

ISSN 2518-1629 (Online),
ISSN 2224-5308 (Print)

ҚАЗАҚСТАН РЕСПУБЛИКАСЫ
ҰЛТТЫҚ ҒЫЛЫМ АКАДЕМИЯСЫНЫҢ
Өсімдіктердің биологиясы және биотехнологиясы институтының

Х А Б А Р Л А Р Ы

ИЗВЕСТИЯ

НАЦИОНАЛЬНОЙ АКАДЕМИИ НАУК
РЕСПУБЛИКИ КАЗАХСТАН
Института биологии и биотехнологии растений

NEWS

OF THE NATIONAL ACADEMY OF SCIENCES
OF THE REPUBLIC OF KAZAKHSTAN
of the Institute of Plant Biology and Biotechnology

**SERIES
OF BIOLOGICAL AND MEDICAL**

1 (331)

JANUARY – FEBRUARY 2019

PUBLISHED SINCE JANUARY 1963

PUBLISHED 6 TIMES A YEAR

ALMATY, NAS RK

Б а с р е д а к т о р

ҚР ҰҒА академигі, м. ғ. д., проф. **Ж. А. Арзықұлов**

Абжанов Архат, проф. (Бостон, АҚШ),
Абелев С.К., проф. (Мәскеу, Ресей),
Айтқожина Н.А., проф., академик (Қазақстан)
Ақшулақов С.К., проф., академик (Қазақстан)
Алшынбаев М.К., проф., академик (Қазақстан)
Бәтпенев Н.Д., проф., корр.-мүшесі (Қазақстан)
Березин В.Э., проф., корр.-мүшесі (Қазақстан)
Берсімбаев Р.И., проф., академик (Қазақстан)
Беркінбаев С.Ф., проф., (Қазақстан)
Бисенбаев А.К., проф., академик (Қазақстан)
Бишимбаева Н.Қ., проф., академик (Қазақстан)
Ботабекова Т.К., проф., корр.-мүшесі (Қазақстан)
Bosch Ernesto, prof. (Spain)
Давлетов Қ.К., ассоц.проф., жауапты хатшы
Жансүгірова Л.Б., б.ғ.к., проф. (Қазақстан)
Ellenbogen Adrian, prof. (Tel-Aviv, Israel),
Жамбакин Қ.Ж., проф., академик (Қазақстан), бас ред. орынбасары
Заядан Б.К., проф., корр.-мүшесі (Қазақстан)
Ishchenko Alexander, prof. (Villejuif, France)
Исаева Р.Б., проф., (Қазақстан)
Қайдарова Д.Р., проф., академик (Қазақстан)
Қохметова А.М., проф., корр.-мүшесі (Қазақстан)
Күзденбаева Р.С., проф., академик (Қазақстан)
Локшин В.Н., проф., корр.-мүшесі (Қазақстан)
Лось Д.А., prof. (Мәскеу, Ресей)
Lunenfeld Bruno, prof. (Израиль)
Макашев Е.К., проф., корр.-мүшесі (Қазақстан)
Миталипов Ш.М., (Америка)
Муминов Т.А., проф., академик (Қазақстан)
Огарь Н.П., проф., корр.-мүшесі (Қазақстан)
Омаров Р.Т., б.ғ.к., проф., (Қазақстан)
Продеус А.П., проф. (Ресей)
Purton Saul, prof. (London, UK)
Рахыпбеков Т.К., проф., корр.-мүшесі (Қазақстан)
Сапарбаев Мұрат, проф. (Париж, Франция)
Сарбасов Дос, проф. (Хьюстон, АҚШ)
Тұрысбеков Е.К., б.ғ.к., асс.проф. (Қазақстан)
Шарманов А.Т., проф. (АҚШ)

«ҚР ҰҒА Хабарлары. Биология және медициналық сериясы».

ISSN 2518-1629 (Online),

ISSN 2224-5308 (Print)

Меншіктенуші: «Қазақстан Республикасының Ұлттық ғылым академиясы» РҚБ (Алматы қ.)

Қазақстан республикасының Мәдениет пен ақпарат министрлігінің Ақпарат және мұрағат комитетінде
01.06.2006 ж. берілген №5546-Ж мерзімдік басылым тіркеуіне қойылу туралы куәлік

Мерзімділігі: жылына 6 рет.

Тиражы: 300 дана.

Редакцияның мекенжайы: 050010, Алматы қ., Шевченко көш., 28, 219 бөл., 220, тел.: 272-13-19, 272-13-18,
<http://biological-medical.kz/index.php/en/>

© Қазақстан Республикасының Ұлттық ғылым академиясы, 2019

Типографияның мекенжайы: «Аруна» ЖК, Алматы қ., Мұратбаева көш., 75.

Г л а в н ы й р е д а к т о р

академик НАН РК, д.м.н., проф. **Ж. А. Арзыкулов**

Абжанов Архат, проф. (Бостон, США),
Абелев С.К., проф. (Москва, Россия),
Айтхожина Н.А., проф., академик (Казахстан)
Акшулаков С.К., проф., академик (Казахстан)
Алчинбаев М.К., проф., академик (Казахстан)
Батпенов Н.Д., проф. член-корр.НАН РК (Казахстан)
Березин В.Э., проф., чл.-корр. (Казахстан)
Берсимбаев Р.И., проф., академик (Казахстан)
Беркинбаев С.Ф., проф. (Казахстан)
Бисенбаев А.К., проф., академик (Казахстан)
Бишимбаева Н.К., проф., академик (Казахстан)
Ботабекова Т.К., проф., чл.-корр. (Казахстан)
Bosch Ernesto, prof. (Spain)
Давлетов К.К., ассоц. проф., ответственный секретарь
Джансугурова Л. Б., к.б.н., проф. (Казахстан)
Ellenbogen Adrian, prof. (Tel-Aviv, Israel),
Жамбакин К.Ж., проф., академик (Казахстан), зам. гл. ред.
Заядан Б.К., проф., чл.-корр. (Казахстан)
Ishchenko Alexander, prof. (Villejuif, France)
Исаева Р.Б., проф. (Казахстан)
Кайдарова Д.Р., проф., академик (Казахстан)
Кохметова А.М., проф., чл.-корр. (Казахстан)
Кузденбаева Р.С., проф., академик (Казахстан)
Локшин В.Н., проф., чл.-корр. (Казахстан)
Лось Д.А., prof. (Москва, Россия)
Lunenfeld Bruno, prof. (Израиль)
Макашев Е.К., проф., чл.-корр. (Казахстан)
Миталипов Ш.М., (Америка)
Муминов Т.А., проф., академик (Казахстан)
Огарь Н.П., проф., чл.-корр. (Казахстан)
Омаров Р.Т., к.б.н., проф. (Казахстан)
Продеус А.П., проф. (Россия)
Purton Saul, prof. (London, UK)
Рахыпбеков Т.К., проф., чл.-корр. (Казахстан)
Сапарбаев Мурат, проф. (Париж, Франция)
Сарбасов Дос, проф. (Хьюстон, США)
Турысбеков Е. К., к.б.н., асс.проф. (Казахстан)
Шарманов А.Т., проф. (США)

«Известия НАН РК. Серия биологическая и медицинская».

