

STRATIGRAPHY OF THE PALEOGENE OF THE SURKHANDARYA DEPRESSION BY NANNOPLANKTON

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Abstract:

Zones and subzones' dissection stratigraphic of Palaeogene sediments of nannoplankton in Surxandarya is considered in the article.

Keywords: Nannoplankton , paleogen, kokkolitoforid , paleosen, dat, mont, yarus, eosen , tanet, foraminifer .

Аннотация:

Сурхондарё палеоген ётқизиқларининг стратиграфияси наннопланктон қолдиқлари зона ва кичик зоналар бўйича берилган.

Калит сўзлар: Наннопланктон , палеоген, кокколитофорид, палеоцен, дат, монт, ярус, эоцен, танет, фороминифера.

Ключевые слова: Наннопланктон , палеоген, кокколитофорид, палеоцен, дат, монт, ярус, эоцен, танет, фороминифера.

Introduction

In recent decades, the main role in the fractional dismemberment and correlation of Paleogene deposits of Central Asia has been assigned to the group of calcareous nannoplankton coccolithophorides (microscopic unicellular "golden" algae). This is due to the fact that nannoplankton clearly stands out among other Paleogene organic remains by its wide distribution in oceanic basins, independent of the facies composition of the rocks in which it is found and by sharp short-term changes in development, which is very important when establishing chronostratigraphic levels and correlation of sections of very remote regions.

Previously, during the stratigraphic dissection of Paleogene sediments of the Surkhandarya depression, complexes of mollusk remains, foraminifera, and ostracids were used, i.e. groups of organisms with slow evolution of development and dependent on the facies composition of sediments, which generally negatively affected stratigraphic structures without clear stratigraphic boundaries and reasonable correlation of sections.

The most popular was O.S.Vyalov's scheme, which for a long time was the basis for various geological constructions, geological mapping and other scientific and industrial needs. However, there was one drawback to this scheme. It was based on an endemic group of fauna and could not solve the issues of regional correlation and its correlation with the international stratigraphic scale of the Paleogene.

A very large group of scientists dealt with the issues of stratigraphic dismemberment and correlation of sections of the Surkhandarya depression: A.A.Abdusamatov, N.V.Averburg, O.S.Vyalov, etc.

Scientists' interest in this region was explained by the fact that gas and oil deposits have been discovered in Paleogene deposits in this region and potential prospects for the discovery of new hydrocarbon deposits still remain. To achieve these tasks, a reliable, paleontologically sound stratigraphic scheme of the Paleogene, linked to the international stratigraphic scale, is needed.

The following is a stratigraphic diagram of the dissection of the Paleogene of the Surkhandarya basin, based on the study of nannoplankton complexes.

It is presented in the following form:

Paleocene Lower Paleocene - Dat and Mont tiers

The Dat tier may be missing in the Surkhandarya depression. The Montsky tier (Akdjar horizon) lies with erosion on faunistically characterized terrigenous rocks of the Maastrichtian. It is represented by the interlayer of gypsum and dolomites with rare limestone interlayers. In some sections of Gazdagan, Sherabad, Baysun, Toichi, etc., there are no gypsum, and the sections are significantly reduced to 12-15 m, which is explained by the later entry of this area into the sedimentation zone after a long break. In other parts of the Surkhandarya basin (Aktash, Besharcha, Malyand), the capacity reaches 90 m, and in wells - up to 150 m.(8) Mainly mollusks were found from organic remains: *Arcesmontensis* Cossm, *Lucinamontensis* Cossm., *L. duponi*, *Ostrea montensis*, *Corbismontensis* Cossm., *Corbistransversaria* Cossm., *Turritella montensis* Cossm. *Catypreamontensis* Cossm. and others . Of the microfauna, only ostracods are found, and there is no nannoplankton.

Upper Paleocene - Thanet stage

It is represented by two zones of planktonic foraminifera: *Acarinina tadjikistanensis*, *subsphaerica* U. *Acarinata* and four zones of nanoplankton: *Heliolithus kleinPELLI* (NP-6), *Discoaster gemmeus* (NP-7), *Heliolithus riedli* (NP-8) and *Discoaster multiradiatus* (NP-9). The characteristic species are: *Coccolithus eopelagicus* (Braml. Et Ried.) and *Heliolithus riedeli* (Braml.et Sull.). Characteristic complexes of these zones are quite widespread on the territory of Uzbekistan and adjacent areas and therefore the Thanet tier, its volume and boundaries are more confidently distinguished (3,4). This stratigraphic interval is composed of carbonate-sulfate or carbonate-terrigenous, and in the upper part of the section - marl-clay rocks.

