



The Present Ecological Condition of Successfully Introduced Mammalian Species in Azerbaijan

Sabina Bunyatova^{1*} , Gunel Meherremova²

Abstract. The distribution areas of the European rabbit, nutria, and raccoon, which are the main objects of the study, as well as their population density and ecological conditions, were determined. The research was carried out based on route and survey methods. Considering the activity patterns of the species, the studies were conducted in the spring and autumn seasons of 2025. To identify the species, their morphological characteristics, tracks, burrows, and excrements were examined. The European rabbit was studied on Gil and Khara Zira islands, nutria in the floodplains around the Kura River, the South Mughan Canal, and the Goychay Reservoir, while the raccoon was studied in several districts of the Greater Caucasus and Lankaran natural regions. During the research, it was found that these species show a high level of adaptability in Azerbaijan. Moreover, although the raccoon population remains stable, it has expanded its range. However, the lack of proper monitoring and the absence of systematic control over these species make it difficult to investigate their impacts on Azerbaijan's biodiversity, agricultural lands, farm areas, and other effects. Therefore, the conducted research indicates that it is necessary to study these species in the future both from an ecological perspective and as potentially harmful species.

Keywords: mammals, introduction, Azerbaijan, ecology, adaptation

¹ Institute of Living Systems Research, PhD in Biology, Baku, Azerbaijan

² Baku State University, Master's student, Baku, Azerbaijan

* Corresponding author. E-mail: s_bunyatova@mail.ru

Received: 3 February 2026; Accepted: 12 May 2026; Published online: 30 May 2026

© The Author(s) 2026. This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC 4.0).

Azərbaycana introduksiyası uğurlu olmuş məməli növlərin müasir ekoloji vəziyyəti

Səbinə Bünyatova^{1*} , Günel Məhərrəmov²

Xülasə. Tədqiqatın əsas obyekti olan ada dovşanı, nutriya və Amerika yenotunun yayıldığı ərazilər, onların populyasiya sıxlığı və ekoloji vəziyyətləri müəyyən edilmişdir. Tədqiqatlar marşrut və sorğu metoduna əsasən həyata keçirilmişdir. Növlərin aktivlikləri nəzərə alınaraq 2025-ci ilin yaz və payız aylarında təşkil olunmuşdur. Növləri təyin etmək üçün onların morfoloji əlamətləri, izləri, yuvaları və ekskrementlərinə nəzər yetirilmişdir. Ada dovşanı Gil və Xəbə Zira adasında, nutriya Kür çayı ətrafı axmazlar, Cənubi-Muğan kanalı, Göyçay su anbarında, Amerika yenotu isə Böyük Qafqaz və Lənkəran təbii vilayətinin bir neçə rayonunda tədqiq edilmişdir. Tədqiqatlar zamanı məlum olmuşdur ki, bu növlər Azərbaycanda yüksək adaptasiya qabiliyyəti göstərmişdir.

Hətta, Amerika yenotunun sayının stabil olmasına baxmayaraq öz arealını genişləndirmişdir. Lakin bu növlər üzərində lazımlı monitorinqlərin aparılmaması və sistemli nəzarətin yaradılmaması onların Azərbaycanın biomüxtəlifliyinə, kənd təsərrüfatına, ferma sahələrinə vurduğu ziyanın və digər təsirlərinin araşdırılmasını çətinləşdirir. Bu səbəbdən aparılan tədqiqat işləri gələcəkdə bu növlərin həm ekoloji baxımdan, həm də zərərverici növ kimi öyrənilməsinin zəruri olduğunu göstərir.

Açar sözlər: məməlilər, introduksiya, Azərbaycan, ekologiya, adaptasiya

¹ Canlı sistemlərin Tədqiqi İnstitutu, biologiya üzrə fəlsəfə doktoru, Bakı, Azərbaycan

² Bakı Dövlət Universiteti, magistrant, Bakı, Azərbaycan

* Məsul müəllif. E-poçt: s_bunyatova@mail.ru

Daxil oldu: 3 Fevral 2026; Qəbul edildi: 6 May 2026; Onlayn dərc edildi: 30 May 2026

© Müəllif(lər) 2026. Bu, Creative Commons Attribution-NonCommercial 4.0 Beynəlxalq Lisenziyası (CC BY-NC 4.0) şərtləri altında paylanan açıq girişli məqalədir.