ISSN 2518-1629 (Online),

ISSN 2224-5308 (Print)

Собственник: РОО «Национальная академия наук Республики Казахстан» (г. Алматы)

Свидетельство о постановке на учет периодического печатного издания в Комитете информации и архивов Министерства культуры и информации Республики Казахстан №5546-Ж, выданное 01.06.2006 г.

Периодичность: 6 раз в год

Тираж: 300 экземпляров

Адрес редакции: 050010, г. Алматы, ул. Шевченко, 28, ком. 219, 220, тел. 272-13-19, 272-13-18,

www.nauka-nanrk.kz / biological-medical.kz

© Национальная академия наук Республики Казахстан, 2019

Адрес типографии: ИП «Аруна», г. Алматы, ул. Муратбаева, 75

Editor in chief

Zh.A. Arzykulov, academician of NAS RK, Dr. med., prof.

Abzhanov Arkhat, prof. (Boston, USA),
Abelev S.K., prof. (Moscow, Russia),
Aitkhozhina N.A., prof., academician (Kazakhstan)
Akshulakov S.K., prof., academician (Kazakhstan)
Alchinbayev M.K., prof., academician (Kazakhstan)
Batpenov N.D., prof., corr. member (Kazakhstan)
Berezin V.Ye., prof., corr. member. (Kazakhstan)
Bersimbayev R.I., prof., academician (Kazakhstan)
Berkinbaev S.F., prof. (Kazakhstan)
Bisenbayev A.K., prof., academician (Kazakhstan)
Bishimbayeva N.K., prof., academician (Kazakhstan)
Botabekova T.K., prof., corr. member. (Kazakhstan)
Bosch Ernesto, prof. (Spain)
Davletov Kairat, PhD, associate professor, executive Secretary
Dzhansugurova L.B., Cand. biol., prof. (Kazakhstan)
Ellenbogen Adrian, prof. (Tel-Aviv, Israel),
Zhambakin K.Zh., prof., academician (Kazakhstan), deputy editor-in-chief
Ishchenko Alexander, prof. (Villejuif, France)
Isayeva R.B., prof. (Kazakhstan)
Kaydarova D.R., prof., academician (Kazakhstan)
Kokhmetova A., prof., corr. member (Kazakhstan)
Kuzdenbayeva R.S., prof., academician (Kazakhstan)
Lokshin V.N., prof., corr. member (Kazakhstan)
Los D.A., prof. (Moscow, Russia)
Lunefeld Bruno, prof. (Israel)
Makashev E.K., prof., corr. member (Kazakhstan)
Mitalipov Sh.M. (America)
Muminov T.A., prof., academician (Kazakhstan)
Ogar N.P., prof., corr. member (Kazakhstan)
Omarov R.T., cand. biol., prof. (Kazakhstan)
Prodeus A.P., prof. (Russia)
Purton Saul, prof. (London, UK)
Rakhypbekov T.K., prof., corr. member. (Kazakhstan)
Saparbayev Murat, prof. (Paris, France)
Sarbassov Dos, prof. (Houston, USA)
Turysbekov E.K., cand. biol., assoc. prof. (Kazakhstan)
Sharmanov A.T., prof. (USA)

News of the National Academy of Sciences of the Republic of Kazakhstan. Series of biology and medicine.

ISSN 2518-1629 (Online),

ISSN 2224-5308 (Print)

Owner: RPA "National Academy of Sciences of the Republic of Kazakhstan" (Almaty)

The certificate of registration of a periodic printed publication in the Committee of information and archives of the Ministry of culture and information of the Republic of Kazakhstan N 5546-Ж, issued 01.06.2006

Periodicity: 6 times a year

Circulation: 300 copies

Editorial address: 28, Shevchenko str., of. 219, 220, Almaty, 050010, tel. 272-13-19, 272-13-18,
<http://nauka-nanrk.kz/biological-medical.kz>

© National Academy of Sciences of the Republic of Kazakhstan, 2019

Address of printing house: ST "Aruna", 75, Muratbayev str, Almaty

NEWS

OF THE NATIONAL ACADEMY OF SCIENCES OF THE REPUBLIC OF KAZAKHSTAN

SERIES OF BIOLOGICAL AND MEDICAL

ISSN 2224-5308

Volume 1, Number 331 (2019), 60 – 68

<https://doi.org/10.32014/2019.2518-1629.9>

UDC 502.211 (075.8): 574 (063)

**A. K. Serikbayeva¹, G. Kenzhetayev¹, S. Syrlybekkyzy¹,
Sh. K. Shapalov², A. M. Aitimova¹, F. Zhaparbaeva¹**

¹Yessenov university, Kazakhstan, Aktau, Kazakhstan,

²M. Auezov South Kazakhstan state university, Shymkent, Kazakhstan.

E-mail. gkenzhetayev@bk.ru, symbat.serikbayeva@bk.ru, Samal_86a@mail.ru,
shermahan_1984@mail.ru, aynazhan.aytimova@bk, ruzhaparbayeva@inbox.ru

**STUDY OF LANDSCAPE AND BIOLOGICAL DIVERSITY
OF THE CHALK DEPOSIT IN MANGISTAU REGION**

Abstract. Data of a research on geomorphological areas of Mangystau Region are provided. Caspian Depression in Mangystau Region stretches to borders of the hollow of Karagiye (for 132 m below sea-level). On the Ustyurt plateau, Bozzhira's area it is incredibly fine, it can make the worthy competition to the known Valley of monuments (USA). In mountain Mangystau the highest point the mountain Beschoky – 555 of m. Studying of a biodiversity near the field of a chalk of Shetpe Southern showed that from 26 species of reptiles widespread in area, near the field of a chalk and cement works 4 views live: steppe agama, takyr round head fast lizard and Caspian gecko. There is an endemic look – a hedgehog. Steppes are used by birds as a fodder biotope. The revealed biodiversity enriches the area of a research, both ecologically, and esthetically.

