
BIODIVERSITY OF CAUCASIAN DESERTS AND SEMI-DESERTS

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Annotation:

From the geological point of view, the deserts and semi-deserts of the Caucasus are represented in the territory freed from the waters of the Caspian Sea several tens of thousands of years ago. In Transcaucasia, the biome of deserts and semi-deserts occupies a vast area of the Mtkvar-Arax depression. In the west, in the form of a semi-desert, it extends to the meridian of Tbilisi (it ends at Rustavi). Within the limits of Eastern Georgia, we find only semi-deserts with separate fragments of salted (loamy soil) deserts. In addition to floristic elements, the transition of deserts to semi-deserts in the territory of Eastern Georgia is clearly evidenced by the impoverishment of Psilodea hyperxerophilous taxa (Gegechkor, 2008). A detailed faunal survey of the arid regions of the Caucasus fully confirmed the presence of the Mtkvar Arax depression and in the Middle of the river Araxis the diversity of desert taxons characteristic of Iran-Turanian deserts.

According to the forecast, an increase in temperature and a decrease in precipitation are expected in arid and semi-arid regions. This will have severe negative impacts on ecosystems, especially those at the edge of their global natural distribution. As a result, significant changes will occur in the distribution of these ecosystems, plant communities, and species of flora and fauna. Climate change is the most important ecological and socio-economic problem of modern times. It is already recognized - along with habitat degradation, resource overexploitation, environmental pollution, and invasive species - as the fifth factor of biodiversity loss (6).

Keywords: Caucasus, deserts, semi-deserts, biodiversity

Research results: desertification is not only an ecological problem, but also a climatic problem. If this process becomes irreversible, the ecological balance of the Caucasus will be threatened. The strengthening of desertification processes can be clearly observed, which may become irreversible due to the influence of modern global warming on the climate, and we think that this problem is particularly noteworthy and worrying. Therefore, the study and protection of the biodiversity of the deserts and semi-deserts of the Caucasus is an actual problem today. It is necessary to determine the main causes of desertification, and their contributing factors, and to develop practical measures necessary to combat desertification (5). Our study presents the features of the deserts and semi-deserts of the Caucasus, the diversity of plants and animals, and the features of their distribution.

Deserts and semi-deserts represented by mugwort dominance are widespread both in the eastern regions of the North Caucasus and in the eastern and southern regions of the Caucasus. Mugwort grows on weakly saline gray moor, sometimes stony-gravel soils. In the North Caucasus, the proper phylogenesis consists of several species of mugwort. In Transcaucasia, mugworts are mainly made of aromatic mugwort. Holy mugworts are often replaced by mugwort - *Nitrosalsola dendroides* deserts. Eastern Georgia is characterized by *Limonium* semi-deserts, where the leading place is occupied by *Limonium*.

The driest habitats close to deserts in Georgia are known on the Ivri plateau. On the Eldari Plain, Gareji hills, etc. The amount of precipitation here is 250-300 mm. Due to the lack of moisture, the surface of the valley is bare and cracked, and on the top of Gareji, the rocks are worn out by mountain and wind erosion and colorful by the sun.

In the flat areas, semi-deserts of *Nitrosalsola dendroides*, *Nitrosalsola ericoides* and mugworts are spread. Dry steppe elements (*Stipa* species), thorns (*Rhamnus pallasii* Fisch, *paliurus*), as well as Georgian almond, barberries, and Gareji salvia, have serious competition with salinated soil and mugwort on plateau and hills. In the Meskheti basin, on the right bank of the Mtkvari River, on a well-defined loamy substrate, we find plants characteristic of Asian deserts and mountain xerophytes.

The biome is characterized by rare geophytes: tulips, Georgian iris, etc. which are included in the Red Books of Transcaucasian countries. 532 species of flowering plants are recorded in mugwort formations. Brackish-loamy deserts occupy a large area in the Caspian and Mtkvar-Araks plains. developed in the form of more diverse variations than the mugworts. The reason is that various halophytes play the role of edifiers in deserts. Most grow in conditions of excessive soil salinity. Along with the change from overly saline soils to less saline soils. A. Grossheim (1948) lists the following types of suitable biotopes:

➤ (*Halocnemum strobilaceum*) - a low shrub with the ability to form mounds on the soil. We find a landscape consisting of *Halocnemum strobilaceum* in the "steppe" of the Mughan forest.

➤ A small bush - (*Kalidium caspicum*) is common in deserts containing potash soil. Like the *Halocnemum strobilaceum*, it also forms a hilly desert; It is widespread in the East of the North Caucasus and Eastern Transcaucasia.

➤ Deserts formed by *Halostachys caspica* - occupy entire areas in Azerbaijan. It does not produce mounds.

➤ Deserts consisting of *Sueda* (*Sueda microphylla*) bushes - are widely distributed in Eastern Transcaucasia. In the marshy plains and foothills of the South-Eastern Caucasus, it is replaced by a vicarious species of *S. Dendroides*. Deserts formed by *Salsola ericoides* are famous in the lowlands but *S. nodulosa* grow in Transcaucasia.