Introduction

Between 1930 and 1970, the introduction of 10 mammal species into Azerbaijan was carried out: *Oryctolagus cuniculus* L. – European rabbit, *Myocastor coypus* M. – nutria, *Procyon lotor* L. – raccoon, *Chinchilla brevicauda* W. – short-tailed chinchilla, *Mephitis mephitis* S. – striped skunk, *Nyctereutes procyonoides* G. – raccoon dog, *Cervus nippon* T. – sika deer, *Bison bonasus* L. – European bison, *Saiga tatarica* L. – saiga antelope, and *Mustela vison* S. – American mink. These species were intended to be used for several purposes, including the enrichment of Azerbaijan's biodiversity, hunting, fur production, meeting pharmaceutical demands, and preventing the increase of pest species (Musayev et al., 2004).

Compared to other organisms, mammals tend to adapt and establish populations more easily in new territories when introduced outside their natural ranges. However, factors such as the number of released individuals, the size of the natural range of the introduced species, and the mildness of the climate in the new territory influence the success of introduction. In general, the proportion of successfully introduced species worldwide is especially high among the orders Artiodactyla (even-toed ungulates), Carnivora (carnivores), Lagomorpha (lagomorphs), and Perissodactyla (odd-toed ungulates) (Clout & Russell, 2008). In Azerbaijan, the species whose introduction proved successful were *Myocastor coypus* M. – nutria, *Procyon lotor* L. – raccoon, and *Oryctolagus cuniculus* L. – European rabbit. The European rabbit was introduced as a game animal, for fur and meat production, as well as for use as a scientific research model and a pet (Naff & Craig, 2012). Nutria was introduced as a source of meat and fur (Guichon et al., 2003), while the raccoon was introduced mainly for economic purposes related to the fur industry (Stope, 2023). However, systematic control over these species was not established, and they were not even utilized for the purposes for which they had been introduced. As a result, individuals of these species are not hunted, leading to an increase in their population numbers. Since the mentioned species possess certain pest characteristics, the growth of their populations intensifies their destructive impacts. Furthermore, because these species were introduced from outside the country, they were brought in without sufficient prior research. The risk factors associated with the diseases they may carry in Azerbaijan, their effects on the country's ecosystems and native species, and the problems they may create in agricultural and farm areas have not been thoroughly investigated. After the introduction process, issues such as the population density of these species, their current condition, whether they are expanding their ranges, and several related questions have remained uncertain. Although numerous studies on these species exist abroad, no substantial research has been conducted in Azerbaijan for more than 20 years. Therefore, the gaps mentioned above have not been comprehensively studied and still remain unanswered.

Research

Materials and methods. Since all three species are distributed across different regions of Azerbaijan, our research was mainly conducted in areas where these species are abundant. During the study of the European rabbit (*O. cuniculus* L.), we visited Khara Zira and Gil islands, which are part of the Baku-Absheron Archipelago. Considering the size of the island and the population of the European rabbit, this study was completed within one day. To identify nutria or the coypu (*M. coypus* M.), research was carried out in Mingachevir, the floodplains surrounding the Kura River, the South Mughan Canal in Bilasuvar District, and the canals connected to it. The regions of Lankaran, Lerik, and Gakh, where the raccoon (*P. lotor* L.) is most concentrated, were also visited. It should also be noted that during the study of nutria and raccoon, the floodplains around the Kura River and the Lerik region were recorded as new distribution areas for these species.

Considering the seasonal activity of the animals, the studies were conducted from the spring to the autumn of 2025, and preference was given to days considered favorable for these species. For this purpose, weather forecasts were checked before each field study. In addition, field observations were carried out after rainfall in order to make tracks more visible, since tracks can be identified more easily on muddy surfaces. Since there are no illustrated identification guides for these species in Azerbaijan, the identification guide “Mammals of Europe, North Africa and the Middle East” was used. For the identification of tracks, burrows, and excrements of the recorded species, the book “Zhizn' zhivotnykh” was used. Additional information was obtained from internet resources whenever necessary. The studied objects were identified according to the following diagnostic characteristics:

European rabbit (*O. cuniculus* L.): Body length ranges from 25–54 cm, while the ears and hind limbs are 6–7.2 cm long. The forelimbs of the European rabbit leave rounded tracks on the ground, whereas the hind limbs leave longer and larger prints. The dorsal part of the body is grayish-brown or pale yellowish, while the ventral side is white. The underside of the tail is white, whereas the upper side is blackish or the same color as the back. The tips of the ears are black and rounded. Its diet varies according to the season and mainly includes the vegetative organs of herbaceous plants, cabbage, root crops, grain crops, dry grasses, and underground parts of plants (Ahmadov et al., 2023; Sokolov, 1989; Rossolimo et al., 2004; Aulagnier et al., 2009). Even fiber-rich plants such as grasses, hay, and fibrous weeds may constitute part of their diet (Harcourt-Brown, 2003).

