ANALYSIS OF PRIMARY DATA ON THE PALEOECOLOGY OF THE KHOREZM OASIS

Ismailov Ulugbek
Independent Researcher, Urgench State University

Annotation. The research not only helps to understand the ancient natural environment of the territory of Uzbekistan but also provides new evidence for studying the paleoecological evolution of the entire Central Asian region. The materials used in the article also serve as an important source for archaeological and paleontological research. In particular, the study presents new information on the ancient biogeography and climate changes of Central Asia through fossil remains of animals such as Proboscidea, Sinotherium sp., Equus stenonis, and Allohippus cf. stenonis.

Keywords: paleontology, geology, fossil remains, paleoecology, Pliocene, Pleistocene, Khorezm oasis, Central Asia, Tethys Sea, climate change, paleohydrology, crater, dinosaurs.

The territory of Uzbekistan is geologically unique and has an ancient history, formed over long geological periods as a result of various natural changes. In this study, the main focus is on examining the evolution of the natural environment, fauna, and flora of ancient times through fossil remains and geological monuments found in the northwestern regions of our country.

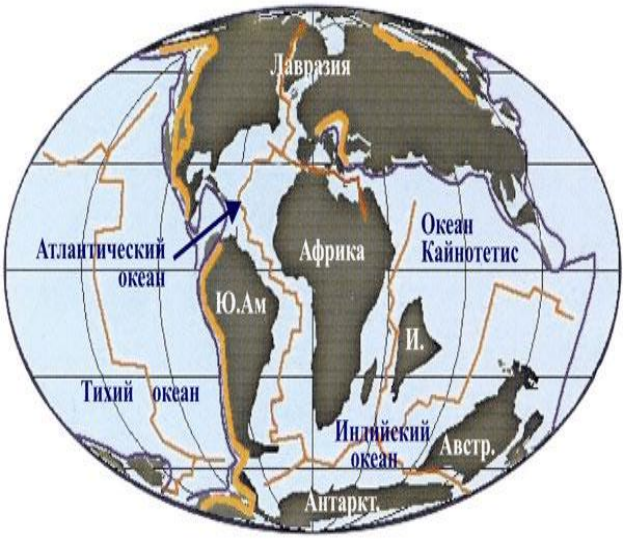
More than 10 fossil fauna sites from the Late Pliocene and Early Pleistocene have been identified in Uzbekistan [7]. In the Central Kyzylkum (on the right bank of the Zarafshan River), fossil remains of Proboscidea (mammoths, mastodons, or ancestors of elephants) and Sinotherium sp. (ancestor of rhinoceroses) were collected from Upper Pliocene deposits near Khazor village (Konimex village). In the Upper Pliocene deposits southeast of Yakkabog, B.I. Pinkhasov discovered bones of Equus stenonis (a single-toed horse) and Tragocerus sp. (mountain goat), though the presence of Tragocerus sp. is doubtful [15]. Near the city of Shahrisabz, Upper Pliocene layers yielded remains of Allohippus cf. stenonis (zebra-like horse) and Elasmotherium sp. (the largest member of the rhinoceros family, living from the Pliocene to the Pleistocene) [7].

Most of the Khorezm oasis consists of Quaternary deposits of the Cenozoic era. In the southern periphery bordering the Karakum and Kyzylkum deserts, Neogene deposits occur. In certain areas on the right bank of the Amu Darya, island-like patches of Mesozoic Cretaceous and Paleogene deposits are found [9]. Khorezm soils not only contain Mesozoic deposits but also yielded remains of a dinosaur named

Ulughbegsaurus uzbekistanensis, which lived in the neighboring Kyzylkum region about 90 million years ago [2].

Another unusual feature is the Uch O‘choq plateau near Tuyamo‘yin, which is of Paleogene age and unique in its formation. It is located in the heavily eroded southern edge of the Tuyamo‘yin hills, composed of Paleogene deposits. In the center of the plateau lies a nearly circular crater with a diameter of about 1,000 meters and a depth of 70–80 meters. Radially distributed small cracks on the inner walls indicate its formation by meteorite impact. The southern part of the crater is heavily eroded by strong northern winds, forming four truncated cone-shaped remnants on the southeastern edge, each about 60–70 meters high with flat tops. These remnants, due to their unusual appearance, are locally nicknamed “the Khorezm pyramids” [6].

In 2006, during excavations at Chilpiq fortress, a fossilized tree dated to the Jurassic period, approximately 85–90 million years old, was discovered [1; 3; 14].



Based on geological strata, the Paleogene period that followed had a hot summer and moderately warm winter, with a predominantly dry continental climate throughout the year in Central Asia [10]. Under such conditions, Khorezm could have been rich in vegetation and trees. However, at that time the Khorezm land had not yet fully formed. According to P.V. Fyodorov, in the Late Cretaceous stage of the Mesozoic era, the northern part of Central Asia was land, while the southern part was under the “Kainotethys” Sea [12].

