

PALYNOLOGY OF THE LATE NEOGENE, INTERCEPTED IN A BOREHOLE FROM CERNEȚI (EAST OF TURNU SEVERIN)

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ABSTRACT. The paper presents the results of the palynologic studies carried on the samples recovered the W1 well from Cerneți. These rocks were assigned to Meotian and Pontian deposits. The **Meotian** deposits, 40 m thick are characterized by a palynological spectrum consisting from: Ferns (3-4%), Conifers (56-62%), Monocotyledonous Angiosperms (1-2%), Dicotyledonous Angiosperms (33-40%). The microflora was compared with the pollinic spectrum from the Late Meotian deposits between Teleajen and Dâmbovița (Cioflică, 1969). The **Pontian** intercepted between m 112 and m 36 keeps a relatively uniform microflora: Ferns (5%), Conifers (60%), Monocotyledonous Angiosperms (1%), Dicotyledonous Angiosperms (34%). This microflora was compared with the pollinic spectrum from the Lower Pontian deposits from Batoți and from the Upper Pontian deposits from V. Vișenilor and V. Boierească. The paper infers on paleoclimatic circumstances specific to the forest vegetation during the Meotian and Pontian times, and also contains a reconstitution of the source vegetation for the studied and identified sporo-pollinic material.

Keywords: microflora, Late Neogene, Cerneți, SW Romania.

INTRODUCTION

The studied area is located in Mehedinți District, next to Drobeta Turnu Severin town.

The W1 well from Cerneți (Fig.1) is 150 m deep and was performed by the SC FORADDEX SA as a component of a large project named: "Water supply for Cerneți-Dedovița Nouă localities", during 2002. Because of the high content in NaCl of the water samples, the drill has been closed and there has been realized a number of lower depth drills for the same purpose of water supplying.

The intercepted sedimentary sequence (Fig.2) starts with the Upper Meotian deposits, consisting on sands and sandy clays with *Congerina panticapaea*, *Psilunio subrecurvus* etc.

In the studied perimeter, the Pontian deposits have a wide extension. In the W1 well, the sedimentary sequence assigned to the Early Pontian, starts at the base with gravels followed and ending with grayish clays.

PALYNOLOGICAL STUDY

The Meotian

From the lower sequence of the core, on an approximately 40 m interval (from m 150 to m 112), consisting of clays and sandy clays, 9 samples subjected to further palynologic analysis, were collected. The microflora records are well preserved and the composition of pollinic spectra from different samples is mainly the same. Further on, we will consider for discussion only the samples 30 (m150) and 24 (m 126).

