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ҰЛТТЫҚ ҒЫЛЫМ АКАДЕМИЯСЫ» РҚБ

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STRATIGRAPHIC SUBDIVISION OF THE PALEOGENE DEPOSITS OF THE KARAKATA DEPRESSION OF KYZYLKUM

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Abstract. The article is devoted to the stratigraphic division of Paleogene sediments of the Karakatinsky depression of Kyzylkum. Before the Eocene, the Kyzylkum landmass separated the Amudarya and Ustyurt-Aral basins, which significantly differed in their hydrodynamic and hydrochemical regimes during the Paleocene period and at the beginning of the Eocene, shallow basins existed in both the eastern and western parts of the Kyzylkums. The eastern part of the territory, adjacent to the hilly land area, hypsometrically occupied a more elevated area compared to the western one. The sedimentation basin of this area in the Paleogene period was mostly shallow, with frequent changes in salinity in the direction of its increase or decrease, with enhanced hydrodynamics, with the predominance of sulfate sedimentation in certain time periods, with its own specific organic world.

In the west of Uzbekistan, whose border runs approximately along the zone of the deep transverse fault, in the Paleogene there was a normal marine basin with stable sedimentation, with planktonic foraminifera and more representative nannoplanktonic forms. These groups of organic remains are reference, with clearly distinguished zonal complexes that allow for reliable correlation of strata with sections of the Caucasus, Crimea, and the Mediterranean.

Identified on the basis of the method of complex biorhythmostratigraphic dissection and correlation of sections, the Akdzhar formation corresponds to the Montan stage, the lower Kyzyltakyr formation corresponds to the Tanet stage of the Paleocene, the upper Kyzyltakyr-Karashor formation corresponds to the Ypres stage of the Early Eocene, the Ilyalin formation corresponds to the Lutetian stage of the Middle Eocene, the Kurtish formation corresponds to the Barton stage, the Akhchakainsky and Daudansky formations -the Obobsonian stage of the Late Eocene, which It allows correlating sections of the Kyzylkum Paleogene with both regional and International scales.

Key words: Karakata, Kyzyltakyr, Karashor, Ilyalinskaya, Kurtishskaya, Akhchakainskaya.

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ҚАРАҚАТА-ҚЫЗЫЛҚҰМ ШӨЛІ АЙМАҒЫНДАҒЫ ПАЛЕОГЕН ЖИНТЫҚТАРЫНЫҢ СТРАТИГРАФИЯЛЫҚ ТАЛДАУЫ

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Аннотация. Мақала Қызылқұм Қарақат ойпатының палеогендік шөгінділерін стратиграфиялық бөлшектеуге арналған. Эоценге дейін Қызылқұм құрлығы Амудария және Үстірт-Арал бассейндерін бөлді, олар палеоцен кезеңінде гидродинамикалық және гидрохимиялық режимдерімен айтарлықтай ерекшеленді және эоценнің басында Қызылқұмның Шығыс және батыс бөліктерінде таяз бассейндер болды. Құрлықтың таулы аймағына іргелес аумақтың шығыс бөлігі Батыс гипсометриямен салыстырғанда биік аймақты алып жатты. Палеоген кезеңіндегі бұл аймақтың тұндыру бассейні оның көп бөлігі таяз болды, тұздылықтың жиі өзгеруімен оның жоғарылауы немесе төмендеуі, гидродинамиканың жоғарылауымен, басым болуымен, сульфатты тұндыру уақытының жекелеген сегменттерінде, өзінің органикалық әлемімен ерекшеленді.

Өзбекстанның батысында, оның шекарасы шамамен терең көлденең ақау аймағымен өтеді, палеогенде тұрақты шөгінділері бар, планктондық фораминифералары бар және нанопланктондық формалары бар қалыпты теңіз бассейні болды. Органикалық қалдықтардың бұл топтары анықтамалық болып табылады, олар Кавказ, Қырым және Жерорта теңізі тіліктерімен қалыңдықтардың сенімді корреляциясын жүргізуге мүмкіндік беретін айқын аймақтық кешендермен ерекшеленеді.

Кешенді биоритмостратиграфиялық бөлшектеу және кесінділерді корреляциялау әдісі негізінде бөлінген Ақжар свитасы монтск деңгейіне, төменгі қызылтақыр свитасы - палеоценнің танет деңгейіне, жоғарғы қызылтақыр-Қарашор свитасы - ерте эоценнің ИПР деңгейіне, Ильялин свитасы-орта эоценнің лютетикалық деңгейіне, куртиш свитасы - Бартон ярусу деңгейіне сәйкес келеді, ахчакаин және даудан свита-кеш эоценнің прибон қабатына, бұл Қызылқұм палеогенінің кесінділерін аймақтық және халықаралық масштабтармен корреляциялауға мүмкіндік береді.

