

BİOLOGİYA VƏ TİBB ELMLƏRİ

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LEOPARD - *PANTHERA PARDUS* L., 1758
IN NAKHCHIVAN AUTONOMOUS REPUBLIC

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The article provides information on the biology of the leopard - Panthera pardus L., which is under international protection in the Nakhchivan Autonomous Republic. A study sponsored by the World Wildlife Fund (WWF) found a stable leopard population in the area. Every year, a new leopard population is discovered with the help of camera traps. The leopard and its main food source, bezoar goat and mouflon, are strictly protected in nature reserves, national parks and wildlife sanctuaries, which occupy 27% of the total area.

Keywords: Felidae, WWF, leopard, cats, camera trap, security

Nakhchivan Autonomous Republic, an inseparable part of Azerbaijan Republic, has a total area of 5502,75 km², or 6.35% of the territory of Azerbaijan. Its climate is extremely continental and split at 5 patterns with respective 4 landscape types. Only here across the country we can observe the absolute maximum (+44⁰C) and absolute minimum (-32⁰C) temperatures. The soil mantle is diverse and includes 15 types.

Known for its exceptional position in the Caucasus ecoregion and specific soil and climate peculiarities, Autonomous Republic of Nakhchivan is also distinct with its rich biodiversity. Recent studies showed distribution of rare plant and animal species in Nakhchivan. Fauna studies over the last few years in Azerbaijan Republic revealed 728 vertebrate species found in the country. Nakhchivan-related studies resulted in sighting 403 vertebrate species across the Autonomous Republic (55.4% of the country's total) (6,10). 33 fish species out of 110 affected the country, 7 amphibian species out of 11 inhabiting Azerbaijan, 39 reptilian species out of 63 occurred in Azerbaijan, 254 bird species out of the country's 429 and 70 mammal species out of 114 distributed in Azerbaijan were found in Autonomous Republic of Nakhchivan (See Table 1). Of above-stated species, 71 are listed in the Red Book of Autonomous Republic of Nakhchivan and 142 in the Red Book of Azerbaijan Republic (1,2,7). As for invertebrates, they

play a crucial role in biodiversity of Autonomous Republic and represented by 5 kingdoms, 18 phyla, 45 classes, 126 orders, 607 families, 2,030 genera and 4,598 species. Many of them are relict, endemic and threatened species (5). The same pattern may be applied to plant life, e.g. it is believed some 5,000 higher sporophyte, gymnosperm and metaspERM species grow in Azerbaijan Republic, while the number of plant species in Autonomous Republic of Nakhchivan exceeds 3,021 and grouped in 176 families and 908 genera (60.4% of the country's total) (8). Despite of tiny territory, the Republic has rich biodiversity, which is undoubtedly related to its history of formation.

As it is clearly seen from the Table, amphibians are the most endangered class (54.5%), followed by mammals (36.8%), reptiles (22.2%), birds (16.6%) and fish species (8.2%). It is of common knowledge that large and easily sighted animals disliked by public are stronger affected by anthropogenous factor. The Table from the second edition of the Red Book of Azerbaijan Republic (2013) clearly indicates sharp increase in number of threatened species, in particular when it comes to more than half of amphibians and up to 37% of mammals that listed as specially protected species. Most recently, substantial activities focused on environmental conservation in the Autonomous Republic led to notable rise in aforementioned protected species populations.

As an outcome of substantial natural conservation measures in the autonomous republic, the status of threatened flora and fauna species improved; visible positive changes were also observed in population dynamics and structure. The Autonomous Republic hosts specially protected nature areas - Zangezur National Park named after academician Hasan Aliyev, Ordubad, Arazboyu and Arpachay state nature sanctuaries with total area of 148.695,58 hectares, or 27.02% of the territory of the Autonomous Republic of Nakhchivan.

