International Journal of Geology, Earth & Environmental Sciences ISSN: 2277-2081
An Open Access, Online International Journal Available at http://www.cibtech.org/jgee.htm
2024 Vol. 14, pp. 226-229/Meliboyev et al.
Research Article

DEPENDENCE OF THE FORMATION OF NON-METALLIC MINERALS, WIDESPREAD IN THE DEPOSITS OF THE PALEOGENE PERIOD ON LITHOLOGICAL-FACIES CONDITIONS

[*]Meliboyev Bahodir Fayzullayevich, Davron Xusanbayev Djorayevich, Atabayeva Nasiba Erkinovna
National University of Uzbekistan named after Mirzo Ulugbek, Uzbekistan
[*]Author for Correspondence: b.meliboyev@mail.ru

ABSTRACT
The unique lithological, petrological, stratigraphic, and facies characteristics of Paleogene deposits widespread in the Fergana Basin and Tashkent Foreland areas have been studied. It has been proven that the Paleogene deposits are associated with non-metallic mineral resources that are stratigraphically approached with specific facies belts, and the results of studying the prospects of non-metallic mineral deposits are discussed.

Keywords: *Ferghana Basin, Paleocene, Facies, Paleogeography, Paleogene, Facies Belt, Lagoon, Facies-Paleogeographic Map, Suzoq, Oloy, Sumsar, Isfara*

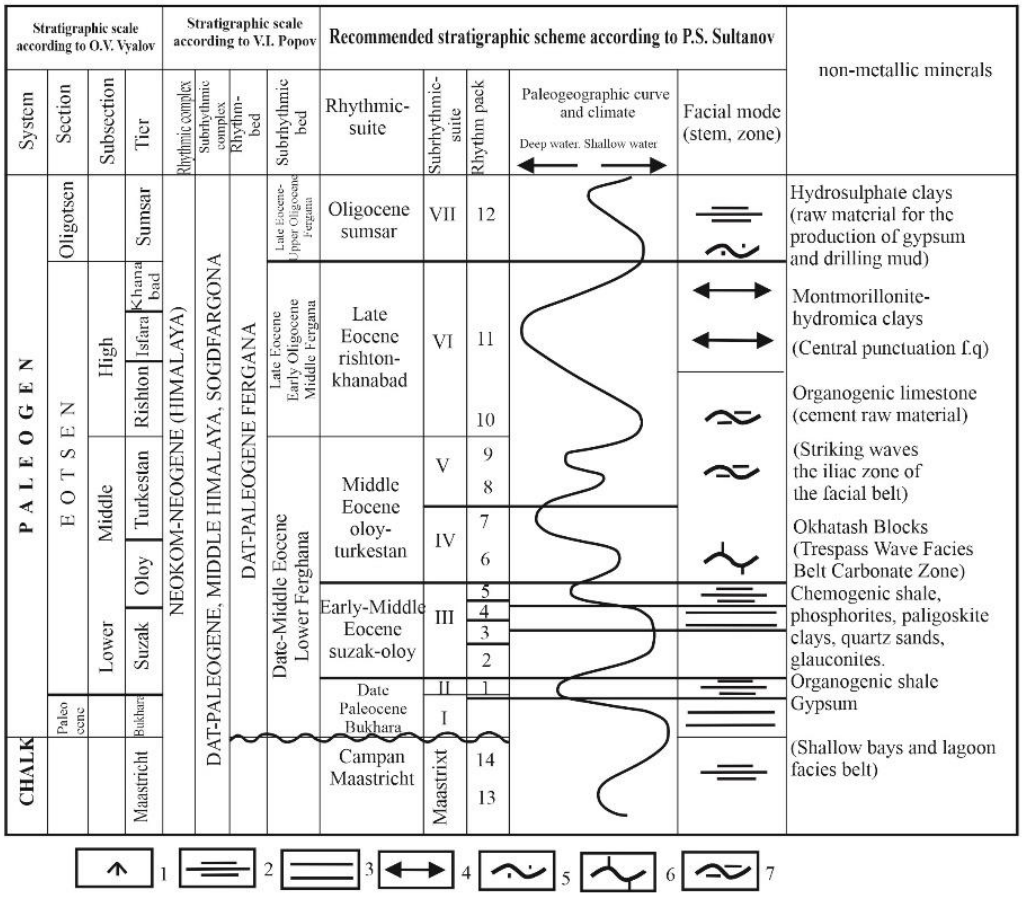
INTRODUCTION
The primary framework for addressing the challenges of lithological-facies mapping is the sedimentary deposits formed in the geological past. A comprehensive study of the composition of sediments, their structural and textural characteristics, thickness, distribution (biocoenoses), and other features serves as the key to identifying Earth's landscapes in geological time and space, taking into account segmental variations. According to D.V. Nalivkin (1955), the diversity of landscapes is reflected in sedimentary facies. Therefore, reconstructing past facies helps determine paleogeographical features of specific intervals of geological time. The unique characteristics include mineralogical composition, rock structures, relationships with overlying and underlying strata, the presence of organic remains, color, inclusions, and other properties.
Non-metallic mineral deposits associated with Paleogene sediments are stratigraphically linked to specific facies belts (see Table 1). For instance, the thick gypsum layers of the Gaznov Formation, palygorskite clays, dolomites, and travertines of the Suzoq Formation are associated with shallow lagoon-type embayment facies. The quartz sands of the Middle Suzoq Formation are linked to underwater delta facies, while the clays, organogenic limestones, and montmorillonite clays of the Oloy, Turkestan, and Rishton Formations are associated with wave-dominated facies. Fine-grained, montmorillonite-rich (alkaline-earth) clays are linked to the central stillwater facies belt.
Based on these principles, we will briefly outline the manifestations of non-metallic deposits present within the study area.
In the Tashkent foreland region, the Paleogene sediments predominantly formed under marine, gulf (lagoonal), and terrestrial facies conditions.