Түйін сөздер: Қарақата ойысы, Қызылтақыр, Қарашор, Ілиялин, Күртіш және Ахшақайың.

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СТРАТИГРАФИЧЕСКОЕ РАСЧЛЕНЕНИЕ ПАЛЕОГЕНОВЫХ ОТЛОЖЕНИЙ КАРАКАТИНСКОЙ ВПАДИНЫ КЫЗЫЛКУМ

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Аннотация. Статья посвящена стратиграфическому расчленению палеогеновых отложений Каракатинской впадины Кызылкум. До эоцена Кызылкумская суша разделяла Амударьинский и Устюрт-Приаральский бассейны, существенно отличающиеся своими гидродинамическим и гидрохимическим режимами. В палеоценовый период и в начале эоцена существовали мелководные бассейны как в восточной, так и в западной частях Кызылкум. Восточная часть территории, примыкающая к холмистой области суши, по сравнению с западной гипсометрически занимала более возвышенное положение.

Седиментационный бассейн этой площади в палеогеновый период большей частью был мелководным, с частыми изменениями солёности — в сторону её повышения или понижения, с усиленной гидродинамикой, с преобладанием в отдельные отрезки времени сульфатного осадконакопления, со своим специфическим органическим миром.

На западе Узбекистана, граница которого проходит примерно по зоне глубинного поперечного разлома, в палеогене существовал нормальный морской бассейн со стабильным осадконакоплением, с планктонными фораминиферами и более представительными формами наннопланктона. Эти группы органических остатков являются эталонными, с чётко выделяющимися зональными комплексами, которые позволяют проводить надёжную корреляцию толщ с разрезами Кавказа, Крыма и Средиземноморья.

Выделенные на основании метода комплексного биоритмостратиграфического расчленения и корреляции разрезов свиты соотносятся со следующими ярусами: акджарская свита соответствует монтскому ярусу, нижняя кызылтакырская свита — танетскому ярусу палеоцена, верхняя кызылтакырская и карашорская свиты — ипрскому ярусу раннего эоцена, ильялинская свита — лютетскому ярусу среднего эоцена, куртишская свита — бартонскому ярусу, ахчакаинская и дауданская свиты — приабонскому ярусу позднего эоцена, что позволяет коррелировать разрезы палеогена Кызылкумов как с региональными шкалами, так и с Международной.

Ключевые слова: Караката, Кызылтакыр, Карашор, Илиялин, Куртиш и Ахчакайн.

Introduction. The stratigraphic basis of the Paleogene of Uzbekistan is based on such traditional groups as mollusks, foraminifers, ostracods, spore-pollen complexes. However, due to the relatively slow evolution and facies dependence, these groups at the current level of knowledge do not provide clear chronostratigraphic levels and substantiated correlation of deposits.

Meanwhile, in various countries of the world, a new group has been successfully used in Paleogene stratigraphy since the 1960s and 1970s - calcareous nannoplankton (microscopic unicellular "golden" algae - coccolithophores). The most important stratigraphic significance, distinguishing them from other Paleogene organic remains, is due to sharp and short-term changes in development, an extremely wide distribution in the world's oceans and relative technical simplicity in study. The latter is associated with small samples (tenths of a gram) and a massive accumulation of nannoplankton in the rock, which is especially important in borehole surveys of the oil-bearing Paleogene in flat areas. In addition, the planktonic lifestyle and, as a result, independence from the facies composition of rocks make this group the most reliable in sediment correlation.

Materials and methods. The issues of stratigraphic division and correlation of Paleogene sections of the Central Kyzylkum in different years were dealt with by A.A. Abdusamatov, N.V. Averburg, V.G. Balakhmatova, I.G. Belenkaya, K.V. Bobkov, O.S. Vyalov, R.O.F. Gekker, B.P. Zhizhchenko, L. P. Kahanova, I.A. Korobkova, A.R. Kushakov, R.K. Lipman, R.K. Makarova, N.E. Minakova, S. Kh. Mirkamalova, L.V.Mironova, A.M.Mosyakova, A.I.Osipova, U.M.Rasulov, E.F.Tsatsir and many others.