The excrement of this species occurs in two forms. The first type is dark brown, odorless, hard, small, and round in shape. The formation process of the second type is called coprophagy. During this process, rabbits re-ingest soft cecal excrement. This ensures the absorption of essential vitamins, improves the digestion of plant-based food (Fortanesi et al., 2021) and proteins (Irlbeck, 2001), and allows water to be reabsorbed into the body (Fortanesi et al., 2021). This type of excrement has a softer consistency. Unlike the European hare, the European rabbit digs burrows and lives in them. The burrow consists of family chambers and chambers containing offspring. Burrows have both entrances and exit. They periodically change their burrows over time (Ahmadov et al., 2023; Sokolov, 1989; Rossolimo et al., 2004; Aulagnier et al., 2009).

Nutria or coypu (*M. coypus* M.): It has a strongly arched body, short legs, and a long, rounded tail. The ears, eyes, and nostrils are located on the upper part of the head. The head and body length range from 47-57 cm, while the hind foot length is 12-15 cm. The fur consists of soft, dense underfur and long, coarse guard hairs. Its color varies from yellowish-brown to dark brown. The tail is sparsely covered with hair. The first four toes of the hind feet are connected by webbing, while the fifth toe is free and used for grooming. The forefeet possess strong claws, whereas the thumb is reduced (Woods et al., 1992). Nutria mainly feeds in water (Guichon et al., 2003), and its diet primarily consists of

aquatic plants. It may also feed on alfalfa, rice, ryegrass, and young shoots of bald cypress trees (Guichon et al., 2003). In occasional cases, it feeds on animal-origin food, mainly insects.

Its excrement is dark green or black in color and cylindrical in shape. Nutria builds its burrows in underwater areas dominated by reeds, bulrushes, and reed thickets, as well as along steep banks. The burrow may consist of a simple short tunnel or more complex systems with several tunnels and entrances located at different levels. Inside the tunnel, there are sections used for resting, feeding, protection from predators, and shelter from unfavorable weather conditions (Ahmadov et al., 2023; LeBlanc, 1994).

Raccoon (*P. lotor* L.): Raccoons have a broad head, a short and narrow snout, short legs, and small rounded ears. Their body length is close to 50 cm, the length of the forepaw is 7 cm, and the hind paw is 9 cm. Their bodies are stout, and the fur is long, soft, dark gray in color, with a dense underfur. Although the upper part of the body is covered with black spots along the spine, the underside is lighter. The area between the eyes and the cheeks has dull stripes. There is a black facial mask bordered with white on the face. The pointed snout and the areas around the eyes contain two black markings. The tail has 5-7 broad black or dark brown rings, and the tip of the tail is black. Since the paws are short and the fingers are long, the footprint resembles a human handprint. Each limb has five long and freely movable fingers.

The animal-based diet of the raccoon mainly includes frogs, crustaceans, fish, rodents, and young muskrats, while its plant-based diet consists of berries, acorns, nuts, hazelnuts, and other fruits. It also feeds on household waste. Their dens can be found in tree hollows, rock crevices, burrows dug by themselves or belonging to other animal species, and piles of brushwood (Ahmadov et al., 2023; Sokolov, 1989; Sarukhanova & Sadiqova, 2019; Aulagnier et al., 2009).

Both route and stationary research methods were used during the studies to locate the animals and determine their population numbers. Routes ranging from 100 m in width and 1–10 km in length were selected. When necessary, the routes were repeated. To study the tracks and individuals of the raccoon, routes were mainly organized along riverbeds, while for nutria, routes were established along floodplains and water canals. To estimate the population of the European rabbit, routes were organized both around burrowing sites and feeding areas. After the animals were observed along the routes, the study proceeded to the stationary research method. Accordingly, the European rabbit is active both during the day and at night, nutria is mainly active at night and during twilight, while the raccoon has a nocturnal lifestyle. Therefore, in order to study their activity patterns without disturbance, activity observations were conducted for 7–8 hours. Since nutria is widely distributed in floodplain areas, these locations were preferred as research sites. Tracks were photographed using a mobile phone, while photographs of the species themselves were taken with a camera. Finally, the survey method was also applied. Through this method, certain information about these species was obtained from employees of the reserve located within the research area, and the researchers were directed to the necessary study locations. “Google Maps” and “Google Earth” were used to determine the distribution areas of these species, while the ArcGIS program was used during the mapping process.

