

EARTH SCIENCES

Gakayev R.A.

PLANT ECOSYSTEMS OF HIGHLAND LANDSCAPES OF THE CHECHEN REPUBLIC AND THEIR CURRENT STATE

**Gakayev R.A., Russian Federation, Chechen State University,
Scientific Laboratory "Landscape Research"**

Abstract

Highlands occupy the south-western, the highest part of the Chechen Republic, they are formed by the links of the Lateral ridge and intermountain depressions located between them and are represented by various ecosystems and vegetation. The general strike of the high mountains of the Eastern Caucasus is from the west-north-west to the east-south-east. Within Chechnya, the upper reaches of the Argun, Gekhi and other river basins are confined to the highlands.

Keywords. Relief, ridge, high-altitude belt, air masses, vegetation.

The landscape diversity of the highlands of the Chechen Republic is associated with complex paleogeography, mountain-forming processes, glaciation, interaction with flora and fauna of many biogeographical regions, fluctuations and climate changes that have resulted in a great variety of geological and geomorphological conditions, relief character, local air mass circulation formation, including seasonal variability of weather and climate conditions. Orientations of mountain ranges, exposures of slopes, soils and hydrological features of the substrate further detailed the geography of the vegetation cover.

With the increase in terrain in the mountains under conditions of a more severe climate, the influence of rocks and their bedding on the formation

of soils and plant communities is sharply reduced. The main role here is played by temperature. Usually the southern slopes are steeper than the northern ones. Snow melts earlier on them and the surface dries faster. If on the southern slope typical feather grass and wormwood prevail, then on the northern slope - timothy, meadow grass, mountain clover, cuff and other moisture-loving plants. Varieties of mountain soils and plant communities are formed as a result of prolonged exposure to complex interrelated natural conditions. Therefore, each type of soil corresponds to certain natural conditions in which it was formed, and a certain vegetation (grassy, forest-bushy) grows on the corresponding varieties of soils. In the nature of the mountains, there is a direct relationship between parent rocks, soils and vegetation. This is especially evident in the natural conditions of the mountain relief [3].

Humidification of rocks increases their mass and accordingly the action of gravitational forces on them, which is accompanied by a weakening of the strength of structural bonds in them, a change in the consistency of soils to plastic and even fluid. This all leads to a decrease in the strength (friction and adhesion) of rocks on the slope. With the rainfall nature of precipitation, only a small part of the moisture is infiltrated, and most of it quickly flows down the slope. Also, the formation of mudflows, is associated with anthropogenic activities in mountainous areas, construction and inordinate grazing. The regime and the amount of precipitation are affected by two factors: atmospheric circulation and the presence of high ranges of the Caucasus Mountains, increasing precipitation of atmospheric precipitation in its mountainous part. Precipitation in the seasons is characterized by great unevenness, primarily due to the intrusion into its limits of the moist air masses that the Atlantic cyclone brings [1].

The change in the vegetation cover from north to south in the republic does not occur from changes in hydrothermal conditions, depending on latitude, but depending on changes in altitude, so it will be more correct to name the successive regions of the vegetation cover not by zones, but by high-altitude belts . In the republic this change of regions goes from the north to the south in the reverse order: from semi-desert plains to forest and meadow in the mountainous part.

The most common altitudinal belts of vegetation in high-altitude conditions are belts of subalpine and alpine vegetation, with some inclusions of the forest belt and vegetation of intermountain hollows (picture).

The subalpine vegetation belt (subalpine meadows) occupies heights ranging from 1300-1400 m and up to 2000-2500 m. On the slopes of northern exposures, the boundaries of the subalpine belt are reduced, and on the slopes of the southern exposition - elevated. The subalpine belt is a meadow. Not

infrequently there are also thickets of rhododendron, confined to the boundary between the subalpine and alpine belts. This rhododendron is Caucasian with evergreen leaves. Subalpine meadows are taller than Alpine meadows, and very bright. Among the tall grass is sorrel alpine, Lobel's chieftain. But the typical high-grass for the subalpine belt is not typical. Characteristic are mixed-grasses and sedge meadows. Here the fescue is variegated, the fire is variegated, the bent grass, the reed. There are almost pure pestrohovsinichniki, in which 80% is fescue. Polovitsa grows on humid places, and reed grass grows on stony slopes. The most common kinds of herbs are up to 50. Often sedge pechalnaya forms grass-sedge associations. A colorful background of herbs throughout the summer creates a large-flowered bukovitsa, pink peretum, wild cherry, oriental elephant, Caucasian scabbio, Caucasian buttercup, Ruprecht primrose, bathing-house, types of bells [2,3].

Alpine meadows grow in more severe climatic conditions at altitudes from 2600m to 3800m, sometimes up to 4000m. Alpine herbs have shortened stems, small leaves, well-developed root system and bright flowers. Most alpine grasses are perennial, they tolerate low temperatures well, some can continue to vegetate even under snow.