Felidae family is traditionally divided into five subfamilies: *Pantherinae*, *Felinae*, *Acinonychinae* and extinct *Machairodontinae* and *Proailurinae*. Extinct cats fall into eight evolutionary lineages and 41 species. Nuclear DNA genotyping of studied species showed cross-species hybridization occurred in the course of evolution within the majority of eight clades. Fur patterns modelling revealed that virtually all patterns originated from small spots.

41 species fall under *Felinae* (Cats) family of carnivores and affect the entire Globe but Australia and some small insular territories. This family includes 4 genera: large cats, snow leopards, cats and cheetahs. Cats genus is composed of 30 species occurring in Eurasia, Africa and Americas, of them, 6 species inhabit Caucasus. Most of above-stated six species are listed in the Red Books of Azerbaijan and the Autonomous Republic of Nakhchivan, some of them even have international conservation status and that makes us really proud for indispensable natural wealth of our country. Studies on the current status of the species above, their habitats and conservation strategies are of para-

mount necessity. These species are as follows:

Familia: *Felidae* Fischer de Waldheim, 1817 - Cats

1. Subfamilia: *Felinae* Fischer de Waldheim, 1817

1. Genus: *Felis* Linnaeus, 1758 - Cat

1. *Felis chaus* Guldenstaedt, 1776 - Jungle cat

2. *F. libyca* Forster, 1817 - African wildcat

3. *F. silvestris* Schreber, 1777 - European wildcat

2. Genus: *Otocolobus* Brandt, 1841

4. *Otocolobus manul* Pallas, 1776 - Pallas's cat or Manul

3. Genus: *Lynx* Linnaeus, 1758 - Lynx

5. *Lynx lynx* Linnaeus, 1758 - Lynx

2. Subfamilia: *Pantherinae* Pocock, 1917

4. Genus: *Panthera* Pocock, 1917 - Leopard

6. *Panthera pardus* Linnaeus, 1758 - Leopard

Historically, almost all genera used to affect Azerbaijan, however, only two genera managed to survive till present (large cats and cats). Caspian tigers were believed to be a subspecies of Tigers genera yet 2009 mitochondrial DNA analysis revealed they were very close to Siberian tigers. Caspian tigers used to occur near western boundaries of Siberian tiger habitats. Caspian tigers were reported extinct in 70th of XX century in Turkey, Iran, Iraq, Kazakhstan, Uzbekistan, Tajikistan, Turkmenistan, Afghanistan and Mongolia. The last individuals of Caspian tiger- *Panthera tigris virgata* Illiger, 1815, representatives of large cats, were killed in Azerbaijan Republic in 1928-1932 (Photo 1). and in South Azerbaijan in 1953 (Photo 2) respectively. Caspian tigers went thereby extinct.



Photo 1. The museum specimens of the last Caspian tiger killed in Azerbaijan in 1928-1932



Photo 2. The last Caspian tiger individual killed in South Azerbaijan in 1953

Persian or Caucasian leopard is the largest subspecies of leopard and its distribution area covers Azerbaijan, Iran, Irak, Turkey, Russia, Afghanistan, Pakistan, Turkmenistan and some other areas. Globally, population of Persian leopard roughly accounts for 1,000 individuals (between 870 and 1,300) and the biggest population is supposed to be found in Iran (from 550 to 850 individuals). Once leopard widely occurred in thick forests and rocky landscapes of Azerbaijan as a carnivore, but nowadays its population declined dramatically. The taxonomy of the Persian leopard was disputed during the XX century. Some time it was believed, that two subspecies inhabit the Caucasus region: *P. p. ciscaucasicus* Satunin and *P. p. tullianus* Valenciennes. However, Heptner, V.G. (3) noted that only *P. p. Ciscaucasicus* subspecies occurs in the Caucasus. By the end of XX century researchers believed that leopard does not inhabit the Greater Caucasus any more. According to references, few individuals had survived in the Autonomous Republic of Nakhchivan and they all were hunted in 80th of XX century (3).