Results: Ecology and Current Status of Acclimatized Mammal Species: 1. European Rabbit (Oryctolagus cuniculus). At the end of the 19th century, the European rabbit was introduced to Sara Island, Boyuk Zira, Khara Zira, Chilov, Chigil, Sangi-Mughan, Los, and Gil islands (Ahmadov et al., 2023). Although the European rabbit possesses a high ecological adaptability (Lombardi et al., 2003), our research revealed that at present this species survives only on two of these islands – Khara Zira and Gil islands.

Khara Zira Island (Bulla Island) is the largest volcanic island of the Baku Archipelago, covering an area of 400 hectares (39°59'43" N, 49°38'38" E). Due to volcanic eruptions, the flat terrain remains largely barren and is surrounded by sparse shrub vegetation. The main vegetation cover belongs to the semi-desert type. Coastal areas support characteristic desert plant communities, while the island is also dominated by wormwood (*Artemisia* spp.), wormwood–halophyte communities, halophytes, ephemeral plant assemblages, and their various combinations. The island occupies a strategically important position for the oil and gas industry; therefore, anthropogenic impacts are clearly evident.

The introduction of rabbits to the islands of the Caspian Sea was carried out by sailors and lighthouse workers as a potential supplementary food source for goitered gazelles (*Gazella subgutturosa*). By the end of the 20th century, the species had become extinct on many islands; however, it was later reintroduced by local residents and fishermen (Sarukhanova et al., 2021).

During field studies conducted in May 2025 on the island, it was observed that the area is currently mainly visited by hunters and fishermen. The most abundant species recorded on the island is the European rabbit (*Oryctolagus cuniculus*). The population was estimated using the line transect method. Along a transect 20-30 m wide and 1 km long, 5-7 individuals were recorded. Considering the total area of the island and observed densities, the rabbit population is estimated to exceed 300 individuals.

On Gil Island, a similar transect-based survey indicated that more than 120 individuals inhabit the area. Individuals belonged to different age groups and showed variation in coat coloration. Unlike the brown hare (*Lepus europaeus*), the European rabbit digs burrows in sandy and soft soils, where it lives in either unlined or fur-lined nests (Sokolov, 1989). Accordingly, rabbits on the island were also observed constructing burrows in soft soil habitats.



Picture 1

Skeleton and live specimen of the European rabbit on Khara Zira Island (Photo by authors)

Nutria or Coypu (Myocastor coypus). This is one of the widely distributed species in Azerbaijan. In 1931, the first 10 pairs were released into the Gizilagach Bay. During the 1930s and 1940s, the species was also introduced into the Garasu River in Masalli District, the Ayrichay River in the Zagatala-Sheki Valley, Shilyan Lake in Shirvan, and Aghgol in the Mil Plain. Between 1931 and 1941, a total of 463 individuals were released. The species currently inhabits the rivers of nearly all lowland districts of southern Azerbaijan, including Kurdamir, Ujar, Goychay, Saatli, Sabirabad, Barda, Agdash, Salyan, Masalli, Khachmaz, and others (Musayev et al., 2004).

In order to monitor the daily activity of nutria, studies were conducted during April-May and June-July. During April-May, air temperatures ranged between 14°C and 24°C, whereas in June-July they ranged between 27°C and 33°C. To study the current ecological characteristics and population status of nutria, research was carried out in the floodplains surrounding the Kura River between Havarli and Varvara villages of Yevlakh District (40°42'55.8" N, 47°05'04.9" E, H –17 m). To investigate the species, routes were selected along the shoreline of the floodplains, and observations were conducted