Key words: researches, regional features, lowland, mountainous areas, field of a chalk, cement works, biodiversity.

Introduction. It is known that decrease in level of biological diversity is one of the main reasons for the progressing degradation of natural ecosystems.

Only on condition of maintaining optimum level of a variety creation of the ecosystems steady against anthropogenic and technogenic and also extreme influences of physical and chemical factors, wreckers and diseases is possible [1].

Preservation of a biodiversity is one of global environmental problems and every year escalates in process of disappearance of new types more and more.

Negatively pollution of the environment of their dwelling influences animals. Pollution of the environmental environment, in particular soils is especially dangerous by cretaceous and cement dust. Particles of cement dust can be transferred to distances up to 5 km and can cover the considerable territories. Cement dust contains from 10 to 40% of calcium in the form of oxide, a carbonate, to 2.5% of a potassium. Though this dust is considered non-toxic, it can become the reason of change of a number of properties of soils and vegetation and them according to their pollution as a result of accumulation of some chemical elements in high concentrations. In view of that the Cement plant Caspian Sea is placed on the Western plain with a foot of the field of a chalk of Shetpe Southern, it is necessary, to note that one of factors of negative impact on a surrounding medium is dust formation when loading and transporting a chalk. The thin dispersion is characteristic of cretaceous breeds thanks to what cretaceous dust is delivered on hundreds of meters from the place of development and transportation. Pollution of soils aero technogenic emissions causes significant changes in biogenocenoses. As a result of extraction of chalk, dust as a part of which calcium oxide within 46.12-53.21%, magnesium oxides – 1.08-11.34% contains is formed, creates an environmental problem for a surrounding medium [2].

Dust the containing lime, forms with water on a surface of leaves a firm crust of $\text{Ca}(\text{OH})_2$ or $3\text{Ca}\cdot\text{SiO}_2$ which close all time and break the gas exchange necessary for a normal delivery of a plant and process of a photosynthesis.

It leads to processes of destruction of a vegetable cover and degradation of soils and the subsequent formation of technogenic deserts. Natural fitotsenoza are broken, there are significant changes in plants, at the same time contents and concentration of a number of chemical elements increases in sol of plants.

In this regard, studying of a biodiversity in areas of extraction of chalk and production of cement in an arid hot climate of the Mvangistausky region, are not only the fundamental directions of the modern ecological researches but also have applied character.

Methods of collecting and processing of material. Field researches are conducted in summertime 2017-2018.

The research technique, is based on the modern scientific ideas of assessment of a condition of a biodiversity in areas of production of mining operations.

All materials on a biodiversity in the territory of the field of a chalk of Shetpe Southern and around cement works are received by a method of "squares". The territory of a research was broken into squares (grids) by means of which also the quantitative are received qualitative (existence of types) (number of visits) data.

At the first stage data collection and processing necessary for a research is carried out (data on geomorphological areas of Mangystau Region and information on valuable natural objects). Share materials of Management of natural resources and rational environmental management of the Mangsitausky region (УИПРиПИ) and the Atlas of Mangystau, 2010) are used [5]. Information on regional features of geomorphological areas of the region is provided.

The second stage - assessment of a condition of a biodiversity around activity of the Caspian Sea Cement plant on the field of a chalk of Shetpe Southern. The assessment was carried out by observation at field researches.

Route (pedestrian) account. Birds. The norm of accounting of birds was 3 km, at a foot of hills and also on northern and east slopes and in the system of the southern gorges. The route on the western plain made from the North to the south 5 km. Data on abundance of birds and other quantitative indices were averaged (on May 15 – on July 15) [6].

For accounting of amphibians and reptiles route account is also used. More complete information on specific variety of animals is given by route accounts. At the same time for obtaining comparable data were guided by the following rules. Account was carried out on registration tapes which width for one person is equal to 1 m (on 0.5 m aside from the accountant) on strongly grassed sites or at night, and 2 m (on 1 m from the accountant aside) on open places in the afternoon. Such bandwidth of account undertakes for the best detection of types. At the same time the chosen width of a registration strip was strictly kept. When accounting Amphibia and lizards length of a route was 3 km, when accounting snakes - 5 km (the central plateau of the field of a chalk) [8,9].

For accounting of a green toad and water already the route was put on the coastline of the drying-up river and the canal around cement works.

During walking routes used GPS receiver (Garmin eTrex 30), the camera (Nikon D90), a caliper and a roulette for measurement of the met traces of animals, reptiles and mammals.

Watched birds by means of the field-glass daily in strictly particular terms: at 6 o'clock in the morning and 18 o'clock in the evening, in total 80 clocks of observations.

Classification of birds was carried out during routes with the assistance of the ornithologist [7].

Methods of geoinformation technologies (GIT). Data of remote sensing of Earth (are received in the free access from services - Google Maps, Yandex, Bing). Schematic maps are executed in the environment of Google Maps, Bing with use of the graphic Corel Draw 11 and Paint programs (Windows XP).

Results of researches and discussion. The area of researches, in particular the field of a chalk of Shetpe Southern is located in the territory of the Mangystau district game of Mangystau Region RK.

According to a technique of researches at the first stage we will provide data on geomorphological areas of Mangystau Region and we will provide information on a landscape variety and the valuable natural objects inherent only to this edge.

Mangystau Region of the Republic of Kazakhstan is located to the east from the Caspian Sea, on the Mangyshlak plateau (Mangystau), borders in the northeast on the Atyrau and Aktyubinsk regions, in the south on Turkmenistan and in the east on the Republic of Karakalpakstan as a part of Uzbekistan. The region from the West is washed by the Caspian Sea, at this pobeorezh Kenderli is given in the West in the form of the peninsula of Mangyshlak, with the deep gulfs Dead Kultuk, Mangyshlaksy, Kazakh. In the Caspian Sea - Seal islands. The majority of the territory of the area is engaged with the wormwood and saline desert with sites of shrubby vegetation at brown soils: the surface is partially covered with saline soils, takyring solonetzic soils and sands with extremely rare vegetation Climate sharp and continental, extremely droughty. Average temperature in January - 7 °C, in July of 27 °C, at the same time in separate days maximum temperature exceeds 40 °C. Osadkov drops out about 100-150 mm in a year [3].

