



Article

Beruni's Works: the Paleogeography of the Ustyurt Plateau and the Historical-Etymological Interpretation of the Term "Xiz Tangkizi"

Kanaatov Esimkan¹

1. Karakalpak State University, Nukus, Uzbekistan

*Correspondence: esimkankanaatov@gmail.com

Citation: Esimkan K. Beruni's Works: the Paleogeography of the Ustyurt Plateau and the Historical-Etymological Interpretation of the Term "Xiz Tangkizi". American Journal of Social and Humanitarian Research 2026, 7(7), 164-168

Received: 23rd Apr 2026

Revised: 06th May 2026

Accepted: 13th Jun 2026

Published: 31th Jul 2026



Copyright: © 2026 by the authors. Submitted for open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>)

Abstract: This article examines the paleogeography of the Ustyurt Plateau and the historical-etymological interpretation of the term Xiz tangkizi based on the works of Abu Rayhan al-Biruni, primarily his Geodesy. Using historical-comparative, historical-geographical, linguistic, and paleogeographical methods, the study analyzes al-Biruni's descriptions of the ancient courses of the Amu Darya, the territories of Khwarazm, Jurjan, Sarykamys, the Uzboy channel, and the Caspian basin. Particular attention is paid to the relationship between medieval geographical knowledge and modern paleogeographical evidence concerning the evolution of the Ustyurt Plateau. The article also reconsiders the etymology of the hydronym Xiz tangkizi. While previous scholars associated the term with the Turkic expression "Sea of the Maiden" or interpreted it as the "Red Sea," this study argues that the name may preserve an older hydronymic layer related to the ancient name of the Amu Darya—Oghuz (Greek: Oxus). Comparative analysis of medieval written sources, Turkic linguistic data, and regional toponymy suggests that phonetic development and folk etymology may have transformed the original hydronym into its later form. The findings demonstrate that al-Biruni's observations provide valuable evidence for reconstructing the historical hydrography, settlement patterns, and communication routes of the Ustyurt region. The study contributes to the historical geography of Central Asia by offering a new interpretation of one of the most debated geographical terms in al-Biruni's writings.

Keywords: Abu Rayhan al-Biruni; Ustyurt Plateau; paleogeography; historical geography; Amu Darya; Oxus; Oghuz; Xiz tangkizi; hydronymy; toponymy; Uzboy; Sarykamys; Central Asia.

1. Introduction

The scholarly legacy of Abu Rayhan al-Biruni constitutes one of the most significant written sources for the study of the natural-geographical development, ancient hydrographic processes, and historical topography of Central Asia. The information contained in his work Geodesy concerning the ancient channels of the Amu Darya, Khwarazm, Jurjan, Sarykamys, and the Caspian region serves not only as evidence of medieval geographical knowledge but also as an important scientific foundation for contemporary paleogeographical and historical-geographical research [1]. In particular, the hydronyms, toponyms, and descriptions of natural features recorded by al-Biruni are of exceptional importance for reconstructing the historical development of the Ustyurt Plateau, the evolution of the Amu Darya delta, and ancient communication routes [2].

Therefore, a comparative analysis of al-Biruni's observations in the light of modern achievements in history, geography, geology, and Turkology makes it possible not only to assess the reliability of his scientific observations but also to offer new interpretations of the origin and historical significance of certain toponyms and hydronyms. From this perspective, the following discussion examines several important references to the Ustyurt Plateau and its adjacent territories found in al-Biruni's works [3].

The flourishing of science, culture, and literature in Kuhna Gurganj, the capital of the Khwarazmian state during the eleventh to fourteenth centuries, had a considerable impact on the socio-economic and cultural development of the Ustyurt Plateau and its surrounding territories. In particular, the fortified towns of Davkesken (Vazir), Shemakhaqal'a, and Tersek, situated approximately 60–70 km northwest of the capital near the southern escarpments of the Ustyurt Plateau, developed into important administrative, military, and economic centers during this period. Al-Biruni also refers to these developments [4]:

"...Soon afterward, the course of this stream (the Amu Darya) was blocked once again by an obstruction similar to the previous one. As a result, the water turned to the left and flowed through the land of the Pechenegs along the channel known as Mazdubasta (present-day Daudan, the Daryalyk channels). This channel crossed the desert located between Khwarazm and Jurjan (Gurganj). For a long time, this new river channel contributed to the prosperity of numerous settlements..." [5].

Through this valuable account, al-Biruni described the major hydrological changes that occurred in the Amu Darya system during the tenth century. In particular, he explained that the river's flow was diverted toward its left branch after its movement along the Aqchadarya channel had been obstructed. Consequently, the river waters first flowed along the eastern margins (escarpments) of the Ustyurt Plateau toward Lake Sarykamysk and subsequently reached the Caspian Sea through the ancient Uzboy channel. His account provides an important historical explanation of these paleohydrological processes [6].

