

DATING OF THE TERTIARY “PTEROPODA EVENTS” IN HUNGARY BY MAGNETOSTRATIGRAPHY

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Abstract: The Hungarian Tertiary marine sediments contain relatively rich pteropoda fauna. Nearly 30 species, assigned to 8 genera have been recognized from 33 Eocene, 21 Oligocene and 43 Miocene localities. In Hungary, the first planktonic gastropods appeared in Middle Eocene, 43 Ma ago in the magnetic chron C20n and disappeared in the Miocene (Badenian), in the chron C5ADn with an age of 14,2 Ma, according to time scale of Berggren et al. (1995).

Key words: Holoplanktonic Mollusca, Euthecosomata, biostratigraphy, magnetostratigraphy, Tertiary, Hungary

The aim of this report is to present the latest results of research of Tertiary pteropods in Hungary, particularly the correlation with biostratigraphic and magnetostratigraphic data.

Large areas of Hungary are covered by Tertiary marine sediments containing a rich fauna of holoplanktonic gastropods.

Recent studies of marine fossil holoplanktonic gastropods suggest that this group of molluscs is an effective biostratigraphic tool for correlation of Tertiary marine sediments all over the world.

The heteropods and pteropods are two groups of planktonic gastropods that have been preserved in fossil records. Pteropods are represented by eight genera of Euthecosomata (Limacina, Creseis, Praehyalocylis, Clio, Styliola, Vaginella, Diacrolinia, Ireneia) distributed from the Middle Eocene to Middle Miocene.

In Hungary, it is particularly important that nannoplankton, plankton foraminiferal and magnetostratigraphic zonation are available from most part of the boreholes yielding pteropods which offer an excellent opportunity for multidisciplinary approach in correlation.

Eocene pteropods occur in 33 localities in Hungary, mostly continuously cored drillings. Nannoplankton and planktonic foraminiferal zones are available in large parts of these boreholes, supported by several magnetostratigraphic correlation.

Eocene deposits contain a rich fauna of pteropods, 10 species have been identified, assigned to 4 genera. Most characteristic are *Limacina* aff. *bartonense*, *Limacina* sp. A., *Cresis hastata*, *Praehyalocylis annulata*.

The first planktonic gastropods in Hungary - *Limacina*, *Creseis*, *Praehyalocylis* - appeared about 43 Ma ago, in the NN16 nannozone, the *Morozovella lehneri* plankton foraminiferal zone and the magnetic chron C20n (Lantos M. et al., 2000).

The first appearance of *Clio* genus at the top of the nannozone NP16, around 40 Ma is the oldest occurrences worldwide (Bohn-Havas M., Lantos M. 2000).

Pteropods disappeared at 36 Ma in Hungary, in the nannozone NP 18, *Globigerinoides semiinvoluta* planktonic foraminiferal zone and magnetic chron C16n (Lantos M. et al. 2000).

Oligocene marine sediments (NP22-25) in 21 localities (5 outcrops, 16 boreholes) also contain rich pteropod fauna, (7 species 5 genera). Most part of localities were studied and dated by nannoplankton (Báldi-Beke M.1983., Nagymarosy A.1984.).

The mass occurrence of *Limacina* (lower part of NP 22); the presence of *Ireneia tenuistriata* (NP 24) which is an index fossil for pteropod zone 16 in NW Europe (Janssen A. W. and King C. 1988) and *Vaginella tricuspidata* (NP 24-25) which is an important species of a correlation of Late Oligocene deposits in Europe, are noteworthy (Janssen A. W. and Zorn I., 1993).

Of 6 genera (*Vaginella*, *Limacina*, *Clio*, *Diacrolinia*, *Creseis*, *Styliola*) assigned 11 species are known from 43 localities of the Hungarian Miocene marine deposits. Most of pteropods occur in continuous cores which can be well-dated by nannoplankton and magnetostratigraphy (Nagymarosy A.19 , Bohn-Havas M., Lantos M. 1997).

Vaginella austriaca, *Clio fallauxi*, *Clio pedemontana*, *Diacrolinia aurita* are important for further classification of the Middle Miocene.

Among the above mentioned important species *Vaginella austriaca* is the most widespread in space and time. It is remarkable that this species appeared first (Karpatian, NN4 nannozone) and only small number can be found in the Early Badenian chron C5ADr, about 14,9 Ma.

14,5 Ma ago (chron C5ADn) *Clio fallauxi*, *Clio pedemontana*, *Diacrolinia aurita* and *Limacina valvatina* appeared. A rapid increasing in the diversity number of specimens and geographic distribution of pteropods are characteristic at the same time.

After this "acme" planktonic molluscs show an abrupt rapid decrease and disappear at the end of chron C5ADn about 14,2 Ma.

The mass occurrence of *Limacina* (=Spiratella horizon) is very characteristic in the Late Badenian deposits in the Paratethys but this horizon has not been identified in Hungary, yet.

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