The peculiarity of alpine meadows is that they consist of grass and sedge grasses, which form the roots of dense sod. Among the grasses there are widespread bonfire, fescue, tonkonog, bluegrass, and from sedges - sedge pyrenean, compact sedge, sedge volosovidnaya, sedge dark-clad. There are also blue gentians - beautifully blossoming alpine grasses. In alpine carpets the predominant role is played by motley grass, and cereals are found to a lesser extent. Widespread carpets from a highland dandelion, sedges, cuffs, tentacles, as well as a bell, Veronica, forget-me-nots.

Directly at the edge of the snow, lying islets, a special type of carpets from alpine buttercups with an admixture of primrose, grains and others develops.

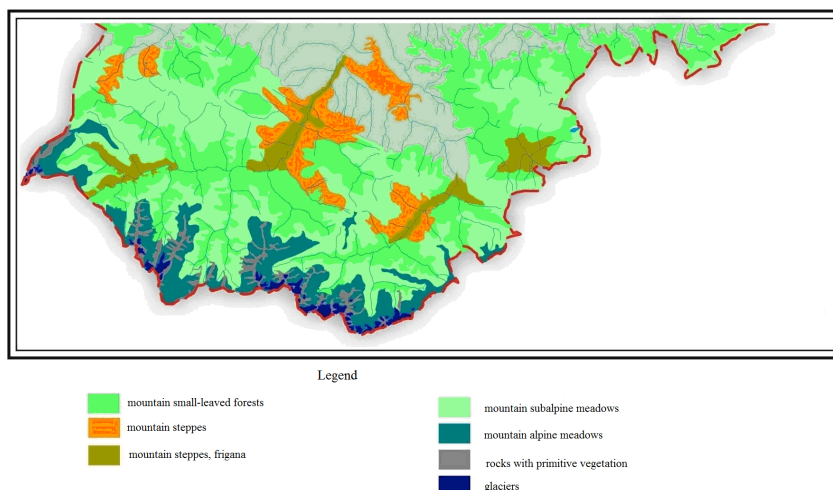
Alpine carpets are transformed into subnival vegetation on primitive soils formed among rocks, debris and placers of rocks. Soils lie here in separate areas, often covered with moss and lichens. In the subnival zone dominate saxifrage Ruprecht, grains, Veronica, Georgian pappa, Pyrethrum Dagestan, Krestyak cross. There are species similar to the Arctic. In the composition of herbs and plants of the subnival part, species that have formed and are found only in our republic grow - these are the endemics of Chechnya. These include: the saxifrage of Haradze, the primroses of Ceylam, and the valerian of Arsenal.

Typical is forest vegetation: dark coniferous forests are represented in the west, which turn into coniferous forests, and on the upper border of the forest into small-leaved forests.

Birch forests stretch along the middle mountains and slightly higher than the torn sections from the western to the eastern border of the republic. Birch forests are widespread in the upper reaches of Fartanga, Chanty-Argun and Sharo-Argun. Birch forests are formed, on the northern macroslopes of the Lateral, Rocky and Andiysky ridges, the ruptured areas are found on the northern macroslopes of the Pasture ridge. In the Black Mountains, on the Andian and Rocky ridges, birch forests occupy the adhering parts of the slopes, forming the upper boundary of the forest. The lower border of the Bereza forest descends to 1500 m on the Pasture Ridge and up to 2000 m on the Skalist. On the side ridge, the lower part of the border of birch forests passes at an altitude of 2100-2200 m. The upper boundary on the side ridge reaches a height of 2500 m.

Birch forests are complex and deeply wedged into the lower vegetation formations: on the side ridge to the strip of pine forests, and to the north of the Rocky Range to the strip of maple and beech forests. Wedged birch forests and up into the subalpine and alpine meadows. Birches in Chechnya are represented by the Radda birch, a birch tree, a birch birch tree. Birch weeping is widespread everywhere, especially on the side ridge. Birch Radde is found more often on the Rocky Ridge, on limestone-dolomite substrates. In the lower parts of the strip of birch trees, the trees are more high-bones, in the upper parts - thin-barreled with curved trunks (crooked). Birch woodlands are confined to mountain "trays", concave forms of terrain such as mountain beams, along which descend snowfields and adversely affect birch forests. Together with the birch - sporadically or in separate small plots - alder grows gray and black, aspen, juniper hemispherical, rhododendron Caucasian. In the underbrush of birch forests there are species of honeysuckle, currant Biberstein, willow goat, willow five-tychin, and from bushes cowberry. In the grass cover - meadow motley grass and high grass from reed reed.

On the upper border of the forest are often found alshanniki from alder black and alder gray. These two species have the largest amplitude of growth at altitude. Alder grows both in the wet floodplains of the plains, and at the upper limit of the forest, but it is always confined to highly humid places.



Picture. High-altitude vegetation belts.