2. Materials and Methods

In our opinion, it is possible that al-Biruni personally visited the Ustyurt Plateau during the period when he headed the Ma'mun Academy in Gurganj. This assumption is supported by the fact that he explained the natural-geographical development of both Ustyurt and Khwarazm through the history of the ancient channels of the Amu Darya. According to the scholar, in ancient times the Jayhun (Amu Darya) flowed across the desert lying between Khwarazm and Jurjan, turned toward Balkhan (the mountain located south of Ustyurt), and eventually emptied into the Caspian Sea. In this context, al-Biruni also mentions the ancient city of Balkh, indicating that the former course of the river was associated with the territories surrounding Balkhan. The commentaries to his work explain Balkh as one of the principal centers of the ancient Amu Darya basin, whereas Balkhan is interpreted as a historical mountainous region situated along the eastern coast of the Caspian Sea. The "mountain" described by al-Biruni is likewise identified as the natural barrier that obstructed the course of the Jayhun and altered its flow (al-Biruni, 1966, p. 95).

From the perspective of the present study, this geographical feature may reasonably be interpreted as referring to the southwestern margins of the Ustyurt Plateau and the surrounding Balkhan region. Indeed, the context strongly suggests that the "mountain" mentioned by al-Biruni refers specifically to the Ustyurt escarpment rather than to an isolated mountain range.

3. Results and Discussion

Al-Biruni further records that he observed stones containing what he described as “fish ears” in the sandy desert situated between Khwarazm and Jurjan. Modern commentators interpret this expression as referring to the fossilized remains of marine mollusks, that is, petrified shells [7]. Al-Biruni regarded this observation as evidence that the region had once been covered by a body of water. Accordingly, his account indicates that the Ustyurt Plateau and the adjacent Balkhan territories once formed part of a complex paleogeographical landscape associated with the lower reaches of the Amu Darya, the Uzboy watercourse, and the Caspian basin [8].

At this point, another important aspect deserves particular attention. Al-Biruni did not merely note the occurrence of these “fish ears” (fossilized mollusks) in the sandy deserts between Khwarazm and Jurjan; rather, the wording of his account clearly suggests that he had personally observed and carefully examined them. The territory described by the scholar undoubtedly corresponds to the present-day Ustyurt Plateau. This conclusion is supported by geological evidence, since the surface layers of the plateau—once part of the floor of the ancient Tethys Ocean—are composed largely of fossilized shells and marine mollusks. From a geographical perspective, the southern ridges of the Ustyurt Plateau extend precisely between Khwarazm and Jurjan (the historical region of Gurgan on the southern coast of the Caspian Sea), further reinforcing this interpretation [9].

When commenting on the term “Xiz tangkizi” mentioned by al-Biruni, P. G. Bulgakov interpreted it as the Turkic expression “Qiz dengizi” (“Sea of the Maiden”) and associated it with the Sarykamysh Basin [10]. Nevertheless, an alternative etymological interpretation cannot be ruled out. In our view, explaining the name “Xiz tangkizi” solely through the word qiz (“girl” or “maiden”) does not fully account for all aspects of the problem. One of the ancient names of the Amu Darya is known to have been Oghuz, while in ancient Greek sources it appears as Oxus. In this context, it seems more appropriate to regard Oghuz not primarily as an ethnonym referring to the Oghuz tribes but rather as a hydronym, that is, the historical name of the river itself.

The Turkologist N. A. Baskakov argued that the words oʻzak (“source”), oʻzan (“riverbed”), and oʻgʻuz share a common linguistic root connected with the concepts of a watercourse, current, and river channel [11]. Likewise, Ármin Vámbéry recorded the toponym “Oʻgʻuz ketken” (“where the Oghuz/river passed”) in connection with the Amu Darya. It is therefore possible that, through phonetic assimilation and the influence of folk etymology over the centuries, this name gradually evolved into “Qiz ketken.” The fact that a canal crossing the center of Nukus still bears the name Qiz ketken may preserve a linguistic trace of this historical transformation.

From this perspective, the term “Xiz tangkizi” recorded by al-Biruni should not necessarily be understood merely as the figurative expression “Sea of the Maiden.” Rather, it may represent one of the historical names preserving the ancient hydronymic layer associated with the former channels of the Amu Darya. Consequently, a proper interpretation of the historical development of the Ustyurt Plateau—particularly its ancient hydrographic processes and communication networks—requires careful consideration of this hydronymic evidence alongside the region's paleogeographical characteristics [12].

In his Uzbek translation of al-Biruni's *Geodesy*, Hamdulloh Aminov rendered the term “Xiz tangkizi” as “Qizil dengiz” (“Red Sea”) and associated it either with Lake Sarykamysh or with the Aral Sea. However, such an interpretation does not fully correspond to the lexical form found in the original text. The source explicitly preserves the form “Xiz,” and it contains neither a lexical element nor a morphological marker denoting the meaning of “red.” Therefore, the interpretation of the term should be sought not through later linguistic conventions but within the historical and linguistic context reflected in the original manuscript itself.