MATERIALS AND METHODS
For the Paleogene sediments, facies of shallow marine environments, coastal shallow marine zones, and occasionally hypersaline shallow seas have been identified. The mixed-facies complexes include underwater plains and submarine delta facies.

International Journal of Geology, Earth & Environmental Sciences ISSN: 2277-2081
An Open Access, Online International Journal Available at http://www.cibtech.org/jgee.htm
2024 Vol. 14, pp. 226-229/Meliboyev et al.
Research Article

Table 1

Stratigraphic location and lithological-facies conditions of minerals from the Paleogene period



1 – Submarine delta facies belt; 2 and 3 – Shallow embayment and lagoon facies belts; 4 – Central stillwater facies belt; 5 – Wave-dominated facies belt; 6 – Clayey zone of the wave-dominated facies belt; 7 – Carbonate zone of the wave-dominated facies belt

Paleocene. Shallow Bays (Lagoon) Facies. This facies have been described by scholars such as D.V. Nalivkin, V.I. Popov, S.D. Makarova, and others. Shallow bays (lagoon) are areas formed as a result of the separation of bays, coves, or inlets from the sea by a shallow semi-enclosed space. If fresh water significantly enters a closed water basin, the lagoon may become freshwater; conversely, if there is a short-term or insignificant connection with the sea, it will become saline.

The formation of lagoons in the Paleogene Sea of the Fergana Bay occurred through two straits, Khodjent and Oloy, which opened and closed during the Paleogene period. The formation of these facies was entirely governed by the paleogeographic conditions, as demonstrated by the narrowing of the Khodjent Strait, making it difficult to connect the western Suzoq Bay with the open sea. In the east, there was no such connection in the Oloy Strait area, where the Suzoq layers consist of coarse-grained gypsum sandstones with brown-red clay in paragenesis. Shallow lagoon-type sulfate facies are limited and include the gypsum geozau formation, which formed after the interruption of the Denmark-Paleocene period due to the transgression of the sea basin through the Oloy Strait.

The gypsum is white, gray, greenish-gray, resembling sugar, or recrystallized with large crystals and can be found in thick, sometimes indistinct horizontal layers or as non-laminated forms. Selenite veins are widely developed on the surface, and nodular chalcedony is less common. The thickness of individual layers does not exceed 10–15 meters. In the Oloy Strait area and at the Yeskinaukat depth, the thickness of the facies reaches 50 meters or more.

In the eastern part of the studied area, thin layers of gypsum dolomite, usually without organic remains, can be found within the gypsum layers. However, sometimes they contain small crushed forms of pelecypods and gastropods. Thin layers of dolomite green clays are less common.

To the south, dolomite layers lie above the gypsum, and micro-paleontological studies have revealed organic remains consisting of agglutinated foraminifera shells typical of the lower Paleocene. In the western part of the Fergana Valley, Paleocene terrigenous sediments (conglomerates, gravelites) were deposited during the same period.

In the Toshkentoldi area, shallow depressions formed at the end of the boreal period due to negative epeirogenic movements, creating cove-type water basins. During this period, the sea level gradually began to recede. Since the Toshkentoldi region was a lowland area and tectonic movements were very slow, almost the entire region consisted of shallow basins. Organic remains, often in the form of "Kaplanbek"-type fauna typical of lagoon facies, accumulated in sandy limestones.

Thus, it can be concluded that during the Paleocene, almost the entire territory of the Toshkentoldi region consisted of shallow water basins or connected cove-type basins, characterized by varying salinity levels. The presence of dolomites, dolomitized limestones, and gypsum layers in the early Paleocene (e.g., the G‘aznov gypsum in Southern Fergana) indicates that an arid (hot) climate prevailed.