The rivers of the Caspian Basin, the river of the basin of the Aral Sea and also many rivers flowing into small lakes or losing the drain in desert waterless areas belong to the extensive internal drainless Aralo-Caspian Basin. This pool watershed covers 23% of the territory of the CIS. For the Aralo-Kaspiysky watershed, allocate six large geomorphological regions [4].

Falls to the share of Mangystau Region four: 1. Caspian Depression. 2. The Ustyurt plateau bordered with the system of ledges of chinok (Northern, Southern and Western subdistricts). 3. Mountain Mangystau. 4. Flat Mangystau. Geomorphological areas of Mangystau Region are shown in figure 1.

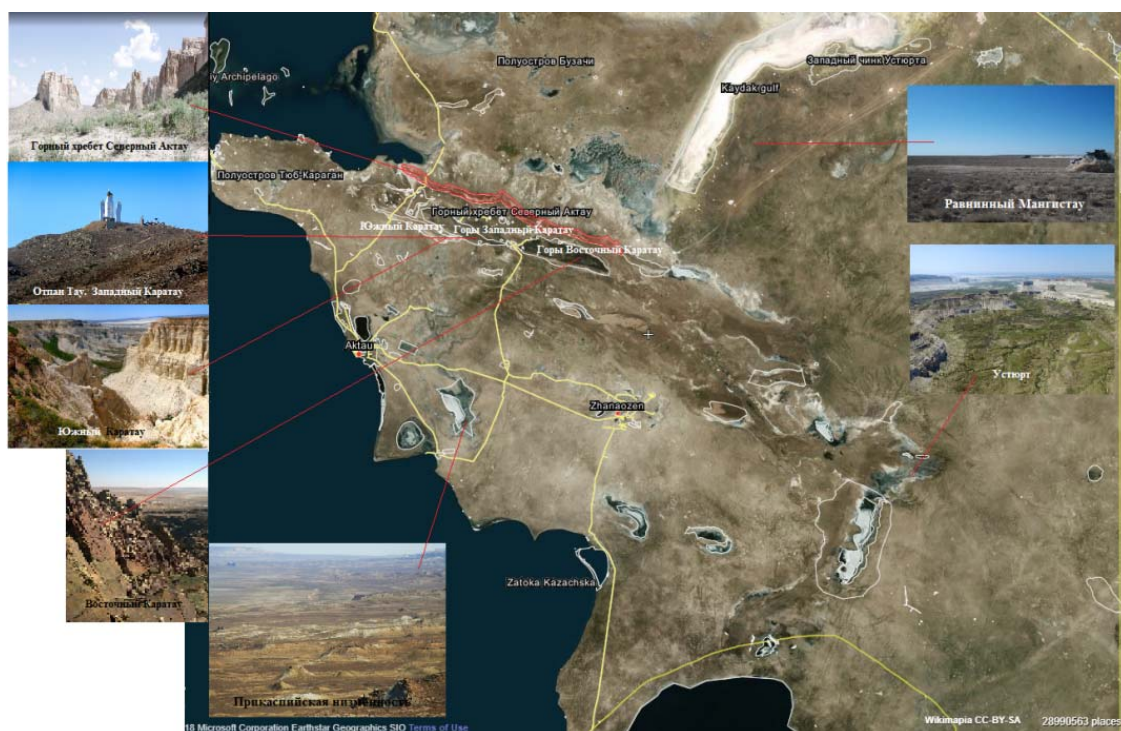


Figure 1 – Geomorphological areas of Mangystau Region
(the schematic map is executed in the environment of Google Maps)

1. Caspian Depression is located in the southeast of the Votochno-Evropeysky plain, on the northern coast of the Caspian Sea (figure 2). It is called by name (каспиев), the people of Scythian origin which were once living on coast of the Caspian Sea. The area - about 200 thousand sq.km. In a northern part (The Astrakhan region of the Russian Federation, the Atyrau region) the lowland is put clay, and in southern (Mangystau Region) is put by sandy deposits. In Mangystau Region deserts and semi-deserts prevail. Caspian Depression in Mangystau Region stretches to borders of the hollow of Karagiye (for 132 m below sea-level). The low plain surface lies in the interior below sea-level on 28 m (Atyrau), to the outskirts rises up to 100 m. In the western part it is crossed by the Volga-Akhtubinsk flood plain. The largest rivers: Volga, Ural, Terek, Kuma. On Caspian Depression within Mangystau Region there is an Aktau-Buzachinsky wildlife area [3, 5].



Figure 2 – Caspian Depression (physical map Russian Federation, 2003)

2. The Ustyurt plateau (Ustyurt on tyursky - a plateau). The well-known Ustyurt plateau (figure 1 and 2) is located in Central Asia and occupies the same territory as well as Caspian Depression - nearly 200 thousand sq.m. The fact that across this plateau there pass borders of our Kazakhstan, Uzbekistan and the small site of Turkmenistan is remarkable. So, in the western part the peninsula of Mangyshlak and the gulf Kara-Bogaz-Gol (a black mouth). In the east - the drying Aral Sea and delta of the Amudarya River.

The highest the southwest part of the plateau - Bozzhyr's (figure 3) natural boundary which is located in the Mangymtausky region is considered.



Figure 3 – Bozzhyr's natural boundary in Mangystau Region (a picture, 2018)

The tract consists of rocky ridges, hills (ridges) with almost flat outlines. The area Bosire incredibly beautiful, she can compete with the famous monument Valley (USA). Unfortunately, few of them have heard about the existence of this pearl of Ustyurt. It is worth studying Kazakhstan on the map of mountain chains to assess the scale of this place. It is believed that more than 21 million years ago the plateau was deep under water. Thus, sea shells are found in Ustyurt limestone, which confirms the hypothesis.