Over the past years, various schemes of division and correlation have been developed for complexes of various organisms: oysters, microfauna, nannoplankton, etc. The first such scheme was developed by O.S. Vyalov for oysters in the eastern part of Central Asia in the 1930s (1). For a long time, it was the basis for various geological constructions, geological mapping, and industrial work. However, this scheme was based on an endemic group of fauna and did not provide the possibility of regional correlation and linkage with the international scale.

Later, V.G. Balakhmatova, R.K. Makarova and E.F. Tsatsir compiled schemes for the western regions of Central Asia that correlated with the Crimean-Caucasian scale.

It was later found that the schemes of the western regions of Central Asia do not correlate with the eastern ones. This was explained by the different evolutionary course of the sedimentary basins of Central Asia, the endemicity and significant differences in the organisms that inhabited them. The importance of calcareous nannoplankton for the correlation of deposits is shown in the works of many researchers (Muzylev, 1980; Khodzhakhmedov, 1990; Kushakov, 1998, etc.).

Results. The Paleogene marine sediments of this region have been divided by geologists into the Kyzyltakyr (P_1^2-P_2^1 ktr), Karashor (P_2^{2-3}kz), Ilyalinskaya (P_2^2iln), Kurtishskaya (P_2^2krt) and Akhchakainskaya (P_2^3akn) suites (2).

Kyzyltakyr formation (P_1^2-P_2^1 ktr), is composed of dolomites. The section is

divided into two packs. The first pack is represented mainly by sandy dolomites, and the second by white floury dolomites. It is widespread in the southeastern Kyzylkum.

The second pack is represented in the Karangul Say basin by continental proluvial deposits. Their thickness varies from 2.5 m on the left side to 6 m on the right.

The second pack is separated from the first by a layer of ferruginous sandstones 0.1-0.2 m thick and has a two-membered structure. The lower part is composed of white dolomites, and the upper part is composed of fragmental-platy dolomites containing organic remains of marine organisms.

The color of the rocks of both packs is white or almost white. The total thickness of the Bukhara suite in the Navbahor area is 8.0-8.5 m.

Higher up the section, a layer of fine-grained dolomite of white color is encountered, exactly the same as in the Vaush section. The dolomites are soft, stain the hand. The thickness of the layer is 1.5 m.

The section of the second pack ends with a layer of clayey dolomite. On the weathered surface of the rock, a detrital texture is observed, on a fresh fracture it is white. The layer contains shells of bivalves and gastropods. A.A.Abdusamatov identified: Cerithium sp., Cyrena (Corbicula) forbesi Desh. According to his conclusion, they are found in the roof of the Kyzyltakyr suite of southeastern Fergana and Kyzylkum and the Bukhara depression. (1)

The total thickness of the Kyzyltakyr suite of the Jizlan area is 5-6 m.

In the north of the Jizlan area, the lower unit is composed of coarse and coarse-grained quartz sandstones cemented by dolomite material and a layer of conglomerates at the base of the section. The unit is 6 m thick.

The second pack here is represented by white dolomites. The texture of the rock is lenticular-layered. Under a magnifying glass, foraminifera remains are observed. The thickness of this pack is 1.5 m.

In the Kokchinskaya area, the first pack of the Kyzyltakyr suite is also represented by sandy dolomites with a thickness of 4 m. The dolomites are gray, massive, and contain evenly dispersed quartz grains. The pack lies by erosion on the underlying chalk deposits.

From the organic remains of the second rhythmic layer, A.A. Abdusamatov identified: Corbula (Cuneocorbula) turkestanensis Vial., Corbuka (Cuneocorbula) asisticavial., Milthaproava (Archan) and fragments of miliolids, characterizing the Bukhara stage (Thanetian).(1)

The thickness of the Kyzyltakyr Formation of the Kokchinskaya area is 6.5 m.

Thus, in all studied sections the Kyzyltakyr suite is divided into two units. The first unit is characterized by a stronger, and the second by a weaker dynamics of the sedimentation environment.

Karashor suite (P_2^{2-3}kz) It conformably lies on the second pack of the Bukhara suite or by erosion and unconformity on more ancient deposits.

In the eastern part of the area, the suite lies on proluvial sediments of the second

pack of the Bukhara suite and is composed of yellowish-gray feldspar - quartz sands. Here, the thickness of the suite is 4 m.

In the western part of the Karangul-Kyzylbulak area (Kyzyl-bulak basin), the suite lies on the eroded surface of the Paleozoic Karatau granitoid massif, where an increase in its thickness to 8 m is noted. With an increase in the thickness of the sand section, they are divided into two parts: greenish-yellow in the lower part and light gray in the upper part.