The final stage of the Tethys Sea, known as the Absheron Sea, corresponds to the Lower Paleolithic period, including part of the Khorezm oasis, and connected the waters of the Aral, Sarykamysh, Caspian, and Black Seas [13].

One of the oldest creatures in the studied area belongs to the genus Acipenser (sturgeon). Sturgeon are famous for their meat and caviar, with some species reaching unusual sizes — the beluga sturgeon is likely the largest living fish species today. Three species of the genus Scaphirhynchus live only in freshwater: one in the Syr Darya, and two in the Amu Darya. Their close relative, Scaphirhynchus raffinesquii, is found in the Mississippi River [11].

According to modern research, the species Pseudoscaphirhynchus kaufmanni of the sturgeon family now survives only in the Amu Darya, and its evolutionary history dates back to the Mesozoic era. The presence of this ancient fish in the region’s waters indicates that during the Quaternary period, the Uzboy–Caspian–Manych–Azov–Black Sea and Mediterranean were interconnected, enabling the exchange of aquatic

fauna. The Syr Darya species, however, has not been recorded since 1960 [4]. The closest relative, the sturgeon fish of the Aral Sea, became completely extinct in 1996 due to the sea's desiccation [5].

Fundamental information about the paleoecology of the Khorezm oasis shows that its land contains strata dating back to the earliest stages of Earth's development. Paleoflora and paleofauna data indicate that primitive animals lived in the oasis in ancient times. By the Quaternary period, the conditions in the oasis were suitable for human habitation, though primitive humans did not yet have sufficient survival skills to settle along rivers. The prevailing paleozoological conditions of the oasis likely deterred them. However, traces of Stone Age cultures have been found in nearby regions such as Ustyurt, Kyzylkum, and the foothills of the Sultan Uvays Mountains [8].

In conclusion, data on the paleoecology of the Khorezm oasis reveal that the formation processes of its land date back to very ancient times, and that its flora and fauna have been widespread since early stages. Although the formation of the anthropogenic landscape is associated with the Neolithic period, it can be concluded that the nature of the oasis had already accumulated sources of life in much earlier stages.

References:

1. https://einfolib.uz/post/avesto-muzeji-tarih-va-manaviyat-kuzgusi
2. https://www.dailymail.co.uk/sciencetech/article-9969009/Newly-discovered-dinosaur-shark-like-teeth-predated-T-Rex-7-million-years.html?ns_mchannel=rss&ns_campaign=1490&ito=1490 (murojaat qilingan sana: 11.05.2025)
3. https://www.ekogazeta.uz/xabarlar/7422
4. https://www.gazeta.uz/oz/2021/06/08/amudarya-sturgeon/
5. Sheraliev B., Peng Z. Complete mitochondrial genome sequence and phylogenetic position of the Amu Darya sturgeon, Pseudoscaphirhynchus kaufmanni (Acipenseriformes: Acipenseridae). J Appl Ichthyol. 2020; 36(4): 389–92. https://doi.org/10.1111/jai.14043.
6. Баратов С.Р. Новые данные по археологии южного Хорезма // Археология Узбекистана. 2013. № 1 (6). – С. 27-59.
7. Батыров Б.Х. Фаунистические комплексы антропогена Узбекистана. Четвертичный период. Палеонтология и археология. – Кишинев: «Штиинца», 1989. – С. 5-8.
8. Исмаилов У. Проблема хищников в экологии древнего периода Хорезмского оазиса // Ma'mun science, 3 (5): 127-131.
9. Қурбониёзов Р. Хоразм географияси. – Урганч, 2002. – Б. 6.
10. Синицын В. М. Введение в палеоклиматологию. – Л.: «Недра», 1980. – С.199.

11. Труды Арало-Каспийской экспедиции. Вып. 4. Кесслер К.Ф. Рыбы, водящиеся и встречающиеся в Арало-каспийско-понтийской ихтиологической области. – СПб.: Типография М. Стасюлевича, 1877. – С. 322.
12. Фёдоров П.В. История земной коры. Атлас иллюстраций к курсу исторической геологии. – СПб., 2006. –С. 16.
13. Чепалыга А.Л. Этапы формирования геоэкологических ареалов как среды обитания и путей миграции архантропов в нижнем и среднем плейстоцене Кавказа и Восточной Европы // Мегаструктура Евразийского мира: основные этапы формирования. Материалы Всероссийской научной конференции. – М.: «Таус», 2012. – С. 59-66.
14. Эрпўлат Бахт. Халқаро «Олтин мерос» жамғармаси Хоразм вилояти бўлими раҳбари, ўлкашунос-тарихчи Комилжон Нуржонов билан суҳбат // Oila va tabiat, 2023-yil 19-oktabr.
15. Юрьев А.А., Умаров А.У. Геоморфология и новейшая тектоника Западного Узбекистана. – Т.: «Фан», 1971. – 115 с.