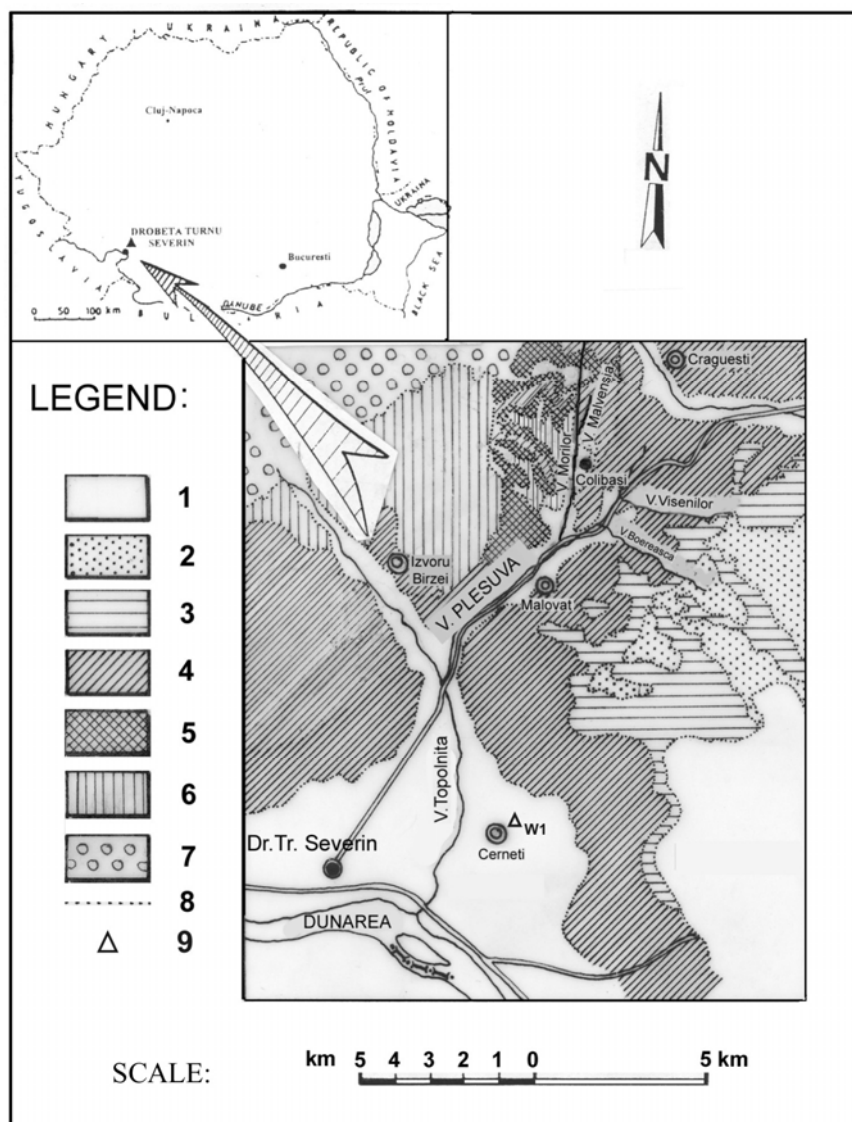


Fig.1. Location of the W1 Cerneți well (1 – Quaternary, 2 – Romanian, 3 – Dacian, 4 – Pontian, 5 – Meotian, 6 – Sarmatian, 7 – Badenian, 8 – geological boundary, 9 – drill (after the geological map of Romania, scale 1:200.000, modified).

The Sample no. 30 (m 150). FERNS – 3%, CONIFERS – 62%, (Taxodiaceae + Cupressaceae – 3%, Pinaceae – 59%), ANGIOSPERMS – 35% (Monocotyledons – 2%, Dicotyledons – 33%) (Fig.2).

The Sample no. 24 (m 126). FERNS – 4%, CONIFERS – 55%, (Taxodiaceae + Cupressaceae – 2%, Pinaceae – 53%), ANGIOSPERMS – 41% (Monocotyledons – 1%, Dicotyledons – 40%) (Fig.2).