In the Vaush area, the Karashor suite stands out clearly in the Paleogene section due to its reddish-yellow color. The thickness is 10 m.

In the Zyum and Navbahor areas, the suite's thickness is significantly reduced (to 3-4 m), where it is represented by medium- and coarse-grained sands, sometimes with inequigranular feldspar-quartz composition. It is characterized by poor sorting of sand and the presence of clayey material.

To the west, in the southern part of the Jizlan area, the Karashor suite is composed of yellow loose feldspar-quartz fine-grained sands with inclusions of phosphate mineral grains. They are homogeneous and well sorted. The thickness is 6 m.

In the north of this area, at a distance of 4-5 km, a significant coarsening of the structure-forming grains is observed, characterized by heterogeneity and poor sorting of the constituent grains. Here, the thickness of the rhythmic pack, on the contrary, decreases to 2-3 m.

In the extreme west of the study area (Kokcha area), the suite is characterized by a pattum sandy-silt-clay granulometric composition.

In the area, the Karangul suite is represented by dark-gray bentonite clays. Its lower boundary with the sands of the Karashor suite is clear, sharp, and there is no sandiness in the lower part of the section, as is usually observed.

The thickness of the suite is consistent throughout this area and is 5 m.

In the Vaush area the suite is composed of brown at the bottom and dark gray bentonite clays. The thickness of the suite here is also 5 m.

In the Zyum area, bentonite clays of the Karashor suite have a green, greenish-gray color. On the surface of natural outcrops, a "cauliflower" texture is observed. Its section is monotonous. The thickness increases to 8 m.

In the Navbahor area, bentonite clays of this suite represent an industrial suite, where they increase significantly in thickness. They form the northern and southern wings of the sublatitudinal alpine fold. Approximately in the middle part of the section, a lenticular layer of quartzite with a thickness of 20-25 cm and several layers of carbonated clays and sands are noted.

Bentonite clays of the Navbahorskaya area suite are greenish-gray, grayish-green, gray, light-gray, sometimes brown. All of them are highly colloidal, plastic, wax-like, greasy to the touch.

On the surfaces of the soil layer above the bentonite clays, networks of large polygonal cracks are developed.

In these bentonite clays, scoliths are often observed - passages of the life activity of silt eaters

They are noted both on the surface of the bedding of rocks and are cross-cutting in relation to the bedding. Some suites are intensively enriched with them. In addition to the passages of silt eaters, numerous microscopic organic remains of a spiral-disc shape (nummulites) of 0.1-0.5 mm in size are found.

Phosphorites are found in all varieties of bentonite clays. They are represented by thin layers, lenses and separate accumulations of phosphate matter in the form of rounded fragments, coprolites or phosphatized bone remains of marine organisms (shells of microfauna, vertebrae, scales and teeth of fish) of brown, brown-brown or white color with a smooth or rough surface.

The bentonite clays of the Navbakhor suite lie conformably on the underlying sands of the Kazakhtau suite and have a thickness of 13 m, the largest in the entire territory of the study area.

In the extreme west of the study area (two kilometers from the village of Zafarabad), the suite is exposed on the day surface. Here it is represented by a monotonous thickness of light-gray and gray bentonite clays. It is characterized by a platy structure. It lies conformably on the underlying gray quartz sandstones. The thickness is 8 m.

In the area of the Tamdytau mountains the thickness of the suite decreases to 8-12 m. The unit consists mainly of quartz sandstones, sands and siltstones, lying with erosion on more ancient deposits up to the Paleozoic. At the base, in gravelstones and small-pebble conglomerates, phosphorite pebbles and fragments of fish bones are found. In carbonate clays and marls, a foraminiferal complex characteristic of the Lower Eocene was found, including forms of the Globorotalia subbotinae zone. The upper unit is represented by light-brown phosphorite-bearing marls with interlayers of marls and clays, where the complex of the NP-13 zone was found: Discoaster lodoensis, Pontosphaera pestinata Bram. et. Sull., Discoaster kupperi Strad., Imperastera obscurus Martini., and others (2,3,4,6). Thickness from25 mto45 m. In the Agitminskaya and Karakatinskaya basins, the eastern part of the Kyzylkum, the thickness of the pack increases, a large number of foraminifera shells are observed in it, including Globorotalia aragonensis, and the complex of the NP-13 zone was discovered: Discoaster lodoensis, Pontosphaera pestinata Bram. et. Sull., Discoaster kupperi Strad., Imperastera obscurus Martini. (2,3,4,6), etc. The upper, more clayey part contains forms of the foraminifera complex of the Middle Eocene.