Potash-rich deserts and semi-deserts consisting of *S. dendroides* are the most common on the slopes of the mountains. The latter is found on less saline soils. It often creates coenoses with mugworts, as well as with *Alhagi* (*Alhagi pseudoalhagi*) and licorice (*Glycyrrhiza glabra*). *Nitraria schoberi* often dominates the brackish soil. One-year halophytes are dominated by *Petrosimonia brachiata* and its related species.

Sand deserts and semi-deserts are characteristic of the Caucasus regions (Azerbaijan, North Caucasus - Terg-Dagestan section). Similar biotopes can also be found in the "steppes" of Milli and Mughan of Azerbaijan. The river Arax Valley is famous for the so-called Sands of Gorovani (Southern Armenia). Depending on the sand substrate, the composition and structure of the vegetation cover change. In the Caucasus, we find different sand dunes, ranging from rolling barchans (Caspian coastal areas) to desert steppes with developed soils. Each edaphic type will have its own dominant vegetation (we can also find barchans devoid of vegetation). According to L. Prilipko and S. Agajanov, typical associations for sandy deserts in the Caspian Sea are the endemic species of *Calligonum* (*Calligonum aphyllum*, *C. petunnikowii*, *C. bakuense*), in the sands of Gorovani in the Arax valley another species of the same plant (*C. polygonoides*).

Coastal - psamphytic-littoral flora consists of up to 600 species of plants, among which the vast majority are annual and perennial grasses (92%), and the remaining 8% are shrubs, semi-shrubs, and trees. A very characteristic cenosis is created by the Persian *Convolvulus* (*Convolvulus persicus*). It grows on shifting sands and dunes. *Artemisia scoparia* is also found on the sands. Among other plants, psamphytic *Astragalus* (*Astragalus karakugensis*), semi-parasitic - *Cistanche flava*, some grains - *ephemeris* are characteristic.

Hamada is a very peculiar type of desert. In the Caucasus, it is spread only in the South Transcaucasia, in the valley of the Arax River. We find desert cenoses of the Hamad type mainly in the Eastern Mediterranean (Palestine) and Pre-Asia. Plant groups often different from the above-mentioned cenoses are present on gypsum-containing soils. *Achillea tenuifolia* is among them, *Jaubertia szovitsii*, *Leontice armeniaca*, *Aristida plumosa* are typical in Julfi areas. Small bushes of *Salsola* (*S. cana*, *S. glauca*) and others are common from the salinity. In the Arax river valley, on a small area, Hamada is characterized by brackish and sandy

biotopes with the participation of corresponding halophytes and psamophytes. In the floodplain forests of the river Arax and its tributaries, together with willows, *Elaeagnus*, and *Tamarix*, the desert (Euphrates) poplar - *Populus (Turanga) euphratica* is a typical tree.

The diversity of animals in deserts and semi-deserts is specific. We often find biotope-specialized animals, halophytes, petrophiles, etc. (Arn. Gegechkori, 1997). Scorpions, phalanges, weaver spiders and soil forms, poisonous mites - Karakurt, insects - locusts, beetles, and others are characteristic of invertebrate animals. We meet green toad (*Bufo viridis*), from reptiles - Caspian gecko (*Gymnodactylus caspius*), Caucasian lizard (*Agama caucasica*), Persian roundhead (*Phrynocephalus helioscopus persicus*), various lizards (striped, medium and others). Among the snakes, the field rattlesnake (*Eryx jaculus*), various swimmers, from the vipers - the viper (*Vipera lebetina*), the horned viper (*V. Ammodytes*) is relatively rare; from turtles - Greek turtle (*Testudo greaca*), Caspian turtle (*Clemmys caspica*); Among the birds, the *Tetrax tetrax (Otis tetrax orientalis)*, the *Otis tarda (O. tarda tarda)*; From the predators - Falcon (*Falco colimbarius*), bald eagle (*Aquila heliasa*), field eagle (*A. repax orientalis*), snake-eating eagle (*circetos ferox ferox*), golden and common Merops, hoopoe, red-fronted serin, field sparrow, larks;

In the floodplains of the river Duraji, Sultan's chicken, Iranian and Caspian Remizinae. There are many water-loving birds near water bodies, especially in Azerbaijan. For rare migratory and nesting birds (pelican, flamingo, swan, and others) the Kizil-Agachi reserve was established;

From mammals, rodents are typical: hares, hamsters, sandpiper, transcaucasian hare, short-eared hedgehog, from carnivores - *Vormela peregusna*, Caucasian wolf (*Canis lupus cubanensis*), jackal, field fox (*Vulpes vulpes alpherakyi*), striped hyena, jungle cat (*Chaus chaus*), especially worthy of attention is gazelle (*Gazella subgutturosa*), which became extinct within Georgia and is currently being reintroduced. Wild boar, red deer, lynx, badger, and common hedgehog live in floodplain forests (4).

Conclusion:

Our study presents the peculiarities of the deserts and semi-deserts of the Caucasus, the diversity of plants and animals and their distribution.). A detailed faunal survey of the arid regions of the Caucasus fully confirmed the presence of the Mtkvar Arax depression and in the Middle of the river Araxis the diversity of desert taxons characteristic of Iran-Turanian deserts.

The study and protection of the biodiversity of the deserts and semi-deserts of the Caucasus is an actual problem today. It is necessary to determine the main causes of desertification, and their contributing factors, and to develop practical measures necessary to combat desertification.

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