In the Surkhandarya depression, the upper part of the sulfate-carbonate Paleogene stratum is represented by dolomitized limestones, as well as limestones with layers of gypsum and anhydrites belonging to the Bukhara horizon. Its capacity varies from 50 to 193 m.(2) Mollusks are characterized by the forms: *Musculuselegans* (Sow.), *M. karabilensis* (Vial.), *Brachydomtes jeremejevi* (Rom.), *Lucinaduponti* Cossm. and others, nummulites - *Nummulites solitarius* de la Harpe, *N. deserti* de la Harpe, *N. Solitarus*, etc.

The Karatag horizon is located above - light gray, greenish-gray marls, clay limestones with interlayers of clays up to 10-15 m thick. The nanoplankton zone *Heliolithus kleinPELLI* NP-6 and the foraminiferous zones *Globorotali apseudomenardii* and *Acarinina tadjikistanensis* were isolated in the rocks of this horizon. The characteristic mollusks are *Photadomya KoninckiNyst.* and *Cyprinamorrisi* et al. ("Karadag complex").(2) This horizon is absent in sections of the western part of the square.

Sections of both the Paleogene and overlying horizons are reduced here. It is also absent in Bukhara-Khiva, Central Kyzylkum, Ferghana and Tashkent districts.

The lower part of the Suzak (Givar) horizon of the Upper Paleogene in Southern Uzbekistan is represented by dark gray non-carbonate clays, usually of kaolinite composition with pyrite crystals. There are nodules of phosphorite. A layer of combustible shale with a capacity of up to 0.7 m is located close to the roof of the clay pack. The thickness of the clays of the lower part of the Suzak horizon is from 18 to 25 m.

The characteristic forms of mollusks in this part of the section are *Amphidontaeversa*, *Ostrea ecamelus*, *O. bellovacina*, *Neocardium Vateleti*, *Chlamys abominosa*, etc. and complexes of foraminifera zones *Acarinina tadjikistanensis*, *Ac. subsaerica*, *Ac. acarinata*.

The forms of nanoplankton zones *Discaster gemmeus* (NP-7), *Heliolithus riedli* (NP-8) and *Discoaster multiradiatus* (NP-9) found in rocks are extremely important, characteristic species are: *Discoaster salisburgensis* Stradner, *D. barbadiensis* Tan., *D. lenodosus* Mert., *Chiasmolithus bidens* (Braml. et Sull.), *C. grandis* (Braml. et Ried), *Marthasterites tribrachiatus* (Braml. et Ried.) The complex of the *Discoaster diartypus* zone is diverse: *Colliter eolelagicus* Braml. et Ried., *C. crassus* Braml. et Sull., *Discoaster saliburgensis* (Braml. et Ried., *D. barbadiensis* Tan., *D. elegans* Braml. et Sull., *D. strictus*, *D. binodosus* Mart., *D. diastypus* Braml. et Sull.? *Chiasmolites expansus* Braml., *Ch. grandis*. et Ried., *Ch. bidens*, *Neochias Tozygus distentus* Braml. et Sull., *Marthasterites tribrachiatus* Braml. et Ried., *M. bramlette* Bronn. Et Strad., *Iniperaster obscurus* Mart., *Micrantolithus intaster* Tranversopontes *pulcher* (Deflandre), *Neococcolites dibus* (Deflandre), *Cycoccolitina formosa* Kampther, indicating the Upper Paleocene. From the listed complex in the upper layers of the zone appear: *Imperaster obscurus* Martini, *Transversopontis pulcher* (Deflandre), *Discoaster binodosus* Martini, *Neochiastozygus distentus* Braml. et Sull., *Braarudosphaera bigelovi* Deflandre, *Cyclococcolithina formosa* Kamp., *Marthasterites bramlette* Bronn. Et Strad.

The upper boundary of the zone is drawn inside the Suzak marls.

The total thickness of the Upper Paleocene in the Surkhandarya basin ranges from 70 to 210 m.

The Eocene

Lower Eocene - Ipres stage

In sections of the Surkhandarya depression, this stratum includes dark gray, dark green carbonate clays with interlayers of marls, rare sandstones in the upper part, as well as limestones, oyster beds with a thickness of 35 to 90 m. Mollusks are represented here by *Musculus elegans*, *Glycymeris exgr. polymarphus* (Desh.), *G. Pseudopulvinatus* Orb., *Ostrea hemiglobosa* Rom., *Liostreareussu* (Netsh.), etc.

Agglutinated and secreted foraminifera, characteristic of the Lower Eocene zones of *Globorotalia subbotinaeu*, *Gl. araganensis*, are widely developed.(1)

Nanoplankton fossils of the zones *Marthasterites contortus* (NP-10), *Discoaster binodosus* (NP-11), *Marthasterites tribrachiatus* (NP-12) and *Discoaster lodoensis* (NP-13) *Rhabdosphaera tenius* Bram have also been established. Et Salle., *Cuclococcolitina gammation* Bram. Et Coll., *Prinsius bisulcus* Stradner, et al.