Ilyalinskaya suite (P_2^2iln) according to A.G. Kutepov et al., (1989). The Ilyalinskaya suite is characterized by an abundance of organic remains and the presence of phosphorite suites. Organic remains are represented mainly by planktonic foraminifers and coccolithophores. Some layers consist almost entirely of nannoplankton shells. The suite corresponds to two microfaunistic zones: Globorotalina aragenensis and Acarinina bulbroki and nannoplankton of the NP-14 Discoaster sublodoensis zone and a clayey layer, up to 70-80 mwhich is characterized by a decrease in carbonate content from the bottom up along the section, with thin (up to1 m) layers of opokas, massive accumulation of radiolarian

shells. The number of radiolarians increases from the bottom up (6). Foraminifera are mainly benthic. The thickness of the suite varies from 8 m to 50 m.

The Ilyalinskaya suite differs from the underlying ones in its essentially carbonate-palygorskite composition and lighter color.

In the extreme east of the study area (Karangul-Kyzylbulak area) the suite is composed of dolomites and dolomite marls. The rocks are medium and finely layered, the thickness of the layers is 5-80 cm.

The Ilyalinskaya suite here has a thickness of 11 m and lies conformably on the bentonite clays of the Karashor suite.

In the Melkombinat area, the Ilyalinskaya suite is composed of finely layered dolomite and calcareous marls. The thickness of the layers is 5-25 cm. The marls are light gray, white, and considerably strong. Its visible thickness is 10 m, the lower contact is turfed.

In the Vaush area, the Ilyalinskaya suite deposits conformably build up the Karashor suite section and are easily traced in the Paleogene section due to their lighter color. Here, it has a two-member structure. The lower part is composed of carbonate clays, and the upper part is made up of marls, which are difficult to distinguish visually. The thickness is 8 m.

The Ilyalinskaya suite in the Zyumskaya area is also represented by carbonate clays and calcareous marls. They are white in color and have a conchoidal fracture. When dry, they disintegrate into shell-shaped oval-concentric fragments. The thickness of the Sugralinskaya suite in the Zyumskaya area is 4 m.

The maximum thickness of the Ilyalinsky suite is noted in the Navbahorskaya area, where it is more than 15 m. Here it is composed exclusively of carbonate clays and lies conformably on the layer of palygorskite clays of the Karashor suite.

In the Jizlan area, the suite is composed of platy marls and carbonate clays of light gray and white color. At the base of the section, there is a 0.2 m thick phosphorite layer. The layer is reddish-brown in color. The constituent material is loose, intensively gypsumed and ferruginized. Phosphorites are represented by phosphatized fragments of shells, dark brown coprolites. The suite is 12 m thick.

In the Kokcha area, the Ilyalinsky suite is represented by calcareous marls and carbonate clays with layers of white opoka and dolomites. It lies conformably on the underlying bentonite clays. The lower boundary is clear, drawn by the appearance of marls in the section. To the south of the village of Kokcha, Makarova and A.A. Abdusamatov identified organic remains from marls and carbonate clays: Pteria eletratea Rom., Postalia postalensis Oppenh. and others, characteristic of the lower Ypresian stage.

In the Karakatinsky Depression sections, the NP-14 Discoaster sublodoensis zone was encountered. It corresponds to the Ilyalinsky suite of Ustyurt and the Southern Aral Sea region. The age is confirmed by the presence of nannoplankton in the NP-14 zone: Discoaster sublodoensis, Coccolithus eopelagicus Bram.et Ried., Neococcolithus dubius Deflan., Discoaster elegans Bram.et Sull. Cyclococcolithus formosa Kamptner. and others (2,3,4,5).

Kurtish Formation (P_2^2krt) with a capacity of up to50 mconsists of sandstones, siltstones, clays, in which a wide development of agglutinating foraminifers and radiolarians is observed.

The presence of the characteristic species Globigerina turkmenica in the foraminifer complex in the Central Kyzylkum Desert allows us to compare them with the Kurtysh (Kum) suite of the western regions. In addition, the discovery of the NP-16 zone complex Discoaster bifax, Coccolithus eopelagicus Bram. et Sull., Neococcolithus dubius Deflandre., Discoaster elegans Bram.et Sull., Cuclococcolithus formosa Kamptner and others in the Ayakkuduk region confirms this age determination.

The Middle Eocene Kutysh suite is the most widespread of all the Paleogene stratigraphic units. In the Kyzylkum Desert it is divided into 4 units and in the Nuratau foothills into three. The first unit is represented by carbonate clays, it is characterized by the presence of several layers of true bentonites. Organic remains are mainly planktonic foraminifers. The thickness of the unit is 20-25 m.

