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REMAINS OF NANNOPLANKTON DISTRIBUTED IN THE PALEOGENE DEPOSITS OF THE SURKHANDARYA DEPRESSION AND THEIR GEOLOGICAL SIGNIFICANCE

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ABSTRACT

This article analyzes the composition, stratigraphic distribution, and geological significance of nannoplankton remains distributed in the Paleogene deposits of the Surkhandarya depression. It has been demonstrated that nannoplankton identified in Paleocene marine deposits are of significant importance in determining the relative age of strata, performing stratigraphic correlations, and restoring the paleogeographic environment. Furthermore, based on nannoplankton complexes, the relationship between the marine conditions of the Surkhandarya depression during the Paleogene period and the Tethys paleobassine was evaluated.

KEYWORDS

Surkhandarya depression, Paleocene, nannoplankton, nanofossil, biostratigraphy, paleogene, stratigraphy, paleogeography.

Introduction

Аннотация

Ушбу мақолада Сурхондарё ботиқлиги палеоген даври палеоцен ётқизиқларида тарқалган наннопланктон қолдиқларининг таркиби, стратиграфик тарқалиши ҳамда геологик аҳамияти таҳлил қилинди. Палеоцен даври денгиз ётқизиқларида аниқланган наннопланктонлар қатламларнинг нисбий ёшини белгилаш, стратиграфик корреляция қилиш ва палеогеографик муҳитни тиклашда муҳим аҳамиятга эга эканлиги кўрсатилди. Шунингдек, наннопланктон комплекслари асосида Сурхондарё ботиқлигининг палеоген давридаги денгиз шароити ва Тетис палеобассейни билан алоқадорлиги баҳоланди.

Калит сўзлар: Сурхондарё ботиқлиги, палеоцен, наннопланктон, наннофоссилия, биостратиграфия, палеоген, стратиграфия, палеогеография.

Аннотация

В данной статье проанализированы состав, стратиграфическое распространение и геологическое значение остатков наннопланктона, распространенных в палеоценовых отложениях палеогенового периода Сурхандарьинской впадины. Показано, что обнаруженные в палеоценовых морских отложениях наннопланктоны имеют важное значение для

определения относительного возраста пластов, стратиграфической корреляции и восстановления палеогеографической среды. Также на основе комплексов наннопланктона была оценена взаимосвязь Сурхандарьинской впадины с морскими условиями палеогенового периода и палеобассейна Тетиса.

Ключевые слова: Сурхандарьинская впадина, палеоцен, наннопланктон, нанофоссилия, биостратиграфия, палеоген, стратиграфия, палеогеография.

Introduction

The Surkhandarya depression is located in the southern part of Uzbekistan and is characterized by thick marine deposits belonging to the Mesozoic and Cenozoic eras. The region is geologically complex and is characterized by the widespread distribution of Paleogene sedimentary layers.

Nannoplankton remains found within Paleocene deposits constitute significant micropaleontological material. Nannoplankton are microscopic calcium-bearing organisms inhabiting marine environments, which are of great importance as stratigraphic indicators due to their rapid evolution and wide geographical distribution.

The study of Paleozoic deposits in the Surkhandarya depression based on nannoplankton allows for the determination of the age of strata, their comparison with the international stratigraphic scale, and the restoration of the paleogeographic environment.

The object and methodology of the research

The object of the research work is the Paleocene deposits of the Paleogene period in the Surkhandarya depression. Samples were collected from natural openings and boreholes.

The following methods were used in the research work:

- Micropaleontological analysis;
- Identification of nanophossils using an optical microscope;
- biostratigraphic zoning;
- lithological and paleontological correlation.

Nannoplankton preparations were prepared according to standard laboratory methods and subjected to microscopic analysis.

In the Paleocene deposits of the Surkhandarya depression, the following main species of nannoplankton complexes have been identified:

- Cruciplacolithus tenuis
- Coccolithus pelagicus
- Chiasmolithus danicus
- Prinsius martini
- Tympaniform fasciculi
- Ericsonia subpertusa
- Neochiastozygus modestos

These species are characteristic of various stratigraphic intervals of the Paleozoic period, allowing for the zoning of strata.

In the Lower Paleozoic deposits, the genera Cruciplacolithus and Chiasmolithus predominate. In the middle and upper Paleocene layers, the species Fasciculithus and Ericsonia are widespread.

Stratigraphic significance of nannoplankton. Nannoplankton distributed in Paleocene deposits possess high biostratigraphic significance. They are used to:

- the relative age of the layers is determined;
- the stages of the Paleozoic are determined;
- establishing stratigraphic boundaries;
- correlation is carried out between different regions.

In particular, nannoplankton complexes serve as an important criterion for distinguishing between the Dat and Zeeland layers. The first appearance or disappearance of certain species determines a specific geological time interval.

Geological and paleogeographical significance

Analysis of nannoplankton complexes indicates that a warm marine environment prevailed in the Surkhandarya depression during the Paleocene period. Species composition confirms the existence of biogeographic links with the Tetis Paleocean.

During the Paleozoic era, the region experienced relatively deep marine conditions with active carbonate sediment accumulation. This created conditions for the preservation of nannoplankton remains.

Nannoplankton is also of great importance in oil and gas geology, where it is used to determine the age and developmental stages of sedimentary basins.

Conclusion

Nannoplankton remains distributed in the Paleocene deposits of the Surkhandarya depression hold significant stratigraphic and geological significance.

Based on the research results, the following conclusions were drawn:

1. Nannoplankton is well-preserved in Paleocene deposits.
2. The identified nanofossils are consistent with international bio-zones.
3. Nannoplankton complexes allow for the determination and correlation of the age of the layers.
4. The Surkhandarya depression developed during the Paleocene period under the influence of the Tethys Sea basin.
5. Nannoplankton data are of great importance for oil and gas exploration.

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