Besides, there is a huge amount of ferromanganese concretions which the size and a form remind spheres for billiards. Not everyone will guess that the spherical educations disseminated through all surface by the plateau are created in the conditions of the sea. Water gradually washed away dolomitic and calcareous breeds, but ferromanganese concretions came to light stronger, only found roundish outlines. Locals are proud of such sight.

3. Mountain Mangystau. Mountain Mangystau district. The West Karatau district with a low-mountainous terrain. Absolute marks in the area fluctuate from 250-450 m above sea level (figure 4). The highest parts of a peneplenizirovana with the certain towering hills (Mount Otpan-Tau with height of 533 m) [4].

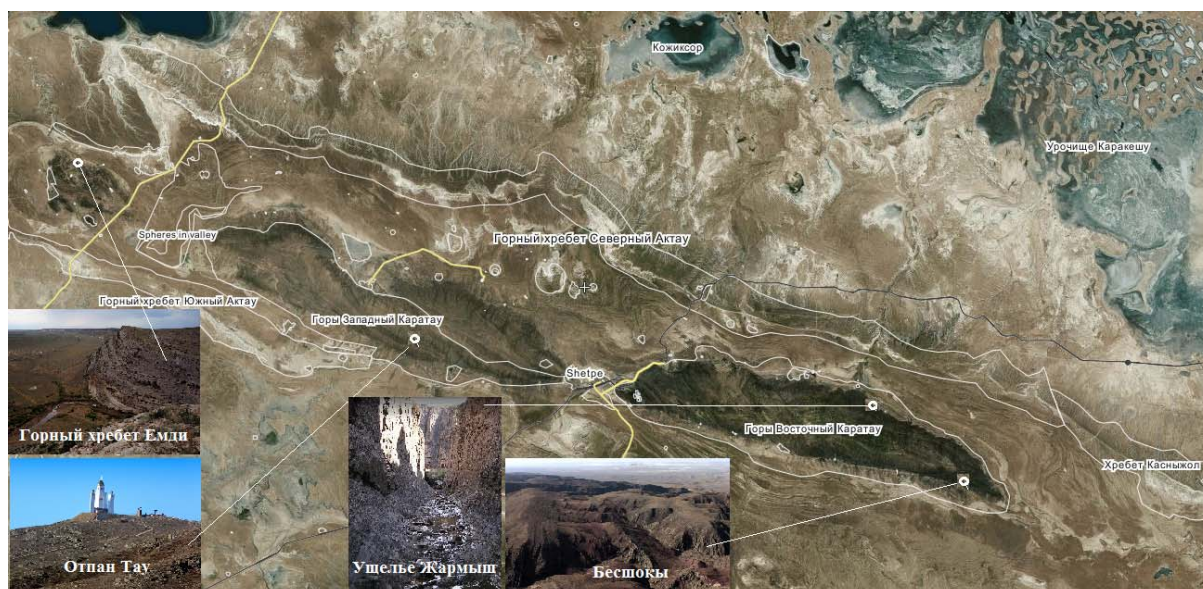


Figure 4 – Mountain Mangystau (the schematic map is executed in the environment of Google Maps)

Northern and southern slopes of mountains very steep with dense network of gorges in the form of canyons. Slopes of mountains stony with numerous exits of radical breeds. It is put by Nizkogorye the Perm and Triassic sandstones, slates, aleurolites with pro-layers of conglomerates and limestones.

The east Karatau district with a low-mountainous terrain. Elevation marks fluctuate from 380 to 480 m. Tops peneplening hilly with the certain hills towering on 50-100 m (the highest point of area Mangystauskoy the mountain Beschoky - 555 of m (village of Zharmysh).

Northern and especially southern macroslopes steep stony with exits of radical breeds and cut up numerous by the canyon log of an uschelyamiya. Lithologic structure of breeds the also composite (sandstones, aleurolites, slates). Severomangyshlaksy district of poorly inclined under plains (from 100 to 0 m sea-level) with a hilly uvalistym a relief.

The close podstilaniye of cretaceous breeds is characteristic of the area, is more rare than limestones and sandstones, a part them comes to a surface. Uvala krutosklonny with exits of breeds, and flat with small beams and ravines.

Differences in structure of fauna of mammals are characteristic of each of these areas. So, in Caspian Depression dwelling of 43 types, in the Northern predustyurt – 44 types, Flat Mangystau – 45 types, in Mountain Mangystau – 35 types, Northern Ustyurt – 47 types, the Southern Ustyurt – 52 types, the Western Ustyurt – the 51st species of mammals is revealed [3, 5, 9].

The originality of the Aralo-Kaspiysky watershed is traced not only in a geological structure and landscape and geographical features, but also specific structure and the nature of distribution of animals, first of all land vertebrata. Therefore the fauna of Ustyurt and Mangystau has to be considered as the self-contained zoogeographical site – the Ustyurt [3, 5].

Features of a landscape variety of the field of a chalk of Shetpe Southern.

Central plateau of the field of a chalk. Represents the flat and equal, located at the considerable height (about 17 m), above sea level, plateau, with the vegetation which fell into decay as a result of an intensive pasture of horses and to a lesser extent camels and goats [10].

Western plain. It is characterized by very limited difference of height, very smoothly going down from the West to the east, a low part is to the west from the plant territory. The northwest part of the plain is completely covered with a grass cover for a cattle pasture locals.

Hills of a foot. This area – result of slipping of breeds of the main plateau. One of the most various and strongly structured regions of a landscape of the explored territory, also harbors the considerable proportion of biological diversity of the area.

Northern slope. A northern slope – quite monotonous steep slope which designates northern border of the plateau. The top third, about 20-30 m, is almost vertical calcareous slope with erosive ravines and cuts.

From the ecological point of view, for ecotourism, two systems of gorges which are on the different ends of the field of a chalk are of huge interest:

- northern system of gorges: the wide and strongly structured system of the gorge with the steep, vertical, bouldery osypny slopes and very narrow gorges where it isn't enough, but trees and bushes meet;
- southern system of gorges: it isn't so extensive as Northern, gorges the most narrow here, but with more steep exits of breed.

Geoekologicheski important difference of this system consisting of several gorges connected by a canyon are:

- the steep steep rocks formed as a result of the severe erosion with numerous small caves and cracks;
- osypny slopes and boulders of breeds at a foot of steeps which form the system of caves and semi-caves.

Geographical isolation and generally rare vegetation does this area unattractive for the grazed pets and therefore pasturable loading is considerably reduced here. The described landscape is shown in figure 5.