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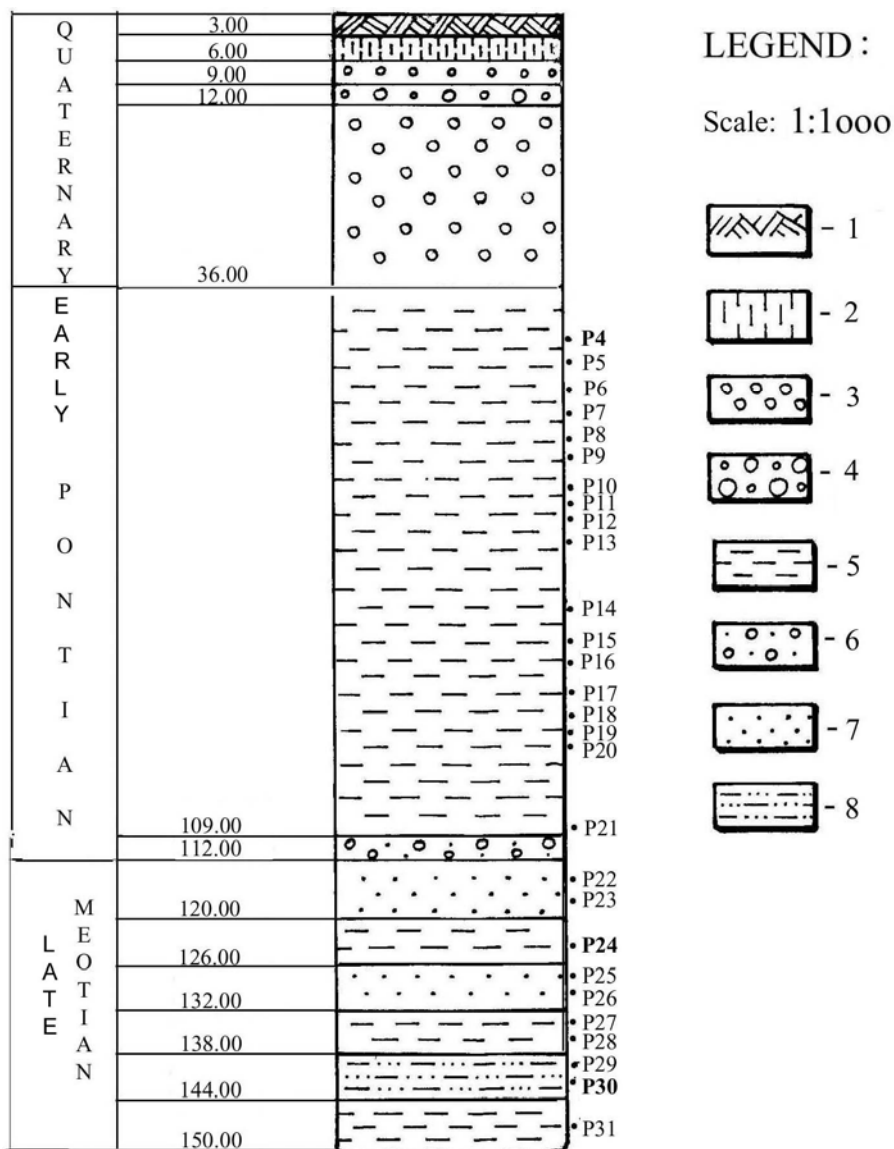


Fig. 2. Synthetic lithologic column of deposits crossed by the W1 well from Cerneți, indicating the samples locations (1 – vegetal soil, 2 – loess, 3 – gravel, 4 – gravel with rugged elements, 5 – grayish plastic clay, 6 – coarse sand with gravel elements, 7 – grayish fine sand, 8 – clayey fine sand)

On the whole, FERNS (3-4%) are represented by Polypodiaceae (*Laevigatisporites*, *Polypodiaceoisporites*, *Leiotriletes*) and Osmundaceae (*Baculatisporites*) spores.

CONIFERS (55-62%) are evidence by Taxodiaceae + Cupressaceae (2-3%) pollen and dominantly by Pinaceae (53-59%) pollen.

From the first group we have identified: *Sequoiapollenites polyformosus*, *Inaperturopollenites verrupapillatus*, *Cupressacites bockwitzensis* and *Sciadopityspollenites serratus*.

The Pinaceae Family is certified by: *Pinus* sg. *diploxylon* – 28-32%, *Pinus* sg. *haploxylon* (+ *Cathaya*) – 15-16%, *Abies* – 2-3%, *Picea* – 4%, *Cedrus*-3-4%, *Tsuga*-2%, *Keteleeria* sub 1%.

The pollen of *Ephedra* – *Ephedripites* (*Eph.*) *wolkenbergensis* is absolutely sporadic.

THE MONOCOTYLEDONOUS ANGIOSPERMS (1-2%) are represented by monoporate pollen of *Sparganium* și *Graminiidites*. Sporadically also might be identified de palm trees monocolpate pollen (*Monocolpopollenites* sp.).