The second pack is represented by non-carbonate clays. In the lower part of the section, layers of mica-quartz sands are observed. Radiolarian microfauna is noted in the clays. The thickness of the pack reaches 70 m. In the South-West Kyzylkum, this pack is eroded.

The third pack of the suite is presented in sections most widely developed in the Central Kyzylkum. In other areas its section is incomplete or completely washed out. The third pack is composed of quartz sands. In those areas where quartz sands are absent, its section is presented by silty clays. The thickness of the pack is 5-20 m. The fourth pack is composed of monotonous clays.

The upper part of the suite is characterized by the presence of radiolarian microfauna and non-carbonate clays.

The section of Eocene marine formations is unconformably overlain by Oligocene polyfacies deposits (synonym: Sarybatyr suite) with erosion at the base. They are composed of coastal-marine, lagoonal and continental sediments.

The lower boundary of the suite is clear. It is carried out along a phosphorite interlayer with a thickness of 5-15 cm. This interlayer is noted in all studied sections and has a regional character of distribution, forming a unique stratigraphic benchmark. This phosphorite interlayer is also traced to the Central Kyzylkum, where it increases in thickness and passes into the category of the industrial suite of the Dzheroy-Sadarinskoye deposit.

The lower boundary of the suite is drawn along the phosphorite suite, the thickness of which here is 7-10 cm. It is represented by densely cemented gravel phosphorite of a rounded shape with a smooth, greasy surface, dark brown, brown color.

The first pack is composed of bentonite-like clays of greenish-gray and gray color. Its cross-section has a slab structure.

The thickness of the pack is 13.5 m.

The second pack is composed of bentonite clays with a phosphorite suite at the

base of the section. The phosphorite suite is 7-10 cm thick and is consistent along the strike. The phosphate rock is loose and soft.

Bentonite clays of the second pack are dark gray, non-carbonate (do not react with hydrochloric acid).

The third pack is represented, as well as the first, by bentonite-like clays. It has a monotonous structure of the section, gray and light gray color. The presence of impurities of carbonate material is noted. Unlike the first pack, it does not have interlayers of phosphorites and sedimentary gypsum.

The first member in the South-Eastern Kyzylkum lies conformably on the marls of the underlying suite with a suite of phosphorites at the base of the section. It is represented by dark-gray platy bentonite-like clays, very similar to the bentonite-like clays of the first member. Several thin layers of sedimentary gypsum are also noted here. The thickness of the first pack is about 20 m.

The second unit is composed of green, grayish-green bentonite clays. The upper part of the unit section is eroded. The partial thickness of the unit is 15 m. The total thickness of the Kurtish suite in the Melkombinat area is 35 m.

At a distance of 10 km from this area to the west, in the area of the Vaush farm, a large field of development of deposits of this suite is noted. However, in most cases they are covered by a soil layer of 1.0-1.5 m thickness, on the surface of which networks of polygonal cracks are developed everywhere. Isolated natural outcrops of them are noted on the steep sides of small sais.

All the packs are developed in the Vaushskaya area. Unlike the sections of the previous areas, here they are all represented by bentonite-like clays.

The first pack, as elsewhere, lies conformably on the clay-carbonate deposits of the Kurtish suite with a thin, highly ferruginous phosphorite layer at the base of the section. The pack thickness is 13.5 m.

The second pack is also composed of bentonite-like clays. Unlike the first pack, it has a platy structure and is dark green in color. The plasticity of the clays is also relatively high, and they swell little in water. The pack is 18 m thick.

The third pack, like the first, is green. The structure of the section, the structural and textural features of the rocks and their physical properties are also similar to the bentonite-like clays of the first pack. The thickness of the pack is 21 m.

At the base of the first pack, a 5 cm thick layer of ferruginous rocks is noted. At this stratigraphic level, a phosphorite layer is noted in all studied sections.

The section is composed mainly of bentonite-like clays. These clays have a lumpy structure when wet. Their plasticity and colloidality are low. A characteristic feature of the section of the pack is the enrichment of clays with manganese oxides. Marls and carbonate clays, which complete the section of the pack, are significantly enriched in manganese oxides. The upper two packs are similar in structure to the first.

Conclusions.Thus, the Kurtish suite in the most complete sections is divided into three packs of similar material composition. The lower boundary of the suite is drawn along the phosphorite suite, which has a regional distribution character.

The completeness of the section depends on the depth of the pre-Neogene and pre-Quaternary erosions.

