

Calcareous nannofossil biostratigraphy of the Buchak and Kiev Formations (Middle Eocene) of the central part of the Ukrainian Shield

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Paleogene sediments are widely distributed above the crystalline rocks of the Ukrainian Shield. The most complete section of the Paleogene is located in the Southern Krivbass (Inguletsk quarry). The Middle Eocene is represented here by the Voikovska, Rahmanivska, Malynivska, Staroinguletska and Borisfenska suites (Berezovskiy, 2000). The first three correspond to the Buchak Formation of the Lutetian stage; the Staroinguletska suite is equivalent with the Kiev Formation of the Bartonian stage. The Borisfenska suite is assigned to the Lower Oligocene (Berezovskiy, 2000). Despite a long period of paleontological research within this area, the age of most of the suites remains equivocal. Doubts mostly concern the age of the upper part of the Staroinguletska suite (Berezovskiy, 2000).

We studied nannofossils from sediments of the Malynivska (samples 1-9) and Staroinguletska (samples 10-19) suites (Andreeva-Grigorovich *et al.*, 2003; Waga, 2007). Both formations are represented by terrigenous (sandstone-clayey) and clayey (silty-mudstone) sediments and constitute a total thickness of about 40m. Samples 1-4 from the lower half of the Malynivska suite did not contain any nannofossils. Nannofossils appear in the upper part of the suite (samples 5-7) where they are represented by an association of moderate- to well-preserved species: *Coccolithus pelagicus*, *Coccolithus eopelagicus*, *Ericsonia formosa*, *Ericsonia fenestrata*, *Reticulofenestra minuta*, *Discoaster germanicus*, *Discoaster deflandrei*, *Discoaster barbadiensis*, *Discoaster elegans*, *Discoaster kuepperi*, *Nannotetrina* sp., *Nannotetrina fulgens*, *Chiasmolithus solitus*, *Rhabdosphaera* sp., *Transversopontis pulcheroides*, *Neococcolithus dubius*, *Discoaster binodosus binodosus*, *Discoaster distinctus*, *Reticulofenestra dictyoda* (Waga, 2007). These samples were assigned to the *Nannotetrina fulgens* (NP15) of Martini (1971) or *Nannotetrina cristata* (CP13) of Okada & Bukry (1980) zonation.

The lower part of the Staroinguletska suite (samples 8-14) is characterized by similar species, but with the FO of *Rhabdosphaera truncata*, *Chiasmolithus consuetus*, *Chiphragmalithus cristatus*, *Rhombosphaera* sp., *Coronocyclus nitescens*, *Zygrhablithus bijugatus*, *Rhabdosphaera creber* (Waga, 2007). This section was correlated with the upper part of the *Nannotetrina fulgens* (NP15) zone of Martini (1971).

Based on the FO of *Discoaster bifax*, the following interval (samples 15-19) was assigned to the *Discoaster bifax* (CP14a) Subzone of Okada & Bukry (1980). Apart from the zonal marker the most common species are: *Transversopontis pulcheroides*, *Neococcolithus dubius*, *Reticulofenestra dictyoda*, *Discoaster tanii nodifer*, *Coccolithus pelagicus*, *Reticulofenestra umbilica*, *Chiasmolithus gran-*

dis, *Reticulofenestra hilliae*.

In the paleoecological aspect, within the study area during the Middle Eocene existed a shallow to moderately-deep paleobasin with warm to tropical conditions. Both nannofossil zones contain species which, according to the classification of Dmitrenko (1993), are typical for tropical ecological zone (*Discoaster deflandrei*, *Sphenolithus moriformis*, *Cyclicargolithus formosus*, *Discoaster barbadiensis*, *Discoaster binodosus binodosus*, *Chiasmolithus grandis*, etc.). On the basis of the paleobionomical classification (Baldi-Beke, 1983), nannofossil assemblages are characteristic of an open-ocean (*Coccolithus*, *Cyclicargolithus*, *Zygrhablithus*, *Discoaster tanii nodifer*) to a shallow-water (*Rhabdosphaera*, *Pontosphaera*) environment (Waga, 2007).

These results allow us to conclude that the sediments of the Staroinguletska suite (Kiev Formation), which were earlier believed to be equivalents of the Bartonian stage, can be correlated indeed with both the Lutetian and the Bartonian stages of the Geological Time Scale (2004).

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