THE DICOTYLEDONOUS ANGIOSPERMS (33-40%) are frequent and represented by the pollen of *Carya*, *Alnus*, *Ulmus*. With a lower frequency it follows: *Pterocarya*, *Quercus*, *Fagus*, *Betula* and pollen of herbaceous plants (*Tubulifloridites kozaniensis*, *Persicarioipollis welzowense*, *Chenopodipollis multiplex*, *Artemisiapollenites sellularis* ș.a.). Rarely, pollen of *Myrica*, *Carpinus*, *Momipites punctatus*, *Zelkova*, Araliaceae, *Juglans*, *Engelhardtia*, *Tilia*, Ericaceae etc may be present.

Considering the ratio of participation between the main botanical groups, within it can be noticed the dominance of Pinacea pollen, the lower participation of Ferns and especially the Angiosperms composition (among of the pollen of herbaceous plants participate up to 3-4%), it can be concluded that the pollen analyzed here show strong resemblance with the Meotian flora from the “upper horizon” (Late Meotian), identified in the Meotian deposits developed between Teleajen and Dâmbovița by Cioflică (1969, p.9). In the Late Meotian, studied by Cioflică, FERNS participates up to 2-6%. The Pinaceae pollen is dominant: *Pinus* - 54-74%, *Picea* – 1-5%, *Abies* – 1%, *Tsuga* – 1%. The Taxodiaceae pollen has a participation of 2%. The herbaceous pollen participates with 2-4%.

In the Late Neogene of Slovakia, Planderova (1990, p.101), separated the MF-9 palinozone, dominated by the Pinaceae (*Pinus*, *Tsuga*, *Picea*), temperate dycotyledonous (*Ulmus*, *Betula*), as well as by the xerofile herbaceous plants (Chenopodiaceae, Gramineae, *Artemisia*, Compositae). This palynozone is assigned to the Late Sarmatian and in lot of aspects show resemblances with our pollinic spectrum.

The Pontian

After a sequece dominated mainly by gravels and subordinately by loess and vegetal soil (of 36 m in thickness) is developed a sequence consisting of gravels at the lower part (3 m) and grayish clays at the upper part (73 m in thickness), assigned to the Early Pontian (m 112 – m 36). There were palynologically analyzed a number of 18 samples keeping a quite uniform and well preserved microflora.

For the **sample no. 6 (m 48)** we have noticed the following participation percentages among the main botanical groups: FERNS – 5%, CONIFERS – 60% and ANGIOSPERMS – 35% (Fig.2).

FERNS (5%) are sensitively numerous than those from the Meotian deposits. We noticed in this case also, a dominance of Polypodiaceae spores (*Laevigatisporites haardti*, *L. gracilis*, *L. nutidus*, *Leiotriletes wolffi*, *Polypodiaceoisporites* div.sp.). It can be found *Echinosporis* cf. *echinatus*, *Favoisporis* cf. *trifavus*, *Stereisporites* (*St.*) *involutus* etc.

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CONIFERS (60%). The Taxodiaceae + Cupressaceae pollen is present under 1%. It is represented by *Inaperturopollenites hiatus*, *Sciadopityspollenites*. On the other hand the Pinaceae pollen is dominant overall the pollinic spectrum (59%). In this sample we have noticed the following participation percentages: *Pinus* sg. *diploxylon* - 27%, *Pinus* sg. *haploxylon* (+ *Cathaya*) – 10%, *Abies* – 3%, *Cedrus* - 4%, *Picea* – 8%, *Tsuga* - 6%, *Keteleeria* under 1%.

Scarcely might be found pollen of *Ephedra*.

THE MONOCOTYLEDONOUS ANGIOSPERMS (approximately 1%) have the same consistency as in the lower sequence (the Meotian one).