along a 100 m route. Since the shore was densely covered with reeds, it was impossible to count individuals directly; therefore, individuals located approximately 100 m from the shore were counted using binoculars. Subsequently, the number of individuals per 10,000 m² or 1 hectare was determined. The population density was estimated at 3-4 individuals per hectare. However, it should be noted that individuals were not evenly distributed throughout the floodplains and were mainly concentrated in reed-covered areas that constitute their primary food source. During June-July, the daily activity of nutria in the floodplains around the Kura River was observed. In summer, nutria remained active in the water throughout the day, feeding intermittently. The species was not recorded in the Goychay Reservoir (40°41'27.0"N 47°45'20.0"E, H 149 m), which is associated with the absence of suitable habitats for its survival. During studies conducted in the South Mughan Canal within Bilasuvar District (39°28'10.0"N 48°45'33.0"E, H -24 m), nutria was recorded in sections of the canal characterized by slow-flowing water and dense reed vegetation. Observations were conducted along the shoreline using the route method. Individuals were mainly recorded near the shore. The population density was estimated at 2-3 individuals per hectare. Our studies revealed that the density of nutria is higher in floodplains and lakes (the floodplains around the Kura River, Mahmudchala Lake, and Aghgol) than in water canals such as the South Mughan Canal. In floodplains and lakes, the density reaches 3-4 individuals per hectare, whereas in irrigation canals it is 2-3 individuals per hectare. When the air temperature rises above 25-27°C, nutria remains active in the water, whereas at temperatures below 25°C, it becomes more active in coastal areas and on land.



Picture 2

Nutria (in the floodplains around the Kura River located between Havarlı and Varvara villages of Yevlakh District) (Photo by authors)

Raccoon (Procyon lotor). The raccoon's high adaptive capacity facilitates its wide distribution in new habitats (Stope, 2023). It also successfully adapts to various habitats, including urban and residential areas (Salgado, 2018). The species was first introduced into Azerbaijan in 1941 in the territory of Goytepe village of the Ismayilli District (Musayev et al., 2004). At present, it is distributed in the Zagatala-Ismayilli and Lankaran massifs. During the last 10-15 years, no scientific research has been conducted in Azerbaijan regarding the distribution and population size of this species, and currently there is no comprehensive or accurate literature data concerning its population status. Taking these circumstances into account, studies were conducted in several districts of the Greater Caucasus and Lankaran natural regions. During both route and stationary research, live individuals of the species, as well as their tracks and excrements, were identified. In both natural regions, the population density was estimated at 0,5-1 individuals 2-3 hectare. In densely forested areas, the species was mainly detected along river valleys. In addition, the raccoon was recorded for the first time in Tabrizli village of Lerik District (38°46'52.4"N 48°33'01.7"E), which belongs to the Lankaran natural region. Currently, the raccoon is widely distributed and possesses a high population density in the Greater Caucasus and Lankaran natural regions.



Picture 3

Raccoon observed in the territory of Lerik District (Photo by authors)



Picture 4

The current distribution areas of the raccoon and nutria in Azerbaijan (Photo by authors; prepared using ArcGIS)

Acknowledgement. We express our sincere gratitude to PhD in Biology Nijat Hasanov for his valuable guidance regarding the assignment and for his assistance and support in providing additional information during the course of this study.

Conclusion

As a result of the conducted research, it was found that the European rabbit (*Oryctolagus cuniculus*), nutria (*Myocastor coypus*), and raccoon (*Procyon lotor*) have shown a high level of adaptation in different regions of Azerbaijan. Accordingly, it was determined that the European rabbit currently persists only on Gil and Khara Zira islands, while nutria is distributed across floodplains throughout Azerbaijan, especially in the floodplains of the Kura River, water canals, and areas with bays and wetlands. The raccoon has been recorded in the Greater Caucasus and Lankaran natural regions. The raccoon was first recorded in southeastern Azerbaijan in Tabrizli village of Lerik District. Since these species have not been used for the purposes for which they were introduced, their populations previously increased significantly, and their negative impacts became more pronounced. However, at present, the harmful effects of these species have relatively decreased. Nevertheless, since they may act as carriers and vectors of diseases, these species should be kept under control in the future, and appropriate monitoring and control measures should be implemented. In the areas where these species are distributed, systematic plans should be developed every few years to assess their ecological status and population density, and regular population monitoring should be conducted.