During the period 2003-2007, by the team of T.H. Talibov, E.K. Askarov, V.S. Lukarevsky and B.Avgan several fieldworks were organised and according to the signs of leopard presence, by questioning local population, borderguards etc on Nakhchivan the local population was estimated as 3-5 individuals. These few individuals inhabited large areas ranging from Ardıjdag mountain in Sharur district till Soyugdag mountain in Ordubadç especially in Kotam valley and Kechi Aghili hillsides close to Gamigaya-Gapıjig and Ayırchay river estuary within Zangezur National Park. The habitats of leopard in Nakhchivan autonomy repeats almost habitats of the Bezoar goat (*Capra aegagrus*) and partly Moufflon (*Ovis orientalis*).

The surveys revealed no serious conflict in human-leopard interaction in the Republic. There are few cases of leopard attack on human during the XX century, in 70th the leopard jumped on a resident of Nasırvaz village hunter Bashir when crossing the rocky slopes of Gapıjig mountain on Zangezur range. Fortunately, they rolled down the rock and then the leopard run away. The hunter had a hand injury but managed to survive. A leopard was hunted near a cave in Ballıgaya area of Ardıjdag mountain by a hunter residing in Danyeri (Danzik)

village located on the bank of Arpachay river in Sharur district. A local shepard of the village of Nus-nus of Ordubad district stated a leopard attacked a flock of sheep in Gaplangaya neighborhood of Sari ravines on the bank of Ordubadchay river early in the morning, caught and suffocated a sheep and then escaped leaving the prey on the river bank. Besides these recorded encounters, no other human-leopard interaction cases were ever been reported though local residents normally ascend to the mountains to collect wild herbs and medicinal plants to meet their needs in early spring. Also, shepherds at summer pastures, who settle in highland farms for 5 to 6 months annually reported they accidentally spotted leopards or even heard their roaring but never interacted with them closely. In our opinion, this happened due to sufficient prey availability in the area. Moreover, shepards, hunters and local residents in Talysh Mountains confirmed sighting leopards in woodlands, but very rarely.

For recent decades there were no reliable scientific references on leopards in Azerbaijan, but starting from 2006, Institute of Bioresources of Nakhchivan Division of ANAS initiated fundamental studies on the issue above with support of World Wildlife Fund (WWF). The first field investigations were lead by the well-known leopard specialist V. Lukarevsky. The other experts P.I. Veyenberg and Y.A. Yarevenko helped in studying Bezoar goat and moufflon populations, key prey species of leopard. As a kick-off activity that resulted in design of relevant conservation strategies reported to the Ministry of Ecology and Natural Resources of Autonomous Republic of Nakhchivan. Starting from 2007 WWF supported the Institute team by camera traps. As a result of studies, the camera trap installed in the neighborhood of Kilit village of Ordubad district took the first ever photo of a female leopard in September 2012. A respective article was published in 57th edition of CAT NEWS newsletter in 2012 (12). Next year 2 more male leopards were captured by photo traps and in 2014 a leopard couple was trapped together in mating period. The first reproduction case was documented in 2015 when the female Eve was captured with 3 cubs.

According to the scientific literature, herbivore mammals (Bezoar goat, Moufflon, Roe deer, Wild boar, Red deer, etc.) are deemed to be the

key prey base for Persian leopard. As for porcupine, hare, snowcock, pheasant, quail, etc., they play the secondary role in feeding of leopard. The populations of Bezoar goat and Mouflon in the autonomous republic increased after hunting ban introduced in 2001. The number of goats was estimated as 1800-2000, and mouflons - about 400-450.

Leopard was announced as a protected species in Azerbaijan from 1967. And in 1989 it was included into the first edition of the Red book of Azerbaijan. Leopard habitats are protected within all 4 PAs in Nakhchivan. The overall size of PAs in Azerbaijan was doubled during the last decades.