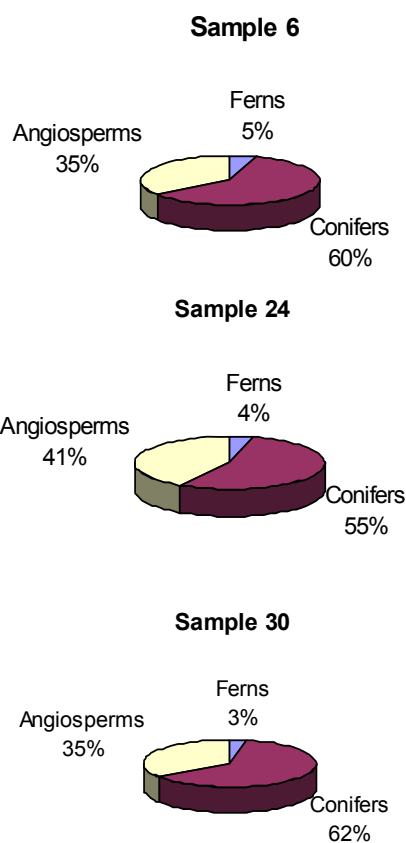


Fig. 3. The percentage diagram of the most important botanical groups (samples 6 – Early Pontian; 24 and 30 – Late Meotian)

THE DICOTYLEDONOUS ANGIOSPERMS (34%) are on the second place (after conifers) in the pollinic spectrum of the Pontian. The pollen of *Carya*, *Carpinus*, *Quercus*, *Ulmus*, *Fagus*, *Pterocarya* is very frequent. The pollen of *Betula*, *Myrica*,

Alnus, *Eucomia*, *Engelhardtia*, *Juglans*, *Zelkova*, *Liquidambar*, *Tilia*, Ericaceae is rare. The pollen of *Manikinipollis tetradoides* (considered to be *Periploca* pollen) appears to be singular, and is mentioned by Nagy (1985, p. 179) from the Sarmatian deposits in Hungary; here it might be a new presence in time of such tetrads. Actually in the Early Pontian from the Baraolt Basin (Petrescu et al., 1988, pl. II, fig. 12) this tetrad has been previously mentioned. Finally, in the Romanian from Gorj, this tetrad appears for the last time in Romania (Petrescu et al., 1987). Also the pollen of *Scabiosaepollenites minimospinosus* described by Nagy (1985, p. 179) in Pannonian, is rare.

An important participation (approximately 5%) has the pollen of xerofite plants: *Tubulifloridites macroechinatus*, *T. grandis*, *Cichoreacidites gracilis*, *Chenopodipollis multiplex*, *Artemisiapollenites sellularis*, Umbeliferae etc. The important participation of herbaceous plants specific for dry climate, indicates a continentalisation stage in the studied Pontian from Muntenia (Roman & Papaianopol, 1982), respectively in Early and Late Pontian cross sections from Mehedinți (Petrescu et al., 2002), respectively (Petrescu et al., 2001).

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Plate 1 (Meoțian) (1000x)

- Fig. 1. *Abies* (*Abiespollenites sivaki*);
- Fig. 2. *Inaperturopollenites verrupapillatus*;
- Fig. 3. *Pinus* sg. *haploxylon* (*Pityosporites alatus*);
- Fig. 4. *Pinus* sg. *diploxylon*;
- Fig. 5. *Tilia* (*Intratrisporopollenites cordataeformis*);
- Fig. 6. *Picea* (*Piceapollis tobolicus*);
- Fig. 7. *Sequoiapollenites polyformosus*;
- Fig. 8. *Chenopodiaceae* (*Chenopodipollis multiplex*).

Plate 2 (Ponțian) (1000x)

- Fig. 1. *Abies* (*Abiespollenites absolutus*);
- Fig. 2. *Periploca* (*Manikinipollis tetradoides*);
- Fig. 3. *Sphagnaceae* (*Stereisporites* (St.) *stereoides*);
- Fig. 4. *Picea* (*Piceapollis planoides*);
- Fig. 5. *Cedrus* (*Cedripites crassiundulicristatus*);
- Fig. 6. *Leiotriletes wolffi*;

