a lower part of the outcrop (0–4.5 m, samples 1–23, Fig. 1). Textural stratification is less frequent in this part of sequence.

Silt content gradually increases toward the up and thin rhythmic deposition of clay, silt and very fine sand is observed from 4.5 to 9.0 m (samples 24–45). The parallel lamination, current ripples, and small-scale graded bedding are common in thin silty and sandy beds. Bioturbation and carbonized remains of flora are also present. Above the sampled part (not shown on the Fig. 1), the silty and sandy rhythmic development is terminated by coarse-grained silts and sands with cross-bedding, current ripple bedding, scour-and-fill structures and erosional surfaces. Thin layers of fine-grained gravels, horizon with shell concentration as well as abundance of well preserved plant remains have been found. This part of sedimentary sequence suggests a deposition in distributary mouth bars and distributary channels of delta front within the action of the fair-weather wave base.

Distribution of the families

Candonidae are the most abundant family on the individuals and species in the deposits but a majority of Candonidae come from the subfamily Candoninae – *Camptocypria*, *Candona*, *Caspiocypris*, *?Cryptocandona*, *Lineocypris*, *Pontoniella*, *Pseudocandona*, *Serbiella*, *Typhlocyprella*, *Typhlocypris*. Only one genus of Cyclocypridinae – *Cypria* – has been identified with a rare occurrence in the deposits. An abundance of the Candoninae is the highest in a clayey sequence from 0.0 to 2.4 m with a maximum 1593 preserved juvenile and adult valves in a sample 3. Their abundance decreases noticeably in silty deposits.

Cyprididae are represented here by the brackish *Amplocypris*, *Herpetocyprella* and mesohalophilic *Heterocypris*, of which only *Amplocypris* is abundant in a sandy layer v9.

Abundance of Cytherideidae (genus *Cyprideis*) decreases from 175 preserved valves in the sample 1 to 0 in the sample 15, and above this interval their occurrence is sporadic and abundance does not exceed two preserved individuals.

Hemicytheridae, represented here by fossil brackish *Hemicytheria*, have the highest abundance in clay with a maximum 43 valves in a sample 3. They do not occur in the silty sequence.

Leptocytheridae, represented here by brackish *Amnicythere* and *Euxinocythere*, are minor family in the clayey sequence from 0.0 to 1.4 m. They attain a maximum abundance in a sample 13 (39 preserved valves), but their abundance in the silty sequence is low (1–2 individuals).

Loxoconchidae, represented here by brackish *Loxoconcha*, *Loxocauda* and *Loxocorniculum*, are abundant in a clayey sequence, mainly between the samples 9–15, with a maximum in sample 12 (179 preserved valves). Above, in a silty part with higher dynamic of water environment, they occurrence is only occasional.

Carbon content

It shows higher variability in the clayey sequence from 0.0 to 2.4 m than in silty sequence. TOC has a maximum content in clay sample 11 (1.16 %), but generally it displays a trend to decrease towards the up. $CaCO_3$ attains its minimal (8.67 %) and maximal (30.25 %) content in clayey sequence and its content is approximately stable in a silty sequence. TIC and TC show similar trends.

Conclusion

The ostracods occur along the outcrop but a number of the preserved ostracod juvenile and adult valves is significantly higher in the lower clayey sequence (from 0.0 to 2.4 m), than in the upper silty sequence (from 4.5 to 9.0 m). It seems a presence of the ostracod was independent on the carbon content and their abundance in the water environment was influenced by dynamics and a depth of the water environment.

Acknowledgement

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Reference

Magyar, I. – Lantos, M. – Ujszaszi, K. – Kordos, L. (2007): Magnetostratigraphic, seismic and biostratigraphic correlations of the Upper Miocene sediments in the northwestern Pannonian Basin System. – Geologica Carpathica, 58, 277–290.