In 2009 the first Action Plan for Conservation of the Leopard was developed in Azerbaijan and approved by the government. Besides to governmental organisations, non government and scientific sector is also interested in conserving of this endangered species. Ms. Leyla Aliyeva, Vice President of Heydar Aliyev Foundation launched international environmental campaign IDEA [*The initiative international dialogue for environment protection*] on 12 July 2011 aimed at endangered local Big Five (bear, wolf, gazelle, eagle and leopard) conservation and the activities she implemented produced big effect.

Besides all above-stated achievements, the war outbroken against Azerbaijan strongly affected nature conservation area among many others. Position of armament and technical equipment in the Autonomous Republic of Nakhchivan from Sadarak to Daralayaz and Zangezur ranges as well as pavement of new important roads kept animals away from the territory. Therefore, leopards once occurred in Ardijdag mountain had to resettle in new and safe areas. As for Shahbuz and Babak districts, if there are no occasional trails for leopard passing there, there is no chance of sustainable leopard populations survival as the neighborhoods are densely populated and strongly affected by anthropogenous factor. Ordubad and Julfa districts are the other way round less subject to anthropogenous impact, so there are good chances for availability of sustainable leopard populations there.

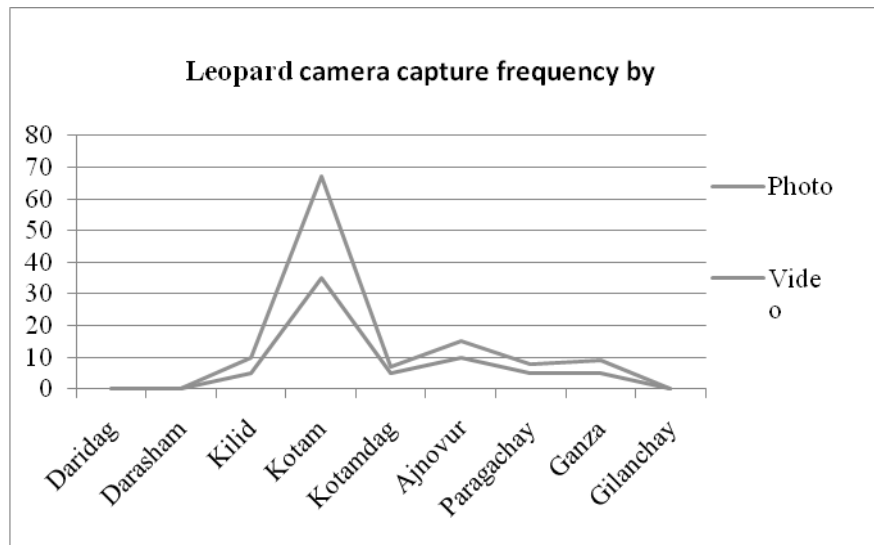
For 08-11 October 2014, Caucasian Ecoregion of World Wildlife Fund (WWF) and International Union for Conservation of Nature (IUCN) held a broad workshop "Cats in the Caucasus" in Tbilisi.

IUCN experts dealing with endangered cats conservation closely participated and contributed to design of National Action Plan on Leopard Protection in Caucasian ecoregion. The Ministry of Environment and Natural Resources of Azerbaijan approved the National Action Plan on Leopard Protection in Azerbaijan as an outcome of the above-mentioned cooperation. The Plan designed specified activities in two mainstream areas: enhancement of leopard conservation in leopard habitats in specially protected nature reservations and country monitoring of leopard populations. It is worth stating, large landscape areas (wildlife corridors) are supposed to get allocated in the country for gene exchange between isolated leopard populations.

The relevant research activities were implemented in Zangezur National Park of the Autonomous Republic of Nakhchivan (11 camera traps were installed in Soyugdag-Ajnovur area, 10 in the vicinity of Ganza village, 8 close to Gilanchay, 7 near Paragachay, 11 in Mamadeyin neighborhood of Kotam village and 15 cameras near the village of Kilid) and in Babak and Julfa districts (3 camera traps in Darasham-I, 3 in Darasham-II and 5 cameras in Daridag). Of the camera traps installed across Zangezur National Park, 51 devices were Bushnell, 16-Cuddle Back and 1-Panthera, that's 68 camera traps totally. 5 Bushnell, 4 Panthera and 2 Cuddle Back type cameras (totally 11) were installed in Babak and Julfa districts. Totally, 79 camera traps were installed in 10 sites of the Autonomous Republic of Nakhchivan.

