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## Description of geographical climate factors of high mountains in training

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### Abstract

This article describes the geographical climatic factors of high mountains in the training of athletes. It also covers the impact of geographical and climatic factors on the movement, body, breathing, and altitude of athletes to become champions.

**Keywords:** Sport, geografiya, balandlik mintaqalari, harorat, namlik, quyosh nuri, atmosfera bosimi.

### 1.1. Introduction

During the stay in the mountains and during sports, the human body is affected by something called abiotic, that is, environmental factors that are not related to living matter. The main ones are climatic conditions that have physiological effects. They depend on the altitude of the earth, the level of distribution of the relief and other physical and geographical features.

Characteristic factors of mountain climate are decrease in atmospheric pressure, sudden changes in daytime and nighttime temperatures, low absolute humidity, intense sunlight, strong winds that enhance the cooling effect, high air ionization with negative or positive predominance. charged ions, as well as other insufficiently studied physical and chemical modifiers.

They all act together in the body, not alone, under potential stress, and their combination is different. This is why a person tolerates the same elevations in different mountainous areas and conversely the same functional shifts can be recorded at different altitudes. This can be explained by at least two reasons:

- First, the combination of specific influences and environmental factors of different mountainous areas with specific geographical features,
- Second, wide individual differences in resilience to these conditions.

### 1.2 Material and Method

It is known that there are people who are highly resistant to oxygen deficiency and other extreme environmental factors. However, even among athletes, there are individuals with reduced resistance to hypoxia. Let's take a brief look at the characteristics of the individual features of the mountain climate.

**Temperature factor.** With increasing altitude, the average annual air temperature gradually decreases by 0.6 ° C for every 100 m, and in different seasons and in different geographical areas it does not decrease at the same rate: in winter it is slower than in summer, respectively 0.4 ° C and 0.6 ° C. The average summer temperature drop in the Caucasus is 6.3-6.8 ° C, while in the Pamirs it is up to 9 ° C. According to the international standard atmospheric table, which is close to the average annual conditions at moderate latitudes, the average air temperature at 3000 m is minus 4.5 ° C and at 4000 m it is minus 11 ° C.

**Humidity.** This is the amount of water vapor in the air. The partial pressure of water vapor is, as a rule, about 1% of the pressure at sea level. And since the pressure of saturated water vapor is determined only by the air temperature, the partial pressure of water vapor is also small in mountainous areas where the temperature drops. At an altitude of 2000 m, the humidity is twice less than sea level, and at high mountain altitudes the air is almost "dry". This condition

Has three different meanings: it affects the value of solar radiation, alters the state of solar radiation, and increases fluid loss by the body, which occurs not only through evaporation from the skin surface, but also in the lungs during hyperventilation. It is therefore important to ensure an adequate drinking regimen in the mountains, as dehydration reduces performance.

**Sunlight.** At mountain altitudes, the bright energy of the sun increases significantly due to the large dryness and transparency and low density of the atmosphere. At altitudes of 3,000 m, the total amount of solar radiation increases by an average of 10% for every 1,000 m. The body is exposed to visible (light) and invisible (infrared and most biologically active ultraviolet) rays of the sun. Under the influence of sunlight the body is formed, metabolic processes are activated, immunity is strengthened, tissue nutrition, general condition, appetite is improved, sleep is improved.

The sun has an antitractive and hardening effect, so the sun treatment method is used. However, excessive exposure to sunlight can lead to sunburn, sunstroke, cardiovascular and nervous diseases, exacerbation of chronic inflammatory processes. With sunrise, an increase in the biological effectiveness of ultraviolet radiation can lead to skin erythema, keratitis (inflammation of the cornea) and with prolonged exposure - skin cancer and its aging, cataracts. At high doses of ultraviolet radiation, immunity is weakened.

**Atmospheric pressure.** As the altitude increases, the atmospheric pressure decreases, while the percentage of oxygen and other gases remains constant in the atmosphere. At an altitude of 3,000 m, atmospheric pressure decreases by 31% and at an altitude of 4,000 m by 39% compared to sea level, and at this altitude it rises from high latitudes to low, and in hot weather it is usually higher than cold.

Decreased sunlight leads to hypoxemia and oxygen saturation of hemoglobin. Deficiency of O<sub>2</sub> enters the tissue and hypoxia develops. The body seeks to normalize oxygen delivery using three basic reactions or adjusts itself to a "starved oxygen diet".

Only some experts believe that altitude acclimatization is mainly an adaptation to hypocapnia. Many authors considered hypoxic hypoxia as a dominant factor in mountain climates and did not take into account the complex effects of environmental factors on humans, which also affected sports performance.

However, a number of studies on climatophysiology prove that the same vegetative reactions to the influence of major climatic factors were found at the same altitudes but in different mountainous areas. There are data confirming that people do not tolerate equal heights in different mountainous areas. Conversely, the same functional shifts can be recorded at different levels. This is due to two reasons: the specific impact on people in different mountainous areas, which have specific geographical characteristics and vary in a combination of environmental factors, and wide individual differences in tolerance to these conditions. In this regard, the rule that the mountain climate has a holistic effect on people was put forward.

### 1.3. Conclusion

In this regard, a multi-component mathematical model has been developed that takes into account the effects of three main factors of the mountain environment on the human body: partial pressure of oxygen, temperature and humidity. This allowed us to express the integral effect of these factors in the form of a single bioclimatic indicator called "effective

altitude".

It turns out that the "effective height", as a rule, does not correspond to the absolute height and is very sensitive to changes in its structural factors. Due to the constant change of the external environment in the mountain, man undergoes figurative vertical movements comparable to swimming on a giant swing. The use of the criterion of "effective altitude" allows to more accurately identify regional differences in the level of occurrence and development of mountain pathology, rather than partial pressure of oxygen, and to determine the types of mountainous countries by this criterion.

In short, the geographical climatic factors are necessary for the training of athletes, for their preparation for various sports competitions, and for their success. Therefore, it is desirable that not only geographers, but also physical education coaches and scientists know the science of geography.

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