RESULTS AND DISCUSSION

Submarine Delta Facies Belt. The dynamics of the submarine delta facies belt are progressive, as with all surface and submarine flows. Genetically, this belt is related to the water surface delta part of the plain valley belt, serving as its immediate submarine continuation. In the southern part of the studied area, the environment of a stable submarine delta facies existed in the early stages of Suzoq, Oloy, and Sumsar. This facies region is composed of poorly differentiated quartz-alevritoid and clayey sediments. Here, fine-grained dispersive clays alternate with well-sorted aleurites and slates, with small layers. In the Paleogene section, the thickness of the submarine delta deposits reaches 10-50 meters. Under these conditions, sedimentary rocks are sometimes separated from one another, occasionally connected by narrow and wide bands extending tens of kilometers from west to east. The submarine deltas of the studied region formed in the sea or cove zone, similar to modern deltas, where lowland rivers begin and penetrate deep into water basins. The submarine deltas of the Paleoisfera, Paleoxo‘jabaqirg‘on, rarely Paleosox, and Paleoaksu rivers, when combined, formed a unified submarine delta zone in the Suzoq period.

Wave-Induced Facies Belt. The wave-induced facies belt encompasses all coastal areas of the Fergana Basin and the Toshkentoldi region, where shallow sea waves prevailed. This facies region is composed of various sediments, rich in textures and organic remains. Here, aleurolites, clays, marls, limestones, and dolomites are widely distributed. In the rapid zone of the wave-induced facies belt, mainly sandstones developed due to wave effects on the paleocurama slopes and the Khodjent Strait. In the studied area, one can find disorganized and somewhat rounded shell fragments along the coastline. Additionally, wave-induced facies have symmetrical ripples with distances between the crests of 4.5-5 cm and 10-11 cm.

CONCLUSION

The southern part of the Fergana Basin and the Toshkentoldi region were characterized by massive-textured aleuropelitic and peloaleurolitic sediments with organic remains in the stable zone of the wave-induced facies belt (at depths of 150-200 meters). Their color ranges from dark gray to black, with traces of bitumen and iron sulfides.

The shallow bays facies belt in the main part of the sea is composed of various belts and accumulations, including shallow bays, lagoons, harbors, and fjords. Here, large clastic rocks are only found at river mouth deposits.

The connection of useful minerals with Paleogene deposits and specific facies belts has been demonstrated. Specifically, the thick gypsum layers of the Gaznov suite, the palygorskite clays, dolomites, and travertines of the Suzoq layers are associated with lagoon-type shallow bay facies. The quartz sands of the Middle Suzoq layers are associated with submarine delta facies, while the clays, organic limestones, and montmorillonitic clays of the Oloy, Turkestan, and Rishton layers are linked to the wave-induced facies. The thick montmorillonitic layers of fine-grained clays are associated with the central quiet facies belt.

REFERENCES

Belenkiy G.A., Mirkamalova S.Kh (1965). Paleogeography of the Cretaceous and Paleogene of the Pritashkent Depression." Moscow-Leningrad Publishing: "Nedra,".113p.

Belenkiy G.A., Mirkamalova S.Kh., Morozov S.D., Ibragimov R.N (1963). Cretaceous and Paleogene Deposits of the Northeast Part of the Pritashkeisk Depression (Turbat Village Area)." Tr. *TashGU*, **220**, *Geology*, *Tashkent*.

Meliboyev Bahodir Fayzullayevich, G'apurov Mirshod Farhod o‘g‘li, Jo‘rayev Fayyoziddin Xolboy o‘g‘li (2023). Lithofacies analysis of suzak layers (early eocene) distributed in the Fergana basin and the Tashkent region. *International Journal of Geology, Earth & Environmental Sciences, Available at http://www.cibtech.org/jgee.htm*. **13**, 213-217.

Popov V.I., Zaprometov V.Yu (1985). Genetic Theory of Geological Formations *Moscow*: *Nedra*. 456 pages.

Rajabov Sh.S., Sim T.V., Evsyukov V.A (2012). New Ideas on the Geological Development of the Northern Border of the Fergana Basin during the Meso-Cenozoic Era. *Tashkent, Bulletin of the National University of Uzbekistan*, No. 2/1.

Sultonov P.S (2015). Facies-Paleogeographic Conditions for the Formation of the Paleogene of Southern Fergana and Related Mineral Resources." *Geology and Mineral Resources*. **3** 38-45.

Vyalov O.S (1935). The Division Scheme of the Fergana Triassic Deposits. Proceedings of the Academy of Sciences of the USSR 3-4. 16-22.