Distribution of amphibians and reptiles. Gerpetofauna of Mangystau Region, in general includes 2 species of amphibians and 26 species of reptiles.

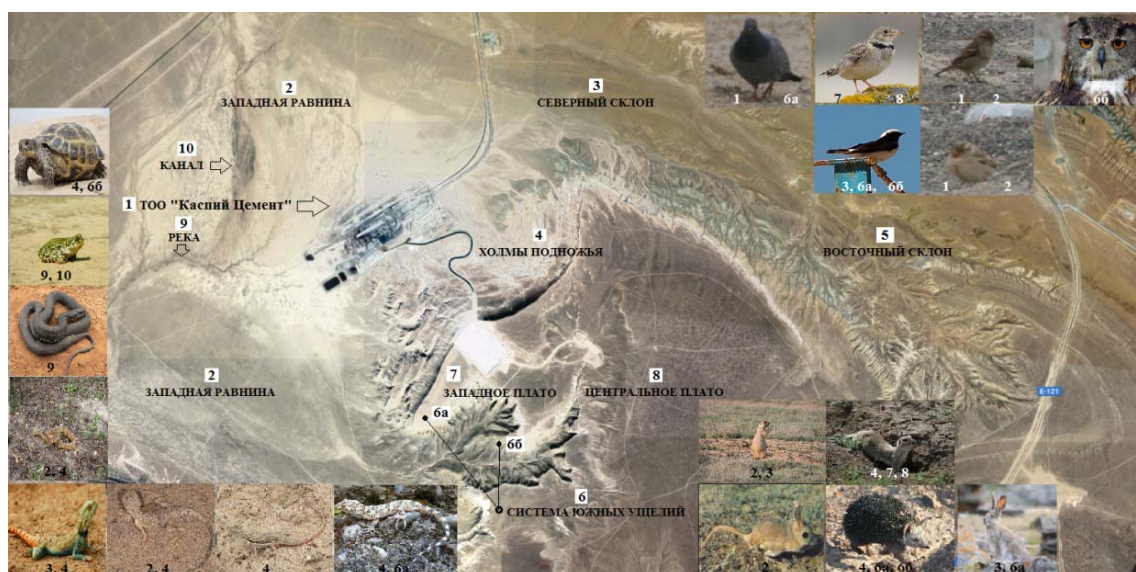


Figure 5 – The schematic map with the available species of reptiles and Amphibia, mammals and birds on the field swept also the Caspian Sea Cement plant (the card is executed in Google Maps)

All species of amphibians and reptiles widespread in area are classified on: 1 – widespread; 2 – having a limited area; the distribution 3 – having mosaic character; 4 – known on single finds.

From widespread reptiles in the territory of a research live: steppe agama (*Trapelus sanguinolentus*), takyr round head (*Phrynocephalus helioscopus*), fast yashchurka (*Eremias velox*). Density of their settlement of ordinary, that is 1-10 individuals on 1 hectare. From desert types – a Sarmatian runner (*Elaphe sauromates*). Settlement density – infrequent, less than 1 individual on 1 hectare. Also – a green toad (*Bufo viridis*) (1-10 individuals on 1 hectare), water (*Natrix tessellata*) (1-10 individuals on 1 hectare), an ordinary shchitomordnik (*Gloydius halys*) (1-10 individuals on 1 hectare). From routine types - the Central Asian turtle (*Agrionemys horsfieldi*) (1-10 individuals/hectare), the Caspian gecko (*Cyrtopodion caspium*) (1-10 individuals/hectare). The green toad (*Bufo viridis*) meets on the canal and the drying-up river, with saltish water and its number is small [10].

The number of the Central Asian turtle (*Agrionemys horsfieldi*) in this area is higher than 1 individual's, that is density routine that is characteristic of hilly sands and plaster and loamy decreases in Mountains Karatau (The western plain).

The steppe agama (*Trapelus sanguinolentus*), takyr round head (*Phrynocephalus helioscopus*), fast yashchurka (*Eremias velox*) inhabit the fixed and dispelled sands though they sometimes meet in clay, shchebenisty and stony deserts (a foot of Northern and East slopes). Density of the settlement of lizards in the territory of the field varies, being for a steppe agama – 1-3 individuals/hectare, a takyr round head – 1-6 individuals/hectare, a fast lizard – 1-11 individuals/hectare.

In the most suitable habitats – on sands for a steppe agama and a fast lizard and on the takyrovidnykh soils for a takyr round head the occurrence of lizards reaches several tens by 100 m of a route.

Snakes as a rule are more infrequent, than lizards. Water (*Natrix tessellata*) it is intimately bound to water during life and dated for the damp habitats.

Mammals. In the territory of a research the following, widespread desert types meet (a slepushonka). In local fauna absolutely there are no real steppe types, it isn't enough in it and semidesertic types (a small gopher, a corsac fox, a saiga). At the same time there is an endemic look – a dlinnoigly hedgehog.

It testifies to the relative antiquity and isolation of local fauna. Besides, in its structure there are representatives of an afrikano-Asian desert complex: (hare-tolay and jackal). At the same time there are almost no Turonian elements (a grebenschikovy gerbil, Severtsov's jerboa and a small jerboa) [10]. Severtsov's jerboa was recorded only once. At the same time, now, there were two new views delivered by rail (black and gray rats).

Birds. In the territory of a research a variety of birds very low, but at the same time, the factory platform attracts types, the related to the person of wild pigeons and house sparrows, and availability of water and food attracts migratory birds.

On open plains or fruitless hills far from areas of the raised vegetation only 1-3 views usually live. While regions of the raised vegetation (the rivers and canyons) and also the factory platform attract the considerable number of birds, plains can also contain the most larger congestions of larks and sparrows. In general, the research showed that the Mangystau district also plays the significant role for migratory birds and that these birds prefer the same environments of dwelling areas, as the majority of the crossed types.

The fauna of these sites, in connection with weak protective conditions and poor fodder resources, is very poor. It is possible to go 2-3 km., and not to meet any bird.

The nesting types are presented only by a steppe lark and the field skate but both views are rare. In places of stony exposures are frequent only Kamenka-pleshanki, but they use these sites only as a fodder biotope, the eagle owl (*Bubo bubo*), near the southern gorge is also noticed. Steppes are used by birds more as a fodder biotope, than as the place of nesting. Only 20-25% make the types nesting there of all types met on the field of a chalk.