Coniferous forests in Chechnya are scarce, mostly pine forests. They are concentrated near the southern border of the republic, in the interfluvium of Chanty-Argun and Sharo-Argun. And only in the extreme south-east of the republic significant areas of pine forests are located in the basin of Sharo-Argun, on the parallel of the village of Botlich. The pine occupies the northern macroslopes of the Lateral and southern slopes of the Rocky Range. Pine forests are represented by a single species - the pine of Sosnovsky (formerly called the pine hooked). The pine forests are best preserved on the northern macroslope of the Lateral ridge in the Azi-Chan gorge (Guloy-hi) [4].

Pine together with other deciduous species forms a leafy pine stand with participation of the Caucasian lime, hornbeam, rock oak, Litvinov birch, gray alder, ordinary mountain ash, high mountain maple, oriental beech, willow goat. On the slopes of the western, north-western and northeastern orientations, the oak of the rock yields the place to the oak tree. On the border with Georgia, on the side ridge, a large oak oak is sometimes mixed. Significant areas of lime among pine forests are common near the southern border.

In the formation of the landscapes of the intermontane basins of the high-mountainous part of the republic, the role of the Rocky Range, which blocks the way to the northwestern and northern moisture-bearing air masses, is significant. A certain role is played by Lateral and other ridges, which protect the basins from other, less humid air masses. The average annual precipitation

is 350-400 mm., The average annual air temperature is + 8.50 ° C. Exceptional air dryness, a large number of sunny days a year, small clouds and insignificant number of days with fogs and precipitation are typical for arid climate of "rain shadows" of intermontane basins .

Specific conditions of relief, climate cause the formation here of a special soil-vegetation cover and fauna. Soils, depending on the location on the bottom, on the slope of the northern or southern exposure, differ: from light chestnut and chestnut to mountain-steppe chernozem. In more humid places - meadow-steppe soils. The peculiarity of the intermontane valleys is the change of landscapes from the bottom and higher along the slopes, as the height increases. At the bottom is a mountain-semi-desert landscape. Precipitation is less than 350 mm., Soils are light chestnut, frigid shrub thickets (astragalus, buckthorn, barberry) [1].

In the high-mountainous regions of Chechnya, endemics are widespread, both in the Eastern Caucasus, the Greater Caucasus, and in the Chechen Republic, which are currently experiencing increasing anthropogenic pressures in the form of overgrazing, unsystematic logging of forests, laying and expanding road traffic.

In the considered landscapes, mudflow processes, rockfalls, talus, less landslide processes are facilitated by the landslide processes, the development of which is promoted by geomorphological features: a straight erosion-tectonic relief with a clear morphological reflection of structural elements in it, disturbed Neogene's new folding, the terrain of the relatively young, actively forming in the confrontation of intensive modern uplifts and progressive erosion, with increased precipitation from 800 to 1000 and more mm. per year [4,5].

The consequences of neglect of nature are not immediately apparent. Only when it is discovered that the ecological situation is approaching the catastrophic, the society begins to sound the alarm. Anthropogenic impact on high-mountain landscapes has led to their transformation into agricultural landscapes. In turn, this affected the transformation of the components of the landscape, both the geomorphological situation, the soil cover, and the transformation of the vegetation cover in some areas. In addition to anthropogenic impact, climate warming plays a big role, in some places it aridisation, which directly affects the current state, the transformation of plant communities, their reproduction and sustainable development.

References:

- [1] Bayrakov I.A. The current state of landscapes and ecological zoning of the territories of the Chechen Republic. News of higher educational

- institutions. North-Caucasian region. Series: Natural Sciences. 2005. No. S6. P. 51-57.
- [2] Gageeva Z.Sh. Mountain landscapes: problems of modern use and prospects for further development. In the collection: Science, education, culture and information and educational activities - the basis for sustainable development of mountain areas. Materials of the VIII International Scientific and Practical Conference. 2015. P. 293-296.
- [3] Gageeva Z.Sh., Kerimov I.A. Landscape small-scale mapping and sustainable development // WIT Transactions on the Built Environment 3rd International Conference on Evaluation, Monitoring, Simulation, Management and Remediation of the Geological Environment and Landscape, Geo-Environment 2008. Ser. "Geo-Environment and Landscape Evolution III: Evolution, Monitoring, Simulation, Management and Remediation of the Geological Environment and Landscape" sponsors: WIT Transactions on the Built Environment. New Forest, 2008. P. 203-209.
- [4] Gakayev R.A. Highland landscapes of the Chechen Republic and patterns of their distribution. The young scientist. 2015. No. 15 (95). P. 327-331.
- [5] Gakayev R.A. Anthropogenic landslide formation in residential landscapes of the Shatoi Basin. In the collection: Sergeevskie readings. Engineering-geological and geoecological problems of urban agglomerations. Materials of the annual session of the Scientific Council of the Russian Academy of Sciences on the problems of geoecology, engineering geology and hydrogeology. 2015. P. 230-234.