The Paleogene sections of Kyzylkum are difficult to correlate with the sections of the eastern part of Central Asia and the Ustyurt-Aral region based on organic remains. The identified stratigraphic units allow us to correlate the Paleogene sections of Kyzylkum with both regional and international scales. The Akdzhar suite corresponds to the Montian, and the lower Kyzyltakyr (Bukhara) - to the Thanetian stages of the Paleocene, the upper Kyzyltakyr (Suzak) suite - to the Ypresian stage of the lower Eocene of the International scale.

The Lower Eocene Karashor (Alai) suite corresponds to the nannoplankton zones of the Martini scale: NP 12 – Marthasteries tribrachiatus, NP 13 – Discoaster lodoensis. It is comparable with the upper part of the Ypresian stage.

The Ilyalinskaya (Middle Eocene, Turkestan) suite corresponds to two microfaunistic zones: Akarinina bulbrooki, Acarinina rotundimarginata (Lutetian stage) or corresponds to the nannoplankton zones of the Martini scale: NP 14 – Discoaster sublodoensis, NP 15 – Nannotetuina fulgens.

The Kurtysh (middle Eocene) suite corresponds to the microfaunal zone Hantkenina alabamensis, Globigerina turkmenica (Bartonsian stage) or corresponds to the nannoplankton zones of the Martini scale: NP 16 – Discoaster bifax, NP 17 – Discoaster saipanensis.

The Akhchakainskaya (upper Eocene) suite corresponds to the microfaunistic zone of Globigera tropicalis (Priobonian stage) or corresponds to the nannoplankton zones of the Martini scale: NP 18-20 Discoaster barbadiensis.

Before the Eocene, the Kyzylkum land divided the Amu Darya and Ustyurt-Aral basins, which differed significantly in their hydrodynamic and hydrochemical regimes in the Paleocene period, and at the beginning of the Eocene, there were shallow basins both in the eastern and western parts of the Kyzylkum. The eastern part of the territory, adjacent to the hilly region of land, occupied a more elevated area hypsometrically compared to the western part. The sedimentation basin of this area in the Paleogene period was mostly shallow, with frequent changes in salinity towards its increase or decrease, with enhanced hydrodynamics, with a predominance, in certain periods of time, of sulfate sedimentation, with its own specific organic world.

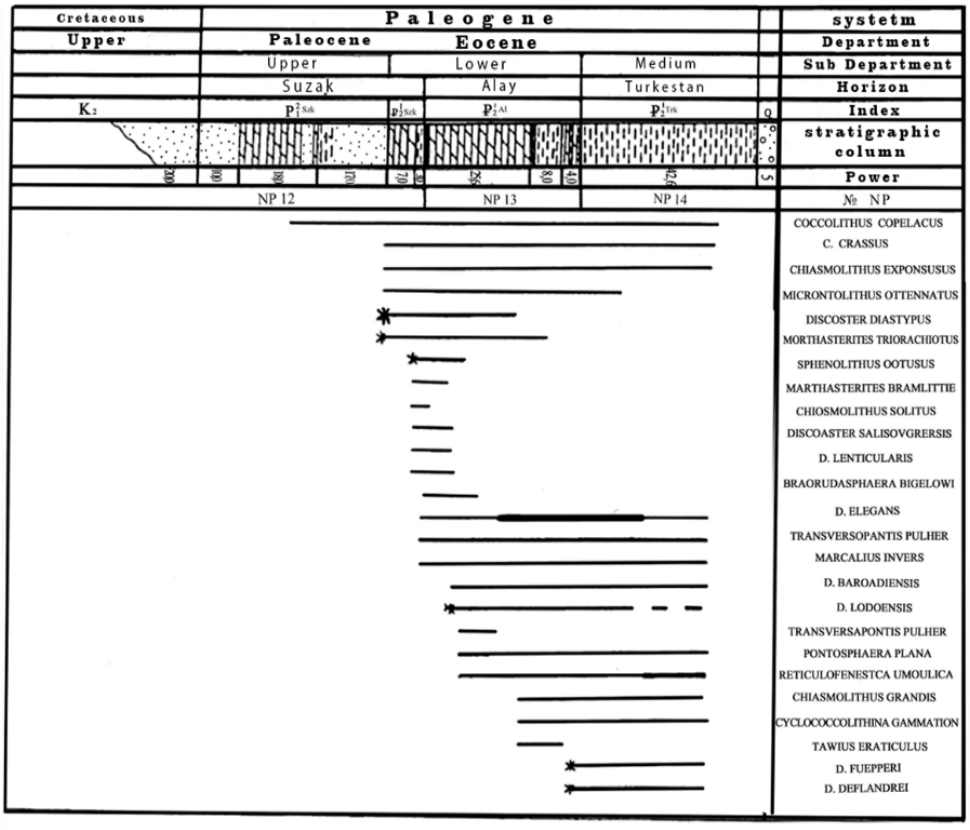
In the west of Uzbekistan, the border of which runs approximately along the zone of the deep transverse fault identified by D.P. Rezvy and O.M. Borisov (1962), in the Paleogene there was a normal sea basin with stable sedimentation, with planktonic foraminifers and more representative nannoplanktonic forms. These groups of organic remains are standard, with clearly distinguishable zonal complexes, which allow for reliable correlation of strata with sections of the Caucasus, Crimea and the Mediterranean.