Buteo rufinus, steppe eagle (*Aquila nipalensis*), steppe kestrel (*Falco naumanni*), bustard beauty (*Chlamydotis undulata*), eagle owl (*Bubo bubo*), belobryukhy martin (*Apus melba*), green merop (*Meropssuperciliosus*), desert raven (*Corvusruflcollis*), the Spanish Kamenka (*Oenanthe hispanica*), desert Kamenka (*Oenanthe deserti*), stone sparrow (*Petronia petronia*), larks (*Galerida cristata*, *Eremophila alpestris*, *Melanocorypha bimaculata*, *Calandrella brachydactyla*, *Crufescens*) [10].

From this list the following bird species were included in the database of researches: wild pigeon (*Columba livia*), steppe lark (*Melanocorypha calandra*), house sparrow (*Passer domesticus*), black soiling sparrow (*Passer hispaniolensis*), Eurasian eagle owl (*Bubo bubo*) and Kamenka-pleshanka (*Oenanthe pleschanka*). The schematic map with the available species of reptiles and Amphibia, mammals and birds on the field swept and Caspian Sea Cement cement works is shown in figure 5.

Conclusion. The relief of the territory of the area is various. Caspian Depression borders: in the east – with ostanets of the Northern chink of Ustyurt with values of absolute heights to 152 m, in the southeast – with the Western chinok of Ustyurt which consists of ostants with heights more than 200 m, in the south – with Mangistusky uplands. The southern part of the lowland adjoins the peninsula of Mangystau. Ranges of Mangystausky uplands rise to the level of the highest point in the territory of the area – the mountain Besshoky (555 m).

Overwhelming part of the territory of the area – the deserts and semi-deserts alternated by saline soils and takyra with wormwood and rare shrubby vegetation.

There are no constant rivers in the territory of the area, the region has acute shortage of sources of sweet water. Climatic features of deserts contribute to the development of a desert relief in which erosive and aeolian processes are well shown.

At the relative variety of fauna of the Prikaspiya Desert inhabits 56 species of mammals, 278 bird species and 18 species of Amphibia and reptiles, many animal species fall into categories infrequent and disappearing and demand careful attitude to them. Among them there are 7 species of mammals, 36 bird species and 1 species of reptiles are included in the Red List of the Republic of Kazakhstan.

By results of researches, it is established that from widespread reptiles in the territory of a research live: steppe agama, takyr fillister head fast lizard. From routine types - the Central Asian turtle and the Caspian gecko.

The green toad is recorded on the canal and the drying-up river, with salt water.

Steppes are used by birds more as a fodder biotope, than as the place of nesting. The following birds were included in the database of researches: wild pigeon steppe lark, house sparrow, black soiling sparrow, Eurasian eagle owl and kamenka-pleshanka. Even this biological diversity studied as a result of researches near the field of a chalk and cement works, undoubtedly enriches this territory both ecologically, and esthetically.

**А. К. Серикбаева¹, Г. Ж. Кенжетаев¹, С. Сырлыбекқызы¹,
Ш. К. Шапалов², А. М. Айтимова¹, Ф. Жапарбаева¹**

¹Есенов Университеті, Ақтау, Қазақстан,

²М. Әуезов атындағы Оңтүстік Қазақстан мемлекеттік университеті, Шымкент, Қазақстан

МАҢҒЫСТАУ ОБЛЫСЫНДАҒЫ БОР КЕНОРНЫНЫҢ ЛАНДШАФТТЫҚ ЖӘНЕ БИОЛОГИЯЛЫҚ ӘРТҮРЛІЛІГІН ЗЕРТТЕУ

Аннотация. Мақалада Маңғыстау облысының геоморфологиялық аудандары туралы мәліметтер берілген. Маңғыстау облысындағы Каспий маңы ойпаты Қарақия ойпатының шекарасына дейін созылып жатыр (теңіз деңгейінен 132 м төмен). Үстірт жазықтығындағы Бозжыраның жері керемет, ол белгілі монументтер алқабына (АҚШ) лайықты бәсекелестік жасай алады. Маңғыстауда Бесшоқы тауының ең биік нүктесі – 555 м. Шетпе бор кен орны ауданындағы биоалуантүрлілікті зерттеу облыста кең таралған 26 рептилияның түрінің ішінен бор кен орны мен цемент зауытының ауданында 4 түрі: дала ағамы, тақыр жыл басы, жылдам аусыл және Каспий гекконынан тұратынын көрсетті. Эндемиялық түрі – ұзын қырлы кірпі. Дала құстарға жемдік биотоп ретінде пайдаланылады. Анықталған биоалуантүрлілік зерттеу ауданын экологиялық және эстетикалық жағынан байытады.

Түйін сөздер: зерттеулер, аймақтық ерекшеліктер, ойпаттық, тау аудандары, бор кен орны, Цемент зауыты, биоалуантүрлілік.

**А. К. Серикбаева¹, Г. Ж. Кенжетаев¹, С. Сырлыбекқызы¹,
Ш. К. Шапалов², А. М. Айтимова¹, Ф. Жапарбаева¹**

¹Университет Есенова, Ақтау, Қазақстан,

²Южно-Казахстанский государственный университет им. М. Ауэзова, Шымкент, Қазақстан

ИЗУЧЕНИЕ ЛАНДШАФТНОГО И БИОЛОГИЧЕСКОГО РАЗНООБРАЗИЯ МЕСТОРОЖДЕНИЯ МЕЛА В МАНГИСТАУСКОЙ ОБЛАСТИ

Аннотация. Представлены данные исследования о геоморфологических районах Мангистауской области. Прикаспийская низменность в Мангистауской области простирается до границ впадины Карагие (на 132 м ниже уровня моря). На плато Устюрт, местность Бозжиры невероятно прекрасна, она может составить достойную конкуренцию известной Долине монументов (США). В горном Мангистау наивысшая точка гора Бесчоқы – 555 м. Изучение биоразнообразия в районе месторождения мела Шетпе Южное показало, что из

26 видов рептилий распространенных в области, в районе месторождения мела и цементного завода обитают 4 вида: степная агама, такырная круглоголовка быстрая ящурка и каспийский геккон. Имеется эндемичный вид – длинноиглый еж. Степи используются птицами как кормовой биотоп. Выявленное биоразнообразие обогащает район исследования, как экологически, так и эстетически.