Leopard conservation activities started in Azerbaijan with passing a law banning hunt on leopards in 1967. Red Books of the former USSR (1984), Azerbaijan (1989, 2013) and the Autonomous Republic of Nakhchivan (2006), the inseparable part of Azerbaijan listed leopard as endangered species and banned hunt on leopards without indication of any subspecies. Leopard biology is not well studied, however, according to scientific references, cats mate in January in the Caucasus and cubs are born in April or May 2 to 3 cubs are usually born in one litter.

For recent years, photos and videos taken by camera traps across the Autonomous Republic have been analyzed and posted in respective materials.



Camera traps-taken photos and videos analysis showed leopards walked in pairs for 08 January-20 February, mating occurred in Ordubad district for 12 March-06 April and cubs walking with the mother leopard were spotted for 15 October-18 November. Due to climatic factors leopard mating in the Autonomous Republic of Nakhchivan falls on early spring and cubs freely walking with their mother can be sighted in early fall.

REFERENCES

1. Azərbaycan SSR-in Qırmızı Kitabı. Nadir və nəsli kəsilmək təhlükəsi olan heyvan və bitki növləri. Bakı: İşıq nəşriyyatı, 1989, 544 s.
2. Azərbaycan Respublikasının Qırmızı Kitabı. İkinci nəşr. Nadir və nəsli kəsilməkdə olan heyvan növləri. Bakı: "Şərq-Qərb" nəşriyyatı, 2013, 680 s.
3. Azərbaycan Respublikasının heyvanlar aləmi. Onurğalılar. III cild. Bakı: Elm, 2004, 619 s.
4. Əsgərov E.K., Talibov T.H., Zəzənaşvili N.İ., Fətullayev P.Ü., Məmmədov İ.B. Zəngəzur dağ silsiləsi regionunda bəbirin (*Panthera pardus saxicolor*, Pocock, 1927) mühafizəsi üçün vacib olan landşaftdır. AMEA Zoologiya İnstitutunun Əsərləri, 2015, cild 33, №1, s.26-31
5. Naxçıvan Muxtar Respublikasının onurğasızlar faunasının taksonomik spektri. Tərtib edənlər: A.Bayramov, M.Məhərrəmov, İ.Məmmədov. Ön söz və elmi redaktor T.H. Talibov. Naxçıvan: Əcəmi, 2014, 318 s.
6. Talibov T.H. Naxçıvan Muxtar Respublikasında nadir heyvan növləri və onların genofondunun qorunması. Bakı: Elm, 1999, 102 s.
7. Talibov T.H. Naxçıvan Muxtar Respublikasının Qırmızı Kitabı. Onurğalılar üzrə. I c. Naxçıvan: Əcəmi, 2006, 211 s.
8. Talibov T.H., İbrahimov Ə.Ş. Naxçıvan Muxtar Respublikası florasının taksonomik spektri. Naxçıvan: Əcəmi, 2008, 364 s.
9. Talibov T.H., Veynberg P.İ., Məmmədov İ.B., Məmmədov E.N., Talibov S.T. Azərbaycanda Asiya muflonu və bezoar keçisinin qorunma strategiyası. Стратегия сохранения Азиатского муфлона и безоарового козла в Азербайджане (Xülasə ingilis dilində). Naxçıvan: Əcəmi, 2007, 72 s.
10. Talibov T.H., Məmmədov A.F. Naxçıvan Muxtar Respublikasının onurğalılar faunasının taksonomik spektri. Bakı: "Müəllim" nəşriyyatı, 2016, 76 s.
11. Talibov T.H., Weinberg P.İ., Məmmədov İ.B., Məmmədov E.N., Talibov S.T. Conservation Strategy of the Asiatic Mouflon (*Ovis [orientalis] gmelini* Blyth) and the Bezoar Goat (*Capra aegagrus* Erxleben) in Azerbaijan. Status and protection of globally threatened species in the Caucasus. CEPF Biodiversity Investments in the Caucasus Hotspot 2004-2009. Tbilisi: CEPF, WWF. Contour Ltd., 2009, 232 pp. (p. 46-52)
12. Batur Avqan, Təriyel Talibov, Abbas İsmayilov, Parviz Fətullayev, Elshad Askerov, Urs Breitenmoser. First hard evidence of leopard in Nakhchivan. IUCN SSC, CAT NEWS, № 57, I AUTUMN, 2012, CAT SPECIALIST GROUP, p.33
13. Elshad Askerov, Təriyel Talibov, Karen Manvelyan, Nugzar Zazanashvili, Alexander Malkhasyan, Parviz Fətullayev & Aurel Heidelberg. South-Eastern Lesser Caucasus: the most important landscape for conserving the Leopard (*Panthera pardus*) in the Caucasus region (*Mammalia: Felidae*). Zoology in the Middle East, 2015, v.61, No 2, 95-101, <http://dx.doi.org/10.1080/09397140.2015.1035003> Cross Mark status information for this content will be available soon. Published online: 08 Apr 2015
14. Elshad Askerov, Təriyel Talibov, Karen Manvelyan, Nugzar Zazanashvili, Parviz Fətullayev, Alexander Malkhasyan. Leopard (*Panthera pardus*) reoccupying its historic range in the South Caucasus: a first evidence (*Mammalia: Felidae*). Zoology in the Middle East, Received 23 Jul 2018, Accepted 08 Nov 2018, Published online: 11 Dec 2018
15. McKenna, M.C.; Bell, S.K. (2000). "Family Felidae Fischer de Waldheim, 1817:372. Cats". Classification of *Mammals*. Columbia University Press. p. 230. ISBN 978-0-231-11013-6