Selected Based on the method of complex biorhythmostratigraphic subdivision and correlation of sections, the Akdzhar suite corresponds to the Montian stage, the lower Kyzyltakyr suite to the Thanetian stage of the Paleocene, the upper

Kyzyltakyr-Karashor suite to the Ypresian stage of the early Eocene, the Ilyalinsky suite to the Lutetian stage of the middle Eocene, the Kurtish suite to the Bartonian stage, the Akhchakainsky and Daudansky suites to the Priobonian stage of the late Eocene, whichallows us to correlate the Paleogene sections of the Kyzylkum.

Desert with both regional and International scales.

Stratigraphic distribution of nannoplankton in the Kyzylkum region of the Aznek area**sq.** 1700
M-b 1:500
Compiled by A.R.Kushakov



Stratigraphic distribution of nannoplankton Kyzylkum
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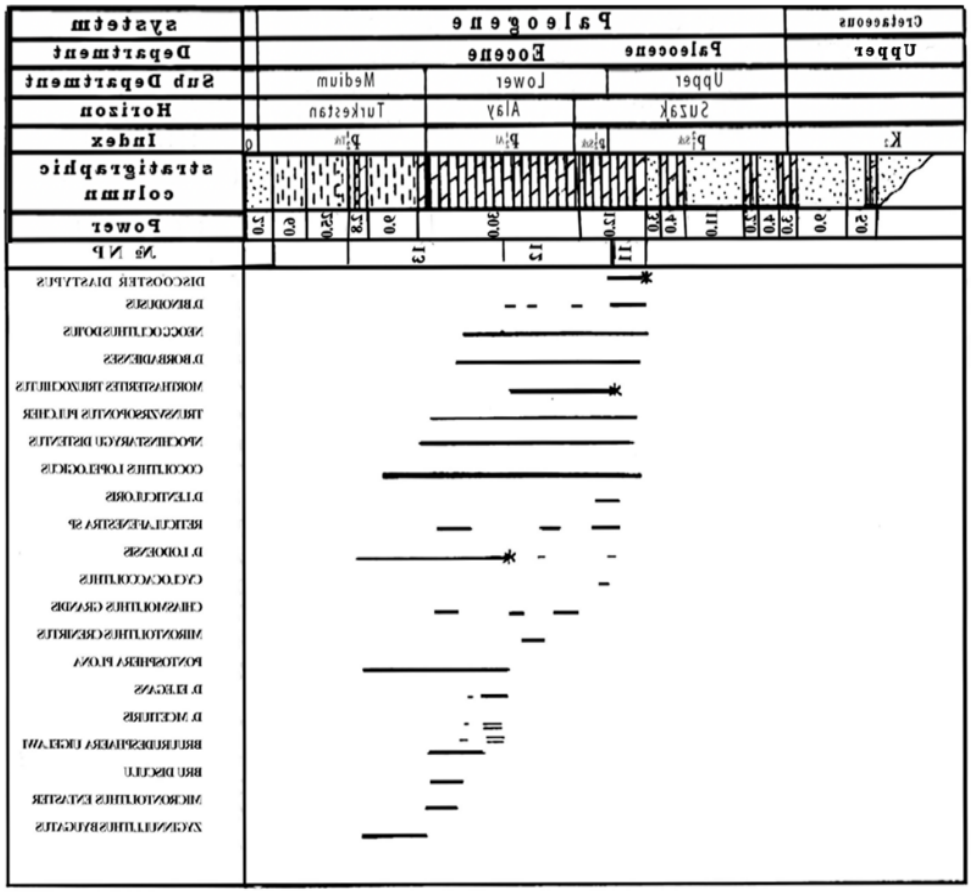

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