Ключевые слова: исследования, региональные особенности, низменность, горные районы, месторождение мела, цементный завод, биоразнообразие.

Information about authors:

Serikbayeva Akmaral Kabylobna, candidate of technical science, associate professor Department Ecology and chemical engineering, Yessenov university, Kazakhstan, Aktau, Kazakhstan; symbat.serikbayeva@bk.ru; <https://orcid.org/0000-0002-9901-9638>

Kenzhetayev Gusman Zhardemovich, doctor of technical science, Professor Department Ecology and chemical engineering, Yessenov university, Kazakhstan, Aktau, Kazakhstan; gkenzhetayev@bk.ru;

Syrlybekkyzy Samal, PhD, associate professor; Department Ecology and chemical engineering, Yessenov university, Kazakhstan, Aktau, Kazakhstan; Samal_86a@mail.ru; <https://orcid.org/0000-0002-0260-0611>

Shapalov Shermakhan Kuttibayevich, PhD, senior teacher Department Life safety and environmental protection, M. Auezov South Kazakhstan state university, Shymkent, Kazakhstan; shermahan_1984@mail.ru; <https://orcid.org/0000-0002-3015-5965>

Aitimova Ainazhan, senior teacher Department Ecology and chemical engineering, Yessenov university, Kazakhstan, Aktau, Kazakhstan; aynazhan.aytimova@bk.ru; <https://orcid.org/0000-0002-0486-3781>

Zhapparbaeva Fatima, master Department Ecology and chemical engineering, Yessenov university, Kazakhstan, Aktau, Kazakhstan; ruzhapparbayeva@inbox.ru; <https://orcid.org/0000-0001-8162-5915>

REFERENCES

[1] Convention on biological diversity [Electronic resource]: URL: http://www.un.org/ru/documents/decl_conv/conventions/biodiv.shtml.

[2] About a condition of an ecological situation of Mangystau Region and sources of its pollution. Management of natural resources and regulation of environmental management of Mangystau Region (УПРиРП). Aktau, 2015. 62 p.

[3] Republic of Kazakhstan. Vol. 3. Surrounding medium and ecology. 2 prod. Almaty, 2010. 520 p.

[4] Blagoveshchensk Accusative, Medeu A.R., Ranova S.U. Atlas of natural and technogenic dangers and risks of emergency situations of the Republic of Kazakhstan // Bulletin of the Kokshetau technical institute Ministry of Emergency Situations of the Republic of Kazakhstan. Kokshetau, 2011. N 2. P. 9-10.

[5] Atlas of Mangystau Region. Resources and ecology. Almaty, 2010. 256 p.

[6] Hazov O.V. Methods of accounting of number of Amphibia and reptiles. Ecosystem, 2009. / Access mode: http://zoomet.ru/metod_reptilii.html.

[7] Hazov O.V., Bogolyubov A.S. Methods of accounting of number of shallow mammals. Ecosystem, 2013. / Access mode: <http://www.ecosystema.ru/04materials/manuals/40.htm>.

[8] Megarran A.A. Ecological variety and its measurement. Publishing house World, 2011. P. 14-17.

[9] Tatarinov A.G., Dolgin M.M. Specific variety and methods of its assessment: studies. Grant. Syktyvkar, 2010. 44 p.

[10] Zhidebayeva A., Kenzhetayev G., Syrlybekkyzy S., Aitimova A., Suleimenova B., Janaliyeva N. // Studying state of soils in South shetpe chalk deposit. EEC-EM - Ecology, Environment and Conservation (0971765X-India-Scopus), 03, 385758. ISSN 0971-765X. (0971765 X-India-Scopus), 03, 385758. 2018. 24(3). P. 1065-1068.

Publication Ethics and Publication Malpractice in the journals of the National Academy of Sciences of the Republic of Kazakhstan

For information on Ethics in publishing and Ethical guidelines for journal publication see <http://www.elsevier.com/publishingethics> and <http://www.elsevier.com/journal-authors/ethics>.

Submission of an article to the National Academy of Sciences of the Republic of Kazakhstan implies that the described work has not been published previously (except in the form of an abstract or as part of a published lecture or academic thesis or as an electronic preprint, see <http://www.elsevier.com/postingpolicy>), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. In particular, translations into English of papers already published in another language are not accepted.

No other forms of scientific misconduct are allowed, such as plagiarism, falsification, fraudulent data, incorrect interpretation of other works, incorrect citations, etc. The National Academy of Sciences of the Republic of Kazakhstan follows the Code of Conduct of the Committee on Publication Ethics (COPE), and follows the COPE Flowcharts for Resolving Cases of Suspected Misconduct (http://publicationethics.org/files/u2/New_Code.pdf). To verify originality, your article may be checked by the Cross Check originality detection service <http://www.elsevier.com/editors/plagdetect>.

The authors are obliged to participate in peer review process and be ready to provide corrections, clarifications, retractions and apologies when needed. All authors of a paper should have significantly contributed to the research.

The reviewers should provide objective judgments and should point out relevant published works which are not yet cited. Reviewed articles should be treated confidentially. The reviewers will be chosen in such a way that there is no conflict of interests with respect to the research, the authors and/or the research funders.

The editors have complete responsibility and authority to reject or accept a paper, and they will only accept a paper when reasonably certain. They will preserve anonymity of reviewers and promote publication of corrections, clarifications, retractions and apologies when needed. The acceptance of a paper automatically implies the copyright transfer to the National Academy of Sciences of the Republic of Kazakhstan.

The Editorial Board of the National Academy of Sciences of the Republic of Kazakhstan will monitor and safeguard publishing ethics.

Правила оформления статьи для публикации в журнале смотреть на сайте:

www.nauka-nanrk.kz

ISSN 2518-1629 (Online), ISSN 2224-5308 (Print)

<http://biological-medical.kz/index.php/en/>

Редактор *М. С. Ахметова, Т. М. Апендиев, Д. С. Аленов*
Верстка на компьютере *Д. Н. Калкабековой*

Подписано в печать 13.02.2019.

Формат 60x881/8. Бумага офсетная. Печать – ризограф.
6,4 п.л. Тираж 300. Заказ 1.