Moreover, several medieval and earlier historical sources refer to the Aral Sea as the "Blue Sea" (Ko'k dengiz) rather than the "Red Sea" [13]. This circumstance likewise makes the identification of "Xiz tangkizi" with the Aral Sea open to question. A more plausible explanation is that the first component of the term belongs to the ancient hydronymic tradition associated with the historical name of the Amu Darya, namely Oghuz (Greek: Oxus).

It is conceivable that, over a long period of linguistic development, phonetic change and folk etymology transformed the original form Oghuz into Xiz or Qiz. Such phonetic developments are not uncommon in the historical evolution of Turkic toponyms and hydronyms, where the original semantic motivation is often obscured through repeated reinterpretation by later generations of speakers. Consequently, the modern form may preserve only a modified reflex of an earlier geographical designation [14, 15].

4. Conclusion

From this standpoint, the expression "Xiz tangkizi" should not be understood simply as the color designation "Red Sea." Rather, it is more convincingly interpreted as a historical hydronym preserving the memory of the ancient channels of the Amu Darya and the hydronymic system associated with them. Such an interpretation is more consistent with both the linguistic evidence and the paleogeographical context presented by al-Biruni. Taken together, al-Biruni's observations demonstrate an exceptional knowledge of the historical geography of the Khwarazm oasis, the Ustyurt Plateau, and the lower Amu Darya basin. His descriptions of ancient river courses, fossil remains, settlements, and historical place names correspond remarkably well with many conclusions reached by modern paleogeography, geomorphology, historical geography, and Turkic historical linguistics. Consequently, Geodesy remains not only an outstanding monument of medieval Islamic scholarship but also one of the most valuable primary sources for reconstructing the environmental and historical development of the Ustyurt Plateau and the ancient hydrographic network of Central Asia.

REFERENCES

- [1] A. R. al-Biruni, **Geodeziya (Opredelenie granits mest dlya utochneniya rastoyaniy mezhdu poseleniyami) [Geodesy: Determination of the Coordinates of Localities for the Correction of Distances Between Settlements]**, P. G. Bulgakov, Trans., Ed., and Comm., vol. 3. Tashkent, Uzbekistan: Fan Publishing House of the Uzbek SSR, 1966.
- [2] N. A. Baskakov, "Geograficheskaya nomenklatura v toponimii Gornogo Altaya [Geographical Nomenclature in the Toponymy of the Altai Mountains]," in **Toponimika Vostoka: Issledovaniya i materialy**. Moscow, USSR: Nauka, 1969, p. 66.
- [3] B. Spuler, "Aral Sea," in **Encyclopaedia Iranica**, vol. II, fasc. 3, 1986. [Online]. Available: <https://www.iranicaonline.org/articles/aran-sea-daryaca-ye-karazm>
- [4] I. Ismoilov, "Alisher Navoiyning 'Saddi Iskandariy' dostoni debochasi badiiyati," *Oltin Bitiglar–Golden Scripts*, vol. 1, no. 1, 2021.
- [5] I. Ismoilov, "Tafsirlarda Iskandar mavzusiga oid talqinlar," *Oltin Bitiglar–Golden Scripts*, vol. 2, no. 2, 2021.
- [6] I. A. Ismoilov, "On the issue of literary influence and originality in the epic 'Saddi Iskandariy'," *Inostrannye Yazyki v Uzbekistane*, no. 3, pp. 220–226, 2020.
- [7] I. Ismoilov, "Nizomiy 'Iskandarnoma'sining o'zbek adabiyotshunosligida o'rganilishi," *Uzbekistan: Language and Culture*, vol. 4, no. 4, 2019.
- [8] I. Ismoilov, "Iskandar oynasi," *Oltin Bitiglar–Golden Scripts*, vol. 4, no. 4, 2019.
- [9] I. Ismoilov, "The image of 'The Mirror of Iskandar' in the poetry of Alisher Navai and its comparative analysis," unpublished article.
- [10] I. Ismoilov, "About the Talismans of Iskandar (Alexander) by Alisher Navoi," *International Journal of Linguistics, Literature and Culture*, vol. 7, no. 3, pp. 139–145, May 2021, doi: 10.21744/ijllc.v7n3.1488.

-
- [11] I. Ismoilov, "'Boburnoma' as a Literary Source," *American Journal of Social Sciences and Humanity Research*, vol. 5, no. 11, pp. 128–130, 2025, doi: 10.37547/ajsshr/Volume05Issue11-32.
 - [12] Q. S. Makhmudov, "Forms of Quick Management of Manufacturing in the Conditions of Market Relations," 2023.
 - [13] K. Makhmudov, "Key Concepts Regarding the Quality of Services and Its Management," 2023.
 - [14] K. Makhmudov, "The Need to Introduce Quality Systems in the Field of Services," *European Journal of Business Startups and Open Society*, vol. 2, no. 7, pp. 11–14.
 - [15] M. K. Saydullayevich, "The Role of Leadership in Management Systems and Its Impact on Organizational Effectiveness: Evidence from Uzbekistan and Central Asian Enterprises," *Central Asian Journal of Innovations on Tourism Management and Finance*, vol. 7, no. 3, pp. 226–232, 2026.