The general complex of species is represented by: *Coccolites eopelagicus* Braml. Et Sull., *crassus* Braml. et Sull., *Discoaster barbadiensis* Tan., *D. lodoensis* Braml. et Ried., *D. elegans* Braml. et Sull.,

D.Woodringi Braml. et Ried., D.binodosus Mart., D. lenticularis Braml. et Sull., D.diastrypus Braml. et Sull., Chiasmolithus expansus Braml. et Sull., Ch.grandis (Braml. et Ried.), Ch.solitus (Braml. et Sull.), Helicopontosphaera seminulum (Braml. et Sull.), Reticulafenestra oamaruensis (Defl.), Micrantolithus attenuatus, M.crenulatus Braml. et Sull., Neochustozygus distentus Braml. et Sull., Marthasterites tribrachiatus Braml. et Ried., Imperaster obscurus Mart., Traversopontes pulcher Delf., Neococcolithus dubius (Delf.) Cyclococclitina formosa Kamp.

Characteristic species are: Marthasterites tribrachiatus Braml. et Ried., Discoaster elegance Braml. et Sel., Helicopontosphaera seminulum (Braml. et Sull.), Chiasmolithus expansus (Braml. et Sull.)

Middle Eocene - Lutetian and Barton stage

The Middle Eocene in the Surkhandarya basin is represented by sandstones, marls, limestones, dolomites with oysters and phosphorite strata of the Alai horizon (middle and upper parts) up to 120 m; gray-green clays with interlayers of sandstones and marls of the Turkestan horizon - up to 127 m and sandstones, siltstones, clays of the Rishtan horizon - up to 10 m with a characteristic views and complex of the NP-14 zone: Discoaster sublodoensis Braml. et Sull., D. tani nodifer Braml. et Ried., Creciplacolithus staurion Braml. et Sull., Reticulofenestra coenura Rheinhardt, Braarudosphaera bigelowi Deflandre, Discoaster deflandrei Braml. et Ried. the Discoaster lodoensis Braml. species complex. Et Ried., Discoaster deflandre Braml. et Ried., Discoaster sublodoensis Braml. et Sull., Discoaster kupperi (Stradner), Neochustozygus distentus Braml. et Sull., Transversopontes pulcher Deflandre, Pontosphaera plana Braml. et Sull., Reticulofenestra umbilica (Levin), Reticulofenestra sp.sp., Sphenolithus radians Defl., Zigodiscus biogatus Defl., Cyclococcolithina formosa (Kamptner), Coccolithus eolelagicus Braml. et Sull., Coccolithus crassus Braml. et Sull.

The total thickness of the Middle Eocene reaches 180 m. However, the upper parts of the section: the Rishtan and most of the Turkestan deposits in the western regions of the area are eroded.

The dominant species of the underlying zones are becoming scarce here: Discoaster kupperi Strad., Helicopontosphaera seminulum Braml. et Sull., Cyclococcolithina gammtion (Braml. et Sull.), D. lodoensis Braml. et Sull. And mass Reticulofenestra sp.sp. (the umbilica group) and D.sublodoensis Braml. et Sull. appear.

The appearance of the last two species determines the boundary of the zone.

The D.sublodoensis zone contains a number of species not found in other zones: Lygodiscus bijugatus Deflandre, D.sublodoensis, Sphenolithus radians Reticulofenestra sp.

Among the visible zones of B.lodoensis and B.sublodoensis are the following: B.sublodoensis, ms.solitus, Transversopontes pulcher, Pontosphaera plana, Discoaster kupperi, Reticulofenestra umbilica, Neochustozygus distentus.

The upper boundary of the zone could not be determined, since the overlying rocks do not contain nanoplankton.

According to N.G.Muzylev (1980) (6) the zone of D.sublodoensis corresponds to the zone of the same name in the context of the North Caucasus and Crimea, along with Acarinina bulbrooki and Globorotalia caucasica.

On the scale of Western Europe, the D.sublodoensis zone corresponds to the NP 14 Discoaster sublodoensis zone and the upper part of the Globorotalia pentacamerata zone and the lower part of the Hastigerina nuttali zone – upper lower – lower Middle Eocene.

According to the decision of the MSC (1983), the D.sublodoensis zone corresponds to the Foraminifera zone of Acarinina bulbrooki and occupies the lower part of the Middle Eocene.

The study of Paleogene nanoplankton complexes in the Surkhandarya depression showed that they contained zonal and characteristic species for the Eocene of Western Europe, the North Caucasus and the Crimea. This made it possible to identify zones of the same name in the sediments of the Lower and Middle Eocene.

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