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NAXÇIVAN MUXTAR RESPUBLİKASINDA BƏBİR - *PANTHERA PARDUS* L., 1758

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Məqalədə, Naxçıvan Muxtar Respublikası ərazisində beynəlxalq mühafizə altında olan bəbirin - *Panthera pardus* L. biologiyası haqqında məlumat verilir. Ümumdünya Təbiəti Mühafizə Fondunun (WWF) dəstəklədiyi tədqiqatlarla ərazidə sabit bəbir populyasiyasının olduğu müəyyənləşdirildi. Hər il fototələlərin köməkliyi ilə yeni bəbir ailəsi aşkar edilir. Bəbir və onun əsas qida mənbəyi olan bezoar keçisi və muflon, ümumi ərazinin 27% -ni tutan qoruq, milli park və yasaqlılarda ciddi mühafizə olunur.

Açar sözlər: Felidae, WWF, bəbir, pişikimilər, fototələ, mühafizə

ЛЕОПАРД - PANTHERA PARDUS L., 1758 В НАХЧЫВАНСКОЙ АВТОНОМНОЙ РЕСПУБЛИКЕ

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В статье представлена информация о биологии леопарда - *Panthera pardus* L., находящегося под международной защитой в Нахчыванской Автономной Республике. Исследование, проведенное при поддержке Всемирного фонда дикой природы (WWF), выявило стабильную популяцию леопарда в этом районе. Каждый год с помощью фотоловушек открывается новое пополнение леопардов. Леопард, а также безоаровый козел и муфлон, являющиеся основным источником пищи для него, находятся под строгой охраной в заповедниках, национальных парках и заказниках, которые занимают 27% общей площади.

Ключевые слова: *Felidae*, WWF, леопард, кошки, фотоловушка, охрана