References

1. Ahmadov, E., Alakbarov, I., Guliyev, Q., Aliyev, A., Iskandarov, T., Aliyeva, S., Ahmadov, B., Bunyatova, S., Sultanov, E., & Asgerov, E. (2023). *Information system of the fauna of Azerbaijan (vertebrates)*. “Tərəqqi” MMC.
2. Aulagnier, S., Haffner, P., Mitchell-Jones, A.J., Moutou, F., & Zima, J. (2009). *Mammals of Europe, North Africa and the Middle East*. A&C Black Publishers Limited.
3. Clout, M.N., & Russell, J.C. (2008). The invasion ecology of mammals: A global perspective. *Wildlife Research*, 35(3), 180–184. <https://doi.org/10.1071/WR07091>
4. Fontanesi, L., Utzeri, V.J., & Ribani, A. (2021). The evolution, domestication and world distribution of the European rabbit (*Oryctolagus cuniculus*). *The genetics and genomics of the rabbit* (pp. 1–22). CAB International. Doi:10.1079/9781780643342.0001.
5. Guichón, M.L., Benítez, V.B., Abba, A., Borgnia, M., & Cassini, M.H. (2003). Foraging behaviour of coypus, *Myocastor coypus*: Why do coypus consume aquatic plants? *Acta Oecologica*, 24(5–6), 241–246. <https://doi.org/10.1010/j.actao.2003.08.001>
6. Guichón, M.L., Doncaster, C.P., & Cassini, M.H. (2003). Population structure of coypus (*Myocastor coypus*) in their region of origin and comparison with introduced populations. *Biological Invasions*, 5, 283–299. <https://doi.org/10.1023/B:BINV.0000005578.34969.50>
7. Harcourt-Brown, F. (2003). Rabbit gastrointestinal physiology. *Veterinary Clinics of North America: Exotic Animal Practice*, 6(1), 139–153. [https://doi.org/10.1016/S1094-9194\(02\)00024-5](https://doi.org/10.1016/S1094-9194(02)00024-5)
8. Irlbeck, N. A. (2001). How to feed the rabbit gastrointestinal tract. *Journal of Animal Science*, 79, E343–E346. <https://doi.org/10.2527/jas2001.79E-SupplE343x>
9. LeBlanc, D. J. (1994). *The handbook: Prevention and control of wildlife damage* (16th ed.).
10. Lombardi, L., Fernández, N., Moreno, S., & Villafuerte, R. (2003). Habitat-related differences in rabbit (*Oryctolagus cuniculus*) abundance, distribution, and activity. *Journal of Mammalogy*, 84(1), 26–36. [https://doi.org/10.1644/1545-1542\(2003\)084<0026:HRDIRO>2.0.CO;2](https://doi.org/10.1644/1545-1542(2003)084<0026:HRDIRO>2.0.CO;2)
11. Musayev, M. O., Əliyev, S. V., Qasimov, Ə. H., Mikayılov, T. K., & Yolçiyev, Y. Y. (2004). *Azərbaycan heyvanlar aləmi. III cild: Onurğalılar*. Elm.
12. Naff, K. A., & Craig, S. (2012). *The domestic rabbit, Oryctolagus cuniculus: Origins and history*. In J. A. Suckow, K. A. Stevens, & R. P. Wilson (Eds.), *The laboratory rabbit, guinea pig, hamster, and other rodents* (pp. 157–163). Elsevier. <https://doi.org/10.1016/B978-0-12-380920-9.00006-7>
13. Rossolimo, O.L., Pavlinov, I.Ya., Kruskop, S.V., Lisovskiy, A.A., Spasskaya, N.N., Borisenko, A.V., & Panyutina, A.A. (2004). *Raznoobrazie mlekopitayushchikh* (ch. II). Izdatelstvo KMK.
14. Salgado, I. (2018). Is the raccoon (*Procyon lotor*) out of control in Europe? *Biodiversity and Conservation*, 27, 2243–2256. <https://doi.org/10.1007/s10531-018-1535-9>
15. Sarukhanova, S., & Sadiqova, N. (2019). *Heyvan izləri: Məməli heyvanlar üçün çöl bələdçisi* (Animal tracks: A field guide for mammals). GİZ Azərbaycan.
16. Sarukhanova, S., Askerov, E., Tagieva, Y., & Hasanov, N., 2021. History and future prospects of gazelle (*Gazella subgutturosa* Guld, 1780) population on the island of Khara Zira. *Khazar Journal of Science and Technology*, 5(1), 54–60. <https://doi.org/10.5782/2520-6133.2021.5.1.54>
17. Sokolov, V.E. (Ed.). (1989). *Zhizn' zhivotnykh. T.7. Mlekopitayushchiye* (2nd ed., revised). Prosveshcheniye.
18. Stope, M.B. (2023). The raccoon (*Procyon lotor*) as a neozoon in Europe. *Animals*, 13(2), 273. <https://doi.org/10.3390/ani13020273>
19. Woods, C.A., Contreras, L., Willner-Chapman, G., & Whidden, H.P. (1992). *Myocastor coypus*. *Mammalian Species*, 398, 1–8.